APPENDICES

APPENDIX A

PRE-HARVEST INSPECTION AND NOTICE OF PREPARATION COMMENTS

APPENDIX A

Pre-Harvest Inspection Comment Letters

State of California
Department of Fish and Wildlife

Memorandum

Date: September 15, 2016

To: Forest Practice Manager
North Coast Region Office
California Department of Forestry and Fire Protection (CAL FIRE)
135 Ridgway Avenue
Santa Rosa, CA 95401
SantaRosaReviewTeam@fire.ca.gov

From: Mr. Scott Wilson, Regional Manager
California Department of Fish and Wildlife-Bay Delta Region, 7329 Silverado Trail, Napa, CA 94558

Subject: California Department of Fish and Wildlife Pre-Harvest Inspection Report for Timber Harvesting Plan/Timber Conversion Plan (THP/TCP) 1-16-079 NAP "Le Colline"

PROJECT DESCRIPTION

Timberland Owner/Plan Submitter:	Le Colline LLC and Cold Springs LLC
County and General Project Location:	Napa; 0.5 miles south of the town of Angwin, CA
7.5 Minute Quadrangle(s):	St. Helena
CALWATER Planning Watershed:	Conn Creek (2206.500305)
Legal Description:	Mt. Diablo Base and Meridian; T8N, R5W, Section 8; Assessor Parcel Numbers 024-300-070, 024-300-071, 024-300-072, and 024-340-001
Total Area:	36.0 acres
Silviculture Treatments:	Conversion (32.0 acres), Non-Timberland Area (4.0 acres)
Winter Operations:	Yes, per winter operations plan
Erosion Hazard Rating:	Moderate
Harvest Methods:	Ground Based • Tractor, including end/long lining • Rubber tired skidder, Forwarder
Proposed In-Lieu Practices and Exceptions:	None proposed
Lake and Streambed Alteration Agreement:	None proposed

Pre-harvest Inspection (PHI) Date and Attendees:	<u>August 29, 2016</u> • Scott Butler, Registered Professional Forester (RPF) • Steve Smith, RPF • Kimberley Sone, CAL FIRE • Jim Wright, Cal FIRE • Dan Stapleton, Cal FIRE • Kevin Brown, Regional Water Quality Control Board • Dave Longstreth, California Geologic Society (CGS) • Kevin Doherty, CGS • Jeanne Wetzel Chinn, California Department of Fish and Wildlife (CDFW) • Amanda Culpepper, CDFW • Angela Moran, CDFW • Brian Bordona, County of Napa Planning Department • Wesley Salter, County of Napa Planning Department • Dave DiCesaris, Landowner • Analise Rivero, Analytical Environmental Services (AES) • Ali Middlekauff, AES • Diane Wilson, Vineyard Engineering Consultant • Drew Aspegren, Vineyard Engineering Consultant

This report includes CDFW's recommendations based on the review of the 1-16-079 NAP Le Colline Timber Harvest Plan/Timber Conversion Plan (THP/TCP) and participation in the pre-harvest inspection (PHI). These recommendations are focused on avoiding or minimizing the proposed project's effects on fish, wildlife, and botanical resources. CDFW's recommendations do not necessarily reflect the opinion of other government agencies. CDFW's participation in the PHI was a reconnaissance level survey without quantitative sampling of fish, wildlife, aquatic invertebrates, rare and endangered plants, sediment, large woody debris, snags, canopy, vegetation composition, or stream flow.

CAL FIRE, acting as lead agency, is preparing a draft Environmental Impact Report (draft EIR) to analyze the potential environmental impacts of the Le Colline Vineyard Project under the California Environmental Quality Act (CEQA). CDFW reviewed the Notice of Preparation (NOP) and Administrative Draft EIR for the proposed project and submitted a comment letter dated May 10, 2016. The focus of this PHI report is on avoiding or minimizing impacts to fish and wildlife resources from proposed timber harvest activities.

DESCRIPTION AND SETTING

The THP/TCP is located on an 88-acre property within Napa County, approximately 0.5 miles south of the Town of Angwin (Figure 1). Under the THP, the project proposes to harvest 32 acres of timberland and clear 4 acres of existing grass and brush (non-timberland). Proposed future land uses, which will be analyzed under the draft EIR, include vineyard blocks, internal farm avenues and space for vineyard maintenance. The net vineyard area would be approximately 28 acres. The remaining 52 acres of the property would not be impacted by the project.

The THP area includes various stages of Douglas-Fir Forest Alliance developing over Mixed Manzanita-Chamise Chaparral Alliance, a dense stand of Douglas-Fir Forest Alliance, Mixed Oak Alliance, California annual grassland, and a rock outcrop. Several large ponderosa pines

are scattered throughout the southern portions of the property. Vegetation ranges from 20 to 120 years old, with evidence of past fire exposure in older vegetation types. Density and plant succession vary significantly, and plant succession is evident as conifers grow and capture the light. In the northern portion of the plan area, vegetation conditions show signs of stress as a result of shallow soil and drought, and the southern portion of the plan area has healthier vegetation where streams provide moisture. Elevations within the THP/TCP range from 1,450 to 1,700 feet above sea level with slopes ranging from 2 to 50 percent, and the project area slopes are primarily under 30%.

The THP/TCP is within the Conn Creek Watershed, a sub-watershed of the Napa River Watershed, and an Anadromous Salmonid Protection (ASP) watershed, which supports anadromous salmonids. Conn Creek is a Class I watercourse that drains to Lake Hennessey and the Napa River. The Napa River is listed as impaired under the Clean Water Act Section 303(d) due to pathogens, sediment and nutrients. The project area is located approximately 5.5 miles above Conn Dam and Lake Hennessey. Conn Dam is a total barrier for anadromy precluding access for salmonids to Lake Hennessy and upstream watercourses. As a result, the Conn Creek Watershed is considered to be outside of the Central California Evolutionarily Significant Unit (ESU) for coho salmon (*Oncorhynchus kisutch*) and steelhead (*Oncorhynchus mykiss*). Moreover, the THP/TCP is not located in a State Planning Watershed with populations of anadromous salmonids listed as threatened or endangered under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA).

FIELD REVIEW AND TIMBER HARVEST PLAN ASSESSMENT

Field Assessment

During the PHI, the Review Team examined existing roads, proposed road construction areas, four proposed landings, and proposed fire hazard reduction areas. Special-status plant species were observed, as well as deer tracks, bear scat, fox scat in numerous locations, a rocky outcropping, five bat habitat trees, Class I, II, and III watercourses and Watercourse and Lake Protection Zones (WLPZs), vineyard blocks, two attenuation basins, three sediment basins, and two swales.

Roads, Landings, and Fire Hazard Reduction Areas

The Review Team began at the landing in the center of Block B and walked the eastern side of the THP along the proposed road construction area above a line of houses (Figure 1). Bushes in this area would be removed, and trees would be limbed to a height of eight feet for fire hazard reduction. The Review Team and the RPF discussed and agreed to rock the proposed road. Two large wildlife trees – Tree A (Figure 2), east of Block B along the proposed road, and Tree B (Figure 3), just west of Block B in a scarp area – are both in the fire reduction area, and would be preserved with the bottom 8 feet de-limbed to minimize ladder fuels. During the PHI, the landowner agreed to preserve an additional wildlife tree, Tree C (Figure 4), on the northwest corner of Block A2. CDFW questioned the need for the large fire hazard reduction boundary surrounding Block B. Following the PHI, CDFW and the RPF agreed to reduce the fire hazard reduction area by four acres around Block B and leave it intact as habitat for wildlife species. CDFW recommends removing the fire hazard reduction area in the south and southwest area surrounding Block B. Figure 5 is a map showing wildlife trees A, B, and C, the reduced fire hazard reduction area around Block C, and should be incorporated into the THP in Section II to replace the Habitat Enhancement Plan map (**Recommendation 1**).

South of Block B and above the newly constructed road is an area that the THP designates as an “erosion feature.” The Review Team examined this area, which CGS considers to be a

landslide area (Figure 6) with a scarp that needs to be addressed in the THP.

Removal of Water Lines

The Review Team found old water lines at the rocky outcropping (Figure 7) leading to Conn Creek. The rocky outcropping is 85 feet above Conn Creek on the west side of the plan area. The water lines were also found above the riparian zone in several locations on the west side of A1, along with an old camp containing blankets, clothing, a tent, garbage, plant pots, water lines, and fertilizers. CDFW recommends all water lines be taken out of the Conn Creek riparian zone (**Recommendation 2**).

Habitat Enhancement Plan

The Review Team walked along the western boundary of the proposed 12-acre Habitat Enhancement Plan area, inspecting existing conditions (Figure 8). The RPF proposes to girdle one tree per acre in areas where there are no snags to create more snags for wildlife use. The RPF also proposes to plant 1,000 ponderosa pine seedlings under the existing chemise/manzanita chaparral alliance native habitat; the seedlings would be shaded by the brush and receive enough groundwater to survive without watering; a twenty-five percent survival rate is expected. Planting these seedlings would be disruptive to an intact native habitat. CDFW recommends not disturbing the established natural chemise/manzanita chaparral alliance habitat (**Recommendation 3**).

Watercourses, Swales, and Basins

The Review Team evaluated an unnamed Class III watercourse on the property boundary at the northeast corner of Block A1. The delineation of this watercourse alignment is incorrect in the THP. The boundary flagging had been removed along this watercourse and also along Conn Creek. The Review Team worked with the RPF to correct the delineation of the Class III watercourse northeast of Block A1 and accompanying buffer zone, and worked with the RPF's assistant to clarify the WLPZ buffer for Conn Creek. The description of this feature should be updated in the THP to reflect the correct watercourse alignment, and the appropriate WLPZ should be established and flagged in the field. Flagging should be replaced for Conn Creek and all unnamed Class III watercourses where it is missing (**Recommendation 4**).

An issue of concern raised by CDFW and other Review Team members during the PHI was the treatment of instream basins, such as attenuation and sediment basins, how these basins should be classified, and what WLPZ protections should be applied to these features. Two Class III watercourses with attenuation basins were examined by the Review Team. The Review Team also inspected two Class III watercourses with sediment basins on the central western portion of Block D1. The basins on all of these Class III watercourses are instream basins, that is, they are in-channel basins that attenuate stormwater, or sediment and flood flows, on these watercourses. However, the THP does not treat these features as requiring Class III WLPZ protections. Class III protection measures should be extended to include each of the basins (**Recommendation 5**).

The Review Team observed a spring, and beneath it a large wetland feature between Blocks E1 and E2.[1] The grassy meadow adjoining the west boundary of the wetland (Figure 9) is not proposed as part of the conversion and would remain undisturbed. The THP/TCP map shows a gap between the bottom of the wetland and the beginning of the Class III watercourse below

[1] This feature is termed a "wetland seep", with a picture showing hydrophytic plants, in THP Appendix D, Figure 5.

(Figure 10). The plan proposes to harvest and convert this area as part of the vineyard. However, there is hydrological connectivity between the wetland and Class III watercourse; in other words, the wetland clearly flows into the watercourse. The THP should be revised to designate the area directly downstream of the wetland as a Class III watercourse, which provides connectivity between the wetland and Class III channel downstream; therefore, Class III WLPZ buffers should be applied in this area (**Recommendation 6**).

If this area is proposed to be converted to a vineyard or otherwise modified, the RPF should consult with CDFW regarding the need for notification under the Lake and Streambed Alteration Program. Federal Clean Water Act exemptions for timber activities may not apply to proposed vineyard conversion activities in this wetland area; therefore, the RPF may wish to consult the U.S. Army Corps of Engineering regarding the need for a wetland delineation and/or Section 404 permit.

Pallid Bat and Townsend's Big-Eared Bat

Pallid bats (*Antrozous pallidus*) are a state species of special concern. Townsend's big-eared bat (*Corynorhinus townsendii*) is currently listed as a candidate species under CESA[2] and is also a species of special concern. Timber harvest plans must contain operational provisions that avoid take as defined by and consistent with the candidate status of Townsend's big-eared bat under CESA, and avoid take of state species of special concern.

Within the THP area, there are five trees with exfoliating bark that are suitable day and night roosting habitat for pallid bats and Townsend's big-eared bats, as well as a rocky outcropping with cavities between the rocks that are suitable roosting habitat for pallid bats. The rocky outcropping is 85 feet from Conn Creek and is not in the proposed conversion area. Of the five suitable bat roosting trees, Trees #1 (Figure 11) and #5 (Figure 12) will be preserved, Trees #2 (Figure 13) and #4 (Figure 14) in Block E2, and Tree #3 (Figure 15) in Block D1 are proposed to be removed.

THP Appendix R provides acoustic and sunset fly-out (emergence) survey results, criteria for additional surveys prior to tree removal, and measures for protection of bat species prior to and during tree removal. The rocky outcropping and bat tree surveys detected pallid and Townsend's big-eared bats as well as other bat species. The first round of bat surveys detected special-status bats, but did not confirm roosting in trees or the rocky outcropping (i.e., findings were inconclusive). Further acoustic and sunset fly-out surveys will be performed a maximum of three days prior to construction with improved survey recording devices set closer to potential roosting areas and with microphones placed at higher elevations for improved sonar detection accuracy.

CDFW provided recommendations during First Review and the PHI to improve bat survey methods to provide more conclusive data. Responses to CDFW First Review questions #12 and #13 were not answered prior to the PHI because the biologists who wrote the Bat Survey Report were not available. The RPF agreed to text changes to THP Section II and THP Appendix R, the Bat Survey Report, to provide better protection of Townsend's big-eared bats. CDFW recommends that an additional acoustic and sunset fly-out survey be performed a <u>maximum of three days</u> prior to construction. (**Recommendation 7**). Positive survey data should be sent to California Natural Diversity Database (CNDDB).

[2] The California Fish and Game Commission voted on August 25, 2016 not to list Townsend's big-eared bat; however, the candidate status and protections under CESA remain in place until findings have been issued.

Wildlife Corridor

Block E2 includes a late seral forest of large and mid-size trees with little to no undergrowth (Figure 16). A grassy meadow and wetland adjoin Block E2 on the west side with a swale/Class III watercourse below the wetland going through E2 and connecting with a clearly defined Class III watercourse. Besides containing Bat Trees #2 and #4, this Block shows signs of being a significant wildlife corridor with bear and fox scat, and signs of raptors use with bird wash and prey remains surrounding the base of one tree (Figure 17), as well as several suitable perch trees and nesting trees. Given wildlife signs, mature forest characteristics, low ground cover/high visibility, and nearby meadow and wetland habitat, Block E2 appears to be an important area for wildlife use and movement. CDFW recommends further consideration of Block E2 as a wildlife corridor in the draft EIR, including application of feasible mitigation if this area is proposed to be converted to vineyards (**Recommendation 8**).

Northern Spotted Owl

Northern spotted owls (*Strix occidentalis caurina*) are listed as federally endangered, a species of special concern, and candidate for listing under CESA. Two historical activity centers (NAP0014 and NAP0028) are within 1.3 miles of proposed harvesting activities. The THP contains 3 acres of northern spotted owl nesting/roosting habitat and 19 acres of northern spotted owl foraging habitat, which will be converted to vineyards, which is over half of the 36-acre project. A pair of northern spotted owls were detected in activity center NAP0014 in all three 2016 surveys. A northern spotted owl was detected in 2015 in NAP0028 during a CAL FIRE survey. There have been no barred owl detections in this area; barred owls are an invasive competitor that have displaced northern spotted owl throughout much of their range. CDFW's 1st Review question #14 inquired whether or not cumulative effects of other conversions in this area had been considered. The reply was non-responsive, indicating "[t]he property owners have no control over future land-uses of the landscape outside their ownership," and they knew of one other potential conversion project within 1.3 miles of this project so it was, "therefore, not addressed for the LeColline Project." CDFW has provided a map (Figure 21) showing other conversions in the area, excluding the Ciminelli (1-16-044 NAP) and this THP, with northern spotted owl activity centers in large circles, and positive detections of northern spotted owls in dots. Other recent conversions in the area, which are part of the public record, include 1-00-213 NAP, 1-00-447 NAP, 1-01-287 NAP, 1-01- 409 NAP, 1-01-429 NAP, 1-02-203 NAP, 1-03-187 NAP, and 1-13-074 NAP. CDFW recommends a more rigorous evaluation of cumulative effects, including an evaluation of foraging and nesting habitat loss associated with the approved and pending timber conversion projects described above ["reasonably foreseeable projects" as defined in CEQA Guidelines Section 15130(b)(1)(A)], of northern spotted owl habitat be provided in the THP. Such an analysis is also indicated under U.S. Fish and Wildlife Service guidelines (USFWS, 2008) to demonstrate that northern spotted owl habitat quantities will be retained at or above the habitat threshold for take under ESA. (**Recommendation 9**).

Special Species Plants

The Review Team observed pink and yellow flagging in a meadow on the western edge of Block B for protection of narrow-anthered brodiaea (*Brodiaea leptandra*, brodiaea) (Figure 18). Brodiaea is an annual, has a California Native Plant Society status of 1B.2 ("rare, threatened, or endangered in California and elsewhere") and is only visible in spring when flowering. In addition to the flagging, the RPF agreed to place rocks or wood around plants for further protection. The Review Team also observed the perennial Napa false indigo (*Amorpha californica* var. *napensis*) (Figure 19), also listed by the California Native Plant Society as 1B.2, in two locations; several plants are in an area just north of Block B and south of Winding Way

Road, with another near Bat Tree #5. THP Appendix D, Plate 5, page 51, is a map showing locations of the two special species plants (Figure 20). Currently, Napa false indigo has a five-foot buffer from activities. The RPF explained there is no plan to protect Napa false indigo, as it does well in disturbance. Although a small level of disturbance may be beneficial, extensive disturbance of the topsoil, as frequently occurs during harvesting operations may have an adverse impact on this species. Also, due to extended drought conditions, the plant populations and seed banks may be more spatially extensive than currently estimated. CDFW recommends flagging both plant species, and placing a 25-foot buffer around each area where the brodiaea and Napa false indigo populations are located (**Recommendation 10**). CDFW further recommends placing the narrow-anthered brodiaea and Napa false indigo on the Conversion map and Habitat Enhancement Plan map (**Recommendation 11**).

RECOMMENDATIONS

CDFW is a trustee agency for California's fish, wildlife, and native plant resources (Public Resources Code Section 21000, et seq.), a responsible agency pursuant to CEQA §15381 and §15386, and a Review Team agency under 14 CCR §1037.5(a). In this capacity and in accordance with Forest Practice Rules 14 CCR § 1037.5(f), CDFW recommends feasible and project-specific mitigation measures to be incorporated into the THP.

1. The RPF should replace the fire hazard reduction map in the THP in Section II, page 93 to reflect the revised agreed upon map shown in Figure 5.

2. The property owner should take out all unpermitted water lines in the Conn Creek riparian zone.

3. The RPF should leave the established natural chemise/manzanita chaparral alliance habitat intact, and replace the Habitat Enhancement Plan to reflect no disturbance in this 12 acre portion of the plan area.

4. The RPF should correct the delineation of the Class III watercourse northeast of Block A1 and accompanying buffer zone, and update the THP maps to reflect correct watercourse alignment, and the appropriate WLPZ should be established and flagged in the field. Flagging should be replaced for Conn Creek and all unnamed Class III watercourses where it is missing.

5. The RPF should extend the Class III protection measures to include each of the two attenuation basins and two sediment basins (not including sediment basin C).

6. The RPF should revise the maps in the THP on page 91 and 174 to designate the area directly downstream of the wetland as a Class III watercourse, which provides connectivity between the wetland and Class III channel downstream, and flag with Class III WLPZ buffers.

7. The RPF should include in Appendix R that additional acoustic and sunset fly-out surveys shall be performed a <u>maximum of three days</u> prior to construction, and that positive detections will be sent to CNDDB.

8. The RPF should provide should provide in-depth consideration of Block E2 as a wildlife corridor in the draft EIR, including application of feasible mitigation if this area is converted to vineyards.

9. The RPF shall provide a more rigorous evaluation of cumulative effects, including an evaluation of foraging and nesting habitat loss associated with the approved and pending timber conversion projects described above ["reasonably foreseeable projects" as defined in CEQA Guidelines Section 15130(b)(1)(A)], of northern spotted owl habitat be provided in the THP. Such an analysis is also indicated under U.S Fish and Wildlife Service guidelines (USFWS, 2008) to demonstrate that northern spotted owl habitat quantities will be retained at or above the habitat threshold for take under the Endangered Species Act.

10. The RPF should flag both plant species, Brodiaea and Napa False Indigo, and place a 25-foot buffer around each area where the Brodiaea and Napa False Indigo are located as a buffer to prevent seed impaction and restriction of plant distribution.

11. The RPF should include the special species plants found in the project area, narrow-anthered brodiaea and Napa false indigo, on the Conversion map and Habitat Enhancement Plan map.

Please direct questions or correspondence regarding this memorandum to Ms. Jeanne Wetzel Chinn, Environmental Scientist, at (707) 944-5523 or Jeanne.Chinn@wildlife.ca.gov; or Ms. Randi Adair, Senior Environmental Scientist (Supervisory), at (707) 944-5596.

cc: Scott Butler, RPF
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REFERENCES

Baker, Michael D., et al., Habitat Use of Pallid Bats in Coniferous Forests of Northern California, 2008. Northwest Science, Vol. 82, No. 4, p.269-275

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California Native Plant Society, 2014. Rare and Endangered Plant Inventory, Accessed on September 7, 2016.

Napa County, 2008. Napa County General Plan. June 3, 2008. Available online at: http://www.countyofnapa.org/generalplan/. Accessed on June 21, 2016.

USFWS, 2008. NSO Take Avoidance Analysis and Guidance, For California Coast Forest District and Interior Forest District, Attachments A and B. March 15, 2011.

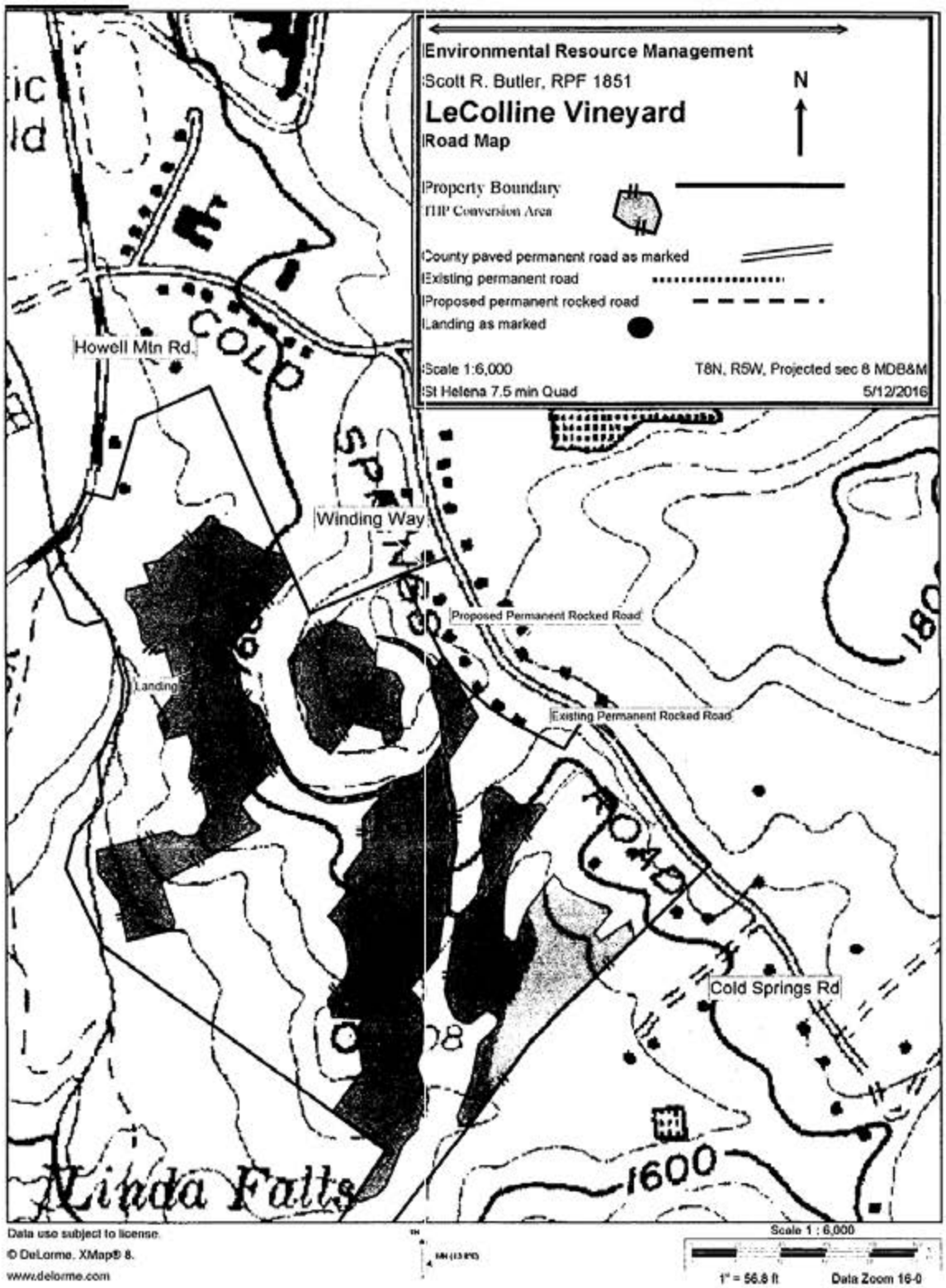

Figure 1 –Map of Project Site
Source: THP, Section II, Page 94

Figure 2 – Wildlife Tree A

Figure 3 – Wildlife Tree B

Figure 4 – Wildlife Tree C

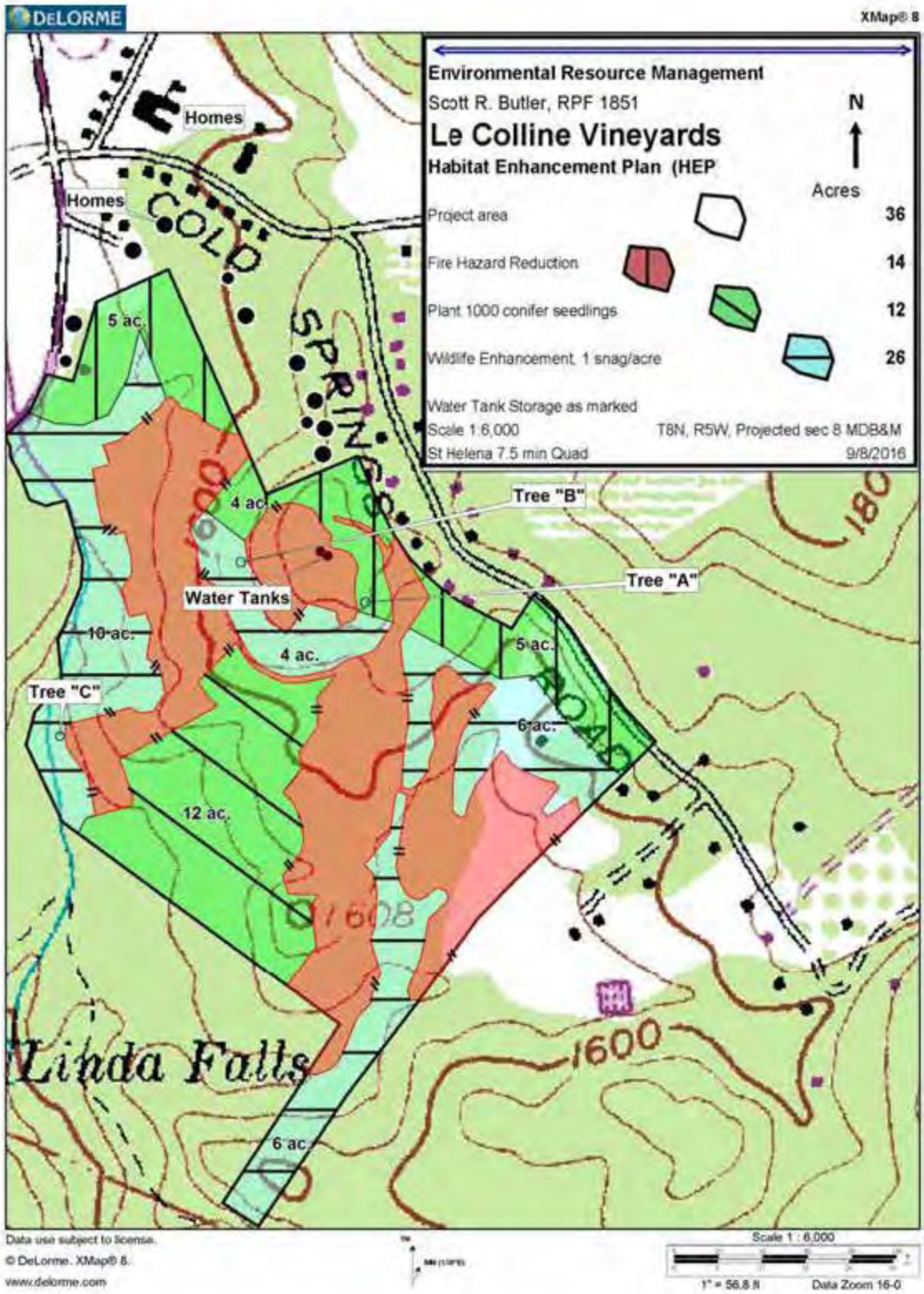

Figure 5 – Wildlife Tree Map and Fire Hazard Reduction Area, Revised 9/8/2016

Figure 6 – Scarp below Block B,
And Above New Road to be Constructed

Figure 7 – Marijuana lines above Conn Creek

Figure 8 – Habitat Enhancement Plan Area

Figure 9 – Grassland Adjoining Wetland

Figure 10 – Hydrologically connected area in E2 between the Wetland and Class III

Figure 11 – Bat Habitat Tree #1

Figure 12 – Bat Habitat Tree #5

Figure 13 –Bat Habitat Tree #2

Figure 14 – Bat Habitat Tree #4

Figure 15 – Bat Habitat Tree #3

Figure 16 – Mature Forest in E2

Figure 17 – Raptor Tree in Block E2

Figure 18 – Narrow-anthered Brodiaea

Figure 19 – Napa False Indigo

Figure 20 – Appendix D, Plate 5, p.51

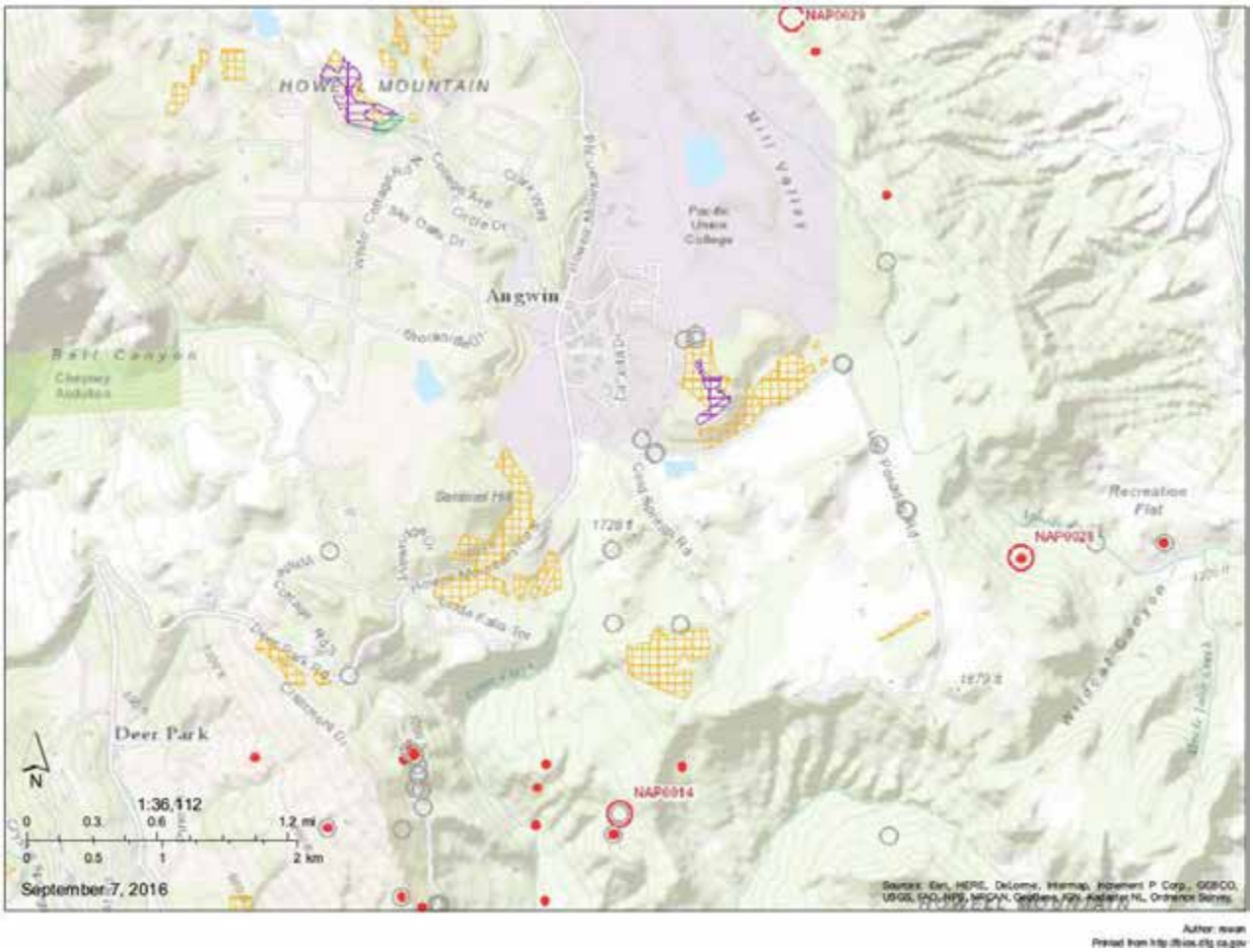

Figure 21 – Map of Other Conversions in the Area in Gold,
Not Included: Ciminelli & LeColline THP/TCPs
Red Circles = NSO Activity Centers
Red Dots = NSO Positive Detections

Source: CDFW 2016. Timber harvest exemption data provided by CAL FIRE

State of California • Natural Resources Agency
Department of Conservation
California Geological Survey
135 Ridgway Avenue
Santa Rosa, CA 95401

Edmund G. Brown Jr., *Governor*
John G. Parrish, Ph.D., *State Geologist*

MEMORANDUM

DATE: September 14, 2016

TO: Helge Eng, Deputy Director
California Department of Forestry and Fire Protection
135 Ridgeway Avenue
Santa Rosa, California 95401

FROM: Kevin Doherty
Department of Conservation
California Geological Survey
135 Ridgeway Avenue
Santa Rosa, California 95401

SUBJECT: Engineering Geologic Review of Timber Harvesting Plan 1-16-079 NAP

Inspection Date: August 29, 2016

County: Napa

Quadrangle: St. Helena 7.5' Quadrangle

Watershed: Conn Creek (2206.500305)

Silvicultural Method: Conversion

Slopes: Gentle to Steep

Logging System: Ground Based

EHR: Moderate

Legal Description: Sec 8 (Projected), T8N, R5W; MDB&M.

Timberland Owner/Plan Submitter:
Le Colline, LLC/Cold Springs, LLC

Participants-Affiliation:
RPF – Scott Butler
Steve Smith – RPF
Dave DiCesaris – Landowner
Diane Wilson – Napa Valley Vineyard Engineering
Drew Aspegren – Napa Valley Vineyard Engineering
Analise Rivero – AES
Ali Middlekauff – AES
Kimberly Sone – Cal Fire
Jim Wright – Cal Fire
Dan Stapleton – Cal Fire
Brian Bordona – Napa County
Wesley Salter – Napa County
Jeanne Chinn – CDFW
Angela Moran – CDFW
Mandy Culpepper – CDFW
Kevin Brown – RWQCB
David Longstreth – CGS
Kevin Doherty – CGS

Area: 32 acres

Geologic Concerns: Potential effects of operations on slope stability; construction of new roads and use of existing roads and skid trails; potential for sediment delivery to Conn Creek and tributaries.

References:

California Geological Survey, 1999 (Revised), Factors Affecting Landslides in Forested Terrain, California Geological Survey (formerly Division of Mines and Geology) Note 50, 5p.

California Geological Survey, 2013, Guidelines for Engineering Geologic Reports for Timber Harvesting Plans, California Geological Survey (formerly Division of Mines and Geology) Note 45, 6p.

Dwyer, M.J., Noguchi, N., O'Rourke, J., 1976, Reconnaissance Photointerpretation Map of Landslides in 24 Selected 7.5 Minute Quadrangles in Lake, Napa, Solano, and Sonoma Counties, California, St. Helena 7.5-Minute Quadrangle: United States Geological Survey, Open File Map 76-74, Sheet 12 of 25, scale 1:24,000.

Fox,Jr., K.F., Sims, J.D., Bartow, J.A., Helley, E.J., 1973, Preliminary Geologic Map of Eastern Sonoma County and Western Napa County, California; USGS Miscellaneous Field Studies MF-483, map scale 1:62,500.

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Gilpin, L.M., 2016, Response to Comments, Engineering Geologic Evaluation, Le Colline Vineyard, APN 024-300-070, 071, 072 & 024-340-001, Cold Springs Road, Angwin, California; dated August 22, 2016.

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Aerial Photographs Inspected:

Napa County, 1973, Black and white photographs, Flight 3575, Roll 1, Frames 240, 241; nominal scale 1:24,000.

Napa County, 1989, Black and white photographs, Flight AV 3566, Roll 10, Frames 14, 16; nominal scale 1:28,800.

WAC Inc., 1999, Color photographs, Flight WAC-C-99, Roll 5, Frames 238, 239; nominal scale 1:24,000.

Google earth images: 38°33'39.63"N and 122°26'17.28"W. Google Earth., 7/9/1993; 8/11/2004; 6/11/2005; 4/24/2010; 7/17/2012; 6/1/2013; 8/23/2014; 4/1/2015; Accessed August 25, 2016.

Lidar Images: 38°33'39.63"N and 122°26'17.28"W. Napa County, LiDAR, 2003, collected by National Center for Airborne Laser Mapping (NCALM); obtained from opentopography.org.

Geologic Conditions:

Timber Harvest Plan 1-16-079 NAP is in an area underlain by Pliocene age Sonoma Volcanics (Fox and others, 1973, Figure 1). It is described as locally welded or partially welded pumicitic ash-flow tuff, with intercalated bedded agglomeritic tuff, andesitic or basaltic lava flows, tuff breccia, bedded tuff, and pumicitic tuff. PHI observations of weathered bedrock exposed along trails and in road cuts within and adjacent to the plan area generally appeared as weathered fine-grained light

gray tuff consistent with descriptions by Fox and others (1973). The plan area is located approximately 16 miles east of the active Maacama Fault Zone and 16 miles southwest of the Hunting Creek fault (Jennings and Bryant, 2010). The Maacama fault is capable of generating a Maximum Moment Magnitude 7.1 earthquake with a recurrence interval of 220 years (Petersen and others, 1996). The Hunting Creek fault is capable of generating a Maximum Moment Magnitude 6.9 earthquake (Gilpin, 2014). High ground acceleration associated with fault rupture along these fault systems are likely contributing factors for movement on deep-seated landslides in Napa County.

Soils complexes identified in the THP are the Forward Gravelly Loam, 2 to 9 percent slopes, Forward Gravelly Loam, 9 to 30 percent slopes, Forward Gravelly Loam, 30 to 75 percent slopes, and Kidd Loam, 15 to 30 percent slopes. Soils observed during the PHI generally consisted of gray to brown clay and gravelly loams that appeared well drained. The site inspection concurs with the Moderate Erosion Hazard Ratings calculations included with the THP.

Site slopes (ranging from 20 to 50± percent gradients) drain to the west and southwest via Class II and III watercourses that are tributaries to Conn Creek, a Class I watercourse. No landslides are mapped within or adjacent to the THP boundary (Dwyer, 1976, Figure 2 and Gilpin, 2014, Figure 3). A landslide feature observed within the THP boundary during the PHI is discussed below under the Specific Observations portion of this memo.

Agency Question: 1). The THP proposes conversion harvesting directly adjacent to and upslope of what appear to be existing residential structures. The plan attached geologic report (Gilpin Geosciences, 2014) does not discuss potential impacts to the structures from harvesting. Are additional mitigations necessary to minimize adverse impacts to the slope stability above the residential structures?

Response: The THP proposes to conduct conversion harvesting directly adjacent to and upslope of existing residential houses along the eastern THP boundary. Conversion harvesting is similar to a clearcut and is anticipated to significantly reduce existing canopy and root function. Based on review of the THP map and PHI observations, it appears conversion harvesting is proposed within 30 to 40-feet of the adjacent residential structures. Additionally, the THP proposes to construct an approximately 600-foot long segment of a new permanent road along 30-percent slopes approximately 75 to 100-feet upslope of the residential structures. Public comment letters received by Cal Fire express concern that proposed harvesting operations will adversely affect slope stability above the residential structures. The proposed operations and proximity of the adjacent residential structures to the proposed harvest area constitutes a public safety concern. The plan attached engineering geologic evaluation (Gilpin, 2014) does not identify the residential structures, describe existing conditions or discuss potential impacts of the proposed harvesting operations.

In response to CGS first review comments, the project geologist submitted a 2-page memo, dated August 22, 2016. This memo noted the shallow, competent bedrock at the site and included a general statement that no evidence of slope instability was observed above the residences. The conclusion presented was that no additional mitigations were necessary. The memo does not include a geomorphic description specific to the slope above the residences or specifically address potential impacts of proposed operations on the slope, including potential changes to root function, drainage and subsurface hydrology resulting from road construction and the loss of canopy adjacent to and above the residential structures. CGS Note 45 recommends that geologic investigations identify and discuss potential impacts to houses, public buildings, roads or other features that could be potentially adversely affected by landsliding or surface soil erosion

associated with timber harvesting activities. Based on the lack of supporting information provided in the engineering geologic evaluation it is difficult to determine whether potential impacts to public safety have been adequately evaluated. The area was visited during the PHI and is discussed under the Specific Observations portion of the memo.

Agency Question: 2). The THP proposes to construct a new road below an erosional feature identified in the plan attached geologic report (Gilpin Geosciences, 2014) located above the head of a mapped Class III watercourse. Are additional mitigations needed to minimize adverse impacts to slope stability and sediment delivery?

Response: The THP proposes to construct approximately 2800-feet of new permanent road within the central and northern portions of the THP area. Based on review of the THP map and PHI observations, portions of the proposed road alignment are located below steep (approximately 50-percent) slopes and a large bowl-shaped feature. The proposed road crosses approximately 50-feet up slope of the head of a mapped Class III watercourse. The road construction is not discussed in the plan attached engineering geologic evaluation (Gilpin, 2014). The proposed road alignment was visited during the PHI and is discussed under the Specific Observations portion of the memo.

Specific Observations: *(keyed to Figures 4, 5, 6 and 7)*

CGS-1: What appears to be an approximately 150 to 200-foot wide and long bowl-shaped feature was observed along the southern slopes of a geomorphic knoll near the northeastern THP boundary. A Class III watercourse is mapped approximately 50 to 75-feet below the bowl-feature. The top of the knoll is approximately 3.5-acres in size and surface drainage appears to be generally to the northwest. A small section of the top of the knoll (approximately 0.5-acre) appears to drain to the bowl-shaped feature along the southern slope of the knoll. The swale of the bowl-shaped feature below the top of the knoll did not appear incised or channelized during the PHI. The plan attached engineering geologic evaluation describes the bowl-shaped feature as a drainage channel resulting from long-term erosion of the volcanic bedrock. Based on the small drainage area above the bowl-shaped feature and the lack of channelization observed within the bowl-shaped feature, it appears unlikely that surface drainage alone would be responsible for the feature.

Geomorphic topographic indicators as observed during review of aerial photographs (sets 1973, 1989, 1999, Google Earth images), lidar images (Figure 6) and on ground PHI observations suggest that the bowl-shaped feature is likely a translational landslide feature. This topographic evidence for landsliding consists of concave slopes approximately 75 to 100-feet feet high that likely corresponds to a weathered and rounded main scarp. The presumed body of the feature includes evidence of localized historic activity including benched topography and 30 to 65-percent slopes that support several pistol-butted and slightly swept second and third growth conifers. Small concave depressions were observed along the sides of the main scarp. Loose debris was observed along the steep slopes and on the benches below concave depressions where it appears groundwater has seeped through the face of the headwall. These features appear to be historic to recent weathered debris slide scarps.

The THP proposes to construct a new permanent road along an existing bench below the likely landslide feature. The bench appeared to be nearly level and only a minimal amount of grading is required to establish the road surface. Fire Hazard Removal harvesting, approved separately from the THP, is proposed along the side slopes of the knoll and within the presumed landslide feature. Harvesting above the headwall of the landslide feature can potentially change the hydrologic cycle

by reducing evapotranspiration. Increased infiltration and resulting pore pressures as a result of the reduction in canopy may increase the potential for adverse impacts to slope stability. As was discussed during the PHI, establishing a no-harvest zone within and above the landslide feature would retain canopy and root function and minimize the potential for adverse impacts to slope stability.

Road construction and harvesting in Timber Harvest Block C: The THP proposes to construct approximately 2800-feet of new permanent road. An approximately 600-foot long segment of the proposed new road is located approximately 75 to 100-feet up slope of five existing residential structures. The approximately 20 to 30-percent slope below the road alignment is proposed for conversion harvesting within Timber Conversion Block C. Canopy below the road alignment appeared low to moderate, with few conifers observed. The approximately 30-percent slope above the road alignment is located between Timber Conversion Blocks B and C and appeared to support straight standing second growth conifers. No evidence of slope instability (for example fresh scarps, exposed soils, bulging ground, pistol-butted or swept conifers) was observed along proposed road alignment above the residential structures. The THP proposes that the 600-foot road segment be rocked and outsloped, minimizing the potential for road runoff to concentrate and erode the road surface. The THP describes Fire Hazard Reduction harvesting, approved separately from the THP, as proposed on the slope above the road alignment between Timber Conversion Blocks B and C. Only conifer seedlings under 4-inches in diameter and ground fuels up to 8-feet in height are proposed for removal, which is anticipated to retain root function and canopy minimizing adverse impacts to slope stability above the proposed road alignment. According to the RPF, generally the road is proposed to be constructed using full bench/end haul methods, however some cut/fill construction will also be employed. It was discussed that where cut/fill road construction methods are proposed above the residential structures, a keyway should be constructed and the fill placed in compacted lifts. The RPF agreed.

Rock Fill: The THP proposes to construct a rock fill on 20 to 25-percent slopes along the western boundary of Timber Conversion Block A1 approximately 200-feet above Conn Creek, a Class I watercourse. The rock fill is located in an area identified as non-timberland. The fill is proposed to be constructed of rock generated from ground preparation and locally gathered volcanic field stones removed from the slope during brush clearing along the slope. Ground preparation is described in the plan attached Erosion Control Plan (ECP, Appendix B) as ripping the existing surface to a maximum depth of 36-inches and tilling. Public comment letters received by Cal Fire express concern that proposed harvesting operations will increase the potential for sediment delivery to Conn Creek. Mitigations proposed in the ECP, including constructing diversion ditches, sediment basins and attenuation basins, appear designed to minimize the potential for sediment delivery to Con Creek. A typical rock fill cross section, describing ground preparation, keyway construction and maximum fill face slope gradient, is included on page 5, Sheet 3 of 3 of Appendix B (Figure 7) attached to the THP. The cross section does not include the proposed thickness of the rock fill or describe potential mitigations designed to minimize adverse impacts to the stability of the steep fill face. During the PHI, the project engineer stated that determining exact fill thickness would be difficult due to the hummocky nature of the terrain and the variable size of the rocks proposed for use. It was discussed, that including mitigation measures designed to minimize adverse impacts to slope stability resulting from the construction of a thick and steep fill face would minimize the potential for the rock fill to fail. The RPF agreed.

Specific Recommendations:

Public Safety: The project geologist shall amend the geology report to specifically include a description of the slope above the residences of concern. This description shall include slope steepness, slope aspect in relation to the residences, anticipated soil thickness and morphology (i.e. smooth, hummocky etc.). The amendment shall specifically address the effects of the proposed operations on the slope including increased soil moisture and direct raindrop impact, potential loss of reinforcing root function, altered drainage patterns and slope loading or undercutting resulting from the proposed timber harvest and road construction.

CGS-1: The project geologist shall specifically address the points presented above under Site Specific Observations. The resultant document shall be made a part of the plan and shall be submitted for Agency review a reasonable amount of time prior to Second Review. Alternatively, the suspected landslide feature shall be identified on the THP maps. Additionally, Section II of the THP shall be revised to describe that harvesting, including Fire Hazard Removal harvesting, shall not occur on the landslide feature or within 50-feet of the headwall as was flagged in the field during the PHI.

Road construction and harvesting in Timber Harvest Block C: Prior to second review Section II of the THP shall be revised to describe that cut/fill road construction along the road alignment above the residential structures shall be constructed with a keyway and fill placed in 12-inch compacted lifts.

Rock Fill: Prior to second review Section II of the THP shall be revised to describe mitigation measures designed to minimize the potential for failure of the thick and steep rock fill face. Mitigation measures discussed with the project engineer during the PHI include constructing benches in the fill face at 10-foot intervals if the fill face exceeds 10-feet in height.

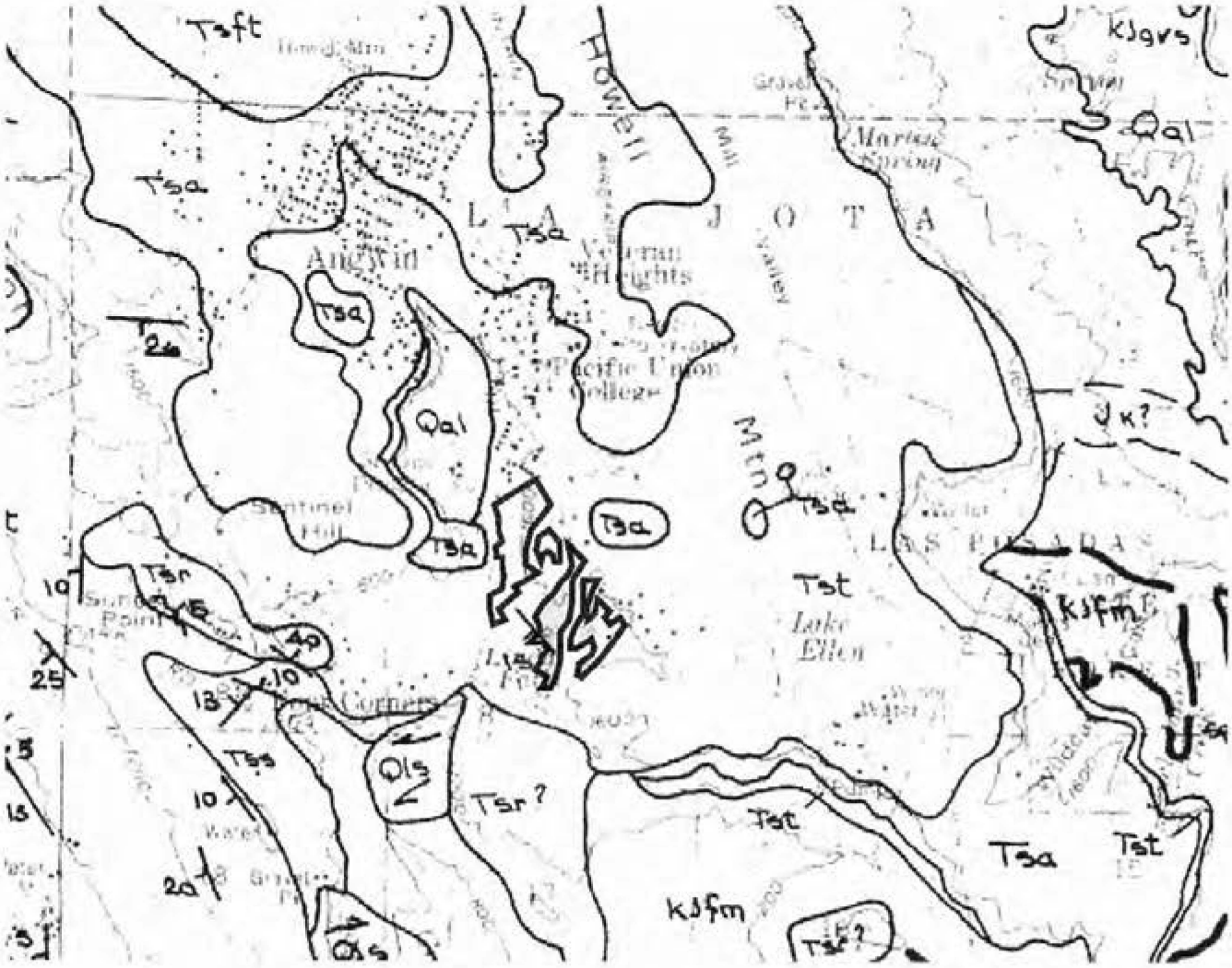
Original signed by
Kevin F. Doherty, PG # 7824
Engineering Geologist

PROFESSIONAL GEOLOGIST
KEVIN F. DOHERTY
No. 7824
STATE OF CALIFORNIA

Concur
9/14/2016 original signed by
Date, Gerald Marshall, CEG # 1909
Senior Engineering Geologist

PROFESSIONAL GEOLOGIST
G.J. MARSHALL
No. 1909
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Attachments: Figures 1, 2, 3, 4, 5, 6 and 7



Explanation

Tsa	Sonoma Volcanics - Lava Flows
Tst	Sonoma Volcanics - Ash Flow Tuff
KJfm	Franciscan Formation
Qls	Landslide Deposits
Qal	Alluvium

Geologic contact, dashed where approximately located

Rotational/Translational Landslide

Earthflow

Debris Slide

Debris Flow/Torrent Track

Debris Slide Amphitheater/ Slope

Inner gorge

Active Landslide (too small to show at map scale)

Disrupted ground

Slopes >70 percent

75 Strike and dip of bedding

Shaded area represents estimated limits of proposed harvest area.

N

0 1350' 2700'

Base Map: Modified from Fox, Jr., K.F., Sims, J.D., Bartow, J.A., Helley, E.J., 1973, Preliminary Geologic Map of Eastern Sonoma County and Western Napa County, California, USGS Miscellaneous Field Studies MF-483, map scale 1:62,500

Date: Sep. 2016	Regional Geologic Map*	Figure:
Scale: 1" = 2700'	To Accompany	1
Approved By: CGS	Engineering Geologic Review of THP 1-16-079 NAP	

Explanation

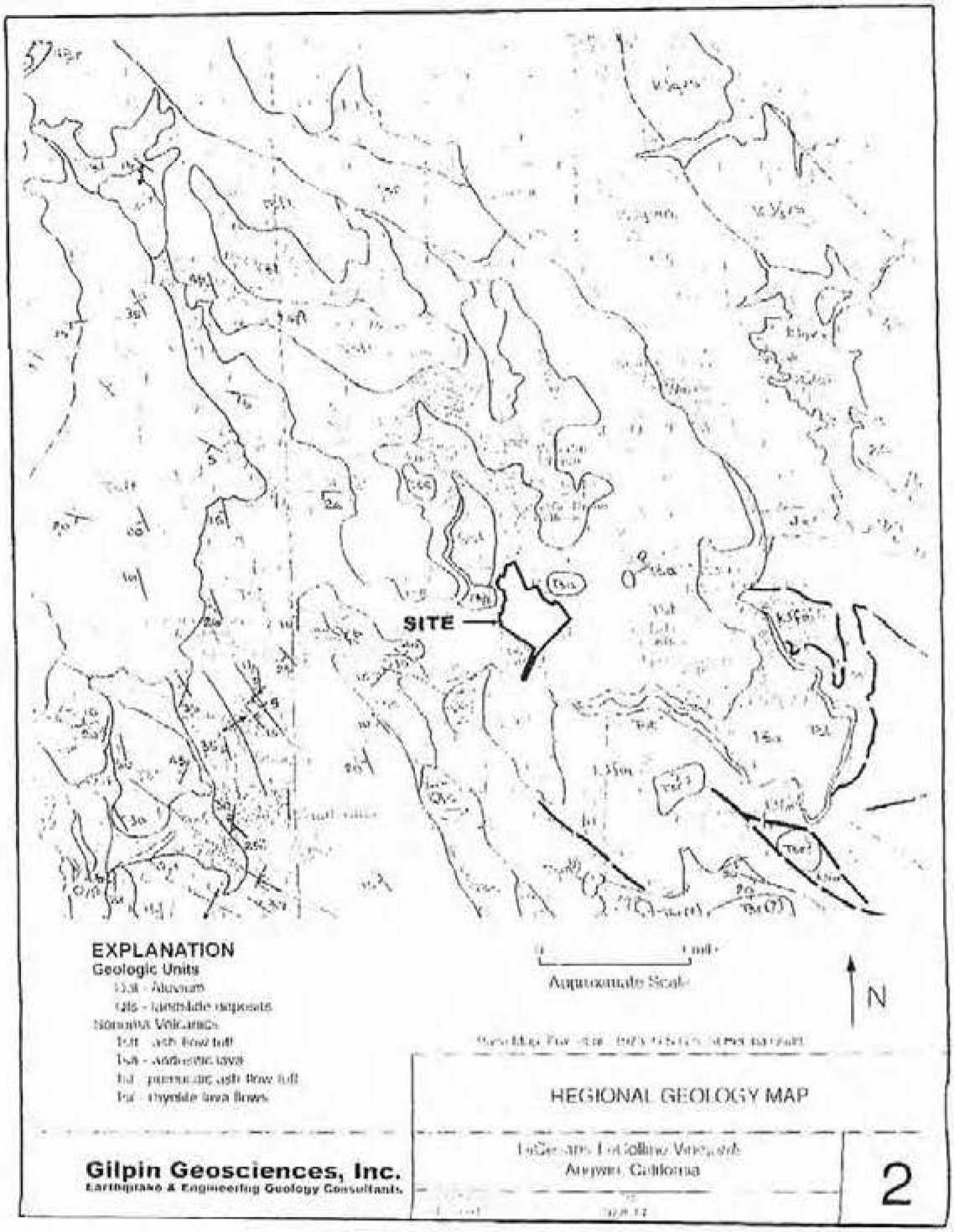
- Geologic contact, dashed where approximately located
- Rotational/Translational Landslide
- Earthflow
- Debris Slide
- Debris Flow/Torrent Track
- Debris Slide Amphitheater/ Slope
- Inner gorge
- Active Landslide (too small to show at map scale)
- Disrupted ground
- Slopes >70 percent
- 75 Strike and dip of bedding
- Shaded area represents estimated limits of proposed harvest area.

N

0 1250' 2500'

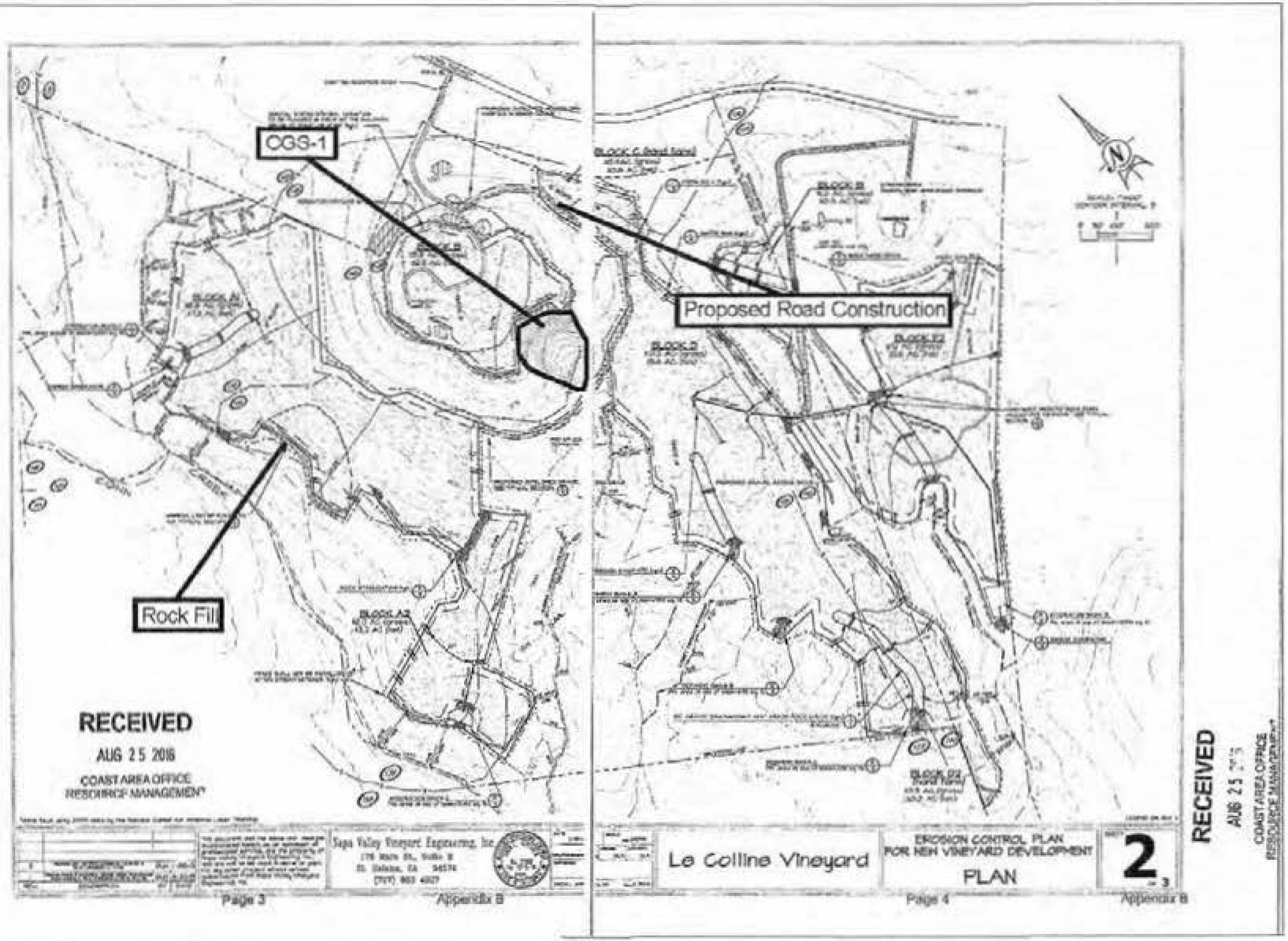
Base Map: Modified from Dwyer, M.J., Noguchi, N., O'Rourke, J., 1976, Reconnaissance Photointerpretation Map of Landslides in 24 Selected 7.5 Minute Quadrangles in Lake, Napa, Solano, and Sonoma Counties, California, St. Helena 7.5-Minute Quadrangle: United States Geological Survey, Open File Map 76-74, Sheet 12 of 25, scale 1:24,000.

Date: Sep. 2016	Regional Geologic Map* To Accompany Engineering Geologic Review of THP 1-16-079 NAP	Figure: 2
Scale: 1" = 2500'		
Approved By: CGS		



Base Map: Modified from Gilpin, 2014, THP 1-16-079 NAP, pg. 7

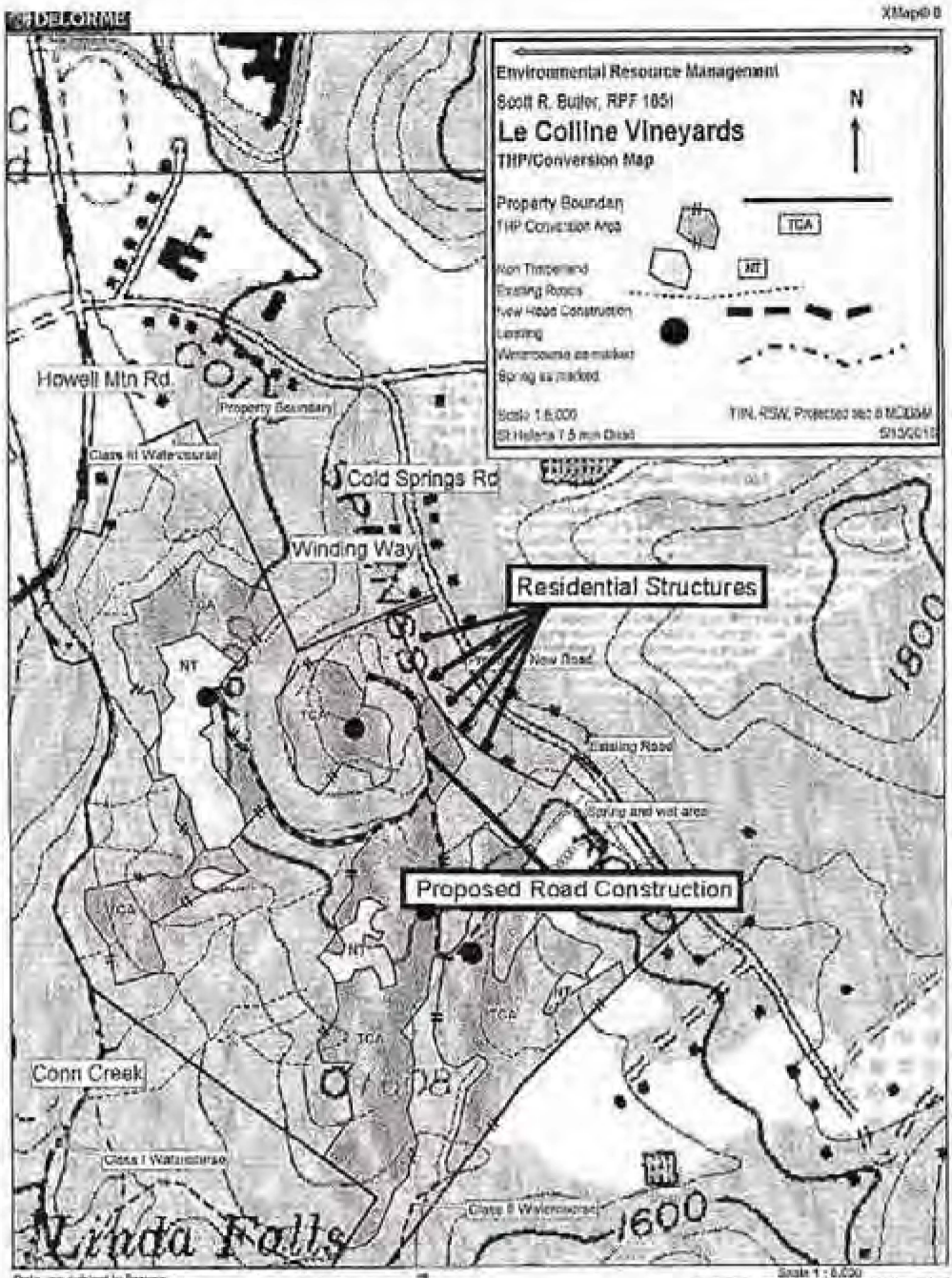
Date: Sep. 2016	Site Map To Accompany Engineering Geologic Review of THP 1-16-079 NAP	Figure: 3
Approved By: CGS		



Base Map: Modified from THP 1-16-079 NAP, RPF Response to First Review, pages 14-15

Site Map To Accompany Engineering Geologic Review of THP 1-16-079 NAP

Figure: 4



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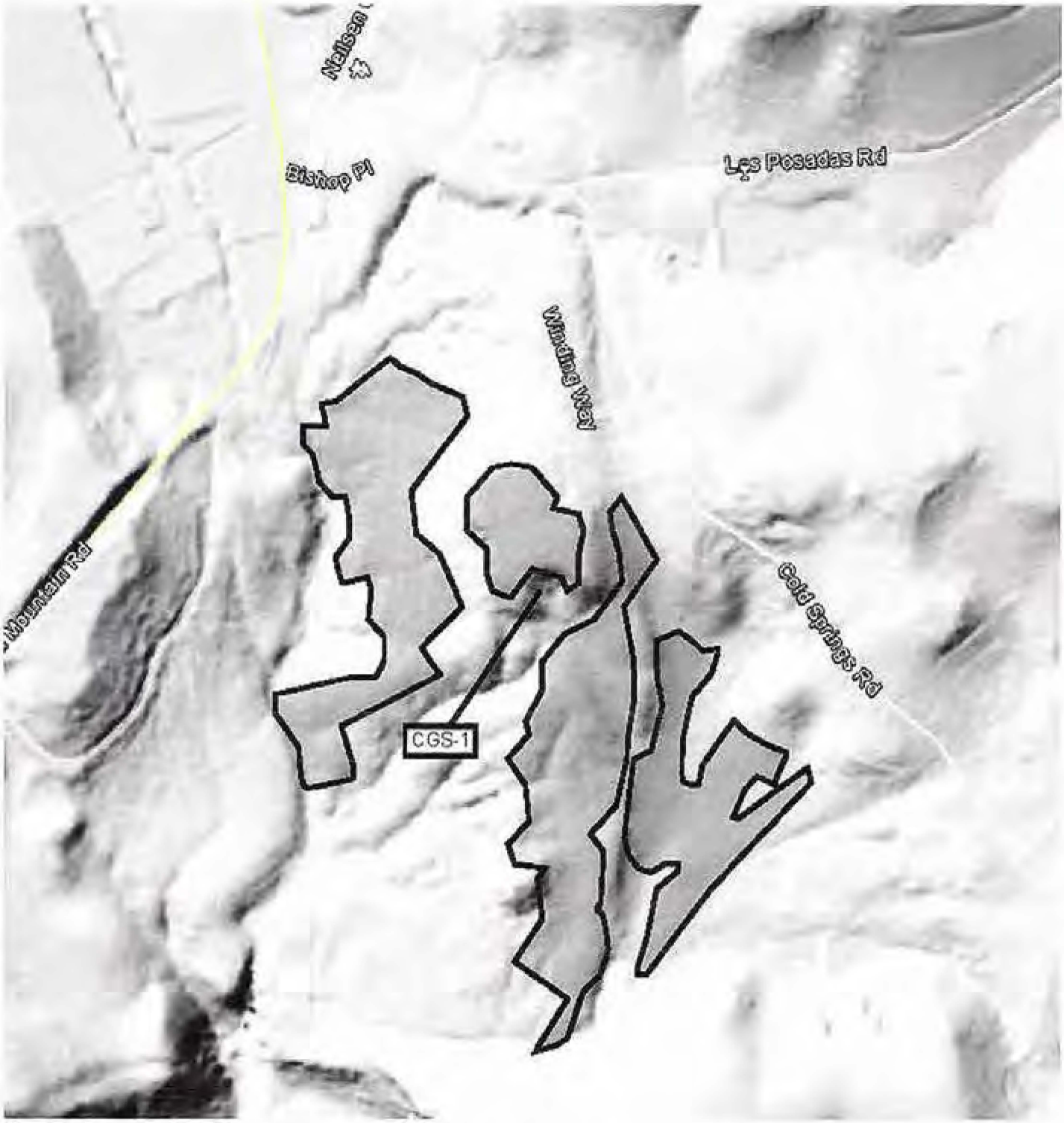
AUG 25 2016
COAST AREA OFFICE
RESOURCE MANAGEMENT

8-18-2016

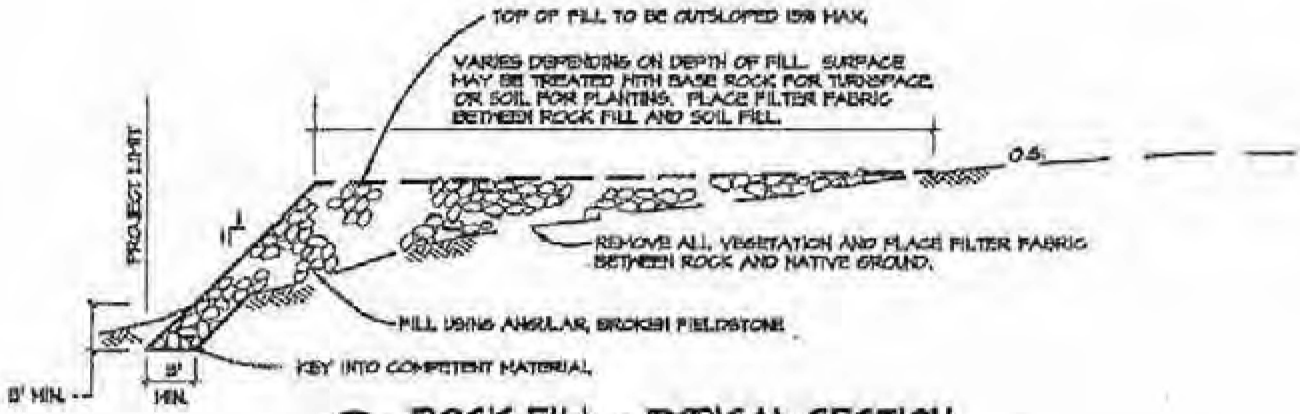
Base Map: Modified from THP 1-16-079 NAP, RPF Response to First Review, pg. 81

Date: Sep. 2016	Site Map To Accompany Engineering Geologic Review of THP 1-16-079 NAP	Figure: 5
Approved By: CGS		



Base Map: Modified from Napa County, LiDAR, 2003, collected by National Center for Airborne Laser Mapping (NCALM).

Date: Sep. 2016	Site Map To Accompany Engineering Geologic Review of THP 1-16-079 NAP	Figure: 6
Approved By: CGS		



6/3 ROCK FILL - TYPICAL SECTION

NTS

SPECIAL NOTE-RSP

Rock Slope Protection (RSP) shall be locally gathered field stone (20 lb.), or class light, as defined in Caltrans Standard Specifications, Sec. 72-2.02. A non woven filter fabric (Mirafi 140 N, or equal) shall be placed between all RSP and earthen material.

Base Map: Modified from THP 1-16-079 NAP, RPF Response to First Review, pg. 5

Date: Sep. 2016	Sketch Schematic Cross Section Rock Fill - Typical Section Erosion Control Plan THP 1-16-079 NAP	Figure: 7
Approved By: CGS		

APPENDIX A

NOP and Comment Letters

California Department of Forestry and Fire Protection

To: State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

From: Bill Solinsky
CAL FIRE, Resource Management
P.O. Box 944246
Sacramento, CA 94244-2460

Subject: Notice of Preparation of a Draft Environmental Impact Report
Le Colline Vineyard Conversion Project
April 13, 2016

The California Department of Forestry and Fire Protection (CAL FIRE) is the Lead Agency and Napa County is a Responsible Agency for the preparation of an Environmental Impact Report (EIR) for the Le Colline Vineyard Conversion Project (Proposed Project) in compliance with the California Environmental Quality Act (CEQA). Consistent with CEQA Guidelines Section 15082, CAL FIRE, as Lead Agency, has prepared this Notice of Preparation (NOP) to inform all responsible and trustee agencies that an EIR will be prepared. The purpose of the NOP is to describe the Proposed Project and potential environmental effects in order to allow agencies and interested parties to provide input on the scope and content of the EIR. A copy of this NOP and the figures referenced herein is provided on CAL FIRE's website: http://calfire.ca.gov/resource_mgt/resource_mgt_EPRP_PublicNotice.php. Comments on this NOP are due to CAL FIRE by 5:00 PM on May 13, 2016.

Project Summary

The purpose of the Proposed Project is to convert approximately 35 gross acres to 28 net acres of commercial vineyard with an additional 1.0 acre of disturbance that includes the construction of three new access driveways and improvement of an existing dirt trail. Therefore, the total project area will be 36± acres (Project Site). A Timberland Conversion Permit (TCP) is required for the Project Site, which triggers preparation of a CEQA document for the Proposed Project. Given the potential for environmental impacts, an Environmental Impact Report (EIR) is being prepared. A Napa County Erosion Control Plan (ECP) is also required for the Proposed Project. The environmental impacts of the TCP, the ECP, and the development of the vineyard on the Project Site will be evaluated against the CEQA baseline of the Project Site. In addition, a Timber Harvest Plan (THP) is being prepared concurrently for the harvest of the 32 gross acres and will be processed separately by CAL FIRE. The THP will be evaluated by CAL FIRE through a CEQA equivalent process consistent with the Forest Practice Rules. The EIR will include the THP, the TCP, and the ECP as attachments.

Project Location

The Project Site is located on an approximately 88.3-acre property within the un-sectioned portion of Township 8N Range 5W of the Mount Diablo Base and Meridian (MDBM). The property is comprised of four parcels identified as Napa County APNs 024-300-070, 024-300-071, 024-300-072, and 024-340-001. The property is located at 300 Cold Springs Road, just southeast of the Town of Angwin in northern Napa County, California, as shown in **Figure 1**.

Environmental Setting

Land uses in the vicinity of the property include rural residences, vineyards, wineries, and open space. Property elevations range from approximately 1,415 feet to 1,750 feet above mean sea level. Soils on the property are predominantly Forward gravelly loam and Kidd loam. The slopes on the Project Site range from 7 to 29 percent. The

property drains to the Conn Creek watershed, tributary to Lake Hennessey thence the Napa River. Conn Creek runs along the southwest property line. There are four county-definitional streams and three Class III watercourses on the property; setbacks have been provided from these drainages in accordance with the Napa County Conservation Regulations and Forest Practice Rules. A map of the Project Site is included as **Figures 2** and **3**.

As part of the EIR process, a report on the biological resources within the Project Site and immediate surrounding area has been prepared. The following habitats have been identified to date within the property: California Annual Grasslands Alliance, Mixed Oak Alliance, Douglas Fir Alliance, Chamise Alliance, Freshwater Wetland, Rock Outcrop, and Ponderosa Pine Alliance. One of the parcels includes a residence and associated landscaping. In addition, two special status plant species have been located within the property. Impacts to these habitats and special status species will be addressed in the EIR.

General Plan/Zoning Designations
The Project Site is zoned Agricultural Watershed (AW).

Project Description
The Proposed Project will convert approximately 32 acres of timberland and 4 acres of brush to a commercial vineyard within an 88.3-acre property. The 35± gross acres plus an additional 1.0 acre of road improvements result in a total Project Site of 36± acres. Within the Project Site, 28± net acres of vineyards will be planted within five vineyard blocks (**Figure 3**); vineyard blocks would be accessed via the existing driveway at Winding Way and the existing driveway off of Cold Springs Road. The vineyard blocks will include wine grape vines as well as internal farm avenues and space for vineyard maintenance operations; therefore, the net area of the vineyard will be approximately 28 acres. The establishment of the vineyard as part of the Proposed Project is consistent with the current Napa County zoning designation of Agricultural Watershed (AW).

The Project Site is not located within a Timberland Production Zone (TPZ). However, since the Proposed Project would convert "non-TPZ timberland to a non-timber growing use" through timberland operations in which "future timber harvests will be prevented or infeasible because of land occupancy and activities thereon," a TCP and approval is required from CAL FIRE consistent with the Z'Berg-Nejedly Forest Practice Act (Division 4, Chapter 8, Public Resources Code) and California Forest Practice Rules (Title 14, California Code of Regulations). CAL FIRE will therefore be the CEQA Lead Agency on the EIR.

Harvested timber will be shipped to saw mills and ports in Northern California. All non-merchantable trees and vegetation would be removed, chipped, and/or burned on-site, consistent with CAL FIRE, Napa County, and San Francisco Bay Area Air Quality Management District standards. Suitable forest products such as sawlogs, firewood and wood chips will be marketed as is economically feasible. Wood products leaving the site would be transported in logging trucks. Material leaving the site would exit via Cold Springs Road and Winding Way. New internal farm roads would be limited to access between blocks; no new access points to county roads are required. As a result of implementation of the ECP and the Forest Practice Act, post-project sediment erosion conditions and peak hydrological runoff are projected to be below pre-project conditions; these aspects are detailed in the hydrological report and sediment report that have been prepared for the Proposed Project and will be included with the EIR as attachments.

Chapter 18.108 of the Napa County Code (Conservation Regulations) requires an ECP be prepared by a Licensed Civil Engineer for the Proposed Project and approved by Napa County because slopes on the Project Site are

greater than 5 percent. Consequently, Napa County will be a Responsible Agency for the EIR.

Environmental Factors Potentially Affected

Anticipated impacts of the Proposed Project on the following list of resource areas will be analyzed in the EIR per CEQA Guidelines (Title 14 CCR Division 6, Chapter 3). The impacts of the Proposed Project will be determined by evaluating against the CEQA baseline, which is the Project Site as it currently exists (prior to the THP).

Aesthetics: The Project Site is not visible by vehicles traveling on Cold Springs Road. However, the proposed vineyard may be visible from surrounding residences. An analysis of potential impacts to aesthetics from the Proposed Project will be provided in the EIR.

Agriculture and Forestry Resources: The impacts of the Proposed Project to these resources will be a primary subject of the EIR. An analysis of impacts to agricultural and forestry resources in the vicinity of the Project Site and local region will be included in the EIR.

Air Quality: Non-merchantable trees and vegetation will be removed, chipped, and/or burned on-site, consistent with Napa County and San Francisco Bay Area Air Quality Management District standards. An analysis of potential impacts to air quality from construction and operation of the Proposed Project will be provided in the EIR.

Biological Resources: An analysis of potential impacts to biological resources as a result of the construction and operation of the Proposed Project will be provided in the EIR.

Cultural Resources: A preliminary cultural resources survey of the Project Site did not identify any significant historic or cultural resources on the Project Site. One isolated projectile point made of obsidian and one isolated obsidian flake tool were located onsite, neither of which constitutes a significant historic or cultural resource. Further analysis of potential impacts to cultural resources as a result of the Proposed Project will be provided in the EIR.

Geology/Soils: An ECP is required to be prepared for the Proposed Project, which includes erosion control measures to be implemented during construction and operation of the vineyard. Further analysis of potential impacts to local geology/soils will be provided in the EIR.

Greenhouse Gas Emissions: An analysis of potential impacts due to the Proposed Project's greenhouse gas emissions attributed to construction, operation, and tree canopy removal will be provided in the EIR.

Hazards and Hazardous Materials: An analysis of hazards and hazardous materials as they pertain to construction and operation of the Proposed Project will be provided in the EIR.

Hydrology/Water Quality: The property is located in the Conn Creek watershed, a County-designated Sensitive Domestic Water Supply Drainage. An analysis of impacts from the Proposed Project to local hydrology and water quality will be provided in the EIR. Particular attention will be paid to the Napa River Section 303(d) standards. Groundwater from two existing wells will be the water source for the vineyard and will be discussed further in the EIR.

Land Use/Planning: No significant impacts are anticipated. As stated above, the Proposed Project would result in the development of a vineyard within the 36-acre Project Site, which is consistent with the current Napa County zoning designation, Agricultural Watershed. An analysis of impacts to land use/planning due to the Proposed Project

will be provided in the EIR.

Mineral Resources: No known mineral resources that are of State, regional, or local value are identified on or within the vicinity of the Proposed Project site, and therefore no significant impacts are anticipated. No further analysis will be provided in the EIR.

Noise: No significant impacts are anticipated. However, given the proximity of existing residences, an analysis of noise impacts to the Project Site and vicinity as a result of construction and operation of the Proposed Project will be provided in the EIR.

Population/Housing: The Proposed Project would not induce substantial population growth and would displace neither existing housing nor people; therefore, no significant impacts are anticipated. No further analysis will be provided in the EIR.

Public Services: The Proposed Project would not result in a substantial increase of demand on public services, and therefore no significant impacts are anticipated. No further analysis will be provided in the EIR.

Recreation: The Proposed Project would not include construction of any recreational facilities and would not increase the use of existing recreational facilities, and therefore no significant impacts are anticipated. No further analysis will be provided in the EIR.

Transportation/Traffic: Wood products leaving the site would be transported in logging trucks. Material leaving the site would exit via Cold Springs Road and Winding Way. New internal farm roads would be limited to access between blocks; no new access points to county roads are required. An analysis of transportation/traffic issues as they pertain to construction and operation of the Proposed Project, including the off-site hauling of logs due to the THP, will be provided in the EIR.

Utilities/Service Systems: The Proposed Project would not result in any additional demands on utilities and service systems. Groundwater will be pumped from existing on-site wells and serve as the irrigation water source, and no wastewater will be generated. Therefore, no significant impacts are anticipated, and no further analysis will be provided in the EIR.

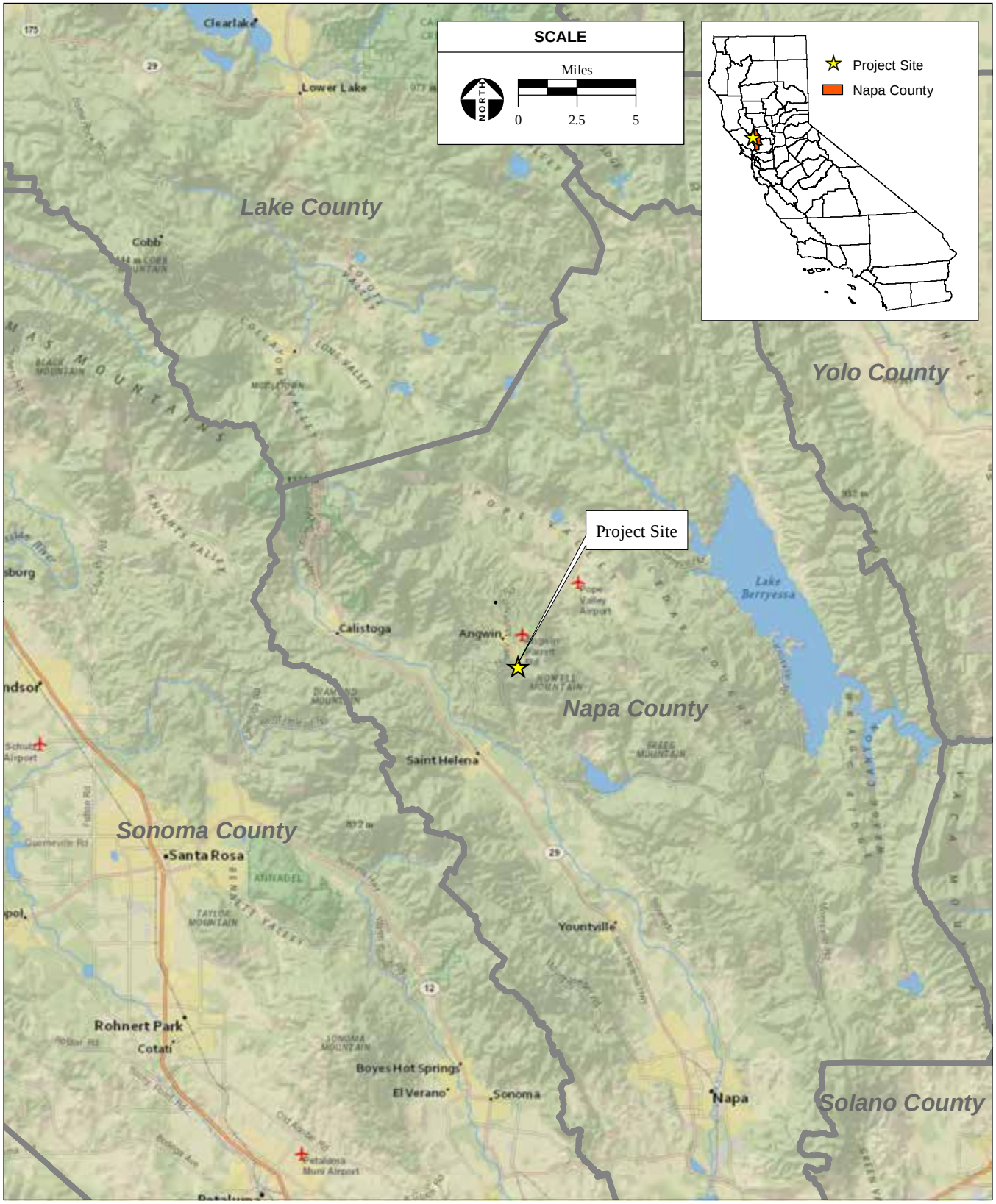
Mandatory Findings of Significance: A complete analysis of mandatory findings of significance, including cumulative impacts of the Proposed Project, will be provided in the EIR.

In order for comments to be considered, please submit written comments no later than **5:00 PM** on **May 13, 2016** to:

Bill Solinsky
CAL FIRE, Resource Management
P.O. Box 944246
Sacramento, CA 94244-2460

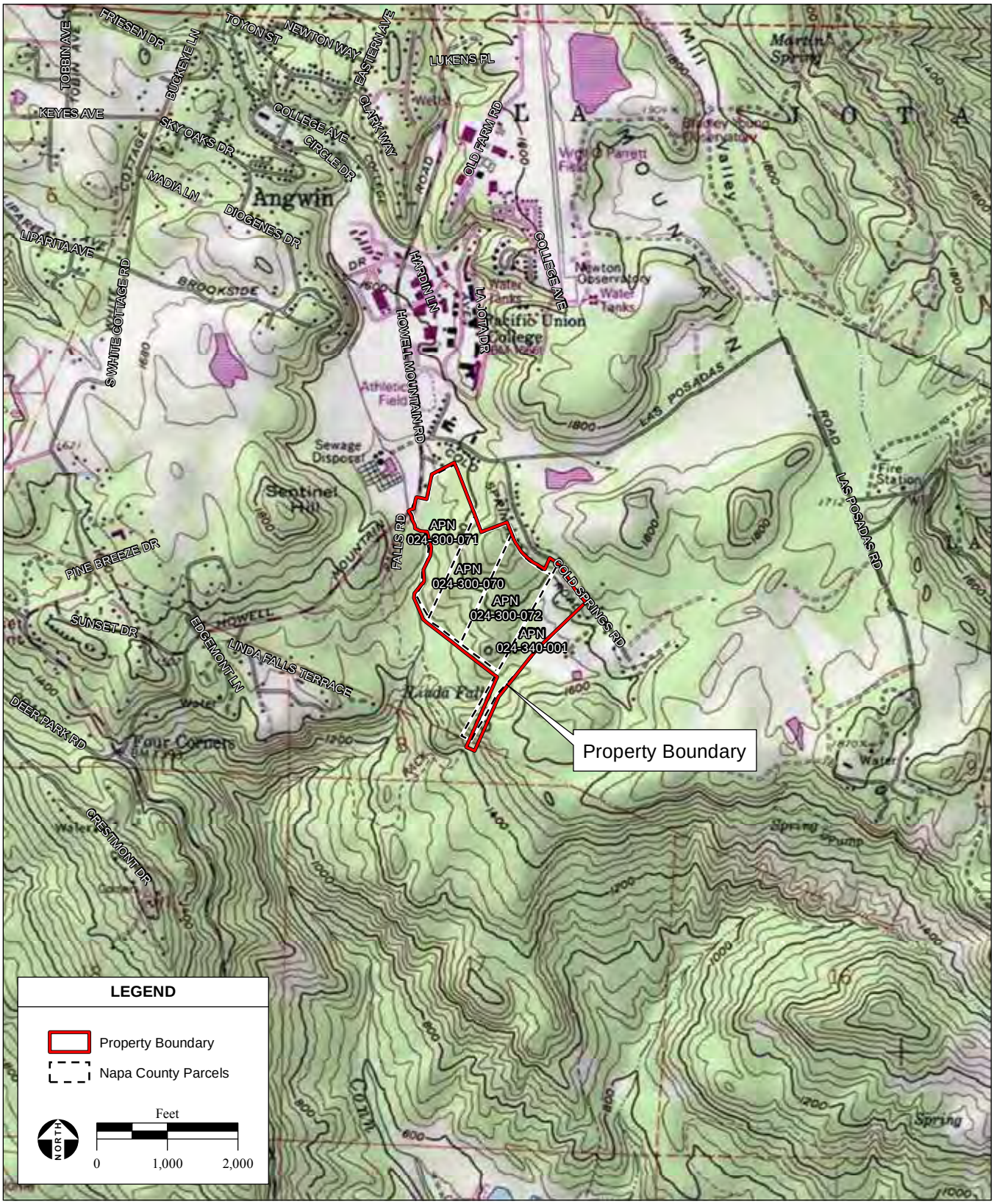
Email: SacramentoPublicComment@fire.ca.gov (Please include "Le Colline Vineyard" in subject line).

Comments by Fax will not be accepted.



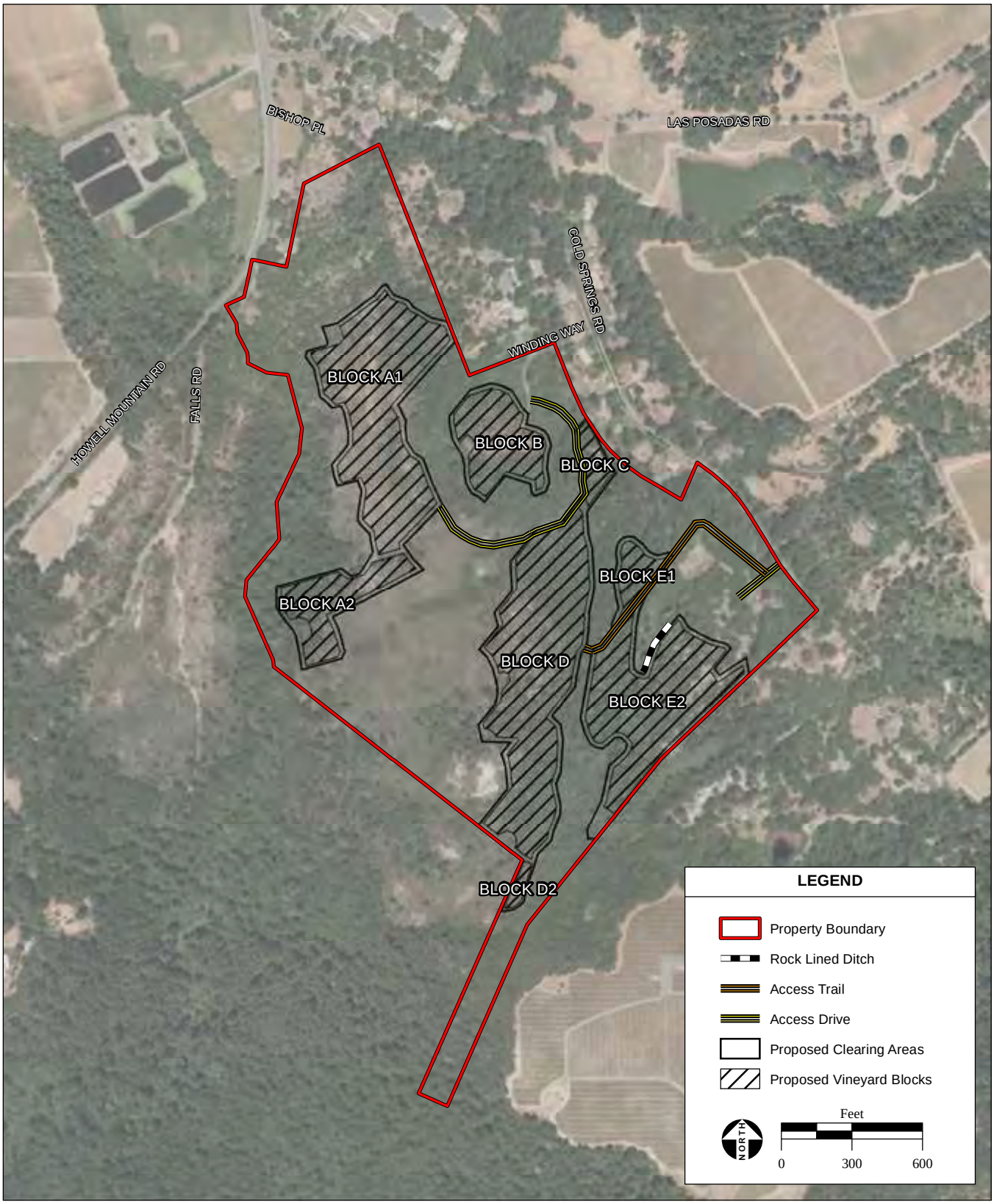
SOURCE: NatGeo, 2015; AES, 2015

Figure 1
Regional Location



SOURCE: "Saint Helena, CA" USGS 7.5 MinuteTopographic Quadrangle, T8N, R5W, Unsectioned Area of Saint Helena, Mt. Diablo Baseline & Meridian; ESRI Data, 2015; AES, 2015

Figure 2
Site and Vicinity



SOURCE: Microsoft aerial photograph, 2/4/2012; Napa Valley Vineyard Engineering, Inc., 2015; ESRI Data, 2015; AES, 2015

Figure 3
Project Site Boundary

A Tradition of Stewardship
A Commitment to Service

Planning, Building & Environmental Services

1195 Third Street, Suite 210
Napa, CA 94559
www.countyofnapa.org

David Morrison
Director

May 12, 2016

Bill Solinsky
CAL FIRE
Division of Resource Management
P.O. Box 944246
Sacramento, CA 94244-2460

RE: N.O.P. COMMENTS
Le Colline Vineyard Conversion: File No. P14-00410-ECPA
300 Cold Springs Road: APNs 024-300-071, -072, -073, and 024-340-001

Dear Mr. Solinsky:

Thank you for the opportunity to comment on the Notice of Preparation (NOP) for the Environmental Impact Report (EIR) that will be prepared for the Le Colline Vineyard Conversion and Timber Harvest Plan Application. The project involves the removal of timberland and other native vegetation including oak woodland, Douglas fir forest, and chaparral and development of approximately 36 acres of new vineyard and related infrastructure.

As a Responsible Agency (California Code of Regulations [CCR] Section 15381) under the California Environmental Quality Act (CEQA) it is the County's obligation to review and decide on the permit for the proposed hillside vineyard, an Agricultural Erosion Control Plan application (ECPA), for the development of 36 acres of new vineyard as referenced in the ECPA application. It is the County's intention, via this correspondence, to ensure that environmental review of the project, pursuant to CEQA, considers impacts associated with entire project including the proposed vineyard development and subsequent vineyard operations (CCR Section 15063.1). For the County to rely on the EIR for the review and approval of the County ECPA permit, the EIR will need to adequately disclose any potential impacts of the entire project and include appropriate mitigation measures for those impacts.

A CEQA document that does not adequately disclose and assess potential impacts of the entirety of the project could result in additional environmental review when the County conducts its discretionary review of the associated permit noted above, which could result in delays to the applicant and project implementation, as well as, potential project modifications. In addition, it is the County's obligation to only approve projects that are consistent with the policies set forth by our General Plan (2008). As such, the County would like you to consider the following comments regarding the NOP as they relate to CEQA and General Plan consistency.

A. Biological Resources: The comments below are based on the County's review of the Kjeldsen Biological Resources Report, dated July 2015, received as a supplemental attachment to the ECPA. These comments should be addressed through a revised biological report and/or within the Biological Resources section of the EIR.

i. Napa County Conservation Policy CON-24 requires preservation, to the extent feasible, of other significant vegetation that occur near the heads of drainages or depressions to maintain diversity of vegetation type and wildlife habitat as part of agricultural projects. Doug fir, Ponderosa pine trees, and oak trees at the westerly edge of Blocks A1, A2, D, and E, typically areas where sediment basins are placed, are ideal candidates to meet this preservation requirement and they should be avoided.
ii. Napa County Conservation Policy CON-24 also requires retention of oak woodland to the extent feasible. Therefore, rationale will need to be provided stating why impacts to oak woodlands cannot be avoided and the Planning Director will make the ultimate determination of infeasibility. If portions of oak woodlands are deemed infeasible to retain, then replacement of lost oak woodlands or preservation of like habitat at a 2:1 ratio is required. Currently, no infeasibility rationale has been provided and the current project would result in 8 acres of oak woodland impacts and 12 acres of avoidance, which does not meet the second step of the CON-24 hierarchy (2:1 preservation requirement) in the event avoidance, in whole or in part, is infeasible. Lastly, it is not clear that there are any opportunities for replacement within the project parcels, and on this subject the report is silent.
iii. Please provide an expanded discussion of cumulative woodland loss; considering the setting and surrounding vineyard development and potential cumulative impacts (in particular cumulative loss of forest land). As noted in *A.ii.*, there are opportunities for further woodland avoidance near Conn Creek and at the heads of waters of the U.S./State that should be considered.
iv. Wildlife Movement: The EIR should evaluate the project's potential impact on wildlife movement. While it is acknowledged that proposed wildlife exclusion fencing is limited to the footprint of the proposed vineyard blocks, the EIR should consider the potential impacts to small mammals as a result of the installation of such fencing. Ultimately, the fencing should be designed to ensure that impacts to wildlife movement remain less than significant.

B. Water Supply Availability and Use:

i. The EIR should consider drought conditions (dry years) in assumptions made related to rainfall and recharge potential to adequately analyze potential impacts to groundwater, and where necessary, related summer time base flows of nearby watercourses. The EIR will need to include the estimated project water use, including existing and proposed uses of water on the project parcel(s), shall include estimates for normal and dry water years. If an alternative water source will be used for dry years (e.g. trucked in water for non-potable uses), the alternate source, source location and estimated water volume shall be disclosed.

C. Land Use and Planning

i. Please note that the EIR should include a discussion of how the proposed project and mitigation measures achieves or are otherwise consistent with applicable County Goals, Policies and Regulations:
   Goal CON-2: Maintain and enhance the existing level of biodiversity.
   Goal CON-3: Protect the continued presence of special-status species, including special-status plants, special-status wildlife, and their habitats.

Policy CON-13: The County shall require that all discretionary residential, commercial, industrial, recreational, agricultural, and water development projects consider and address impacts to wildlife habitat and avoid impacts to fisheries and habitat supporting special-status species to the extent feasible. Where impacts to wildlife and special-status species cannot be avoided, projects shall include effective mitigation measures and management plans including provisions to:

d) Provide protection for habitat supporting special-status species through buffering or other means.
e) Provide replacement habitat of like quantity and quality on- or off-site for special-status species to mitigate impacts to special-status species.
f) Enhance existing habitat values, particularly for special-status species, through restoration and replanting of native plant species as part of discretionary permit review and approval.

Policy CON-17: Preserve and protect native grasslands, serpentine grasslands, mixed serpentine chaparral, and other sensitive biotic communities and habitats of limited distribution. The County, in its discretion, shall require mitigation that results in the following standards:

a) Prevent removal or disturbance of sensitive natural plant communities that contain special-status plant species or provide critical habitat to special-status animal species.
b) In other areas, avoid disturbances to or removal of sensitive natural plant communities and mitigate potentially significant impacts where avoidance is infeasible.
e) Require no net loss of sensitive biotic communities and habitats of limited distribution through avoidance, restoration, or replacement where feasible. Where avoidance, restoration, or replacement is not feasible, preserve like habitat at a 2:1 ratio or greater within Napa County to avoid significant cumulative loss of valuable habitats.

Policy CON-24: Maintain and improve oak woodland habitat to provide for slope stabilization, soil protection, species diversity, and wildlife habitat through appropriate measures including one or more of the following:

a) Preserve, to the extent feasible, oak trees and other significant vegetation that occur near the heads of drainages or depressions to maintain diversity of vegetation type and wildlife habitat as part of agricultural projects.
c) Provide replacement of lost oak woodlands or preservation of like habitat at a 2:1 ratio when retention of existing vegetation is found to be infeasible. Removal of oak species limited in distribution shall be avoided to the maximum extent feasible.

Policy CON-27: The County shall enforce compliance and continued implementation of the intermittent and perennial stream setback requirements set forth in existing stream setback regulations.

Policy CON-55: The County shall consider existing water uses during the review of new water uses associated with discretionary projects, and where hydrogeologic studies have shown that the new water uses will cause significant adverse well interference or substantial reductions in groundwater discharge to surface waters that would alter critical flows

to sustain riparian habitat and fisheries or exacerbate conditions of overdraft, the County shall curtail those new or expanded water uses.

Chapter 18.108 Napa County Conservation Regulations (Section 18.108.010 NCC) in part encourages: the preservation of the natural resources of the county of Napa; minimization of grading operations and other such man-made effects in the natural terrain; preservation of riparian areas and other natural habitat by controlling development near streams and watercourses; and, development which minimizes impacts on existing land forms and preserves existing vegetation.

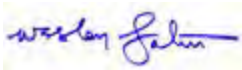
D. Transportation and Circulation/Safety

i. The EIR should address whether there would be a less than significant impact on traffic and circulation as a result of the proposed project, such as impacts associated with the number of truck and worker trips associated with vineyard development and installation, and subsequent ongoing vineyard operation to support that conclusion. The EIR should include information regarding the approximate anticipated equipment and trips necessary to implement and maintain the proposed project. This information should be incorporated when assessing potential construction and operation air quality and GHG emission impacts associated with the proposed project. In addition, the EIR should address whether the proposed access routes during construction and operations increase hazards as well as whether the access design is consistent with County policies as they relate to public safety.

In short, the intent of these comments is to outline the sufficiency of the environmental review document in identifying and analyzing the potential impacts of the entire project and the ability of the County to utilize the document in reviewing and issuing associated permits necessary for project implementation. In addition, its intent is to highlight the County's obligation to only approve projects that are consistent with the goals and policies set forth by the Napa County General Plan (2008).

I would like to thank you for providing the County an opportunity to review and comment on the NOP and eventually the draft EIR. If you should have any questions regarding any of the above items, please feel free to contact me at your convenience at 707-299-1788 or wesley.salter@countyofnapa.org.

Sincerely,



Wesley Salter
Planner III

Cc: Brian Bordona, Supervising Planner, Engineering and Conservation Division (email only)
Drew Aspegren, Napa Valley Vineyard Engineering, Inc., 176 Main Street, St. Helena CA 94574 (email only)
Scott Butler, Environmental Resource Management, 889 Hwy 20-26, Ontario, OR 97914 (email only)

May 13, 2016

Mr. Bill Solinsky
CAL FIRE, Resource Management
PO Box 944246
Sacramento, CA 94224-2460

Subject: Le Colline LLC Vineyard
Assessor's Parcel: 024-300-071,072,073 & 024-340-001

Dear Mr. Solinsky:

The City of Napa Public Works Water Division (Water Division) has reviewed the above mentioned project and is unable to determine that the proposed erosion control protection measures are sufficient to safeguard against an increase (by no more than one percent individually or ten percent cumulatively) of sediment or other pollutants into the Water Division's Lake Hennessey reservoir. The City has great concern over increased introduction of nutrients and dissolved pollutants into the municipal water supply such as phosphates, nitrates and sulfates used in agricultural practices. As State water quality compliance policies stiffen, the Water Division continues to monitor the reservoir's water quality and will consider the ten percent cumulative impacts amidst continual data collection, analysis and reporting per Napa County Ordinance CON 18.108.027 Sensitive Domestic Water Supply Drainages. The owner shall be responsible for ensuring that all erosion control measures remain intact and are routinely maintained to prevent exceedance of said runoff levels.

The Water Division is a public water supplier that owns and operates Lake Hennessey, which is the main source of supply used to serve water to homes and workplaces, to provide fire protection, and to meet other needs of more than 86,000 people throughout Napa Valley. The Water Division appreciates the attention to detail in the submitted erosion control plans including the attenuation basins. However, the Water Division remains concerned that the proposed project will cause significant adverse impacts associated with increased dissolved nutrients and pollutants mobilized into the public water supply of Lake Hennessey despite the mitigation measures aimed at sediment described in the erosion control plan. To insure effectiveness of the erosion control measures are maintained throughout the life of the project sufficient to avoid impacts to the water supply, the Water Division requires monitoring and sample analyses of the creek both upstream and downstream of the project outfalls. The samples shall be analyzed at minimum for the presence and concentrations of the following parameters:

- Turbidity
- Specific conductance
- Phosphates

- Sulfates
- Nitrogen (as ammonia)
- pH

Frequency: three times each year as follows

- Within 72 hours after the first major storm event (1 or more inches of rainfall within 24 hours) of the wet season Oct 1 – April 30th
- Within the period Jan 1-31st
- Within the period May 1-30th

Location: Upstream of the project site and downstream of the outfall and runoff area of the project site. Locations must remain consistent each year and be identified using GPS coordinates. Analyses must be performed at an ELAP-certified laboratory and the results submitted within 30 days of samples being gathered and include the chain of custody. Data shall be submitted to:

City of Napa Water Division
Attn: Water Quality Manager
PO Box 660
Napa, CA 94559

The Water Division owns and operates a certified laboratory at our water treatment facility and is amenable to providing empty sample bottles and performing the analyses as cost control measures.

Please contact me at 257-9319 if you have any questions or require additional information.

Respectfully,

Joy Eldredge, P.E.
Water General Manager

cc: Michael Hether
scoop/file

CITY of NAPA
www.cityofnapa.org/water

PUBLIC WORKS DEPARTMENT
WATER DIVISION
1340 Clay Street
Mailing Address:
P.O. Box 660
Napa, California 94559-0660
Phone: (707) 257-9521
Fax: (707) 258-7831
California Relay Service (CRS) Dial 7-1-1

July 29, 2015

Mr. Brian Bordona
County of Napa
Planning, Building & Environmental Sciences
1195 Third Street, Room 210
Napa, CA 94559-3092

Subject: Le Colline LLC Vineyard Conversion (P14-00410-ECPA)
Assessor's Parcel: 024-300-071,072,073 & 024-340-001

Dear Mr. Bordano:

The City of Napa Public Works Water Division (Water Division) has reviewed the above mentioned project and is unable to determine that the proposed erosion control protection measures are sufficient to safeguard against an increase (by no more than one percent individually or ten percent cumulatively) of sediment or other pollutants into the Water Division's reservoir (Lake Hennessey). The City has great concern over increased turbidity levels in the creeks, the introduction of phosphates as used for fertilizers as well as pesticides used in agricultural practices. As State water quality compliance policies stiffen, the Water Division continues to monitor the reservoir's water quality and will consider the ten percent cumulative impacts amidst continual data collection, analysis and reporting. The owner shall be responsible for ensuring that all erosion control measures remain intact and are routinely maintained to prevent exceedance of said runoff levels.

Details regarding the fertilizer brand was not provided with the submitted plan. It is known the most effective agricultural fertilizers have a lasting residual and therefore are required to include Prop 65 language regarding potential harmful health effects. These are also the most persistent in the environment and detrimental to runoff water quality. Attached is one example of a Product Data Sheet for a fertilizer with Ammonium phosphate sulfate (16-20-0.)

The Water Division is a public water supplier that owns and operates Lake Hennessey, which is the main source of supply used to serve water to homes and workplaces, to provide fire protection, and to meet other needs of more than 86,000 people throughout Napa Valley. The Water Division appreciates the attention to detail in the submitted erosion control plans including the attenuation basins. However, the Water Division remains concerned that the proposed project will cause significant adverse impacts to the public water supply from Lake Hennessey despite the robust mitigation measures described in the erosion control plan. To insure erosion control measures are maintained throughout the life of the project sufficient to avoid impacts to the water supply, the Water Division requires monitoring and sample analyses of the creek both upstream and downstream of the project outfalls. At owner's expense, the samples shall be analyzed at minimum for the following parameters:

- Turbidity

For TTY/Speech-to-Speech users, dial 7-1-1- for the California Relay Service or email clerk@cityofnapa.org
California Relay Services offers free text-to-speech, speech-to-speech, and Spanish-language services 24 hours a day, 7 days a week

- pH
- Phosphates
- Ammonia
- Sulfur
- Total Nitrogen
- TOC
- Acute toxicity

Frequency: every 2 months for the period from Nov 1 – May 1 each year. Subject to increased monitoring frequency if downstream analytical results exceed upstream results.
Location: Upstream of the project site and immediately downstream of the outfall and runoff area of the project site. Locations must remain consistent each year and be identified using GPS coordinates. Analyses must be performed at an ELAP-certified laboratory and the results submitted within 30 days of samples being gathered and include the chain of custody. Data shall be submitted to:

City of Napa Water Division
Attn: Water Quality Manager
PO Box 660
Napa, CA 94559

Please contact me at 257-9319 if you have any questions or require additional information.

Respectfully,

Joy Eldredge, P.E.
Water General Manager

cc: Michael Hether
scoop/file

Simplot

PRODUCT DATA SHEET

Simplot agropell

AMMONIUM PHOSPHATE
16-20-0
with 13% Sulfur

GUARANTEED ANALYSIS

Total Nitrogen (N) 16.00%
16.00% Ammoniacal Nitrogen
Available Phosphate (P_2O_5) 20.00%
Sulfur (S) 13.00%

Derived from Monoammonium Phosphate and Ammonium Sulfate.

Information regarding the contents and levels of metals in this product is available on the Internet at http://www.regulatory-info-jr.com

This product contains a chemical known to the State of California to cause cancer, birth defects or other reproductive harm. Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986, requires notification of potential exposure to substances identified by the State of California as causing cancer, birth defects or other reproductive harm.

PHYSICAL CHARACTERISTICS

		US	Metric
Lbs. of Nutrients (Ton / Tonne):	Nitrogen (N)	320	358
	Phosphate (P_2O_5)	400	448
	Sulfur (S)	260	291
	Combined Nutrient Total	**980**	**1097**
Bulk Density (lbs per ft³ / kg per m³):	Poured	60	969
	Packed	62	1001

Solubility in Water: Better than 90%.

Granule Size: 98% retained by Tyler screen mesh #16. (This is an in-line product of uniformly sized granules.)

USES

1. An excellent fertilizer for use on soils and crops requiring nitrogen, phosphate and sulfur. The nitrogen is long lasting and the phosphate and sulfur are in forms that are immediately available to the plant.
2. Adapts to a wide range of application methods: fall plow-down, spring preplant broadcast, banding at time of planting, drilled in with small grain seed, side dressed and broadcast on pasture or grass alfalfa stubble.
3. Ideal combination of N, P_2O_5 and S to apply as a starter fertilizer on most crops.
4. Can be used in custom blending as a source of nitrogen, phosphate and sulfur.
5. For specific application rates follow the recommendation of a qualified individual or institution, such as, but not limited to, a certified crop advisor, agronomist, university crop extension publication, or apply according to recommendations in your approved nutrient management plan.

ADVANTAGES

1. High sulfur content–contains sulfate sulfur the type utilized by plants. It also makes soils more friable, improves moisture penetration, aids in crop residue breakdown, increases the availability of other nutrients and helps reclaim alkaline soils.
2. High water soluble phosphate–goes to work quickly and is utilized most efficiently by plants.
3. Long lasting non-leachable nitrogen–the nitrogen is in the ammonium form which resists leaching and provides nitrogen to the plant over a longer period of time.
4. Low volatility–form of nitrogen and phosphate that resists volatility.
5. Nitrogen and Phosphate combination improved nutrient uptake–ammoniacal form of nitrogen combined with phosphate helps the plants to utilize the phosphate more efficiently.
6. Monoammonium phosphate–the risk of fertilizer injury to germinating seeds is reduced.
7. Acidic fertilizer–has a slight acidic effect which helps offset nutritional problems in calcareous soils.

BULK STORAGE PRECAUTION

This product is not suitable for storage in overhead/upright free standing bins. The J.R. Simplot Company will not warrant or guarantee product stored in this manner and will not be subject to any claims against set-up product, damaged bins, labor to remove product or other damages and liabilities. An example of overhead/upright bins include but not limited to Stor-King, Wheatland, Meridian and others. This warning includes bins that have special "Fertilizer Coatings" to the internal walls to promote free flowing of the contents.

SAFETY

Slight abrasion may result from eye contact or prolonged skin contact. Not generally considered toxic. Nonflammable.

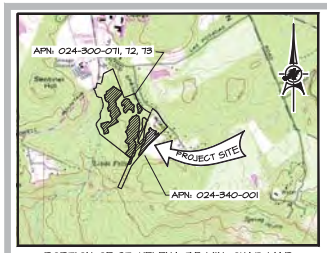
Agropell® is a registered trademark of J.R. Simplot Company

14060_ammoniumsulfate_16200_us-metric_R3-6-2012

APPENDIX B

EROSION CONTROL PLAN

LE COLLINE VINEYARD
EROSION CONTROL PLAN
FOR NEW VINEYARD DEVELOPMENT



PORTION OF ST. HELENA 7.5 MIN. QUAD MAP

Vicinity Map

1" = 2000'

SHEET INDEX

1. TITLE SHEET
2. PLAN
3. DETAILS

Narrative

This project consists of A Timberland Conversion (pursuant to a Timber Conversion Permit) and the development of approximately 32.8 gross acres (±25.0 net acres) of new vineyard within APNS 024-300-071, 72, 73, and 024-340-001, a total holding of 88.34 acres, located at 300 Cold Springs Rd., Angwin. The project includes construction of three new access drives and improvement of an existing dirt trail, for a total project area of 33.8 acres. The parcels consist of brush and tree canopy, and existing access drives. Parcel 024-340-001 includes a residence with landscaping. There is existing access from Cold Springs Rd. and from Winding Way. Existing ground slopes within the project area range from 7% to 29%. The vinerows will run northeast/southwest and will be planted 6' apart. Blocks C & D2 shall be hand-farmed with limited use of motorized equipment. Cultivation practices are described below under Permanent Erosion Control Measures. A new drip irrigation system will be installed and an existing irrigation well will serve as the water source. Water use on the new vineyard is expected to be ±11.7 acre-feet per annum (afa); total use on the holding is expected to be 12.5 afa.

The USGS St. Helena 7.5 minute Quad Map shows one blueline stream (Conn Creek) running along the southwest property line, four county definition streams and three Class III streams (as identified by CalFire) within the parcels and appurtenant to the project. Setbacks have been provided in accordance with the Napa County Conservation Regulations. The project drains toward Conn Creek and lies within the Conn Creek-Upper Reach and Conn Creek Main Fork subwatersheds.

Soils within the block boundaries have been classified in the USDA Soil Conservation Service's Napa County Soil Survey, as Forward gravelly loam and Kidd loam.

Special Status Species identified in the Biological Report prepared by Kjeldsen Biological Consulting shall be avoided. Orange construction fence shall be placed around those plants by the owner, and the it shall be checked and approved by Napa County PBES prior to construction.

No Cultural Resources occur in the project area, as concluded in the Cultural Resources Study prepared by Origer & Associates.

No Slope Instability is evident in the project area, as concluded in the Engineering Geological Evaluation prepared by Gilpin Geosciences.

Vegetation Removal consists of brush and resident grasses, and trees as identified in the associated Timber Conversion Plan. All organic material to be burned or chipped shall be stacked at strategic locations within the cleared area. Burning of the organic material only shall take place after obtaining approval from all the governing agencies.

Ground preparation includes ripping to a maximum depth of 36" and tilling. Rock generated during land preparation will be used to construct a rock fill along the lower boundary of Block A as shown on the plan, and may be used for road surfacing and other erosion control features. Soil amendments shall be added as specified in the *Project Notes*.

Wildlife Exclusion Fencing may be installed around the vineyard, as shown on the plan, with gates and/or cattle guards provided at access locations. For convenience, the fence may be routed around trees and other imposing physical features. Fence shall be 6" min. wire mesh.

Temporary Erosion Control Measures consist of the installation of fiber rolls and the application of straw mulch where seeding occurs. The installation of all **fiber rolls** shall be completed in accordance with the appropriate detail along the contours at locations shown on the plan, prior to the rainy season at the end of years P-1 and P. They shall be left in place through the winter after planting after which they may be removed. A **straw mulch** cover shall be applied over all open and/or disturbed and seeded areas at the rate specified in the seeding requirements.

Permanent Erosion Control Measures consist of the following:

1) Clean and repair existing drainage features as needed.

2) Diversion ditches shall be constructed where shown on the plan, and maintained throughout the life of the vineyard. The ditches shall not be tilled or disked during any vineyard operations.

3) Rock lined ditches and rock stabilization at low points in the vineyard avenues shall be constructed of locally gathered fieldstone in accordance with the appropriate details. Some locations of rock stabilization are shown on the plan. Others may be discovered during construction. Rock structures shall remain in place as permanent features.

4) Construction of water bars where shown on the plan in accordance with the appropriate detail.

5) Attenuation basins shall be constructed where shown on the plan in accordance with the appropriate detail. Level water spreaders or energy dissipators shall be installed at the basin outlets in accordance with the appropriate detail.

6) A winter cover crop shall be planted within the new vineyard areas in year P-1. At the end of the growing season in year P, a permanent cover crop shall be planted within the new vineyard blocks (refer to cultivation chart under *Project Notes)*. In Blocks A thru D, the cover crop may be mowed and spot sprayed around the base of each vine using springtime applications of post-emergent contact sprays. Weeds within those blocks may also be spot sprayed, if desired. No strip spraying shall occur and NO PREEMERGENT SPRAYS SHALL BE USED. In Block E, the cover crop may be mowed, but NO SPRAYING shall occur within Block E. As a normal cultural practice no disking, ripping or other tillage shall occur within the vineyard once the permanent cover crop has been established. No areas outside the vineyard blocks, including avenues and turnspaces, shall be disked or sprayed at any time. Using this method a minimum ground cover of 80% will be obtained each winter in Blocks A thru D, and a minimum of 85% will be obtained in Block E. From time to time (every three or four years), it may be necessary to disk the cover crop to open up the ground or to re-establish proper ground cover. Should this be necessary, notification shall be provided to Napa County and Napa County RCD, and the work shall proceed as prescribed in Napa County Conservation, Development and Planning Department guidelines, dated April 8, 2004, entitled "Protocol for Replanting/Renewal of Approved Non-Tilled Vineyard Cover Crops".

7) Implementation and adherence to the **Annual Winterization** program presented in the Project Notes.

Costs: The total cost of all erosion control measures is estimated to be $1500-2000/acre including equipment, materials, and labor.

The project site was visited by the plan preparer in May, 2014 to inspect the site, and will be visited during and after development to check for proper erosion control features.

Project Notes

APN & Owner:

024-300-071, 72, 73	Le Colline LLC 5 White Pine Canyon Rd Park City, UT 84060
024-340-001	Cold Springs LLC 5 White Pine Canyon Rd Park City, UT 84060

Site Address: 300 Cold Springs Rd., Angwin

Contact: Jim Barbour @ 257-1829 Barbour Vineyards 104 Camino Dorado Napa, CA 94558	Drew L. Aspegren, P. E. @ 963-4927 Napa Valley Vineyard Engineering, Inc. 176 Main St., Suite B St. Helena, CA 94574

Mapping: Tetra Tech, using 2003 data by the National Center for Airborne Laser Mapping

Implementation Schedule: Work may begin during the first growing season after project approval and may be completed over several years. Preplant and planting year operations may be conducted over two growing seasons or they may be conducted during the same year. The work will be scheduled as follows:

Year P-1 April 1 thru Sept 1	Clearing, rock and root removal, stacking vegetation for burning or other disposal, disking, installing permanent erosion control measures prior to vineyard layout, staking and installation of drip system, installing temporary erosion control measures. Winterization, consisting of seeding and mulching, shall be completed by September 1.
Rainy Season Sep 15 thru March 31	Maintain erosion control measures, burning as allowed by government agencies.
Year P Apr 1 thru Sept 1	Complete unfinished pre-plant operations, plant vineyard and begin cultural practices (refer to cultivation chart below). Maintain all erosion control features.

Cover Cropping and Cultivation Practices

Year	Cultivation during growing season	Cover Crop, planted at end of growing season
Pre-plant (P-1)	rip and disk	winter cover crop
Planting (P)	full till	permanent cover crop
P+1 Forward	no till, spot spray	permanent cover crop

All ground disturbing activities shall be completed by September 1 of each year, and all erosion control measures shall be in place by September 15.

Seeding Requirements: All exposed or disturbed soils shall be seeded. Seed and fertilizer shall be applied hydraulically or broadcast at the rates specified below:

Le Colline mix @ 100 lbs/ac	Annual Calif. brome	30%
	Perennial Calif. brome	20%
	Blue wild rye	15%
	3 weeks fescue	15%
	Calif. poppy	10%
	Blue lupine	10%

Fertilizer : Ammonium phosphate sulfate (16-20-0) 200-240 lbs/ac

Soil Amendments, Block E	Dolomitic Lime	6 tons/ac
	Compost	5 tons/ac

An alternate seed mix and/or fertilizer may be used after review and approval by Napa County RCD.

Straw Mulch shall be spread over all disturbed and seeded areas. The mulch shall be certified weed free and shall be spread mechanically or by hand at the rate of 2 tons/acre.

Fiber Rolls shall be installed at the locations shown on the plan in accordance with the appropriate detail. Fiber Rolls shall be maintained through the winter after planting, after which they may be removed.

Water Bars shall be constructed where shown on the Plan. Water bars shall remain as permanent structures and shall be reshaped as necessary prior to each rainy season.

Diversion Ditches and Drop Inlets shall be contructed at the locations shown on the Plan. Ditch flowline shall be sloped to drain at 3 to 6%. Ditches shall remain as permanent structures and shall be reshaped as necessary prior to each rainy season.

Rock Stabilization and Rock Lined Ditches shall be constructed of locally gathered fieldstone, or class light as defined in Caltrans Standard Specifications, Sec. 72-2.02. A non woven filter fabric (Mirafi 140N, or equal) shall be placed between all RSP and earthen material.

Maintenance: A winter cover crop shall be seeded and mulched prior to September 15 during year P-1 (refer to the cultivation chart). At the end of the growing season in year P, a permanent cover crop shall be planted within the vineyard block (refer to *Permanent Erosion Control Measures* in the *Narrative*). The cover crop may be mowed in the spring after the seed has fully matured (hard dough stage) to ensure annual grass species regeneration for the following year. Minimum mowing height of 4" shall be maintained for establishing annual and perennial grasses. As a normal cultural practice, no tillage shall take place after the vineyard has been planted, and spraying shall occur as provided in the *Narrative* under *Permanent Erosion Control Measures*. A minimum ground cover of 80% will be obtained each winter in Blocks A thru D, and a minimum of 85% will be obtained in Block E. The owner shall be responsible for reseeding and maintenance in order to reach the desired degree of cover.

Annual Winterization: After harvest and prior to first rains, but no later than September 15 each year, the following winterization shall be completed:

1) The condition of the cover crop shall be evaluated, including those areas outside the vineyard, and the suitability and effectiveness of the seed mix shall be evaluated. Weak areas shall be reseeded as necessary; if addition of soil amendments is indicated, they shall be incorporated and those areas shall be seeded and mulched.

2) All roads and avenues/turnspaces which are not rocked or paved shall be seeded as needed to maintain a minimum 80% cover, and mulched, and shall remain undisturbed throughout the rainy season.

3) All ditches, drop inlets, culverts, and other drainage and erosion control features shall be inspected and repaired as necessary.

4) All basins shall be inspected, cleaned and repaired as necessary. The rock anchoring filter fabric on interior slope of dikes shall be replaced annually, or as needed.

5) All other existing erosion control and drainage features shall be inspected and cleaned, or repaired as necessary.

All erosion control measures and drainage features shall be inspected after each storm event, and repairs shall be promptly performed.

Legend

	BLOCK BOUNDARY
	AVENUE/TURNSPACE
	VINEYARD BOUNDARY (APPROX.)
CPP	CORRUGATED POLYETHYLENE PIPE, SMOOTH WALL
O, D.I.	DROP INLET
1/3	DETAIL 1, SHEET 3
(E)	EXISTING
	FIBER ROLL
	FLOWLINE OF DIVERSION DITCHES
	GRASS ACCESS DRIVE (proposed)
	GRAVEL ACCESS DRIVE (proposed)
, HP	HIGH POINT
	IRRIGATION MAINLINE (proposed)
25' - 18" CPP	LENGTH/SIZE/KIND OF PIPE
PBES	PLANNING, BUILDING AND ENVIRONMENTAL SERVICES (Napa County)
MSB	MINIMUM SETBACK
	PROPERTY LINE
x x	PROPOSED WILDLIFE EXCLUSION FENCE
RSP	ROCK SLOPE PROTECTION
SCS	SOIL CONSERVATION SERVICE
139	SCS SOIL MAPPING UNIT
	SCS SOIL TYPE BOUNDARY
	SPECIAL STATUS SPECIES TO BE AVOIDED (approx. location)
	SUBSURFACE DRAINAGE PIPE
	WATER BAR

Special Notes-Attenuation Basins

1. Basin geometry shall be determined by field survey. Prior to construction, the final basin design shall be presented to NCPBES for approval. Alternates to the rock fill may be, but not limited to, rock walls, concrete walls, rock or concrete box, or earth fill. In no case shall the basin footprint extend outside the approved project limits without written approval from NCPBES.
2. Synthetic liners shall be water tight. Seams shall be lapped and bonded as recommended by manufacturer. Sleeves shall be used on all pipe penetrations. Alternates to synthetic liners may be, but not limited to, gunite facing or grouted rock facing.

LE COLLINE VINEYARD
EROSION CONTROL PLAN
FOR NEW VINEYARD DEVELOPMENT

REV 10 11-24-17 DLN Added setback from drainage in Block E (sheet 2)
REV 9 6-1-17 DLN Revised per NCPBES comments (5-18-17)
REV 8 2-22-17 DLN Revised per ongoing environmental review (sheets 2 & 3)
REV 7 1-31-17 DLN Revised per ongoing environmental review (sheets 2 & 3)
REV 6 12-14-16 DLN Revised per ongoing environmental review
REV 5 7-7-16 DLN Revised seed mix specifications in Project Notes
REV 4 2-23-16 DLN Revised cover crop specifications in Narrative and Project Notes
REV 3 2-10-16 DLN Revised per RCD memo to NPBES (1-12-16)
REV 2 11-30-15 DLN Revised per NPBES comments (10-8-15) and RCD comments (7-17-15)
REV 1 6-22-15 DLN Revised per Napa County Comments (1-15-15) and RCD comments (5-7-15)

REGISTERED PROFESSIONAL ENGINEER
DREW L. ASPEGREN
No. 31418
Exp. 12-31-18
CIVIL
STATE OF CALIFORNIA

Napa Valley Vineyard Engineering, Inc.
176 Main St., Suite B
St. Helena, CA 94574
(707) 963 4927

DREW L. ASPEGREN, PE
R.C.E. 31418

December 18, 2014
DATE

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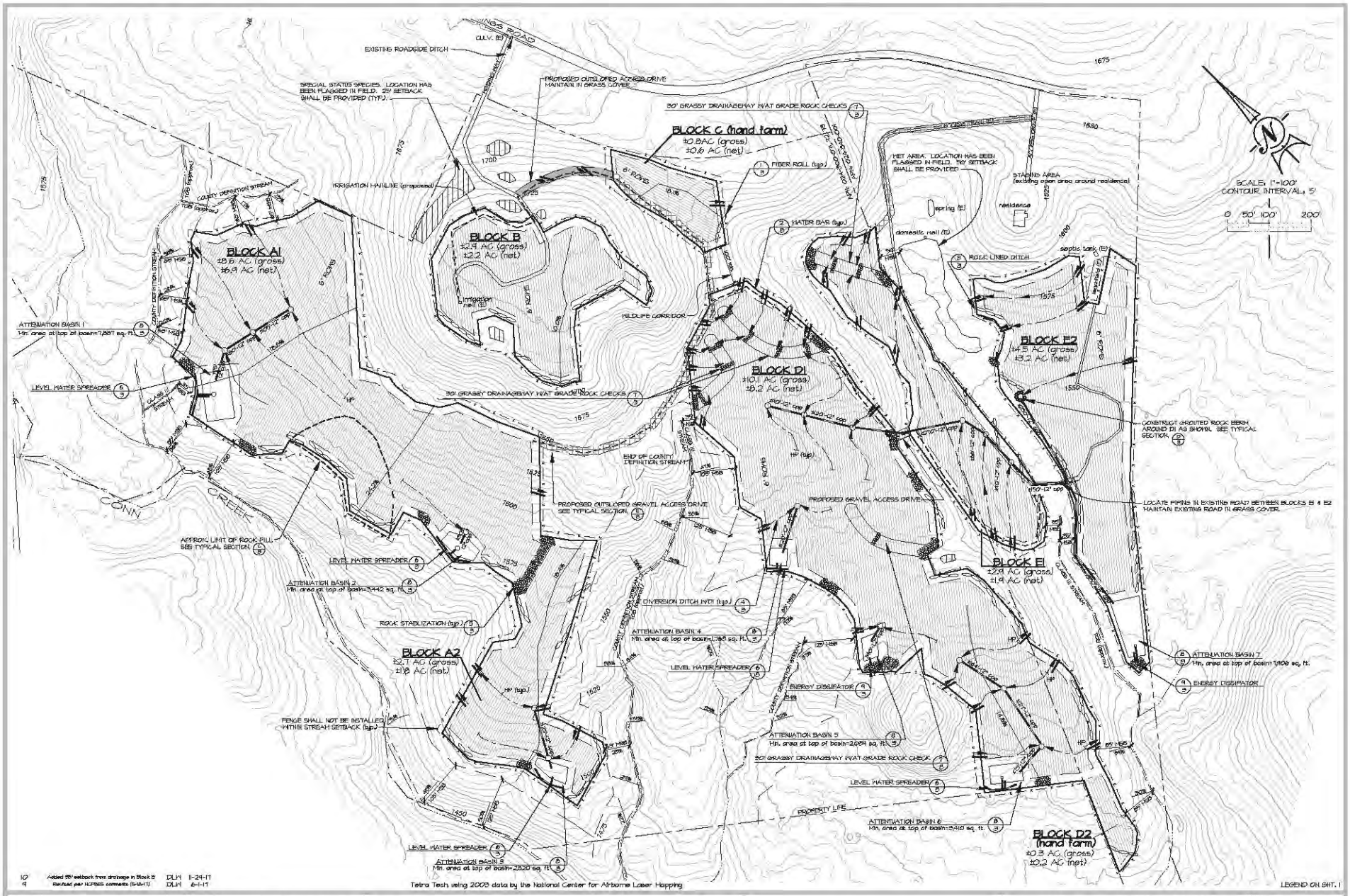

REV.	DESCRIPTION	BY	DATE
10	Added 25' setback from drainage in Block E	DLH	11-24-17
9	Revised per NCRWQCB comments (5-18-17)	DLH	6-1-17
8	Revised per ongoing environmental review	DLH	2-22-17
7	Revised per ongoing environmental review	DLH	1-31-17
6	Revised per ongoing environmental review	DLH	12-14-16
2	Revised per NCRWQCB comments (10-8-15) & RCD comments (11-11-15)	DLH	11-30-15
1	Change Block E boundary, realign road, hydrologic Napa County & RCD comments (1-15-15, 5-1-15)	DLH	6-22-15

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REGISTERED PROFESSIONAL ENGINEER GREG L. ASPERGREN No. 31418 Exp. 12-31-18 CIVIL STATE OF CALIFORNIA

DATE	SCALE
12-19-14	AS SHOWN
DRAWN	CHECKED
DLH	TEA

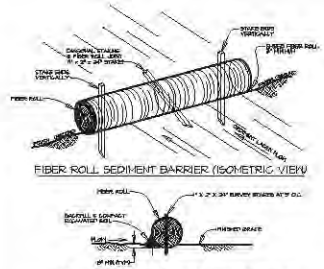
HES:PDCdwgs:R2.dwg
APPROVED
GREG L. ASPERGREN, PE R.C.E. 31418

Le Colline Vineyard

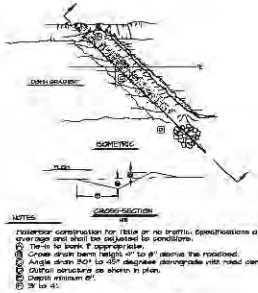
EROSION CONTROL PLAN FOR NEW VINEYARD DEVELOPMENT

PLAN

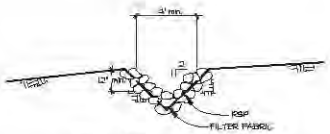
SHEET 2 OF 3



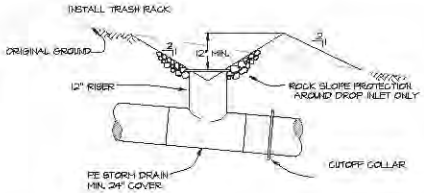
1/3 FIBER ROLL
NTS.



2/3 WATER BAR
NTS.

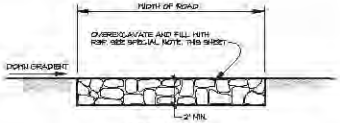


3/3 ROCK LINED DITCH
NTS.

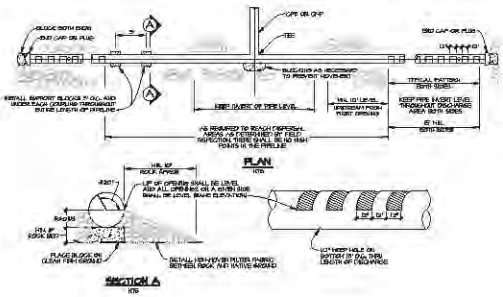


NOTES:
1. FLOWLINE SLOPE SHALL BE 3% TO 5%.
2. DIVERSION DITCHES SHALL BE SEEDED, MULCHED & COVERED W/JUTE NETTING WHICH SHALL BE SECURELY ANCHORED IN PLACE.

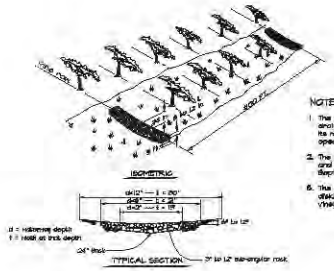
4/3 DIVERSION DITCH & DROP INLET
NTS.



5/3 ROCK STABILIZATION
NTS.

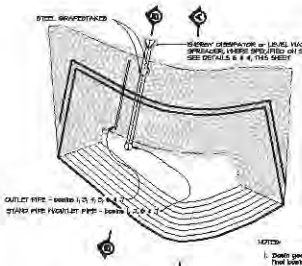


6/3 LEVEL WATER SPREADER
NTS.



NOTES:
1. The course of the drainageway shall be preserved. This drainageway SHALL NOT BE RIPPED within 20 feet either side of its natural flowline at any time during construction or vineyard operation.
2. The drainageway shall be seeded and fertilized by September 1, and shall be sufficiently pre-irrigated so that there is germination by September 15.
3. The drainageway may be planted in vineyard, but ripping and/or staking shall not be allowed as part of ground preparation or vineyard operation.

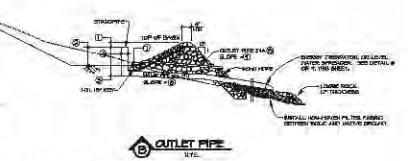
7/3 DRAINAGEWAY WITH AT GRADE ROCK CHECKS
NTS.



	BASIN						
	1	2	3	4	5	6	7
A - Basin Depth	8' MIN.	6' MIN.	4' MIN.	8' MIN.	3' MIN.	3.5' MIN.	8' MIN.
B - Area at top of stand pipe	6450 sq.ft	2181 sq.ft	–	–	–	3170 sq.ft	5697 sq.ft
C - Area at invert of outlet pipe	7148 sq.ft	–	2206 sq.ft	1522 sq.ft	1649 sq.ft	2504 sq.ft	6032 sq.ft
D - Interior slope	2:1	2:1	2:1	2:1	2:1	2:1	2:1
1 - Top of basin to top of stand pipe	2'	1'	–	–	–	5'	2'
2 - Top of stand pipe to basin bottom	6'	5'	–	–	–	8'	6'
3 - Top of stand pipe to invert of outlet	7'	6'	–	–	–	6'	7'
4 - Diameter of stand pipe	8'	12"	–	–	–	8'	18"
5 - Diameter of outlet pipe	6"	8"	–	–	–	8"	10"
6 - Minimum slope of outlet pipe	.02 MIN.	.02 MIN.	–	–	–	.02 MIN.	.02 MIN.
7 - Basin bottom to outlet invert	7'	–	5.5'	4.25'	4'	3.5'	5.5'
8 - Diameter of outlet pipe	6"	–	8"	8"	8"	8"	8"
9 - Minimum slope of outlet pipe	.02 MIN.	–	.02 MIN.	.02 MIN.	.02 MIN.	.02 MIN.	.02 MIN.

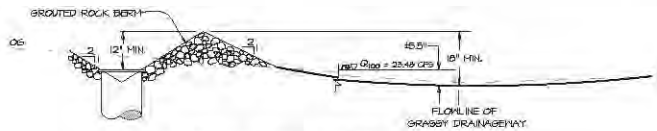
NOTES:
1. Basin geometry shall be determined by field survey. Prior to construction, the final basin design shall be presented to NCRCD for approval. Alternates to the rock fill may include but not limited to, rock walls, concrete walls, rock or concrete box, or earth fill. In no case shall the basin footprint extend outside the approved project limits without written approval from NCRCD.
2. Synthetic liners shall be water tight. Seams shall be lapped and bonded as recommended by manufacturer. Seams shall be used on all pipe penetrations. Alternate to synthetic liners may be, but not limited to, gunite facing or grouted rock facing.

A BASIN
NTS.

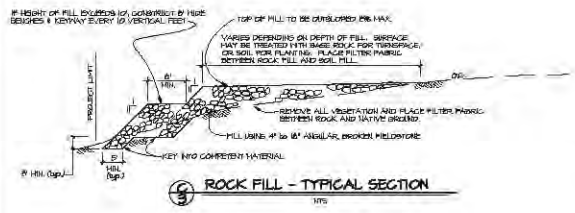


B OUTLET PIPE
NTS.

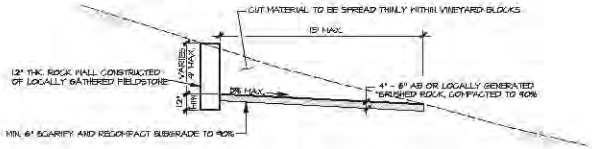
8/3 ATTENUATION BASIN
NTS.



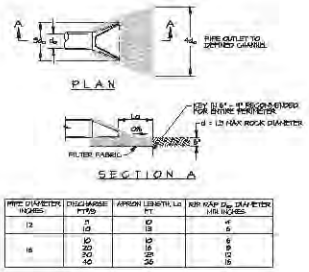
9/3 BERM - TYPICAL SECTION
NTS



10/3 ROCK FILL - TYPICAL SECTION
NTS



11/3 NEW ACCESS DRIVE - TYPICAL SECTION
NTS



PIPE DIAMETER INCHES	DISCHARGE CFS	APRON LENGTH, La FT	MIN MAP D_{50} DIAMETER MIL INCHES
12	5	10	4
	10	13	6
18	10	10	6
	20	16	8
	30	20	12
	40	26	16

9/3 ENERGY DISSIPATOR
NTS.

SPECIAL NOTE-RSP

Rock Slope Protection (RSP) shall be locally gathered field stone (20 lb.) or stone type, as defined in California Standard Specifications, Sec. 72-2.02. A non woven filter fabric (Mirafi 140 N, or equal) shall be placed between all RSP and native material.

10	Revise section C	DLH 11-24-17
9	Revise detail 8	DLH 8-1-17
8	Revise detail 8	DLH 2-22-17

REV.	DESCRIPTION	BY	DATE
7	Revise detail 8	DLH	1-31-17
6	Add level water spreader detail	DLH	12-14-16
5	Revise typical section E3	DLH	6-7-16
2	Add berm typical section	DLH	11-30-15
1	Add section & basin details	DLH	6-22-15

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REGISTERED PROFESSIONAL ENGINEER DREW L. ASPERGREN No. 31418 Exp. 12-31-18 CIVIL STATE OF CALIFORNIA

DATE 12-18-14	SCALE AS SHOWN	
RECOMMENDED	DRAWN DLH	CHECKED DLH
APPROVED		
DREW L. ASPERGREN PE	R.C.E. 31418	

Le Colline Vineyard

EROSION CONTROL PLAN FOR NEW VINEYARD DEVELOPMENT

DETAILS

SHEET 3 OF 3

APPENDIX C

CALEEMOD OUTPUT FILES

Le Colline

Napa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	0.00	User Defined Unit	34.50	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.6	**Precipitation Freq (Days)**	64
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Ag Industrial

Construction Phase - Phase 1 assumed Sept - Oct 2015 (25d)
Phase 1 log haul assumed 75 days per truck (600 hr)

Phase 2 assumed April - June 2017 (50d)
Phase 2 grading assumed March 2017 (5d)

Phase 3 assumed March - July 2018
days to match final equipment list PDF

Site Prep utlitized due to lack of agircultural defaults in Caleemod

Off-road Equipment - grader and off highway not included in this phase

Off-road Equipment -

Off-road Equipment - Dozer and Excavators used defaults
Off-road Equipment - grader used defaults

Off-road Equipment - grader not included in this phase

log haulers assumed off-highway trucks - defaults used
Off-road Equipment - tractor default

Off-road Equipment - tractor default

Off-road Equipment - ATV = off highway tractor
Tractor and spray rig = default tractor
Off-road Equipment - tractor default

Off-road Equipment - tractor default

Grading - Total disturbed is gross acres for phase 1 and 2. Phase 3 is net acres from project description. Remaining = default.

Trips and VMT - Worker trips phase 1 = 3.2 = 4*0.8 because workers travel 80% of phase 1

Worker trips phase 3 = 10.8 to account for 27 days in 20 day step of phase

Hauling phase 3 = 1.39 grape trucks a day 25 (a season)/ 18 (days in that phase step)
On-road Fugitive Dust - defaults retained

Vehicle Trips -

Land Use Change -

Sequestration - no new trees

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	75.00	5.00
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tblConstructionPhase	NumDays	30.00	75.00
tblConstructionPhase	NumDays	30.00	15.00
tblConstructionPhase	NumDays	30.00	50.00
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tblConstructionPhase	NumDays	30.00	20.00
tblConstructionPhase	NumDays	30.00	40.00

tblConstructionPhase	NumDays	30.00	8.00
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tblGrading	AcresOfGrading	0.00	27.60
tblGrading	AcresOfGrading	0.00	27.60
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tblOffRoadEquipment	UsageHours	8.00	9.00

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tblTripsAndVMT	VendorTripLength	6.60	0.00
tblTripsAndVMT	WorkerTripLength	12.40	240.00
tblTripsAndVMT	WorkerTripLength	12.40	0.00
tblTripsAndVMT	WorkerTripLength	12.40	0.00
tblTripsAndVMT	WorkerTripLength	12.40	150.00
tblTripsAndVMT	WorkerTripLength	12.40	0.00
tblTripsAndVMT	WorkerTripLength	12.40	0.00
tblTripsAndVMT	WorkerTripLength	12.40	32.00
tblTripsAndVMT	WorkerTripLength	12.40	0.00
tblTripsAndVMT	WorkerTripLength	12.40	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.1923	2.1698	1.1425	2.8400e-003	0.0541	0.0831	0.1373	8.6200e-003	0.0765	0.0851	0.0000	264.1815	264.1815	0.0760	0.0000	265.7782
2017	0.0808	0.8394	0.7808	9.2000e-004	0.3651	0.0420	0.4071	0.1768	0.0387	0.2154	0.0000	79.8099	79.8099	0.0188	0.0000	80.2042
2018	0.0194	0.1937	0.1593	2.7000e-004	0.0744	0.0121	0.0865	8.2200e-003	0.0112	0.0194	0.0000	24.1478	24.1478	7.2500e-003	0.0000	24.3001
Total	**0.2926**	**3.2028**	**2.0826**	**4.0300e-003**	**0.4936**	**0.1373**	**0.6309**	**0.1936**	**0.1263**	**0.3199**	**0.0000**	**368.1391**	**368.1391**	**0.1021**	**0.0000**	**370.2825**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.1923	2.1697	1.1425	2.8400e-003	0.0541	0.0831	0.1373	8.6200e-003	0.0765	0.0851	0.0000	264.1812	264.1812	0.0760	0.0000	265.7779
2017	0.0808	0.8394	0.7808	9.2000e-004	0.3651	0.0420	0.4071	0.1768	0.0387	0.2154	0.0000	79.8098	79.8098	0.0188	0.0000	80.2042
2018	0.0194	0.1937	0.1593	2.7000e-004	0.0744	0.0121	0.0865	8.2200e-003	0.0112	0.0194	0.0000	24.1478	24.1478	7.2500e-003	0.0000	24.3001
Total	**0.2926**	**3.2028**	**2.0826**	**4.0300e-003**	**0.4936**	**0.1373**	**0.6309**	**0.1936**	**0.1263**	**0.3199**	**0.0000**	**368.1388**	**368.1388**	**0.1021**	**0.0000**	**370.2821**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	-3,380.8800
Total	**-3,380.8800**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 1 (Timber Harvest)	Site Preparation	8/15/2016	9/16/2016	5	25	
2	Phase 1 (Timber Harvest) -log haul	Site Preparation	9/17/2016	12/31/2016	5	75	log haul 600 hours per truck
3	Phase 2 (Site Prep)	Site Preparation	4/3/2017	6/9/2017	5	50	
4	Phase 2 (Site Prep) - grading	Grading	6/17/2017	6/25/2017	5	5	
5	Phase 3 (Vineyard Maintenance) - tractor disc	Site Preparation	3/1/2018	3/21/2018	5	15	line 1
6	Phase 3 (Vineyard Maintenance) - tractor +rock trailer	Site Preparation	3/22/2018	4/16/2018	5	18	line 2
7	Phase 3 (Vineyard Maintenance) - ATV	Site Preparation	3/22/2018	4/18/2018	5	20	lines 3 and 5
8	Phase 3 (Vineyard Maintenance) - tractor trailer	Site Preparation	4/19/2018	6/13/2018	5	40	line 4
9	Phase 3 (Vineyard Maintenance) - mowing	Site Preparation	6/14/2018	6/25/2018	5	8	line 6

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 2 (Site Prep) - grading	Excavators	0	8.00	162	0.38
Phase 2 (Site Prep) - grading	Graders	1	8.00	174	0.41
Phase 1 (Timber Harvest) -log haul	Off-Highway Trucks	5	8.00	400	0.38
Phase 3 (Vineyard Maintenance) - tractor disc	Rubber Tired Dozers	0	8.00	255	0.40
Phase 2 (Site Prep)	Rubber Tired Dozers	2	8.00	255	0.40
Phase 1 (Timber Harvest)	Excavators	1	8.00	255	0.40
Phase 3 (Vineyard Maintenance) - ATV	Tractors/Loaders/Backhoes	1	8.00	255	0.40
Phase 3 (Vineyard Maintenance) - tractor trailer	Rubber Tired Dozers	0	8.00	255	0.40
Phase 3 (Vineyard Maintenance) - mowing	Rubber Tired Dozers	0	8.00	255	0.40
Phase 1 (Timber Harvest)	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Phase 3 (Vineyard Maintenance) - tractor +rock trailer	Rubber Tired Dozers	0	8.00	255	0.40
Phase 3 (Vineyard Maintenance) - tractor +rock trailer	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Phase 2 (Site Prep) - grading	Scrapers	0	8.00	361	0.48
Phase 1 (Timber Harvest) -log haul	Rubber Tired Dozers	0	8.00	255	0.40
Phase 2 (Site Prep)	Excavators	2	8.00	97	0.37
Phase 3 (Vineyard Maintenance) - tractor disc	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Phase 1 (Timber Harvest)	Skid Steer Loaders	1	8.00	64	0.37
Phase 2 (Site Prep)	Graders	0		174	0.41
Phase 1 (Timber Harvest)	Rubber Tired Dozers	0	8.00	255	0.40

Phase 2 (Site Prep) - grading	Rubber Tired Dozers	0	8.00	255	0.40
Phase 2 (Site Prep) - grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Phase 3 (Vineyard Maintenance) - ATV	Rubber Tired Dozers	0	8.00	255	0.40
Phase 2 (Site Prep)	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Phase 1 (Timber Harvest) -log haul	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Phase 3 (Vineyard Maintenance) - ATV	Off-Highway Tractors	1	8.00	97	0.37
Phase 3 (Vineyard Maintenance) - tractor trailer	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Phase 3 (Vineyard Maintenance) - mowing	Tractors/Loaders/Backhoes	1	9.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 1 (Timber Harvest)	3	8.00	0.00	0.00	240.00	0.00	20.00	LD_Mix	HDT_Mix	HHDT
Phase 3 (Vineyard Maintenance) - tractor	1	3.00	0.00	0.00	0.00	0.00	20.00	LD_Mix	HDT_Mix	HHDT
Phase 1 (Timber Harvest) -log haul	5	13.00	0.00	0.00	0.00	0.00	20.00	LD_Mix	HDT_Mix	HHDT
Phase 3 (Vineyard Maintenance) - tractor	1	3.00	0.00	1.39	0.00	0.00	20.00	LD_Mix	HDT_Mix	HHDT
Phase 2 (Site Prep)	4	10.00	0.00	0.00	150.00	0.00	20.00	LD_Mix	HDT_Mix	HHDT
Phase 2 (Site Prep) - grading	1	3.00	0.00	0.00	0.00	0.00	20.00	LD_Mix	HDT_Mix	HHDT
Phase 3 (Vineyard Maintenance) - ATV	2	5.00	0.00	0.00	32.00	0.00	20.00	LD_Mix	HDT_Mix	HHDT
Phase 3 (Vineyard Maintenance) - tractor	1	3.00	0.00	0.00	0.00	0.00	20.00	LD_Mix	HDT_Mix	HHDT
Phase 3 (Vineyard Maintenance) - mowin	1	3.00	0.00	0.00	0.00	0.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Phase 1 (Timber Harvest) - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0183	0.0000	0.0183	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0105	0.1224	0.0753	1.7000e-004		6.2000e-003	6.2000e-003		5.7000e-003	5.7000e-003	0.0000	16.3558	16.3558	4.9300e-003	0.0000	16.4594
Total	**0.0105**	**0.1224**	**0.0753**	**1.7000e-004**	**0.0183**	**6.2000e-003**	**0.0245**	**1.9800e-003**	**5.7000e-003**	**7.6800e-003**	**0.0000**	**16.3558**	**16.3558**	**4.9300e-003**	**0.0000**	**16.4594**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8900e-003	0.0123	0.1148	2.0000e-004	0.0175	1.5000e-004	0.0177	4.6600e-003	1.4000e-004	4.8000e-003	0.0000	15.2286	15.2286	9.5000e-004	0.0000	15.2487
Total	**3.8900e-003**	**0.0123**	**0.1148**	**2.0000e-004**	**0.0175**	**1.5000e-004**	**0.0177**	**4.6600e-003**	**1.4000e-004**	**4.8000e-003**	**0.0000**	**15.2286**	**15.2286**	**9.5000e-004**	**0.0000**	**15.2487**

3.2 Phase 1 (Timber Harvest) - 2016

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0183	0.0000	0.0183	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0105	0.1224	0.0753	1.7000e-004		6.2000e-003	6.2000e-003		5.7000e-003	5.7000e-003	0.0000	16.3558	16.3558	4.9300e-003	0.0000	16.4594
Total	**0.0105**	**0.1224**	**0.0753**	**1.7000e-004**	**0.0183**	**6.2000e-003**	**0.0245**	**1.9800e-003**	**5.7000e-003**	**7.6800e-003**	**0.0000**	**16.3558**	**16.3558**	**4.9300e-003**	**0.0000**	**16.4594**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8900e-003	0.0123	0.1148	2.0000e-004	0.0175	1.5000e-004	0.0177	4.6600e-003	1.4000e-004	4.8000e-003	0.0000	15.2286	15.2286	9.5000e-004	0.0000	15.2487
Total	**3.8900e-003**	**0.0123**	**0.1148**	**2.0000e-004**	**0.0175**	**1.5000e-004**	**0.0177**	**4.6600e-003**	**1.4000e-004**	**4.8000e-003**	**0.0000**	**15.2286**	**15.2286**	**9.5000e-004**	**0.0000**	**15.2487**

3.3 Phase 1 (Timber Harvest) -log haul - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0183	0.0000	0.0183	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1766	2.0347	0.9476	2.4700e-003		0.0768	0.0768		0.0706	0.0706	0.0000	232.4963	232.4963	0.0701	0.0000	233.9691
Total	**0.1766**	**2.0347**	**0.9476**	**2.4700e-003**	**0.0183**	**0.0768**	**0.0951**	**1.9800e-003**	**0.0706**	**0.0726**	**0.0000**	**232.4963**	**232.4963**	**0.0701**	**0.0000**	**233.9691**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3400e-003	3.0000e-004	4.7800e-003	0.0000	0.0000	0.0000	1.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.1007	0.1007	2.0000e-005	0.0000	0.1012
Total	**1.3400e-003**	**3.0000e-004**	**4.7800e-003**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.1007**	**0.1007**	**2.0000e-005**	**0.0000**	**0.1012**

3.3 Phase 1 (Timber Harvest) -log haul - 2016

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0183	0.0000	0.0183	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1766	2.0347	0.9476	2.4700e-003		0.0768	0.0768		0.0706	0.0706	0.0000	232.4961	232.4961	0.0701	0.0000	233.9688
Total	**0.1766**	**2.0347**	**0.9476**	**2.4700e-003**	**0.0183**	**0.0768**	**0.0951**	**1.9800e-003**	**0.0706**	**0.0726**	**0.0000**	**232.4961**	**232.4961**	**0.0701**	**0.0000**	**233.9688**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3400e-003	3.0000e-004	4.7800e-003	0.0000	0.0000	0.0000	1.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.1007	0.1007	2.0000e-005	0.0000	0.1012
Total	**1.3400e-003**	**3.0000e-004**	**4.7800e-003**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.1007**	**0.1007**	**2.0000e-005**	**0.0000**	**0.1012**

3.4 Phase 2 (Site Prep) - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3194	0.0000	0.3194	0.1675	0.0000	0.1675	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0734	0.7982	0.6122	6.0000e-004		0.0405	0.0405		0.0372	0.0372	0.0000	55.4441	55.4441	0.0170	0.0000	55.8008
Total	**0.0734**	**0.7982**	**0.6122**	**6.0000e-004**	**0.3194**	**0.0405**	**0.3599**	**0.1675**	**0.0372**	**0.2047**	**0.0000**	**55.4441**	**55.4441**	**0.0170**	**0.0000**	**55.8008**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-003	0.0170	0.1565	3.1000e-004	0.0274	2.2000e-004	0.0276	7.2900e-003	2.0000e-004	7.4900e-003	0.0000	22.9183	22.9183	1.3500e-003	0.0000	22.9466
Total	**5.0000e-003**	**0.0170**	**0.1565**	**3.1000e-004**	**0.0274**	**2.2000e-004**	**0.0276**	**7.2900e-003**	**2.0000e-004**	**7.4900e-003**	**0.0000**	**22.9183**	**22.9183**	**1.3500e-003**	**0.0000**	**22.9466**

3.4 Phase 2 (Site Prep) - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3194	0.0000	0.3194	0.1675	0.0000	0.1675	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0734	0.7982	0.6122	6.0000e-004		0.0405	0.0405		0.0372	0.0372	0.0000	55.4440	55.4440	0.0170	0.0000	55.8007
Total	**0.0734**	**0.7982**	**0.6122**	**6.0000e-004**	**0.3194**	**0.0405**	**0.3599**	**0.1675**	**0.0372**	**0.2047**	**0.0000**	**55.4440**	**55.4440**	**0.0170**	**0.0000**	**55.8007**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-003	0.0170	0.1565	3.1000e-004	0.0274	2.2000e-004	0.0276	7.2900e-003	2.0000e-004	7.4900e-003	0.0000	22.9183	22.9183	1.3500e-003	0.0000	22.9466
Total	**5.0000e-003**	**0.0170**	**0.1565**	**3.1000e-004**	**0.0274**	**2.2000e-004**	**0.0276**	**7.2900e-003**	**2.0000e-004**	**7.4900e-003**	**0.0000**	**22.9183**	**22.9183**	**1.3500e-003**	**0.0000**	**22.9466**

3.5 Phase 2 (Site Prep) - grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0183	0.0000	0.0183	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3800e-003	0.0241	0.0121	2.0000e-005		1.3500e-003	1.3500e-003		1.2500e-003	1.2500e-003	0.0000	1.4461	1.4461	4.4000e-004	0.0000	1.4554
Total	**2.3800e-003**	**0.0241**	**0.0121**	**2.0000e-005**	**0.0183**	**1.3500e-003**	**0.0196**	**1.9800e-003**	**1.2500e-003**	**3.2300e-003**	**0.0000**	**1.4461**	**1.4461**	**4.4000e-004**	**0.0000**	**1.4554**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.4900e-003	1.4900e-003	0.0000	0.0000	1.5000e-003
Total	**2.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.4900e-003**	**1.4900e-003**	**0.0000**	**0.0000**	**1.5000e-003**

3.5 Phase 2 (Site Prep) - grading - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0183	0.0000	0.0183	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3800e-003	0.0241	0.0121	2.0000e-005		1.3500e-003	1.3500e-003		1.2500e-003	1.2500e-003	0.0000	1.4461	1.4461	4.4000e-004	0.0000	1.4554
Total	**2.3800e-003**	**0.0241**	**0.0121**	**2.0000e-005**	**0.0183**	**1.3500e-003**	**0.0196**	**1.9800e-003**	**1.2500e-003**	**3.2300e-003**	**0.0000**	**1.4461**	**1.4461**	**4.4000e-004**	**0.0000**	**1.4554**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.4900e-003	1.4900e-003	0.0000	0.0000	1.5000e-003
Total	**2.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.4900e-003**	**1.4900e-003**	**0.0000**	**0.0000**	**1.5000e-003**

3.6 Phase 3 (Vineyard Maintenance) - tractor disc - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-003	0.0197	0.0175	2.0000e-005		1.4000e-003	1.4000e-003		1.2900e-003	1.2900e-003	0.0000	2.1281	2.1281	6.6000e-004	0.0000	2.1420
Total	**2.0000e-003**	**0.0197**	**0.0175**	**2.0000e-005**	**0.0146**	**1.4000e-003**	**0.0160**	**1.5800e-003**	**1.2900e-003**	**2.8700e-003**	**0.0000**	**2.1281**	**2.1281**	**6.6000e-004**	**0.0000**	**2.1420**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	1.0000e-005	1.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.3100e-003	4.3100e-003	0.0000	0.0000	4.3200e-003
Total	**5.0000e-005**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.3100e-003**	**4.3100e-003**	**0.0000**	**0.0000**	**4.3200e-003**

3.6 Phase 3 (Vineyard Maintenance) - tractor disc - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-003	0.0197	0.0175	2.0000e-005		1.4000e-003	1.4000e-003		1.2900e-003	1.2900e-003	0.0000	2.1281	2.1281	6.6000e-004	0.0000	2.1420
Total	**2.0000e-003**	**0.0197**	**0.0175**	**2.0000e-005**	**0.0146**	**1.4000e-003**	**0.0160**	**1.5800e-003**	**1.2900e-003**	**2.8700e-003**	**0.0000**	**2.1281**	**2.1281**	**6.6000e-004**	**0.0000**	**2.1420**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	1.0000e-005	1.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.3100e-003	4.3100e-003	0.0000	0.0000	4.3200e-003
Total	**5.0000e-005**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.3100e-003**	**4.3100e-003**	**0.0000**	**0.0000**	**4.3200e-003**

3.7 Phase 3 (Vineyard Maintenance) - tractor +rock trailer - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3900e-003	0.0237	0.0210	3.0000e-005		1.6800e-003	1.6800e-003		1.5400e-003	1.5400e-003	0.0000	2.5537	2.5537	8.0000e-004	0.0000	2.5704
Total	**2.3900e-003**	**0.0237**	**0.0210**	**3.0000e-005**	**0.0146**	**1.6800e-003**	**0.0163**	**1.5800e-003**	**1.5400e-003**	**3.1200e-003**	**0.0000**	**2.5537**	**2.5537**	**8.0000e-004**	**0.0000**	**2.5704**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	2.5000e-004	2.6000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0655	0.0655	0.0000	0.0000	0.0655
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	1.0000e-005	2.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.1700e-003	5.1700e-003	0.0000	0.0000	5.1900e-003
Total	**8.0000e-005**	**2.6000e-004**	**4.7000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0707**	**0.0707**	**0.0000**	**0.0000**	**0.0707**

3.7 Phase 3 (Vineyard Maintenance) - tractor +rock trailer - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3900e-003	0.0237	0.0210	3.0000e-005		1.6800e-003	1.6800e-003		1.5400e-003	1.5400e-003	0.0000	2.5537	2.5537	8.0000e-004	0.0000	2.5704
Total	**2.3900e-003**	**0.0237**	**0.0210**	**3.0000e-005**	**0.0146**	**1.6800e-003**	**0.0163**	**1.5800e-003**	**1.5400e-003**	**3.1200e-003**	**0.0000**	**2.5537**	**2.5537**	**8.0000e-004**	**0.0000**	**2.5704**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	2.5000e-004	2.6000e-004	0.0000	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0655	0.0655	0.0000	0.0000	0.0655
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	1.0000e-005	2.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.1700e-003	5.1700e-003	0.0000	0.0000	5.1900e-003
Total	**8.0000e-005**	**2.6000e-004**	**4.7000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0707**	**0.0707**	**0.0000**	**0.0000**	**0.0707**

3.8 Phase 3 (Vineyard Maintenance) - ATV - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.3000e-003	0.0783	0.0503	1.2000e-004		4.0200e-003	4.0200e-003		3.7000e-003	3.7000e-003	0.0000	10.7666	10.7666	3.3500e-003	0.0000	10.8370
Total	**7.3000e-003**	**0.0783**	**0.0503**	**1.2000e-004**	**0.0146**	**4.0200e-003**	**0.0187**	**1.5800e-003**	**3.7000e-003**	**5.2800e-003**	**0.0000**	**10.7666**	**10.7666**	**3.3500e-003**	**0.0000**	**10.8370**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	6.6000e-004	6.1500e-003	1.0000e-005	1.1700e-003	1.0000e-005	1.1800e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9495	0.9495	5.0000e-005	0.0000	0.9507
Total	**2.6000e-004**	**6.6000e-004**	**6.1500e-003**	**1.0000e-005**	**1.1700e-003**	**1.0000e-005**	**1.1800e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9495**	**0.9495**	**5.0000e-005**	**0.0000**	**0.9507**

3.8 Phase 3 (Vineyard Maintenance) - ATV - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.3000e-003	0.0783	0.0503	1.2000e-004		4.0200e-003	4.0200e-003		3.7000e-003	3.7000e-003	0.0000	10.7666	10.7666	3.3500e-003	0.0000	10.8370
Total	**7.3000e-003**	**0.0783**	**0.0503**	**1.2000e-004**	**0.0146**	**4.0200e-003**	**0.0187**	**1.5800e-003**	**3.7000e-003**	**5.2800e-003**	**0.0000**	**10.7666**	**10.7666**	**3.3500e-003**	**0.0000**	**10.8370**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	6.6000e-004	6.1500e-003	1.0000e-005	1.1700e-003	1.0000e-005	1.1800e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9495	0.9495	5.0000e-005	0.0000	0.9507
Total	**2.6000e-004**	**6.6000e-004**	**6.1500e-003**	**1.0000e-005**	**1.1700e-003**	**1.0000e-005**	**1.1800e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9495**	**0.9495**	**5.0000e-005**	**0.0000**	**0.9507**

3.9 Phase 3 (Vineyard Maintenance) - tractor trailer - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9900e-003	0.0592	0.0526	7.0000e-005		4.1900e-003	4.1900e-003		3.8600e-003	3.8600e-003	0.0000	6.3843	6.3843	1.9900e-003	0.0000	6.4260
Total	**5.9900e-003**	**0.0592**	**0.0526**	**7.0000e-005**	**0.0146**	**4.1900e-003**	**0.0188**	**1.5800e-003**	**3.8600e-003**	**5.4400e-003**	**0.0000**	**6.3843**	**6.3843**	**1.9900e-003**	**0.0000**	**6.4260**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	3.0000e-005	4.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0115	0.0115	0.0000	0.0000	0.0115
Total	**1.4000e-004**	**3.0000e-005**	**4.8000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0115**	**0.0115**	**0.0000**	**0.0000**	**0.0115**

3.9 Phase 3 (Vineyard Maintenance) - tractor trailer - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9900e-003	0.0592	0.0526	7.0000e-005		4.1900e-003	4.1900e-003		3.8600e-003	3.8600e-003	0.0000	6.3843	6.3843	1.9900e-003	0.0000	6.4260
Total	**5.9900e-003**	**0.0592**	**0.0526**	**7.0000e-005**	**0.0146**	**4.1900e-003**	**0.0188**	**1.5800e-003**	**3.8600e-003**	**5.4400e-003**	**0.0000**	**6.3843**	**6.3843**	**1.9900e-003**	**0.0000**	**6.4260**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	3.0000e-005	4.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0115	0.0115	0.0000	0.0000	0.0115
Total	**1.4000e-004**	**3.0000e-005**	**4.8000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0115**	**0.0115**	**0.0000**	**0.0000**	**0.0115**

3.10 Phase 3 (Vineyard Maintenance) - mowing - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2000e-003	0.0118	0.0105	1.0000e-005		8.4000e-004	8.4000e-004		7.7000e-004	7.7000e-004	0.0000	1.2769	1.2769	4.0000e-004	0.0000	1.2852
Total	**1.2000e-003**	**0.0118**	**0.0105**	**1.0000e-005**	**0.0146**	**8.4000e-004**	**0.0155**	**1.5800e-003**	**7.7000e-004**	**2.3500e-003**	**0.0000**	**1.2769**	**1.2769**	**4.0000e-004**	**0.0000**	**1.2852**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	1.0000e-005	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.3000e-003	2.3000e-003	0.0000	0.0000	2.3100e-003
Total	**3.0000e-005**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.3000e-003**	**2.3000e-003**	**0.0000**	**0.0000**	**2.3100e-003**

3.10 Phase 3 (Vineyard Maintenance) - mowing - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0146	0.0000	0.0146	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2000e-003	0.0118	0.0105	1.0000e-005		8.4000e-004	8.4000e-004		7.7000e-004	7.7000e-004	0.0000	1.2769	1.2769	4.0000e-004	0.0000	1.2852
Total	**1.2000e-003**	**0.0118**	**0.0105**	**1.0000e-005**	**0.0146**	**8.4000e-004**	**0.0155**	**1.5800e-003**	**7.7000e-004**	**2.3500e-003**	**0.0000**	**1.2769**	**1.2769**	**4.0000e-004**	**0.0000**	**1.2852**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	1.0000e-005	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.3000e-003	2.3000e-003	0.0000	0.0000	2.3100e-003
Total	**3.0000e-005**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.3000e-003**	**2.3000e-003**	**0.0000**	**0.0000**	**2.3100e-003**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.476941	0.074107	0.173759	0.158633	0.057706	0.008286	0.014821	0.021797	0.002336	0.001217	0.006824	0.000711	0.002861

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	-3,380.8800	0.0000	0.0000	-3,380.8800

10.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Cropland	0 / 27.6	171.1200	0.0000	0.0000	171.1200
Trees	32 / 0	-3,552.0000	0.0000	0.0000	-3,552.0000
Total		**-3,380.8800**	**0.0000**	**0.0000**	**-3,380.8800**

APPENDIX D

BIOLOGICAL RESOURCES REPORT

Biological Resources Report

Le Colline Vineyard THP/TCP

APNs 024-300-070, -071, -072 &-340-001

300 Cold Springs Road

Napa County

Prepared
By
KJELDSEN BIOLOGICAL CONSULTING

For
Scott Butler, R.P.F. #1851
Environmental Resource Management

August 2015

Biological Resource Survey
Le Colline Vineyard THP/TCP
APNs 024-300-070, -071, -072 & -340-001
Napa County

PROJECT NAME: Le Colline Vineyard THP/TCP
APNS 024-300-070, -071, -072 & -340-001
Napa County

PROPERTY OWNER: Le Colline LLC
5 White Pine Canyon Rd.
Park City, UT 84060

THP/TCP PLAN: Scott Butler, R.P.F. #1851
Environmental Resource Management
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Ontario, OR 97914

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Biological Resource Survey
Le Colline Vineyard THP/TCP
APNs 024-300-070, -071, -072 & -340-001
Napa County

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APPENDIX B. **CNPS Special Status-Species Listed for the Project Quadrangle and Surrounding Quadrangles**

U.S. Fish and Wildlife Service Trust Resources List Listed Species for the Quadrangle

California Wildlife Habitat Relationship System Species Summary Report by Habitat Present

California Department of Fish and Wildlife Rare Find 5 Species list for the Quadrangle and Surrounding Quadrangles for Habitat found on the project site

Biological Resource Survey
Le Colline Vineyard THP/TCP
APNs 024-300-070, -071, -072 & -340-001
Napa County

Executive Summary

This study was conducted at the request of Scott Butler, Environmental Resource Management on behalf of the property owner as part of the background studies for Napa County Conservation, Development and Planning Department and California Department of Forestry. The project proposes a Timber Harvest Plan / Timber Conversion Plan (THP/TCP) for conversion of 34.8+/- acres of the 88.34-acre property to vineyard. The property is located on the south side of the community of Angwin at 300 Cold Springs Road.

Our survey follows the California Department of Fish and Wildlife (CDFW) Guidelines, California Native Plant Society (CNPS) Guidelines, and Guidelines for Conservation of Sensitive Plant Resources Within the Timber Harvest Review Process and During Timber Harvesting Operations (July 2005). The findings presented below are the results of fieldwork conducted from March through August of 2014 and January and May of 2015 by Kjeldsen Biological Consulting:

- Spring floristic surveys were conducted to determine the presence of potential habitat for special-status species which would be impacted by the proposed project. Two CNPS listed plants (Napa False Indigo and California Brodiaea) were observed on the property;
- We did not observe any State or Federal listed plants or animal known for the Quadrangle, surrounding Quadrangles or the region associated with the proposed vineyard blocks;
- In general the habitat types found on the property would be termed forest or woodland, annual grassland on disturbed ground, and shrubland/chaparral. Our findings using the vegetation criteria of Sawyer et al 2009 shows that the property consists of *Quercus* Forest Alliance Mixed Oak Forest, *Pseudotsuga menziesii* Forest Alliance Douglas-fir Forest, *Adenostoma fasiculatum* Shrubland Alliance Chamise Chaparral and *Arctostaphylos manzanita* Provisional Shrubland Alliance;
- The THP/TCP area does not contain any Sensitive or Natural communities, critical habitat or Biotic Communities of Limited Distribution listed by Napa County, California Department of Fish and Wildlife (CDFW) or US Fish and Wildlife (USFWS). The Sensitive Habitats and or Communities regulated by the California Department of Fish and Wildlife on the property include Conn Creek, seasonal drainages, a wetland and a small area of Ponderosa Pine alliance that meet criteria that would be classified as a Biotic Communities of Limited Distribution listed by Napa County;
- "Waters of the U.S" or Waters of the State as defined by Section 404 of the Clean Water Act have been avoided and provided with setbacks. There is an area below the seasonal

wetland on the south side of the property (Block E) which will require agency review, and may need CDFW 1600 permit;

- No significant native wildlife species, wildlife corridors, and or native wildlife nursery sites were identified within the proposed project sites;
- Trees on the property have the potential for support raptor nesting. No sign or sighting of raptors was observed;
- The project will remove native oaks;
- Recommended measures to reduce biological impacts to a less than significant level pursuant to the California Environmental Quality Act (CEQA) are included within our report; and
- All species observed are listed in the appendix.

Assessment of Impacts

The proposed THP/THC will result in the loss of chaparral and woodland habitat and has the potential to impact local biological resources.

Recommendations included within this report are proposed to reduce potential impacts to on-site and off-site biological resources.

Biological Resource Survey
Le Colline Vineyard THP/TCP
APNs 024-300-070, -071, -072 & -340-001
Napa County

A. PROJECT DESCRIPTION

This study was conducted at the request of Scott Butler, Environmental Resource Management on behalf of the property owner as part of the background studies for Napa County Conservation, Development and Planning Department and California Department of Forestry. The project proposes a Timber Harvest Plan / Timber Conversion Plan (THP/TCP) for conversion of 34.8+/- acres of the 88.34-acre property to vineyard. The property is located on the south side of the community of Angwin at 300 Cold Springs Road.

A.1 Location

The project is within four parcels on the west side of Cold Springs Road on the south side of the community of Angwin. The THP/TCP consists of 5 blocks totaling 34.8+/- gross acres within an 88.34-acre property. The project site is on a west-facing ridge that is at an elevation of approximately 1,600 feet within the Saint Helena 7.5 Min USGS Quadrangle (See Plate I). Maps provided by Scott Butler and Drew Aspegren, Napa Valley Vineyard Engineering, Inc. defined the primary study area.

A.1 Purpose

The purpose of this report is to identify biological resources that may be affected by the proposed project as listed below:

- To determine the presence of special-status species which would be impacted by the proposed project, including habitat types which may have the potential for supporting special-status species (target species that are known for the region, habitat, the Quadrangle and surrounding Quadrangles);
- To identify if the project will have a substantial adverse effect on Sensitive Habitats or Communities regulated by the California Department of Fish and Wildlife;
- To identify and assess potential impacts to Federal or State protected wetlands as defined by Section 404 of the Clean Water Act; and
- To determine if the project will substantially interfere with native wildlife species, wildlife corridors, and or native wildlife nursery sites;
- Identify any State or Federal biological permits required by the proposed project; and
- Recommend measures to reduce biological impacts to a less than significant level pursuant to the California Environmental Quality Act (CEQA).

B. SURVEY METHODOLOGY

Our survey and fieldwork was conducted to identify habitat on the project site, provide a faunal and floristic study of the project site with emphasis on any potential habitat for special-status animals, plants, unique plant populations and or biological resources associated with the property and the proposed project.

B.1 Project Scoping

The scoping for the project considered location and type of habitat and or vegetation types present on the property or associated with potential special-status plant species known for the Quadrangles, surrounding Quadrangles the County or the region. Our scoping also considered records in the most recent version of the Department of Fish and Wildlife California Natural Diversity Data Base (CDFW CNDDB Rare Find-5), and the California Native Plant Society (CNPS) Electronic Inventory of Rare or Endangered Plants. "Target" special-status species are those listed by the State, the Federal Government, or the California Native Plant Society or considered threatened in the region. Our scoping is also a function of our familiarity with the local flora and fauna as well as previous projects on other properties in the area.

Aerial photographs and Napa County Baseline Data Report Vegetation Layers are included within our scoping for the project.

Tables IV and V present CDFW CNDDB Rare Find species records for populations within the proximity of the project.

The California Wildlife Habitat Relationship System Species Summary Report by Habitat Present was run to review the potential species that could be present (Table VI).

We also considered species which are known for the nine surrounding Quadrangles which would potentially be present based on habitat available on property (Appendix C). The special-status species listed in Appendix C with habitat requirements that are present on the project sites or immediate vicinity are considered and included in our findings and comments below. Those species with specific habitat conditions not present within the project footprint such as vernal pools or hot springs are not discussed.

Vegetation cover was evaluated in the field using membership rules defined in the Manual of California Vegetation Second Edition (Sawyer et. al. 2009).

B.2 Field Survey Methodology

A site and project introduction was provided by Mr. Drew Aspegren, Napa Valley Vineyard Engineering, Inc. Our studies were made by walking transects through and around the project sites. A site introduction to the southern parcel was conducted by family members of

the owner of the site at that time. Non-project areas of the property were only opportunistically studied from access roads and trails. Our fieldwork focused on locating suitable habitat for organisms or indications that such habitat exists on the project sites. Digital photographs were taken during our fieldwork. Fieldwork was conducted as shown in the table below.

Our survey follows the California Department of Fish and Wildlife (CDFW) Guidelines, and the California Native Plant Society (CNPS) Guidelines, and Guidelines for Conservation of Sensitive Plant Resources Within the Timber Harvest Review Process and During Timber. Harvesting Operations July 2005.

Table I. Time and Date of Field Work

Date	Personnel	Person-hr.	Time	Conditions
March 5, 2014	Chris K. and Daniel T. Kjeldsen	3.0 person-hours	15:00 to 16:30	High clouds cool light breeze.
April 17, 2014	Chris K. and Daniel T. Kjeldsen	4.0 person-hours	14:45 to 16:45	Clear, clear cool temperatures.
May 8, 2014	Chris K. and Daniel T. Kjeldsen	3.0 person-hours	09:00 to 10:30	Overcast, no wind, with mild temperatures.
May 22, 2014	Chris K. and Daniel T. Kjeldsen	3.0 person-hours	12:00 to 13:30	Clear, windy with warm temperatures.
June 25, 2014	Chris K. and Daniel T. Kjeldsen	3.5 person-hours	09:30 to 11:15	Clear, no wind, with mild temperatures.
July 22, 2014	Chris K. and Daniel T. Kjeldsen	4.25 person-hours	10:00 to 12:15	Clear, no wind, with warm temperatures.
August 20, 2014	Chris K. and Daniel T. Kjeldsen	2.0 person-hours	11:00 to 12:00	Clear mild temperatures no wind.
January 7, 2015	Chris K. and Daniel T. Kjeldsen	4.0 person-hours	10:00 to 12:00	Clear mild temperatures no wind.
May 12, 2015	Chris K. and Daniel T. Kjeldsen	4.0 person-hours	2:00 to 4:00	Clear mild temperatures no wind.

Plants

Field surveys were conducted identifying and recording all species on the site and in the near proximity. Transects through the proposed project sites were made methodically by foot. Transects were established and scrutinized to cover topographic and vegetation variations within the study area. The Intuitive Controlled approach calls for the qualified surveyor to conduct a survey of the area by walking through it and around its perimeters, and closely examining portions where target species are especially likely to occur.

Surveys were floristic in nature and were conducted following Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities State of California, California Natural Resource Agency, Department of Fish and Game (November 24, 2009) the California Department of Fish and Game Guidelines for

Conservation of Sensitive Native Plant Resources Within the Timber Harvest Review Process and During Timber Harvesting Operations July 2005.

The fieldwork for identifying special-status plant species is based on our knowledge and many years of experience in conducting special-status plant species surveys in the region. Plants were identified in the field or reference material was collected, when necessary, for verification using laboratory examination with a binocular microscope and reference materials. Herbarium specimens from plants collected on the project site were made when relevant. Voucher material for selected individuals is in the possession of the authors and shown in the attached plant list (Appendix A) with an @ in front of the taxon. All plants observed (living and/or remains from last season's growth) were recorded in field notes.

Typically, blooming examples are required for identification however; it is not the only method for identifying the presence of or excluding the possibility of rare plants. Vegetative morphology and dried flower or fruit morphology, which may persist long after the blooming period, may also be used. Skeletal remains from previous season's growth can also be used for identification. Some species do not flower each year or only flower at maturity and therefore must be identified from vegetative characteristics. Algae, fungi, mosses, lichens, ferns, Lycophyta and Sphenophyta have no flowers and there are representatives from these groups that are now considered to be special-status species, which require non-blooming identification. For some plants unique features such as the aromatic oils present are key indicator. For some trees and shrubs with unique vegetative characteristics flowering is not needed for proper identification. The vegetative evaluation as a function of field experience can be used to identify species outside of the blooming period to verify or exclude the possibility of special-status plants in a study area.

Habitat is also a key characteristic for consideration of special-status species in a study area. Many special-status species are rare in nature because of their specific and often very narrow habitat or environmental requirements. Their presence is limited by specific environmental conditions such as: hydrology, microclimate, soils, nutrients, interspecific and intraspecific competition, and aspect or exposure. In some situations special-status species particularly annuals may not be present each year and in this case one has to rely on skeletal material from previous years. A site evaluation based on habitat or environmental conditions is therefore a reliable method for including or excluding the possibility of special-status species in an area.

Reference sites for Napa False Indigo, Napa Western Flax, White Manzanita and Holly-leaf Ceanothus were visited.

Animals

Animals were identified in the field by their sight, sign, or call. Our field techniques consisted of surveying the area with binoculars and walking the perimeter of the project site. Existing site conditions were used to identify habitat, which could potentially support special status animal species. All animal life was recorded and is presented in Appendix A.

Trees were surveyed to determine whether occupied raptor nests were present within the proximity of the project site (i.e., within a minimum 500 feet of the areas to be disturbed). Surveys consisted of scanning the trees on the property (500 ft +) with binoculars searching for nest or bird activity. Our search was conducted from the property and by walking under existing trees looking for droppings or nest scatter from nests that may be present that were not observable by binoculars.

Aerial photos were reviewed to look at the habitat surrounding the site and the potential for wildlife movement, or wildlife corridors from adjoining properties onto or through the site.

Trees were assessed for bats using 10x42 roof-prism binoculars. Trees were examined for evidence of suitable potential colonial bat roosting habitat, comprised of cavities, crevices, and exfoliating bark. All animal life observed was recorded and is presented in Appendix A.

Wildlife Movement

Aerial photos were reviewed to look at the habitat surrounding the site and the potential for wildlife movement, or wildlife corridors from adjoining properties onto or through the property. Our field methodology for identifying corridors for movement searched for game trails or habitat which would favor movement of wildlife or potential gene flow. We also looked for barriers which would prevent movement or direct movement to particular areas. No game cameras, track plates, or other field equipment were used.

Criteria for evaluating the corridors - Corridors are considered suitable for wildlife movements if they provide avenues along which:

1. Wide-ranging animals can travel, migrate and meet mates.
2. Plants can propagate.
3. Generic interchange can occur.
4. Populations can move in response to environmental changes and natural disasters.
5. Individuals can re-colonize habitats from which populations have been locally extirpated.

These five functions were used to evaluate potential wildlife corridors on the property and to determine if the project would interrupt any corridors.

Wetlands

The project site was reviewed to determine from existing environmental conditions with a combination of vegetation, soils, and hydrologic information if seasonal wetlands were present. Wetlands were evaluated using the ACOE's three-parameter approach: Vegetation, Hydrology, and Soils.

Tributaries to Waters of the U.S.

Tributaries to Waters of the US are determined by the evaluation of continuity and “ordinary high water mark.” The ordinary high water mark is determined based on the top of scour marks and high flow impacts on vegetation. Tributaries to Waters of the U.S. as well as “Waters of the State” are determined by the presence of a definable bed and bank, evidence

of or ability to transport sediment and/or a blue line on USGS Quadrangle Map.

Streams /Drainages

In the area there are two types of streams or drainages; 1) perennial flowing waters and 2) seasonal ephemeral creeks or drainages that convey water during and shortly after rainfall. USGS 7.5 Min Quadrangle maps for the site were analyzed for the presence of "blue line" creeks. On site topography and evidence of bed and bank was used for evaluating ephemeral drainages. Drainages were walked and visually evaluated for continuity of bed and bank as well as signs of aquatic life. Representative photographs were made. The streambed was evaluated for flow, pools, substrate, bank and quality of habitat recorded in field notes. Vegetation in the streambed was recorded if present and quality and quantify of riparian conditions as distinct from surrounding vegetation noted.

C RESULTS / FINDINGS

Our results and findings are based on our fieldwork, literature search, and the background material available for the proposed vineyard blocks.

C.1 Site Description and Biological Resources Evaluation Area

The property is located above the Napa Valley within the inner North Coast Range Mountains, a geographic subdivision of the larger California Floristic Province (Hickman, 1993). The property and surrounding region is strongly influenced storms and fog from the Pacific Ocean. The region is in climate Zone 14 "Ocean influenced Northern and Central California" characterized as an inland area with ocean or cold air influence. The climate of the region is characterized by hot, dry summers and cool, wet winters, with precipitation that varies regionally from less than 30 to more than 60 inches per year. This climate regime is referred to as a "Mediterranean Climate." The average annual temperature ranges from 45 to 90 degrees Fahrenheit. The variations of abiotic conditions including geology results in a high level of biological diversity per unit area in the region.

The property is on a southwest-facing ridge that is at an elevation of approximately 1,600 feet above sea level and is within the Saint Helena 7.5 Min USGS Quadrangle, south of the community of Angwin.

The project site and proposed vineyard blocks are shown in Figures 1 to 7.

The survey area is shown on Plate III. Our survey focused on the proposed project footprint, and immediate surrounding habitat. The aerial photo illustrates the site (Plate III) and the photographs that follow further document existing conditions of the project sites.

C.2 Habitat Types Present

The vegetation of California has been considered to be a mosaic with major changes present from one area to another often with distinct vegetation changes within short distances. The variation in vegetation is a function of topography, geology, climate and biotic factors. It is generally convenient to refer to the vegetation associates on a site as a plant community or alliance. Typically plant communities or vegetation alliances are identified or characterized by the dominant vegetation form or plant species present. There have been numerous community classification schemes proposed by different authors using different systems for the classification of vegetation. A basic premise for the designation of plant communities, associations or alliances is that in nature there are distinct plant populations occupying a site that are stable at any one time (climax community is a biotic association, that in the absence of disturbance maintains a stable assemblage over long periods of time). There is also evidence that vegetation on the site is part of a continuum without well-defined boundaries.

Biotic Communities integrate the concept of assemblages of plants and animals in a discrete area of the landscape associated with particular soils climate and topographic conditions. The Plant Community on the parcel would be classified by California Native Plant Society (CNPS) and Department of Fish and Wildlife California Natural Diversity Data Base (CNDDB) as: Cismontane Woodland and Chaparral. The disturbed area on the north side of the property and around the spring on the south side consist of ruderal grasslands which.

Our analysis of the vegetation cover on the property using the Manual of California Vegetation Second Edition (Sawyer et al 2009) shows that the property and the project sites (THP/TCP) consist of Forest or Woodland Alliances, Shrubland Chaparral Alliances, and Herbaceous Grassland Stands with Herbaceous Layer. Forest or Woodland Alliances are *Quercus* Forest Alliance Mixed Oak Forest, *Pinus ponderosa* Woodland Alliance Ponderosa Pine Woodland, and *Pseudotsuga menziesii* Forest Alliance Douglas-fir Forest. The Shrubland Chaparral Alliances are *Adenostoma fasiculatum* Shrubland Alliance Chamise Chaparral and *Arctostaphylos manzanita* Provisional Shrubland Alliance (see Plate IV).

The project footprint THP/TCP consists of:

Quercus Forest Alliance Mixed Oak Forest,
Pseudotsuga menziesii Forest Alliance Douglas-fir Forest.
Adenostoma fasiculatum Shrubland Alliance Chamise Chaparral and
Arctostaphylos manzanita Provisional Shrubland Alliance.

The non-project areas of the property consist of:

Pinus ponderosa Woodland Alliance Ponderosa Pine Woodland,
Quercus Forest Alliance Mixed Oak Forest,
Pseudotsuga menziesii Forest Alliance Douglas-fir Forest,
Adenostoma fasiculatum Shrubland Alliance Chamise Chaparral,
Arctostaphylos manzanita Provisional Shrubland Alliance,
Wetland and Riparian (provided with standard setbacks) and
Herbaceous Grassland Stands with Herbaceous Layer.

In the sections below each of the vegetation habitat types present on the property are described and further categorized with the vegetation classification of Sawyer *et al* (2009).

Forest or Woodland Alliances

Woodland Alliances are characterized by a dominant tree overstory and different degrees of understory development. Fire management, canopy age and degree of closure, windfalls, historic use, present use, substrate base, invasive species, aspect and rainfall are variables that control the degree of understory shrubs, herbs and tree recruitment.

The woodland alliances on the property consist of the following:

Pseudotsuga menziesii Forest Alliance Douglas-fir Forest; *Pseudotsuga menziesii* is dominant or co-dominant with hardwoods in the tree canopy with *Abies concolor, Acer macrophyllum, Alnus rhombifolia, Arbutus menziesii, Calocedrus decurrens, Chamaecyparis*

lawsoniana, Chrysolepis chrysophylla, Cornus nuttallii, Pinus contorta, P. lambertiana, P. jefferyi, Quercus agrifolia, Q. chrysolepis, Q. garryana, Q. kelloggii, and *Sequoia sempervirens* (membership rules >50% relative cover in the tree canopy and reproducing successfully, though hardwoods may dominate or co-dominate in the subcanopy and regeneration layer). Trees > 75 m; canopy is intermittent to continuous, and it may be two tiered. Shrubs are infrequent or common. Herbaceous layer is sparse or abundant.

***Quercus* (*agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni*)** Forest Alliance Mixed Oak Forest; *Quercus agrifolia, Q. douglasii, Q, garryana, Q. kelloggii, Q. lobata* and/or *Q. wislizeni* are co-dominant in the tree canopy with *Aesculus californica, Arbutus menziesii, Pinus sabiniana, Pseudotsuga menziesii,* and *Umbellularia californica*. The canopy is intermittent to continuous. Shrubs are infrequent or common, herbaceous layer is sparse or abundant, may be grassy. This Alliance is found in valley and on gentle to steep slopes. The membership rules require three or more *Quercus* species present at >30% constancy and they are co-dominant in the tree canopy.

Pinus ponderosa Forest Alliance Ponderosa Pine Forest; *Pinus ponderosa* is the dominant or co-dominant in the tree canopy with *Pseudotsuga menziesii* and *Quercus kelloggii.* Trees >50 m: canopy is open to continuous. Shrub layer is open to continuous with a herbaceous layer that is sparse, abundant or grassy (membership rules *Pinus ponderosa,* the principle canopy species, >10% absolute cover in the tree layer. *Quercus kelloggii,* if present substantially lower cover than *P. ponderosa. Pinus ponderosa >50%* relative cover, hardwoods such as *Q. kelloggii* are low in cover, if present. This stand is outside of the footprint of the project in the southwest corner of the property and is associated with the seasonal drainage present.

Willows within the wetland and surrounding the wetland are noted but are not considered an alliance and not treated as a habitat type on the property.

<u>Chaparral/Scrub Alliance</u>

This vegetation type has been divided by numerous authors into Mixed Chaparral/Scrub, Serpentine Chaparral, and Chamise Chaparral**.** Chaparral is a vegetation type that is restricted to dry, exposed slopes (usually south facing) and is typical for the ridges and slopes of the interior Coast Range Mountains of Napa County. The dominant plant species that define the chaparral habitat sub-type will be dependent on the soil substrate, such as serpentinite or volcanic geologic formations. Chaparral habitat types tend to be low in biotic diversity, as they do not provide rich habitat value. Chaparral vegetation consists mainly of shrubs that are woody and with leaves adapted to xeric conditions (Holland and Kiel, l986). Periodic fires are characteristic of this community. Many of the species stump sprout after fires, which is characteristic of this habitat and this community, and as a seral stage, is threatened by the absence of a normal fire regime. The principal shrub constituents of Chaparral/Scrub are; chemise (*Adenostoma fasciculatum),* manzanita, *(Arctostaphylos* ssp.), sticky monkey flower *(Mimulus aurantiacus),* yerba-santa (*Eriodicyton californicum*) ceanothus *(Ceanothus* ssp.), scrub oak *(Quercus berberidifolia),* and pitcher sage *(Lepchinia calycina)*.

The chaparral Shrubland alliance on the property consist of the following:

Arctostaphylos manzanita Provisional Shrubland Alliance. *Arctostaphylos manzanita* is a variable Manzanita with subspecies. The most widely ranging subspecies is ssp. *manzanita,* and it occurs in many chaparral and woodland types. *Arctostaphylos manzanita* is dominant in the shrub canopy with *Adenostoma fasiculatum, Ceanothus* ssp., and *Heteromeles arbutifolia.* Emergent *Quercus douglasii* trees may be present at low cover. Shrubs <6m. canopy is intermittent. Herbaceous layer is sparse.

Adenostoma fasiculatum Shrubland Alliance Chamise Chaparral; *Adenostoma fasiculatum* is dominant in the shrub canopy with *Arctostaphylos glandulosa, A. manzanita, Ceanothus* ssp., *Diplacus aurantiacus, Eriodictyon californicum, Eriogonum fasiculatum, Heteromeles arbutifolia, Quercus berberidifolia, W. wislizeni,* and *Toxicodendron diversilobum.* Emergent trees may be present at low cover. Shrubs < 4 m; canopy is intermittent to continuous. Herbaceous layer is sparse to intermittent. (Membership Rules *Adenostoma fasciculatum* >50% relative cover in the shrub canopy: codominance of *A. fasiculatum* with the following species *Arctostaphylos glandulosa* and *Ceanothus cuneatus*). This alliance occurs across cismontane California in a variety of topographic settings. *Adenostoma fasciculatum* Is a long-lived, shade intolerant shrub that grows to 3.5 m. Stands over 60 years old produce little new growth as dead stem biomass accumulates.

Ruderal Grassland/ Semi-natural Grassland Stand with Herbaceous Layer

This stand is present in disturbed open areas of the study area. Sawyer uses the term Semi-natural to classify grassy areas that consist of non-native naturalized species.

A complete list of all plants encountered on the project site and immediate vicinity is included in Appendix A. The vegetation mapping shown on Plate III provides a visual indication of the major alliances.

Table II. Approximate Acreage of Plant Communities or Alliances Impacted

Plant Community or Vegetation Alliance	Acreage on Property (88.34-acre Property)	Acreage Within THP/TCP (Total 34.8-acres)	Estimated Percentage to be removed	Estimated Percentage to Remain
Woodland Alliance Douglas-fir Forest Alliance	**32**	**12**	**37%**	**63%**
Woodland Alliance Mixed Oak Alliance	**20**	**8**	**40%**	**60%**
Shrubland/Chaparral Alliance Manzanita Chaparral Alliance	**10**	**4**	**40%**	**60%**
Shrubland/Chaparral Alliance Chamise Chaparral Alliance	**22**	**9**	**40%**	**60%**
Ruderal Grassland along access roads, wetland, fruit trees	**2**	**1**	**50%**	**50%**

Table III. Respective Characteristics Of Plant Communities (See Plate IV as well as the photographs below which illustrate the distribution and characteristics of each alliance).

Plant Community or Vegetation Alliance	Respective Characteristics Approximate tree density (Average trees and species per acre)
Douglas-fir Forest Alliance	Douglas-fir forest on the site is a result of modified fire regime and the Douglas-fir represent a succession stage where they are replacing the Oak Woodlands. The understory is limited. Douglas-firs are on a < 10-foot spacing. There are occasional Ponderosa Pines mixed with this Alliance but their canopy cover does not meet the criteria for considering this as a separate alliance.
Mixed Oak Alliance	The trees in this alliance are of mixed age classes. Several different Oak species are present mixed with Doug-fir and Ghost Pine. This Mixed Oak Alliance differs from the Oak Woodlands found in the Valley and classic Oak Woodlands as they contain many different shrubs and tree species. The canopy is intermittent to continuous. Shrubs are infrequent or common, herbaceous layer is sparse. Oaks 6 to 20" DBH dominate the site on 10 to 20 foot spacing.
Manzanita Chaparral Alliance	*Arctostaphylos manzanita* is the dominant shrub with other chaparral species. The cover is dense with occasional openings and the population is primarily of one age class. The herbaceous layer is sparse to intermittent. The cover is dense and complete with occasional openings.
Chamise Chaparral Alliance	The *Adenostoma fasiculatum* alliance contains dominant of Chamise with open areas of grassland, rock and contains areas with Ghost Pines. Emergent trees are present at low cover apparently a result of the absence of fire. Herbaceous layer is sparse to intermittent. The cover is dense and complete with occasional openings.
Grassland	Semi-natural stands in areas that have been disturbed by historic clearing. The areas are dominated by "Weeds."

Figure 1. View of typical habitat associated with the THP/TCP illustrating Douglas-fir alliance.

Figure 2. Open area with regenerating shrubs and Douglas-fir on the northeast side of the project site.

Figure 3. Chaparral along the west side of the property.

Figure 4. Chaparral in the foreground and Douglas-fir woodlands in the background on the south west side of the property.

Figure 5. Wetland seep along the southeast side of the property that has been avoided.

Figure 6. Douglas-fir woodland with understory of Napa false indigo. This area will be avoided by the proposed project.

Figure 7. Mixed Oak Woodland Alliance.

The aerial photograph, Plate III illustrates the site and the surrounding environment.

Forest Characteristics Surrounding The Property

Our study focused on the property and the project sites. Aerial interpretation and observations from access roads show that the surrounding vegetation cover consists of;

- On the north side of the property-Douglas fir Woodland Alliance, Grassland Semi-natural Herbaceous Stands and Mixed Oak Alliance;
- On the east side of the property-Residences with landscape plantings, Douglas fir Forest Alliance and Mixed Oak Alliance;
- On the south side of the property- Douglas fir Forest Alliance;
- On the west side of the property- Chaparral Alliance and Mixed Oak Alliance.

All indications show that the surrounding forest alliances are seral stages as a result of previous harvests or fire.

C.3 Special-Status Species

Special-status organisms are plants or animals that have been designated by Federal or State agencies as rare, endangered, or threatened. Section 15380 of the California Environmental Quality Act [CEQA (September, 1983)] has a discussion regarding non-listed (State) taxa. This section states that a plant (or animal) must be treated as Rare or Endangered even if it is

not officially listed as such. If a person (or organization) provides information showing that the taxa meets the State's definitions and criteria, then the taxa should be treated as such.

Plants

A map from the CDFW CNDDB Rare Find shows known special-status species in the proximity of the project as shown on Plate II. These taxa as well as those listed in Appendix C Special-status Species known for the Quadrangle and Surrounding Quadrangles were considered and reviewed as part of our scoping for the project site and property. Reference sites were reviewed as part of our scoping for some of the species.

Table IV below provides a list of species that are known to occur in the area (CDFW CNDDB Rare Find 5 mile search). The table includes an analysis / justification for concluding presence or absence.

Table IV. Analysis of CDFW CNDDB target plant species. Columns are arranged alphabetically by scientific name.

Scientific Name Common Name	**Species Habitat Association or Plant Community**	**Habitat present on Project Site**	**Bloom Time**	**Obs. on or Near Site**	**Analysis of habitat on project site for presence or absence.**
Amorpha californica var. *napensis* Napa False Indigo	Cismontane Woodland	Yes	April-July	Yes	Present and common on property north side (see Plate IV.
Amsinkia lunularis Bent-flowered Fiddleneck	Cismontane Woodland, Valley and Foothill Grassland, 3 to 500 M	No	March-June	No	Potential for project site. No indications for presence during our fieldwork.
Astragalus claranus Clara Hunt's Milk-vetch	Chaparral, Cismontane Woodland, Valley and Foothill Grassland	No	March-May	No	Absence of requisite micro-habitat, vegetation associates and closed canopy. Lack of finding during our fieldwork.
Brodiaea leptandra Narrow-anthered Brodiaea	Cismontane Woodland	Yes	May-June	Yes	Present. Populations on site will be avoided.
Calystegia collina ssp. *oxyphylla* Mt. Saint Helena Morning-glory	Chaparral Serpentinite	Yes	April-June	No	Requisite habitat and edaphic conditions absent.

Scientific Name Common Name	Species Habitat Association or Plant Community	Habitat present on Project Site	Bloom Time	Obs. on or Near Site	Analysis of habitat on project site for presence or absence.
Ceanothus confusus Rincon Ridge Ceanothus	Closed Cone Conifer Forests, Chaparral	No	Feb.-April	No	Absence of typical habitat and vegetation associates.
Ceanothus divergens Calistoga Ceanothus	Chaparral, Serpentinite or Volcanic-Rocky.	No	May-Sept.	No	Absence of typical habitat and vegetation associates. Lack of finding during our fieldwork.
Ceanothus purpureus Holly-leaved Ceanothus	Chaparral	No	March-May	No	Absence of typical habitat and vegetation associates. Lack of finding during our fieldwork.
Ceanothus sonomensis Sonoma Ceanothus	Chaparral, Serpentinite or rocky Volcanic	Yes	Feb.-March	No	No evidence found during our surveys.
Centromadia parryi ssp. *parryi* Pappose Tarplant	Grassland salt or alkaline Marshes	No	March-June	No	Requisite mesic conditions absent. Lack of finding during our fieldwork.
Erigeron greenei Green's Narrow-leaved Daisy	Chaparral, (Serpentinite)	No	May-Sept.	No	Absence of edaphic conditions required for presence.
Harmonia hallii Hall's Harmonia	Open Areas in Serpentinite Chaparral	No	April-June	No	Absence of requisite edaphic conditions.
Hesperolinon bicarpellatum Two-carpellate Western Flax	Chaparral	No	May-July	No	Requisite edaphic habitat absent on the site or in the immediate vicinity precludes presence.
Hesperolinon scharsmithiae Sharsmith's Western Flax	Chaparral, Serpentinite	No	May-July	No	Requisite edaphic habitat absent on the site or in the immediate vicinity.
Hesperolinon tehamense Tehama County Western Flax	Chaparral, Serpentinite	No	May-July	No	Requisite edaphic habitat absent on the site or in the immediate vicinity.

Scientific Name Common Name	Species Habitat Association or Plant Community	Habitat present on Project Site	Bloom Time	Obs. on or Near Site	Analysis of habitat on project site for presence or absence.
Juncus luciensis Santa Lucia Dwarf Rush	Seeps, Meadows, Vernal Pools, Stream sides	No	April-June	No	Absence of requisite mesic habitat.
Layia septentrionalis Colusa Layia	Cismontane Woodland, Valley & Foothill Grassland, Chaparral Serpentinite, or sandy soils.	No	April-May	No	Requisite edaphic habitat absent on the site or in the immediate vicinity.
Leptosiphon jepsonii Jepson's Leptosiphon	Chaparral, Cismontane Woodland, Valley and Foothill Grassland	Yes	April-May	No	Requisite habitat absent on the site as well as closed canopy. Lack of finding during our fieldwork.
Limnanthes floccosea ssp. *floccosa* Woolly Meadowfoam	Meadows and Seeps, Vernal Pools Grassland, Cismontane Woodland	No	April-May	No	Requisite mesic habitat absent on the site or in the immediate vicinity.
Limnanthes vinculans Sebastopol Meadowfoam	Meadows and Seeps, Valley and Foothill Grassland, Vernal Pools	No	April-May	No	Requisite mesic habitat absent on the site or in the immediate vicinity.
Lupinus sericatus Cobb Mountain Lupine	Broadleaved upland forest, chaparral, cismontane woodland	Yes	March-June	No	Absence of requisite vegetation associates as well as historical use of project site precludes presence.
Navarretia leucocephala ssp. *bakeri* Baker's Navarretia	Meadows and Seeps Cismontane Woodland, Valley and Grassland, Vernal Pools	No	May-July	No	Absence of typical habitat and vegetation associates. Lack of finding during our fieldwork.

Scientific Name Common Name	Species Habitat Association or Plant Community	Habitat present on Project Site	Bloom Time	Obs. on or Near Site	Analysis of habitat on project site for presence or absence.
Navarretia rosulata Marin County Navarretia	Closed Cone Coniferous Forest, Chaparral, Serpentinite	No	May-July	No	Requisite edaphic conditions absent on the site or in the immediate vicinity.
Penstemon newberryi var. *sonomensis* Sonoma Beardtongue	Cismontane Woodland, exposed rock outcrops/ talus of peaks.	Yes	April-Aug.	No	No findings during our fieldwork. Closed canopy also precludes presence.
Plagiobothrys strictus Calistoga Popcorn-flower	Vernal pools near thermal springs	No	March-June	No	Requisite mesic habitat absent on the site or in the immediate vicinity.
Sidalcea oregana ssp. *hydrophila* Marsh Checkerbloom	Meadows and seeps, Riparian scrub mesic	No	June-Aug.	No	Requisite mesic habitat absent.
Strepthanthus hisperidis Green Jewel-flower	Rocky Chaparral, Grassland	No	April-July	No	Lack of edaphic habitat and historic use of project site precludes presence
Trichostema ruygtii Napa Bluecurls, Vinegar Weed	Grassland	No	June-Aug.	No	Requisite habitat absent on the site. Historic use of the site precludes presence.

The CDFW CNDDB shows a confidence interval for the Cobb Mountain Lupine (*Lupinus sericatus*) that overlaps the project site. Cobb Mountain Lupine is easily identified in flower or in its vegetative state. We found no evidence for presence of this species on the property or the project sites.

Other taxa in the table above that are known to occur within five miles of the project site are reasonably precluded from being present based on the lack of wetlands within the project area, absence of serpentinite soils or rock, habitat and vegetation present.

Spring surveys found two CNPS listed plants the Napa false Indigo and California Brodiaea. These plants do not have Federal or State Listing. This species does not have state or federal listing but must be addressed as per CEQA.

The project has been designed to avoid all identified populations of these species. These have been flagged and are mapped on the THC TCP and ECP. We submit that the project will not significantly impact these species and no action is recommended other than avoidance.

Animals

A map from the CDFW CNDDB Rare Find-3 shows known special-status species in the proximity of the project as shown on Plate II. These taxa as well as those listed in Appendix B Special-status Species known for the Quadrangle and Surrounding Quadrangles were considered and reviewed as part of our scoping for the project site and property.

Table V below provides a list of species that are known to occur in the area (CDFW CNDDB Rare Find 3-5 mile search, Rare Find 5 surrounding quadrangles and U.S. Fish and Wildlife species for the area). The table includes an analysis / justification for concluding presence or absence.

Table V. Analysis of target animal species. Columns are arranged alphabetically by scientific name.

Scientific Name Common Name	**Habitat**	**Potential for Property**	**Obs. or Potential for Project Site**	**Analysis of habitat on project site for presence or absence.**
Accipter sriatus Sharp-Shinned Hawk	Avian prey, Nests in conifers or tops of live oaks	Yes	No	Species was not observed during our survey. Potential nesting habitat present.
Agelaius tricolor Tricolored Blackbird	Tule Marshes	No	No	Lack of habitat.
Antrozous pallidus Pallid Bat	Roosts in Buildings and Overhangs, woodlands	Yes	Yes	Known to use a wide variety of habitats. Low potential on project site.
Aquila pallidus Golden Eagle	shrublands, grasslands, coniferous forests	No	No	Lack of suitable habitat.
Ardea alba Great Egret	Nests in colonies	No May fly over	No	Lack of Habitat.
Ardea herodias Great Blue Heron	Forages in wetlands, flooded fields, & shallow water. Nests in colonies in large trees.	No	No	Lack of suitable habitat for nesting.

Scientific Name Common Name	**Habitat**	**Potential for Property**	**Obs. or Potential for Project Site**	**Analysis of habitat on project site for presence or absence.**
Corynorhinus townsendii Townsend's Big-eared Bat	Caves, also in Buildings	Yes	Yes	No significant natural roosting habitat observed. Trees contain low potential habitat.
Desmocerus californicus dimorphus Valley Elderberry Longhorn Beetle	Larva Require Elderberry Plants	No	No	No host plants present.
Elanus leucurus White-tailed Kite	Nests in tall trees near water	No	No	Requisite habitat absent.
Emys marmorata Western Pond Turtle	Slow moving water or ponds	No	No	May be in Conn Creek. Not likely to be associated with proposed project footprint.
Falco mexicanus Prairie Falcon	Nests on cliffs	No	No	May fly over. Lack of habitat for nesting and feeding.
Falco peregrinus anatum American Peregrine Falcon	Nests on cliffs	No	No	May fly over. Lack of habitat for nesting and feeding.
Halliaetus leucocephalus Bald Eagle	Nests near open water.	No	No	Lack of habitat.
Hypomesus transpacificus Delta Smelt	Sacramento San Joaquin Delta	No	No	Lack of aquatic habitat.
Lasiurus cinereus Hoary Bat	Roosts tree foliage	Yes	Yes	Low potential on project site.
Myotis yummanensis Yuma myotis	Juniper, Riparian Woodlands	Yes	No	Low potential on project site.
Myotis thysanodes Fringed Myotis	Montane Forests or Montane Meadows	Yes	Yes	Low potential on project site.
Oncorhynchus mykiss irideus Steelhead-central California Coast	Aquatic	No	No	No Aquatic habitat on property.

Scientific Name Common Name	Habitat	Potential for Property	Obs. or Potential for Project Site	Analysis of habitat on project site for presence or absence.
Phalacrocroax auritus Double-crested Cormorant	Colonial nests on cliffs & islands on the coast & lake margins. Feeds in open water.	No	No	Lack of habitat.
Rana boylii Foothill Yellow-legged Frog	Streams with pools	No	No	Lack of habitat precludes presence.
Rana draytonii California Red-legged Frog	Creeks, Rivers, Permanent flowing water.	No	No	Lack of habitat within the project footprint.
Progne subis Purple Martin	Open areas near water	No	Yes	Lack of habitat.
Strix occidentalis caurina Northern Spotted Owl	Old Growth Forests	Yes	Yes	Lack of nesting habitat. Potential foraging habitat on property.
Syncaris pacifica California Freshwater Shrimp	Creeks & Estuaries below 300 ft.	No	No	Requisite habitat required for presence lacking.

Our fieldwork did not find special-status animal species known for the Quadrangle surrounding Quadrangles or for the region that would be impacted by the proposed project. The present conditions of the project site are such that there is little reason to expect the occurrence of any special-status animal species within the footprint of the project.

California Wildlife Habitat Relationships System

California Wildlife Habitat Relationship System Query provides a list of species predicted to occur within habitat types on the property. The Woodlands and Chaparral present on the property support native wildlife species typical for the region. The THP/TCP will remove a portion of the habitat on the property. Wildlife associated with the habitat within the THP/TCP will be displaced to adjoining parcels or to avoided habitat on the property. Our analysis of the loss is that the impacts will be less than significant provided the recommendations are followed.

Table VI. California Wildlife Habitat Relationship System selected by Habitat Types Present.

Taxa Common Name	**Potential for Habitats on project site**	**Species Observed On Site**	**Impact of THP/TCP on Species Habitat**
CALIFORNIA TIGER SALAMANDER	No	No	None
COMMON ENSATINA	Yes	No	Low
CALIFORNIA RED-LEGGED FROG	No	No	None
GREAT BLUE HERON	No	No	None
GREAT EGRET	No	No	None
OSPREY	No	No	None
WHITE-TAILED KITE	No	No	None
BALD EAGLE	No	No	None
NORTHERN HARRIER	Yes	No	Low
BLACK RAIL	No	No	None
CLAPPER RAIL	No	No	None
MOUNTAIN PLOVER	No	No	None
BURROWING OWL	No	No	None
LONG-EARED OWL	No	No	None
SHORT-EARED OWL	No	No	None
OLIVE-SIDED FLYCATCHER	Yes	No	Low
PURPLE MARTIN	No	No	Low
BEWICK'S WREN	No	No	Low
MARSH WREN	No	No	None
LOGGERHEAD SHRIKE	Yes	No	Low
HUTTON'S VIREO	No	No	Low
YELLOW WARBLER	No	No	Low
COMMON YELLOWTHROAT	No	No	Low
YELLOW-BREASTED CHAT	No	No	Low
SPOTTED TOWHEE	Yes	Yes	Low
CALIFORNIA TOWHEE	Yes	No	Low
VESPER SPARROW	No	No	Low
BELL'S SPARROW	No	No	None
SAVANNAH SPARROW	No	No	None
GRASSHOPPER SPARROW	No	No	Low
SONG SPARROW	Yes	No	Low
YELLOW-HEADED BLACKBIRD	No	No	None
ORNATE SHREW	No	No	None
WESTERN RED BAT	Yes	No	Low
TOWNSEND'S BIG-EARED BAT	Yes	No	Low
PALLID BAT	Yes	No	Low

Taxa Common Name	Potential for Habitats on project site	Species Observed On Site	Impact of THP/TCP on Species Habitat
BRUSH RABBIT	No	No	None
BLACK-TAILED JACKRABBIT	Yes	No	
CALIFORNIA KANGAROO RAT	No	No	None
DEER MOUSE	Yes	No	Low
DUSKY-FOOTED WOODRAT	Yes	Nests	Low
CALIFORNIA VOLE	No	No	Low
RINGTAIL	No	No	Low
MOUNTAIN LION	Yes	No	Low
NORTHERN RUBBER BOA	No	No	Low
RING-NECKED SNAKE	Yes	No	Low
STRIPED RACER	No	No	Low
GOPHERSNAKE	Yes	No	Low
COMMON GARTERSNAKE	Yes	No	Low

C.4 Discussion of Sensitive Habitat Types

The Napa County Baseline Data Report defines Biotic communities as the characteristic assemblages of plants and animals that are found in a given range of soil, climate, and topographic conditions across a region. Sensitive biotic communities in the County were identified using a two-step process for the Napa County Baseline Data Report.

The Napa County Baseline Data Report as well as the California Department of Fish and Wildlife Natural Diversity Data Base (CDFW CNDDB) lists recognized Sensitive Biotic Communities. The Napa County Baseline Data Report lists twenty-three communities which are considered sensitive by CDFW due to their rarity, high biological diversity, and/or susceptibility to disturbance or destruction.

The Sensitive Biotic Communities recognized for Napa County are the following:
Serpentine bunchgrass grassland, Wildflower field (located within native grassland), Creeping ryegrass grassland, Purple Needlegrass grassland, One-sided bluegrass grassland, Mixed serpentine chaparral, McNab cypress woodland, Oregon white oak woodland, California bay forests and woodlands, Fremont cottonwood riparian forests, Arroyo willow riparian forests, Black willow riparian forests, Pacific willow riparian forests, Red willow riparian forests, Narrow willow riparian forests, Mixed willow riparian forests, Sargent cypress woodland, Douglas-fir-ponderosa pine forest (old-growth), Redwood forest, Coastal and valley freshwater marsh, Coastal brackish marsh, Northern coastal salt marsh, and Northern vernal pool.

Napa County biotic communities of limited distribution that are sensitive include:

> *Native grassland; Tanbark oak alliance; Brewer willow alliance; Ponderosa pine alliance; Riverine, lacustrine, and tidal mudflats; and Wet meadow grasses super alliance.*

Kjeldsen Biological Consulting did not identify any Sensitive Biotic Communities and or Biotic Communities of Limited Distribution as defined in the County Baseline Data Report within the THP/TCP.

The woodlands on the site and surrounding the project area consist of a mix of conifers and broad leaf trees. The chaparral is not a *Mixed Serpentine Chaparral* and the grasslands are ruderal with a dominance of non-native annuals.

Ponderosa pines are present within the woodlands but they do not meet the criteria, as per Sawyer 2009, for an alliance based on the percent canopy cover within the area of the proposed THP/THC. They are a part of the Douglas-fir Alliance. The ponderosa pines within the THP/TCP do not constitute a ponderosa pine forest in that they do not meet the dominance criteria, size criteria or canopy cover requirements for this forest type (see below for the Sawyer criteria). Ponderosa pine is commonly associated with Douglas-fir and sometimes with knobcone pine. Associated shrubs include manzanita, ceanothus, and poison oak. Grasses and forbs include one-sided bluegrass, bedstraw (*Galium* spp.), and bracken fern.

There is a small area of Ponderosa Pine Forest Alliance present within the drainage on the south side of the on the property, this area has been avoided.

Pinus ponderosa Forest Alliance Ponderosa Pine Forest; *Pinus ponderosa* is the dominant or co-dominant in the tree canopy with *Pseudotsuga menziesii* and *Quercus kelloggii.* Trees >50 m: canopy is open to continuous. Shrub layer is open to continuous with a herbaceous layer that is sparse, abundant or grassy (membership rules *Pinus ponderosa,* the principle canopy species, >10% absolute cover in the tree layer. *Quercus kelloggii,* if present substantially lower cover than *P. ponderosa. Pinus ponderosa >50%* relative cover, hardwoods such as *Q. kelloggii* are low in cover, if present (Sawyer, 2009).

Pseudotsuga menziesii Forest Alliance Douglas-fir Forest (Old Growth) is a recognized sensitive plant community. The property is dominated by a Douglas-fir alliance. The trees represent seral stages of growth indicative of a historic fire regime that has impacted the area. The trees show evidence of open growth as evidenced by the branching pattern. We found no evidence of a typical old growth forest.

Old Growth Douglas fir is considered in the Napa County Baseline Report as a sensitive woodland community in the county. The Douglas fir on the property consists of seral stages with areas with dense regeneration and different age classes. Mature Douglas fir individual are present but they do not constitute an "Old growth Forest."

The grasslands within the footprint of the project do not consist of any of the sensitive grassland communities listed by the County Baseline Data Report or CDFW. Sawyer, J. O., T. Keeler-Wolf and Julie M. Evans 2009 A Manual of California Vegetation Second Edition was used in defining grassland types found on the project. There are scattered individual

patches (clones) of native bunch grasses within the fringing woodlands but they do not constitute a grassland per say. The following grassland alliances within the project footprint (the boundaries and extent of each of these alliances vary depending on, topography, soils, exposure and biological conditions, and are within the understory of the Forest of Woodland Alliance on the property (note that these are all non-native introduced species and denoted as Semi-natural stands).

There is no evidence of sensitive grassland Alliances or communities on the property.

The California Department of Fish and Wildlife Natural Diversity Database five-mile search shows that Northern Vernal Pool and Serpentine Bunchgrass is present near the project site. There are no vernal pools or serpentine soils associated with the project sites.

Wetlands

A wetland is present on the southeast side of the property this area was flagged in the field and avoided on ECP map. The wetland is below a spring or seep. There are no wetlands or wetland features within the THP/TCP sites that fall within the jurisdiction of the U.S.ACOE, RWQCB or CDFW.

Stream Analysis

There are several seasonal drainages that originate on the property and flow to the southwest into Conn Creek which is along the west property boundary. Drainages on the property are ephemeral drainages, they do not contain in-stream riparian vegetation, but have vegetation similar to that found upslope as an overstory which provides shade. None of the ephemeral drainages on the property would support fish.

The southeast ephemeral drainage extends down slope from the wetland described above. This drainage consists of a narrow eroded channel in the landscape which forms several braded channels on the south side of the property. The ephemeral drainage contains a shallow cut channel with rock, mud or gravel bed present. The project has been designed to avoid portions of this drainage which contain a definable bed and bank.

The ephemeral drainage within the middle of the property between the THP/TCP blocks consists of two eroded channel that originates on site. These drainage contain shallow cut channel with rock, mud or gravel bed present.

The vegetation associated with these ephemeral drainages is no different than the upland vegetation (typical riparian trees, shrubs and herbs are not present). The only vegetation within the channel consists of poikliohydric bryophytes on the larger more stable boulders in the streambed. We found no evidence of in-channel aquatic life within the ephemeral drainages.

Conn Creek on the north property line is a blue line perennial creek with permanent flow. It is a deeply incised rock lined creek with overhanging vegetation. The vegetation in the section adjacent to the property is similar to the upland vegetation. This stream has been provided with standard setbacks.

D. POTENTIAL BIOLOGICAL IMPACTS

The project's effect to onsite or regional biological resources is considered to be significant if the project results in:

- Alteration of unique characteristics of the area, such as sensitive plant communities and habitats (i.e. serpentine habitat, wetlands, riparian habitat);
- Adverse impacts to special-status plant and animal species;
- Adverse impacts to important or vulnerable resources as determined by scientific opinion or resource agency concerns (i.e. sensitive biotic communities, special-status habitats; e.g. wetlands);
- Loss of critical breeding, feeding or roosting habitat; or
- Interference with migratory routes or habitat connectivity.

The proposed THP/THC will result in the loss of chaparral and woodland habitat and has the potential to impact biological resources without appropriate avoidance and protection measures.

Biological resources present on the property include seasonal drainages, a wetland, Conn Creek, populations of special-status plants (Napa False Indigo and California Brodiaea), chaparral and conifer/oak woodlands which function as wildlife habitat and watershed.

In the sections below a discussion of potential impacts of the project on biological resources is presented.

D.1 Analysis of Potential Impacts to Special-status Species

A map from the CDFW CNDDB records of special-status species in the vicinity of the project is shown on Plate II. Two special-status species were found on the property: Napa False Indigo (*Amorpha californica* var. *napensis)* and the Narrow-anthered Brodiaea (*Brodiaea leptandra)*. The THP TCP boundaries have been adjusted to avoid populations of these species.

A map from the DFW CNDDB records of special-status species in the vicinity of the project is shown on Plate II. The following species are addressed based on their sensitivity to habitat loss.

California Red-legged Frog (*Rana draytonii*) inhabits permanent or nearly permanent water sources (quiet streams, marshes, and reservoirs). They are highly aquatic and prefer shorelines with extensive vegetation. There is no potential habitat associated with the proposed conversion area. The wetland on the property is inadequate habitat for this species. The shallow ephemeral drainages on the property are also inadequate habitat for this species. No California Red-legged Frogs were observed and it is unlikely that the proposed project would result in take of this species.

Foothill Yellow-legged Frog (*Rana boylii*) is found in or near rocky streams with riffles and sunny banks in a variety of habitats from sea level to approximately 6,300 feet elevation. Yellow-legged frogs require shorelines with dense, overhanging vegetation such as willow trees. There is no habitat associated with the project sites or on the property which would support the Foothill Yellow-legged Frog (Rana boylii). Foothill Yellow-legged Frogs require permanent flowing water. The ephemeral drainages on the property do not provide suitable habitat for this species. There were no pools or flowing water in the drainages on the property during the summer months. Conn Creek on the north property line has potential habitat for this species but there are no records of this species for this creek.

Pallid Bat (*Antrozous pallidus*): The Pallid Bat occupies a wide variety of habitats, such as grasslands, shrublands, and forested areas of oak and pine, but prefer rocky outcrops with desert scrub. The pallid bat roosts in caves, mines, crevices, and occasionally in basal hollows or buildings. They forage over open country and in woodland areas. No roosts or evidence of their presence was observed within the proposed project area.

Townsend's Big-Eared Bat (*Corynorhinus townsendii*): Townsend's big-eared bats are more abundant in mesic habitats such as riparian woodland. They require caves, mines, tunnels, bridges, or other man-made structures for roosting. There is no habitat in the form of cabins, barns, and other structures within the assessment area or on the property. No roosts or evidence of their presence was observed within the proposed project area or within the assessment area during this field survey. The CDFW CNDDB shows that the project site is within a confidence interval for this species. Potential suitable habitat is low for this species on the property.

American Peregrine Falcon (*Falco peregrinus anatum)*: Peregrine falcons require protected cliffs and ledges for cover. Peregrines often breed near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes or mounds however, they will nest on human-made structures and will occasionally use snag cavities or old nests of other raptors. Suitable habitat in the form of cliffs over 70' high do not exist on the property. Peregrine falcons were not observed during this field survey within the project area.

Northern Spotted Owl (*Strix occidentalis caurina*): Northern spotted owls require mature forest patches with permanent water and suitable nesting trees and snags (Zeiner et al. 1990a). Northern spotted owls use dense, old-growth forests, or mid- to late- seral stage forests, with a multi-layered canopy for breeding. Mixed conifer, redwood, and Douglas-fir habitats are required for nesting and roosting. There is a recorded CNDDB location for the Northern spotted owl 1.5 miles to the south and 3.3 miles to the north. The project and property contains potential suitable nesting habitat and potential foraging habitat. Surveys for Northern Spotted Owl have been conducted on the property. No evidence of there presence has been recorded.

<u>Our fieldwork did not find any special-status animal species that are known for the Quadrangle surrounding Quadrangles or for the region that would be impacted by the proposed project</u>. The project site conditions are such that there is little reason to expect the occurrence of any special-status animal species within the footprint of the project.

Habitat impacted by the proposed project is such that it will not substantially reduce or restrict the range of listed animals.

D.2 Analysis of Potential Impacts on Sensitive Habitat

The project proposes a THP/TCP for a vineyard that totals 34.8-gross acres within an 88.34-acre property. The project will retain 62% of the property in its present condition retaining function as open space, wildlife habitat and watershed.

The woodlands on the site and surrounding the project area consist of a mix of conifers and broad leaf trees. The Napa County Baseline Report identifies as sensitive communities the following:

Douglas-fir-ponderosa pine forest (old-growth),
Native *Grasslands* and
Ponderosa pine Alliance.

Douglas fir-ponderosa pine forest (old-growth*)*
The Napa County Baseline Report identifies this forest type as a sensitive woodland community. Historic use and harvest and or fire have eliminated this community on the project site and property.

There is no evidence of an old growth forest of Douglas fir Forest Alliance on the property.

Native Grassland Napa County Data base vegetation mapping shows a small area of California Annual Grasslands Alliance on the property. We did not observe this alliance on the property. The understory Festuca bunch grasses are not considered to be a sensitive community but a common understory element of woodlands. The grasslands within the footprint of the project do not consist of any of the sensitive grassland communities listed by the County Baseline Data Report or CDFW. Native grasses on the project site do not meet the definition of Native Grass Grassland and would not be considered a species with limited distribution or a sensitive natural plant communities for the following reasons: Lack of typical native grassland species and diversity. The grasses present are within an understory and not associated with historic grasslands.

The project will not impact any native grassland.

Ponderosa pine Alliance
Ponderosa pines are present as part of the Douglas fir Alliance within property. There are occasional Ponderosa Pines mixed with this Alliance but their canopy cover does not meet the criteria for considering this as a separate alliance (Sawyer et. al. 2009 membership rules require *Pinus ponderosa* presence as the principal canopy species >10% absolute cover).

The southeast edge of the property supports a relatively small area of this Alliance. In the design of the project this area has been adjusted to avoid the Ponderosa Pine Alliance.

The ponderosa pines within the THP/TCP do not meet the criteria for a Napa County Sensitive Woodland Community.

Seasonal Wetland generally denotes areas where the soil is seasonally saturated and/or inundated by fresh water for a significant portion of the wet season, and then seasonally dries during the dry season. To be classified as "Wetland," the duration of saturation and/or inundation must be long enough to cause the soils and vegetation to become altered and adapted to the wetland conditions. Varying degrees of pooling or ponding, and saturation will produce different edaphic and vegetative responses. These soil and vegetative clues, as well as hydrological features, are used to define the wetland type. Seasonal wetlands typically take the form of shallow depressions and swales that may be intermixed with a variety of upland habitat types. Seasonal wetlands fall under the jurisdiction of the U.S. Army Corps of Engineers. The wetland seep on the south side of the property will be avoided and provided with a setback.

There are no seasonal wetlands or vernal pools associated with the project footprint. The wetland at the southeast corner of the project property is outside of the THP/TCP and will be avoided.

"Waters of the State" include drainages which are characterized by the presence of definable bed and bank that meet ACOE, and RWQCB definitions and or jurisdiction. Drainage from the proposed THP/TCP is by sheet flow into unnamed drainages of Conn Creek, thence the Napa River.

Napa County Definition for a Defined Drainages is a watercourse designated by a solid line or dash and three dots symbol on the largest scale of the United States Geological Survey maps most recently published, or any replacement to that symbol, and or any watercourse which has a well-defined channel with a depth greater that four feet and banks steeper that 3:1 and contains hydrophilic vegetation, riparian vegetation or woody-vegetation including tree species greater that ten feet in height.

Conn Creek along the northwest property line meets the definition on of a Napa County Defined Drainage. There are no other Napa County Defined Drainages associated with the proposed project sites. There is an area between proposed Vineyard Block E that will require agency review to determine if is would be considered "Waters of the State" and potential permits.

Riparian Vegetation is by all standards considered sensitive. Riparian Vegetation functions to control water temperature, regulate nutrient supply (biofilters), bank stabilization, rate of runoff, wildlife habitat (shelter and food), release of allochthonous material, release of woody debris which functions as habitat and slow nutrient release, and protection for aquatic organisms. Riparian vegetation is also a moderator of water temperature has a cascade effect in that it relates to oxygen availability. Conn Creek contains riparian vegetation along its banks.

The project will not impact any riparian vegetation.

Trees The project will remove native Oaks within a Mixed Oak Woodland habitat. The majority of the trees proposed to be removed are of a relative young age class and are 6-20 inches DBH.

The project should comply with the Oak Woodlands Preservation Act (PRC Section 21083.4) regarding oak woodland preservation to conserve the integrity and diversity of oak woodlands, and retain, to the maximum extent feasible, existing oak woodland communities, and the project should also comply with Napa County General Plan Policy CON-24 Paragraph (c) stated that a project should "provide replacement of lost oak woodlands or preservation of like habitat at a 2:1 ratio.

Oak preservation on site is recommended.

Wildlife Habitat and Wildlife Corridors Natural areas interspersed with developed areas are important for animal movement, increasing genetic variation in plant and animal populations, reduction of population fluctuations, and retention of predators of agricultural pests and for movement of wildlife and plant populations. Wildlife corridors have been demonstrated to not only increase the range of vertebrates including avifauna between patches of habitat but also facilitate two key plant-animal interactions: pollination and seed dispersal. Corridors also provide ecosystem services such as preservation of watershed connectivity. Corridor users can be grouped into two types: passage species and corridor dwellers. The data from various studies indicate that corridors should be at least 100 feet wide to provide adequate movement for passage species and corridor dwellers in the landscape.

Game trails are present but there was no evidence for distinct corridors passing through the property. Riparian zones are functional as corridors in many biomes. The riparian zone along the drainages on the property did not show any evidence of functionality as a wildlife corridor.

Wildlife will continue to move around and though the property. Conn Creek would be considered a wildlife corridor. Properties north and east of the site consists of residences and have formed a barrier for movement across the property. Vineyard blocks will allow wildlife to continue to move within the property.

There are no identifiable significant wildlife corridors associated with the project.

Raptor Nests, Bird Rookeries, Bat Roosts, Wildlife Dens or Burrows Raptors were observed in the area although no raptor nests were identified during our survey. We found no indications of nesting raptors on the property or in the near vicinity of the project sites. We did not observe any nests, whitewash or nest droppings, perching associated with the project site. No bird rookeries were present on the property or within the project footprint.

We did not identify any trees on the project site, which would provide significant suitable bat

roosting habitat. Foliage and bark with small cavities in any tree could provide suitable temporary habitat for solitary tree-roosting bat species. Based on the marginal habitat, i.e. (lack of thick bark, deep fissures and cracks, no large burned out trees, or hollow cavities), trees to be removed would not be considered suitable habitat. It is unlikely that the Townsend's Big-Eared Bat (*Corynorhinus townsendii*) or Pallid Bat (*Antrozous pallidus)* would be present.

Very few gopher or mole burrows were observed, but small mammals and songbirds likely utilize habitats on the project site for foraging and cover. No significant wildlife dens or burrows were observed. Soils are not sandy and are not conducive to burrowing mammals or birds.

The project site does have potential for bird nesting and marginal bat roosting habitat. Pre-construction raptor and bat surveys are recommended.

Unique Species that are Endemic, Rare or Atypical for the Area Unique populations of organisms are associated with microclimates or specific habitats which are part of the diversity of the California landscape. This includes fringing populations of organisms at their limits geographically or associated with particular soils or geologic features.

No unique or unusual populations of animals were present on the property or the project site. Two populations of special-status plants are present on the property. These have been mapped and will be avoided.

Habitat Fragmentation is a local and global concern. Habitat fragmentation can result in a net-loss of habitat and genetic isolation. Small clearings can increase the edge habitat and can be beneficial for wildlife and botanical resources. The project will incrementally reduce a small amount of habitat in the area. The proposed change in land use will result in less than significant changes in avifauna and rodent utilization in the area.

The proposed project will not lead to significant habitat fragmentation in the region, significant species exclusion, or significant change in species composition in the region.

D.3 Potential Off-site Impacts of the Project

A potential impact is the movement of silt, dust and the creation of noise during site construction. Construction and Erosion Control BMP's during development of the site will prevent any significant off-site impacts.

There is nothing to indicate any significant potential impacts to off-site biological resources by the proposed project provided BMPs for the THP/TCP and ECP are implemented.

D.4 Potential Cumulative Impacts

Cumulative biological effects are the result of incremental losses of biological resources within a region. Removal of vegetation can reduce the abundance and diversity of species in an area. Vineyards provide limited foraging, cover, and breeding habitat for native wildlife species. Vineyards can be used by wildlife but the diversity is low within vineyards and foraging may be difficult. Loss of habitat can also be an important factor affecting the long-term survival of rare, threatened and endangered species.

The project is surrounded by extensive open habitat of similar species and vegetation alliances. Vineyards and urban development is sparse surrounding the project site. Removal of vegetation by this project will not significantly reduce the available foraging, nesting and habitat for wildlife in the area. Properties surrounding the proposed project site do not have deer fencing and do not restrict movement of large mammals.

Factors that were considered in the evaluation of cumulative biological impacts include:

1. Any known rare, threatened, or endangered species or sensitive species (as described in the Forest Practice Rules) that may be directly or indirectly affected by project activities or if significant cumulative effects on the habitat of the species may be expected from the results of activities over time.

2. Any significant, known wildlife or fisheries resource concerns within the immediate project area and the biological assessment area (e.g. loss of oaks creating forage problems for a local deer herd, species requiring special elements, sensitive species, and significant natural areas). Significant cumulative effects may be expected where there is a substantial reduction in required habitat or the project will result in substantial interference with the movement of resident or migratory species.

3. The aquatic and near-water habitat conditions on the THP and immediate surrounding area results in cumulative biological impacts. Habitat conditions of major concern are: pools and riffles, large woody material in the stream, near-water vegetation.

<u>There is no indication that there will be any significant cumulative biological impacts.</u>

D.5 State and Federal Permits

Any impact to unnamed seasonal drainages on property will require agency consultation and permits from the California Department of Fish and Wildlife, U.S. Army Corps of Engineers, and Regional Water Quality Control Board for impacts to “Waters of the State”.

A drainage on the southeast side of the property within proposed vineyard Block E (See ECP Map for location of Block E) which contains areas with a definable bed and bank and areas that do not. This portion of this drainage does not transport sediment. This area will require agency review to determine if a 1600 permit is required for installation of rock check dams.

E. RECOMMENDATIONS

E.1 Significance

The significance of potential impacts is a function of the scope and scale of the proposed project within the existing Federal, State and Local regulations and management practices. The project must comply with Napa County requirements to ensure that best management practices are adopted in order to minimize the amount of sediment and other pollutants leaving the site during construction activities. ECP and THP/TCP setbacks or buffer zones are designed to provide protection for the watershed.

E.2 Recommendations

The proposed THP/THC will result in the loss of chaparral and woodland habitat and has the potential to impact biological resources without appropriate avoidance and protection measures.

Biological resources present include Special-status Species, Sensitive Natural Communities, seasonal wetlands, "Waters of the State", Riparian Vegetation, oak trees, wildlife habitat and bird nesting and bat roosting habitat.

The following recommendations are proposed to reduce potential impacts to biological resources on and off-site.

<u>There are two special-status species present on the property Napa False Indigo and California Brodiaea</u>.

Recommendation 1.0 The ECP and THP/TCP have been adjusted to avoid and provide a buffer for populations of these species. All populations identified must be avoided. It is recommended that construction fencing and signage as ESA along the edges of these areas should be implemented.

<u>The project has the potential to impact a Napa County Sensitive Community Ponderosa Pine.</u>

Recommendation 2.0 The ECP and THP/TCP have been adjusted to avoid the Napa County Sensitive Alliance identified on the property.

<u>The project has the potential to impact seasonal wetlands and "Waters of the State"</u>

Recommendation 3.0 The ECP and THP/TCP have been adjusted to avoid the identified seasonal wetland on the property. It is recommended that construction fencing and signage along the edges of this area be installed. Standard THP buffers will protect the creeks and drainages on the property.

The project has the potential to impact Oak Woodlands and potential for damaging oaks along the edge of the project.

Recommendation 4.0 The project should comply with the Oak Woodlands Preservation Act (PRC Section 21083.4) regarding oak woodland preservation to conserve the integrity and diversity of oak woodlands, and retain, to the maximum extent feasible, existing oak woodland communities, and Napa County General Plan Policy CON-24 Paragraph (c) stated that a project should "provide replacement of lost oak woodlands or preservation of like habitat at a 2:1 ratio. We recommend Oak Woodland preservation on site.

Recommendation 4.1 Native Oak trees within close proximity of the project should be protected from the vineyard construction activities. Heavy equipment intrusion or parking under the drip line must be prevented to protect their roots. Soil compaction or cutting of roots has the potential for damaging the continued existence of the tree. Prior to site preparation the contractor should be informed of the need to protect the root zone of surrounding trees. The drip line of the remaining trees adjacent clearing activities should be labeled on the project maps, and flagged around the drip line to protect their roots from intrusion of equipment.

The project has the potential to impact wildlife movement into and through undeveloped areas of the property.

Recommendation 5.0 Deer fencing should be designed with exit gates and limited to vineyard blocks. It is recommended that only the vineyard blocks be fenced to allow wildlife movement through and around the project. We also recommend any new fencing use a design that has 6-inch square gaps at the base instead of the typical 3" by 6" rectangular openings to allow small mammals to move through the fence.

The project has the potential to impact nesting raptors and migratory birds by direct tree removal.

Recommendation 6.0 If project activities are scheduled between February 15 and September 15, CDFW recommends surveys and avoidance measures for nesting birds. With respect to surveys for nesting bird and raptor species, CDFW recommends that the project specifies: 1) nest surveys shall be conducted no more than 14 days prior to tree removal and/or breaking ground, 2) in the event that nesting birds are found, the project applicant shall consult with CDFW and obtain approval for nest-protection buffers prior to tree removal and/or ground disturbing activities, and 3) nest protection buffers shall remain in effect until the young have fledged. All nest protection measures shall apply to off-site impacts and within 500 feet of project activities. If a lapse in project-related work of 14 days or longer occurs, another focused survey and, if required, consultation with CDFW, shall be required before project work can be reinitiated. If active nests are found during a preconstruction

survey, 300-foot no-disturbance buffer zones shall be created around active raptor and songbird nests and shall be maintained until it is determined by a qualified biologist that all young have fledged or the nest has failed. These buffer zones may be modified in coordination with CDFW based on existing conditions at the project site. Buffer zones shall be fenced with temporary construction fencing and remain in place until the end of the breeding season, until the young have fledged, or the nest has failed. If a 14-day or greater lapse of project-related work occurs during the breeding season, another bird preconstruction survey and consultation with CDFW will be required before project work can be reinitiated.

<u>The project has the potential to impact roosting bats by direct tree removal.</u>

Recommendation 7.0 If initial ground disturbance occurs during the bat maternity roosting season (May 1 through August 31), a qualified biologist will conduct a bat roost assessment of trees on the site searching for suitable entry points, roost cavities or crevices. If the biologist determines there is potential for maternal roosting on the project site then, these trees shall be removed between August 15, and October 15 (or before evening temperatures fall below 45F and/or more than 1" of rainfall within 24 hours occurs), or between February 28, and April 15.

<u>Direct or indirect impacts to seasonal drainages on site has the potential to result in negative impacts to special-status species known or expected to occur downstream in the Napa River and its riparian woodland habitat.</u>

Recommendation 8.0 All drainages which contain a definable bed and bank must be avoided. Any impact to unnamed seasonal drainages will require agency consultation and permits if agency consultation determines that this is jurisdictional from the California Department of Fish and Wildlife, U.S. Army Corps of Engineers, and Regional Water Quality Control Board for impacts to "Waters of the State."

F. SUMMARY

This study is provided as background information necessary for evaluating potential impacts of the project on local biological resources.

We find that the proposed project will not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

We find that the project as proposed will not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.

We find that the project as proposed will not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. No wetlands or vernal pools are associated with the proposed project.

We find that the proposed project will not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

In order for the proposed project to not conflict with any local policies or ordinances protecting biological resources, the project must comply with the Oak Woodlands Preservation Act and Napa County General Plan Policy CON-24 Paragraph (c).

The proposed project will not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plans.

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G.2 Qualifications of Field Investigators

Chris K. Kjeldsen, Ph.D., Botany, Oregon State University, Corvallis, Oregon. He has over forty years of professional experience in the study of California flora. He was a member of the Sonoma County Planning Commission and Board of Zoning (1972 to 1976). He has over thirty years of experience in managing and conducting environmental projects involving impact assessment and preparation of compliance documents, Biological Assessments, CDFW Habitat Assessments, CDFW Mitigation projects, ACOE Mitigation projects and State Parks and Recreation Biological Resource Studies. Experience includes conducting special-status species surveys, jurisdictional wetland delineations, general biological surveys, 404 and 1600 permitting, and consulting on various projects. He taught Plant Taxonomy at Oregon State University and numerous botanical science and aquatic botany courses at Sonoma State University including sections on wetlands and wetland delineation techniques. He has supervised numerous graduate theses, NSF, DOE and local agency grants and served as a university administrator. He has a valid CDFW collecting permit.

Daniel T. Kjeldsen, B. S., Natural Resource Management, California Polytechnic State University, San Luis Obispo, California. He spent l994 to l996 in the Peace Corps managing natural resources in Honduras, Central America. His work for the Peace Corps in Central America focused on watershed inventory, mapping and the development and implementation of a protection plan. He has over ten years of experience in conducting Biological Assessments, CDFW Habitat Assessments, ACOE wetland delineations, wetland rehabilitation, and development of and implementation of mitigation projects and mitigation monitoring. He has received 3.2 continuing education units MCLE 27 hours in Determining Federal Wetlands Jurisdiction from the University of California Berkeley Extension. Attended Wildlife Society Workshop Falconiformes of Northern California Natural History and Management California Tiger Salamander 2003, Natural History and Management of Bats Symposium 2005, Western Pond Turtle Workshop 2007, and Western Section Bat Workshop 2011. Laguna Foundation & The Wildlife Project Rare Pond Species Survey Techniques 2009. A full resume is available upon request.

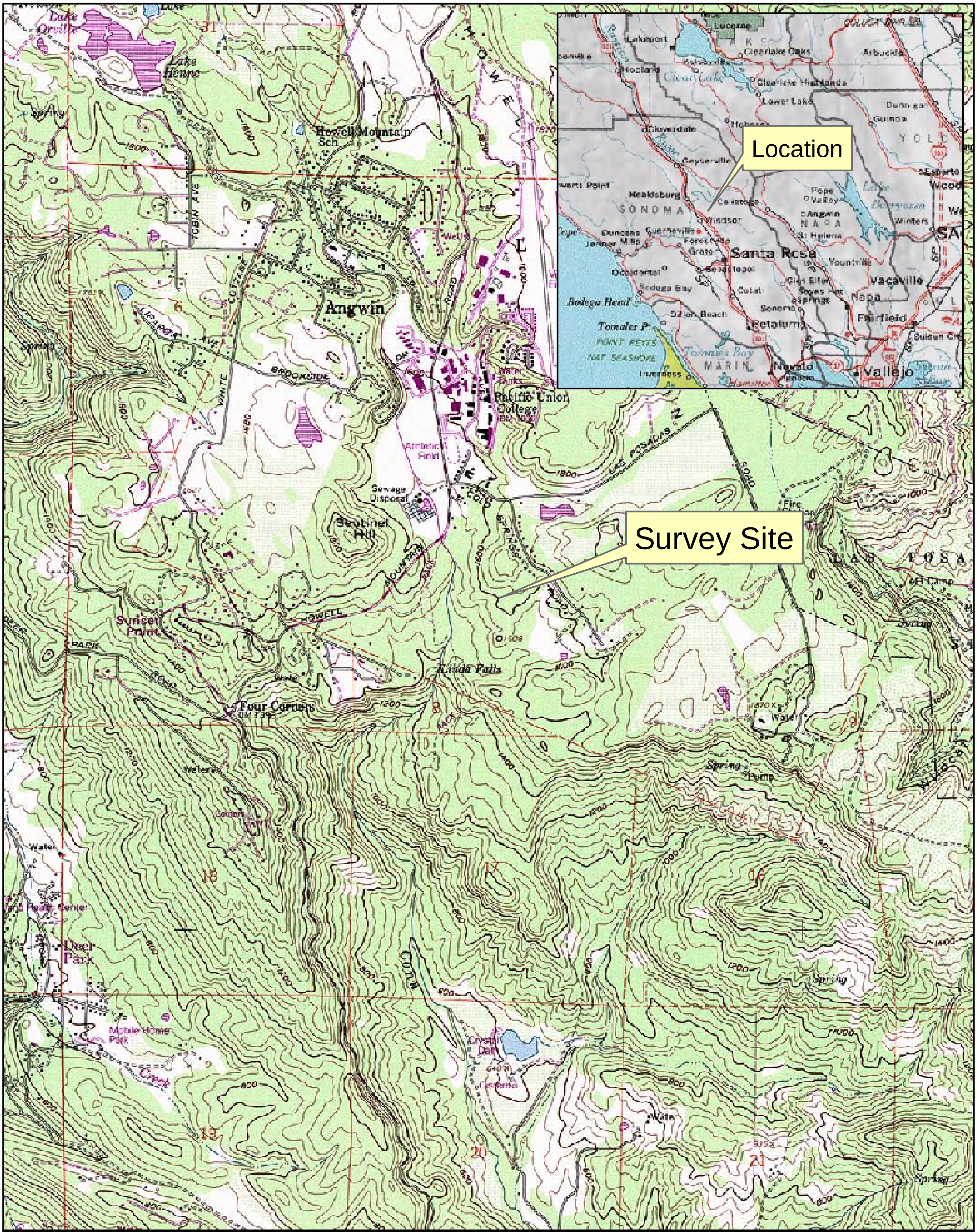


Plate I. Site / Location Map

(St Helena Quadrangle)

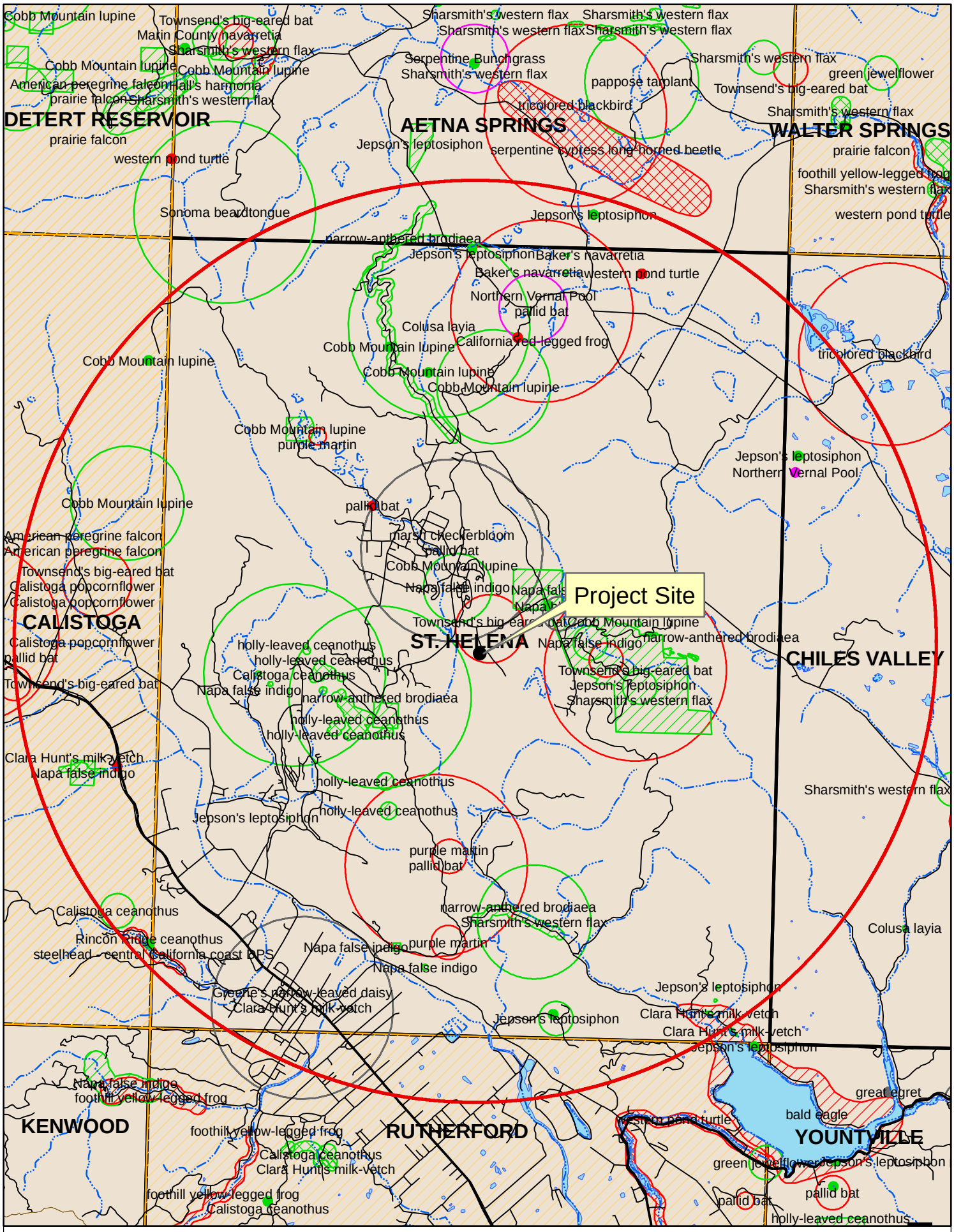


Plate II CDFW CNDDB 5-Mile Search

(Data Date April 2015)

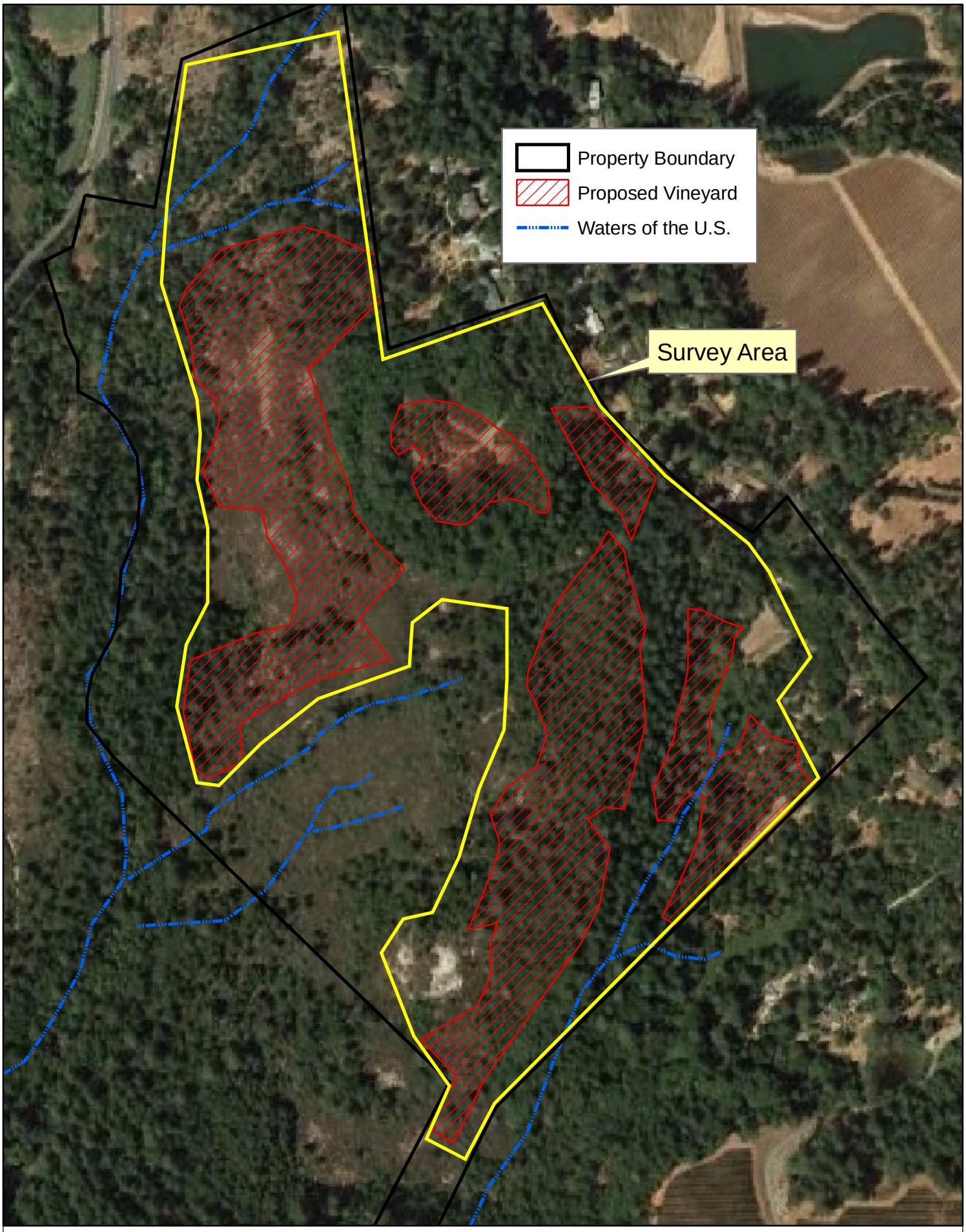


Plate III. Aerial Photo / Survey Area

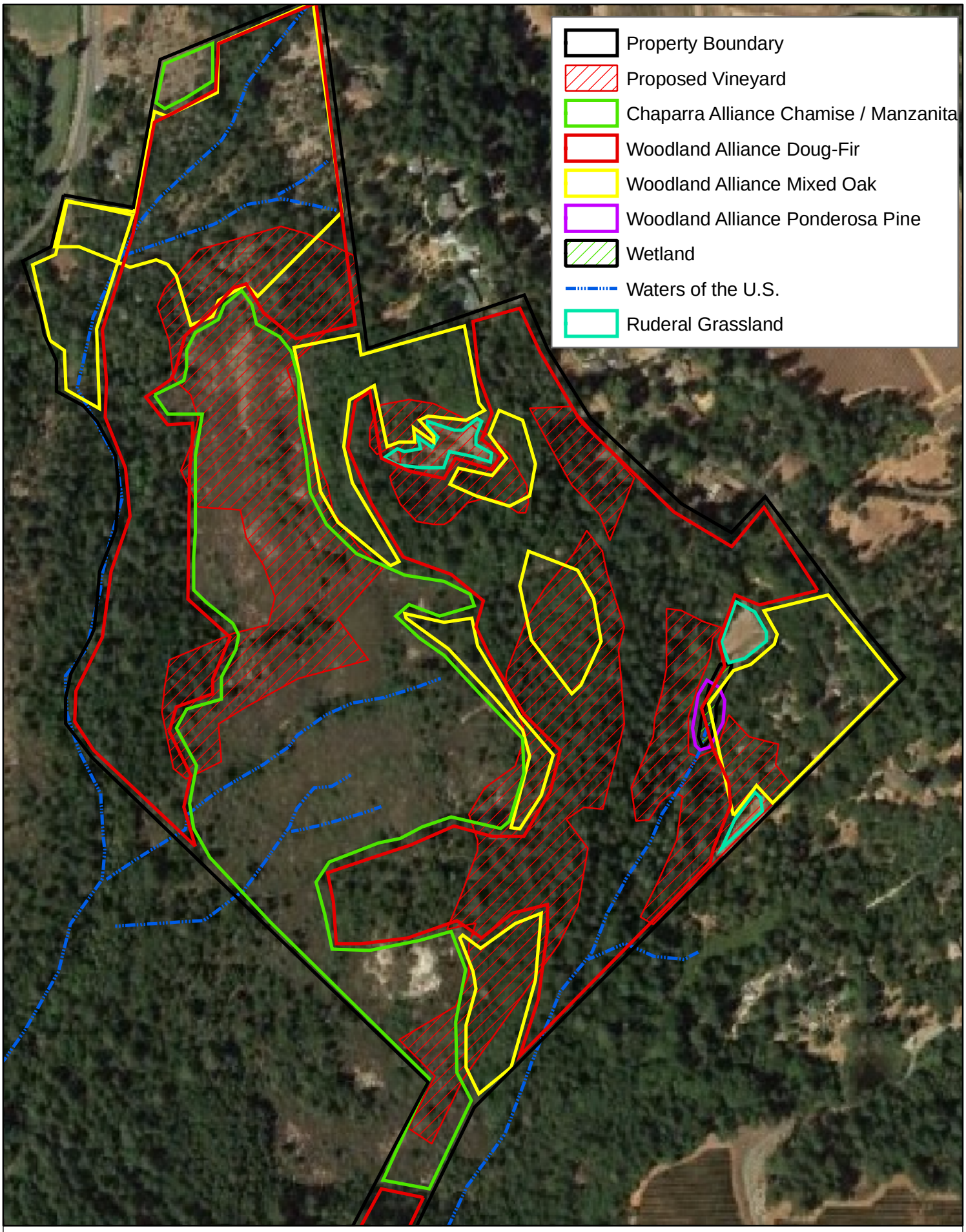


Plate III. Aerial Photo / Survey Area

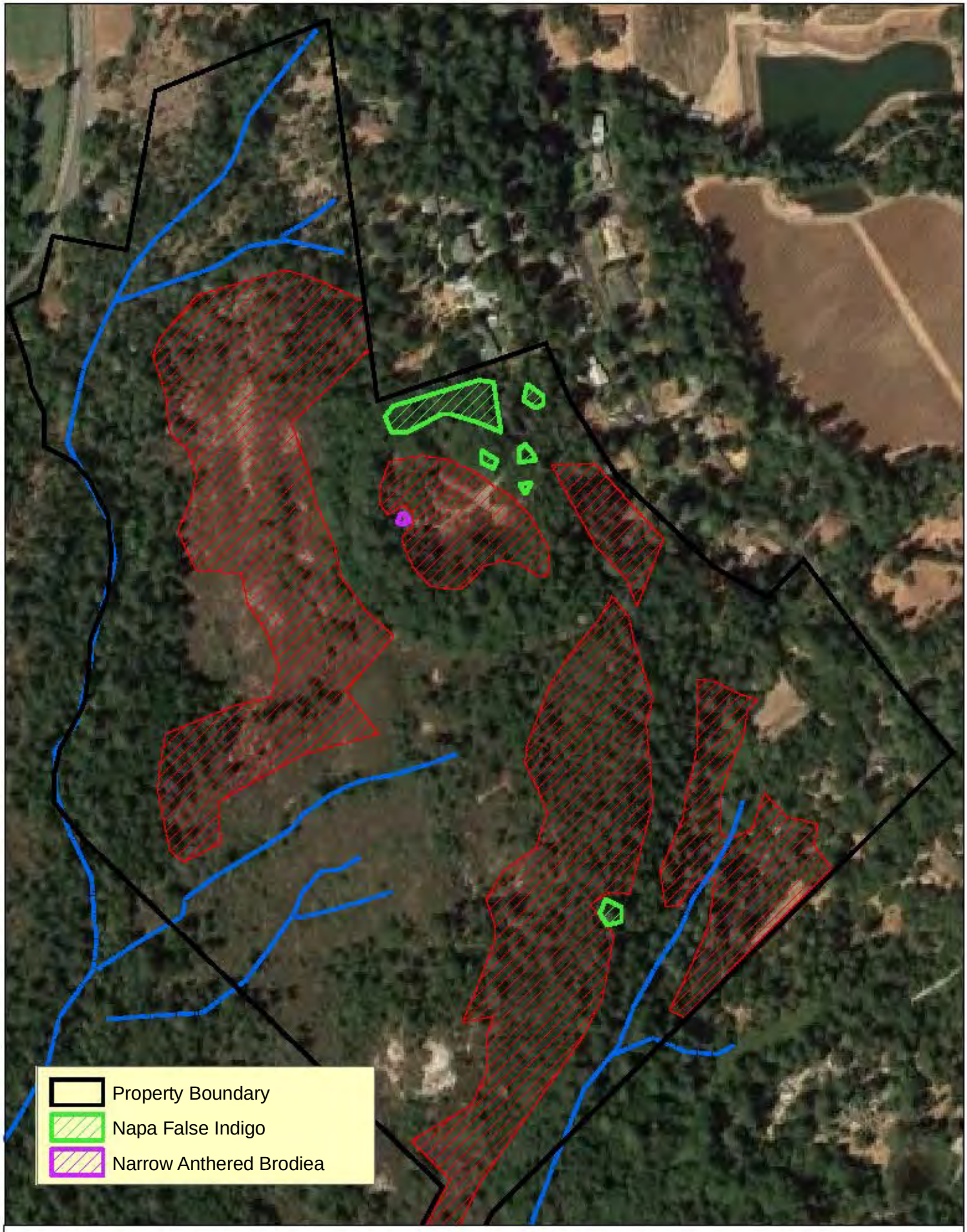
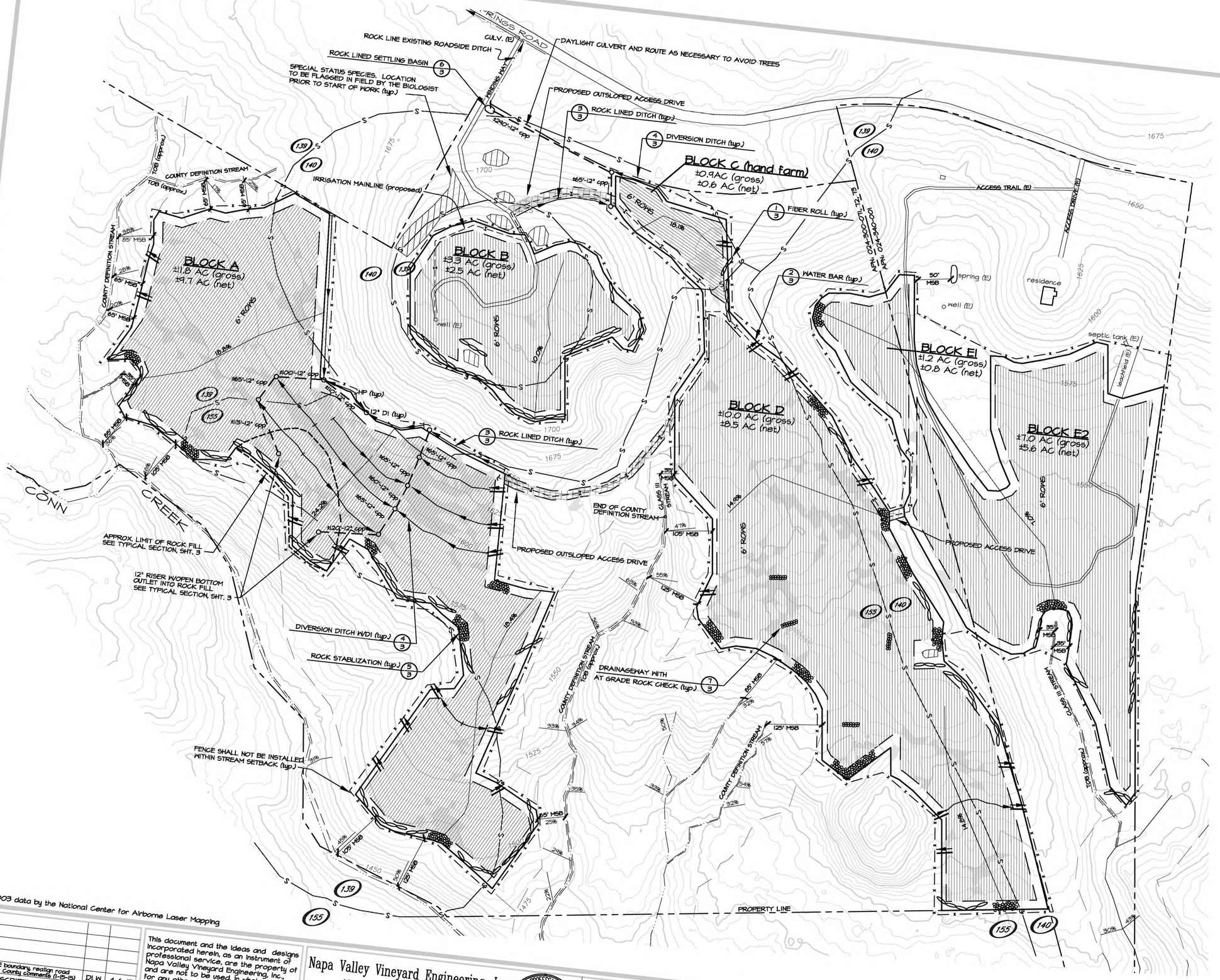


Plate V. Location of Special-status Species



Tetra Tech, using 2003 data by the National Center for Airborne Laser Mapping

REV.	DESCRIPTION	BY	DATE
1	Change Block E boundary, realign road Incorporate Napa County comments (1-15-15)	DLW	4-6-15

This document and the ideas and designs incorporated herein, as an instrument of professional service, are the property of Napa Valley Vineyard Engineering, Inc., and are not to be used, in whole or part, for any other project without written authorization from Napa Valley Vineyard Engineering, Inc.

Napa Valley Vineyard Engineering, Inc.
176 Main St., Suite B
St. Helena, CA 94574
(707) 963 4927

REGISTERED PROFESSIONAL ENGINEER DREW L. ASPEGREN No. 31418 Exp. 12-31-14 CIVIL STATE OF CALIFORNIA

DATE 12-18-14		SCALE AS SHOWN	
MECPD\Cesar\sRI.dwg		DRAWN DLW	CHECKED DLA
APPROVED			
DREW L. ASPEGREN, PE		R.C.E. 31418	

Le Colline Vineyard

EROSION CONTROL PLAN FOR NEW VINEYARD DEVELOPMENT

LEGEND ON SHT. 1

SHEET 2

APPENDIX A
Plants and Animals Observed Associated With The Project Site

PLANTS

The nomenclature for the list of plants found on the project site and the immediate vicinity follows: Brodo, Irwin M., Sylvia Duran Sharnoff and Stephen Sharnoff, 2001, for the lichens; S Norris and Shevrock - 2004, for the mosses; Doyle and Stotler - 2006 for liverworts and hornworts and Baldwin, B.G., D.H. Goldman, D.J.Keil, R.Patterson, T.J.Rosati, and D.H.Wilkens, editors, 2012 - for the vascular plants.. The plant list is organized by major plant group.

Habitat type indicates the general associated occurrence of the taxon on the project site or in nature.

Abundance refers to the relative number of individuals on the project site or in the region.

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

FUNGI		
Basidiomycota- Club Fungi		
CLAVARIACEAE		
Ramariopsis kunzei	Hardwood, Conifer Woodlands	Common
White Coral Mushroom		
LYCOPERDIALES		
Pisolithus tinctorius	Woodlands, Ruderal	Common
Dead Man's Foot		
POLYPORACEAE		
Ganoderma applanatum	On Conifers or Hardwoods	Common
Artist's Conk		
Lenzites betulina	Woodlands on Dead Wood	Common
Gilled Polypore		
Phaeolus schweinitzii	Woodlands Parasite of D-fir	Common
Dyer's Polypore		
Trametes versicolor	Woodlands on Dead Wood	Common
Turkey Tail		
Stereum hirsutum	Woodlands on Dead Wood	Common
False Turkey Tail		
RUSSULACEAE		
Lactarius scorbiculatus	Woodlands, Conifer, Oak	Common
Scorbiculate Milk Cap		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

Russula brevipes	Mixed Woodlands	Common
Blackening Russula		
Russula cremoricolor	Woodlands	Occasional
Creamy Russula		
TREMELLALES		
Exidia glandulosa	Woodland on Dead Wood	Occasional
Black Witch's Butter		
Tremella aurantia	Dead Wood Parasitizes *Serium hirsutum*	Occasional
Witch's Butter		

FUNGI

Ascomycota - Sac Fungi

DALDINEACEAE

Daldinia grandis	Woodlands on Dead Wood	Common
Carbon Balls		

MOSSES

MINACEAE

Alsia californica (W.J.Hooker&Arnott) Sullivant	Coastal Forests On Trees	Common
NCN		
Dendroalsia abietina (Hook.) Brit.	Woodlands	Common
NCN		
Homalothecium nuttallii (Wilson) Jaeger	Epiphytic on Trees Near Coast-Inland	Common
NCN		
Kindbergia oregana (Sull) Ochyra	Woodlands	Common
NCN		
Orthotrichum lyellii Hook & Tayl.	Woodlands, Upper Canopy	Common
NCN		
Polytrichum juniperinum Hedw.	Woodlands	Occasional
Haircap Moss		
Pseudobraunia californica (Lesq.) Broth.	Woodlands on Base of Trees	Common
NCN	Also on rocks or cut banks	
Scleropodium touretii (Brid.) L Koch.	Woodlands	Common
NCN		

MAJOR PLANT GROUP
Family
Genus **Habitat Type** **Abundance**
Common Name

NCN = No Common Name, * = Non-native, @= Voucher Specimen

LICHENS

FOLIOSE

@Cetraria chlorophylla (Willd.) Vain NCN	On Wood Conifer Forests	Occasional
@Cetraria orbata (Nyl.) Fink NCN (=*Tuckermannopsis orbata)*	On Limbs Usually Conifers	Occasional
Cetraria platyphylla Tuck. NCN	On Tree Limbs Conifer Forests	Occasional
Flavoparmelia caperata (L.) Hale NCN	On Oaks	Common
Flavopunctilia flaventor (Stirt.) Hale NCN	On Oaks	Common
Hypogymina imshaugii Krog NCN	On Conifers, Oaks	Common
Parmelia sulcata Taylor NCN	On Oaks	Common
Pseudocypehallaria anomola Brodo & Ahti NCN	On Oaks	Common
Pseudocyphellaria anthraspis(Ach.) H. Magn. NCN	On Oaks	Common
Teloschistes chrysophthalmus (L.) Th. Fr. NCN	On Oaks	Common
Xanthoparmelia mexicana (Gyeln.) Hale NCN	On Rocks	Common
Xanthoria polycarpa (Hoffm.) Rieber Pin-cushion Sunburst Lichen	On Oaks Young Twigs	Common

FRUTICOSE

Cladonia coniocrea (Flörke) Spreng. Common Powderhorn	On Soil	Common
Cladonia furcata (Huds.) Schrad. NCN	On Soil	Common
Evernia prunastri (L.) Ach. NCN	On Oaks	Common
Ramalina farinacea (L.) Ach. NCN	On Oaks	Common
Usnea intermedia=U. arizonica NCN	On Oaks	Common
Usnea mutabilis NCN	On conifers	Common

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

CRUSTOSE		
Leicidia atrobrunnea (Ramond ex Lam. & DC.) Schaer.	On Rocks	Common
NCN		
Leicidia tessellata Flörke	On Rocks With Rings of Aapothecia	Common
NCN		
Ochrolechia orgonensis H. Magn.	On Bark	Common
NCN		
Pertusaria armara (Ach.) Nyl.	On Oaks	Common
NCN		
UMBILICATE		
*Umbilicaria phaea*Tuck.	On Rocks	Common
NCN		

VASCULAR PLANTS FERNS

DENNSTAEDTIACEAE		
Pteridium aquilinum (L.) var. *pubescens* Underw.	Grasslands or Woodlands	Common
Bracken Fern		
DRYOPTERIDACEAE		
Dryotpteris expansa (C. Presl) Fraser-Jenk.	Shaded Creek Banks	Common
Wood Fern		
Polystichum munitum (Kaulf.) C Presl	Redwood or Riparian	Common
Sword Fern		
POLYPODIACEAE		
Polypodium californicum Kaulf.	Woodlands or Riparian	Common
Common Polypody		
PTERIDACEAE		
Pentagramma triangularis (Kaulf.)G.Yatsk. subsp. *triangularis*	Woodlands	Common
Goldback Fern		

VASCULAR PLANTS DIVISION CONIFEROPHYTA--GYMNOSPERMS

PINACEAE		
Pinus ponderosa Laws.	Woodlands-Planted	Occasional
Ponderosa Pine		
Pinus sabiniana Douglas	Dry Ridges	Occasional
Gray or Foothill Pine		
Pseudotsuga menziesii (Vassey) Mayr var. *menziesii*	Woodlands	Common
Douglas-fir		

MAJOR PLANT GROUP **Family** **Genus**	**Habitat Type**	**Abundance**
Common Name		

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TAXODIACEAE		
Sequoia sempervirens (D.Don) Endl.	Probably Planted	Common
Redwood		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--DICOTYLEDONAE- TREES

MAGNOLIIDS		
LAURACEAE		
Umbellularia californica (Hook.&Arn.) Nutt.	Conifer&Oak Woodlands	Occasional
California Laurel, Sweet Bay, Pepperwood, California Bay		
EUDICOTS		
ERICACEAE Heath Family		
Arbutus menziesii Pursh	Woodlands	Common
Madrone		
FAGACEAE Oak Family		
Quercus agrifolia Nee	Woodlands	Common
Live Oak		
Quercus kelloggii Newb.	Woodlands	Common
Black Oak		
Quercus wislizenii A.D.C.	Woodlands	Occasional
Interior Live Oak		
JUGLANDACEAE Walnut Family		
**Juglans regia* L.	Ruderal	Common
English Walnut		
MORACEAE Mulberry Family		
**Ficus carica* L.	Ruderal Escape	Occasional
Fig		
OLEACEAE Olive Family		
**Olea europaea* L.	Domestic Ruderal	Occasional
Olive		
ROSACEAE Rose Family		
**Crataegus monogyna* Jacq.	Naturalized Escape	Occasional
Hawthorn (Note Long Thorns)		
**Malus sylvestris* Mill.	Escape	Occasional
Apple		
**Prunus cerasifera* Ehrh.	Escape, Ruderal	Occasional
Cherry Plum		
SALICACEAE Willow Family		
Salix laevigata Bebb.	Riparian	Common
Red Willow		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

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SAPINDACEAE Soapberry Family		
Acer macrophyllum Prush	Riparian, Stream Banks, Canyons	Common
Big-leaf Maple		
Aesculus californica (Spach) Nutt.	Woodlands, Riparian	Common
California Buckeye		
SIMAROUBIACEAE Quassia or Simarouba Family		
**Ailanthus altissima* (Mill.) Swingle	Ruderal Escape	Common
Tree of Heaven		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--DICOTYLEDONAE-SHRUBS AND WOODY VINES

MAGNOLIIDS		
ARISTOLOCHIACEAE Pipevine Family		
Aristolochia californica Torry	Woodlands	Occasional
Dutchman's Pipe, Pipevine		
CALYCANTHACEAE Calycanthus Family		
Calycanthus occidentalis Hooker&Arn.	Riparian, Woodlands	Occasional
Spicebush		
EUDICOTS		
ANACARDIACEAE Sumac Family		
Toxicodendron diversilobum (Torry&Gray) E.Green	Woodlands	Common
Poison Oak		
APOCYANACEAE Dogbane Family		
Apocyanum cannabinum L.	Riparian or Ruderal	Occasional
Indian Hemp		
**Vinca major* L.	Woodlands, Riparian, Ruderal	Common
Periwinkle		
ARALIACEAE Ginsing Family		
**Hedra helix* L.	Ruderal	Occasional
English Ivy		
ASTERACEAE (Compositae) Sunflower Family		
Baccharis pilularis deCandolle	Woodlands, Grasslands	Common
Coyote Brush		
BETULACEAE Birch Family		
Corylus cornuta Marshall var. *californica*	Riparian, Woodlands	Occasional
Hazelnut		
BORAGINACEAE Borage or Waterleaf Family		
Eriodictyon californicum (Hook.&Arn.) Torr.	Chaparral	Common
Yerba Santa		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
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CAPRIFOLIACEAE Honeysuckle Family		
Lonicera hispidula Douglas var. *vacillans* Honeysuckle	Woodlands	Occasional
Symphoricarpos mollis Nuttall Creeping Snowberry, Trip Vine	Woodlands	Common
ERICACEAE Heath Family		
Arctostaphylos glandulosa Eastwood ssp. *cushingiana* Cushing Manzanita-Scabrous Leaf	Woodlands, Chaparral	Common
Arctostaphylos manzanita Parry ssp. *glaucesens* Common Manzanita	Woodlands	Common
Arctostaphylos manzanita Parry ssp. *manzanita* Common Manzanita	Woodlands	Common
Arctostapylos stanfordiana C. Parry ssp. *stanfordiana* Stanford Manzanita	Chaparral	Common
Rhododendron occidentale(Torry&Grey)A.Grey Western Azalea	Riparian	Occasional
FABACEAE (Leguminosae) Legume Family		
Amorpha californica Nuttall var. *napensis* Napa False Indigo	Chaparral, Woodlands	Rare
**Genista monspessulana* (L.) Johnson Broom, French Broom	Woodlands	Common
OLEACEAE Olive Family		
**Ligustrum* ssp. Privet	Domestic Escape	Occasional
PHRYMACEAE Lopseed Family		
Mimulus aurantiacus Curtis Bush Monkey Flower	Woodlands	Occasional
RHAMNACEAE Buckthorn Family		
Ceanothus cuneatus Nutt.var. *cuneatus* Buckbrush	Chaparral	Common
Ceanothus foliosus Parry var. *foliosus* Wavyleaf Ceanothus	Chaparral	Common
Frangula californica (Eschsch.) A.Gray ssp. *californica* California Coffee Berry (=*Rhamnus californica)*	Shrub/Scrub	Common
ROSACEAE Rose Family		
Adenostoma fasciculatum Hooker&Arn. Chamise	Shrub/Scrub	Common
Heteromeles arbutifolia (Lind.) M. Rome. Christmas Berry, Toyon	Shrub/Scrub	Common

MAJOR PLANT GROUP **Family** **Genus**	**Habitat Type**	**Abundance**
Common Name		

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Rosa californica Cham.& Schlidl. Rose	Grasslands, Edge of Woodlands	Common
**Rosa rubiginosa* L. Sweet-brier (=*Rosa eglanteria*)	Ruderal	Common
**Rubus armeniacus* Focke Himalayan Blackberry	Ruderal	Common
Rubus leucodermis Torr.&A. Gray Western Raspberry	Woodlands	Common
VITACEAE Grape Family		
Vitis californica Benth California Wild Grape	Riparian Woodlands	Occasional

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--DICOTYLEDONAE-HERBS

EUDICOTS

APIACEAE (Umbelliferae) Carrot Family		
**Dacus carota* L. Wild Carrot, Queen Anne's Lace	Ruderal Grasslands	Common
Osmorhiza bertoli DC. Sweet Cicely (=*Osmorhiza chilense)*	Woodlands, Ruderal	Common
Sanicula crassicaulis DC. Pacific Sanicle	Woodlands	Common
**Torilis arvensis* (Huds.) Link Hedge-parsley	Grasslands Woodlands	Common
ASTERACEAE (Compositae) Sunflower Family		
Arnica discoidea Benth. Rayless Arnica	Chaparral, Foothill Woodland	Occasional
Artemesia douglasiana Besser Mugwort	Riparian	Common
**Carduus pycnocephalus* L.subsp.*pycnocephalus* Italian Thistle	Woodlands	Common
**Centaurea solstitalis* L. Yellow Star Thistle	Grasslands, Ruderal	Common
**Cichorium intybus* L. Chicory	Ruderal	Occasional
**Circium vulgare* (Savi) Ten. Bull Thistle	Grasslands, Ruderal	Common
**Helminthotheca echioides* (L.) Holub Ox-tongue (=*Picris echioides)*	Ruderal	Common

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
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Hieracium albiflorum Hook.	Woodlands, Grasslands	Occasional
White-flowered Hawkweed		
**Hypochaeris glabra* L.	Ruderal	Common
Cat's Ear		
**Hypochaeris radicata* L.	Ruderal	Common
Harry Cat's Ear		
**Lactuca serriola* L.	Ruderal	Occasional
Prickly Lettuce		
**Logifa gallica* (L.) Cros&Germ	Ruderal Grasslands	Common
Herba Impa, Daggerleaf Cottonrose (=*Filago gallica)*		
Madia elegans D.Don	Ruderal, Grasslands	Common
Common Madia		
**Pseudognaphalium luteoalbum* (L.) Hill.&Burtt	Ruderal	Common
White Cudweed (=*Gnaphalium luteo-album)*		
**Senecio vulgaris* L.	Ruderal	Occasional
NCN		
**Sonchus asper* (L.) Hill var. *asper*	Ruderal	Common
Prickly Sow Thistle		
**Sonchus oleraceus* L.	Ruderal	Common
Common Sow Thistle		
**Taraxacum officinale* F.H.Wigg	Ruderal	Common
Dandelion		
**Tragopogon porrifolius* L.	Grasslands	Occasional
Salsify		
Wyethia angustifolia (DC.) Nutt.	Grasslands	Occasional
Narrow Leafed Mules Ears		
BORAGINACEAE Borage or Waterleaf Family		
Amsinckia menziesii (Lehm) Nelson&Macbr.	Grasslands	Occasional
Rancher's Fireweed		
Cyanoglossum grande Lehm.	Woodlands	Common
Hound's Tongue		
**Myosotis discolor* Pers.	Woodands, Grasslands	Common
Forget-me-not, Blue Scorpion Grass		
BRASSICACEAE Mustard Family		
Cardamine oligosperma Nutt.	Ruderal	Common
Bitter-cress		
**Hirschfeldia incana* (L.) Lagr.-Fossat	Ruderal	Common
Summer Mustard		
Nasturtium officinale W.T. Aiton	Palustrine	Occasional
Water Cress (=*Rorippa nasturtium-aquaticum*)		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
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**Sisymbrium officinalis* L.	Ruderal, Grasslands	Common
Hedge Mustard		
CARYOPHYLLACEAE Pink Family		
**Stellaria media* (L.) Vill.	Ruderal	Common
Chickweed		
CONVOLVULACEAE Morning-glory Family		
Convolvulus arvensis L.	Grasslands	Common
Morning-glory, Bindweed		
FABACEAE (Leguminosae) Legum Family		
Hosackia crassifolia Benth var. *crassifolia*	Along Roads Chaparral	Occasional
NCN (=*Lotus crassifolia)*		
Acmispon micranthus (Torr.&A. Gray)	Grasslands, Ruderal	Common
Small Flowered Lotus (= *Lotus micranthus)*		
Hoita orbicularis (Lindl.) Rydb.	Meadows, Riparian	Occasional
Psoralea		
**Lathyrus sphaericus* Retz.	Ruderal	Occasional
Grass Pea		
Lathyrus vestitus Nutt. var. *vestitus*	Woodlands	Occasional
Hillside Pea		
**Lotus corniculatus* L.	Grasslands, Ruderal	Common
Birdfoot Trefoil		
**Medicago arabica* (L.) Huds	Ruderal	Common
Spotted Bur Clover		
**Medicago polymorpha* L.	Ruderal, Grasslands	Common
California Bur Clover		
Rupertia physodes (Douglas) Grimes	Woodlands	Common
California-Tea		
**Trifolium hirtum* All.	Ruderal	Common
Rose Clover		
Vicia americana Wild. subsp. *americana*	Woodlands	Common
American Vetch		
**Vicia sativa* L. subsp. *nigra*	Grasslands, Ruderal	Common
Narrow Leaved-vetch		
GERANIACEAE Geranium Family		
**Erodium botrys* (Cav.) Bertol.	Grasslands	Common
Broadleaf Filaree, Long-beaked Filaree		
**Geranium dissectum* L.	Grasslands	Common
Common Geranium		

MAJOR PLANT GROUP		
Family		
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EUPHORBIACEAE Spurge Family		
Croton setigerus Hook.	Ruderal	Common
Turkey Mullein, Dove Weed (=*Eremocarpus setigerus)*		
HYPERICACEAE St John's Wort Family		
**Hypericum perforatum* L. subsp. *perforatum*	Ruderal/Grasslands	Occasional
Klamath Weed		
LAMIACEAE (Labiatae) Mint Family		
Stachys ajugoides Benth.	Moist Open Places	Occasional
Hedge-nettle		
MONTIACEAE Miner's lettuce Family		
*Claytonia perfoliata*Willd. ssp. *perfoliata*	Woodlands, Riparian	Common
Miners Lettuce		
OROBANCHACEAE Broomrape Family		
Pedicularis densiflora Hook.	Woodlands, Chaparral	Common
Indian Warrior		
PLANTAGINACEAE Plantain Family		
Plantago erecta E.Morris	Grassland, Open Woodland	Common
California Plantain		
**Plantago lanceolata* L.	Ruderal	Common
English Plantain		
POLEMONIACEAE Phlox Family		
Leptosiphon bicolor Nutt.	Grassland, Chaparral- Open Areas	Occasional
NCN (= *Linanthus)*		
@Leptosiphon parviflorus Benth.	Grassland, Woodlands	Occasional
Common Baby Stars (= *Linanthus)*		
Navarretia squarrosa (Eschsch.) Hook.&Arn.	Ruderal, Grasslands	Common
Skunkweed		
POLYGALACEAE Milkwort Family		
Polygala californica Nutt.	Woodlands, Shrub/Scrub	Occasional
Milkwort		
POLYGONACEAE Buckwheat Family		
**Polygonum agyrocoleon* Kunze	Ruderal Wet Ground	Occasional
Persian Wireweed		
**Rumex acetosella* L.	Ruderal	Common
Sheep Sorrel		
RANUNCULACEAE Buttercup Family		
**Rumex crispus* L.	Ruderal	Common
Curly Dock		
Ranunculus californicus Benth.	Grasslands, Woodlands	Common
Buttercup		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
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ROSACEAE Rose Family		
Fragaria vesca L.	Woodlands/Grasslands	Common
Wood Strawberry		
Horkelia californica Cham.&Schltdl var. *californica*	Open Areas Woodlands	Common
NCN		
RUBIACEAE Madder Family		
Galium aparine L.	Woodlands, Riparian, Ruderal	Common
Goose Grass		
**Galium parisiense*	Grasslands, Woodlands	Common
Wall Bedstraw		
SCROPHULARIACEAE Figwort Family		
**Verbascum thapsus* L.	Ruderal	Occasional
Wooley Mullein		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--MONOCOTYLEDONAE-GRASSES

POACEAE Grass Family		
**Aira caryophyllea* L.	Grassland	Common
Silver European Hairgrass		
**Avena barbata* Link.	Grasslands	Common
Slender Wild Oat		
**Bromus diandrus* Roth	Ruderal, Grasslands	Common
Ripgut Grass		
**Briza maxima* L.	Grasslands, Ruderal	Common
Large Quaking Grass, Rattlesnake Grass		
**Briza minor* L.	Grasslands, Ruderal	Common
Small Quaking Grass		
**Cynosurus echinatus* L.	Ruderal	Common
Hedgehog, Dogtail		
Elymus glaucus Buckley ssp. *glaucus*	Woodlands	Common
Blue Wildrye		
Festuca californica Vassey	Grasslands, Woodlands	Common
California Fescue		
**Festuca myuros* L.	Grasslands	Common
Rattail Fescue, Zorro Annual Fescue (=*Vulpia myuros)*		
**Holcus lanatus* L.	Grasslands, Ruderal	Common
Velvet Grass		
**Hordeum murinum* Huds. subsp. *leporinum*	Grasslands	Common
Farmers Foxtail		

MAJOR PLANT GROUP **Family** **Genus**	**Habitat Type**	**Abundance**
Common Name		

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Melica torreyana Schribn. Torrey's Melic	Chaparral, Woodlands	Common

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--MONOCOTYLEDONAE-SEDGES AND RUSHES

CYPERACEAE Sedge Family

Cyperus eragrostis Lam. Nut-grass	Ruderal Moist Areas	Common

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--MONOCOTYLEDONAE-HERBS

Chlorogalum *pomeridianum* (DC.) Kunth var. *pomeridianum* Soap Plant	Woodlands, Grasslands	Common

IRIDACEAE Iris Family

Iris macrosiphon Torr. Long-tubed Iris	Sunny Woody or Grassy Hillsides	Occasional
Sisyrinchium bellum Watson Blue-eyed Grass	Grasslands	Common

MELANTHIACEAE False-hellebore Family

Toxicoscordion fremontii (Torr) Rydb. Star Lily (= *Zigadenus)*	Grassy or Wooded Slopes Outcrops	Common

THEMIDACEAE Brodiaea Family

Dichelostemma capitatum (Benth.) Blue Dicks	Wood Grasslands, Open Woodlands	Occasional
Brodiaea leptandra Greene) Baker Narrow-flowered California Brodiaea	Mixed Evergreen Woodland, Chaparral	Rare

Fauna Species Observed in the Vicinity of the Project Site

The nomenclature for the animals found on the project site and in the immediate vicinity follows: Mc Ginnis –1984, for the fresh water fishes; Stebbins -l985, for the reptiles and amphibians; and Udvardy and Farrand – 1998, for the birds; and Jameson and Peeters - l988 for the mammals.

OSTEICHTHYES		
ORDER		
Common Name	**Genus**	**Observed**
SQUAMATA		
Western Fence Lizard	*Sceloporus occidentalis*	X

AVES		
ORDER		
Common Name	**Genus**	**Observed**
AVES		
Acorn Woodpecker	*Melanerpes fomicivorus*	X
Black Phoebe	*Sayornis nigricans*	X
Mockingbird	*Mimus polyglottos*	X
Mourning Dove	*Zenaida macroura*	X
Oregon Junco	*Junco oreganus*	X
Spotted Towhee	*Pipilo erythrophthalmus*	X
Scrub Jay	*Aphelocoma coerulescens*	X
Steller's Jay	*Cyanocitta stelleri*	X
Turkey Vulture	*Cathartes aura*	X
Violet-green Swallow	*Tachycineta thalassina*	*X*

MAMMALS		
ORDER		
Common Name	**Genus**	**Observed**
CERVIDAE		
Black-tailed Deer	*Odocoileus hemionus*	Sight
MARSUPIALIA		
Virginia Opossom	*Didelphis virginiana*	Scat
RODENTIA		
Dusky-footed Wood Rat	*Neotoma fuscipes*	Den
Pocket Gopher	*Thomomys bottae*	Sight

APPENDIX B

CNPS Special Status-species Listed for the Project Quadrangle and Surrounding Quadrangles

U.S. Fish and Wildlife Service Trust Resources List Listed Species for the Quadrangle

California Wildlife Habitat Relationship System Species Summary Report by Habitat Present

California Department of Fish and Wildlife Rare Find 5 Species list for the Quadrangle and Surrounding Quadrangles for Habitat found on the project site

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE RareFind

Query Summary:
Quad IS (Detert Reservoir (3812265) OR Aetna Springs (3812264) OR Walter Springs (3812263) OR Calistoga (3812255) OR St. Helena (3812254) OR Chiles Valley (3812253) OR Kenwood (3812245) OR Rutherford (3812244) OR Yountville (3812243))
AND Habitat IS (Chaparral OR Wetland OR Cismontane woodland OR Riparian woodland)

Print Close

CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Accipiter striatus	sharp-shinned hawk	Birds	ABNKC12020	21	1	None	None	G5	S4	null	CDFW_WL-Watch List	Cismontane woodland | Lower montane coniferous forest | Riparian forest | Riparian woodland
Agelaius tricolor	tricolored blackbird	Birds	ABPBXB0020	431	3	None	Endangered	G2G3	S1S2	null	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_EN-Endangered | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern	Freshwater marsh | Marsh & swamp | Swamp | Wetland
Allium peninsulare var. franciscanum	Franciscan onion	Monocots	PMLIL021R1	21	1	None	None	G5T1	S1	1B.2	null	Cismontane woodland | Ultramafic | Valley & foothill grassland
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Monocots	PMPOA07012	21	1	Endangered	None	G5T1Q	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Freshwater marsh | Marsh & swamp | Riparian scrub | Wetland
Amorpha californica var. napensis	Napa false indigo	Dicots	PDFAB08012	45	23	None	None	G4T2	S2	1B.2	SB_RSABG-Rancho Santa Ana Botanic Garden	Broadleaved upland forest | Chaparral | Cismontane woodland
Amsinckia lunaris	bent-flowered fiddleneck	Dicots	PDBOR01070	64	1	None	None	G2?	S2?	1B.2	BLM_S-Sensitive	Cismontane woodland | Valley & foothill grassland
Antrozous pallidus	pallid bat	Mammals	AMACC10010	402	11	None	None	G5	S3	null	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Chaparral | Coastal scrub | Desert wash | Great Basin grassland | Great Basin scrub | Mojavean desert scrub | Riparian woodland | Sonoran desert scrub | Upper montane coniferous forest | Valley & foothill grassland
											BLM_S-	Broadleaved

Aquila chrysaetos	golden eagle	Birds	ABNKC22010	309	1	None	None	G5	S3	null	Sensitive | CDF_S-Sensitive | CDFW_FP-Fully Protected | CDFW_WL-Watch List | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	upland forest | Cismontane woodland | Coastal prairie | Great Basin grassland | Great Basin scrub | Lower montane coniferous forest | Pinon & juniper woodlands | Upper montane coniferous forest | Valley & foothill grassland
Arctostaphylos canescens ssp. sonomensis	Sonoma canescent manzanita	Dicots	PDERI04066	25	1	None	None	G3G4T2	S2	1B.2	BLM_S-Sensitive	Chaparral | Lower montane coniferous forest | Ultramafic
Arctostaphylos manzanita ssp. elegans	Konocti manzanita	Dicots	PDERI04271	34	5	None	None	G5T3	S3	1B.3	null	Chaparral | Cismontane woodland | Lower montane coniferous forest
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	Dicots	PDERI041G4	12	3	None	None	G3T1	S1	1B.1	null	Chaparral
Ardea alba	great egret	Birds	ABNGA04040	35	1	None	None	G5	S4	null	CDF_S-Sensitive | IUCN_LC-Least Concern	Brackish marsh | Estuary | Freshwater marsh | Marsh & swamp | Riparian forest | Wetland
Ardea herodias	great blue heron	Birds	ABNGA04010	133	1	None	None	G5	S4	null	CDF_S-Sensitive | IUCN_LC-Least Concern	Brackish marsh | Estuary | Freshwater marsh | Marsh & swamp | Riparian forest | Wetland
Astragalus claranus	Clara Hunt's milk-vetch	Dicots	PDFAB0F240	6	5	Endangered	Threatened	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral | Cismontane woodland | Valley & foothill grassland
Astragalus rattanii var. jepsonianus	Jepson's milk-vetch	Dicots	PDFAB0F7E1	51	3	None	None	G4T3	S3	1B.2	BLM_S-Sensitive	Cismontane woodland | Ultramafic | Valley & foothill grassland
Brodiaea leptandra	narrow-anthered brodiaea	Monocots	PMLIL0C022	29	16	None	None	G3?	S3?	1B.2	null	Broadleaved upland forest | Chaparral | Cismontane woodland | Lower montane coniferous forest | Valley & foothill grassland
Buteo swainsoni	Swainson's hawk	Birds	ABNKC19070	2394	1	None	Threatened	G5	S3	null	BLM_S-Sensitive | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Great Basin grassland | Riparian forest | Riparian woodland | Valley & foothill grassland
Calycadenia micrantha	small-flowered calycadenia	Dicots	PDAST1P0C0	16	1	None	None	G2	S2	1B.2	BLM_S-Sensitive | USFS_S-Sensitive	Chaparral | Meadow & seep | Ultramafic | Valley & foothill

												grassland
Calystegia collina ssp. oxyphylla	Mt. Saint Helena morning-glory	Dicots	PDCON04032	9	7	None	None	G4T3	S3	4.2	null	Chaparral | Lower montane coniferous forest | Ultramafic | Valley & foothill grassland
Castilleja ambigua var. meadii	Mead's owls-clover	Dicots	PDSCR0D404	3	2	None	None	G4T1	S1	1B.1	null	Meadow & seep | Vernal pool | Wetland
Ceanothus confusus	Rincon Ridge ceanothus	Dicots	PDRHA04220	34	17	None	None	G1	S1	1B.1	BLM_S-Sensitive	Chaparral | Cismontane woodland | Closed-cone coniferous forest | Ultramafic
Ceanothus divergens	Calistoga ceanothus	Dicots	PDRHA04240	23	19	None	None	G2	S2	1B.2	BLM_S-Sensitive	Chaparral | Cismontane woodland | Ultramafic
Ceanothus purpureus	holly-leaved ceanothus	Dicots	PDRHA04160	40	16	None	None	G2	S2	1B.2	null	Chaparral
Ceanothus sonomensis	Sonoma ceanothus	Dicots	PDRHA04420	22	19	None	None	G2	S2	1B.2	null	Chaparral | Ultramafic
Coastal and Valley Freshwater Marsh	Coastal and Valley Freshwater Marsh	Marsh	CTT52410CA	60	1	None	None	G3	S2.1	null	null	Marsh & swamp | Wetland
Corynorhinus townsendii	Townsend's big-eared bat	Mammals	AMACC08010	619	13	None	Candidate Threatened	G3G4	S2	null	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Broadleaved upland forest | Chaparral | Chenopod scrub | Great Basin grassland | Great Basin scrub | Joshua tree woodland | Lower montane coniferous forest | Meadow & seep | Mojavean desert scrub | Riparian forest | Riparian woodland | Sonoran desert scrub | Sonoran thorn woodland | Upper montane coniferous forest | Valley & foothill grassland
Cryptantha dissita	serpentine cryptantha	Dicots	PDBOR0A0H2	10	1	None	None	G2	S2	1B.2	BLM_S-Sensitive	Chaparral | Ultramafic
Downingia pusilla	dwarf downingia	Dicots	PDCAM060C0	127	2	None	None	GU	S2	2B.2	null	Valley & foothill grassland | Vernal pool | Wetland
Elanus leucurus	white-tailed kite	Birds	ABNKC06010	158	2	None	None	G5	S3S4	null	BLM_S-Sensitive | CDFW_FP-Fully Protected | IUCN_LC-Least Concern	Cismontane woodland | Marsh & swamp | Riparian woodland | Valley & foothill grassland | Wetland
											BLM_S-Sensitive |	Aquatic | Artificial flowing waters | Klamath/North coast flowing waters | Klamath/North coast standing

Emys marmorata	western pond turtle	Reptiles	ARAAD02030	1138	14	None	None	G3G4	S3	null	CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFS_S-Sensitive	waters | Marsh & swamp | Sacramento/San Joaquin flowing waters | Sacramento/San Joaquin standing waters | South coast flowing waters | South coast standing waters | Wetland
Erigeron greenei	Greene's narrow-leaved daisy	Dicots	PDAST3M5G0	12	7	None	None	G2	S2	1B.2	null	Chaparral | Ultramafic
Eryngium constancei	Loch Lomond button-celery	Dicots	PDAPI0Z0W0	3	1	Endangered	Endangered	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Vernal pool | Wetland
Fritillaria pluriflora	adobe-lily	Monocots	PMLIL0V0F0	107	2	None	None	G3	S3	1B.2	BLM_S-Sensitive | SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral | Cismontane woodland | Ultramafic | Valley & foothill grassland
Harmonia hallii	Hall's harmonia	Dicots	PDAST650A0	19	2	None	None	G2	S2?	1B.2	BLM_S-Sensitive | SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral | Ultramafic
Hesperolinon bicarpellatum	two-carpellate western flax	Dicots	PDLIN01020	22	7	None	None	G3	S3	1B.2	null	Chaparral | Ultramafic
Hesperolinon sharsmithiae	Sharsmith's western flax	Dicots	PDLIN010E0	32	26	None	None	G2Q	S2	1B.2	BLM_S-Sensitive	Chaparral | Ultramafic
Juncus luciensis	Santa Lucia dwarf rush	Monocots	PMJUN013J0	26	1	None	None	G2G3	S2S3	1B.2	USFS_S-Sensitive	Chaparral | Great Basin scrub | Lower montane coniferous forest | Meadow & seep | Vernal pool | Wetland
Lasiurus cinereus	hoary bat	Mammals	AMACC05030	235	1	None	None	G5	S4	null	IUCN_LC-Least Concern | WBWG_M-Medium Priority	Broadleaved upland forest | Cismontane woodland | Lower montane coniferous forest | North coast coniferous forest
Lasthenia burkei	Burke's goldfields	Dicots	PDAST5L010	34	1	Endangered	Endangered	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Meadow & seep | Vernal pool | Wetland
Layia septentrionalis	Colusa layia	Dicots	PDAST5N0F0	46	14	None	None	G2	S2	1B.2	BLM_S-Sensitive	Chaparral | Cismontane woodland | Ultramafic | Valley & foothill grassland
Leptosiphon jepsonii	Jepson's leptosiphon	Dicots	PDPLM09140	39	23	None	None	G2	S2	1B.2	null	Chaparral | Cismontane woodland | Ultramafic
Limnanthes floccosa ssp. floccosa	woolly meadowfoam	Dicots	PDLIM02043	54	1	None	None	G4T4	S3	4.2	null	Chaparral | Cismontane woodland | Valley & foothill grassland | Vernal pool | Wetland

Limnanthes vinculans	Sebastopol meadowfoam	Dicots	PDLIM02090	45	2	Endangered	Endangered	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Meadow & seep | Valley & foothill grassland | Vernal pool | Wetland
Lupinus sericatus	Cobb Mountain lupine	Dicots	PDFAB2B3J0	45	32	None	None	G2	S2	1B.2	BLM_S-Sensitive	Broadleaved upland forest | Chaparral | Cismontane woodland | Lower montane coniferous forest | Ultramafic
Myotis yumanensis	Yuma myotis	Mammals	AMACC01020	259	1	None	None	G5	S4	null	BLM_S-Sensitive | IUCN_LC-Least Concern | WBWG_LM-Low-Medium Priority	Lower montane coniferous forest | Riparian forest | Riparian woodland | Upper montane coniferous forest
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Dicots	PDPLM0C0E1	58	6	None	None	G4T2	S2	1B.1	BLM_S-Sensitive	Cismontane woodland | Lower montane coniferous forest | Meadow & seep | Valley & foothill grassland | Vernal pool | Wetland
Navarretia leucocephala ssp. pauciflora	few-flowered navarretia	Dicots	PDPLM0C0E4	8	1	Endangered	Threatened	G4T1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Vernal pool | Wetland
Navarretia myersii ssp. deminuta	small pincushion navarretia	Dicots	PDPLM0C0X2	1	1	None	None	G1T1	S1	1B.1	null	Vernal pool | Wetland
Navarretia rosulata	Marin County navarretia	Dicots	PDPLM0C0Z0	13	3	None	None	G2	S2	1B.2	null	Chaparral | Closed-cone coniferous forest | Ultramafic
Northern Vernal Pool	Northern Vernal Pool	Herbaceous	CTT44100CA	20	6	None	None	G2	S2.1	null	null	Vernal pool | Wetland
Penstemon newberryi var. sonomensis	Sonoma beardtongue	Dicots	PDSCR1L483	11	9	None	None	G4T1	S2	1B.3	null	Chaparral
Phalacrocorax auritus	double-crested cormorant	Birds	ABNFD01020	37	1	None	None	G5	S4	null	CDFW_WL-Watch List | IUCN_LC-Least Concern	Riparian forest | Riparian scrub | Riparian woodland
Plagiobothrys strictus	Calistoga popcornflower	Dicots	PDBOR0V120	3	3	Endangered	Threatened	G1	S1	1B.1	SB_UCBBG-UC Berkeley Botanical Garden	Meadow & seep | Valley & foothill grassland | Vernal pool | Wetland
Poa napensis	Napa blue grass	Monocots	PMPOA4Z1R0	2	2	Endangered	Endangered	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Meadow & seep | Valley & foothill grassland | Wetland
Rana boylii	foothill yellow-legged frog	Amphibians	AAABH01050	805	16	None	None	G3	S2S3	null	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened | USFS_S-Sensitive	Aquatic | Chaparral | Cismontane woodland | Coastal scrub | Klamath/North coast flowing waters | Lower montane coniferous forest | Meadow & seep | Riparian forest | Riparian woodland | Sacramento/San

												Joaquin flowing waters
Rana draytonii	California red-legged frog	Amphibians	AAABH01022	1339	3	Threatened	None	G2G3	S2S3	null	CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable	Aquatic | Artificial flowing waters | Artificial standing waters | Freshwater marsh | Marsh & swamp | Riparian forest | Riparian scrub | Riparian woodland | Sacramento/San Joaquin flowing waters | Sacramento/San Joaquin standing waters | South coast flowing waters | South coast standing waters | Wetland
Sidalcea hickmanii ssp. napensis	Napa checkerbloom	Dicots	PDMAL110A6	2	1	None	None	G3T1	S1	1B.1	null	Chaparral
Sidalcea oregana ssp. hydrophila	marsh checkerbloom	Dicots	PDMAL110K2	23	2	None	None	G5T3	S3	1B.2	null	Meadow & seep | Riparian forest | Wetland
Sidalcea oregana ssp. valida	Kenwood Marsh checkerbloom	Dicots	PDMAL110K5	2	1	Endangered	Endangered	G5T1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBBG-UC Berkeley Botanical Garden	Freshwater marsh | Marsh & swamp | Wetland
Streptanthus brachiatus ssp. brachiatus	Socrates Mine jewelflower	Dicots	PDBRA2G072	10	1	None	None	G2T1	S1	1B.2	BLM_S-Sensitive	Chaparral | Closed-cone coniferous forest | Ultramafic
Streptanthus hesperidis	green jewelflower	Dicots	PDBRA2G510	19	11	None	None	G2	S2	1B.2	null	Chaparral | Cismontane woodland | Ultramafic
Streptanthus morrisonii ssp. elatus	Three Peaks jewelflower	Dicots	PDBRA2G0S1	7	7	None	None	G2T2	S2	1B.2	BLM_S-Sensitive	Chaparral | Ultramafic
Streptanthus vernalis	early jewelflower	Dicots	PDBRA2G120	1	1	None	None	G1	S1	1B.2	BLM_S-Sensitive	Chaparral | Closed-cone coniferous forest | Ultramafic
Trichostema ruygtii	Napa bluecurls	Dicots	PDLAM220H0	19	8	None	None	G2	S2	1B.2	null	Chaparral | Cismontane woodland | Lower montane coniferous forest | Valley & foothill grassland | Vernal pool | Wetland
Trifolium hydrophilum	saline clover	Dicots	PDFAB400R5	49	2	None	None	G2	S2	1B.2	null	Marsh & swamp | Valley & foothill grassland | Vernal pool | Wetland
Viburnum ellipticum	oval-leaved viburnum	Dicots	PDCPR07080	29	1	None	None	G5	S3	2B.3	null	Chaparral | Cismontane woodland | Lower montane coniferous forest

U.S. Fish & Wildlife Service

My project

IPaC Trust Resource Report

Generated May 05, 2015 03:05 PM MDT

US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description

NAME

My project

PROJECT CODE

YRPBA-XLJ2Z-BRLC4-UDZRY-KWKA7A

LOCATION

Napa County, California

DESCRIPTION

No description provided

U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

Sacramento Fish And Wildlife Office
Federal Building
2800 COTTAGE WAY, ROOM W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

Amphibians

California Red-legged Frog

Threatened

DESCRIPTION

This subspecies of red-legged frog occurs from sea level to elevations of about 1,500 meters (5,200 feet). It has been extirpated from 70 percent of its former range and now is found primarily in coastal drainages of central California, from Marin County,California, south to northern Baja California, Mexico. Potential threats to the species include elimination or degradation of habitat from land development and land use activities and habitat invasion by non-native aquatic species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D02D

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

Birds

Northern Spotted Owl

Threatened

DESCRIPTION

The northern spotted owl is a medium-sized, dark brown owl with a barred tail, white spots on the head and breast, and dark brown eyes surrounded by prominent facial disks. Males and females have similar plumage, but females typically weigh 10 to 20 percent more than males.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08B

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

Crustaceans

California Freshwater Shrimp

Endangered

DESCRIPTION

No description available

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K01W

CRITICAL HABITAT

No critical habitat has been designated for this species.

Fishes

Delta Smelt

Threatened

DESCRIPTION
No description available

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E070

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

Steelhead Northern California DPS - See 50 CFR 223.102

Threatened

DESCRIPTION
Steelhead trout (Oncorhynchus mykiss) belong to the family Salmonidae which includes all salmon, trout, and chars. Steelhead are similar to some Pacific salmon in their life cycle and ecological requirements. They are born in fresh water streams, where they spend their first 1-3 years of life. They then emigrate to the ocean where most of their growth occurs. After spending between one to four growing seasons in the ocean, steelhead return to their native fresh water stream to spawn. Unlike Pac...

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

Flowering Plants

Clara Hunt's Milk-vetch

Endangered

DESCRIPTION
No description available

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q05J

CRITICAL HABITAT
No critical habitat has been designated for this species.

Insects

Valley Elderberry Longhorn Beetle

Threatened

DESCRIPTION
No description available

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I01L

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

Bald Eagle

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Year-round

DESCRIPTION
A large raptor, the bald eagle has a wingspread of about 7 feet. Adults have a dark brown body and wings, white head and tail, and a yellow beak. Juveniles are mostly brown with white mottling on the body, tail, and undersides of wings. Adult plumage usually is obtained by the 6th year. In flight, the bald eagle often soars or glides with the wings held at a right angle to the body.

Bell's Sparrow

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Year-round

DESCRIPTION
The Sage Sparrow is a medium-sized bird ranging from 12 15 cm in length. It is generally brownish-gray in color with a grayer head and a more brown-colored back and wings. Some distinctive features of the Sage Sparrow include a white eye ring, a white spot in front of the eye, white streaks along the side of the lower jaw, and sometimes a white streak in the middle of its forehead. The Sage Sparrows under parts are mostly white with a contrasting much darker blackish, brown tail. The Sage Sp...

Black Rail

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Breeding

DESCRIPTION
No description available

Burrowing Owl

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Year-round

DESCRIPTION
No description available

Costa's Hummingbird

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Breeding

DESCRIPTION
No description available

Fox Sparrow

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Wintering

DESCRIPTION
No description available

Least Bittern

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Breeding

DESCRIPTION
No description available

Lesser Yellowlegs

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Wintering

DESCRIPTION
No description available

Lewis's Woodpecker

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Wintering

DESCRIPTION
No description available

Loggerhead Shrike

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Wintering

DESCRIPTION
No description available

Nuttall's Woodpecker

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Year-round

DESCRIPTION
No description available

Oak Titmouse

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Year-round

DESCRIPTION
No description available

Olive-sided Flycatcher

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Breeding

DESCRIPTION
No description available

Peregrine Falcon

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Year-round

DESCRIPTION
No description available

Short-billed Dowitcher

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Wintering

DESCRIPTION
No description available

Short-eared Owl

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Wintering

DESCRIPTION
The short-eared owl is an owl of about 0.7 to 0.8 lbs with females slightly larger in size than males. Plumage is brown, buff, white and rust colors. Patches of brown and buff occur mostly on the back side, while the underside is colored more lightly, being mostly white. Females and males have similar plumage. Some distinguishing characteristics of this owl are its gray white fascial disk, and black coloring around yellow eyes. Juveniles have similar plumage to adults, but upper parts and head a...

Swainson's Hawk

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Breeding

DESCRIPTION
Swainsons Hawks are broad-winged Buteos of between 48 and 56 cm in length with females slightly larger than males. Males and females have similar plumage. Swainsons Hawks are polymorphic with pale, light and intermediate morph plumage ranging from dark to light or rufous in color. Most Swainsons Hawks have a sharp contrast between the wing linings and flight feathers. However, some of the darkest Swainsons Hawks do not have this distinction. Swainsons Hawks are distinguishable from other Bu...

Tricolored Blackbird

This is a bird of conservation concern and has the highest priority for conservation

SEASON
Year-round

DESCRIPTION
The Tricolored Blackbird is a medium-sized (18-24cm total length), sexually dimorphic North American passerine (Beedy, Edward, and Hamilton III 1999). Adult males are typically larger than females, and are black with bright red and white plumage on the wing shoulder. Adult females have sooty brown-black plumage with distinct grayish streaks, a relatively white chin and throat, and a smaller reddish shoulder-patch. Banding studies indicate a lifespan of 12-13 years (DeHaven and Neff 1973, Kenn...

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to NWI wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands identified in this project area

CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS SYSTEM
supported by the
CALIFORNIA INTERAGENCY WILDLIFE TASK GROUP
and maintained by the
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
Database Version: 9.0

SPECIES SUMMARY REPORT

FE = Federal Endangered
FT = Federal Threatened
CE = California Endangered
CT = California Threatened
CF = California Fully Protected
CP = California Protected
SC = California Species of Special Concern
PE = Federally-Proposed Endangered
PT = Federally-Proposed Threatened
FC = Federal Candidate
BL = BLM Sensitive
FS = USFS Sensitive
CD = CDF Sensitive
HA = Harvest

Note: Any given status code for a species may apply to the full species or to only one or more subspecies or distinct population segments.

ID	Species Name	Status	Native/Introduced
A001	CALIFORNIA TIGER SALAMANDER	FE FT CT SC	NATIVE
A012	COMMON ENSATINA	SC BL FS	NATIVE
A071	CALIFORNIA RED-LEGGED FROG	FT SC	NATIVE
B051	GREAT BLUE HERON	CD	NATIVE
B052	GREAT EGRET	CD	NATIVE
B110	OSPREY	CD	NATIVE
B111	WHITE-TAILED KITE	CF BL	NATIVE
B113	BALD EAGLE	CE CF BL FS CD	NATIVE
B114	NORTHERN HARRIER	SC	NATIVE
B143	BLACK RAIL	CT CF BL	NATIVE
B144	CLAPPER RAIL	FE CE CT CF	NATIVE
B159	MOUNTAIN PLOVER	SC BL	NATIVE
B269	BURROWING OWL	SC BL	NATIVE
B272	LONG-EARED OWL	SC	NATIVE
B273	SHORT-EARED OWL	SC	NATIVE
B309	OLIVE-SIDED FLYCATCHER	SC	NATIVE
B338	PURPLE MARTIN	SC	NATIVE
B368	BEWICK'S WREN	SC	NATIVE
B372	MARSH WREN	SC	NATIVE
B410	LOGGERHEAD SHRIKE	FE SC	NATIVE
B417	HUTTON'S VIREO	SC	NATIVE
B430	YELLOW WARBLER	SC	NATIVE
B461	COMMON YELLOWTHROAT	SC	NATIVE
B467	YELLOW-BREASTED CHAT	SC	NATIVE
B483	SPOTTED TOWHEE	SC	NATIVE
B484	CALIFORNIA TOWHEE	FT CE	NATIVE
B494	VESPER SPARROW	SC	NATIVE
B497	BELL'S SPARROW	FT SC	NATIVE
B499	SAVANNAH SPARROW	CE SC	NATIVE
B501	GRASSHOPPER SPARROW	SC	NATIVE
B505	SONG SPARROW	SC	NATIVE
B522	YELLOW-HEADED BLACKBIRD	SC	NATIVE
M006	ORNATE SHREW	FE SC	NATIVE
M033	WESTERN RED BAT	SC FS	NATIVE
M037	TOWNSEND'S BIG-EARED BAT	SC BL FS	NATIVE
M038	PALLID BAT	SC BL FS	NATIVE
M045	BRUSH RABBIT	FE CE HA	NATIVE
M051	BLACK-TAILED JACKRABBIT	SC HA	NATIVE
M105	CALIFORNIA KANGAROO RAT	SC	NATIVE

ID	Species	Status	Native/Introduced
M117	DEER MOUSE	SC	NATIVE
M127	DUSKY-FOOTED WOODRAT	FE SC	NATIVE
M134	CALIFORNIA VOLE	FE CE SC BL	NATIVE
M152	RINGTAIL	CF	NATIVE
M165	MOUNTAIN LION	SC	NATIVE
R046	NORTHERN RUBBER BOA	CT FS	NATIVE
R048	RING-NECKED SNAKE	FS	NATIVE
R053	STRIPED RACER	FT CT	NATIVE
R057	GOPHERSNAKE	SC	NATIVE
R061	COMMON GARTERSNAKE	FE CE CF SC	NATIVE

Total Number of Species: 49

Query Parameters

Included Locations
Napa Co

Included Location Seasons
Migrant, Summer, Winter, Yearlong

Included Habitats & (Stages)
Blue Oak Woodland, Blue Oak-foothill Pine, Coastal Oak Woodland, Coastal Scrub, Douglas-fir, Fresh Emergent Wetland, Lacustrine, Mixed Chaparral, Perennial Grassland, Ponderosa Pine, Redwood, Valley Foothill Riparian, Wet Meadow

Habitat Suitability Threshold
Reproduction - Low, Cover - Low, Feeding - Low

Included Habitat Seasons
Migrant, Summer, Winter, Yearlong

Excluded Elements
Barren, Bogs, Brush Pile, Buildings, Campground, Cave, Cliff, Dump, Fences, Grass/agriculture, Jetty, Kelp, Lakes, Lithic, Mine, Mud Flats, Nest Box, Nest Island, Nest Platform, Pack Stations, Ponds, Salt Ponds, Sand Dune, Soil - Aerated, Soil - Friable, Soil - Gravelly, Soil - Organic, Soil - Saline, Soil - Sandy, Springs, Springs - Hot, Springs - Mineral, Steep Slope, Talus, Tidepools, Transmission Lines, Tree/agriculture, Vernal Pools, Water, Water - Created Body, Water - Fast, Water - Slow, Water/agriculture, Wharf

Included Species
All Species Included

Included Special Statuses
California Endangered, California Fully Protected, California Protected, California Species Of Special Concern, California Threatened, Cdf Sensitive, Federal Candidate, Federal Endangered, Federal Proposed Endangered, Federal Proposed Threatened, Federal Threatened, Usfs Sensitive

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad is (Detert Reservoir (3812265) or Aetna Springs (3812264) or Walter Springs (3812263) or Calistoga (3812255) or St. Helena (3812254) or Chiles Valley (3812253) or Kenwood (3812245) or Rutherford (3812244) or Yountville (3812243)) and Habitat is (Chaparral or Wetland or Cismontane woodland or Riparian woodland)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter striatus sharp-shinned hawk	ABNKC12020	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Endangered	G2G3	S1S2	SSC
Allium peninsulare var. franciscanum Franciscan onion	PMLIL021R1	None	None	G5T1	S1	1B.2
Alopecurus aequalis var. sonomensis Sonoma alopecurus	PMPOA07012	Endangered	None	G5T1Q	S1	1B.1
Amorpha californica var. napensis Napa false indigo	PDFAB08012	None	None	G4T2	S2	1B.2
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G2?	S2?	1B.2
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arctostaphylos canescens ssp. sonomensis Sonoma canescent manzanita	PDERI04066	None	None	G3G4T2	S2	1B.2
Arctostaphylos manzanita ssp. elegans Konocti manzanita	PDERI04271	None	None	G5T3	S3	1B.3
Arctostaphylos stanfordiana ssp. decumbens Rincon Ridge manzanita	PDERI041G4	None	None	G3T1	S1	1B.1
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Astragalus claranus Clara Hunt's milk-vetch	PDFAB0F240	Endangered	Threatened	G1	S1	1B.1
Astragalus rattanii var. jepsonianus Jepson's milk-vetch	PDFAB0F7E1	None	None	G4T3	S3	1B.2
Brodiaea leptandra narrow-anthered brodiaea	PMLIL0C022	None	None	G3?	S3?	1B.2
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Calycadenia micrantha small-flowered calycadenia	PDAST1P0C0	None	None	G2	S2	1B.2
Calystegia collina ssp. oxyphylla Mt. Saint Helena morning-glory	PDCON04032	None	None	G4T3	S3	4.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Castilleja ambigua var. meadii Mead's owls-clover	PDSCR0D404	None	None	G4T1	S1	1B.1
Ceanothus confusus Rincon Ridge ceanothus	PDRHA04220	None	None	G1	S1	1B.1
Ceanothus divergens Calistoga ceanothus	PDRHA04240	None	None	G2	S2	1B.2
Ceanothus purpureus holly-leaved ceanothus	PDRHA04160	None	None	G2	S2	1B.2
Ceanothus sonomensis Sonoma ceanothus	PDRHA04420	None	None	G2	S2	1B.2
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	Candidate Threatened	G3G4	S2	SSC
Cryptantha dissita serpentine cryptantha	PDBOR0A0H2	None	None	G2	S2	1B.2
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erigeron greenei Greene's narrow-leaved daisy	PDAST3M5G0	None	None	G2	S2	1B.2
Eryngium constancei Loch Lomond button-celery	PDAPI0Z0W0	Endangered	Endangered	G1	S1	1B.1
Fritillaria pluriflora adobe-lily	PMLIL0V0F0	None	None	G3	S3	1B.2
Harmonia hallii Hall's harmonia	PDAST650A0	None	None	G2	S2?	1B.2
Hesperolinon bicarpellatum two-carpellate western flax	PDLIN01020	None	None	G3	S3	1B.2
Hesperolinon sharsmithiae Sharsmith's western flax	PDLIN010E0	None	None	G2Q	S2	1B.2
Juncus luciensis Santa Lucia dwarf rush	PMJUN013J0	None	None	G2G3	S2S3	1B.2
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasthenia burkei Burke's goldfields	PDAST5L010	Endangered	Endangered	G1	S1	1B.1
Layia septentrionalis Colusa layia	PDAST5N0F0	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Leptosiphon jepsonii Jepson's leptosiphon	PDPLM09140	None	None	G2	S2	1B.2
Limnanthes floccosa ssp. floccosa woolly meadowfoam	PDLIM02043	None	None	G4T4	S3	4.2
Limnanthes vinculans Sebastopol meadowfoam	PDLIM02090	Endangered	Endangered	G1	S1	1B.1
Lupinus sericatus Cobb Mountain lupine	PDFAB2B3J0	None	None	G2	S2	1B.2
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Navarretia leucocephala ssp. pauciflora few-flowered navarretia	PDPLM0C0E4	Endangered	Threatened	G4T1	S1	1B.1
Navarretia myersii ssp. deminuta small pincushion navarretia	PDPLM0C0X2	None	None	G1T1	S1	1B.1
Navarretia rosulata Marin County navarretia	PDPLM0C0Z0	None	None	G2	S2	1B.2
Northern Vernal Pool Northern Vernal Pool	CTT44100CA	None	None	G2	S2.1	
Penstemon newberryi var. sonomensis Sonoma beardtongue	PDSCR1L483	None	None	G4T1	S2	1B.3
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Plagiobothrys strictus Calistoga popcornflower	PDBOR0V120	Endangered	Threatened	G1	S1	1B.1
Poa napensis Napa blue grass	PMPOA4Z1R0	Endangered	Endangered	G1	S1	1B.1
Rana boylii foothill yellow-legged frog	AAABH01050	None	None	G3	S2S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Sidalcea hickmanii ssp. napensis Napa checkerbloom	PDMAL110A6	None	None	G3T1	S1	1B.1
Sidalcea oregana ssp. hydrophila marsh checkerbloom	PDMAL110K2	None	None	G5T3	S3	1B.2
Sidalcea oregana ssp. valida Kenwood Marsh checkerbloom	PDMAL110K5	Endangered	Endangered	G5T1	S1	1B.1
Streptanthus brachiatus ssp. brachiatus Socrates Mine jewelflower	PDBRA2G072	None	None	G2T1	S1	1B.2
Streptanthus hesperidis green jewelflower	PDBRA2G510	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Streptanthus morrisonii ssp. elatus	PDBRA2G0S1	None	None	G2T2	S2	1B.2
Three Peaks jewelflower						
Streptanthus vernalis	PDBRA2G120	None	None	G1	S1	1B.2
early jewelflower						
Trichostema ruygtii	PDLAM220H0	None	None	G2	S2	1B.2
Napa bluecurls						
Trifolium hydrophilum	PDFAB400R5	None	None	G2	S2	1B.2
saline clover						
Viburnum ellipticum	PDCPR07080	None	None	G5	S3	2B.3
oval-leaved viburnum						

Record Count: 66

APPENDIX E

BIOLOGICAL RESOURCES REPORT ADDENDUM

BIOLOGICAL RESOURCES REPORT ADDENDUM

LE COLLINE VINEYARD PROJECT

To:	Napa County
From:	Kt Alonzo, Biologist
Project:	Le Colline Vineyard Project
Subject:	2015 Kjeldsen Biological Resources Report Addendum
Date:	11/15/2019

INTRODUCTION

This Addendum has been prepared in response to revisions and updated information requested from Napa County (County) regarding the Biological Resources Report (BRR) prepared by Kjeldsen Biological Consulting (KBC) in 2015 (Kjeldsen, 2015) for the Le Colline Vineyard Project (Proposed Project). The Proposed Project includes the development of approximately 26 net acres of vineyard within 34.9 gross acres (project site) on the approximately 88.34-acre property.

FIELD SURVEYS

Biological surveys of the project site have been conducted by KBC and AES beginning in 2014, and are listed in **Table 1**. Surveys were conducted to determine potential impacts of the Proposed Project to on-site biological resources. Survey results are discussed in the BRR. Additional site visits were made between 2014 and 2019 by northern spotted owl (NSO) biologists and members of the California Department of Forestry and Fire Protection and the California Department of Fish and Wildlife (CDFW).

TABLE 1
SUMMARY OF FIELD SURVEYS

Date	Personnel	Survey Time	Hours/Survey
March 5, 2014	KBC: Chris K. and Daniel T. Kjeldsen	15:00 to 16:30	3
April 17, 2014	KBC: Chris K. and Daniel T. Kjeldsen	14:45 to 16:45	4
May 8, 2014	KBC: Chris K. and Daniel T. Kjeldsen	9:00 to 10:30	3
May 22, 2014	KBC: Chris K. and Daniel T. Kjeldsen	12:00 to 13:30	3
June 25, 2014	KBC: Chris K. and Daniel T. Kjeldsen	9:30 to 11:15	3.5
July 22, 2014	KBC: Chris K. and Daniel T. Kjeldsen	10:00 to 12:15	4.25
August 20, 2014	KBC: Chris K. and Daniel T. Kjeldsen	11:00 to 12:00	2
January 7, 2015	KBC: Chris K. and Daniel T. Kjeldsen	10:00 to 12:00	4
May 12, 2015	KBC: Chris K. and Daniel T. Kjeldsen	14:00 to 16:00	4
June 24-25, 2015	AES: Justin Demianew and Katelyn Peterson	9:00 to 15:00	12
September 2-4, 2015	AES: Katelyn Peterson and Nicholas Bonzey	14:00 to 22:00	16
April 3, 2018	AES: Nicholas Bonzey and Megan Sebra	10:00 to 14:00	4
June 6, 2018	AES: Nicholas Bonzey	9:00 to 15:00	6
July 15-16, 2019	AES: Nicholas Bonzey, Cedrick Villaseñor, Kt Alonzo	15:00 to 22:00, 9:00 to 11:00	9

SPECIAL-STATUS SPECIES

PLANTS

Surveys initially identified two special-status plant species on the property; Napa false indigo and narrow-anthered California brodiaea. Both species are listed by the California Native Plant Society as California Rare Plant Rank (CRPR) 1B.2. CRPR 1B.2 plants designated as rare, threatened, or endangered in California and elsewhere. Napa false indigo and narrow-anthered California brodiaea were observed in the northeastern portion of the property in the Mixed Oak Alliance and Douglas Fir Alliance habitats. Approximately 0.022 acres of narrow-anthered brodiaea and 0.29 acres of Napa false indigo were observed prior to 2018 surveys.

Surveys conducted in June 2018 and July 2019 targeted previously identified populations of both species and sought to verify that no other populations of additional sensitive species occurred within the project site. The surveys were timed to coincide with the blooming period of both Napa false indigo (April through July) and narrow-anthered California brodiaea (May through July). As the project site contains multiple habitats that have the potential to support additional sensitive species, vineyard blocks were surveyed via meandering transects. The surveys began near Block E and continued in a clockwise manner through the project site. Particular attention was given to the previously identified population locations to verify their presence and spatial scope.

Although previous surveys conducted within the property identified populations of two sensitive species (narrow-anthered brodiaea and Napa false indigo), surveys conducted on June 6th, 2018 were only able to locate one. One location of Napa false indigo was observed in the location previously identified by Kjeldsen (Kjeldsen, 2015). No individuals of narrow-anthered California brodiaea were found in the previously surveyed locations by Kjeldsen. Populations of milkwort (*Polygala californica*) were found in the locations identified as containing narrow-anthered California brodiaea, and a site-wide survey found that the milkwort was limited to the areas originally identified as containing narrow-anthered brodiaea. While the flowers are similar at first glance, the leaf structure is different and the two plants are in different taxonomic orders. No additional special-status species were observed on the project site.

Surveys of the remainder of the project site did not locate any other sensitive species. The Proposed Project has been designed to avoid impacts to areas containing special-status plant species. To ensure construction of the Proposed Project does not disturb special-status plant species, locations of Napa false indigo and narrow-anthered California brodiaea recently and previously identified on the property will be avoided through the implementation of a 25-foot buffer. Narrow-anthered brodiaea with a 25-foot buffer applied would total approximately 0.14 acres, and Napa false indigo with a 25-foot buffer applied would total approximately 1.179 acres.

BATS

Bat habitat assessment surveys have been conducted on the project site since 2014 with a focus on areas within and immediately adjacent to the project site. Acoustic bat surveys and a sunset fly-out surveys were conducted by biologists from September 2-4, 2015 and July 15-16, 2019.

Potential roosting habitat for pallid bat and Townsend's big-eared bat was identified in the rock outcrop area along the western edge of the project site and in six trees located within the Douglas Fir Alliance and Ponderosa Pine Alliance. Acoustic bat monitoring equipment was placed overnight near trees identified as potential bat habitat and the rock outcrop near Conn Creek. Sunset flyout surveys were also conducted at each location. At the time of the 2019 surveys, one of the trees had fallen down and another was leaning heavily and appeared unstable. The remaining trees appeared to be in somewhat poor condition due to extensive hollows and cracking.

Updated 2019 survey data near the potential bat habitat trees indicated calls by California myotis (*Myotis californicus*), little brown bat (*Myotis lucifigus*), big brown bat (*Eptesicus fuscus*), and Yuma myotis (*Myotis yumanensis*). Data near the rock outcrop indicated calls by California myotis, little brown bat, Mexican free-tailed bat (*Tadarida brasiliensis*), Hoary bat (*Lasiurus cinereus*), Yuma myotis, western small-footed bat (*Myotis ciliolabrum*), canyon bat (*Parastrellus hesperus*), silver-haired bat (*Lasionycteris noctivagans*), and big brown bat (*Eptesicus fuscus*). Calls from Townsend's big-eared bat (*Corynorhinus townsendii*) and western red bat (*Lasiurus blossevillii*), which are listed as a state species of special concern, were also recorded near the rock outcrop. Sunset surveys observed the general presence of bats foraging in the vicinity of the rock outcrop. Sunset flyout surveys did not directly observe bats flying out of the potential bat habitat trees or the rock outcrop. Acoustic surveys did not specifically detect pallid bats near the rock outcrop area but did identify Townsend's big-eared bats foraging at both locations.

Four trees identified as potentially suitable habitat for special-status bat species are within clearing limits of proposed vineyard blocks. The 2019 survey did not directly document bats roosting within these trees, and the trees appeared to be in somewhat poor condition. Potential foraging and roosting habitat would be retained through avoidance and preservation of greater than 60 percent of the property located outside proposed clearing limits, including approximately 64 percent of tree canopy on the property. Additional protection to bats would occur via phased two-day removal of the three trees within clearing limits that have been identified as potential bat roosting habitat. Removal would be conducted during seasons of low bat activity prior to maternity season from approximately March 1 (or when night temperatures are above 45 degrees Fahrenheit and when rains have ceased) through April 15 (when females begin to give birth to young) and prior to winter torpor from September 1 (when young bats are self-sufficiently volant) until October 15 (before night temperatures fall below 45 degrees Fahrenheit and rains begin) with a qualified bat biologist present.

VEGETATION MAPPING

The 92-acre property is located on a largely forested upland within the "Saint Helena, California" USGS 7.5 minute quad in the Conn Creek Watershed. Habitats observed on the property during surveys were classified in the 2015 BRA according to the Manual of California Vegetation Second Edition (Sawyer et. al. 2009). Aquatic features on the property include several Class II and Class III ephemeral drainages on the northern, central, and southern portions of the property, as well as a wetland on the eastern side of the property between Blocks E1 and E2. Aquatic features do not occur within the area proposed for development. A wetland delineation was conducted in 2016 (Kjeldson, 2016). Acreages in Table II of the 2015 BRA have been updated and refined in **Table 2**.

TABLE 2
APPROXIMATE ACREAGE OF PLANT COMMUNITIES OR ALLIANCES IMPACTED (REVISED)

Plant Community or Vegetation Alliance	Acreage on Property (92.00-acres)	Acreage in Clearing Limits (33.80-acres)	Estimated Percentage to be removed	Estimated Percentage to Remain
Mixed Manzanita (Interior Live Oak - California Bay - Chamise) West County NFD Alliance	23.43	9.29	39.65%	60.35%
Mixed Oak Alliance	22.81	7.42	32.53%	67.47%
Douglas-Fir Alliance	43.02	16.50	38.35%	61.65%
California Annual Grasslands Alliance	1.01	0.59	51.41%	48.59%
Ponderosa Pine Alliance	0.58	0.00	0.00%	100.00%
Wetland	0.66	0.00	0.00%	100.0%
Rock Outcrop	0.49	0.00	0.00%	100.0%

SOURCE: Kjeldsen, 2015; 2016

BLOCK E1

Block E1 consists of Douglas-Fir Forest Alliance. The Douglas-Fir Forest Alliance on the property and in Block E1 is dominated by Douglas fir, which is dominant or co-dominant in the canopy with hardwoods including white fir (*Abies concolor*), big-leaf maple (*Acer macrophyllum*), white alder (*Alnus rhombifolia*), Pacific madrone, (*Arbutus menziesii*), and incense cedar (*Calocedrus decurrens*). Shrub species associated with this community often include California hazel (*Corylus cornuta var. californica*), oceanspray (*Holodiscus disco*), creeping snowberry (*Symphoricarpos mollis*), poison oak, ceanothus (*Ceanothus spp*.), California nutmeg (*Torreya californica*), woodland rose (*Rosa gymnocarpa*), thimbleberry (*Rubus parviflorus*) and manzanita. Herbaceous species found in the understory include yerba de selva (*Whipplea modesta*).

Wildlife species commonly found in Douglas-Fir Forest Alliance include ring-necked snake (Diadophis punctatus), rubber boa (*Charina bottae*), hairy woodpecker (*Picoides villosus*), pileated woodpecker (*Dendropus pileatus*), Steller's jay (*Cyanocitta stelleri)*, red-breasted nuthatch (*Sitta americana*), pygmy nuthatch (*Sitta pygmaea*), brown creeper (*Certhia americana*), yellow-rumped warbler (*Dendroica coronate auduboni*), western tanager (*Piranga ludoviciana*), pine siskin (*Carduelis pinus*), Trowbridge's shrew (*Sorex trowbridgii*), black bear (*Ursus americanus*), and western gray squirrel (*Sciurus griseus*). The property has been surveyed for NSO since 2016. NSO nests have not been identified on site (Forest Ecosystem Management, 2016).

Douglas-Fir Forest Alliance is not considered a sensitive habitat type or a biotic community of limited distribution, however old-growth Douglas Fir Forest is considered a sensitive habitat type by CDFW. Maturation of Douglas-fir forests typically occurs at 80 to 110 years of age and mature forests represent a relatively stable stage with substantial continued growth and biomass accumulation (United States Department of Agriculture, 1986). Old-growth firs are at least 150 years of age, and the transition from the mature to old-growth stage is gradual and becomes apparent around 175 to 200 years of age (United States Department of Agriculture, 1986).

Diameter of old-growth firs is usually 3 to 6 feet, and height is over 150 feet. Crowns are large and deep, with branches growing from much of the tree trunk, or bole, rather than the uppermost trunk. The Douglas-Fir Forest Alliance on the property represents seral stages of growth indicative of a historic fire regime, with dense regeneration and different age classes.

PRISM INDEXING

In order to index forest biomass and productivity, AES biologists utilized a prism indexing method to determine differences between forested clearing areas. Prism indexing is used to estimate the within a forest area occupied by tree biomass. A shallow-angled glass prism of a known angle is used to view tree trunks, and trees are counted that are large enough or close enough in distance to appear as overlapping through the prism. The number of trees counted is multiplied by the factor of the prism. For this study, 15 and 20 factor prisms were used to arrive at an estimate of basal area within the forest around the survey point, which included both conifers and hardwoods.

Results are presented in **Figure 1** and **Table 3**. Numbers are expressed in square feet per acre (ft2/acre), and this represents the biological productivity of an area related to the amount of sequestered carbon in the form of the square footage of tree biomass (basal area) at breast height. Areas with larger trees, such as Block E1, were determined to have similar overall productivity in terms of basal area to areas with smaller trees, however the total basal area is concentrated in fewer, larger trees. Results indicate that basal area square footage of conifers and hardwoods per acre are relatively similar.

This method is used to determine the overall forest productivity of a sample point, and is able to normalize the differences between dense, young stands of trees and older stands that have greater spacing. The consistent basal areas seen within Block E1 and elsewhere (**Figure 1** and **Table 3**) suggest that forest productivity is high within this property. While the stand of trees in Block E1 has larger trees, they are spaced considerably further apart. Outliers in this study are points 5 and 10, both of which were stands of regenerating former agriculture or clear-cut forests.

TABLE 3
PRISM INDEXING RESULTS

Prism Point #	Estimated Basal Area (ft^2/acre)
1	180
2	220
3	210
4	210
5	60
6	220
7	180
8	200
9	220
10	100

Figure 1

WILDLIFE MOVEMENT

Game trails were identified on the property, however evidence of distinct continuous natural wildlife corridors within the property was not observed (Kjeldsen, 2015). The property in and of itself has not been identified as part of a major regional movement corridor (NCCDPD, 2010). Existing impediments to wildlife movement occur around the property, including existing fencing, residences, development, and roadways along the west, north, and east boundaries. Movement from the property to the Pacific Union College property to the north is currently limited by these features. Slopes along Conn Creek near the project site are steep. Additionally, Angwin has a Community Wildfire Protection Plan that was developed by the Angwin Fire Safe Council (AFSC, 2016). The Plan discusses the Conn Creek riparian corridor as critical habitat for wildlife that is "choked" by invasive plants, which in combination with steep slopes along the property line, limit wildlife movement onto the project site. The property's location near the disturbed town of Angwin suggests it is not a pinch point for wildlife movement but rather an island of undeveloped land located between a developed town and Conn Creek.

Setbacks under the Proposed Project were determined in accordance with the Napa County Open Space Conservation Policies and are intended to provide habitat to support wildlife movement. Stream setbacks and buffers would be maintained between proposed vineyard blocks to allow for wildlife movement along Conn Creek. Water sources, including the wetland area, will be unfenced to allow wildlife access. Proposed vineyard blocks will be individually fenced to the extent feasible to minimize impacts to wildlife movement through the property. Wildlife corridors ranging from 70 to 375 feet will be maintained. Unfenced corridors between proposed vineyard blocks, especially nearest to Conn Creek, could be traversed by larger wildlife species. The proposed fencing would be permeable to smaller wildlife species. The Proposed Project would maintain openings and undeveloped habitat to facilitate wildlife movement by conserving forestland and natural habitat through avoidance and preservation of approximately 60 percent of the property, including approximately 64 percent of tree canopy. Therefore, the Proposed Project would not significantly impact wildlife movement.

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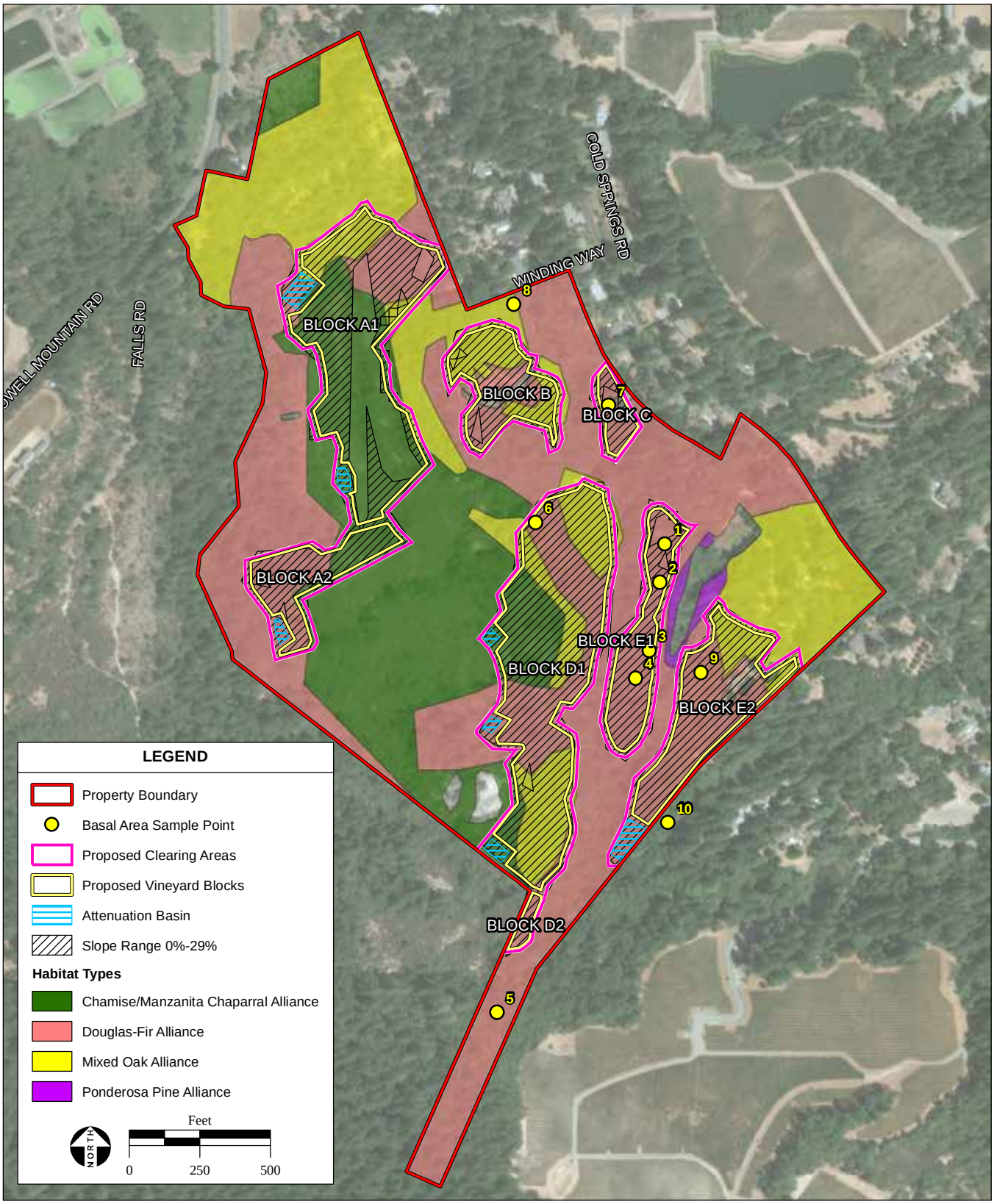

SOURCE: Environmental Resource Management, 5/2016; Microsoft aerial photograph, 2/4/2012; Napa Valley Vineyard Engineering, Inc., 2/22/2017; ESRI Data, 2015; AES, 5/17/2018

Figure 1
Tree Density

APPENDIX F

FOCUSED WETLAND DELINEATION

Focused Wetland Delineation

Le Colline Vineyard Conversion

File No. P14- 00410-ECPA
300 Cold Springs Road
Angwin CA

Prepared
By
Kjeldsen Biological Consulting
923 St. Helena Ave.
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October 2016

Focused Wetland Delineation

Le Colline Vineyard Conversion

File No. P14- 00410-ECPA
300 Cold Springs Road
Angwin CA

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Focused Wetland Delineation

Le Colline Vineyard Conversion

File No. P14-00410-ECPA
300 Cold Springs Road
Angwin CA

EXECUTIVE SUMMARY

Napa County Planning, Building and Environmental Services letter of September 22, 2016, in response to the Pre-Harvest Inspection Report for THP 1-16-079 NAP requested a focused Waters and Wetlands Delineation. The letter requested "Additional detail should include the presence and/or lack of wetland parameter(s) (soils, hydrology, and/or vegetation) utilized in making the boundary determination".

Boundary determinations were made according to the U.S. Army Corps of Engineers protocol. Data sheets are provided in Appendix A as part of this report.

The wetland was identified by its vegetation, soils and evidence of hydrology as distinct from upland conditions. The wetland boundary was flagged in the field following field verification of the boundary based on vegetation, hydrology and soils. The boundary was GPS in the field and points provided to Scott Butler.

Any filling or work within the delineated wetland will require USACOE Verification, a 404 permit, Regional Water Quality Control Board, and a 1600 permit from the California Department of Fish and Wildlife.

Wetland Delineation

Le Colline Vineyard Conversion
File No. P14-00410-ECPA
300 Cold Springs Road
Angwin CA

1.0 INTRODUCTION

This study was conducted at the request Mr. Scot Butler on behalf of the property Owner. The application proposes a timber harvest and conversion of portions of the property to vineyard.

The proposed project involves the removal of ±32 acres of commercial timberland, 4 acres of grassland and shrubland, and the installation of a 36-acres of vineyard. The project is proposed on an approximate 88-acre property at 300 Cold Springs Road, near the town of Angwin in northern Napa County.

The property is located within the Upper Conn Creek drainage, which is a tributary to the Lake Hennessey Domestic Water Supply Reservoir. Access to the parcel is by Winding Way and Cold Springs Road.

1.1 Purpose

Napa County Planning, Building and Environmental Services letter of September 22, 2016 in response to the Pre-Harvest Inspection Report for THP 1-16-079 NAP requested a delineation of wetlands in the eastern portion of the subject site. The letter specifies, "*A focused waters and wetlands delineation should be provided. Additional detail should include the presence and/or lack of wetland parameter(s) (soils, hydrology, and/or vegetation) utilized in making the boundary determination. U.S. Army Corps of Engineers wetland data sheets should be included in the revision, which should include, but not be limited to, detail with respect to soil pit locations and conditions, as well as the presence of associated hydrophytic vegetation, and wetland hydrology, the extent of the wetland boundaries and related potential significant inpacts as a result of the project. A minimum 50 foot buffer should be maintained around all on-site wetlands.*"

1.2 Study Area

The study area was identified in Kjeldsen Biological Consulting August 2015 Biological Resources Report Le Colline Vineyard THP/TCP APNs 024-300-070, -071, -072 &-340-001 300 Cold Springs Road Napa County. "*A wetland is present on the southeast side of the property this area was flagged in the field and avoided on the ECP map. The wetland is below a spring or seep*."

1.3 Definitions

The term **"Waters of the United States"** refers to all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters, including interstate wetlands; all other waters such as interstate lakes, rivers, streams (including intermittent streams), mud flats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds; the use degradation or destruction of which could affect interstate or foreign commerce including any such waters [among which include]. All impediments of waters otherwise defined as waters of the United States under this definition.

The term **"Wetland"** is defined as those areas, which are inundated or saturated, by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (Part 230-Section 404 (b) (1), section 230.3 Federal Register, Vol. 45, No. 249). Wetlands also include less conspicuous types such as vernal pools and other seasonal wetlands.

Wetlands have the following general diagnostic environmental characteristics:

(1) Vegetation- The prevalent vegetation consists of macrophytes which are typically adapted to areas having hydrologic and soil conditions described above. Hydrophytic species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively complete, reproduce, and/or persist in anaerobic soil conditions.

(2) Hydric Soil- A hydric soil is a soil which is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions which favor the growth and regeneration of hydrophytic vegetation.

(3) Hydrology- The term "Wetland hydrology" encompasses all hydrologic characteristics of areas which are periodically inundated or have soils saturated to the surface at some time during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and reducing conditions respectively. Such characteristics are usually present in areas which are inundated or have soils that are saturated to the surface for sufficient duration to develop hydric soils, and support vegetation typically adapted for life in periodically anaerobic soil conditions. Hydrology is often the least exact of the parameters and indicators of wetland

hydrology and are sometimes difficult to find in the field. However, it is essential to establish that a wetland area is periodically inundated or has saturated soils during to growing season.

Seasonal Wetlands- In many regions especially in western states, depression areas occur which have wetland indicators of all three parameters during the wetter portion of the growing season, but normally lack wetland indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophyte and facultative wetland plant species normally are dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. These areas may be inundated during the wetter portion of the growing season, realizing that wetland hydrology indicators may be totally lacking during the drier portion of the growing season. It is important to establish that an area truly is a water body. Water in a depression normally must be sufficiently persistent to exhibit an ordinary high water mark of the presence of wetland characteristics before it can be considered as a water body potentially subject to Clean Water Act jurisdiction. The determination that an area exhibits wetland characteristics for a sufficient portion of the growing season to qualify as a wetland under the Clean Water Act must be made on a case-by-case basis. Such determinations should consider the respective length of time that the area exhibits upland and wetland characteristics, and the manor in which the area fits into the overall ecological system as a wetland.

2.0 METHODS

Fieldwork was conducted on October 16, 2016 by Kjeldsen Biological Consulting.

In selecting a method for analysis of this site the Comprehensive Determination method was used in order to provide a rigorous documentation of potential surface manifestations. We used the U.S. ACOE standards for determining the extent of wetland in this area. Transacts through and across the site were made and the edge was identified by the change in vegetation, hydrology and soils. Soil pits were made and field data sheets were filled out. A field data form was completed from within the wetland and upland indicating dominant plant species, field indicators of soil type, and evidence of wetland hydrology within the wetland and an upland site outside of the wetland. Standard COE wetland delineation procedures were used to determine the extent and boundaries of the local wetland habitat. The delineation was made using the COE's three-parameter approach: Vegetation, Hydrology, and Soils (see the attached Data Sheets for each Data Point).

Photographs using a digital camera were taken during our field studies to illustrate conditions.

2.1 Vegetation

Wetlands in the study area were determined from existing environmental conditions with a combination of vegetation, soils, and hydrologic information. Surveys were conducted in accordance with the Corps of Engineers Wetlands Delineation Manual (ACOE, l987), and Regional supplement to the Corps of Engineers Wetland Delineation Manual Arid West Region (2005).

Vegetation was identified in the field and recorded in the field data forms (See Appendix A).

Plant species were identified in accordance with the Jepson Manual and their wetland indicator status was determined in accordance with the National Wetland Plant US Army Corps of Engineers State of California2016 Wetland Plant List (published April 28 2016.

2.2 Soils

Hydric soils may be classified into two broad categories: Organic and Mineral. Organic soils (Histosols) develop under conditions of nearly continuous saturation and/or inundation. All organic soils are hydric soils except Folists, which are freely drained soils occurring on dry sloped where excess litter accumulates over bedrock. Organic hydric soils are commonly known as peat and mucks. All other hydric soils are mineral soils. Mineral soils have a wide range of textures. Mineral hydric soils are those periodically saturated for sufficient duration to produce chemical and physical soil properties associated with a reducing environment. They are usually gray and/or mottled immediately below the surface horizon, or they have thick, dark-colored surface layers overlying gray or mottled.

Soil pits were dug and the soils were examined for evidence of reducing conditions (e.g., mottling, gleying, low chroma, high organic matter) which are indicative of an anaerobic or oxygen-starved situation brought about by prolonged saturation. Soil color was determined through the use of a Munsell Color Chart. Soil was sampled to depths of approximately 18 inches with a shovel and examined in the field. Soil colors and chroma were determined from Munsell Soil Color Charts and recorded on standard field data sheets.

2.3 Hydrology

The Corps jurisdiction wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (a minimum of 14 consecutive days in the Arid West region). Evidence of wetland hydrology can include primary indicator, such as visible inundation or saturation, drift deposits, oxidized root channels, and salt crusts, or secondary indicators such as FAC-neutral test, presence of shallow aquitard, or crayfish burrows. The Arid West Supplement contains 16 primary hydrology indicators and 10 secondary hydrology indicators. Only one primary indicator is required to meet the wetland hydrology criterion: however; if secondary indicators are used at least two secondary indicators must be present to conclude that an area has wetland hydrology.

Hydrological conditions were recorded as the presence or absence of evidence indicative of prolonged inundation (water marks, silt-cemented thatch, alga matting matted debris, etc.) or evidence indicative of saturation (high soil organic matter, current ground water level, soil colors) and recorded on standard field data sheets.

The presence or absence of primary or secondary indicators described in the Arid West Supplement was utilized to determine if sample points within the Study Area met the wetland hydrology criterion.

3.0 FINDINGS

3.1 VEGETATION

TABLE 1. Plants Recorded on Data Sheets showing their Wetland Status as per State of California 2016 Wetland Plant List.

SCIENTIFIC NAME	COMMON NAME	AW	WMVC
Baccharis pilularis	Coyote Brush	UPLAND	UPLAND
Caryx bolanderi	Bolander's Sedge	FAC	FAC
Fragaria vesca	Strawberry	UPLAND	FACU
Juncus effusuis	Lamp Rush	FACW	FACW
Quercus agrifolia	Live Oak	UPLAND	UPLAND
Plantago lanceolata	English Plantain	FAC	FACU
Rubus armeniacus	Himalyan Blackberry	FAC	FAC
Rubus leucodermis	White-Stem Raspberry	FACU	FACU
Salix laevigata	Polished Willow, Red Willow	FACW	FACW
Symphoricarpos mollis	Creeping Snowberry, Trip Vine	FACU	FACU
Pseudotsuga menziesii	Douglas-fir	FACU	FACU
Toxicodendron diversilobum	Poison Oak	FACU	FAC

3.2 SOILS

Natural Resources Conservation Service online Custom Soils Resource Report lists the soils on the site as:

138—Forward gravelly loam, 2 to 9 percent slopes

Typical profile
H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 35 inches: loam, gravelly loam
H2 - 4 to 35 inches: weathered bedrock
H3 - 35 to 59 inches:
Properties and qualities
Slope: 2 to 9 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Interpretive groups
Hydrologic Soil Group: B
Hydric soil rating: No

140—Forward gravelly loam, 30 to 75 percent slopes

Typical profile
H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 35 inches: loam, gravelly loam
H2 - 4 to 35 inches: weathered bedrock
H3 - 35 to 59 inches:
Properties and qualities
Slope: 30 to 75 percentDepth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Interpretive groups
Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

See attached Custom Soil Resource Report for the site Appendix B.

3.3 HYDROLOGY

The principal hydrologic features of the study site are the evidence of saturated soil conditions. The area contains high moisture content and is fed by a uphill spring. Secondary indicators include Indicator D3: Shallow aquitard.

General Description: The hydrology indicator occurs in and around the margins of depressions, such as temporary pools, and consists of the presence of an aquitard within the soil profile that is potentially capable of perching water within 12 in. (30 cm) of the surface. Indicators of hydrophytic vegetation and hydric soil must also be present.

Cautions and User Notes: An aquitard is a relatively impermeable soil layer or bedrock that slows the downward infiltration of water and can produce a perched water table, generally in flat or depressional landforms. In some cases, the aquitard may be at the surface and cause water to pond on the surface. Potential aquitards include fragipans, cemented layers, dense glacial till, lacustrine deposits, and clay layers. Often redoximorphic features are evident in the layer(s) above the aquitard.

Data Point #1. Soil pit and vegetation within the wet meadow.

Data Point #2. Soil pit and vegetation outside of the wet meadow (upland site).

3.4 MAPPING

Change in vegetation and soil moisture conditions were used to flag the boundary of the wet meadow. The boundary was recorded by Steve Smith with GPS points and is the basis for the attached Map. The wet meadow mapped totals approximately 0.34 acres.

The purpose of the study and this report is to provide Napa County Planning, Building & Environmental Services with a map of the extent of the wetland boundaries as per USACOE criteria.

Any filling or work within the delineated wetland will require USACOE Verification, a 404 permit, Regional Water Quality Control Board, and a 1600 permit from the California Department of Fish and Wildlife.

U.S. Army Corps of Engineers verification of the findings presented in this report is necessary for any development of the mapped site.

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5.0 REPORT AUTHORS

Chris K. Kjeldsen, Ph.D., Botany, Oregon State University, Corvallis, Oregon. He has over thirty years of professional experience in the study of California flora. He was a member of the Sonoma County Planning Commission and Board of Zoning (1972 to 1976). He has over 25 years of experience in managing and conducting environmental projects involving impact assessment and preparation of compliance documents, Biological Assessments, DFG Habitat Assessments, DFG SB 34 Mitigation projects, ACOE Mitigation projects and State Parks and Recreation Biological Resource Studies. Experience includes conducting special-status surveys, jurisdictional wetland delineations, general biological surveys, 404 and 1601-1603 permitting, and consulting on various projects.

Daniel T. Kjeldsen, B. S., Natural Resource Management, California State Polytechnic University, San Luis Obispo, California. He spent l994 to l996 in the Peace Corps managing natural resources in Honduras, Central America. His work in Central America focused on watershed inventory, mapping and protection. He has over four years of experience in conducting Biological Assessments, DFG Habitat Assessments, ACOE wetland delineations, wetland rehabilitation, and development of mitigation projects. He has received 3.2 continuing education units MCLE 27 hours in Determining Federal Wetlands Jurisdiction from the University of California Berkeley Extension.

Plate I. Site / Location Map

(St Helena Quadrangle)

Plate II. Aerial Photo / Survey Area

1

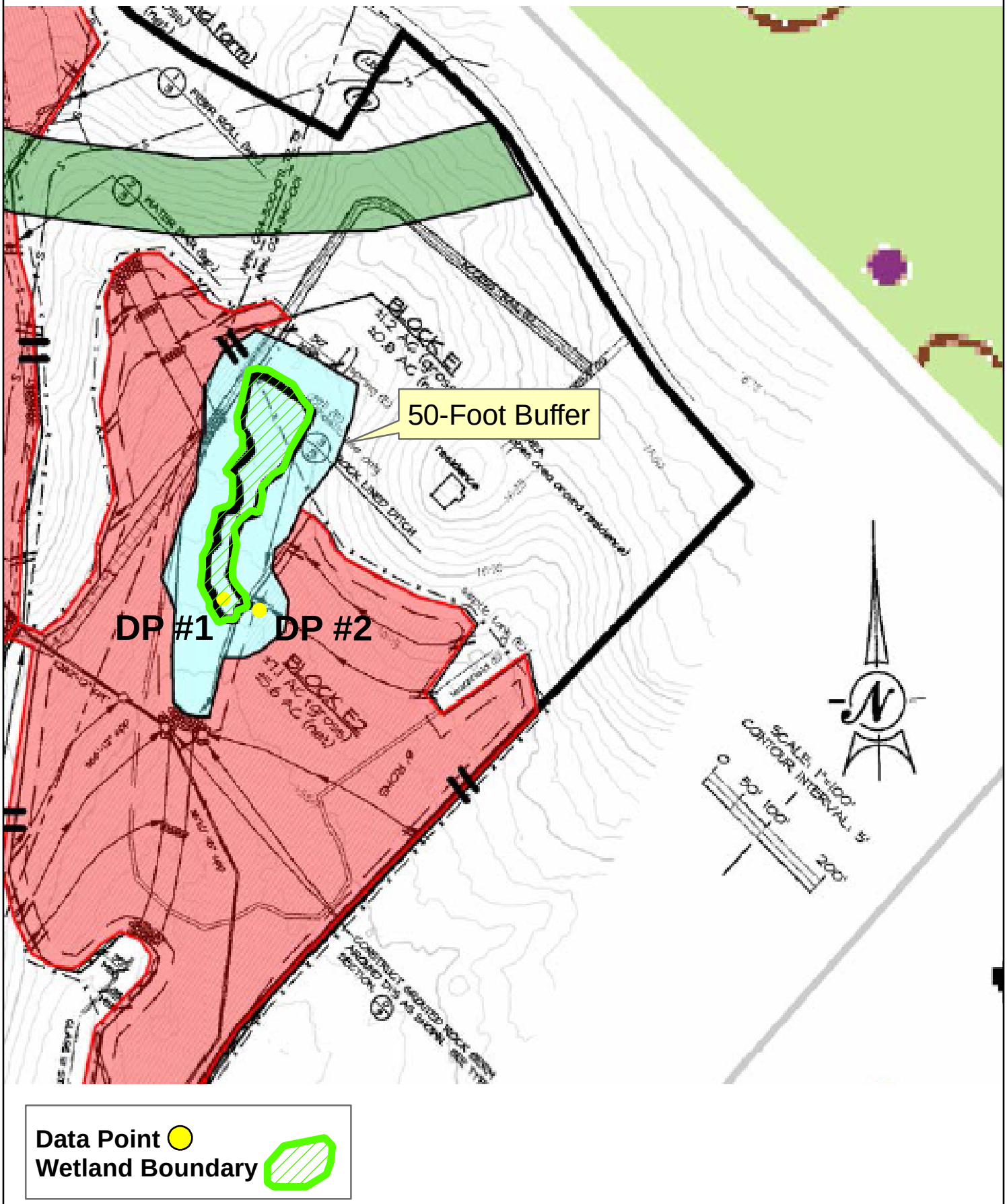

Plate III. Wetland Map

APPENDIX A.

Field Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Le Collins City/County: Napa Sampling Date: 10/18/16
Applicant/Owner: Le Collin LLC State: CA Sampling Point: 1
Investigator(s): David & Chris Kilbsen Section, Township, Range: _____
Landform (hillslope, terrace, etc.): flat basin in field Local relief (concave, convex, none): flat Slope (%): 2
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Forward gravelly loam NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes X	No ____
Wetland Hydrology Present?	Yes X	No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
Wet Meadow within wetlands

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. Salix laevigata			
3.			
4.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. Rubus armeniacus	80		FAC
3. Juncus effusus	10		FACW
4. Carex blanderi	10		FAC
5.			
		= Total Cover	

Herb Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	

Woody Vine Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	1	x 2 = 2
FAC species	2	x 3 = 6
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	3 (A)	8 (B)

Prevalence Index = B/A = 2.66

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1							Organic Soils

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- X Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[1]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[1]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Reducing conditions Low chroma
Vegetation indicates wetter conditions than mapped soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soils are moist + contain hydric vegetation different than surrounding environment.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: La Collina City/County: Napa Sampling Date: 10/18/14
Applicant/Owner: La Collina LLC State: CA Sampling Point: 2
Investigator(s): Daniel & Chris Kjeldsen Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): flat Slope (%): 2
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Sa Suits Pept NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: upland woodland part

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. Quercus agrifolia	Upland 30		
3.			
4. Douglas-Fir Pseudotsuga menziesii	FACU 30		
	60 = Total Cover		

Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		

Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4. Plantago lanceolata	5		FACU
5.			
6. Symphoricarpos mollis	5		FACU
7.			
8.			
	10 = Total Cover		

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	70 = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Dark Croma No reducing conditions Upland point up slope from flat.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators of soil saturation

APPENDIX B.

Soils Report

United States Department of Agriculture

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

Napa County, California

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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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.

122° 26' 12" W
122° 26' 5" W
549080
549100
549120
549140
549160
549180
549200
549220
38° 33' 34" N
38° 33' 27" N
4268050
4268030
4268010
4267990
4267970
4267950
4267930
4267910
4267890
4267870
4267850
138
140
Warning: Soil Map may not be valid at this scale.
Map Scale: 1:1,030 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0
15
30
60
90
Feet
0
50
100
200
300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

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 1:24,000.

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: Napa County, California
Survey Area Data: Version 8, Sep 23, 2015

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

Date(s) aerial images were photographed: Feb 4, 2012—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

Napa County, California (CA055)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
138	Forward gravelly loam, 2 to 9 percent slopes	1.1	37.9%
140	Forward gravelly loam, 30 to 75 percent slopes	1.7	62.1%
Totals for Area of Interest		**2.8**	**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.

Napa County, California

138—Forward gravelly loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hdl7
Elevation: 400 to 4,500 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 54 to 55 degrees F
Frost-free period: 200 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Forward and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Forward

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from rhyolite

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 35 inches: loam, gravelly loam
H2 - 4 to 35 inches: weathered bedrock
H3 - 35 to 59 inches:

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

140—Forward gravelly loam, 30 to 75 percent slopes

Map Unit Setting

National map unit symbol: hdl9
Elevation: 400 to 4,500 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 54 to 55 degrees F
Frost-free period: 200 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Forward and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Forward

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from rhyolite

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 35 inches: loam, gravelly loam
H2 - 4 to 35 inches: weathered bedrock
H3 - 35 to 59 inches:

Properties and qualities

Slope: 30 to 75 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

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APPENDIX G

SPECIAL-STATUS SPECIES SEARCHES

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: May 01, 2018
Consultation Code: 08ESMF00-2018-SLI-1992
Event Code: 08ESMF00-2018-E-05821
Project Name: Le Colline

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2018-SLI-1992

Event Code: 08ESMF00-2018-E-05821

Project Name: Le Colline

Project Type: AGRICULTURE

Project Description: vineyard

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.55854560554941N122.43753587526881W

Counties: Napa, CA

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Crustaceans

NAME	STATUS
California Freshwater Shrimp *Syncaris pacifica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7903	Endangered

Flowering Plants

NAME	STATUS
Clara Hunt's Milk-vetch *Astragalus clarianus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3300	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (St. Helena (3812254))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Amorpha californica var. napensis Napa false indigo	PDFAB08012	None	None	G4T2	S2	1B.2
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Astragalus claranus Clara Hunt's milk-vetch	PDFAB0F240	Endangered	Threatened	G1	S1	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Brodiaea leptandra narrow-anthered brodiaea	PMLIL0C022	None	None	G3?	S3?	1B.2
Ceanothus confusus Rincon Ridge ceanothus	PDRHA04220	None	None	G1	S1	1B.1
Ceanothus divergens Calistoga ceanothus	PDRHA04240	None	None	G2	S2	1B.2
Ceanothus purpureus holly-leaved ceanothus	PDRHA04160	None	None	G2	S2	1B.2
Ceanothus sonomensis Sonoma ceanothus	PDRHA04420	None	None	G2	S2	1B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Dicamptodon ensatus California giant salamander	AAAAH01020	None	None	G3	S2S3	SSC
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erigeron greenei Greene's narrow-leaved daisy	PDAST3M5G0	None	None	G3	S3	1B.2
Eryngium jepsonii Jepson's coyote-thistle	PDAPI0Z130	None	None	G2	S2	1B.2
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Hesperolinon sharsmithiae Sharsmith's western flax	PDLIN010E0	None	None	G2Q	S2	1B.2
Layia septentrionalis Colusa layia	PDAST5N0F0	None	None	G2	S2	1B.2
Leptosiphon jepsonii Jepson's leptosiphon	PDPLM09140	None	None	G3	S3	1B.2
Lupinus sericatus Cobb Mountain lupine	PDFAB2B3J0	None	None	G2?	S2?	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Northern Vernal Pool Northern Vernal Pool	CTT44100CA	None	None	G2	S2.1	
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
Penstemon newberryi var. sonomensis Sonoma beardtongue	PDSCR1L483	None	None	G4T2	S2	1B.3
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Candidate Threatened	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Sidalcea oregana ssp. hydrophila marsh checkerbloom	PDMAL110K2	None	None	G5T2	S2	1B.2
Streptanthus hesperidis green jewelflower	PDBRA2G510	None	None	G2	S2	1B.2
Trichostema ruygtii Napa bluecurls	PDLAM220H0	None	None	G1G2	S1S2	1B.2

Record Count: 30

CNPS California Native Plant Society

Plant List

Inventory of Rare and Endangered Plants

33 matches found. *Click on scientific name for details*

Search Criteria

Found in Quad 3812254

Modify Search Criteria Export to Excel Modify Columns Modify Sort Display Photos

Scientific Name	Common Name	Blooming Period	CA Rare Plant Rank	State Listing Status	Federal Listing Status	Family
Amorpha californica var. napensis	Napa false indigo	Apr-Jul	1B.2			Fabaceae
Astragalus breweri	Brewer's milk-vetch	Apr-Jun	4.2			Fabaceae
Astragalus claranus	Clara Hunt's milk-vetch	Mar-May	1B.1	CT	FE	Fabaceae
Astragalus clevelandii	Cleveland's milk-vetch	Jun-Sep	4.3			Fabaceae
Brodiaea leptandra	narrow-anthered brodiaea	May-Jul	1B.2			Themidaceae
Calamagrostis ophitidis	serpentine reed grass	Apr-Jul	4.3			Poaceae
Castilleja ambigua var. ambigua	johnny-nip	Mar-Aug	4.2			Orobanchaceae
Ceanothus confusus	Rincon Ridge ceanothus	Feb-Jun	1B.1			Rhamnaceae
Ceanothus divergens	Calistoga ceanothus	Feb-Apr	1B.2			Rhamnaceae
Ceanothus purpureus	holly-leaved ceanothus	Feb-Jun	1B.2			Rhamnaceae
Ceanothus sonomensis	Sonoma ceanothus	Feb-Apr	1B.2			Rhamnaceae
Clarkia gracilis ssp. tracyi	Tracy's clarkia	Apr-Jul	4.2			Onagraceae
Collomia diversifolia	serpentine collomia	May-Jun	4.3			Polemoniaceae
Cordylanthus tenuis ssp. brunneus	serpentine bird's-beak	Jul-Aug	4.3			Orobanchaceae
Delphinium uliginosum	swamp larkspur	May-Jun	4.2			Ranunculaceae
Erigeron biolettii	streamside daisy	Jun-Oct	3			Asteraceae
Erigeron greenei	Greene's narrow-leaved daisy	May-Sep	1B.2			Asteraceae
Harmonia nutans	nodding harmonia	Mar-May	4.3			Asteraceae
Hesperolinon bicarpellatum	two-carpellate western flax	May-Jul	1B.2			Linaceae

Hesperolinon sharsmithiae	Sharsmith's western flax	May-Jul	1B.2	Linaceae
Layia septentrionalis	Colusa layia	Apr-May	1B.2	Asteraceae
Leptosiphon jepsonii	Jepson's leptosiphon	Mar-May	1B.2	Polemoniaceae
Lomatium repostum	Napa lomatium	Mar-Jun	4.3	Apiaceae
Lupinus sericatus	Cobb Mountain lupine	Mar-Jun	1B.2	Fabaceae
Micropus amphibolus	Mt. Diablo cottonweed	Mar-May	3.2	Asteraceae
Navarretia cotulifolia	cotula navarretia	May-Jun	4.2	Polemoniaceae
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Apr-Jul	1B.1	Polemoniaceae
Ranunculus lobbii	Lobb's aquatic buttercup	Feb-May	4.2	Ranunculaceae
Senecio clevelandii var. clevelandii	Cleveland's ragwort	Jun-Jul	4.3	Asteraceae
Sidalcea oregana ssp. hydrophila	marsh checkerbloom	(Jun)Jul-Aug	1B.2	Malvaceae
Streptanthus hesperidis	green jewelflower	May-Jul	1B.2	Brassicaceae
Toxicoscordion fontanum	marsh zigadenus	Apr-Jul	4.2	Melanthiaceae
Trichostema ruygtii	Napa bluecurls	Jun-Oct	1B.2	Lamiaceae

Suggested Citation

California Native Plant Society, Rare Plant Program. 2018. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 01 May 2018].

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Contributors

The Calflora Database
The California Lichen Society
California Natural Diversity Database
The Jepson Flora Project
The Consortium of California Herbaria
CalPhotos

Questions and Comments

rareplants@cnps.org

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APPENDIX H

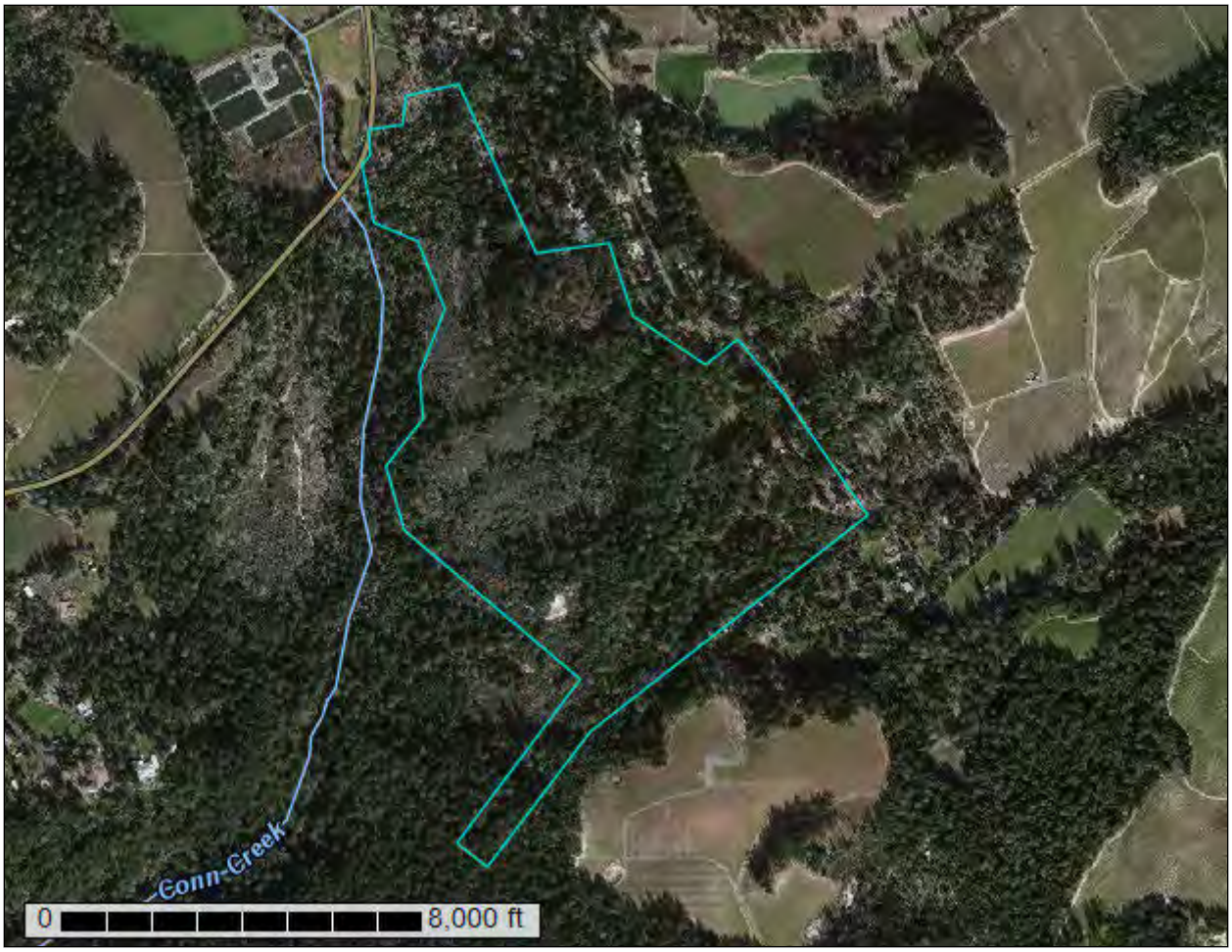
NRCS SOILS REPORT

United States Department of Agriculture

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 Napa County, California



November 2, 2017

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 (https://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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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.

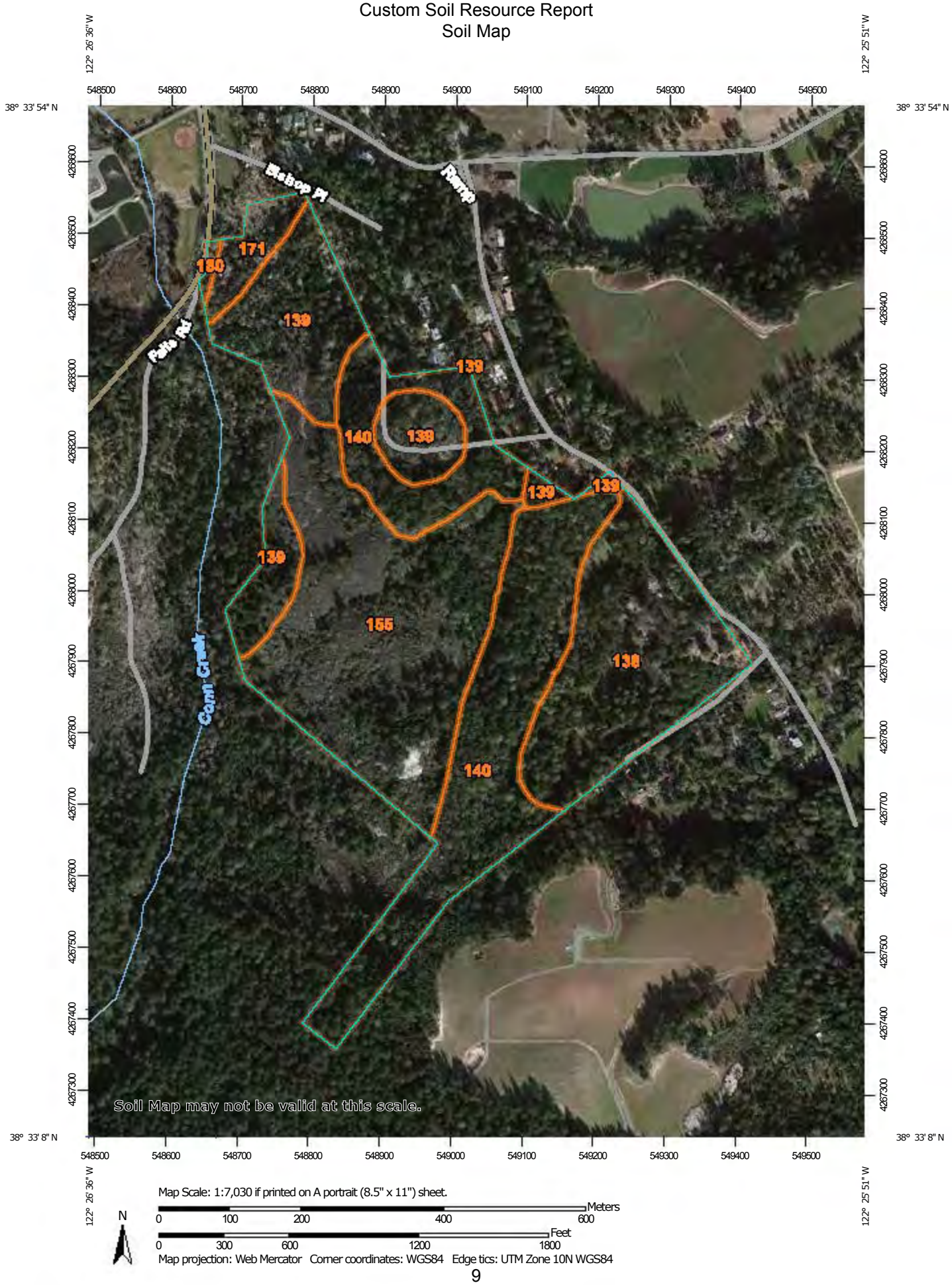
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 Scale: 1:7,030 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

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 1:24,000.

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:
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: Napa County, California
Survey Area Data: Version 10, Sep 25, 2017

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

Date(s) aerial images were photographed: Feb 4, 2012—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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
138	Forward gravelly loam, 2 to 9 percent slopes	17.8	19.1%
139	Forward silt loam, 5 to 39 percent slopes, MLRA 15	15.8	17.0%
140	Forward silt loam, 12 to 57 percent slopes, MLRA 15	27.7	29.6%
155	Kidd loam, 15 to 30 percent slopes	29.2	31.3%
171	Pleasanton loam, 2 to 5 percent slopes, MLRA 14	2.6	2.8%
180	Tehama silt loam, 0 to 5 percent slopes	0.3	0.3%
Totals for Area of Interest		**93.4**	**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.

Napa County, California

138—Forward gravelly loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hdl7
Elevation: 400 to 4,500 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 54 to 55 degrees F
Frost-free period: 200 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Forward and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Forward

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from rhyolite

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 35 inches: gravelly loam, loam
H2 - 4 to 35 inches: weathered bedrock
H3 - 35 to 59 inches:

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

139—Forward silt loam, 5 to 39 percent slopes, MLRA 15

Map Unit Setting

National map unit symbol: 2xc9x
Elevation: 110 to 2,080 feet
Mean annual precipitation: 27 to 45 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 281 to 344 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Forward

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Rhyolitic residuum weathered from volcanic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 6 inches: silt loam
BA - 6 to 12 inches: silt loam
Bw1 - 12 to 19 inches: silt loam
Bw2 - 19 to 28 inches: silt loam
Bw3 - 28 to 37 inches: gravelly silt loam
Cr - 37 to 51 inches: bedrock

Properties and qualities

Slope: 5 to 39 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.2 to 0.5 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Aiken
Percent of map unit: 5 percent

Kidd
Percent of map unit: 5 percent

Boomer
Percent of map unit: 3 percent

Sobrante
Percent of map unit: 2 percent

140—Forward silt loam, 12 to 57 percent slopes, MLRA 15

Map Unit Setting
National map unit symbol: 2xc9y
Elevation: 310 to 2,370 feet
Mean annual precipitation: 33 to 56 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 260 to 338 days
Farmland classification: Not prime farmland

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

Description of Forward

Setting
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Rhyolitic residuum weathered from volcanic rock

Typical profile
Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 6 inches: silt loam
BA - 6 to 12 inches: silt loam
Bw1 - 12 to 19 inches: silt loam
Bw2 - 19 to 28 inches: silt loam
Bw3 - 28 to 37 inches: gravelly silt loam
Cr - 37 to 51 inches: bedrock

Properties and qualities

Slope: 12 to 57 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.2 to 0.5 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Aiken

Percent of map unit: 5 percent

Boomer

Percent of map unit: 5 percent

Kidd

Percent of map unit: 3 percent

Sobrante

Percent of map unit: 2 percent

155—Kidd loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hdls
Elevation: 500 to 4,300 feet
Mean annual precipitation: 30 to 60 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 220 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Kidd and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kidd

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from rhyolite

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 14 to 18 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: VERY SHALLOW ROCKY (R015XD127CA)
Hydric soil rating: No

171—Pleasanton loam, 2 to 5 percent slopes, MLRA 14

Map Unit Setting

National map unit symbol: 2x52t
Elevation: 120 to 3,440 feet
Mean annual precipitation: 12 to 43 inches
Mean annual air temperature: 58 to 60 degrees F
Frost-free period: 240 to 320 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Pleasanton

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 21 inches: loam
Bt1 - 21 to 33 inches: clay loam
Bt2 - 33 to 45 inches: very gravelly clay loam
C - 45 to 55 inches: clay loam
2C - 55 to 79 inches: stratified very gravelly clay

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: CLAYPAN (R015XE087CA)
Hydric soil rating: No

Minor Components

Rincon

Percent of map unit: 5 percent
Landform: Terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: FINE LOAMY BOTTOM (R014XE025CA)
Hydric soil rating: No

Antioch

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: CLAYPAN (R017XE108CA), CLAYPAN (R014XD089CA)
Hydric soil rating: No

Soper

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

180—Tehama silt loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hdml
Elevation: 50 to 1,000 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 250 to 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Tehama and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tehama

Setting

Landform: Terraces, alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 5 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 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
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

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APPENDIX I

HYDROLOGY STUDY

DiCesaris-Le Colline Vineyard
Hydrology Study
Prepared by Napa Valley Vineyard Engineering, Inc
December 12, 2017 (rev 5)

INTRODUCTION

DiCesaris seeks a permit to develop approximately 33.4 gross acres of new vineyard including three new access drives. The project lies within APNs 024-300-071, 72, 73 and 024-340-001 located at 300 Cold Springs Road, St. Helena.

This hydrology study is to determine the anticipated affect the proposed vineyard development project will have on local hydrology and runoff patterns. Hydrologic modeling of existing and proposed conditions was performed using HydroCad software with the CA-1 rainfall distribution curve. Following is a summary of the data used to complete the hydrologic analysis and the results of this analysis.

RAINFALL DATA

Rainfall depths for the project site were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2, Precipitation Frequency Data for California, which uses the latitude and longitude of a site to determine rainfall depths. The latitude and longitude of the DiCesaris project are estimated to be 38.561° N, 122.441° W, based on information obtained from All Topo V7 USGS mapping software.

The following rainfall data from the NOAA website was used in the analysis:

2 year, 24 hour	4.94 inches
5 year, 24 hour	6.21 inches
10 year, 24 hour	7.25 inches
25 year, 24 hour	8.80 inches
50 year, 24 hour	9.98 inches
100 year, 24 hour	11.20 inches

WATERSHED AREAS

The project site is located within nine small watersheds as shown on the Drainage Area Maps in the Appendix. Watersheds 1 thru 7, and watershed 9 are modeled as one simple watershed in pre-project condition. Because of the complexity of Watershed 8, it is broken into four subareas which all flow to a common point of interest (POI). Each watershed was determined based on 2003 LIDAR mapping.

PRE-PROJECT WATERSHED CONDITIONS

Soil Types

The United States Department of Agriculture Soil Conservation Service Soils Map for Napa County, August 1978, maps the following soil types within the watersheds:

SCS #139/#140, Forward gravelly loam (Hydrologic Soil Group(HSG) B)
SCS #155, Kidd loam (HSG D)

Land Use

Land use within each watershed was analyzed based on the 2011 aerial photograph obtained from the Napa County GIS website. All watersheds include tree and brush canopy with pockets of open grassland, and the watersheds encompassing the residential areas along Cold Springs Road include impervious surfaces and residential landscaping. Wooded areas within the watershed is considered in "good" hydrologic condition. Areas of brush and open grassland is considered to be in “fair condition”, except where there are residential lawns, which are considered to be in “good condition”. There is a small pocket of existing vineyard in Watershed 8 which is considered in "fair" condition. A detailed breakdown of land uses by area and hydrologic soil group is included in the HydroCad reports in the Appendix, and is shown on the Drainage Area Map.

Time of Concentration

The time of concentration represents the time it takes for rainfall in the most hydraulically remote portion of the watershed to reach the point of interest.
The time of concentration is estimated assuming sheet flow up to 100 feet in the uppermost reaches of each watershed. A shallow concentrated flow regime is used to model the runoff down to a channel if one exists, or to the POI. Channel flow data was determined using a typical cross section of each channel. A detailed breakdown of the time of concentration parameters is included in the TR55 reports, and is shown on the Drainage Area Map.

POST-PROJECT WATERSHED CONDITIONS

Soil Types

Post-project soils are considered to be the same HSG as pre-project conditions.

Land Use

The proposed project will convert approximately 25 acres of tree canopy and approximately 15 acres of brush and grasses to vineyard and rocked, or grass, access drives. All other areas within the subject watersheds remain unchanged. The project proposes a no-till cover crop with spot spray only, which is considered a "good" hydrologic condition. Vineyard avenues/turnspaces and the new access drive from Winding Way will be maintained in no-till cover and are modeled as part of the vineyard. Rocked access drives and the rocked avenue in Block A are modeled as gravel roads. A detailed breakdown of land uses by area and hydrologic soil group is included in Appendix A.

Time of Concentration

Time of concentration under post-project conditions will increase in watersheds that include construction of diversion ditches within the proposed vineyard blocks. The increased time of concentration typically reduces peak flows at the POI, so this analysis conservatively excludes the ditching from the modeling, unless the ditches outlet to a pipe. Because piping will tend to increase rate of flow, the blocks that include piping are broken into smaller subareas created by the diversion ditches and flow is modeled through the pipes to the attenuation basins. A detailed breakdown of time of concentration and attenuation basin design criteria is included in Appendix A.

CALCULATED RUNOFF RATE/VOLUME

Using the rainfall data, watershed area, land use and time of concentration parameters described above and included in the Appendix, the following runoff rates (cfs), and volume (af) were calculated:

Rate

24 hr. storm event	2 yr.		5 yr.		10 yr.		25 yr.		50 yr.		100 yr.	
Project Condition	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Watershed 1	0.67	0.24	1.34	0.90	1.97	1.55	2.98	2.24	3.81	2.93	4.70	3.81
Watershed 2	1.37	1.36	2.27	2.13	3.07	2.80	4.33	3.85	5.28	4.66	6.37	5.51
Watershed 3	2.61	2.42	4.31	3.88	5.81	5.30	8.18	8.02	10.05	9.84	12.02	11.67
Watershed 4	0.30	0.27	0.58	0.50	0.83	0.76	1.24	1.20	1.58	1.51	1.94	1.88
Watershed 5	3.80	3.61	5.59	5.36	7.11	6.85	9.42	9.13	11.20	10.88	13.04	12.70
Watershed 6	2.04	1.86	2.89	2.67	3.61	3.38	4.69	4.64	5.51	5.51	6.36	6.33
Watershed 7	1.57	1.57	2.40	2.38	3.12	3.11	4.23	4.23	5.09	5.04	5.99	5.96
Watershed 8	7.62	6.60	13.25	11.48	18.31	16.69	26.39	24.83	32.82	30.52	39.63	36.10
Watershed 9	1.48	1.48	2.41	2.41	3.24	3.24	4.53	4.53	5.54	5.54	6.62	6.62

Volume

24 hr. storm event	2 yr.		5 yr.		10 yr.		25 yr.		50 yr.		100 yr.	
Project Condition	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Watershed 1	0.31	0.09	0.57	0.18	0.81	0.48	1.22	1.00	1.56	1.42	1.93	1.89
Watershed 2	0.56	0.53	0.91	0.83	1.23	1.10	1.75	1.52	2.17	1.86	2.61	2.23
Watershed 3	0.93	0.80	1.52	1.42	2.06	1.98	2.92	2.87	3.62	3.59	4.37	4.35
Watershed 4	0.13	0.10	0.22	0.18	0.32	0.25	0.48	0.42	0.61	0.57	0.75	0.72
Watershed 5	1.47	1.39	2.19	2.09	2.81	2.70	3.79	3.65	4.56	4.41	5.37	5.20
Watershed 6	0.79	0.64	1.14	1.00	1.44	1.31	1.90	1.79	2.26	2.15	2.65	2.48
Watershed 7	0.63	0.55	0.98	0.91	1.28	1.22	1.78	1.71	2.14	2.10	2.54	2.50
Watershed 8	3.14	2.76	5.30	4.97	7.29	7.00	10.55	10.32	13.21	13.01	16.08	15.91
Watershed 9	0.60	0.60	0.97	0.97	1.31	1.31	1.85	1.85	2.28	2.28	2.74	2.74

CONCLUSION

Peak flows and total volume during each storm event either remain constant or decrease in the post- project models. This analysis, and supporting information in the Appendix, demonstrate that with the inclusion of diversion ditches and attenuation basins, peak runoff rates and runoff volume will not increase as a result of this vineyard development project.

HydroCad REPORTS & MAP
APPENDIX

APPENDIX J

HYDROLOGY AND EROSION ANALYSIS

Hydrologic and Erosion Analysis for DiCesaris-LeColline Vineyard
Napa County APN's 024-300-070, 71, 72 and 024-340-001

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Appendix D-Napa Valley Vineyard Engineering Memorandum (December 2015)
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Appendix F-Napa Valley Vineyard Engineering Memorandum (November 7, 2016)
Appendix G-Napa County Memorandum (May 18, 2017)

Executive Summary

This analysis of the DiCesaris vineyard conversion project in northern Napa County provides technical review of hydrologic and soil erosion conditions and processes required by the California Environmental Quality Act (CEQA). County of Napa Permit, Building and Environmental Services (PBES) regulates vineyard development projects with respect to hydrologic and erosion impacts through review of Erosion Control Plans (ECPs) prepared by project proponents. ECP's are prepared by qualified professionals and quantify erosion rates and runoff rates for existing conditions and proposed project conditions. The erosion control and drainage management design features embodied by the ECP are evaluated in part to demonstrate that the project design conforms to County of Napa General Plan policies requiring no net increase in erosion or runoff resulting from the proposed project.

The project site is located at 300 Cold Springs Road within parcels 024-300-070, 71, 72 and 024-340-001 just south of the town of Angwin, Napa County, totaling about 88.3 acres. The Project is the proposed Le Colline Vineyard which consists of the conversion of approximately 33.4 gross acres of mixed shrub and forestland to commercial vineyard with about 26.0 net acres planted to wine grapes with an additional 1.0 acres of access drives planned.

The following technical studies address CEQA Checklist issues pertaining to Geology and Soils and to Hydrology and Water Quality, addressing whether the project would:

VI. GEOLOGY AND SOILS, b) Result in substantial soil erosion or the loss of topsoil?

IX. HYDROLOGY AND WATER QUALITY, a) Violate any water quality standards or waste discharge requirements?

b) Substantially deplete groundwater supplies…

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which could result in substantial erosion or siltation on- or off-site?

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

f) Otherwise substantially degrade water quality?

This analysis is presented in two parts. The first part summarizes and supplements the hydrologic analysis of the project prepared by Napa Valley Vineyard Engineering (NVVE). The hydrologic analysis has been revised to evaluate modifications to the ECP requested by County of Napa PBES. The second part summarizes and supplements the analysis of soil erosion prepared by NVVE. In addition, this summary and supplemental analysis comprises a technical peer review in that O'Connor Environmental, Inc. (OEI) has prepared several similar analyses in Napa County and elsewhere in the region.

These analyses indicate that the Project will not cause significant adverse changes in hydrologic or erosion processes owing in large part to County of Napa's implementation of General Plan policies requiring that

projects be designed to prevent increases in runoff and erosion. Modifications to vegetation cover associated with vineyard development and drainage do occur under Project conditions, however, proposed drainage modifications are intended primarily to mitigate increases in runoff and/or erosion that could potentially occur due to changes in vegetation cover. In areas currently occupied by chaparral, ground cover is relatively poor; under Project conditions, vineyard cover crops significantly improve ground cover and reduce erosion rates. In areas currently occupied by forest, ground cover is relatively good, and vineyard cover crops are not sufficient to provide cover comparable to existing forest ground cover. In these areas, potential increases in erosion rates caused by a small decline in ground cover are mitigated by installation of cross-slope ditches in vineyard fields that shorten flow paths to prevent the development of concentrated flow that could cause rill erosion. In addition, four segments of grassy drainageway are proposed in Vineyard Blocks D and E to further reduce potential erosion in areas where concentrated flow could occur.

Potential hydrologic change is potentially significant when converting forest cover to vineyard owing to expected increases in runoff attributed to reduced canopy interception and reduced evapotranspiration. This effect is implicitly simulated by a change in "Curve Number" that defines rainfall-runoff relationships as a function of vegetation type and condition and soil type. Project areas where forest cover is converted to vineyard are predicted to generate increased runoff, while conversion of chaparral vegetation types to vineyard produce small predicted changes in runoff. Predicted runoff increases are mitigated by seven proposed attenuation basins with surface areas ranging from about 0.04 to 0.15 acres; the average attenuation basin surface area is about 0.08 acres.

Overall, the proposed LeColline Vineyard Project is expected to significantly reduce estimated annual erosion from the Project area based on application of the USDA Universal Soil Loss Equation per County of Napa guidelines. Under existing conditions, erosion from the Project area is estimated to be 146.7 tons per year; with the project ECP in place, erosion from the Project area is estimated to be about 56.2 tons per year and representing a decrease in erosion of about 62%. The mean erosion rate under existing conditions is estimated to be about 3.8 tons per acre per year and is reduced to about 1.2 tons per acre per year with the project ECP in place.

Storm runoff from the Project areas has been analyzed per County of Napa guidelines to estimate the peak runoff from the Project for the 2-, 5-, 10-, 25-, 50- and 100-year return period flood events. Runoff from portions of the Project site to be developed was analyzed by dividing the Project site into nine different watersheds and estimating pre- and post-project runoff. Consequently, there are 54 analytical results pertaining to peak runoff (nine watersheds with six return period flood events). The modeling process guides the design of site drainage to meet County requirements. The runoff analysis of the site for Project conditions shows reduced peak runoff rates in all of the 54 analytical results. Typical peak flow decreases are less than 10%, with a maximum decrease of about 64%. Total runoff volume from the Project decreases for the 2-, 5-, 10-, 25, 50 and 100-yr return period flood events.

Hydrologic Analysis

The project site is located at 300 Cold Springs Road within parcels 024-300-070, 71, 72 and 024-340-001 just south of the town of Angwin, Napa County (Figure 1). The Project is the proposed LeColline Vineyard which consists of the conversion of approximately 33.8 gross acres of mixed shrub and forestland to

commercial vineyard with about 25.0 net acres planted to wine grapes with an additional 1.0 acres of access drives planned. This portion of the document summarizes and supplements hydrologic analyses performed by Napa Valley Vineyard Engineering (NVVE).

The hydrologic analyses are quantitative analyses of potential Project effects on runoff in the Conn Creek watershed required by the County of Napa pursuant to General Plan Conservation Element Policy CON-50(c) which states that: "[T]he County shall require discretionary projects to meet performance standards designed to ensure peak runoff in 2-, 10-, 50-, and 100-year events following development is not greater than predevelopment conditions." Napa Valley Vineyard Engineering (NVVE) developed a drainage design and erosion control plan (ECP) to mitigate potential increases in runoff and erosion from the site. NVVE prepared a hydrologic analysis to quantify runoff rates under existing pre-project conditions and under post-project conditions represented by the ECP. The first draft was submitted to Napa PBES in June 2015. Napa PBES reviewed the ECP and the hydrologic analysis and determined that the project complied with the performance standards of CON-50(c) in March 2016. In December 2016, County policy pertaining to the analysis of peak runoff from certain soil types was changed, and because that soil type was present on the Project site, it was necessary to reanalyze site runoff and revise the Erosion Control Plan and supporting documents to comply with the change in County policy. Required revisions to the plan were submitted in December 2016. The current plan incorporates revisions requested from technical review of the December 2016 plan (Appendix G).

Approach to Analysis

This supplemental summary of NVVE's hydrologic analysis provides a broader presentation of the NVVE analysis to facilitate evaluation of project compliance with the California Environmental Quality Act (CEQA through an Environmental Impact Report (EIR). The process of preparing this supplemental summary for the EIR by O'Connor Environmental, Inc. (OEI) also provides peer-review verifying interpretations and calculations that comprise the NVVE analysis. OEI has prepared several similar hydrologic analyses for similar projects in Napa County and is qualified to provide this supplemental summary and peer review.

The hydrologic analysis was performed by NVVE using HydroCAD software developed by HydroCAD Software Solutions, LLC. The HydroCAD software employs methods from common hydrologic models including TR-55 and TR-20 to simulate watershed runoff processes. Both TR-20 and TR-55 are hydrologic models commonly used in Napa County to estimate runoff and peak discharges and develop hydrographs for small basins using unit hydrograph theory and routing procedures that depend on runoff travel time through segments of the watershed (USDA, 1986 and HydroCAD, 2015). A number of parameters are required as inputs for the development of the model including rainfall, soil hydrologic groups, ground cover types along with channel characteristics and dimensions. Specific details regarding these parameters can be found in NVVE's Hydrology Study (Appendix A).

For this project, it was necessary to include storm runoff attenuation in the drainage plan to prevent increases in peak flows from the Project site for the 2-, 5-, 10-, 25-, 50- and 100-year design storms. Changes in peak flow for the Project site were predicted using the HydroCAD analysis (Appendix A). The effect of proposed attenuation basins was evaluated using the HydroCAD software to model storage and release of peak flows. The objective of NVVE's hydrologic analysis was to evaluate potential Project effects on peak runoff resulting from rainstorms. The hydrologic model of the site under existing conditions, including upstream contributing drainage area, is used to establish the baseline (pre-Project) hydrologic conditions. Post-Project peak runoff is simulated by modifying the baseline hydrologic model to represent proposed changes to drainage patterns by the addition of diversion ditches, piping (Figure 2;

see also the ECP Appendix B), and attenuation basins, along with the changes in land cover (vegetation) and changes in soil runoff characteristics of the Kidd loam soils resulting from site preparation for vineyard planting. All surface runoff from the project site is simulated, and runoff leaving the project site is quantified at nodes located near the project boundary. Peak flows for existing and proposed conditions are then compared at each node to evaluate project effects on runoff.

The simulation approach used to estimate potential changes in runoff rates is conservative in that it is likely to overestimate runoff rates. In a previous study by OEI in the Swartz Canyon watershed in northeastern Napa County, peak runoff rates calculated using TR-55 methods were compared to peak runoff rates estimated from US Geological Survey stream gauging data using the National Streamflow Statistics (NSS) computer program. NSS uses USGS regional regression equations developed from USGS gauging station data to estimate streamflow at ungauged sites throughout the United States. HydroCAD estimates peak runoff using a mixture of methods from TR-55 and TR-20 and it is our understanding that HydroCAD produces estimates similar to those generated by TR-55. Compared with NSS results for the same portion of Swartz Canyon, the TR-55 peak flow predictions were about 5x greater than NSS predictions. TR-55 (or HydroCAD in the case of the NVVE study) is an appropriate tool for estimating relative changes in runoff under existing and proposed future conditions, however, there is evidence that it overestimates peak runoff in the form of streamflow. This should be considered in evaluation of both potential impacts and mitigation of Project runoff when using TR-55 as a hydrologic assessment tool in Napa County.

Modeling

HydroCAD was the primary hydrologic model used for this evaluation. In HydroCAD runoff was calculated using the SCS unit hydrograph method (USDA, 1986) while time of concentration (T_c) was calculated using methods described in TR-55 (USDA, 1986). The model requires inputs to describe rainfall for design storms, topographic definition of Project Watersheds, and descriptions of vegetative cover and soils to determine runoff characteristics.

Site Conditions

The Project is in northwestern Napa County in the north-central portion of the Conn Creek watershed (Figure 1). The entire project parcel drains into the main stem of Conn Creek which flows into the Lake Hennessy Reservoir located approximately 5.7 miles downstream. The reservoir provides flood control and drinking water for the City of Napa. When the reservoir is full, water is released into the channel of Conn Creek via a spillway and then flows into the Napa River.

The Project is proposed on parcels totaling 88.34 acres located on gently to moderately sloping terrain and is comprised of a mixture of divergent, planar and convergent slope shapes and convex, planar and concave flow paths. Existing vegetation canopy cover at the project parcel was determined from review of aerial photography. Most of the project parcel (78%, approximately 69.3 acres) is covered by mixed conifer and hardwood forest. The remaining vegetated area is comprised of brush (19.3%; approximately 17 acres) and grass (1.7%; approximately 1.5 acres). Developed areas include existing structures and roads which total 0.4 acres or about 0.4% of the total project area. With respect to bedrock geology, the Project site is mapped as Pliocene to late Miocene aged pumiceous ash flow tuff of the Sonoma Volcanics Formation (map symbol Tst) (Graymer et al., 2007). Soils mapped at the project site (Figure 2) are the Forward gravelly loam, soil units 139 and 140 along with the Kidd loam, unit 155 (USDA, 2007).

Rainfall

Rainfall distributions for 24-hour rainstorms in Napa county and the north coast of California can be classified as Type CA-1 (NOAA Atlas 14, 2012). Rainfall Type CA-1 rainfall intensity represents a typical Mediterranean climate with dry summers and wet winters and specifically represents typical rainfall in the project area. Rainfall events of 24-hour duration were simulated with the model for the 2, 5, 10, 25, 50 and 100-year recurrence interval storms. Rainfall depths (Table 1) were determined from queries of the NOAA Atlas 14 Volume 6 Version 2 (NOAA, 2012). Rainfall depths used are from the upper end of the range of values provided by NOAA.

Table 1. Rainfall depths for typical recurrence interval storms at the project site.

Recurrence Interval Storm (24-hour Duration)	Precipitation Depth (in)
2 year	4.94
5 year	6.21
10 year	7.25
25 year	8.80
50 year	9.98
100 year	11.2

Project Watersheds

Drainage area and land use maps in the NVVE Hydrology Study (Appendix A) display the Project Watersheds analyzed under existing pre-Project conditions and proposed post-Project conditions along with the proposed vineyard footprint and flow paths analyzed with HydroCAD. A detailed Erosion Control Plan (ECP) was been developed by NVVE to comply with Napa County General Plan requirements (See Appendix B). The ECP proposes modifications of drainage patterns on the Project site to collect runoff in attenuation basins to prevent increases in peak runoff. To mitigate potential erosion in some of the vineyard blocks, along-contour diversion ditches are proposed; the effects of these ditches were incorporated in the HydroCAD analysis.

Pre-Project Project Watersheds

Pre-Project Project Watersheds were initially defined based on a topographic analysis of the Napa County LiDAR-derived digital elevation model (DEM) with a 10-ft square grid. For pre-Project baseline conditions, nine Project Watersheds were initially defined, (Figure 2a & b). Of these, one, Basin 8 was subdivided into four sub-basins, 8a, 8b, 8c, and 8 d flowing to a common point of interest (POI) (Figure 2b).

Project Watershed contributing areas range from 2.2 to 7.7 acres. Three of the nine Project Watersheds (2, 3, and 4) are bounded on the downhill edge by the edge of Conn Creek; flows crossing these boundaries were modeled as channelized flow. The remaining Project Watershed boundaries extend below the proposed vineyard boundaries and were modeled as channelized and shallow concentrated flow (Figure 2a and b).

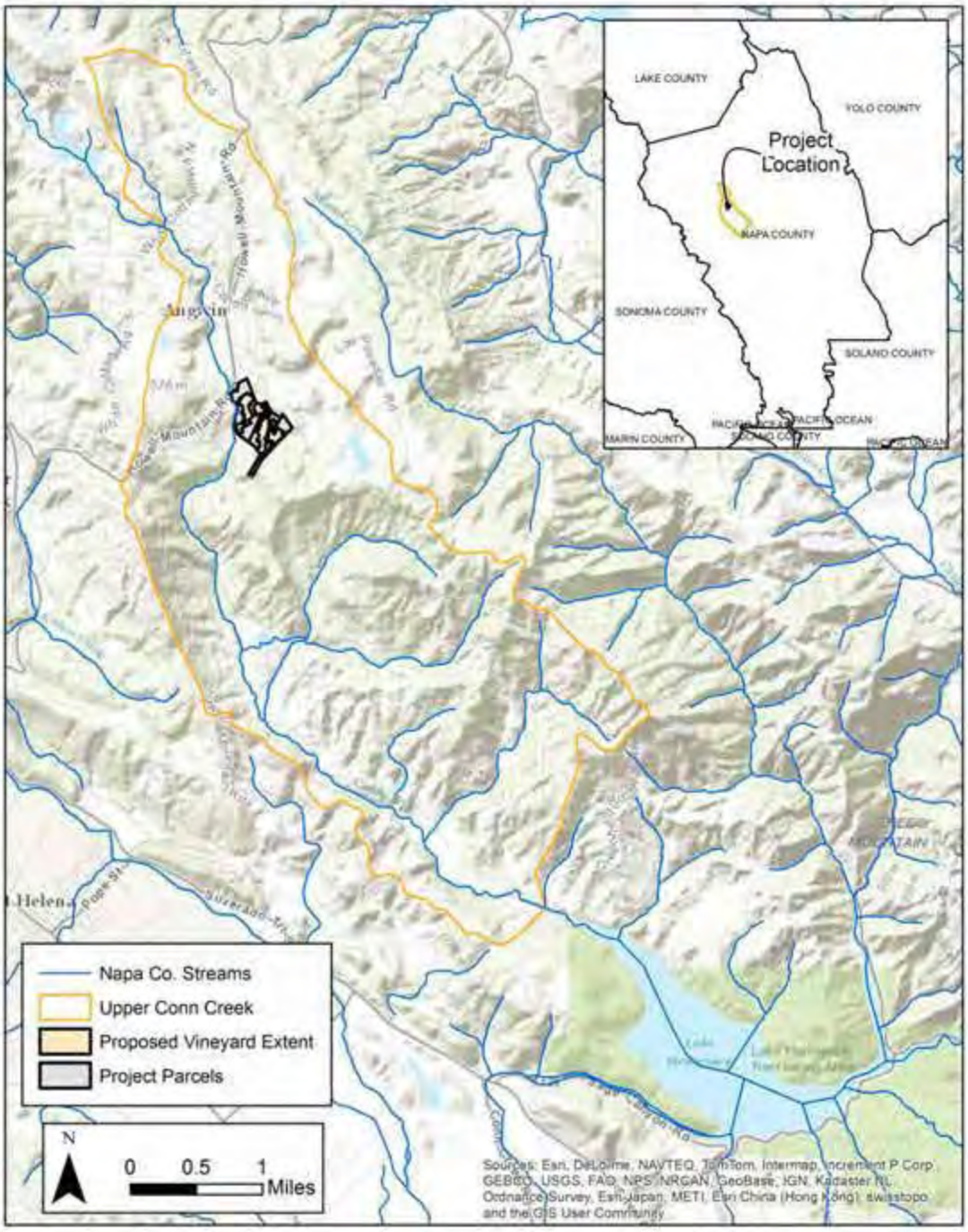


Figure 1. Site location map

Post-Project Watersheds

Post-Project Watersheds were defined by modifying the pre-Project Watersheds to reflect the changes in flow paths proposed in the ECP (Figure 2c & d) with appropriately engineered flow diversion methods (Appendix B-see ECP Sheet 3 for construction details). Each Project Watershed flowing to a drainage ditch and then into a pipe became a new subarea for purposes of post-Project analysis. Project Watersheds in which proposed attenuation basins are planned were also subdivided. Of the nine watersheds created to describe baseline condition, three were sub-divided (Project Watersheds 1, 4 and 8d), producing a total of 19 watersheds (Figures 2c, & 2d). Within this group of watersheds, the drainage areas range from 0.2 to 15.9 acres. The post-Project Watershed areas are modified in Watershed 1, 2, 4 and 5 relative to pre-Project Watershed areas. These modifications of drainage patterns (described below) allow for mitigation of potential increases in surface erosion and runoff per County of Napa requirements. Peak flow comparisons for pre- and post-Project conditions occur at identical Watershed outfalls (points of interest, Figure 2 a, b, c & d) and therefore provide the necessary comparison regardless of some small changes in pre- and post-Project Watershed areas.

Project Watershed 1 (Figure 2a & c) is located on the northern end of the project area; it drains a small portion of a hill top that includes proposed vineyard Block B and then drains to a forested area too steep for planting. Below the forested area the runoff flow paths cross Vineyard Block A1 near the base of the slope. The downhill edge of the Project Watershed is delineated along the edge of a small County definition stream, an unnamed tributary to Conn Creek (Figure 2a). Project Watershed 1 is subdivided into Subareas 1a, 1b, 1c and 1d under post-Project conditions resulting from proposed installation of about 1200 ft of diversion ditches and Attenuation Basin 1 (Figure 2c). Flows from Subareas 1a,1b and 1c will be collected in the proposed diversion ditches and delivered to Attenuation Basin 1 via two drop-inlets to a 12-inch diameter pipe extending about 245 ft. Attenuated flows are released via a level spreader about 100 ft in length. Flows from Subarea 1d will not be collected. Of the 1.32 acres in Subarea 1d, 0.77 acres will be converted to vineyard which is expected to cause an increase in runoff from this sub-area; this local increase in Project Watershed Subarea 1d is not propagated outside of Project Watershed 1 because it is compensated for by runoff detention in Attenuation Basin 1. The remaining 0.55 acres is located outside of the proposed vineyard and no changes in runoff from this area are expected to occur. Project Watershed 1 will increase in area under post-project conditions by 1.43 acres (to a total area of 7.25 acres) owing to proposed runoff diversions that extend into Project Watershed 2.

Project Watershed 2 is located south of Watershed 1 (Figure 2a & c) and includes the adjacent portion of the hill top and a portion of vineyard Block B, the forested area too steep for planting, and a portion of Block A1 near the base of the slope (Figure 2a). Flows in Watershed 2 are evaluated at a point along Conn Creek with the downhill (western) watershed boundary defined along the edge of Conn Creek. Due to a segment of proposed diversion ditch conveying runoff to Attenuation Basin 1, Project Watershed 2 will decrease in area by 1.43 acres (to a total area of 5.79 acres) under post-Project conditions.

Project Watershed 3 (Figure 2a & c), also includes a portion of the hill top and proposed vineyard Block B, the forested area too steep for planting, and portions of Blocks A1 and A2 close to the base of the slope. Flows in Watershed 3 are evaluated at a point along Conn Creek with the downhill (western) watershed boundary defined along the edge of Conn Creek at a boundary defined by the edge of Conn Creek (Figure 2a). Project Watershed 3 is subdivided into Subareas 3a and 3b under post-Project conditions because of about 200 ft of proposed diversion ditch and Attenuation Basin 2 (Figure 2c). Flows from Subarea 3a will be collected in proposed diversion ditches and routed to Attenuation Basin 2 via one drop-inlet to a short length of pipe. No collection of runoff from Subarea 3b occurs and none is needed to mitigate changes in

runoff from Project Watershed 3. There is no change to the drainage area (10.31 acres) under post-Project conditions.

Project Watershed 4 drains a small area between Project Watersheds 3 and 5 (Figure 2a & c) and is evaluated at a point along Conn Creek. Its downhill (western) watershed boundary is defined along the edge of Conn Creek (Figure 2a). Project Watershed 4 is subdivided into Subareas 4a, 4b, and 4c under post-Project conditions because of proposed diversion ditches and Attenuation Basin 3 (Figure 2c). A 150 ft section of diversion ditch will collect flows from the Subarea 4a and direct them via one drop inlet and piped to Attenuation Basin 3. Subarea 4b will also flow into Attenuation Basin 3 via a 250 ft section of diversion ditch with one drop inlet to a pipe. About 125 ft of 12-inch diameter pipe will be used to deliver flow to the Attenuation Basin. Attenuated flows are released via a level spreader about 100 ft in length. No collection of runoff from Subarea 4c occurs and none is needed to mitigate changes in runoff from Project Watershed 4. Proposed diversions collect a small portion of runoff from Project Watershed 5 and increase the total drainage area of Project Watershed 4 by 0.11 acres (to a total of 2.27 acres).

Project Watershed 5 (Figure 2a & c) includes a portion of the hill top and proposed vineyard Block B, the forested area too steep for planting, a portion of proposed vineyard Block D and a portion of Block A2. Runoff from Watershed 5 is evaluated as channelized at a point along an unnamed County definition stream approximately 200 feet upstream of its confluence with Conn Creek. Under proposed conditions a small portion of the drainage area (0.11 acres) will be collected by a proposed diversion ditch in Block A2 and directed to Attenuation Basin 3 within Project Watershed 4 (reducing the total area to 10.03 acres). Within the portion of proposed vineyard Block D located in Watershed 5 flows will be collected in diversion ditches and routed into a grassy swale with at grade rock checks and then leave the block via a rock energy dissipater (see ECP sheet 2 Appendix B).

Project Watershed 6 is located south of Basin 5 and drains part of the western edge of proposed vineyard Block D (Figure 2a & c). Runoff from Watershed 6 is evaluated as channelized flow at a point along an unnamed County definition stream approximately 700 feet upstream of its confluence with Conn Creek. Under proposed conditions Project Watershed 6 is subdivided into Subareas 6a, 6b, and 6c because of about 375 ft of proposed diversion ditches and Attenuation Basins 4 and 5 (Figure 2c). Flows from Subarea 6a will be collected in proposed diversion ditches and then routed to Attenuation Basin 4 via one drop inlet to a 12-inch diameter pipe about 120 ft in length. Attenuated flows are released via a level spreader about 50 ft in length. Flows from Subarea 6b will be collected in ditches and routed to Attenuation Basin 5 via one drop inlet to a 12-inch diameter pipe about 40 ft in length. Attenuated flows are released via a pipe to a rock energy dissipater. No collection of runoff from Subarea 6c occurs and none is needed to mitigate changes in runoff from Project Watershed 6. The proposed diversions do not change the watershed area (4.62 acres) from pre-project conditions.

Project Watershed 7 is the southernmost Project Watershed and is located adjacent to Project Watersheds 6 and 8d (Figure 2b & d). Runoff from Watershed 7 is evaluated at a point approximately 1,000 feet upstream of its confluence with Conn Creek. Under proposed conditions flows from vineyard Block D1 are collected in a series of cross-slope diversion ditches totaling about 750 ft in length and routed via three drop inlets to a 12-inch diameter pipe about 365 ft in length into Attenuation Basin 6 (Figure 2b & d). Project Watershed 7 is divided into four subareas (7a, b, c & d) because of the proposed diversions. Subareas 7a, b and c are collected in the ditches and routed through Attenuation Basin 6. No collection of runoff from Subarea 7d occurs and none is needed to mitigate changes in runoff in Project Watershed 7. Proposed diversions do not alter the total area of Watershed 7 (5.24 acres).

Project Watershed 8 is the largest Project Watershed and drains the eastern edge of the project area including portions of proposed vineyard Blocks B, C, D1, E1 and E2. In addition, approximately 10 acres of neighboring rural residential parcels uphill of the project area are located within Project Watershed 8 (Figure 2b & d). Owing to complex local drainage patterns under existing conditions and necessary drainage modifications to achieve runoff management objectives, Project Watershed 8 was subdivided into four subareas (8a, 8b, 8c and 8d). Proposed diversion ditches subdivide Project Watershed 8d into seven sub-areas: 8d1, 8d2, 8d3, 8d4, 8d5, 8d6 and 8d7 (Figure 2d and ECP Sheet 2 in Appendix B). Flows collected in diversion ditches from Project Watersheds 8d1-6 and 8c will be directed via seven drop inlets and about 1000 ft of 12-inch diameter pipe and about 330 ft of 18-inch diameter pipe into Attenuation Basin 7. Attenuated flows are released via a pipe to a rock energy dissipater. Flows from the remaining drainage area 8a will be routed into a rock lined ditch and then across a rock energy dissipater while flows from 8b will be directed to a grassy drainageway and then across rocked berms before flowing into a Class III stream (ECP Sheet 2 Appendix B). Flows from drainage subarea 8d7 will leave the vineyard area as sheet flow and flow into the Class III stream. Proposed diversions do not alter the total area of Watershed 8 (41.24 acres).

Project Watershed 9 drains the northern edge of the Project area and includes portions of proposed vineyard Block's B and C along with about four acres of neighboring parcels (Figure 2b & d). Flows from Project Watershed 9 are evaluated at a point adjacent to Cold Spring Road. There is a significant amount of impervious surface area (roofs and paved surfaces) in this watershed. There is no change to the drainage area (6.37 acres) or drainage patterns under post-Project conditions.

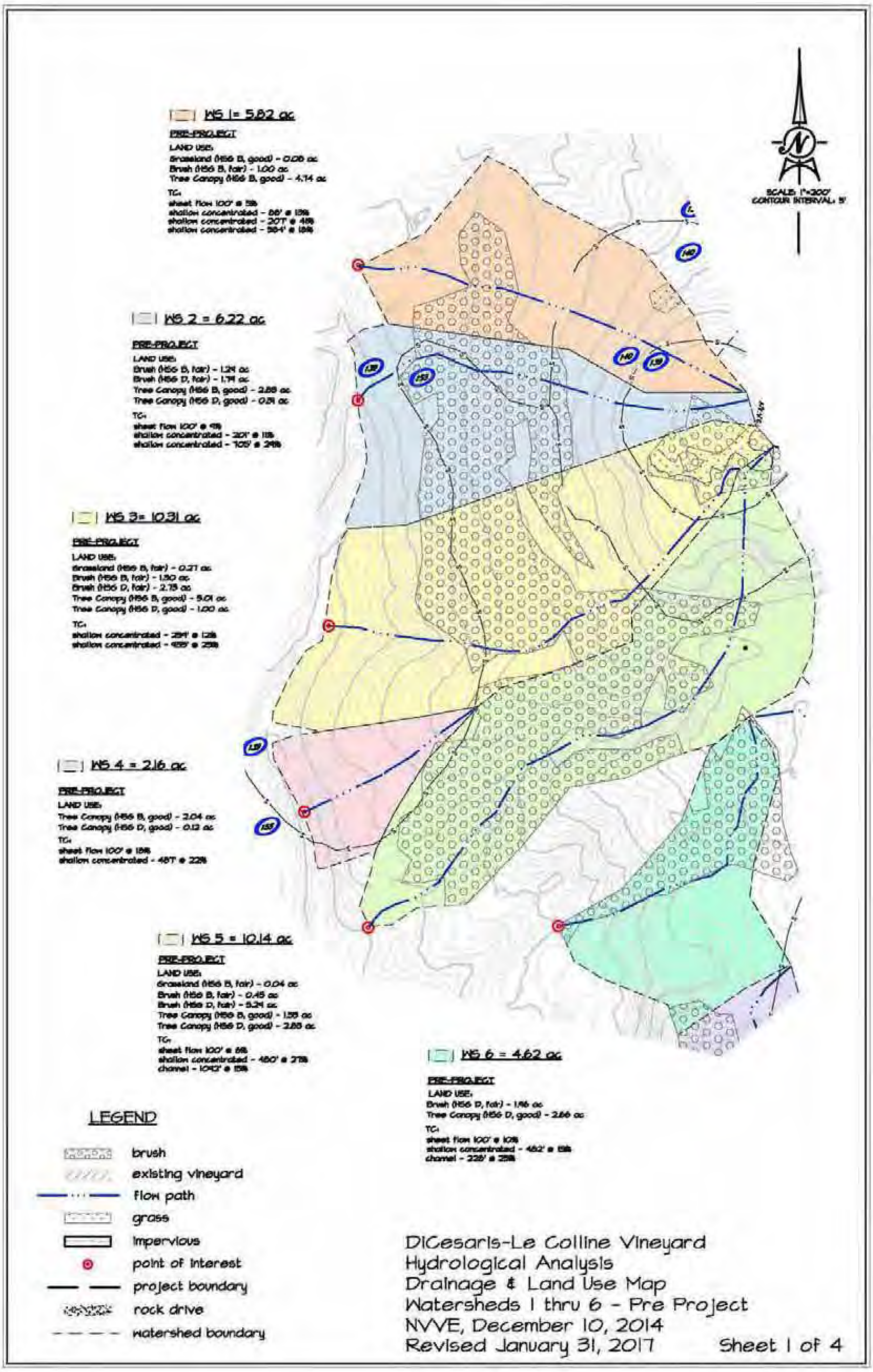


Figure 2a. Pre-Project Drainage and Land Use Maps by Napa Valley Vineyard Engineering

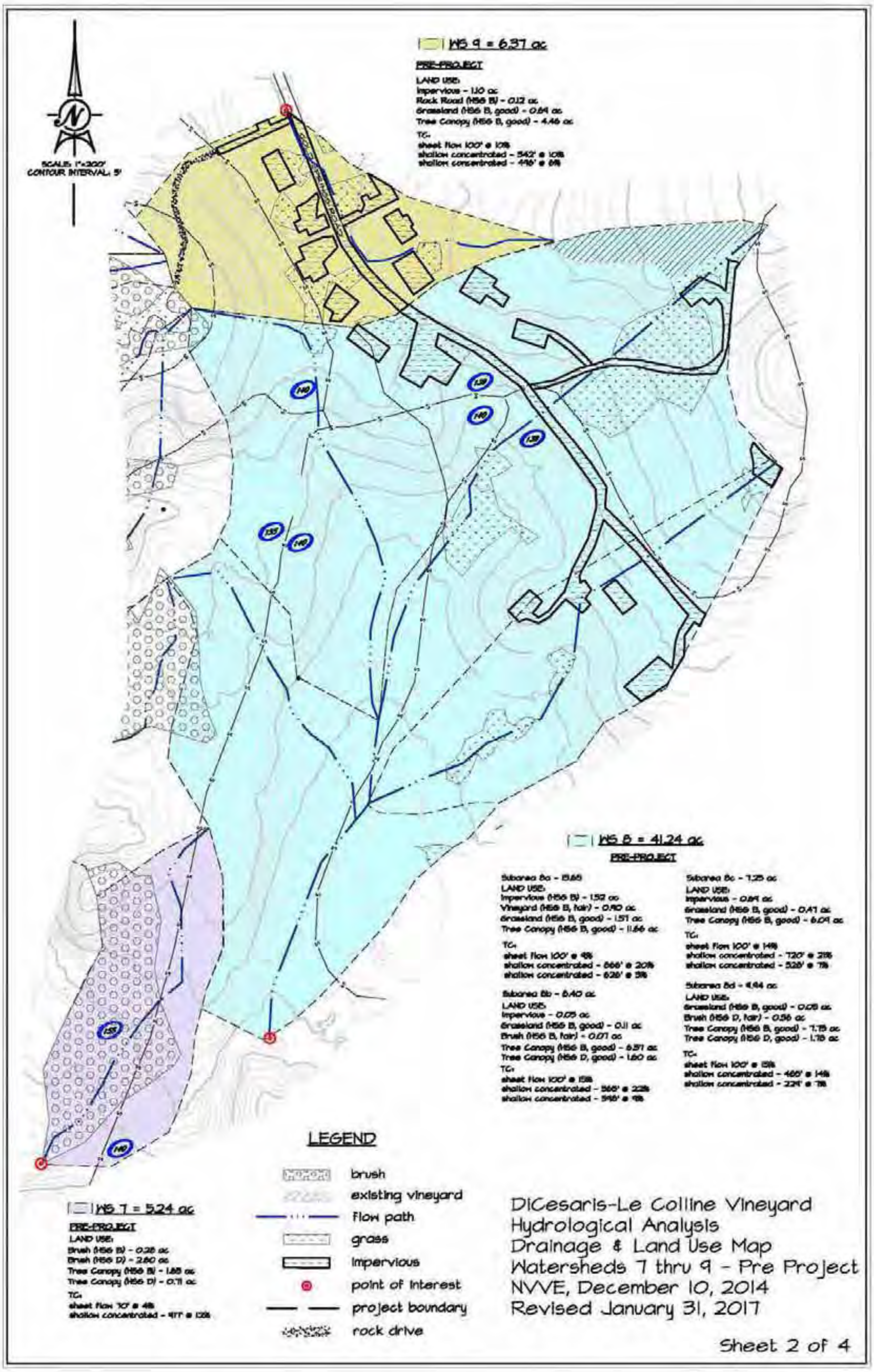


Figure 2b. Pre-Project Drainage and Land Use Maps by Napa Valley Vineyard Engineering

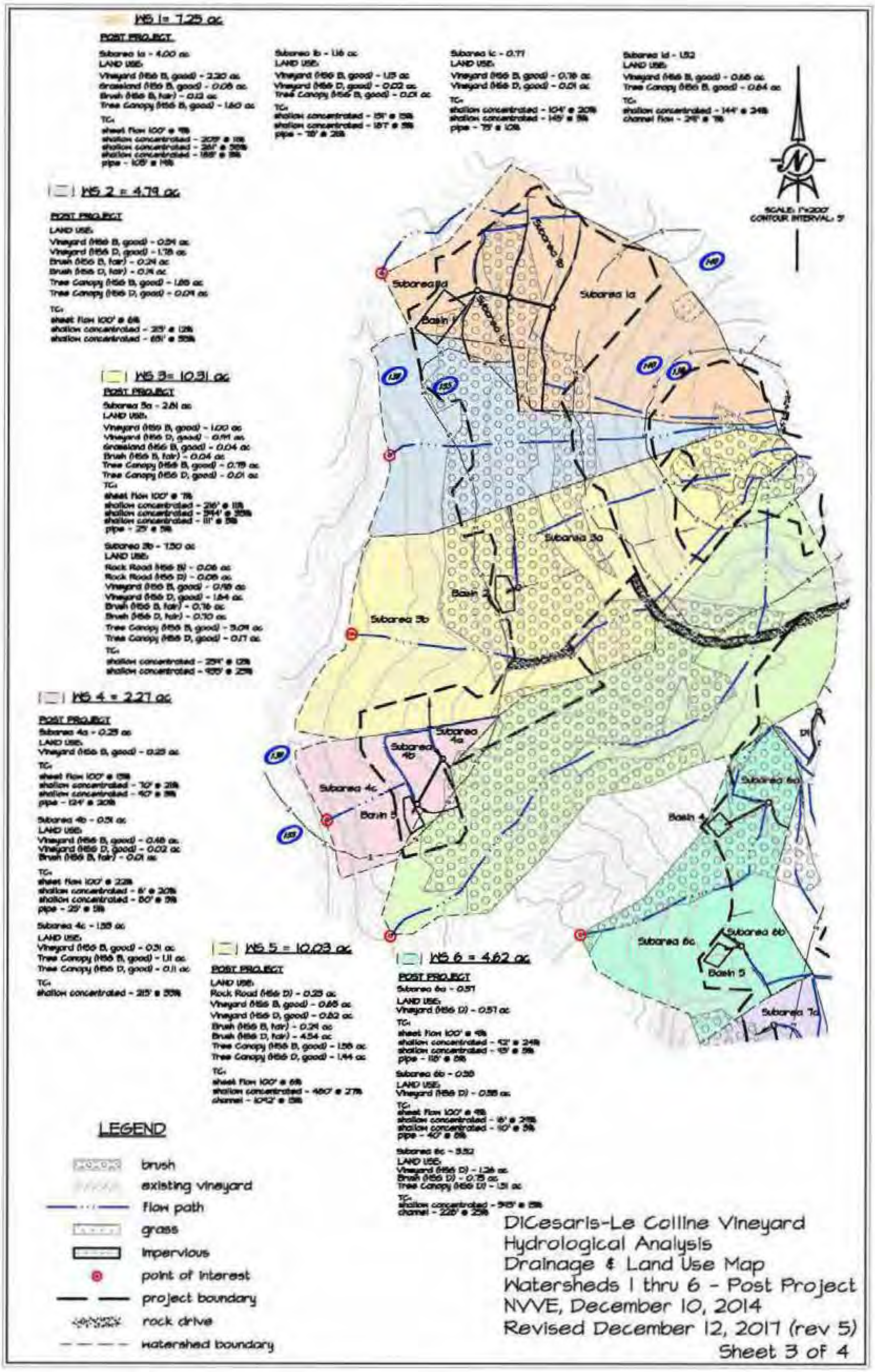


Figure 2c. Post-Project Drainage and Land Use Maps by Napa Valley Vineyard Engineering

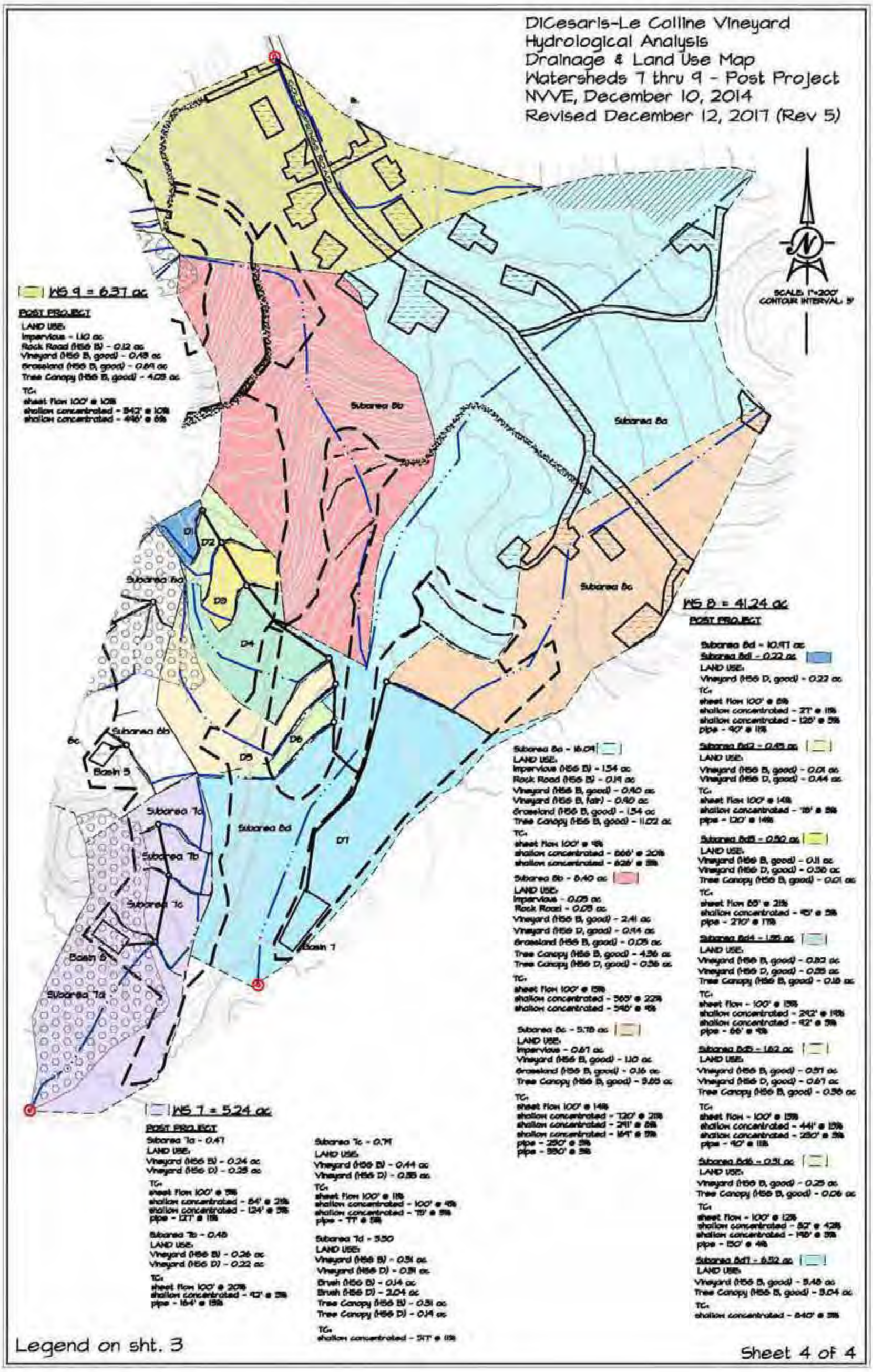


Figure 2d. Post-Project Drainage and Land Use Maps by Napa Valley Vineyard Engineering

Runoff

Curve Number Assignment

The most important parameter the modeler must decide upon when building a TR-55 or a TR-20 model is the Runoff Curve Number (CN) assigned to each land use type. CN's are dependent on land cover types and the hydrologic soil groups found in the area and are used in the calculations of runoff. Area-weighted composite CN's for each basin were calculated in the modeling software using the distribution of the land use and soils coverages within each Project Watershed.

Six land use types were used for current conditions and a seventh was added for proposed conditions to help determine the composite curve numbers for each Project Watershed at the project site. Land cover maps were generated by NVVE based on interpretation of Napa County digital ortho-photos from 2011. Land cover types found within the Project Watersheds are shown in NVVE's Drainage Area and Land Use Maps (Figure 2a-d).

HydroCAD references Tables 2-2 a-d in the TR-55 guidance manual which provide runoff curve numbers for varying types of land uses (USDA, 1986). All Curve numbers for undeveloped and developed land uses (excluding vineyards) selected by NVVE are consistent with values found in Tables 2-2 a-d. Additional values used for existing and proposed vineyards are consistent with those found in Exhibit 2.1-3 "Runoff Curve Numbers for Hydrologic Soil-Cover Complexes" (NRCS, 2008). Undeveloped land use types used were "Woods", "Brush" and "Pasture/Grassland/Range" and are consistent with values found in Table 2-2c "Runoff curve numbers for other agricultural lands". The "Woods" cover type was given a "good" hydrologic condition ("good" conditions encourage average and better than average infiltration and tend to decrease runoff). "Pasture/Grassland/Range" and "Brush" were in "Fair" condition[1]. "Fair" hydrologic cover condition is defined by 50 to 75% ground cover; this hydrologic condition corresponds qualitatively with moderate infiltration and moderate runoff rates. In contrast, "good" cover condition corresponds qualitatively with high infiltration and low runoff rates. For developed land use types, all paved and gravel roads, buildings and developed areas located in the residential lots along Cold Springs Road were given values consistent with those found in Table 2-2a "Runoff curve numbers for urban areas".

In the ECP project narrative, Item 6 in the Permanent erosion control measures section states:

> ...a permanent cover crop shall be planted within the new vineyard blocks...In Blocks A thru *(sic)* D, the cover crop may be mowed and spot sprayed around the base of each vine using springtime applications of post-emergent contact sprays…In Block E, the cover crop may be mowed, but NO SPRAYING shall occur within Block E. As a normal cultural practice no disking, ripping or other tillage shall occur within the vineyard once the permanent cover crop has been established. No areas outside the vineyard blocks, including avenues and turnspaces, shall be disked or sprayed at

[1] Observations of canopy and ground cover in the "Brush" vegetation typed during a May 6, 2015 field conference on-site including representatives of NVVE, OEI, PBES and Napa County Resource Conservation District, indicated that vegetation canopy cover was 75% and that ground cover was 60%. There was a significant proportion of bedrock exposure at the soil surface in the "Brush" vegetation with a thin veneer of soil overlying the bedrock in general. A consensus was reached regarding these cover classifications for soil-loss modeling, which was the subject of the field meeting. These observations also substantiate the assignment of "Fair" hydrologic cover as requested in a comment on the THP/TCP contained in an e-mail dated 9/12/2016 from Mike Napolitano to Kevin Brown, (both staff members of the San Francisco Bay Regional Water Quality Control Board) and subsequently transmitted to the project design team for response. The SFBRWQCB e-mail and NVVE's response pertaining to this issue are attached in Appendix F.

> any time. Using this method, a minimum ground cover of 80% will be obtained each winter in Blocks A thru D, and a minimum of 85% will be obtained in Block E." (See Appendix B, ECP Sheet 1).

To simulate the minimum proposed no-till permanent 80% cover with spot spray land use the "Annual grass" cover type was chosen from Exhibit 2.1-3 (pg. 2.1-7) (NRCS, 2008). These values have become the standard for modeling land cover in vineyards in Napa County and are recommended by the Napa Resource Conservation District. The "Annual grass" land use type was assumed to have a “good” hydrologic condition. For the existing vineyard land use a “fair” hydrologic condition was conservatively applied because vineyard practices on the neighboring parcel are unknown.

OEI made a visit to the Project site in the spring of 2015 to investigate current land cover conditions. The land use classifications selected by NVVE have been reviewed by Napa County and the Napa RCD and are consistent with conditions observed during the site visit (see footnote on preceding page for additional details).

Soils data were obtained from the 1978 United States Department of Agriculture Soil Conservation Service Soils map for Napa County (Lambert and Kashiwagi, 1978; see NVVE ECP Sheet 2, Appendix B) and confirmed by reference to the USDA Web Soil Survey per review policy of PBES. The hydrologic soil group classification is based on the minimum infiltration rate obtained for bare soil after prolonged wetting (USDA, 1986). Soils mapped at the site and within the contributing drainage areas are Forward gravelly loam (139 and 140) and the Kidd loam (155). The Forward gravely loam soils are categorized in hydrologic soil group B described as having "moderately low runoff potential when thoroughly wet" (USDA, 2007). The Kidd loam is in hydrologic soil group D which has "high runoff potential when thoroughly wet" (USDA, 2007). In preparation for planting all soils within the proposed vineyard areas will be ripped and tilled (See Appendix B-ECP Sheet 1) to a depth of 36 inches.[2]

Area-weighted composite curve numbers for each basin were calculated in the HydroCAD software using the distribution of the land use and soils coverages within each Project Watershed. Runoff Curve Number summaries generated by HydroCAD for both existing and proposed conditions are provided in Appendix A of NVVE’s Hydrology Study (Appendix A).

Hydraulic Parameters

Time of concentration (T_c) is the time required for runoff to travel to a point of interest from the hydraulically most distant point of the watershed. Time of concentration is the sum of travel times for each flow segment representing flow types beginning with sheet flow, transitioning to shallow concentrated flow, followed by a transition to open channel flow. Flow paths were determined by NVVE for the pre-and post-project scenarios and are displayed in Drainage Area and Land Use Maps (Figure 2a-

[2] Although there is reason to expect that this site preparation activity would reduce runoff rates and increase infiltration rates for Kidd loam soils with shallow bedrock, concerns were raised regarding Erosion Control Plan development that assumes any change in soil hydrologic characteristics in a comment on the THP/TCP contained in an e-mail dated 9/12/2016 from Mike Napolitano to Kevin Brown, (both staff members of the San Francisco Bay Regional Water Quality Control Board) and subsequently transmitted to the project design team for response. The SFBRWQCB e-mail is attached in Appendix F. To address this concern, the project design team elected to modify the Erosion Control Plan assuming no change in Hydrologic Soil Group resulting from soil preparation. The resulting ECP is expected to be very conservative with respect to potential increases in runoff rates because it is likely that substantial reductions in runoff and increases in infiltration to these soils is likely to occur.

d). Detailed summaries of the T_c calculations for each project Watershed are presented in the HydroCAD summary reports in the appendix of NVVE's Hydrology Study (Appendix A). HydroCAD employs all TR-55 methods in the determination of T_c, a description of these methods can be found in Chapter 3 of the TR-55 Manual (USDA, 1986).

The maximum length of sheet flow allowed in the runoff model by NVVE was 100 ft, after which it was presumed that shallow concentrated flow begins and continues until open channel flow begins. Open channel flow occurs in Project Watersheds 1 – 6. Channel flow within Project Watersheds 1 – 4 occurs within Conn Creek while in Project Watersheds 5 and 6 channel flow is within unnamed tributaries to Conn Creek. Flows in the remaining Project Watersheds all were a combination of sheet flow and shallow concentrated flow.

Sheet flow and open channel flow T_c calculations are made using Manning's kinematic solution and Manning's equation respectively. Flow lengths and slopes were calculated by the HydroCAD software; other specific channel characteristics are required as inputs by the modeler. Manning's roughness values are required to calculate T_c for sheet flow and open channel flow. Table 3-1 in the TR-55 Manual (USDA, 1986) provides roughness coefficients for various sheet flow surface types. NVVE choose a roughness value of 0.24 for sheet flows in grassland and vineyard fields which corresponds to the "Dense Grass" category in Table 3-1. For sheetflow within woods or shrubs Manning's roughness of 0.4 was used which corresponds to the "Woods: Light underbrush" category in Table 3-1. Shallow concentrated flow did not require a roughness value to calculate T_c as its velocity is determined from a relationship defined in the TR-55 manual and presented in Figure 3-1 (USDA, 1986). Flow paths for existing and proposed conditions are displayed in NVVE's Drainage Area and Land Use Maps (Figure 2 a-d).

For the open channel flow segments in the natural channel, time of concentration is based on average flow velocity at bankfull depth, so all roughness values should be assigned in that context. Roughness of 0.04 was assigned for the natural channel by NVVE. A roughness value of 0.04 is appropriate for "mountain streams with rocky beds and rivers with variable sections and some vegetation along banks" (Table 16-1, Dunne and Leopold, 1978, p. 593).

Flows passing through proposed diversion ditches are expected to be slowed which will increase the T_c in the affected watersheds. NVVE notes in its Hydrology study (Appendix A, page 3):

> The increased time of concentration typically reduces peak flows at the POI, so this analysis conservatively excludes the ditching from the modeling, unless the ditches outlet to a pipe. Because piping will tend to increase rate of flow, the blocks that include piping are broken into smaller subareas created by the diversion ditches and flow is modeled through the pipes to the attenuation basins.

This conservative assumption (neglecting the effects of diversion ditches on overall flow velocity) should result in slightly higher post-Project peak flows ensuring that attenuation basin designs will tend to be designed with excess capacity and the system as a whole will provide a greater amount of protection against increases in peak flows. This conservative assumption adds to the conservative assumption neglecting the likely effects of preparation of Kidd soils for vineyard planting that are expected to reduce runoff rates.

Subareas with flows through piping include those in Watershed 1 (Subareas 1a and 1b), Watershed 3 (Subareas 3a), Watershed 4 (Subareas 4a and 4b), Watershed 6 (Subareas 6a ad 6b), Watershed 7

(subareas 7a, 7b, and 7c) and Watershed 8 (Subareas 8c, 8d1, 8d2, 8d3, 8d4, 8d5 and 8d6). Flows through these pipes were modeled as open channel flow in the HydroCAD software. As mentioned above open channel flow is calculated by solving Manning's equation. Required inputs include pipe slope, length and dimensions along with a Manning's roughness value. All piping proposed in the ECP were assigned a Manning's roughness coefficient of 0.013. This value is appropriate as it is consistent with estimated n values published by Barfuss (1988).

Infrastructure Sizing

As previously mentioned, the project area drains into the municipal watershed of Conn Creek. Consequently, all Project drainage infrastructure must be sized to accommodate 100-year recurrence interval peak flow. At the request of Napa County, calculations were made by NVVE to demonstrate the proposed diversion ditches, drainage pipes, sediment basins and attenuation basins were sized appropriately. Appendix D contains the Drainage Facility Analysis by NVVE which discusses the calculations and results. All calculations were performed in HydroCAD and results demonstrated that all infrastructure was appropriately sized.

Runoff Attenuation

Initial analyses with HydroCAD predicted increases in runoff from the Project site owing to changes in vegetative cover from grassland and woodland to cultivated vineyard. It was determined that seven attenuation basins would be required to prevent increases in peak runoff. Descriptions of attenuation basin dimensions and outlet structures are found below; basin locations and detailed plans are located on sheets 2 and 3 of NVVE's ECP (Appendix B).

The effects of the attenuation basins on peak flows were evaluated using the storage indication method. The storage indication method requires numerical relationships between depth and storage volume and depth and outflow to quantify flow through an attenuation basin. The effects of the attenuation basin storage were evaluated in HydroCAD which performs the storage indication calculations. Detailed inputs and output reports for each attenuation basin are summarized in HydroCAD model summary outputs included with NVVE's Hydrology study in Appendix A.

Erosion potential associated with outflows from attenuation basins is mitigated. Attenuation basins were located near naturally occurring points of runoff concentration, and outflows from the basins are released in locations very near the naturally occurring points of concentration. Level spreaders or energy dissipaters are used to mitigate potential surface erosion where attenuated runoff is released and re-joins natural drainageways via short flow paths. Because peak flows are reduced by attenuation basin function, erosion potential in the natural drainageways are reduced providing additional mitigation of erosion potential between level spreaders/energy dissipaters and natural drainageways. Descriptions of attenuation basins are provided below.

Attenuation Basin 1 is in the western portion of proposed Vineyard Block A1 within Project Watershed 1 (NVVE ECP sheet 2 in Appendix B and NVVE Hydrology Study in Appendix A). The proposed storage volume is approximately 0.88 acre-feet. The outlet structures proposed include a 6-inch diameter outlet pipe placed 7 feet above the base of the basin and an 8-inch diameter drop inlet 5 feet above the pond bottom directed into a 6-inch diameter pipe flowing to a level flow spreader located at the proposed vineyard boundary. Outflow from the pipe and flow spreader would traverse a 35-ft wide strip of undisturbed, gently sloping ground to an existing Class III stream. There is no change in erosion potential because the

attenuation basin prevents an increase in peak runoff and the location where attenuated flows are released consistent with pre-project drainage patterns. Figure 3a shows inflow and outflow hydrographs for the 2-year and 100-year 24-hour storm events passing through Attenuation Basin 1.

Attenuation Basin 2 is in the southeast portion of proposed Vineyard Block A1 within Project Watershed 3 (NVVE ECP Sheet 2 in Appendix B and NVVE Hydrology Study in Appendix A). The proposed storage volume is approximately 0.30 acre-feet. The outlet structures proposed are a 12-inch diameter drop inlet 5 feet above the pond bottom directed into an 8-inch diameter pipe flowing to a level flow spreader located at the proposed vineyard boundary. From this outlet, sheetflow would cross an existing undisturbed planar slope of about 30% over a distance of about 320 feet to Conn Creek. The location of release of attenuated flows are consistent with pre-project drainage patterns. There is no change in erosion potential because the attenuation basin prevents an increase in peak runoff. Figure 3b shows inflow and outflow hydrographs for the 2-year and 100-year 24-hour storm events passing through Attenuation Basin 2.

Attenuation Basin 3 is in proposed Vineyard Block A2 within Project Watershed 4 (NVVE ECP sheet 2 in Appendix B and NVVE Hydrology Study in Appendix A). The proposed storage volume is approximately 0.16 acre-feet. The outlet structures proposed is a 6-inch diameter pipe penetrating the downhill berm of the basin 3.5 feet above the pond floor discharging to a level flow spreader. From this outlet, sheetflow would cross an existing undisturbed divergent slope of about 25% over a distance of about 100 feet transitioning to a planar slope of about 50% immediately adjacent to Conn Creek. The location of release of attenuated flows is consistent with pre-project drainage patterns. There is no change in erosion potential because the attenuation basin prevents an increase in peak runoff. Figure 3c shows inflow and outflow hydrographs for the 2-year and 100-year 24-hour storm events passing through Attenuation Basin 3.

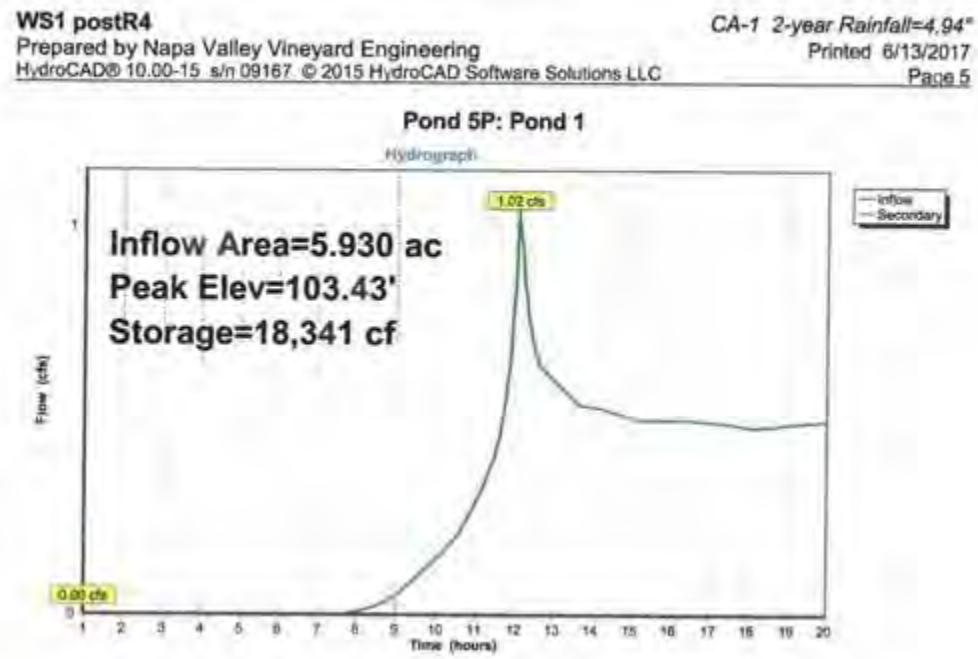
Attenuation Basin 4 is in proposed Vineyard Block D1 within Project Watershed 6 (NVVE ECP sheet 2 in Appendix B and NVVE Hydrology Study in Appendix A). The proposed storage volume is approximately 0.12 acre-feet. The outlet structure proposed is a 6-inch diameter pipe penetrating the downhill berm of the basin 4.25 feet above the pond floor discharging to a level flow spreader. From this outlet, sheetflow would cross an existing undisturbed planar slope of about 21% over a distance of about 120 feet before reaching a Class III stream. The location of release of attenuated flows is consistent with pre-project drainage patterns. There is no change in erosion potential because the attenuation basin prevents an increase in peak runoff. Figure 3d shows inflow and outflow hydrographs for the 2-year and 100-year 24-hour storm events passing through Attenuation Basin 4.

Attenuation Basin 5 is in proposed Vineyard Block D1 south of Attenuation Basin 4 within Project Watershed 6 (NVVE ECP sheet 2 in Appendix B and NVVE Hydrology Study in Appendix A). The proposed storage volume is approximately 0.14 acre-feet. The outlet structure proposed is a 6-inch diameter pipe penetrating the downhill berm of the basin 4 feet above the pond floor discharging to a rock energy dissipater. From this outlet, attenuated flow would be routed to the same swale that it would have reached under pre-project conditions without additional concentration. There is no change in erosion potential because the attenuation basin prevents an increase in peak runoff. Figure 3e shows inflow and outflow hydrographs for the 2-year and 100-year 24-hour storm events passing through Attenuation Basin 5.

Attenuation Basin 6 is in proposed Vineyard Block D1 and within Project Watershed 8 (NVVE ECP Sheet 2 in Appendix B and NVVE Hydrology Study in Appendix A). The proposed storage volume is approximately

0.27 acre-feet. The outlet structures proposed are a 6-inch diameter pipe penetrating the downhill berm of the basin 3.5 feet above the pond floor and one 8-inch diameter drop inlet 5 feet above the pond bottom directed into an 8-inch diameter pipe flowing to a level spreader located at the proposed vineyard boundary. The location of release of attenuated flows is consistent with pre-project drainage patterns. Runoff from the level spreader will flow down a mildly convergent swale with a 10% slope for 450 ft where it meets a Class III channel. There is no change in erosion potential because the attenuation basin prevents an increase in peak runoff. Figure 3f shows inflow and outflow hydrographs for the 2-year and 100- year 24-hour storm events passing through Attenuation Basin 6.

Attenuation Basin 7 is in proposed Vineyard Block E and within Project Watershed 8 (NVVE ECP Sheet 2 in Appendix B and NVVE Hydrology Study in Appendix A). The proposed storage volume is approximately 0.93 acre-feet. The outlet structures proposed are a 6-inch diameter pipe penetrating the downhill berm of the basin 5.5 feet above the pond floor and one 15-inch diameter drop inlet 6 feet above the pond bottom directed into a 10-inch diameter pipe flowing to an energy dissipater located at the proposed vineyard boundary. Runoff from the energy dissipater will enter a Class III channel located about 35 ft from the dissipater and will drain across a very gentle slope. The location of release of attenuated flows is consistent with pre-project drainage patterns. There is no change in erosion potential because the attenuation basin prevents an increase in peak runoff. Figure 3g shows inflow and outflow hydrographs for the 2-year and 100- year 24-hour storm events passing through Attenuation Basin 7.



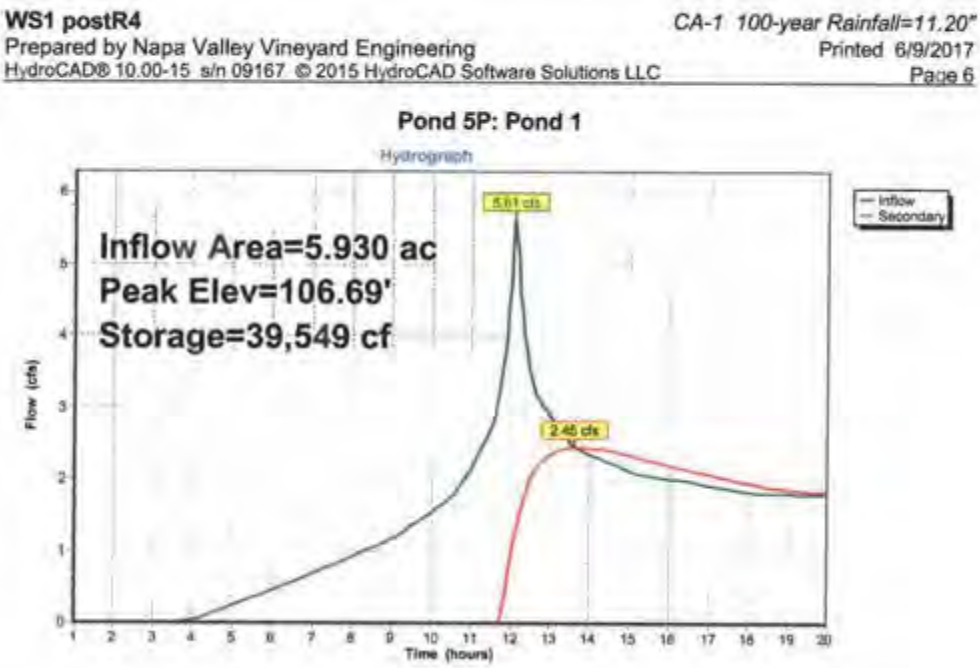
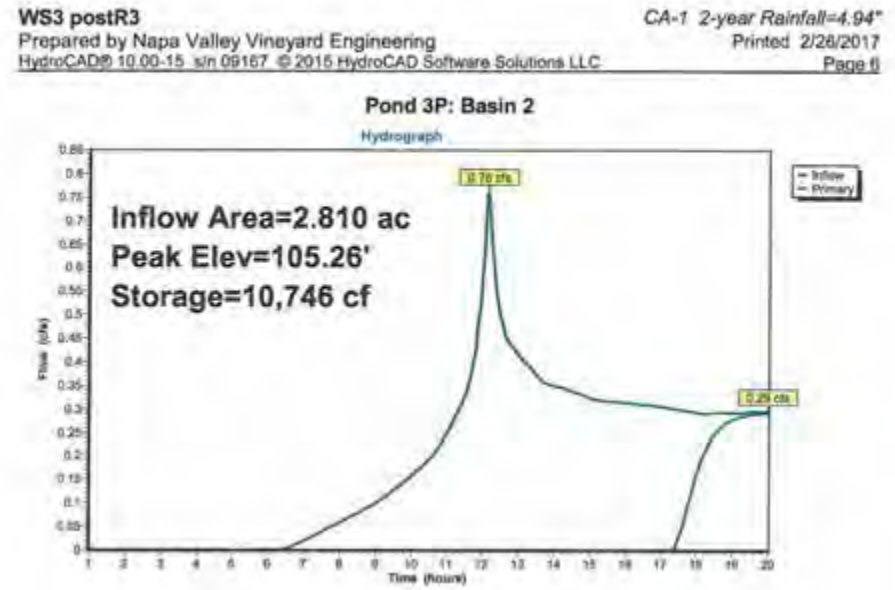


Figure 3a. Inflow and Outflow Discharge Hydrographs for the 2 yr- (top) and 100 yr (bottom) -24-hour storm events for Attenuation Basin 1.



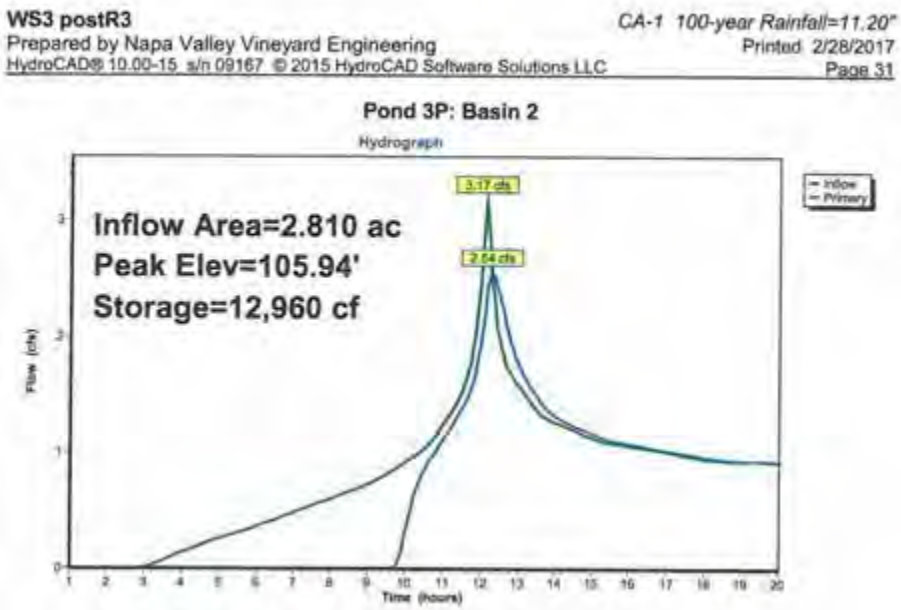
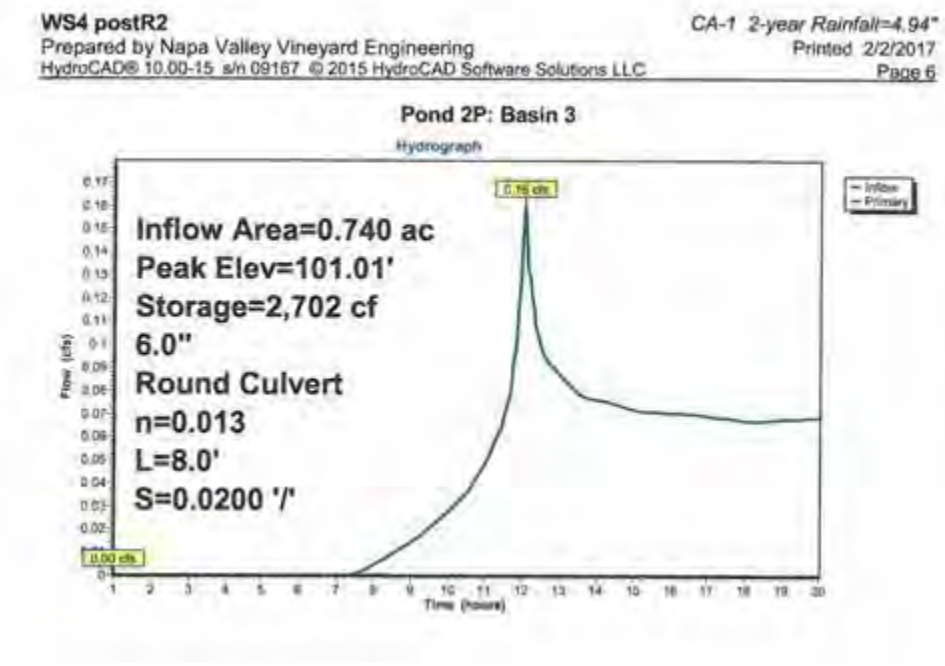


Figure 3b. Inflow and Outflow Discharge Hydrographs for the 2 yr- (top) and 100 yr (bottom)-24-hour storm events for Attenuation Basin 2.



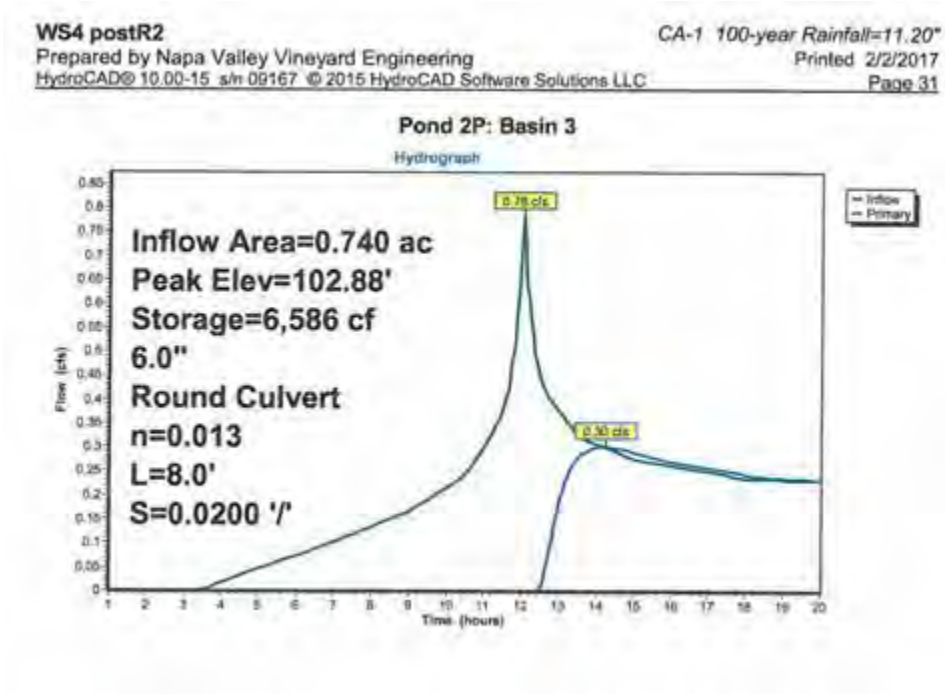
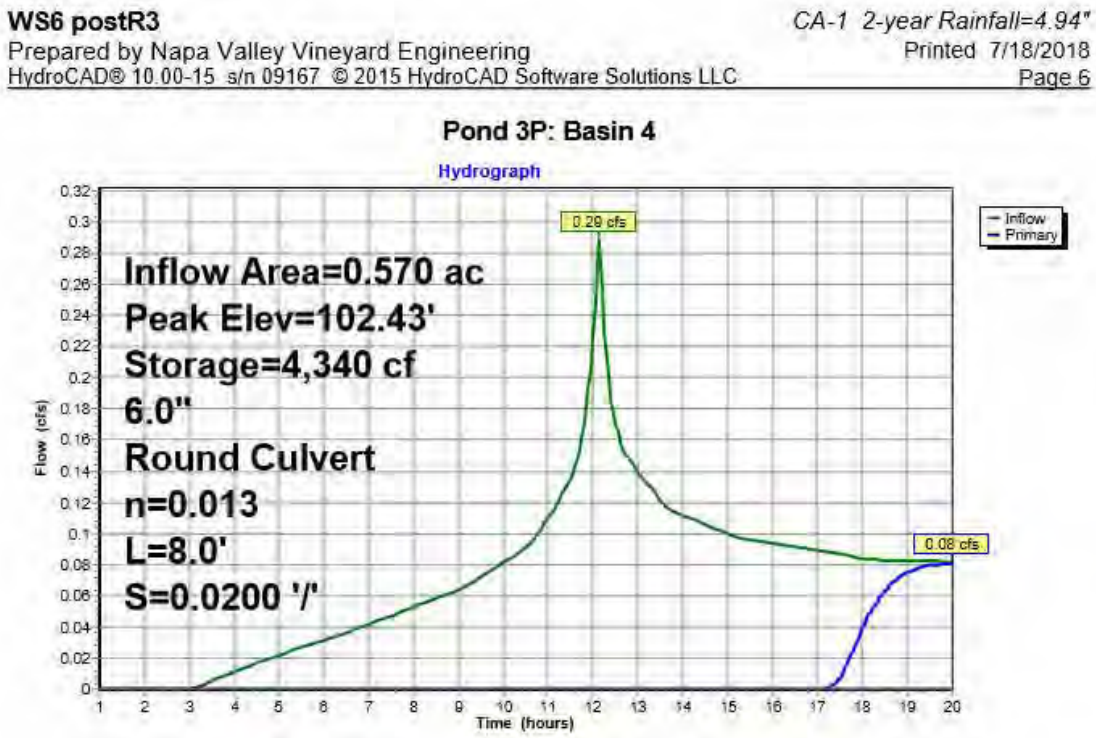


Figure 3c. Inflow and Outflow Discharge Hydrographs for the 2 yr- (top) and 100 yr-(bottom) 24-hour storm events for Attenuation Basin 3.



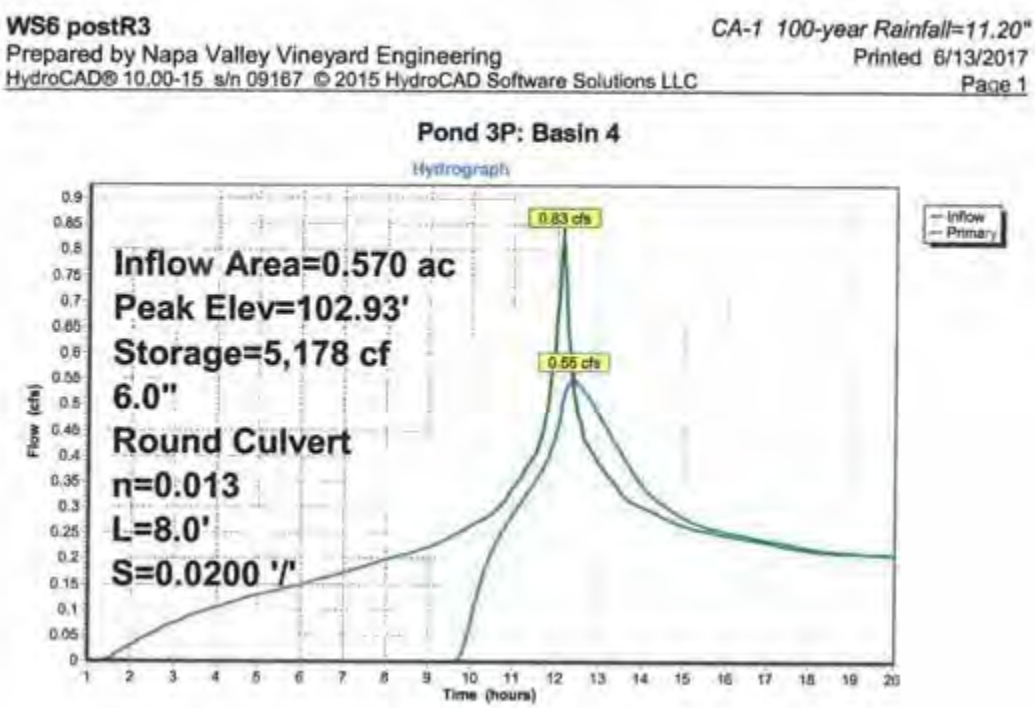
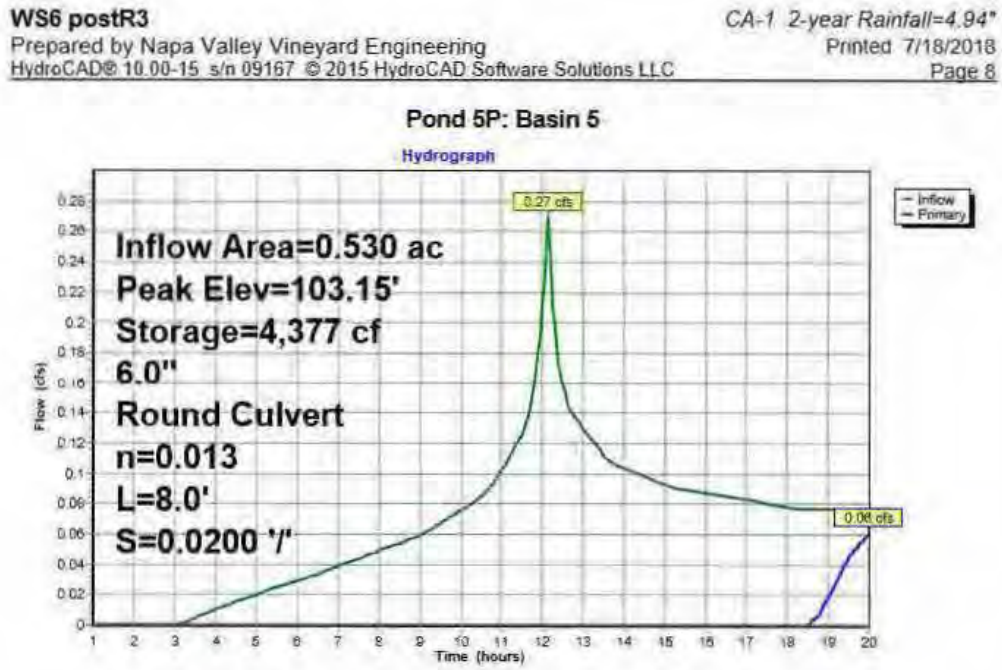


Figure 3d. Inflow and Outflow Discharge Hydrographs for the 2 yr- (top) and 100 yr (bottom)-24-hour storm events for Attenuation Basin 4.



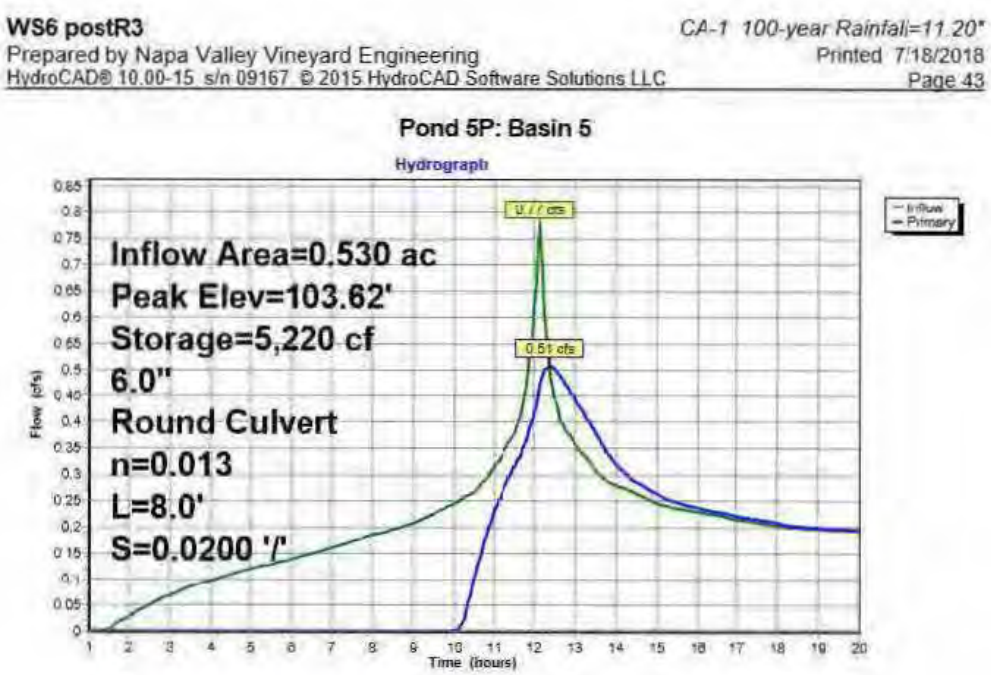
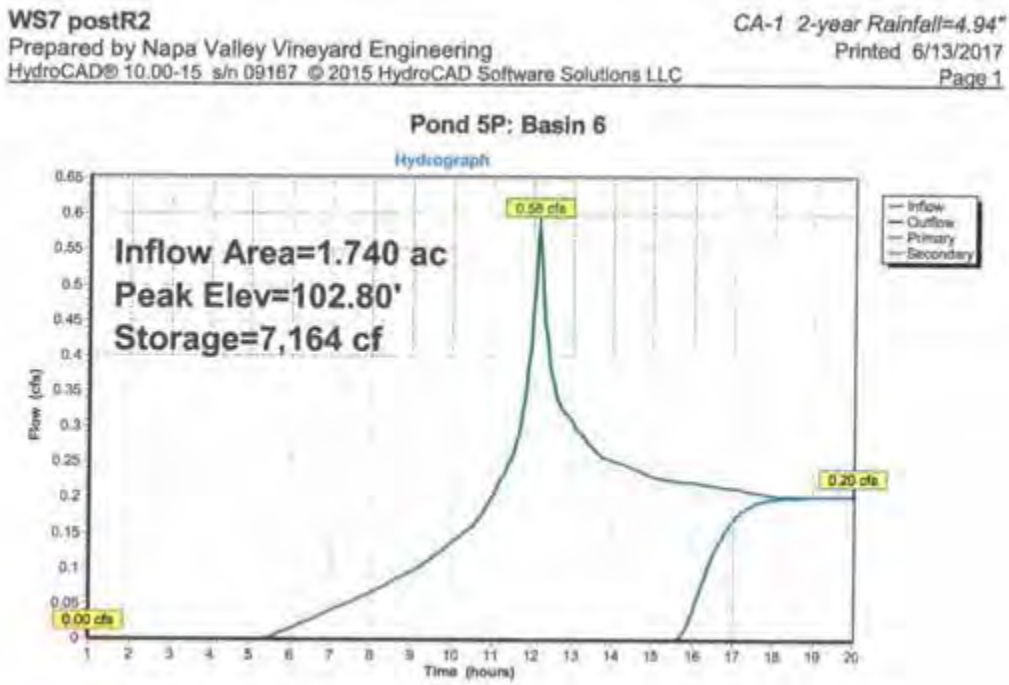


Figure 3e. Inflow and Outflow Discharge Hydrographs for the 2 yr- (top) and 100 yr (bottom)-24-hour storm events for Attenuation Basin 5.



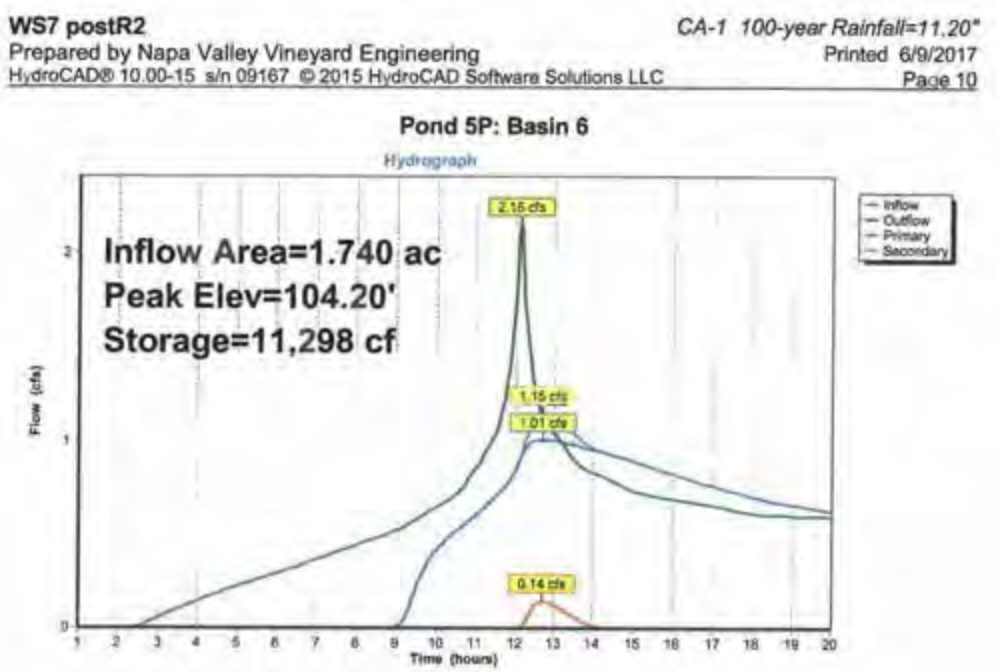


Figure 3f. Inflow and Outflow Discharge Hydrographs for the 2 yr- (top) and 100 yr (bottom)-24-hour storm events for Attenuation Basin 6.

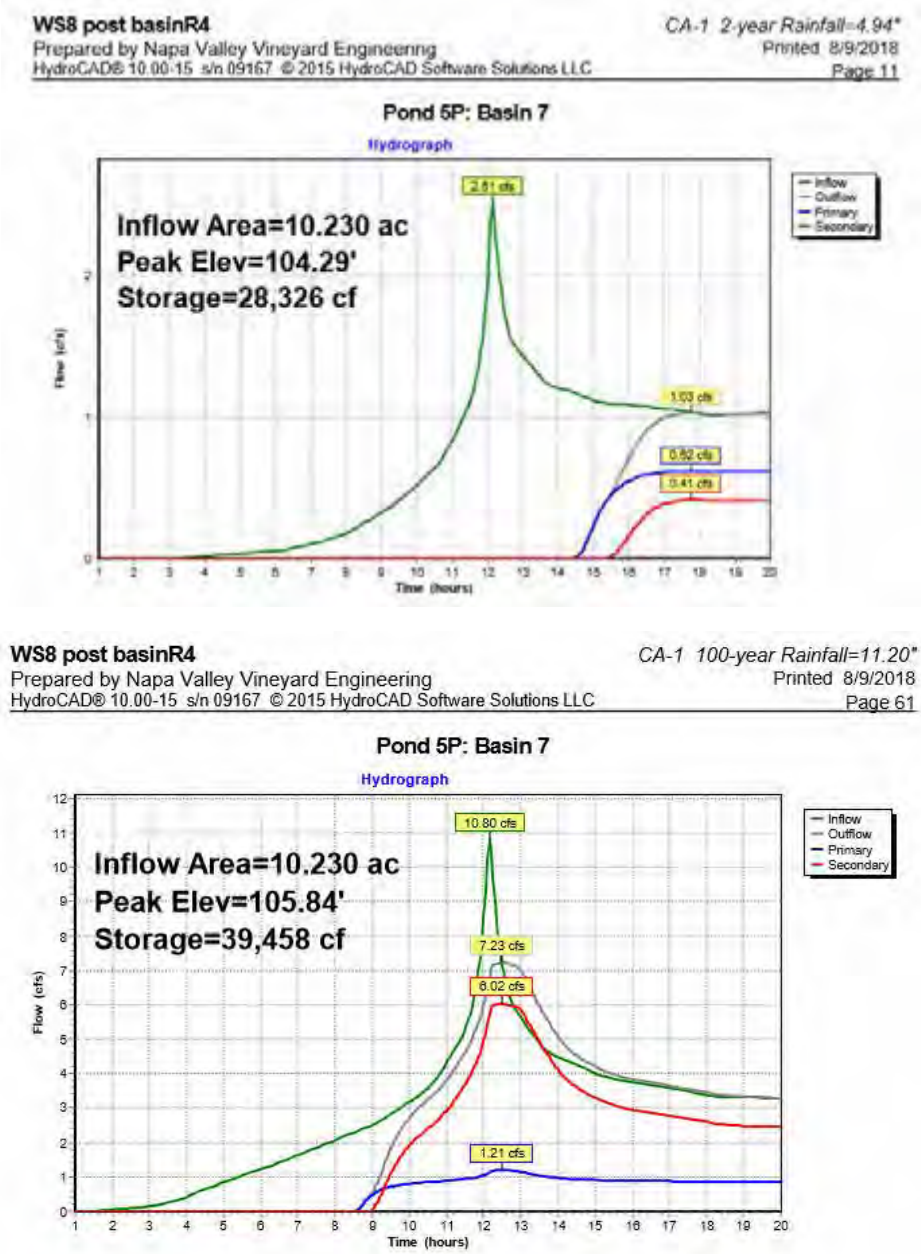


Figure 3g. Inflow and Outflow Discharge Hydrographs for the 2 yr- (top) and 100 yr (bottom)-24-hour storm events for Attenuation Basin 7.

Results

Peak flows were computed for all rainfall events in HydroCAD using the SCS TR-20-unit hydrograph method (HydroCAD, 2015). The effects on flow of the proposed attenuation basins were also computed using the flow indication method in HydroCAD. A summary of calculations including specific model inputs, resultant hydrographs and detailed parameters used to evaluate effects of the attenuation basins are included in the HydroCAD reports found in Appendix A.

Change in peak flows for the individual basins varies substantially as can be seen in Tables 4 through 12 below. Under post-project conditions changes in land cover and flow paths, post-project peak flows decreased or remained the same in three of the nine project watersheds (2, 5, and 9). In watershed areas where post-project conditions caused increases in peak runoff, flow attenuation basins were employed to reduce the post-project discharges to meet Napa County standards.

A comparison of the peak flows for each storm event analyzed is presented for each Project Watershed in Tables 4 through 12. Drainage nodes are defined at the outlet points associated with the Watersheds (Drainage Area and Land Use Maps, Figure 2a-e). Without the proposed attenuation basins changes in peak runoff in Project Watersheds 1 ,3, 4, 6, 7, and 8 range from 2.3% (100-year 24-hour event in Watershed 3) to 97% (2-year 24-hour event in Watershed 1). With attenuation basins, change in peak runoff over the entire Project area ranges from -64.2% (2-year 24-hour event in Watershed 1) to 0% (2-year 24-hour event in Watershed 1) under proposed Project conditions.

It should be noted that changes in drainage patterns due to proposed diversion ditches create changes in watershed boundaries in four of the nine project watersheds (1, 2, 4, and 5). Project Watershed 1 increases in size from pre-project conditions by 1.43 acres (25%) while the neighboring Watershed 2 decreases in size by 1.43 acres (23%) due to a proposed diversion ditch (Figure 2c). Although this change is a moderate portion of each watershed area the increased flows at the point of interest for Project Watershed 1 (Figure 2 a & c) is nevertheless mitigated by proposed Attenuation Basin 1 as shown by the results in Table 4 where changes in peak flows are negative for all storm events. Project Watershed 4 increases in size from pre-project conditions by 0.11 acres (5%) while the neighboring Watershed 5 decreases in size by 0.11 acres (1%) due to a proposed diversion ditch (Figure 2c). The additional area draining into Watershed 4 increases flow to the point of interest for Project Watershed 4 to some degree, but this is mitigated by the effects of proposed Attenuation Basin 3.

Project Watershed 1 runoff is summarized in Table 4 and shows increases in peak flows ranging from 2.59 cfs or 55% (100-year 24-hour event) to 0.65 cfs or 97% (2-year 24-hour event) under proposed conditions without flow attenuation. A decrease in peak flows was calculated ranging from -0.44 cfs or -32.8% (5-year 24-hour event) to -0.89 cfs or -18.9% (100-year 24-hour event) under proposed conditions with flow attenuation provided by Attenuation Basin 1.

Project Watershed 2 runoff is summarized in Table 5 and shows decreases in peak flows ranging from -0.01 cfs or -0.7% (2-year 24-hour event) to -0.86 cfs or -13.5% (100-year 24-hour event) under proposed conditions with no flow attenuation. In this watershed, relatively poor ground cover is present under with existing vegetation (shrubs) in most of the area where vineyard development is proposed and ground cover improves under project conditions because of grass cover crops. A reduction of drainage area due to proposed diversions in the northern portion of Block A1 and this change in cover type reduces runoff without the need for an attenuation basin.

Project Watershed 3 runoff is summarized in Table 6 and shows an increase in peak flows ranging from 0.28 cfs or 10.7% (2-year 24-hour event) to 0.32 cfs or 3.9% (25-year 24-hour event) under proposed conditions without flow attenuation. A decrease in peak flows was calculated ranging from -0.51cfs or -8.8% (10-year 24-hour event) to -0.16 cfs or -2.0% (25-year 24-hour event) under proposed conditions with flow attenuation provided by Attenuation Basin 2.

Project Watershed 4 runoff is summarized in Table 7 and shows increased peak flows ranging from 0.14 cfs or 46.7% (2-year 24-hour event) to 0.45 cfs or 23.2% (100-year 24-hour event) under proposed conditions without flow attenuation. A decrease in peak flows was calculated ranging from -0.03 cfs or -10.0% (2-year 24-hour event) to -0.08 cfs or -13.8% (5-year 24-hour event) under proposed conditions with flow attenuation provided by Attenuation Basin 3.

Project Watershed 5 runoff is summarized in Table 8 and shows decreases in peak flows ranging from -0.19 cfs or -5% (2-year 24-hour event) to -0.34 cfs or -2.6% (100-year 24-hour event) under proposed conditions with no flow attenuation. In this watershed, relatively poor ground cover is present under existing vegetation (shrubs) where vineyard development is proposed and ground cover improves under project conditions because of grass cover crops. A small reduction in watershed area due to proposed diversions along with this change in cover type reduces runoff without the need for an attenuation basin.

Project Watershed 6 runoff is summarized in Table 9 and shows increases in peak flows ranging from 0.24 cfs or 11% (2-year 24-hour event) to 0.51 cfs or 8% (100-year 24-hour event) under proposed conditions without flow attenuation. A zero change or a decrease in peak flows was calculated for all rainfall events. Decreases in peak flows range from -0.03 cfs or -0.50% (100-year 24-hour event) to -0.22 cfs or -7.6% (5-year 24-hour event) under proposed conditions with flow attenuation provided by Attenuation Basins 4 and 5.

Project Watershed 7 runoff is summarized in Table 10 and shows increases in peak flows ranging from 0.39 cfs or 24.8% (2-year 24-hour event) to 0.99 cfs or 16.5% (100-year 24-hour event) under proposed conditions without flow attenuation. A zero change or a decrease in peak flows was calculated for all rainfall events. Decreases range from -0.01 cfs or -0.3% (10-year 24-hour event) to -0.05 cfs or -1.0% (50-year 24-hour event) under proposed conditions with flow attenuation provided by Attenuation Basin 6.

Project Watershed 8 runoff is summarized in Table 11 shows increased peak flows ranging from 0.78 cfs or 10.2% (2-year 24-hour event) to 1.51 cfs or 3.8% (100-year 24-hour event) under proposed conditions without flow attenuation. A decrease in peak flows was calculated ranging from -1.02 cfs or -13.4% (2-year 24-hour event) to -3.53 cfs or -8.9% (100-year 24-hour event) under proposed conditions with flow attenuation provided Attenuation Basin 7.

Node 9 (Project Watershed 9) is summarized in Table 12 and shows no change in peak flows under proposed conditions compared to existing pre-project conditions. The relatively high proportion of impermeable surfaces (roofs and pavement) in this watershed renders it insensitive to the relatively small degree of change in runoff that could occur from changes in cover associated with vineyard development.

Table 4. Composite peak flow comparison for Project Watershed 1. Pre-Project area: 5.82 acres, Post-Project area: 7.25 acres.

24 Hour Rainfall Event	Peak Runoff Existing Conditions (CFS)	Peak Runoff Proposed Conditions without Attenuation (CFS)	% Change	Peak Runoff Proposed Conditions with Attenuation (CFS)	% Change
2 Year	0.67	1.32	97.0%	0.24	-64.2%
5 Year	1.34	2.35	75.4%	0.9	-32.8%
10 year	1.97	3.29	67.0%	1.55	-21.3%
25 Year	2.98	4.79	60.7%	2.24	-24.8%
50 Year	3.81	6	57.5%	2.93	-23.1%
100 Year	4.7	7.29	55.1%	3.81	-18.9%

Table 5. Composite peak flow comparison for Project Watershed 2; no attenuation required. Pre-Project area: 6.22 acres, Post-Project area: 4.79 acres.

24 Hour Rainfall event	Existing Conditions Q (CFS)	Proposed Conditions Without Attenuation Q (CFS)	% Change
2 Year	1.37	1.36	-0.7%
5 Year	2.27	2.13	-6.2%
10 year	3.07	2.80	-8.8%
25 Year	4.33	3.85	-11.1%
50 Year	5.28	4.66	-11.7%
100 Year	6.37	5.50	-13.7%

Table 6. Composite peak flow comparison for Project Watershed 3. No change in Watershed 3 area.

24 Hour Rainfall Event	Peak Runoff Existing Conditions (CFS)	Peak Runoff Proposed Conditions without Attenuation (CFS)	% Change	Peak Runoff Proposed Conditions with Attenuation (CFS)	% Change
2 Year	2.61	2.89	10.7%	2.42	-7.3%
5 Year	4.31	4.61	7.0%	3.88	-10.0%
10 year	5.81	6.13	5.5%	5.30	-8.8%
25 Year	8.18	8.50	3.9%	8.02	-2.0%
50 Year	10.05	10.35	3.0%	9.84	-2.1%
100 Year	12.02	12.30	2.3%	11.67	-2.9%

Table 7. Composite peak flow comparison for Project Watershed 4. Pre-Project area: 2.16 acres, Post-Project area: 2.27 acres.

24 Hour Rainfall Event	Peak Runoff Existing Conditions (CFS)	Peak Runoff Proposed Conditions without Attenuation (CFS)	% Change	Peak Runoff Proposed Conditions with Attenuation (CFS)	% Change
2 Year	0.3	0.44	46.7%	0.27	-10.0%
5 Year	0.58	0.78	34.5%	0.50	-13.8%
10 year	0.83	1.09	31.3%	0.76	-8.4%
25 Year	1.24	1.58	27.4%	1.20	-3.2%
50 Year	1.58	1.96	24.1%	1.51	-4.4%
100 Year	1.94	2.39	23.2%	1.88	-3.1%

Table 8. Composite peak flow comparison for Project Watershed 5; no attenuation required. Pre-Project area: 10.14 acres, Post-Project area: 10.03 acres.

24 Hour Rainfall Event	Peak Runoff Existing Conditions (CFS)	Peak Runoff Proposed Conditions without Attenuation (CFS)	% Change
2 Year	3.80	3.61	-5.0%
5 Year	5.59	5.36	-4.1%
10 year	7.11	6.85	-3.7%
25 Year	9.42	9.13	-3.1%
50 Year	11.20	10.88	-2.9%
100 Year	13.04	12.70	-2.6%

Table 9. Composite peak flow comparison for Project Watershed 6;. No change in Watershed 6 area.

24 Hour Rainfall Event	Peak Runoff Existing Conditions (CFS)	Peak Runoff Proposed Conditions without Attenuation (CFS)	% Change	Peak Runoff Proposed Conditions with Attenuation (CFS)	% Change
2 Year	2.04	2.28	11.8%	1.86	-8.8%
5 Year	2.89	3.2	10.7%	2.67	-7.6%
10 year	3.61	3.96	9.7%	3.38	-6.4%
25 Year	4.7	5.1	8.5%	4.64	-1.3%
50 Year	5.51	5.96	8.2%	5.51	0.0%
100 Year	6.36	6.87	8.0%	6.33	-0.5%

Table 10. Composite peak flow comparison for Project Watershed 7. No change in Watershed 7 area.

24 Hour Rainfall Event	Peak Runoff Existing Conditions (CFS)	Peak Runoff Proposed Conditions without Attenuation (CFS)	% Change	Peak Runoff Proposed Conditions with Attenuation (CFS)	% Change
2 Year	1.57	1.96	24.8%	1.57	0.0%
5 Year	2.4	2.94	22.5%	2.38	-0.8%
10 year	3.12	3.75	20.2%	3.11	-0.3%
25 Year	4.23	5.01	18.4%	4.23	0.0%
50 Year	5.09	5.98	17.5%	5.04	-1.0%
100 Year	5.99	6.98	16.5%	5.96	-0.5%

Table 11. Composite peak flow comparison for Project Watershed 8. No change in Watershed area.

24 Hour Rainfall Event	Peak Runoff Existing Conditions (CFS)	Peak Runoff Proposed Conditions without Attenuation (CFS)	% Change	Peak Runoff Proposed Conditions with Attenuation (CFS)	% Change
2 Year	7.62	8.4	10.2%	6.6	-13.4%
5 Year	13.25	14.23	7.4%	11.48	-13.4%
10 year	18.31	19.43	6.1%	16.69	-8.8%
25 Year	26.39	27.65	4.8%	24.83	-5.9%
50 Year	32.82	34.23	4.3%	30.52	-7.0%
100 Year	39.63	41.14	3.8%	36.1	-8.9%

Table 12. Composite peak flow comparison for Project Watershed 9; no attenuation required. No change in Watershed 9 area.

24 Hour Rainfall Event	Peak Runoff Existing Conditions (CFS)	Peak Runoff Proposed Conditions without Attenuation (CFS)	% Change
2 Year	1.48	1.48	0.0%
5 Year	2.41	2.41	0.0%
10 year	3.24	3.24	0.0%
25 Year	4.53	4.53	0.0%
50 Year	5.54	5.54	0.0%
100 Year	6.62	6.62	0.0%

Table 13 summarizes total runoff volume estimates for composite hydrographs for the 100-, 50-, 25-, 10- , 5- and 2-year 24 hour events. Without the proposed attenuation basins change in runoff volume over the entire Project area increases range from 0.66 acre-feet or 7.7% (2-year 24-hour event) to 1.42 acre-feet or 3.6% (100-year 24-hour event). With attenuation basins, runoff volume over the entire Project area declines for all events and ranges from -1.02acre-feet -2.6% (100-year 24-hour event) to -1.24 acre-feet or -9.0% (5-year 24-hour event).

Table 13. Estimated Runoff Volumes for the 100-, 50-, 25-, 10-, 5- and 2-year 24-hour events comparing existing conditions to proposed conditions with and without attenuation basins.

24 Hour Rainfall Event	Runoff Volume Existing Conditions (acre-feet)	Runoff Volume Proposed Conditions Without Attenuation (acre-feet)	% Change	Runoff Volume Proposed Conditions with Attenuation (acre-feet)	% Change
2 Year	8.5	9.2	7.7%	7.5	-12.7%
5 Year	13.8	14.6	6.2%	12.5	-9.0%
10 year	18.5	19.5	5.4%	17.3	-6.5%
25 Year	26.2	27.4	4.5%	25.1	-4.1%
50 Year	32.40	33.7	4.0%	31.33	-3.3%
100 Year	39.04	40.5	3.6%	38.02	-2.6%

Hydrologic Analysis Summary

Napa Valley Vineyard Engineering evaluated all potential Project effects on runoff at the Project site using HydroCAD to estimate runoff changes and to simulate the effects of the proposed attenuation basins. Results indicate that peak runoff rates will decline for all design storms over the entire Project area. The majority of increases in peak flow from the Project site resulting from expected increases in runoff rates caused by land cover changes from shrubland/woodland to cultivated land cover are mitigated by the seven proposed attenuation basins. These results indicate that the Project will not significantly impact peak runoff rates in this watershed.

O'Connor Environmental Inc. has completed this supplementary document in part to further summarize and validate results from NVVE's DiCesaris-Le Colline Vineyard Hydrologic Study submitted in June 2015 and substantially revised in December 2016 to address uncertainty regarding assumed changes in Hydrologic Soil Group resulting from vineyard site preparation of Kidd soils as was accepted practice in Napa County from 2014 until late-2016 for certain soil types characterized by shallow soil depths overlying weathered bedrock. Additional modifications to the ECP were requested in May 2017 and several updates have been incorporated since as noted in the revision summary in this version of the ECP. OEI has completed several similar analyses, and is thus qualified to provide peer review. This in-depth review of the ECP drainage design and methods employed in its evaluation confirms its findings and conclusions.

Erosion Analysis

This portion of the document summarizes and supplements Napa Valley Vineyard Engineering's (NVVE) soil erosion analysis titled DiCesaris-Le Colline Vineyard Narrative-USLE (Appendix E). An erosion analysis is required by County of Napa to show that the proposed vineyard development embodied in the Project Erosion Control Plan (ECP; Appendix B) complies with County of Napa General Plan Policy CON-48. This County policy requires that erosion control measures "…maintain pre-development sediment erosion conditions or at minimum comply with state water quality pollution control (i.e. Basin Plan) requirements and are protective of the County's sensitive domestic supply watersheds." The County of Napa conducts a review of the ECP, the runoff analysis (preceding sections of this document), and the erosion analysis (Appendix E) to determine the sufficiency of the ECP with respect to County standards. The erosion analysis is coordinated with the preceding hydrologic analysis and is based on the ECP prepared by Napa Valley Vineyard Engineering for the site. The erosion analysis (Appendix E) compares predicted erosion rates under existing site conditions to predicted erosion rates under proposed vineyard conditions using the Universal Soil Loss Equation (USLE) per USDA guidance documents.

This supplemental summary of the NVVE's soil erosion analysis provides a broader presentation of the NVVE analysis to facilitate evaluation of project compliance with the California Environmental Quality Act (CEQA) through an Environmental Impact Report (EIR). The process of preparing this supplemental summary for the EIR by O'Connor Environmental, Inc. (OEI) also provides a thorough peer-review of the NVVE analysis. OEI has prepared several similar soil erosion analyses for similar projects in Napa County and is therefore well-qualified to provide this supplemental summary.

Erosion Modeling

The USLE worksheets comprising NVVE's erosion analysis (Appendix E) demonstrate the effectiveness of the ECP with respect to erosion rates in proposed vineyard blocks. The USLE analysis was used in part as a design tool for elements of the Project drainage plan incorporated in the ECP. The locations and spacing of cross-field interception ditches were determined in part based on USLE-predicted erosion rates. The USLE erosion analysis prepared by NVVE focused on comparing erosion rates for proposed vineyard conditions to existing conditions and demonstrated that in most locations, post-project erosion rates were less than pre-project erosion rates. In this supplementary erosion analysis, erosion rates estimated along USLE transects (runoff pathways) are extrapolated to estimate total annual erosion from the Project site. In addition, the overall fate of sediment eroded from the project site is analyzed in this supplemental analysis.

Cover factors (C) are the most important parameter in the USLE that is affected by vineyard development. These cover factors were determined by NVVE based on definitions of cover in the above-referenced USDA guidance documents and field conditions observed on site visits and finalized on a field trip with staff from County of Napa, Napa County Resource Conservation District, and OEI. C values used for pre- and post-Project conditions are summarized in Table 14. Pre-Project C values presented represent the maximum and minimum of the range of values used since the existing land cover varies. In the areas of chaparral, cover is comprised of 75% brush canopy with 60% ground cover. In forested areas, cover is comprised of 75% tree canopy with 95% ground cover. A number of the transects evaluated pass through areas that contain combinations of the two cover types so their C values are weighted to reflect the relative proportions of each cover type found along the transect (See the USLE worksheets, Appendix E). Post-Project conditions consist of two variations of proposed vineyard with a no-till permanent cover crop. In Proposed vineyard Blocks A-D spot spraying of post-emergent herbicide around the base of each vine

is proposed and is expected to provide 80% ground cover producing a C value of 0.022. Vineyard Blocks E1 and E2 will not be sprayed and therefore would produce 85% groundcover resulting in a reduced C value of 0.017.

Table 14. Summary of USLE cover values (C).

Pre Project	C Value
Chaparral (75% brush w/ 60% ground cover)	0.067
Forest (75% tree canopy w/ 95% ground cover)	0.011
Post Project	**C Value**
Vineyard (permanent no till, spot spray (80% cover)	0.022
Vineyard (permanent no till, no spray (85% cover)	0.017

Predicted Erosion Rates

The results of the USLE analysis are summarized in Table 15 and Figure 4a & 4b. Table 15 provides the estimated net change in erosion associated with each of the eleven USLE hillslope segments analyzed. USLE hillslope transects (runoff pathways) used to represent existing erosion rates are shown in Figure 4a. Proposed Project conditions and ECP features and proposed vineyard areas are shown in Figure 4b.

In this supplemental analysis, we associated the appropriate ground surface area represented by each USLE hillslope transect so that an overall erosion estimate could be made for the project site. This spatial analysis was conducted using GIS tools and the relevant map data. The estimated erosion rate under existing conditions for the portion of the site proposed for vineyard development is 146.7 tons per year. Under proposed vineyard conditions (i.e. with the ECP provisions in place), the estimated erosion rate for the proposed vineyards declines by about 90.5 tons per year to 56.2 tons per year, equivalent to a 62% decrease in erosion. This significant reduction in erosion is due mostly to the change in the relatively poor ground cover factor in areas of existing chaparral and mixed forest/chaparral with varying amounts of ground cover to permanent, no-till vineyard with a much greater amount of expected ground cover.

The largest reductions in erosion occur along USLE transects A2, B and D3 where pre-Project C values are 0.067, 0.033 and 0.067 respectively. These areas would become vineyard with a cover crop providing 80% cover with a C value of 0.022. This reduction of the C parameter by a factor of about 1.5 to 3 is responsible for the large decreases in estimated erosion under Project conditions.

This summary document also considers where eroded sediment is delivered to the landscape and whether that sediment is likely to reach a stream channel or be deposited prior to delivery to a stream channel. Table 16 cross-references Figure 4b and features of the ECP to describe the fate of eroded sediment associated with each of the eleven USLE hillslope transects.

Table 15. Summary of USLE erosion analysis.

Pre-Project Transect	Soil loss tons/acre	Acres	Soil loss Tons	Notes	Post-Project Transect	SubGroup	Soil loss tons/acre	Acres	Soil loss Tons	Project Watershed	Notes	Difference Tons	
A1	1.43	4.75	6.80		**A1**	a	1.86	1.51	2.81	**1**	**Attenuation Basin 1**		**A1**
						b	1.37	1.18	1.62	**1**	**Attenuation Basin 1**		
						c	1.37	1.13	1.55	**1**	**Attenuation Basin 1**		
						d	0.67	0.92	0.62	**1**	**Attenuation Basin 1 (Partially)**		
								sum	6.60			**-0.20**	
A2	16.36	3.89	63.70		**A2**		5.37	3.89	20.89	**2, 3**	**Attenuation Basin 2 (Partially)**		**A2**
												-42.8	
A3	2.76	2.67	7.36	**Complex**	**A3**	a	1.46	0.67	0.98	**3, 4, 5**			**D2**
						b	1.67	0.68	1.13	**3, 4, 5**	**Attenuation Basin 3 (Partially)**		
						c	2.35	1.32	3.12	**3, 4, 5**	**Complex, Attenuation Basin 3**		
								sum	5.23			**-2.1**	
B	8.91	2.91	25.93		**B**		1.01	2.91	2.94	**1, 2, 3**			**D3**
												-23.0	
C	3.73	0.80	2.99		**C**		1.86	0.80	1.49	**8, 9**			**C**
												-1.5	
D1	1.36	1.80	2.44		**D1**	a	1.33	0.18	0.25	**8**	**Attenuation Basin 7**		**D1**
						b	1.44	0.43	0.62	**8**	**Attenuation Basin 7**		
						c	1.48	0.49	0.72	**8**	**Attenuation Basin 7**		
						d	1.12	0.69	0.77	**8**			
								sum	2.36			**-0.08**	
D2	1.62	3.33	5.39		**D2**	a	1.72	0.73	1.25	**7**	**Attenuation Basin 6**		**D2**
						b	1.60	0.54	0.86	**7**	**Attenuation Basin 6**		
						c	1.51	1.04	1.57	**7**	**Attenuation Basin 6**		
						d	1.71	0.84	1.44	**7**			
								sum	5.11			**-0.27**	
D3	9.48	2.30	21.81		**D3**	a	2.79	0.67	1.87	**6**	**Attenuation Basin 4 & 5**		**D3**
						b	1.54	1.76	2.71	**6**			
								sum	4.57			**-17.2**	
D4	1.10	1.13	1.25	**Complex**	**D4**	a	1.25	0.10	0.12	**8**			**D4**
						b	0.94	0.21	0.20	**8**			
						c	0.98	0.27	0.27	**8**			
						d	1.11	0.42	0.46	**8**			
						e	0.85	0.13	0.11	**8**			
								sum	1.16			**-0.09**	
D5	0.71	0.81	0.58		**D5**	a	0.82	0.10	0.08	**5**			**D5**
						b	0.95	0.12	0.11	**5**			
						c	0.52	0.53	0.28	**5**			
						d	0.66	0.06	0.04	**5**			
								sum	0.51			**-0.07**	
D6	4.86	1.00	4.84		**D6**		2.02	1.06	2.14	**8**			**D6**
												-2.70	
E1	0.47	1.51	0.71	**Complex**	**E1**	a	0.68	0.13	0.09	**8**			**E1**
						b	0.58	0.24	0.14	**8**			
						c	0.54	0.47	0.25	**8**			
						d	0.28	0.68	0.19	**8**			
								sum	0.67			**-0.04**	
E2	0.55	1.35	0.75	**Complex**	**E2**	a	0.77	0.34	0.26	**8**	**Attenuation Basin 7**		**E2**
						b	0.66	0.32	0.21	**8**	**Attenuation Basin 7**		
						c	0.42	0.32	0.13	**8**			
						d	0.28	0.37	0.10	**8**			
								sum	0.72			**-0.03**	
E3	0.48	4.56	2.17	**Complex**	**E3**	a	0.87	0.28	0.24	**8**	**Attenuation Basin 7**		**E3**
						b	0.70	0.40	0.28	**8**	**Attenuation Basin 7**		
						c	0.49	1.34	0.65	**8**	**Attenuation Basin 7**		
						d	0.26	2.54	0.66	**8**			
								sum	1.83			**-0.34**	
Pre-Project Erosion tons/year			**146.7**			**Post-Project Erosion tons/year**			**56.2**		**Net Erosion tons/year**	**-90.5**	

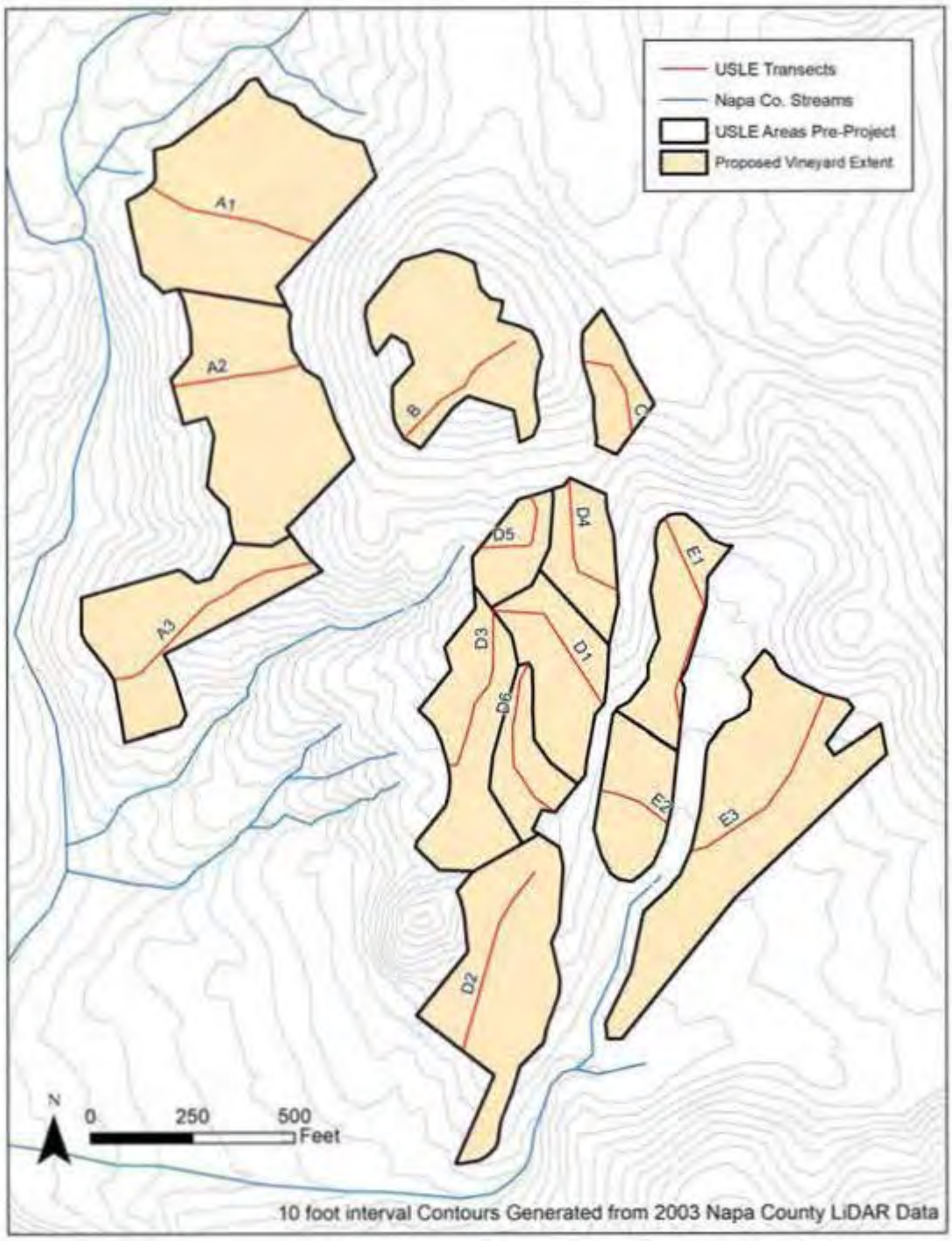


Figure 4a. Map of proposed vineyard blocks and USLE hillslope transects for pre-Project conditions.

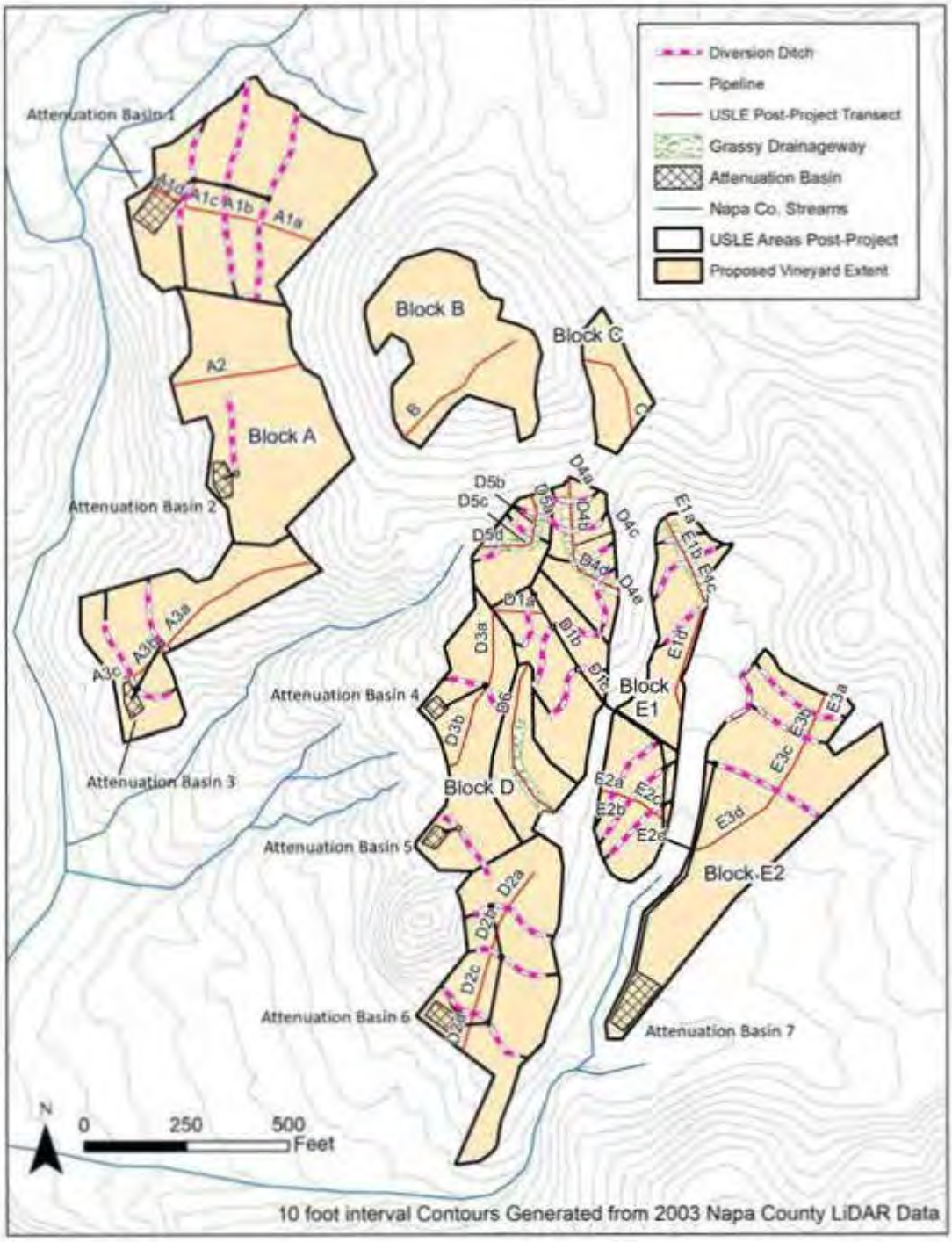


Figure 4b. Map of proposed vineyard Blocks and USLE hillslope transects for post-Project conditions.

Table 16. Fate of eroded sediment.

USLE Segment	Associated ECP Features & Drainage	Fate of Sediment
A1	80% of runoff collected by ditches and routed by pipe to Attenuation Basin (AB) 1 or flows directly into AB1 and thence to level spreader. Remaining uncollected runoff dispersed as sheet flow across vineyard perimeter.	Erosion occurring under existing conditions will be reduced by improved ground cover under proposed project ECP; some eroded sediment expected to reach existing stream channel.
A2	44% of runoff collected by ditches and routed by pipe to Attenuation Basin 2 and thence to level spreader. Remaining uncollected runoff dispersed as sheet flow across vineyard perimeter.	Erosion occurring under existing conditions will be reduced by improved ground cover under proposed project ECP; some eroded sediment expected to reach existing stream channel.
A3	61% of runoff collected by ditches and routed by pipe to Attenuation Basin 3 and thence to level spreader. Remaining uncollected runoff dispersed as sheet flow across vineyard perimeter.	Erosion occurring under existing conditions will be reduced by improved ground cover under proposed project ECP; some eroded sediment expected to reach existing stream channel.
B	Runoff dispersed as sheet flow across vineyard perimeter.	Erosion occurring under existing conditions will be reduced by improved ground cover under proposed project ECP.. Minimal sediment delivery to stream channels as runoff disperses and sediment deposits along flow path on forested hillslope below vineyard boundary.
C	Runoff dispersed as sheet flow across vineyard perimeter.	Erosion occurring under existing conditions will be reduced by shortened flow paths under proposed project ECP; some eroded sediment expected to reach existing stream channel.
D1	Runoff from 65% of the area is collected by ditches and routed by pipe through Block E to Attenuation Basin 7. The remaining area flows as shallow concentrated flow across vineyard perimeter and is collected by ditches in Block E and routed by pipe to AB7. All D1 flows combine with flows from portions of Areas E1, E2 and E3.	Erosion occurring under existing conditions will be reduced by shortened flow paths under proposed project ECP; some eroded sediment expected to reach existing stream channel.
D2	75% of runoff collected by ditches and routed by pipe to Attenuation Basin 6 and thence to level spreader. Remaining uncollected runoff dispersed as sheet flow across vineyard perimeter.	Erosion occurring under existing conditions will be reduced by shortened flow paths under proposed project ECP; some eroded sediment expected to reach existing stream channel. .

Table 16. Fate of eroded sediment (continued).

USLE Segment	Associated ECP Features & Drainage	Fate of Sediment
D3	62% of runoff collected by ditches and routed by pipe to Attenuation Basins 4 5and thence to a level spreader below AB4 and an energy dissipater below AB5. Remaining uncollected runoff dispersed as sheet flow across vineyard perimeter.	Erosion occurring under existing conditions will be reduced by improved ground cover under proposed project ECP.. Minimal sediment delivery to stream channels as runoff disperses and sediment deposits along flow path on forested hillslope below vineyard boundary.
D4	Runoff collected by ditches and routed by grassy drainageway as shallow concentrated flow to vineyard boundary then recollected in ditches within block E and/or routed to a lower grassy drainageway and directed as shallow concentrated flow over a rock berm and into existing Class III Stream.	Erosion occurring under existing conditions will be reduced by shortened flow paths under proposed project ECP; some eroded sediment expected to reach existing stream channel.
D5	Runoff collected by ditches and routed by grassy drainageway as shallow concentrated flow to vineyard boundary then into an existing Class III Stream.	Erosion occurring under existing conditions will be reduced by shortened flow paths under proposed project ECP; some eroded sediment expected to reach existing stream channel.
D6	Runoff collected by ditches and routed by grassy drainageway as shallow concentrated flow to vineyard boundary then into an existing Class III Stream.	Erosion occurring under existing conditions will be reduced by improved ground cover under proposed project ECP; some eroded sediment expected to reach existing stream channel.
E1	Runoff collected by ditches and routed by grassy drainageway as shallow concentrated flow along upper vineyard boundary then crosses boundary into the adjacent broad swale and into existing Class III Stream.	Erosion occurring under existing conditions will be reduced by improved ground cover under proposed project ECP; some eroded sediment expected to reach existing stream channel.
E2	Approximately 70% of runoff collected by ditches and routed by pipe to Attenuation Basin 7 and thence to energy dissipater. Remaining runoff routed via sheetflow into existing Class III Stream.	Erosion occurring under existing conditions will be reduced by shortened flow paths under proposed project ECP; some eroded sediment expected to reach existing stream channel
E3	Approximately 30% of runoff collected by ditches and routed by pipe to Attenuation Basin 7 and thence to energy dissipater. A portion of the remaining runoff collected by ditches and routed to an energy dissipater then the broad swale and finally into existing Class III Stream. The remaining runoff not collected by ditches will leave the vineyard boundary as sheet flow and flow onto Class III Stream.	Erosion occurring under existing conditions will be reduced by shortened flow paths under proposed project ECP; some eroded sediment expected to reach existing stream channel.

Erosion Analysis Summary

As shown in Table 15 and USLE Table 1 in the Appendix of NVVE's , under proposed vineyard conditions all estimated soil loss rates are less than existing conditions. The estimated erosion rate for the proposed vineyards declines by about 90.5 tons per year, this is equivalent to a 62% decrease relative to estimated erosion under existing conditions of about 146.5 tons per year. In summary, considering the effects of both the change in cover factors (C values) and the proposed erosion control measures (including diversion ditches, attenuation basins and sediment basins) the proposed vineyard project and ECP dramatically reduces net erosion from the site considered as a whole. Sediment captured in flow attenuation basins has not been estimated, but will further reduce potential sediment delivery to watercourses leaving the project site.

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Appendix A

DiCesaris-Le Colline Vineyard
Hydrology Study
(includes HydroCAD printouts for the 100 year storm)
Napa Valley Vineyard Engineering

DiCesaris-Le Colline Vineyard
Hydrology Study
Prepared by Napa Valley Vineyard Engineering, Inc
December 12, 2017 (rev 5)

INTRODUCTION

DiCesaris seeks a permit to develop approximately 33.4 gross acres of new vineyard including three new access drives. The project lies within APNs 024-300-071, 72, 73 and 024-340-001 located at 300 Cold Springs Road, St. Helena.

This hydrology study is to determine the anticipated affect the proposed vineyard development project will have on local hydrology and runoff patterns. Hydrologic modeling of existing and proposed conditions was performed using HydroCad software with the CA-1 rainfall distribution curve. Following is a summary of the data used to complete the hydrologic analysis and the results of this analysis.

RAINFALL DATA

Rainfall depths for the project site were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2, Precipitation Frequency Data for California, which uses the latitude and longitude of a site to determine rainfall depths. The latitude and longitude of the DiCesaris project are estimated to be 38.561° N, 122.441° W, based on information obtained from All Topo V7 USGS mapping software.

The following rainfall data from the NOAA website was used in the analysis:

2 year, 24 hour	4.94 inches
5 year, 24 hour	6.21 inches
10 year, 24 hour	7.25 inches
25 year, 24 hour	8.80 inches
50 year, 24 hour	9.98 inches
100 year, 24 hour	11.20 inches

WATERSHED AREAS

The project site is located within nine small watersheds as shown on the Drainage Area Maps in the Appendix. Watersheds 1 thru 7, and watershed 9 are modeled as one simple watershed in pre-project condition. Because of the complexity of Watershed 8, it is broken into four subareas which all flow to a common point of interest (POI). Each watershed was determined based on 2003 LIDAR mapping.

PRE-PROJECT WATERSHED CONDITIONS

Soil Types

The United States Department of Agriculture Soil Conservation Service Soils Map for Napa County, August 1978, maps the following soil types within the watersheds:

SCS #139/#140, Forward gravelly loam (Hydrologic Soil Group(HSG) B)
SCS #155, Kidd loam (HSG D)

Land Use

Land use within each watershed was analyzed based on the 2011 aerial photograph obtained from the Napa County GIS website. All watersheds include tree and brush canopy with pockets of open grassland, and the watersheds encompassing the residential areas along Cold Springs Road include impervious surfaces and residential landscaping. Wooded areas within the watershed is considered in "good" hydrologic condition. Areas of brush and open grassland is considered to be in "fair condition", except where there are residential lawns, which are considered to be in "good condition". There is a small pocket of existing vineyard in Watershed 8 which is considered in "fair" condition. A detailed breakdown of land uses by area and hydrologic soil group is included in the HydroCad reports in the Appendix, and is shown on the Drainage Area Map.

Time of Concentration

The time of concentration represents the time it takes for rainfall in the most hydraulically remote portion of the watershed to reach the point of interest.
The time of concentration is estimated assuming sheet flow up to 100 feet in the uppermost reaches of each watershed. A shallow concentrated flow regime is used to model the runoff down to a channel if one exists, or to the POI. Channel flow data was determined using a typical cross section of each channel. A detailed breakdown of the time of concentration parameters is included in the TR55 reports, and is shown on the Drainage Area Map.

POST-PROJECT WATERSHED CONDITIONS

Soil Types

Post-project soils are considered to be the same HSG as pre-project conditions.

Land Use

The proposed project will convert approximately 25 acres of tree canopy and approximately 15 acres of brush and grasses to vineyard and rocked, or grass, access drives. All other areas within the subject watersheds remain unchanged. The project proposes a no-till cover crop with spot spray only, which is considered a "good" hydrologic condition. Vineyard avenues/turnspaces and the new access drive from Winding Way will be maintained in no-till cover and are modeled as part of the vineyard. Rocked access drives and the rocked avenue in Block A are modeled as gravel roads. A detailed breakdown of land uses by area and hydrologic soil group is included in Appendix A.

Time of Concentration

Time of concentration under post-project conditions will increase in watersheds that include construction of diversion ditches within the proposed vineyard blocks. The increased time of concentration typically reduces peak flows at the POI, so this analysis conservatively excludes the ditching from the modeling, unless the ditches outlet to a pipe. Because piping will tend to increase rate of flow, the blocks that include piping are broken into smaller subareas created by the diversion ditches and flow is modeled through the pipes to the attenuation basins. A detailed breakdown of time of concentration and attenuation basin design criteria is included in Appendix A.

CALCULATED RUNOFF RATE/VOLUME

Using the rainfall data, watershed area, land use and time of concentration parameters described above and included in the Appendix, the following runoff rates (cfs), and volume (af) were calculated:

Rate

24 hr. storm event	2 yr.		5 yr.		10 yr.		25 yr.		50 yr.		100 yr.	
Project Condition	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Watershed 1	0.67	0.24	1.34	0.90	1.97	1.55	2.98	2.24	3.81	2.93	4.70	3.81
Watershed 2	1.37	1.36	2.27	2.13	3.07	2.80	4.33	3.85	5.28	4.66	6.37	5.51
Watershed 3	2.61	2.42	4.31	3.88	5.81	5.30	8.18	8.02	10.05	9.84	12.02	11.67
Watershed 4	0.30	0.27	0.58	0.50	0.83	0.76	1.24	1.20	1.58	1.51	1.94	1.88
Watershed 5	3.80	3.61	5.59	5.36	7.11	6.85	9.42	9.13	11.20	10.88	13.04	12.70
Watershed 6	2.04	1.86	2.89	2.67	3.61	3.38	4.69	4.64	5.51	5.51	6.36	6.33
Watershed 7	1.57	1.57	2.40	2.38	3.12	3.11	4.23	4.23	5.09	5.04	5.99	5.96
Watershed 8	7.62	6.60	13.25	11.48	18.31	16.69	26.39	24.83	32.82	30.52	39.63	36.10
Watershed 9	1.48	1.48	2.41	2.41	3.24	3.24	4.53	4.53	5.54	5.54	6.62	6.62

Volume

24 hr. storm event	2 yr.		5 yr.		10 yr.		25 yr.		50 yr.		100 yr.	
Project Condition	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Watershed 1	0.31	0.09	0.57	0.18	0.81	0.48	1.22	1.00	1.56	1.42	1.93	1.89
Watershed 2	0.56	0.53	0.91	0.83	1.23	1.10	1.75	1.52	2.17	1.86	2.61	2.23
Watershed 3	0.93	0.80	1.52	1.42	2.06	1.98	2.92	2.87	3.62	3.59	4.37	4.35
Watershed 4	0.13	0.10	0.22	0.18	0.32	0.25	0.48	0.42	0.61	0.57	0.75	0.72
Watershed 5	1.47	1.39	2.19	2.09	2.81	2.70	3.79	3.65	4.56	4.41	5.37	5.20
Watershed 6	0.79	0.64	1.14	1.00	1.44	1.31	1.90	1.79	2.26	2.15	2.65	2.48
Watershed 7	0.63	0.55	0.98	0.91	1.28	1.22	1.78	1.71	2.14	2.10	2.54	2.50
Watershed 8	3.14	2.76	5.30	4.97	7.29	7.00	10.55	10.32	13.21	13.01	16.08	15.91
Watershed 9	0.60	0.60	0.97	0.97	1.31	1.31	1.85	1.85	2.28	2.28	2.74	2.74

CONCLUSION

Peak flows and total volume during each storm event either remain constant or decrease in the post- project models. This analysis, and supporting information in the Appendix, demonstrate that with the inclusion of diversion ditches and attenuation basins, peak runoff rates and runoff volume will not increase as a result of this vineyard development project.

HydroCad REPORTS & MAP
APPENDIX

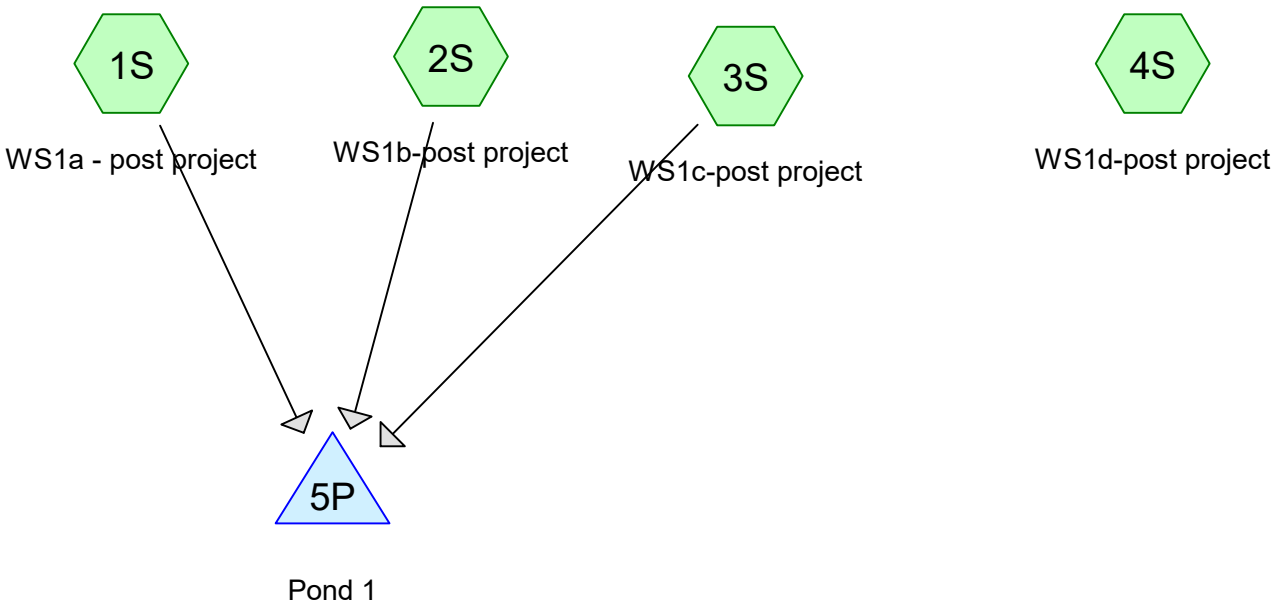
Summary for Subcatchment 1S: WS1A - pre project R1

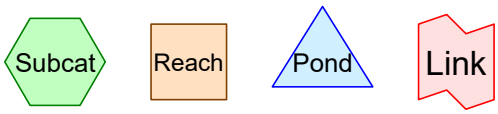
Runoff = 4.70 cfs @ 12.22 hrs, Volume= 1.934 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.080	61	Pasture/grassland/range, Good, HSG B
1.000	56	Brush, Fair, HSG B
4.740	55	Woods, Good, HSG B
5.820	55	Weighted Average
5.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0500	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
0.3	88	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	207	0.4100	10.31		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.4	584	0.1800	6.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.0	979	Total			





Routing Diagram for WS1 postR4
Prepared by Napa Valley Vineyard Engineering, Printed 3/14/2018
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Summary for Subcatchment 1S: WS1a - post project

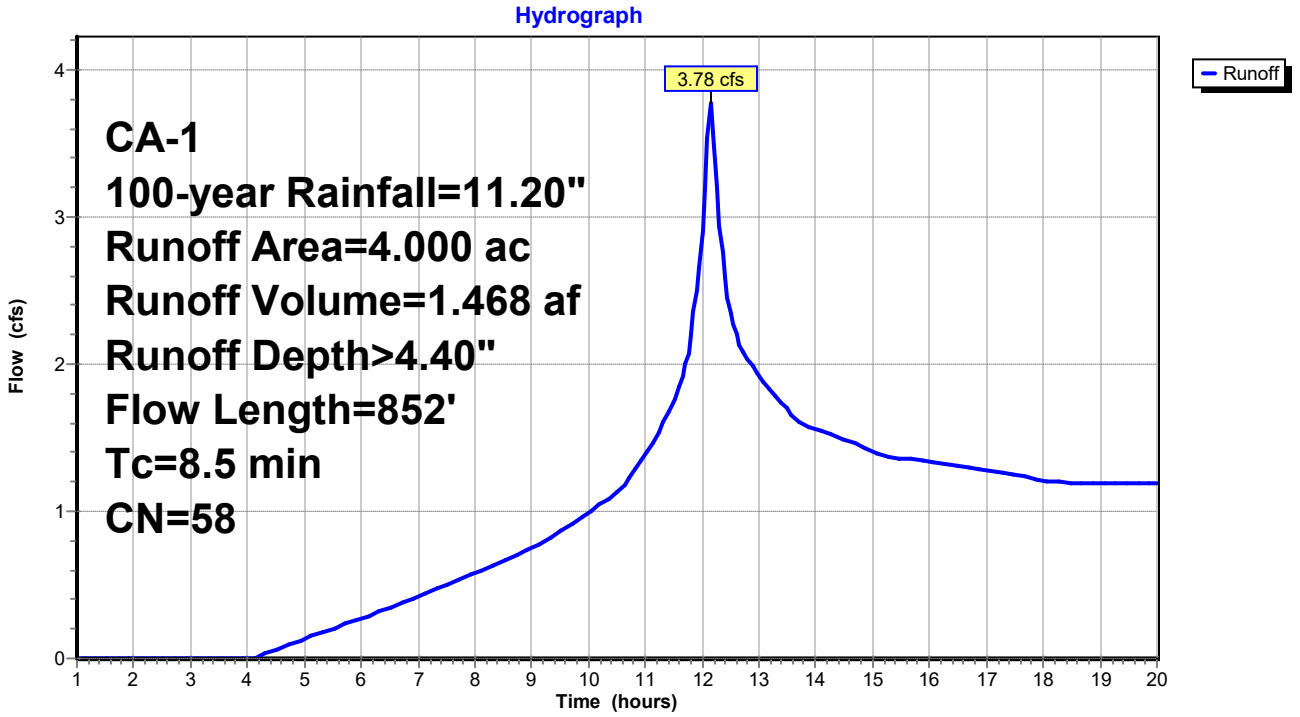
Runoff = 3.78 cfs @ 12.15 hrs, Volume= 1.468 af, Depth> 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
2.200	61	>75% Grass cover, Good, HSG B
0.080	61	Pasture/grassland/range, Good, HSG B
0.120	56	Brush, Fair, HSG B
1.600	55	Woods, Good, HSG B
4.000	58	Weighted Average
4.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0900	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.6	203	0.1100	5.34		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	261	0.3800	9.92		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	183	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	105	0.1900	19.77	15.53	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
8.5	852	Total			

Subcatchment 1S: WS1a - post project



Summary for Subcatchment 2S: WS1b-post project

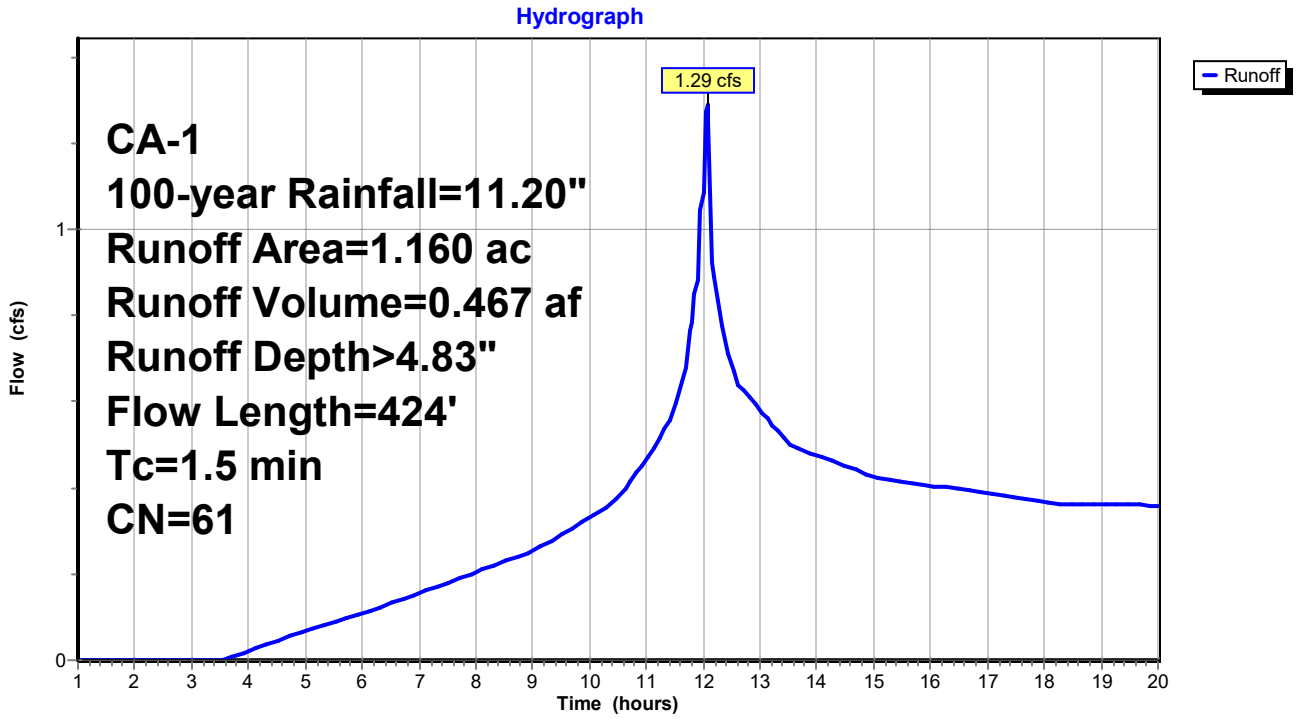
Runoff = 1.29 cfs @ 12.07 hrs, Volume= 0.467 af, Depth> 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	1.130	61	>75% Grass cover, Good, HSG B
*	0.020	81	>75% Grass cover, Good, HSG D
	0.010	55	Woods, Good, HSG B
	1.160	61	Weighted Average
	1.160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	204	0.1900	7.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.9	145	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	75	0.1500	17.57	13.80	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
1.5	424	Total			

Subcatchment 2S: WS1b-post project



Summary for Subcatchment 3S: WS1c-post project

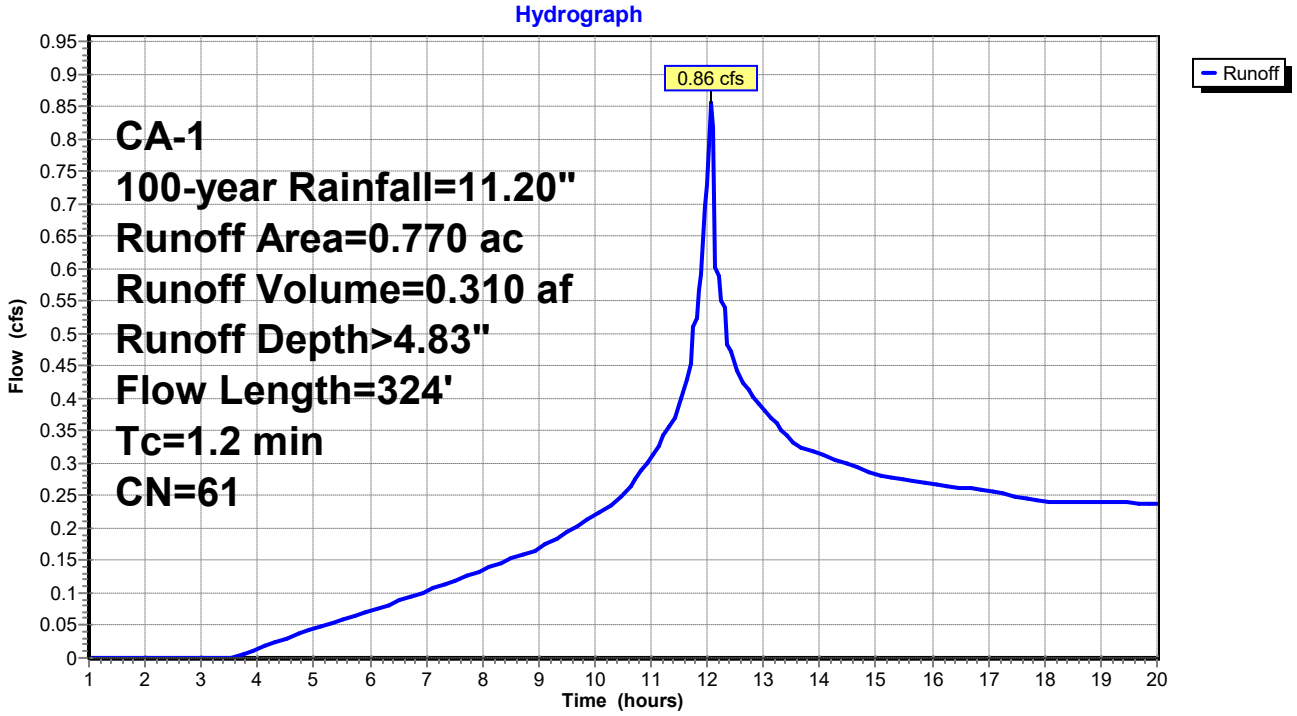
Runoff = 0.86 cfs @ 12.06 hrs, Volume= 0.310 af, Depth> 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.760	61	>75% Grass cover, Good, HSG B
*	0.010	81	>75% Grass cover, Good, HSG D
	0.770	61	Weighted Average
	0.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	104	0.2000	7.20		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.9	145	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	75	0.1000	14.35	11.27	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
1.2	324	Total			

Subcatchment 3S: WS1c-post project



Summary for Subcatchment 4S: WS1d-post project

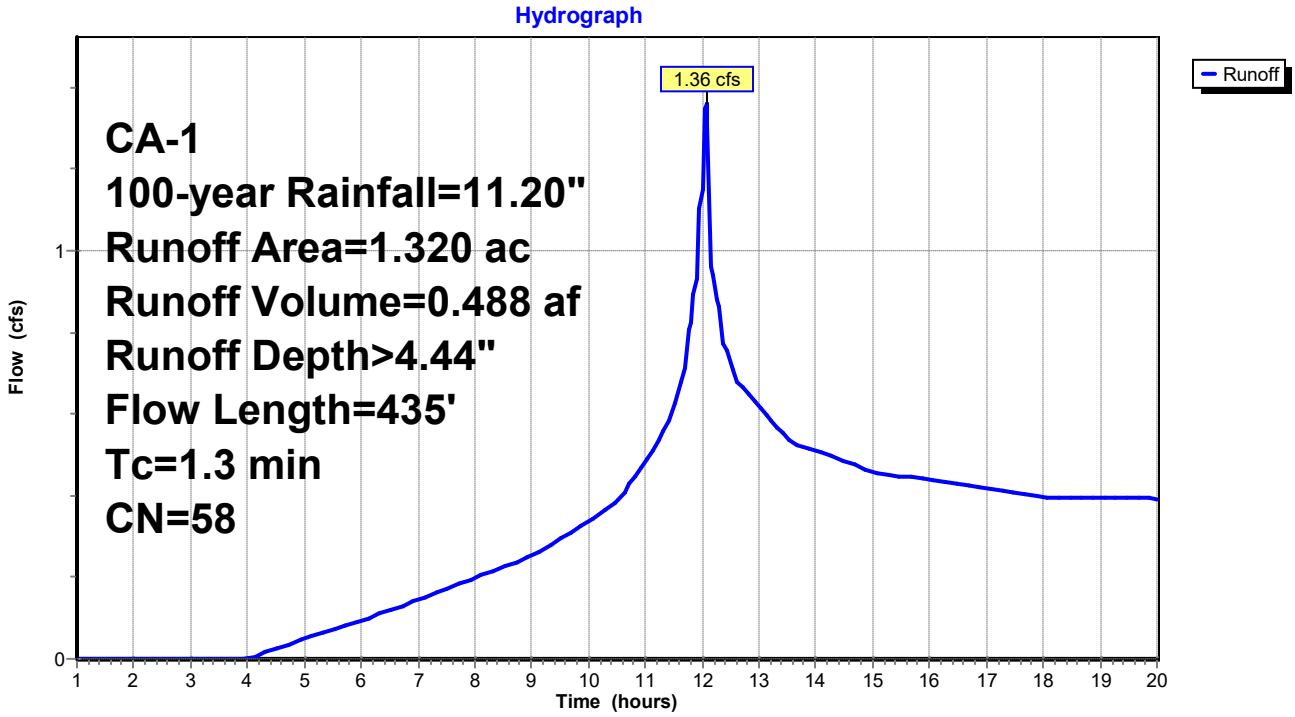
Runoff = 1.36 cfs @ 12.07 hrs, Volume= 0.488 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.680	61	>75% Grass cover, Good, HSG B
0.640	55	Woods, Good, HSG B
1.320	58	Weighted Average
1.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	144	0.2400	7.89		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	291	0.0700	4.93	10.84	**Channel Flow,** Area= 2.2 sf Perim= 6.2' r= 0.35' n= 0.040 Winding stream, pools & shoals
1.3	435	Total			

Subcatchment 4S: WS1d-post project



Summary for Pond 5P: Pond 1

Inflow Area = 5.930 ac, 0.00% Impervious, Inflow Depth > 4.54" for 100-year event
Inflow = 5.61 cfs @ 12.10 hrs, Volume= 2.245 af
Outflow = 2.45 cfs @ 13.63 hrs, Volume= 1.405 af, Atten= 56%, Lag= 91.7 min
Secondary = 2.45 cfs @ 13.63 hrs, Volume= 1.405 af

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 106.69' @ 13.63 hrs Surf.Area= 7,655 sf Storage= 39,549 cf

Plug-Flow detention time= 272.0 min calculated for 1.405 af (63% of inflow)
Center-of-Mass det. time= 138.8 min (951.6 - 812.8)

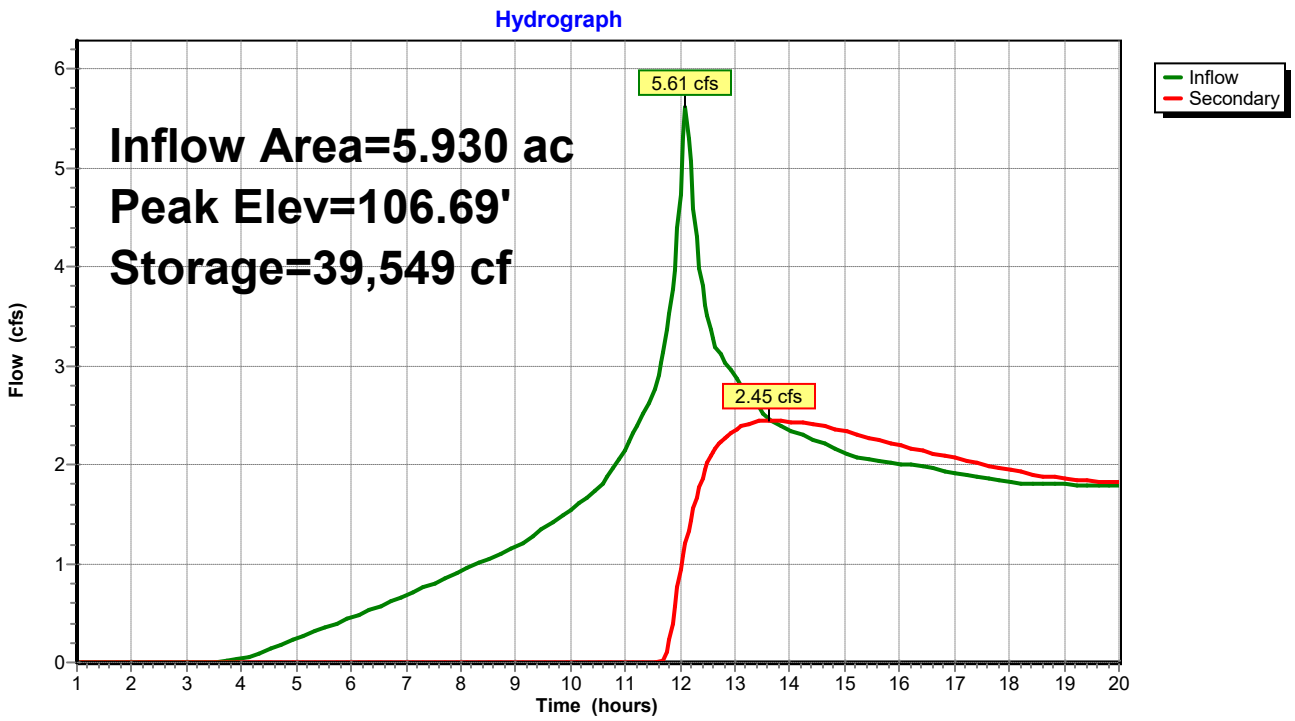
Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	41,989 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	2,962	0	0
100.00	3,462	3,212	3,212
101.00	3,995	3,729	6,941
102.00	4,560	4,278	11,218
103.00	5,158	4,859	16,077
104.00	5,789	5,474	21,551
105.00	6,452	6,121	27,671
106.00	7,148	6,800	34,471
107.00	7,887	7,518	41,989

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	**6.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 104.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	98.00'	**6.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 98.00' / 97.60' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 2	105.00'	**8.0" Vert. Orifice/Grate** C= 0.600

Secondary OutFlow Max=2.45 cfs @ 13.63 hrs HW=106.69' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.49 cfs @ 2.51 fps)
└─**2=Culvert** (Passes 1.95 cfs of 2.17 cfs potential flow)
└─**3=Orifice/Grate** (Orifice Controls 1.95 cfs @ 5.60 fps)

Pond 5P: Pond 1



Summary for Subcatchment 1S: WS2 - pre project

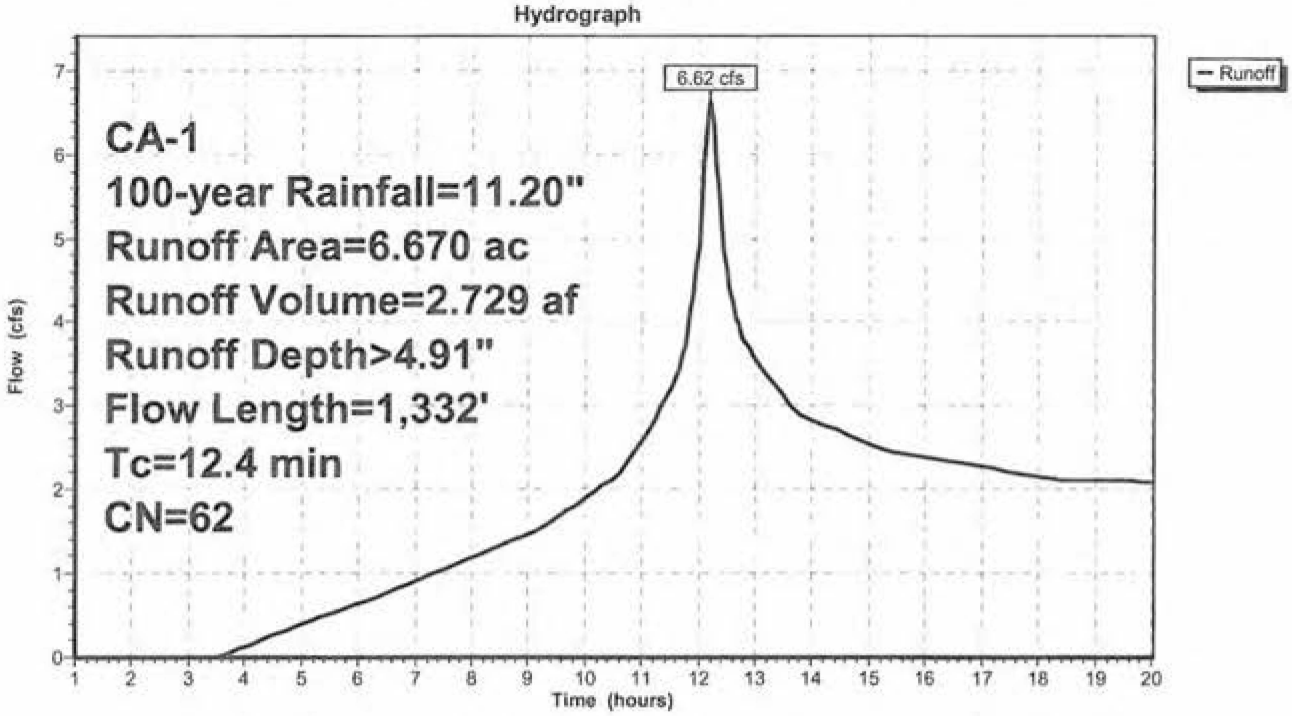
Runoff = 6.62 cfs @ 12.20 hrs, Volume= 2.729 af, Depth> 4.91"

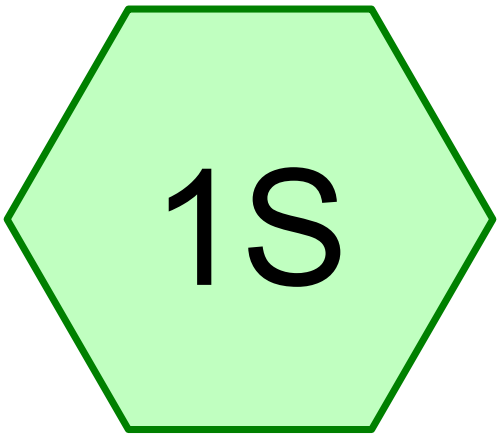
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
1.440	56	Brush, Fair, HSG B
1.790	77	Brush, Fair, HSG D
3.130	55	Woods, Good, HSG B
0.310	77	Woods, Good, HSG D
6.670	62	Weighted Average
6.670		100.00% Pervious Area

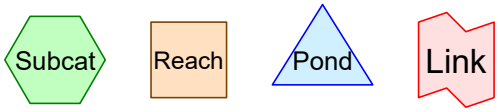
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0900	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
0.6	201	0.1100	5.34		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.4	715	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.9	316	0.0800	6.02	31.29	**Channel Flow,** Area= 5.2 sf Perim= 12.0' r= 0.43' n= 0.040 Winding stream, pools & shoals
12.4	1,332	Total			

Subcatchment 1S: WS2 - pre project





WS2 - post project



Routing Diagram for WS2 postR3
Prepared by Napa Valley Vineyard Engineering, Printed 3/14/2018
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Summary for Subcatchment 1S: WS2 - post project

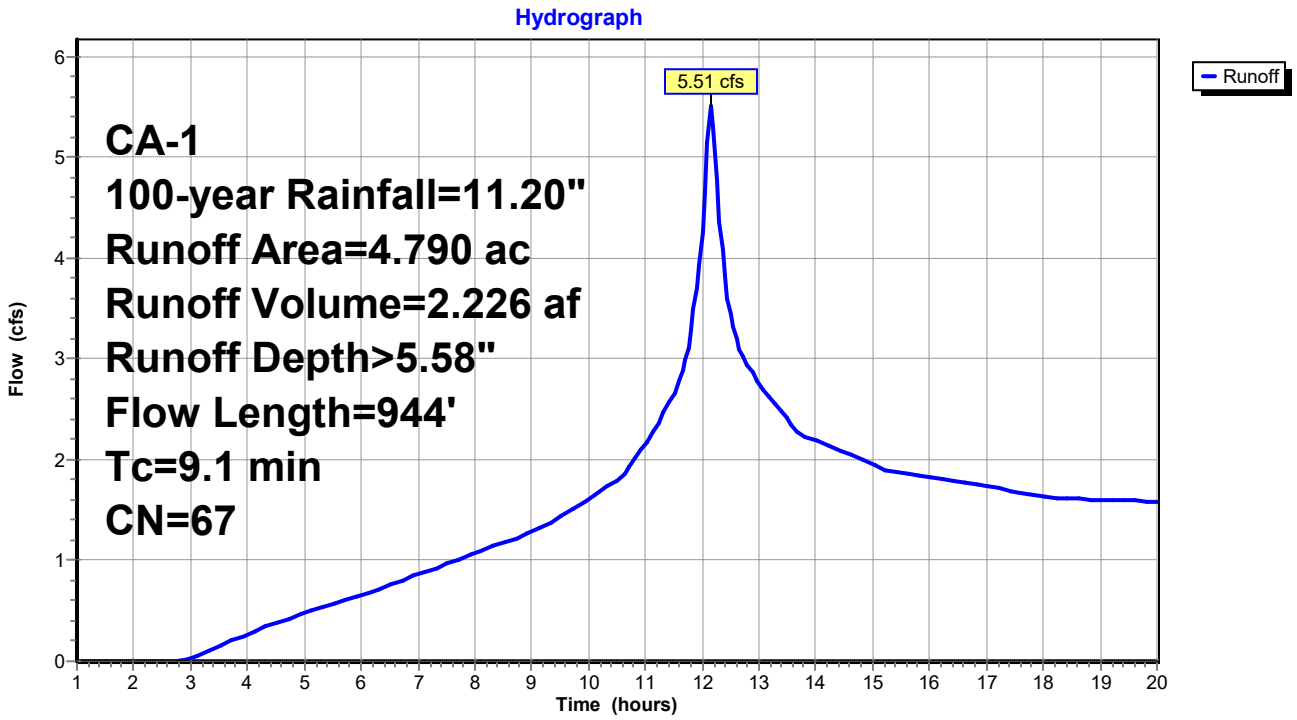
Runoff = 5.51 cfs @ 12.16 hrs, Volume= 2.226 af, Depth> 5.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.590	61	>75% Grass cover, Good, HSG B
*	1.780	81	>75% Grass cover, Good, HSG D
	0.290	56	Brush, Fair, HSG B
	0.190	77	Brush, Fair, HSG D
	1.850	55	Woods, Good, HSG B
	0.090	77	Woods, Good, HSG D
	4.790	67	Weighted Average
	4.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0600	0.23		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.6	213	0.1200	5.58		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	631	0.3500	9.52		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.1	944	Total			

Subcatchment 1S: WS2 - post project



Summary for Subcatchment 1S: WS3 - pre project

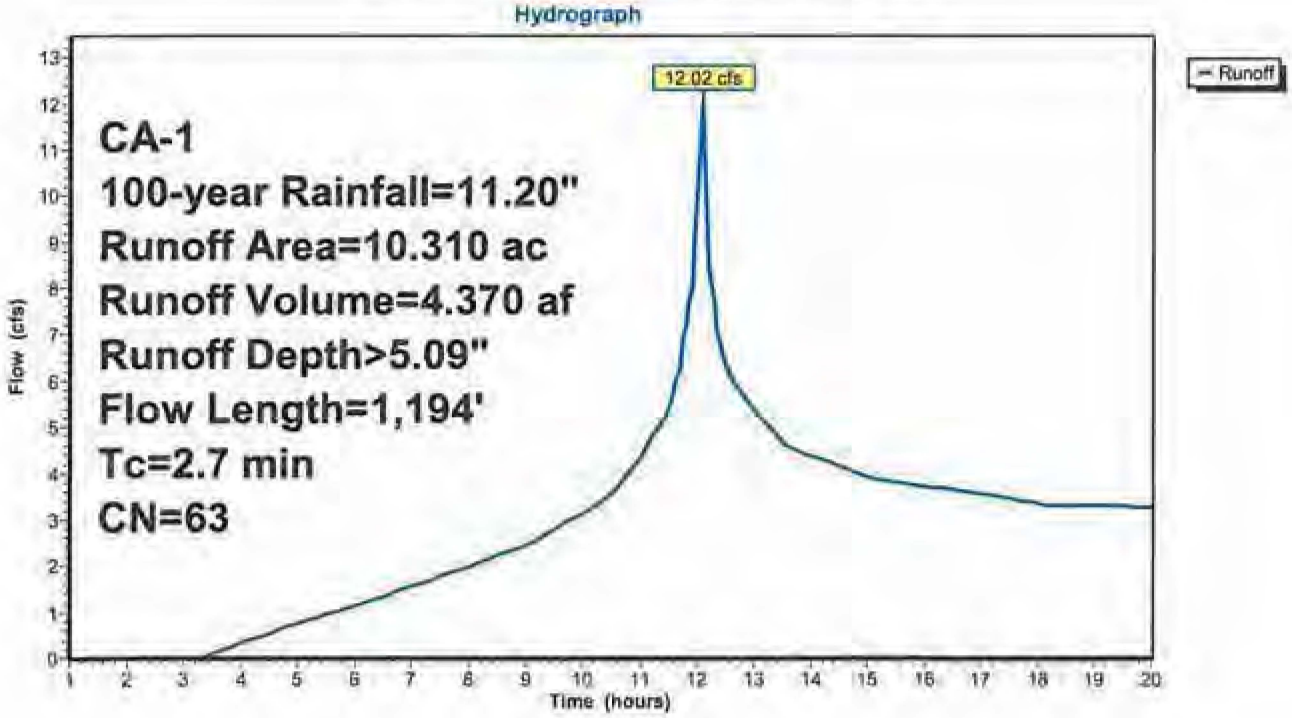
Runoff = 12.02 cfs @ 12.09 hrs, Volume= 4.370 af, Depth> 5.09"

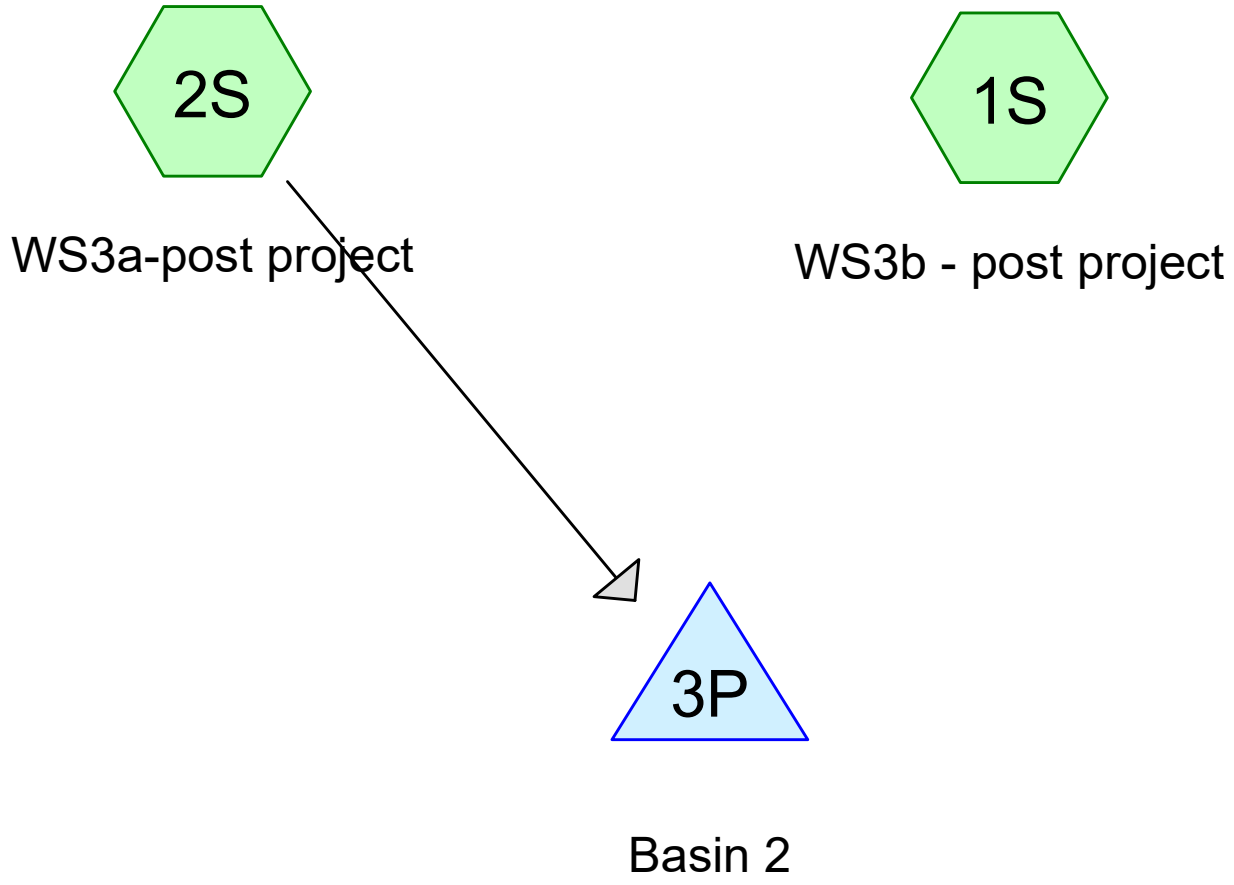
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

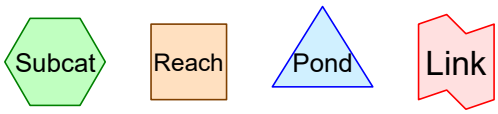
Area (ac)	CN	Description
0.270	69	Pasture/grassland/range, Fair, HSG B
1.300	56	Brush, Fair, HSG B
2.730	77	Brush, Fair, HSG D
5.010	55	Woods, Good, HSG B
1.000	77	Woods, Good, HSG D
10.310	63	Weighted Average
10.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	259	0.1200	5.58		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.9	935	0.2500	8.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.7	1,194	Total			

Subcatchment 1S: WS3 - pre project







Routing Diagram for WS3 postR4
Prepared by Napa Valley Vineyard Engineering, Printed 3/14/2018
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Summary for Subcatchment 1S: WS3b - post project

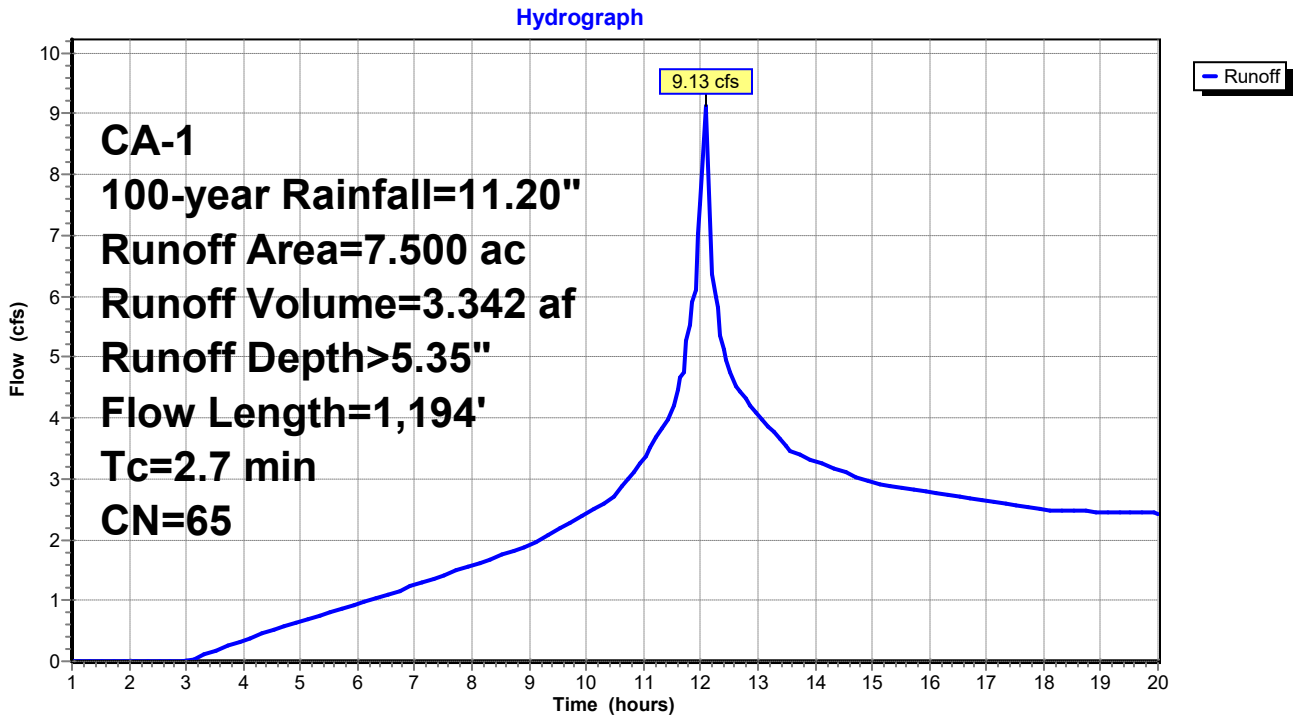
Runoff = 9.13 cfs @ 12.09 hrs, Volume= 3.342 af, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.060	85	Gravel roads, HSG B
	0.080	91	Gravel roads, HSG D
	0.980	61	>75% Grass cover, Good, HSG B
*	1.640	81	>75% Grass cover, Good, HSG D
	0.760	56	Brush, Fair, HSG B
	0.700	77	Brush, Fair, HSG D
	3.110	55	Woods, Good, HSG B
	0.170	77	Woods, Good, HSG D
	7.500	65	Weighted Average
	7.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	259	0.1200	5.58		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.9	935	0.2500	8.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.7	1,194	Total			

Subcatchment 1S: WS3b - post project



Summary for Subcatchment 2S: WS3a-post project

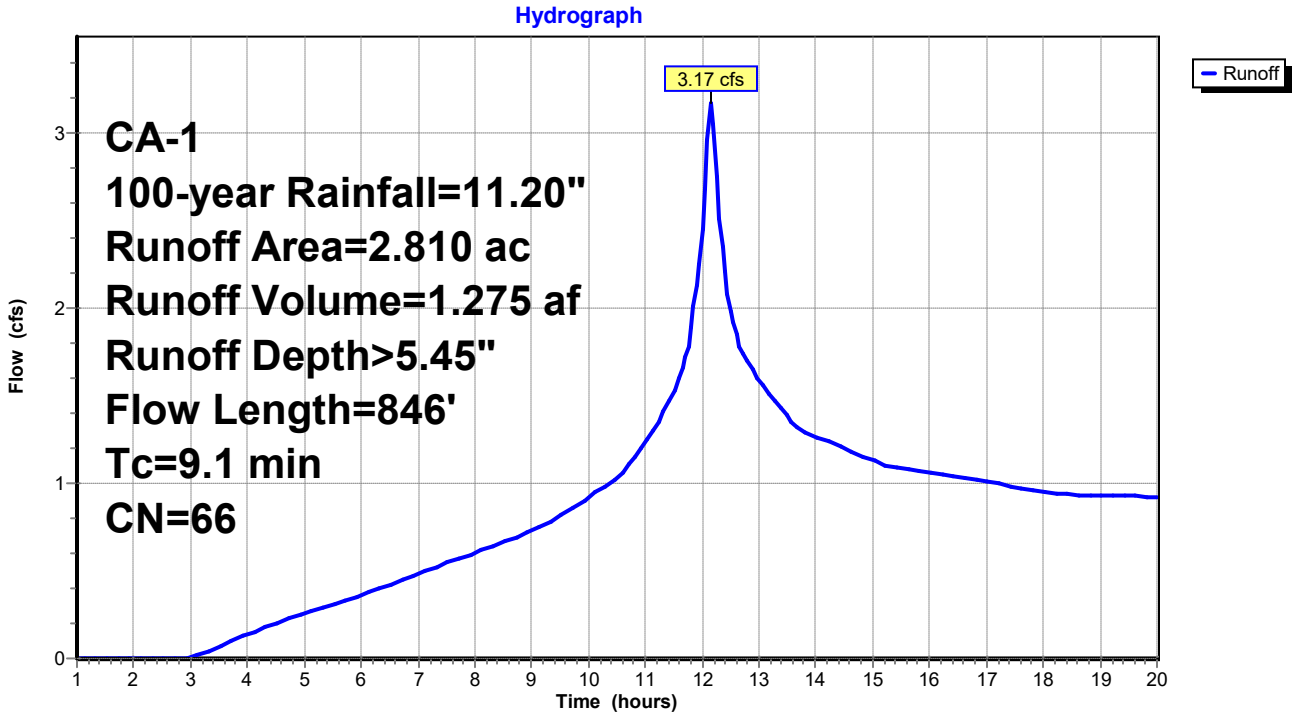
Runoff = 3.17 cfs @ 12.16 hrs, Volume= 1.275 af, Depth> 5.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	1.000	61	>75% Grass cover, Good, HSG B
*	0.990	81	>75% Grass cover, Good, HSG D
	0.040	61	Pasture/grassland/range, Good, HSG B
	0.040	56	Brush, Fair, HSG B
	0.730	55	Woods, Good, HSG B
	0.010	77	Woods, Good, HSG D
	2.810	66	Weighted Average
	2.810		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0700	0.24		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.7	216	0.1100	5.34		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	394	0.3300	9.25		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	111	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.0	25	0.0500	10.14	7.97	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
9.1	846	Total			

Subcatchment 2S: WS3a-post project



Summary for Pond 3P: Basin 2

Inflow Area = 2.810 ac, 0.00% Impervious, Inflow Depth > 5.45" for 100-year event
Inflow = 3.17 cfs @ 12.16 hrs, Volume= 1.275 af
Outflow = 2.54 cfs @ 12.30 hrs, Volume= 1.012 af, Atten= 20%, Lag= 8.6 min
Primary = 2.54 cfs @ 12.30 hrs, Volume= 1.012 af

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 105.94' @ 12.30 hrs Surf.Area= 3,416 sf Storage= 12,960 cf

Plug-Flow detention time= 167.8 min calculated for 1.012 af (79% of inflow)
Center-of-Mass det. time= 87.4 min (876.0 - 788.6)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	13,155 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,113	0	0
101.00	1,428	1,271	1,271
102.00	1,773	1,601	2,871
103.00	2,146	1,960	4,831
104.00	2,549	2,348	7,178
105.00	2,981	2,765	9,943
106.00	3,442	3,212	13,155

Device	Routing	Invert	Outlet Devices
#1	Primary	99.00'	**8.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 99.00' / 98.60' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	105.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.54 cfs @ 12.30 hrs HW=105.94' (Free Discharge)
└─**1=Culvert** (Passes 2.54 cfs of 3.81 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 2.54 cfs @ 3.31 fps)

Summary for Subcatchment 1S: WS4 - pre project

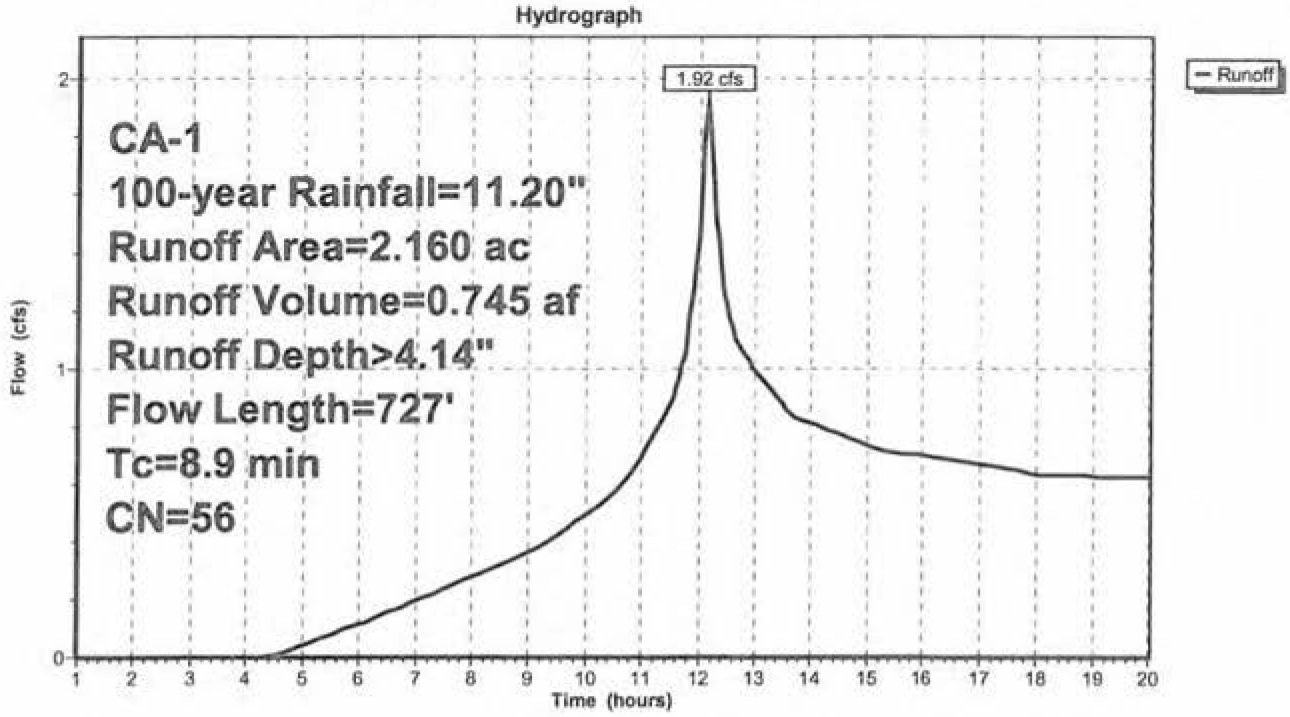
Runoff = 1.92 cfs @ 12.16 hrs, Volume= 0.745 af, Depth> 4.14"

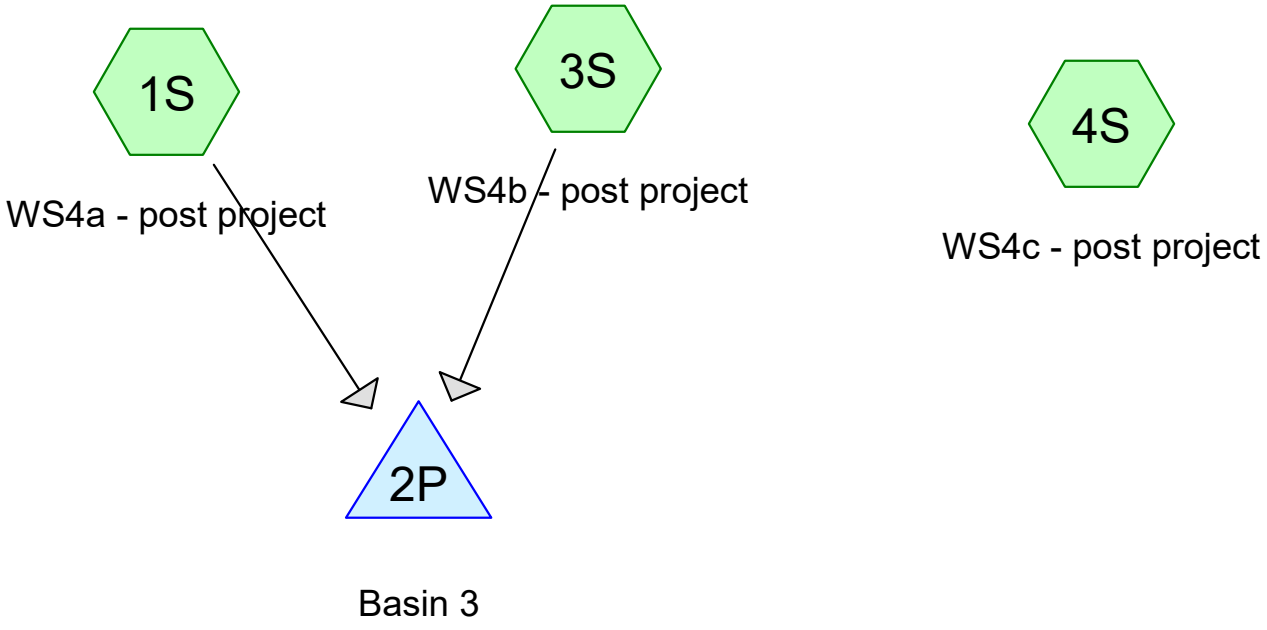
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

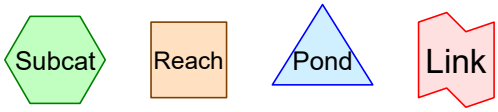
Area (ac)	CN	Description
2.040	55	Woods, Good, HSG B
0.120	77	Woods, Good, HSG D
2.160	56	Weighted Average
2.160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1800	0.23		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
1.1	487	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	140	0.0300	3.68	19.16	**Channel Flow,** Area= 5.2 sf Perim= 12.0' r= 0.43' n= 0.040 Mountain streams
8.9	727	Total			

Subcatchment 1S: WS4 - pre project







Routing Diagram for WS4 postR3
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Summary for Subcatchment 1S: WS4a - post project

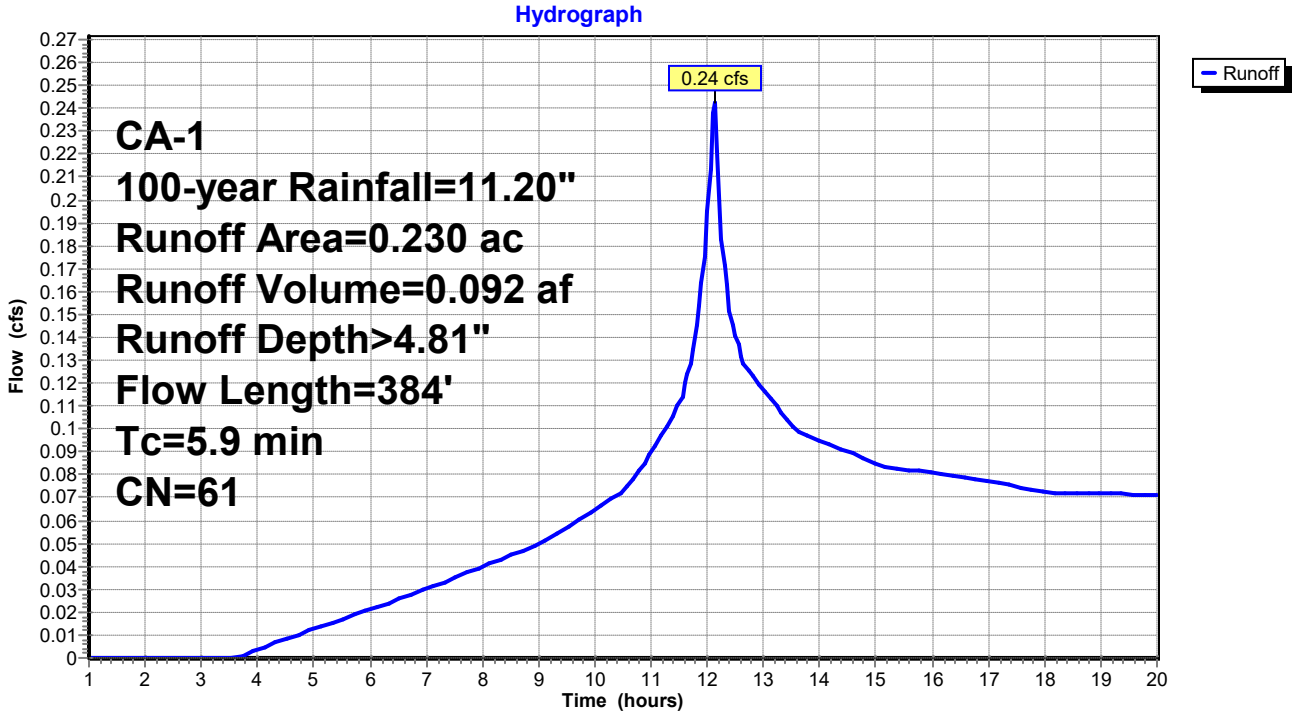
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.092 af, Depth> 4.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.230	61	>75% Grass cover, Good, HSG B
0.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	100	0.1500	0.32		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.2	70	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.5	90	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	124	0.2000	20.29	15.93	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
5.9	384	Total			

Subcatchment 1S: WS4a - post project



Summary for Subcatchment 3S: WS4b - post project

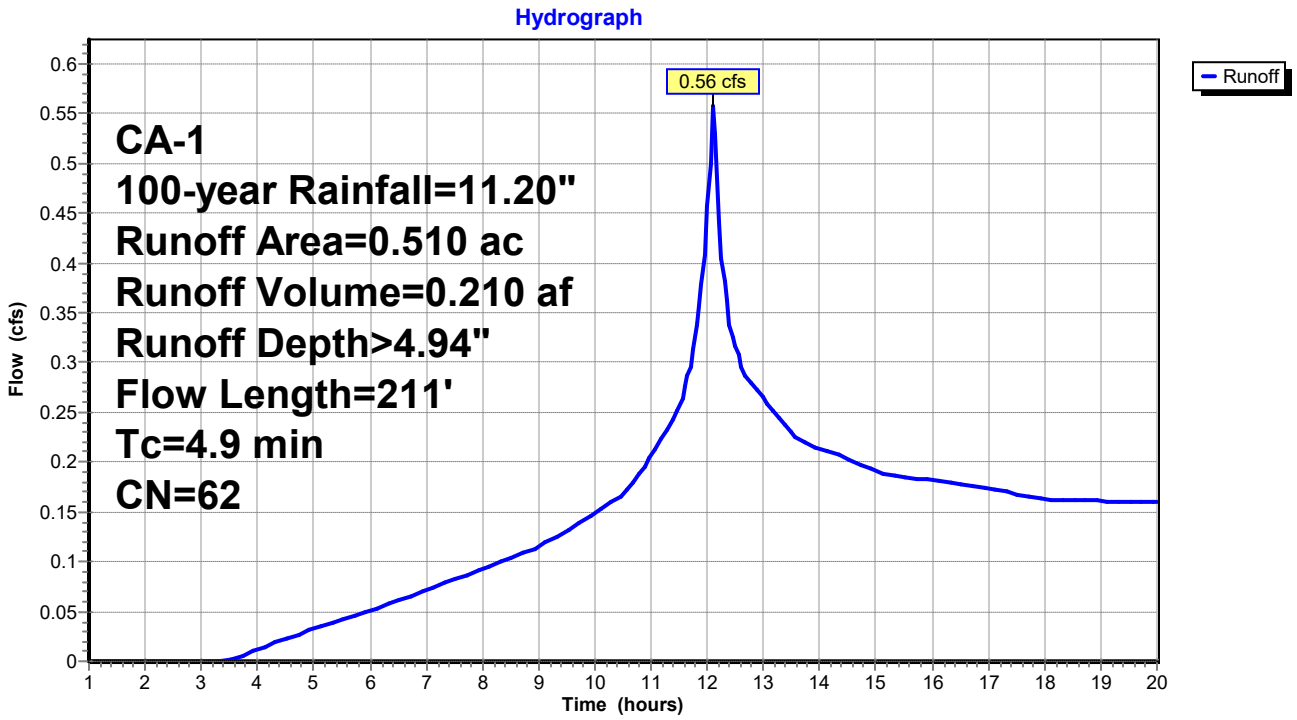
Runoff = 0.56 cfs @ 12.11 hrs, Volume= 0.210 af, Depth> 4.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.480	61	>75% Grass cover, Good, HSG B
*	0.020	81	>75% Grass cover, Good, HSG D
	0.010	56	Brush, Fair, HSG B
	0.510	62	Weighted Average
	0.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	100	0.2200	0.38		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.0	6	0.2000	7.20		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.5	80	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.0	25	0.0500	10.14	7.97	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
4.9	211	Total			

Subcatchment 3S: WS4b - post project



Summary for Subcatchment 4S: WS4c - post project

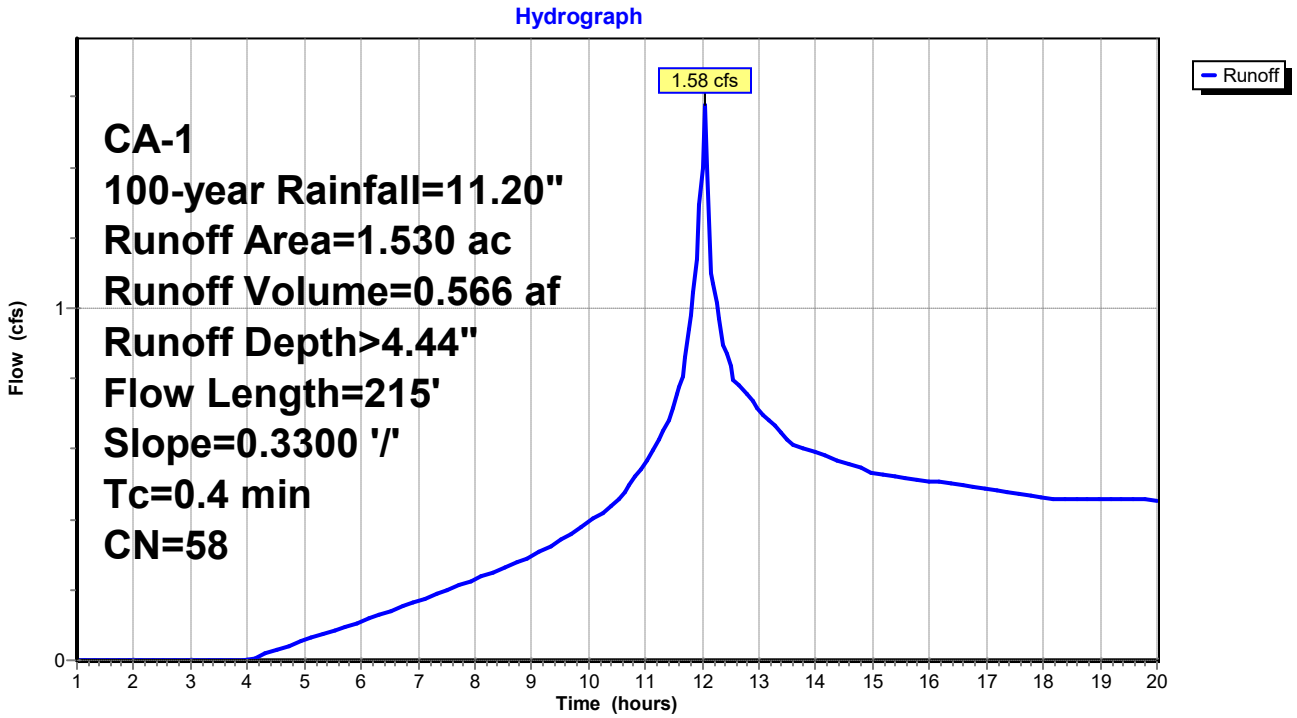
Runoff = 1.58 cfs @ 12.05 hrs, Volume= 0.566 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.310	61	>75% Grass cover, Good, HSG B
1.110	55	Woods, Good, HSG B
0.110	77	Woods, Good, HSG D
1.530	58	Weighted Average
1.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	215	0.3300	9.25		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 4S: WS4c - post project



Summary for Pond 2P: Basin 3

Inflow Area = 0.740 ac, 0.00% Impervious, Inflow Depth > 4.90" for 100-year event
Inflow = 0.80 cfs @ 12.11 hrs, Volume= 0.302 af
Outflow = 0.30 cfs @ 14.28 hrs, Volume= 0.154 af, Atten= 62%, Lag= 129.8 min
Primary = 0.30 cfs @ 14.28 hrs, Volume= 0.154 af

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.88' @ 14.28 hrs Surf.Area= 2,470 sf Storage= 6,586 cf

Plug-Flow detention time= 349.9 min calculated for 0.154 af (51% of inflow)
Center-of-Mass det. time= 176.7 min (979.1 - 802.4)

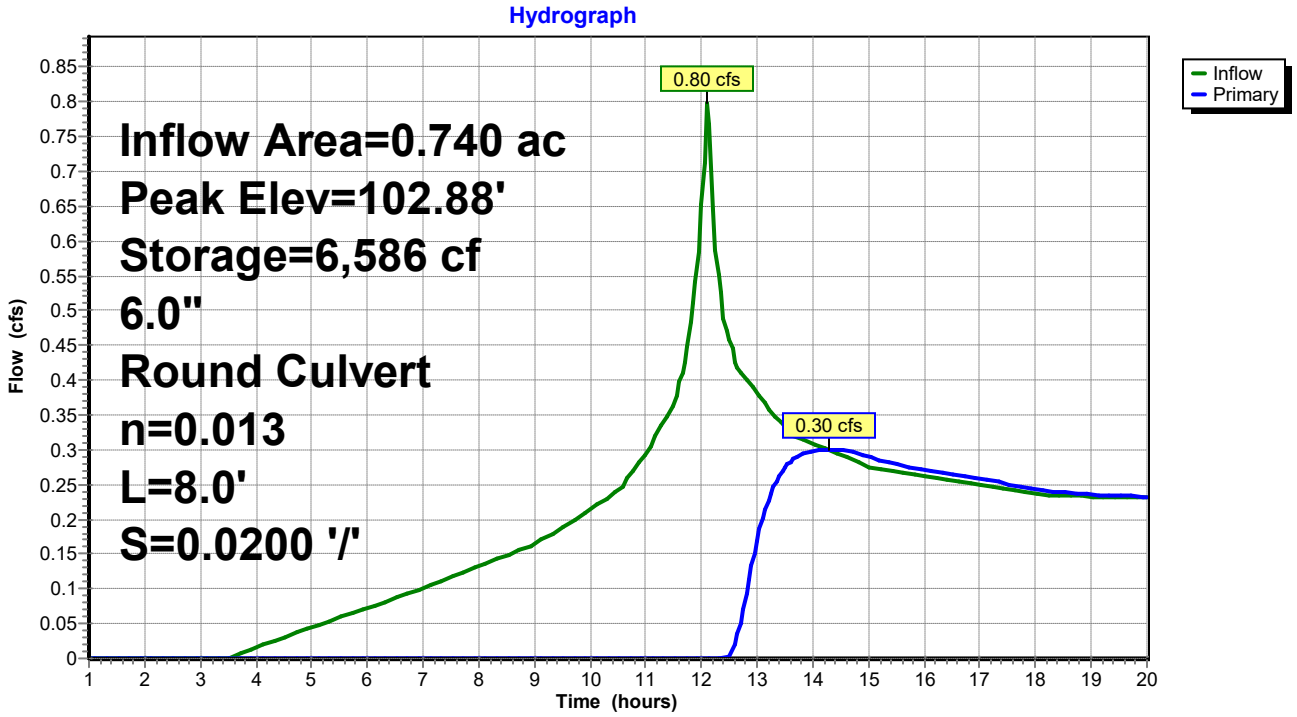
Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	6,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	997	0	0
100.00	1,332	1,165	1,165
101.00	1,695	1,514	2,678
102.00	2,092	1,894	4,572
103.00	2,520	2,306	6,878

Device	Routing	Invert	Outlet Devices
#1	Primary	102.50'	**6.0" Round Culvert** L= 8.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 102.50' / 102.34' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.30 cfs @ 14.28 hrs HW=102.88' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.30 cfs @ 1.86 fps)

Pond 2P: Basin 3



Summary for Subcatchment 1S: WS5 - pre project

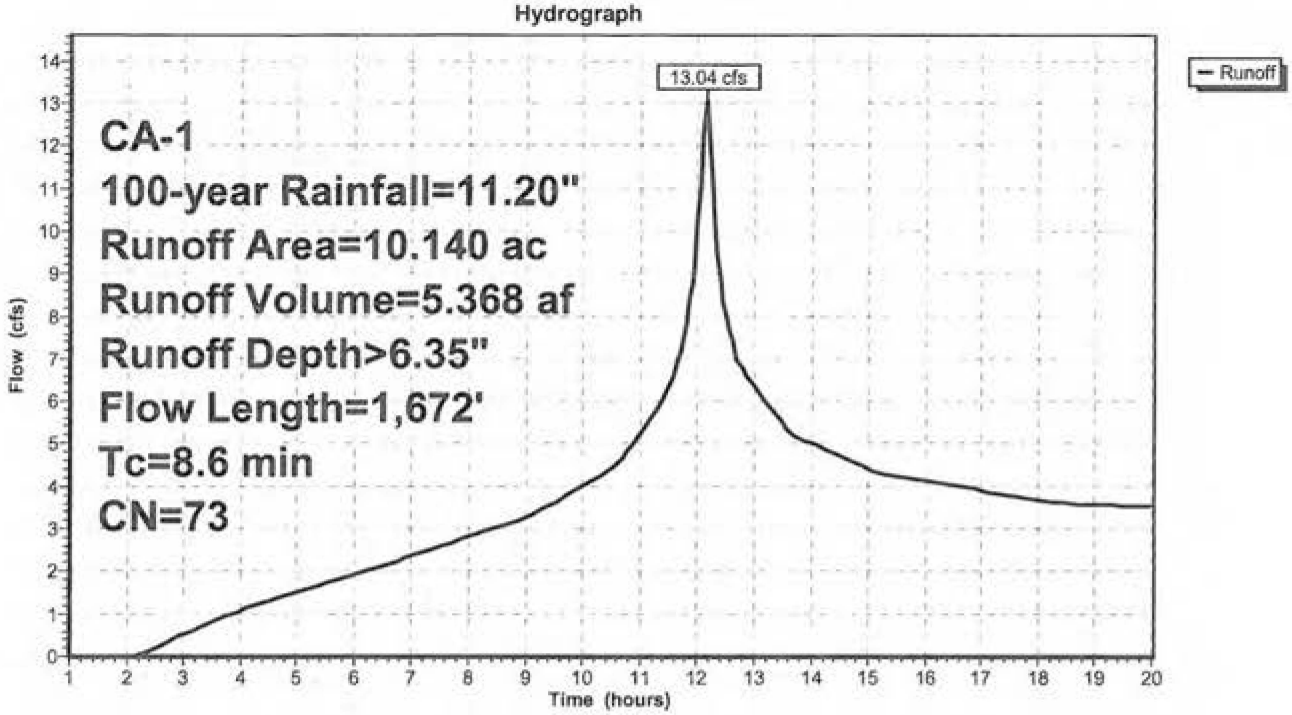
Runoff = 13.04 cfs @ 12.15 hrs, Volume= 5.368 af, Depth> 6.35"

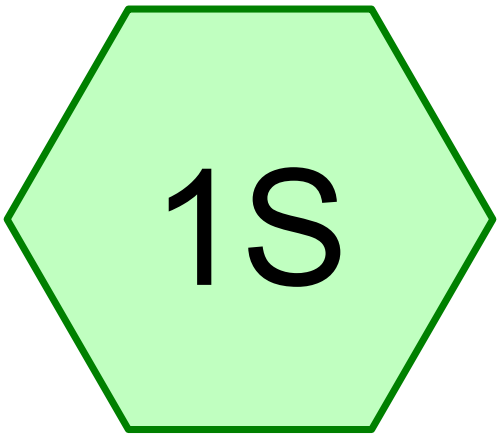
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.040	69	Pasture/grassland/range, Fair, HSG B
0.450	56	Brush, Fair, HSG B
5.290	77	Brush, Fair, HSG D
1.530	55	Woods, Good, HSG B
2.830	77	Woods, Good, HSG D
10.140	73	Weighted Average
10.140		100.00% Pervious Area

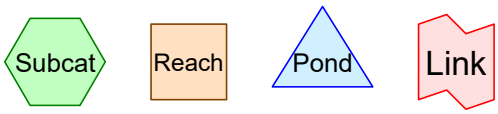
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	100	0.0600	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.94"
1.0	480	0.2700	8.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.5	1,092	0.1500	7.21	15.87	**Channel Flow,** Area= 2.2 sf Perim= 6.2' r= 0.35' n= 0.040 Mountain streams
8.6	1,672	Total			

Subcatchment 1S: WS5 - pre project





WS5 - post project



Routing Diagram for WS5 postR2
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Summary for Subcatchment 1S: WS5 - post project

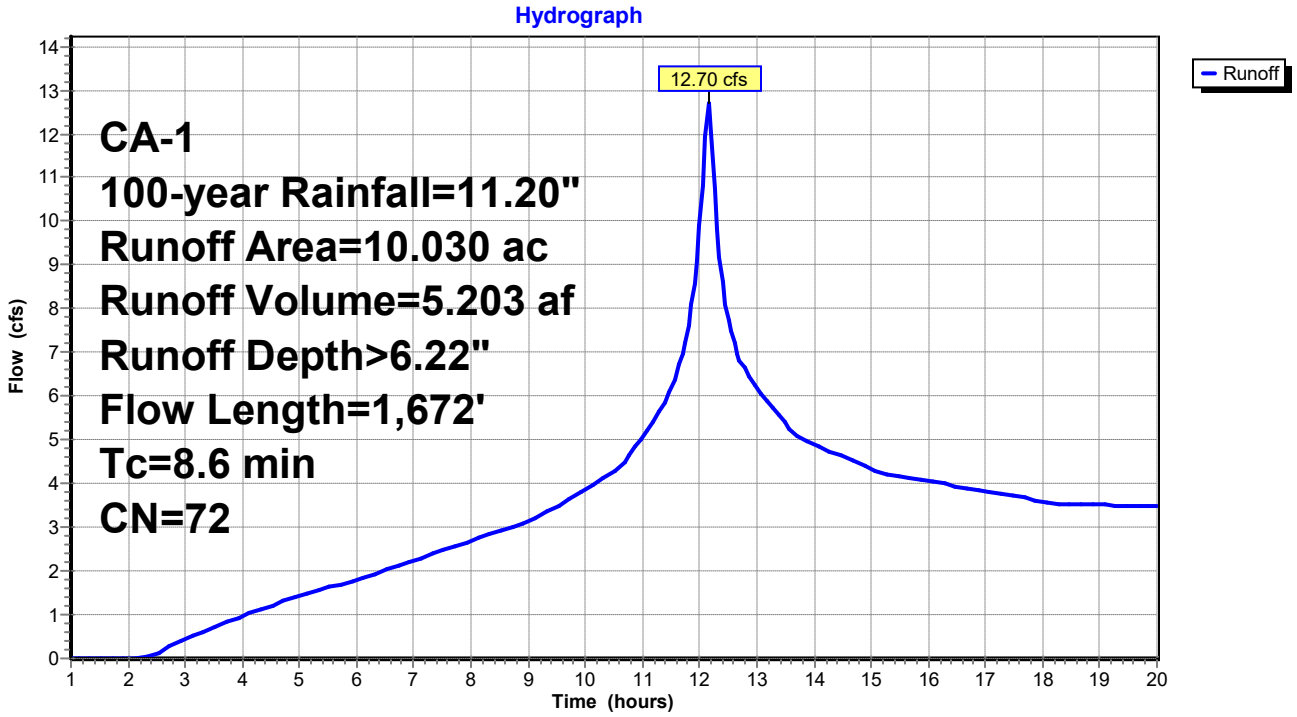
Runoff = 12.70 cfs @ 12.15 hrs, Volume= 5.203 af, Depth> 6.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.230	85	Gravel roads, HSG B
	0.630	61	>75% Grass cover, Good, HSG B
*	0.820	81	>75% Grass cover, Good, HSG D
	0.290	56	Brush, Fair, HSG B
	4.540	77	Brush, Fair, HSG D
	1.580	55	Woods, Good, HSG B
	1.940	77	Woods, Good, HSG D
	10.030	72	Weighted Average
	10.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	100	0.0600	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.94"
1.0	480	0.2700	8.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.5	1,092	0.1500	7.21	15.87	**Channel Flow,** Area= 2.2 sf Perim= 6.2' r= 0.35' n= 0.040 Mountain streams
8.6	1,672	Total			

Subcatchment 1S: WS5 - post project



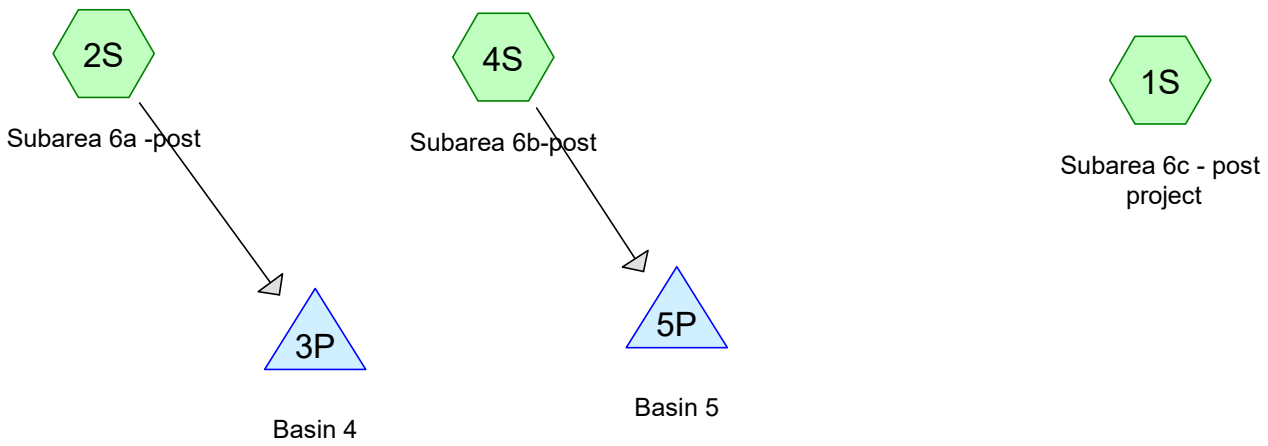
Summary for Subcatchment 1S: WS6 - pre project

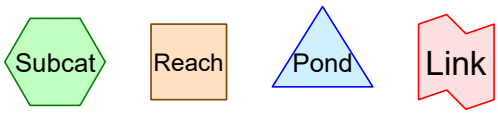
Runoff = 6.36 cfs @ 12.14 hrs, Volume= 2.645 af, Depth> 6.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
1.960	77	Brush, Fair, HSG D
2.660	77	Woods, Good, HSG D
4.620	77	Weighted Average
4.620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	100	0.1000	0.28		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
1.3	482	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	228	0.2500	9.31	20.48	**Channel Flow,** Area= 2.2 sf Perim= 6.2' r= 0.35' n= 0.040 Mountain streams
7.7	810	Total			





Routing Diagram for WS6 postR3
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Summary for Subcatchment 1S: Subarea 6c - post project

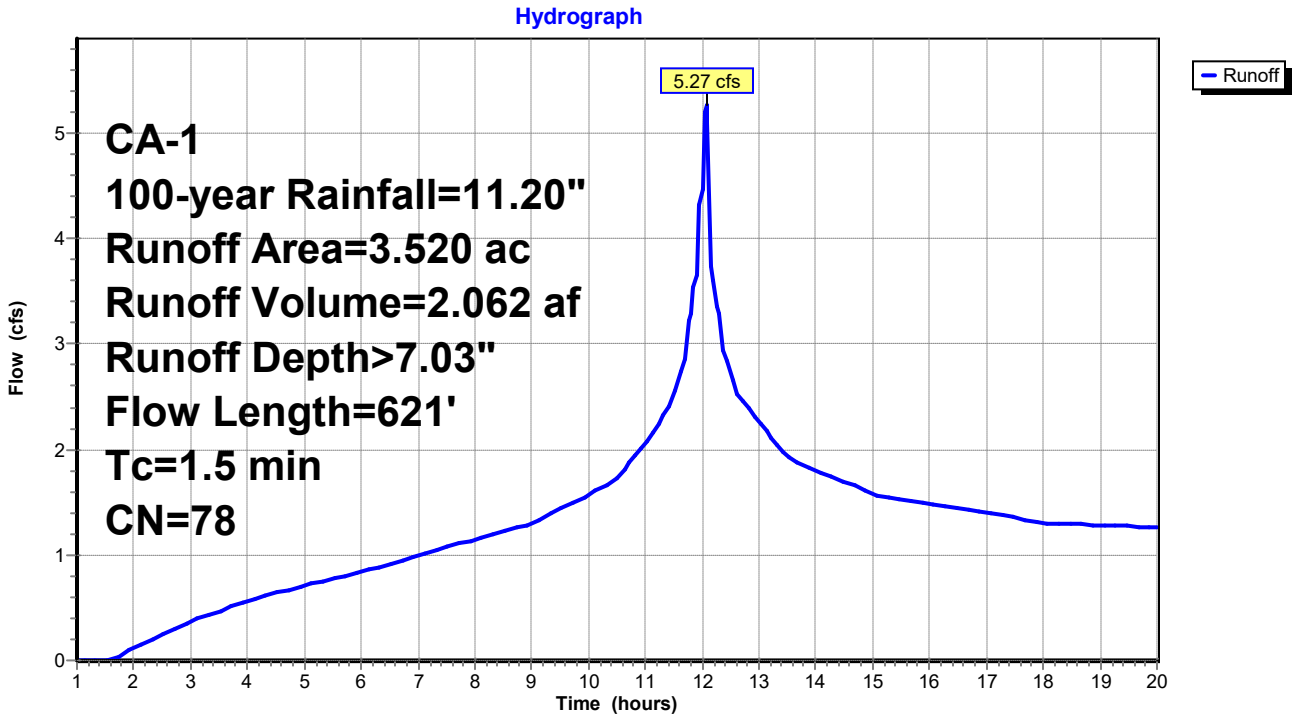
Runoff = 5.27 cfs @ 12.07 hrs, Volume= 2.062 af, Depth> 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
*	1.260	81	>75% Grass cover, Good, HSG D
	0.750	77	Brush, Fair, HSG D
	1.510	77	Woods, Good, HSG D
	3.520	78	Weighted Average
	3.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	393	0.1500	6.24		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	228	0.2500	9.31	20.48	**Channel Flow,** Area= 2.2 sf Perim= 6.2' r= 0.35' n= 0.040 Mountain streams
1.5	621	Total			

Subcatchment 1S: Subarea 6c - post project



Summary for Subcatchment 2S: Subarea 6a -post

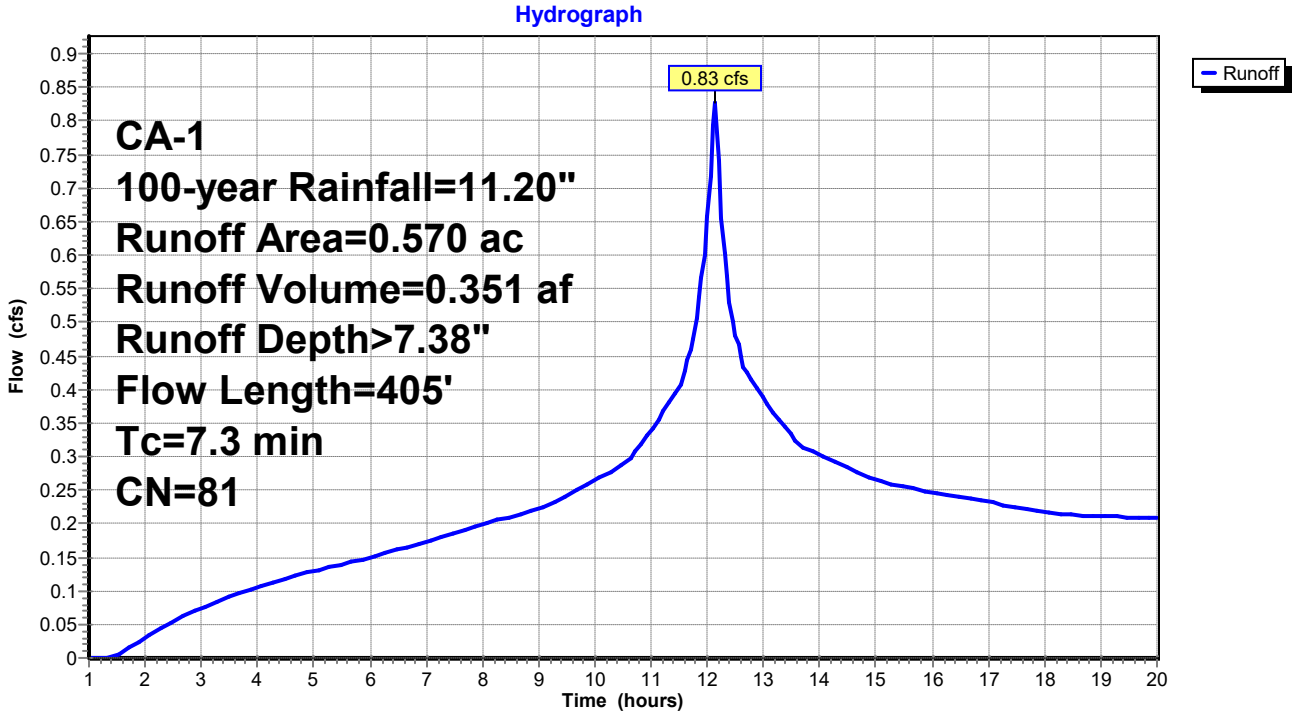
Runoff = 0.83 cfs @ 12.14 hrs, Volume= 0.351 af, Depth> 7.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
*	0.570	81	>75% Grass cover, Good, HSG D
	0.570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0900	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.2	92	0.2400	7.89		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.6	95	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	118	0.0800	12.83	10.08	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
7.3	405	Total			

Subcatchment 2S: Subarea 6a -post



Summary for Subcatchment 4S: Subarea 6b-post

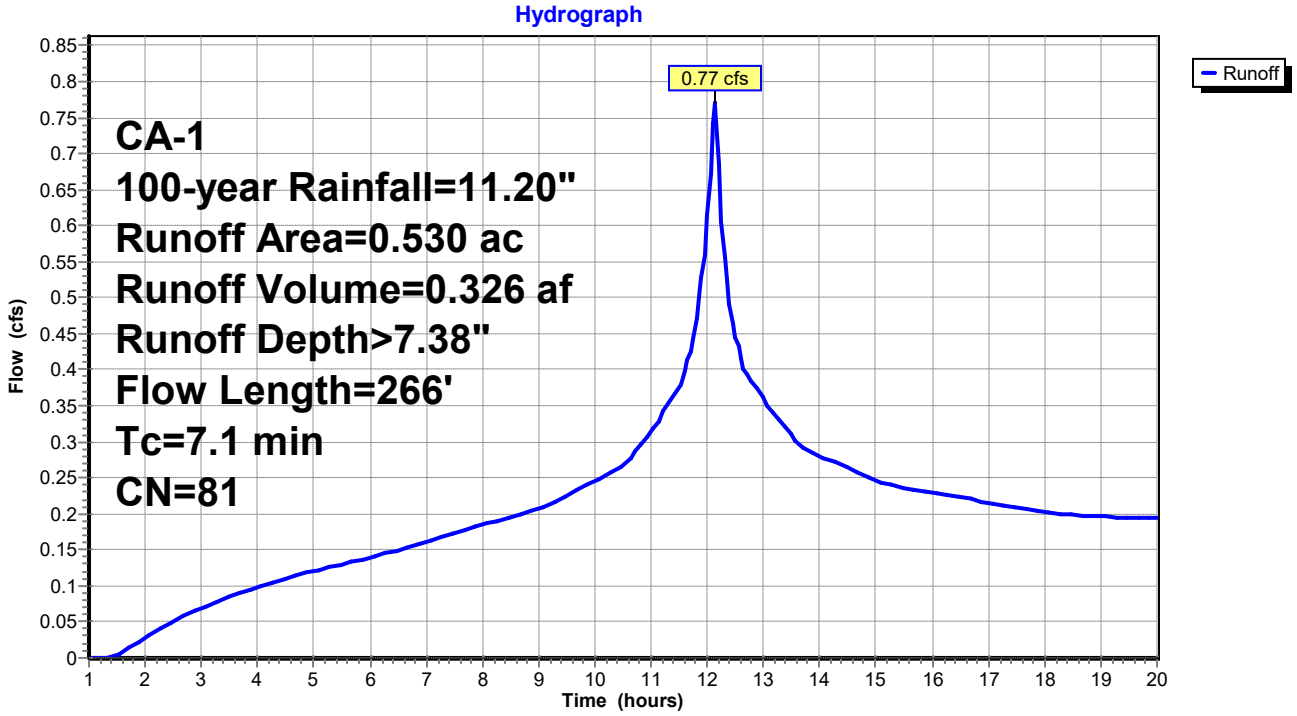
Runoff = 0.77 cfs @ 12.14 hrs, Volume= 0.326 af, Depth> 7.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
*	0.530	81	>75% Grass cover, Good, HSG D
	0.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0900	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.0	16	0.2900	8.67		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	110	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	40	0.0800	12.83	10.08	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
7.1	266	Total			

Subcatchment 4S: Subarea 6b-post



Summary for Pond 3P: Basin 4

Inflow Area = 0.570 ac, 0.00% Impervious, Inflow Depth > 7.38" for 100-year event
Inflow = 0.83 cfs @ 12.14 hrs, Volume= 0.351 af
Outflow = 0.55 cfs @ 12.38 hrs, Volume= 0.246 af, Atten= 34%, Lag= 14.2 min
Primary = 0.55 cfs @ 12.38 hrs, Volume= 0.246 af

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.93' @ 12.38 hrs Surf.Area= 1,742 sf Storage= 5,178 cf

Plug-Flow detention time= 265.5 min calculated for 0.246 af (70% of inflow)
Center-of-Mass det. time= 139.6 min (870.8 - 731.2)

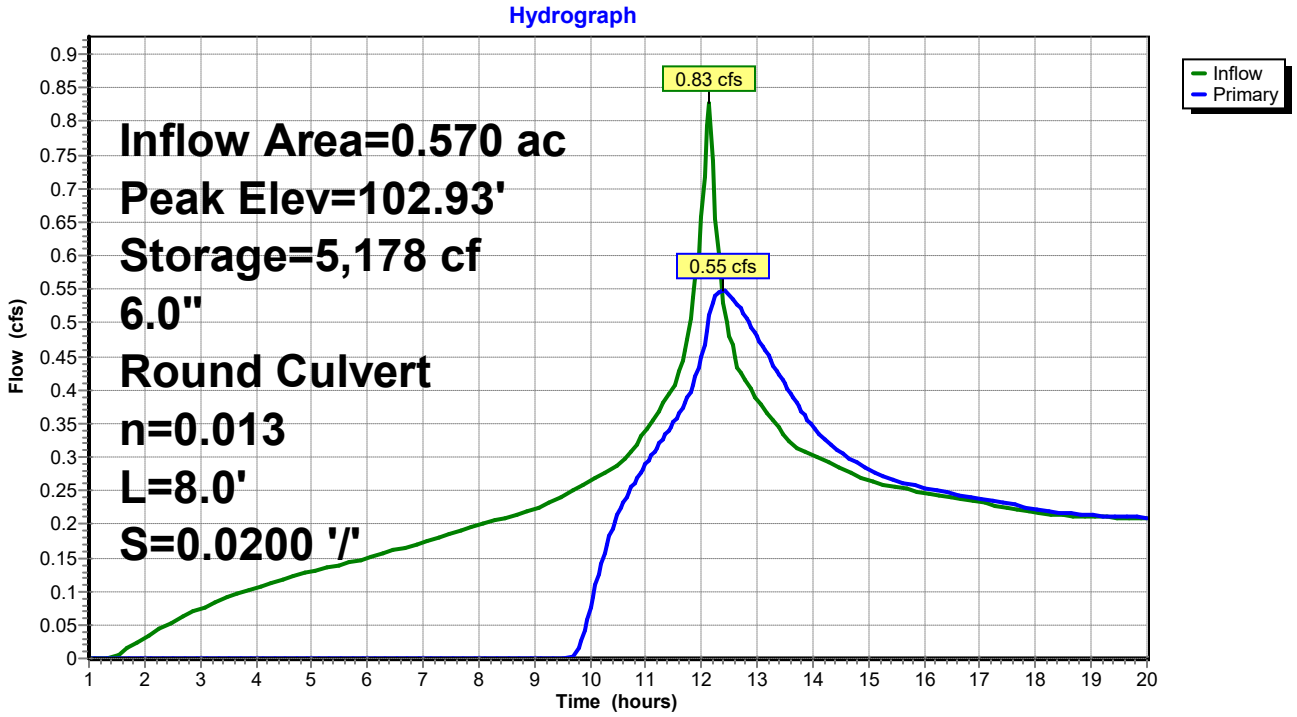
Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	5,295 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	483	0	0
99.00	675	579	579
100.00	899	787	1,366
101.00	1,155	1,027	2,393
102.00	1,443	1,299	3,692
103.00	1,763	1,603	5,295

Device	Routing	Invert	Outlet Devices
#1	Primary	102.25'	**6.0" Round Culvert** L= 8.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 102.25' / 102.09' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.55 cfs @ 12.38 hrs HW=102.93' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.55 cfs @ 2.79 fps)

Pond 3P: Basin 4



Summary for Pond 5P: Basin 5

Inflow Area = 0.530 ac, 0.00% Impervious, Inflow Depth > 7.38" for 100-year event
Inflow = 0.77 cfs @ 12.14 hrs, Volume= 0.326 af
Outflow = 0.51 cfs @ 12.38 hrs, Volume= 0.220 af, Atten= 34%, Lag= 14.3 min
Primary = 0.51 cfs @ 12.38 hrs, Volume= 0.220 af

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 103.62' @ 12.38 hrs Surf.Area= 1,891 sf Storage= 5,220 cf

Plug-Flow detention time= 286.4 min calculated for 0.219 af (67% of inflow)
Center-of-Mass det. time= 150.0 min (881.0 - 731.1)

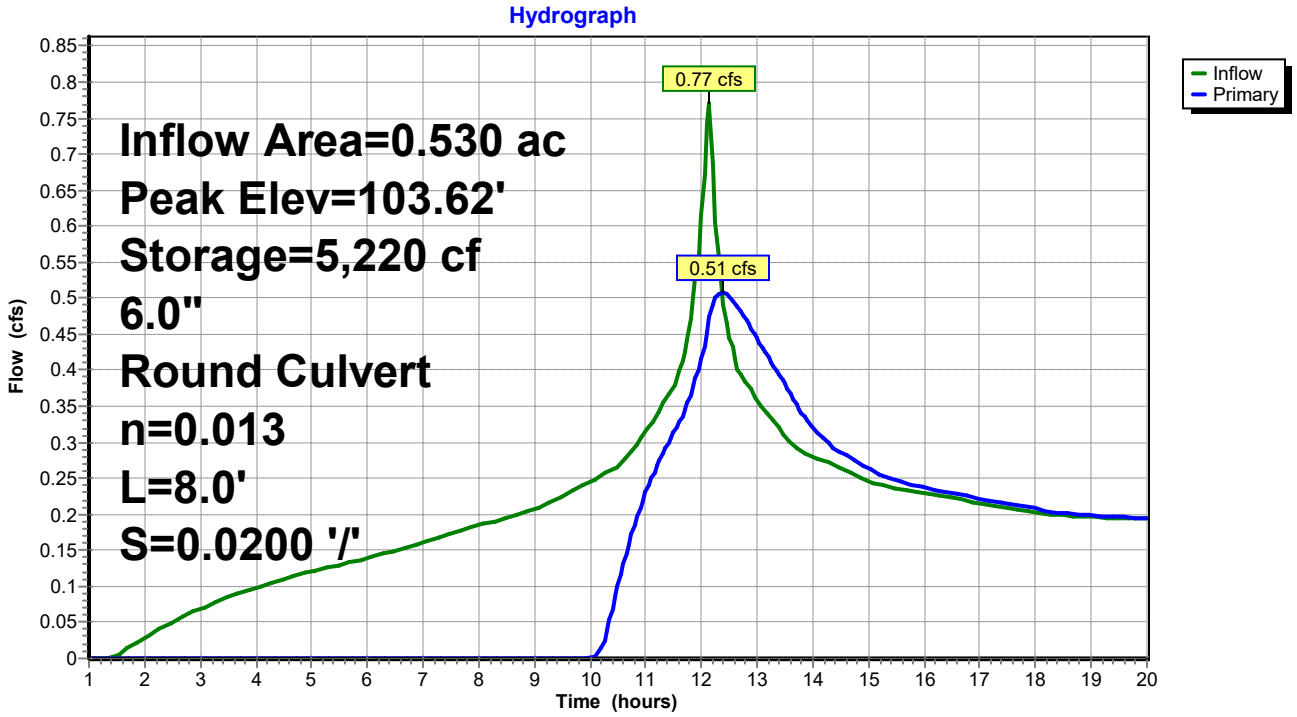
Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	5,964 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	586	0	0
100.00	717	652	652
101.00	988	853	1,504
102.00	1,298	1,143	2,647
103.00	1,648	1,473	4,120
104.00	2,039	1,844	5,964

Device	Routing	Invert	Outlet Devices
#1	Primary	103.00'	**6.0" Round Culvert** L= 8.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 103.00' / 102.84' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.51 cfs @ 12.38 hrs HW=103.62' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.51 cfs @ 2.59 fps)

Pond 5P: Basin 5



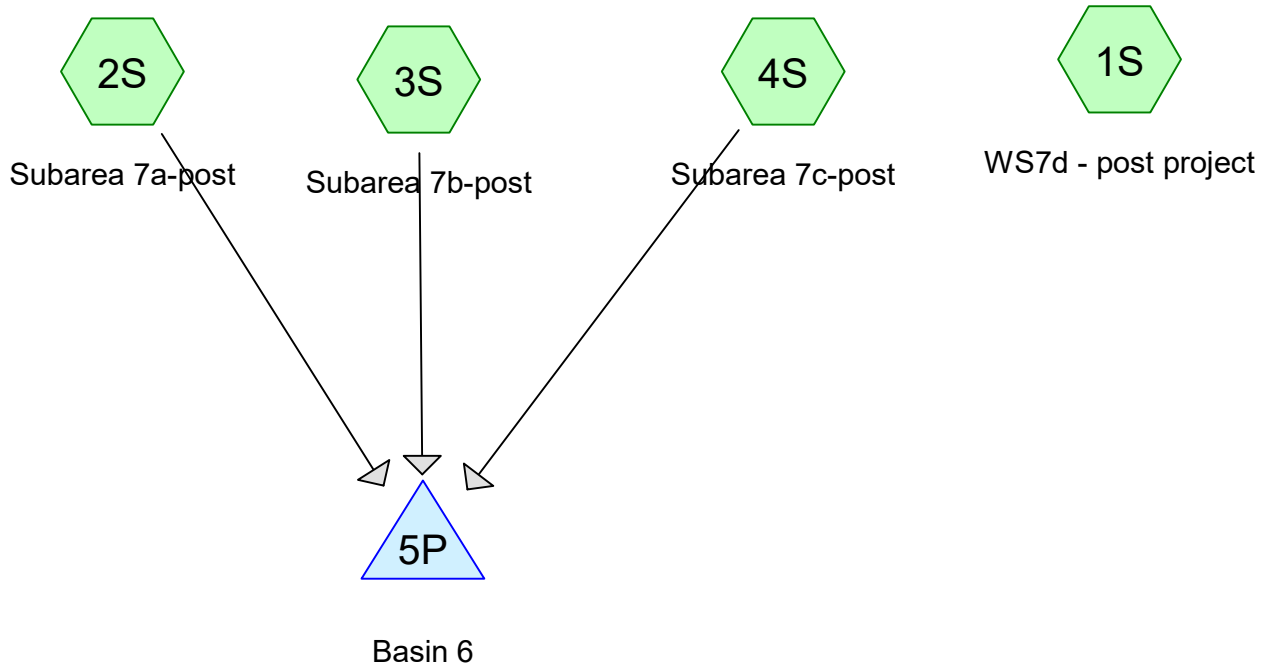
Summary for Subcatchment 1S: WS7 - pre project

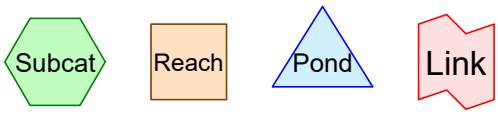
Runoff = 5.99 cfs @ 12.20 hrs, Volume= 2.540 af, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.280	56	Brush, Fair, HSG B
2.600	77	Brush, Fair, HSG D
1.650	55	Woods, Good, HSG B
0.710	77	Woods, Good, HSG D
5.240	69	Weighted Average
5.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	70	0.0400	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
2.7	917	0.1200	5.58		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.5	987	Total			





Routing Diagram for WS7 postR2
Prepared by Napa Valley Vineyard Engineering, Printed 7/18/2018
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Summary for Subcatchment 1S: WS7d - post project

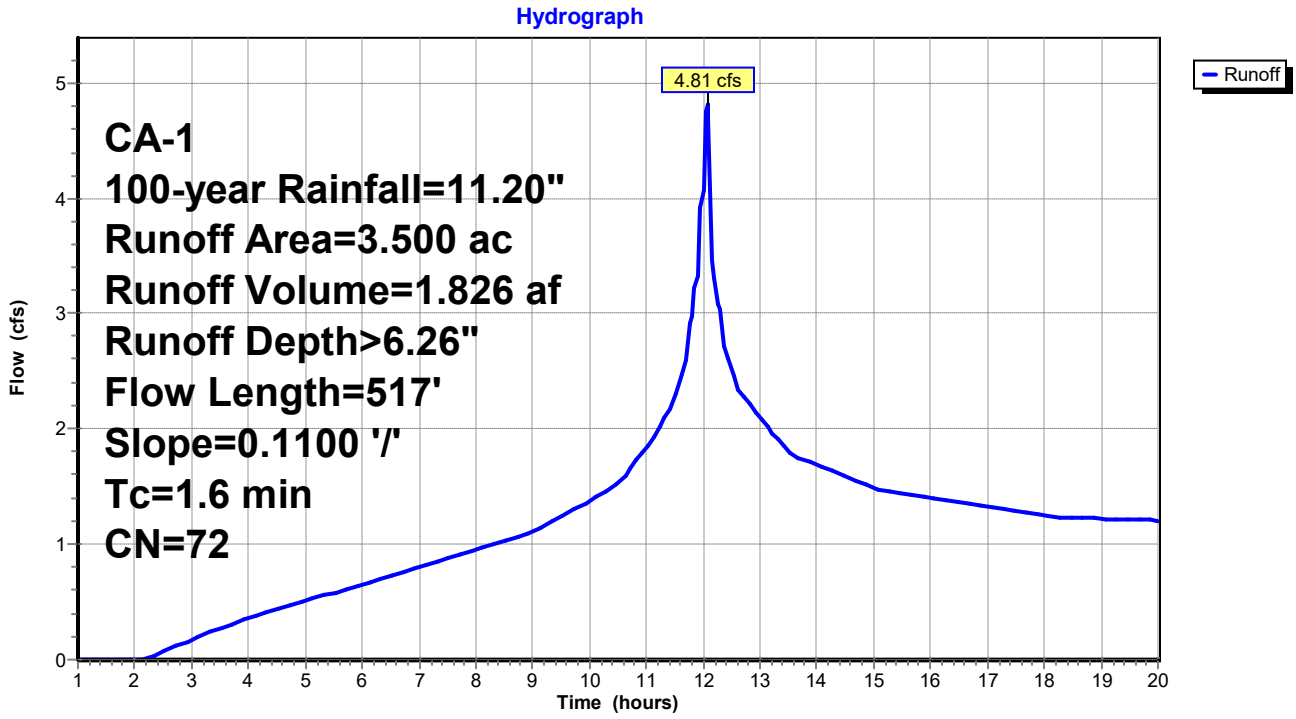
Runoff = 4.81 cfs @ 12.07 hrs, Volume= 1.826 af, Depth> 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.510	61	>75% Grass cover, Good, HSG B
*	0.310	81	>75% Grass cover, Good, HSG D
	0.140	56	Brush, Fair, HSG B
	2.040	77	Brush, Fair, HSG D
	0.310	55	Woods, Good, HSG B
	0.190	77	Woods, Good, HSG D
	3.500	72	Weighted Average
	3.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	517	0.1100	5.34		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 1S: WS7d - post project



Summary for Subcatchment 2S: Subarea 7a-post

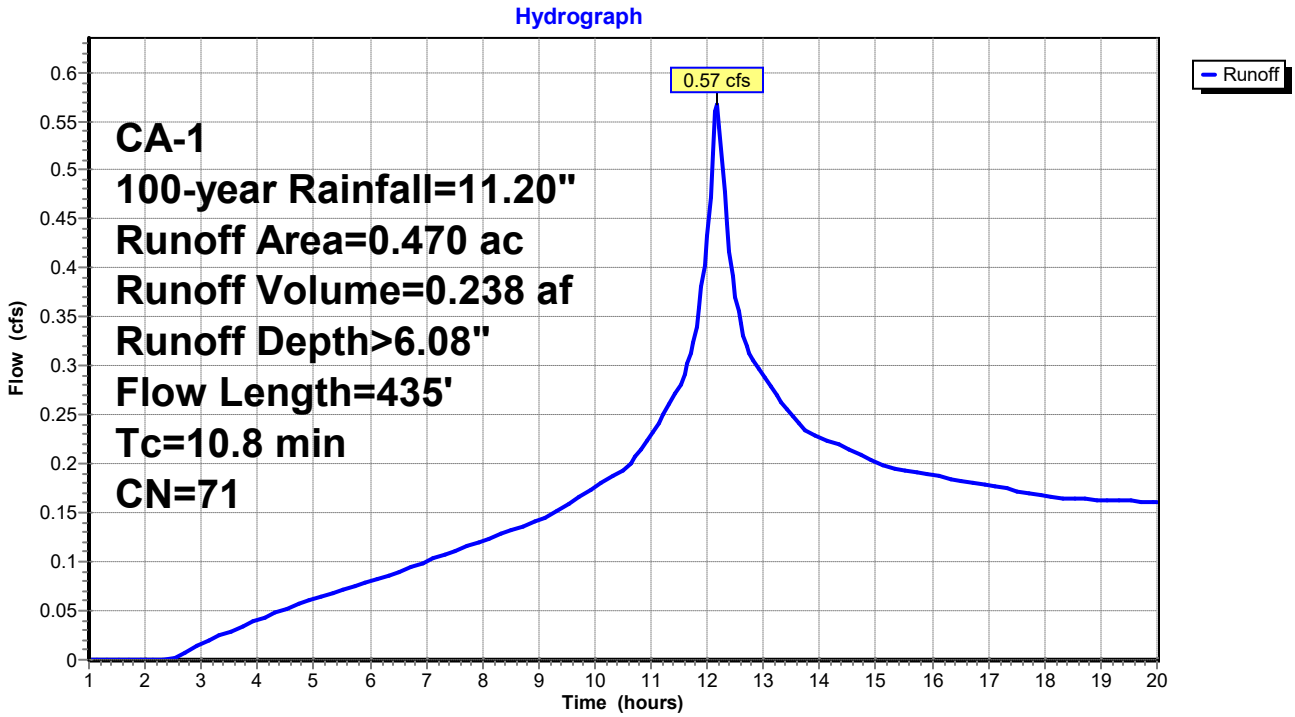
Runoff = 0.57 cfs @ 12.18 hrs, Volume= 0.238 af, Depth> 6.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.240	61	>75% Grass cover, Good, HSG B
*	0.230	81	>75% Grass cover, Good, HSG D
	0.470	71	Weighted Average
	0.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0300	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.2	84	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	124	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	127	0.1100	15.05	11.82	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
10.8	435	Total			

Subcatchment 2S: Subarea 7a-post



Summary for Subcatchment 3S: Subarea 7b-post

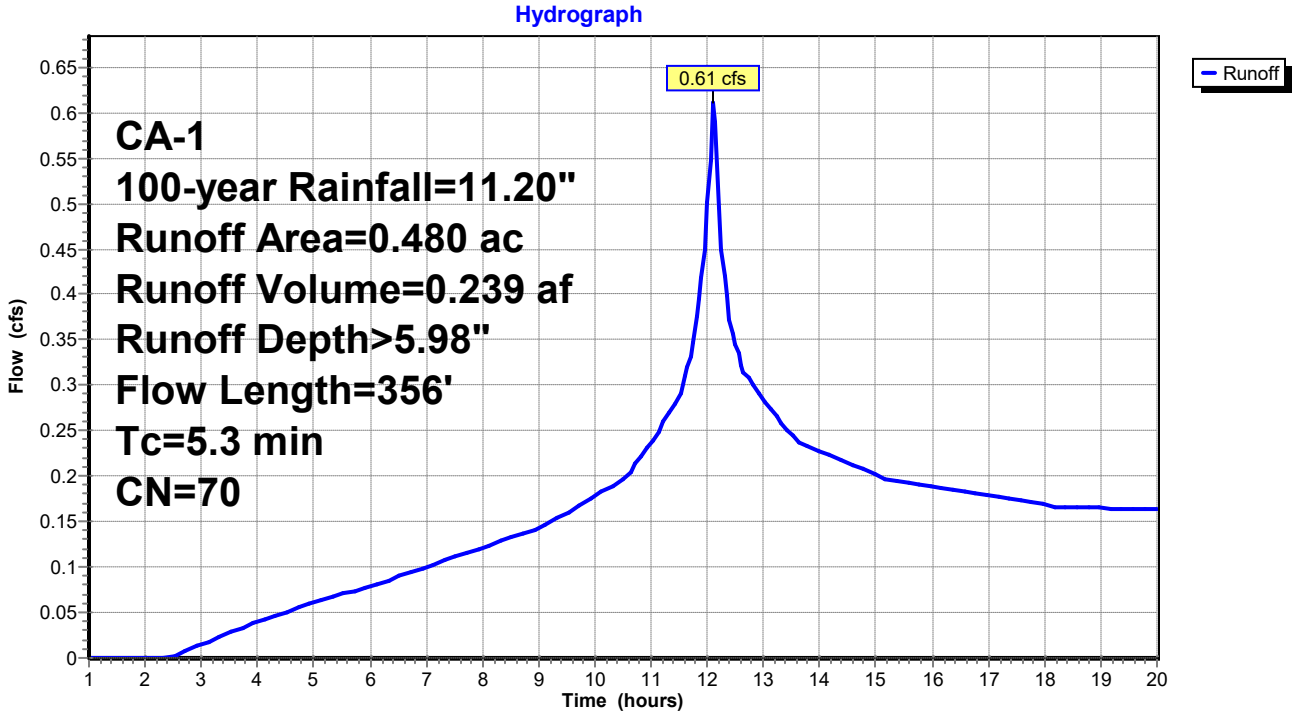
Runoff = 0.61 cfs @ 12.11 hrs, Volume= 0.239 af, Depth> 5.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.260	61	>75% Grass cover, Good, HSG B
*	0.220	81	>75% Grass cover, Good, HSG D
	0.480	70	Weighted Average
	0.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.2000	0.36		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.5	92	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	164	0.1300	16.36	12.85	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
5.3	356	Total			

Subcatchment 3S: Subarea 7b-post



Summary for Subcatchment 4S: Subarea 7c-post

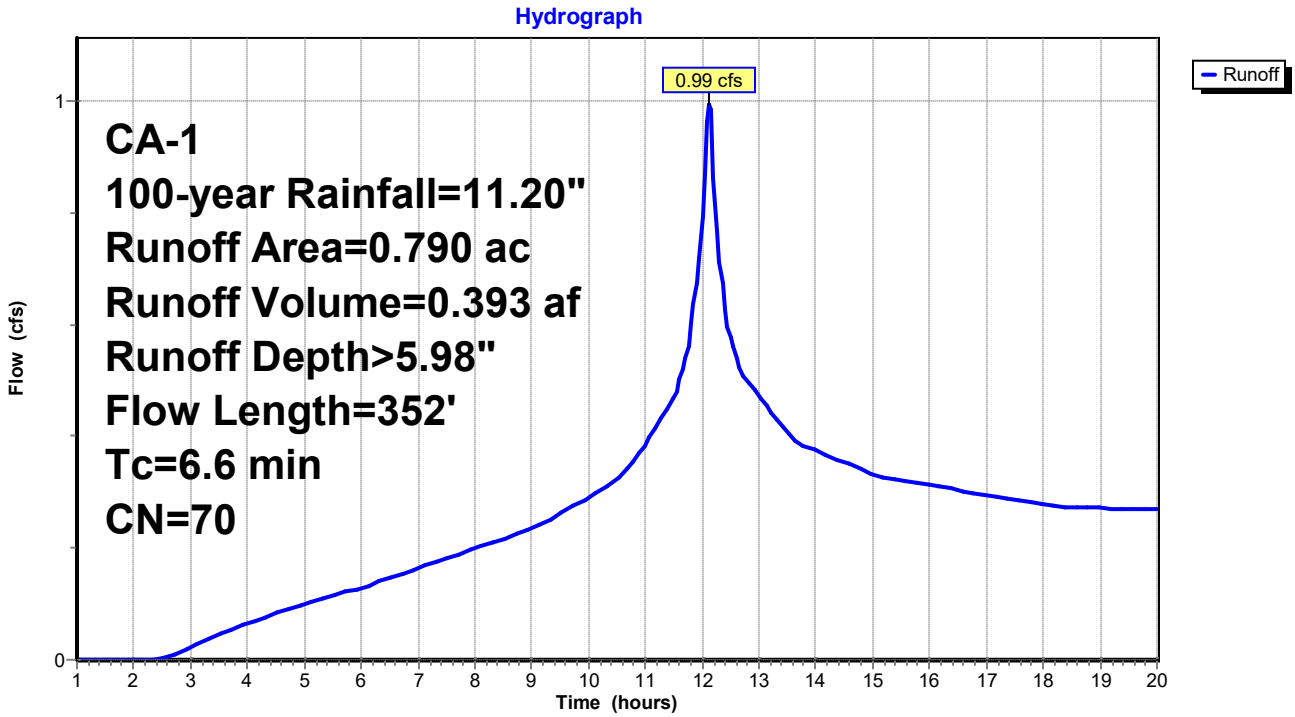
Runoff = 0.99 cfs @ 12.13 hrs, Volume= 0.393 af, Depth> 5.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.440	61	>75% Grass cover, Good, HSG B
*	0.350	81	>75% Grass cover, Good, HSG D
	0.790	70	Weighted Average
	0.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.1100	0.29		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.3	100	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.4	75	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	77	0.0500	10.14	7.97	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
6.6	352	Total			

Subcatchment 4S: Subarea 7c-post



Summary for Pond 5P: Basin 6

Inflow Area = 1.740 ac, 0.00% Impervious, Inflow Depth > 6.01" for 100-year event
Inflow = 2.15 cfs @ 12.13 hrs, Volume= 0.871 af
Outflow = 1.15 cfs @ 12.70 hrs, Volume= 0.674 af, Atten= 47%, Lag= 33.7 min
Primary = 1.01 cfs @ 12.70 hrs, Volume= 0.662 af
Secondary = 0.14 cfs @ 12.70 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 104.20' @ 12.70 hrs Surf.Area= 3,268 sf Storage= 11,298 cf

Plug-Flow detention time= 205.5 min calculated for 0.674 af (77% of inflow)
Center-of-Mass det. time= 114.9 min (886.9 - 771.9)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	12,285 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

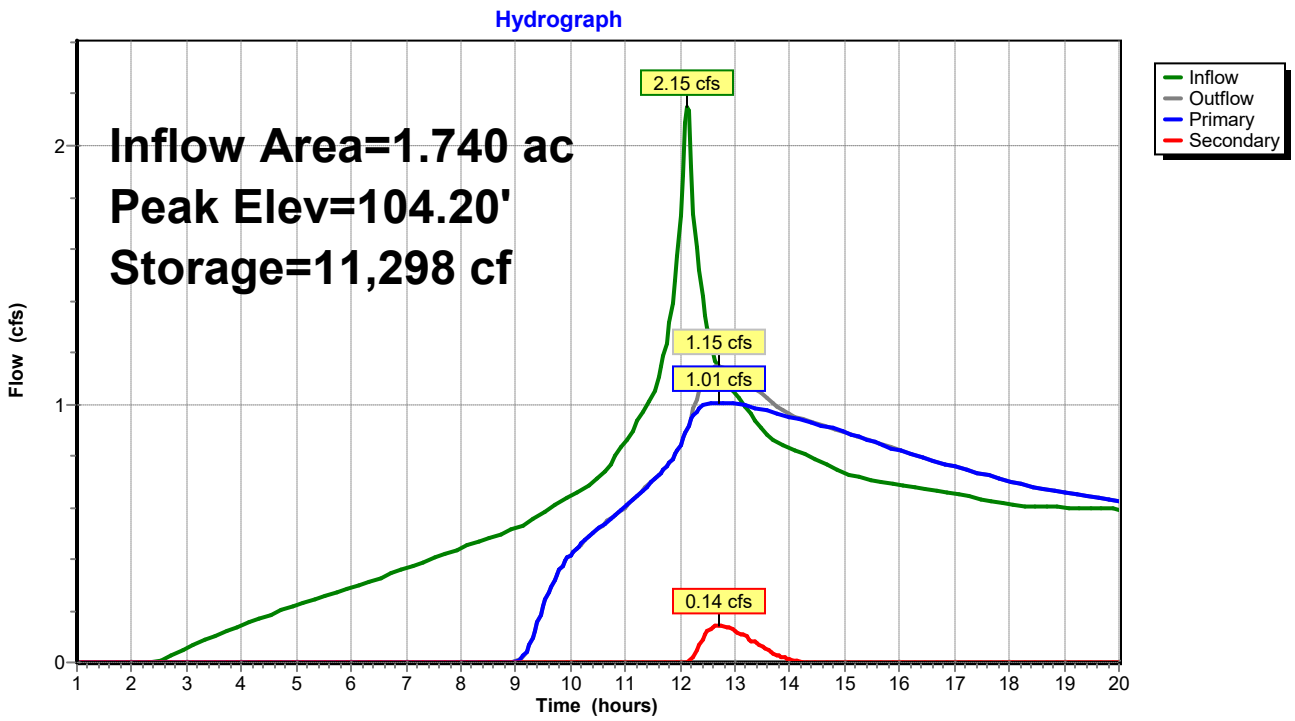
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	1,214	0	0
100.00	1,541	1,378	1,378
101.00	1,900	1,721	3,098
102.00	2,292	2,096	5,194
103.00	2,715	2,504	7,698
104.00	3,170	2,943	10,640
104.50	3,410	1,645	12,285

Device	Routing	Invert	Outlet Devices
#1	Secondary	98.00'	**8.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 98.00' / 97.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	104.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	102.50'	**6.0" Round Culvert** L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 102.50' / 102.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=1.01 cfs @ 12.70 hrs HW=104.20' (Free Discharge)
└─**3=Culvert** (Inlet Controls 1.01 cfs @ 5.12 fps)

Secondary OutFlow Max=0.14 cfs @ 12.70 hrs HW=104.20' (Free Discharge)
└─**1=Culvert** (Passes 0.14 cfs of 3.22 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 0.14 cfs @ 1.54 fps)

Pond 5P: Basin 6



Summary for Subcatchment 1S: WS8a - pre project

Runoff = 14.65 cfs @ 12.23 hrs, Volume= 6.215 af, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
1.520	98	Roofs, HSG B
0.900	69	50-75% Grass cover, Fair, HSG B
1.570	61	Pasture/grassland/range, Good, HSG B
11.660	55	Woods, Good, HSG B
15.650	61	Weighted Average
14.130		90.29% Pervious Area
1.520		9.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0900	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
2.0	866	0.2000	7.20		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.7	626	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
15.2	1,592	Total			

Summary for Subcatchment 2S: WS8b - pre project

Runoff = 8.56 cfs @ 12.14 hrs, Volume= 3.272 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.050	98	Roofs, HSG B
0.110	61	Pasture/grassland/range, Good, HSG B
0.070	56	Brush, Fair, HSG B
6.570	55	Woods, Good, HSG B
1.600	77	Woods, Good, HSG D
8.400	60	Weighted Average
8.350		99.40% Pervious Area
0.050		0.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.1500	0.47		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.94"
1.2	565	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.1	598	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.8	1,263	Total			

Summary for Subcatchment 3S: WS8c - pre project

Runoff = 6.73 cfs @ 12.19 hrs, Volume= 2.732 af, Depth> 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.690	98	Roofs, HSG B
0.470	61	Pasture/grassland/range, Good, HSG B
6.090	55	Woods, Good, HSG B
7.250	59	Weighted Average
6.560		90.48% Pervious Area
0.690		9.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.1400	0.21		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
1.6	720	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.1	528	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.6	1,348	Total			

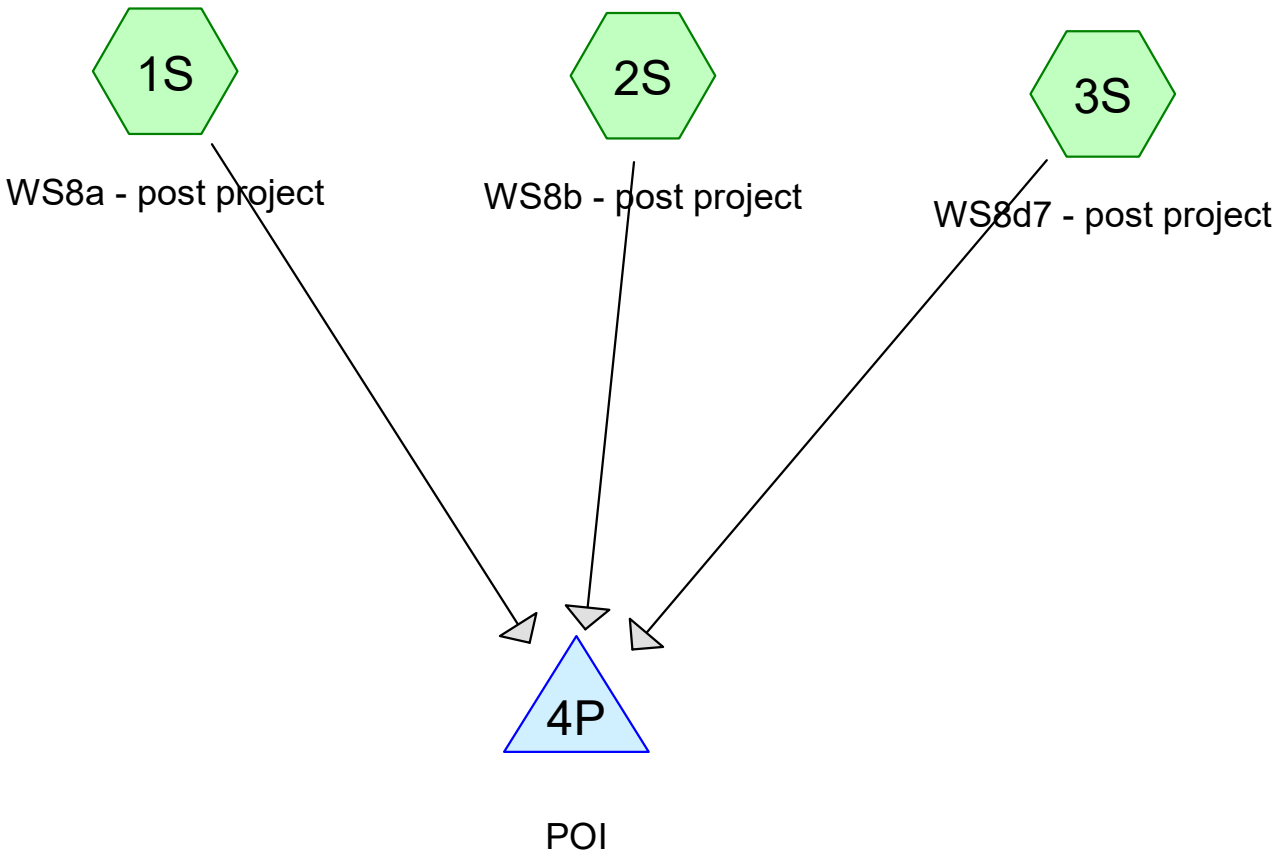
Summary for Subcatchment 4S: WS8d - pre project

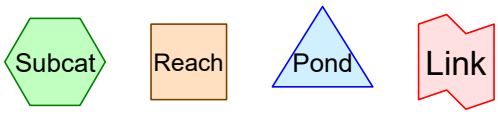
Runoff = 9.69 cfs @ 12.17 hrs, Volume= 3.860 af, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.050	61	Pasture/grassland/range, Good, HSG B
0.360	77	Brush, Fair, HSG D
7.750	55	Woods, Good, HSG B
1.780	77	Woods, Good, HSG D
9.940	60	Weighted Average
9.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.1500	0.22		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
1.3	485	0.1400	6.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.9	229	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.9	814	Total			





Routing Diagram for WS8 post channelR3
Prepared by Napa Valley Vineyard Engineering, Printed 7/18/2018
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Summary for Subcatchment 1S: WS8a - post project

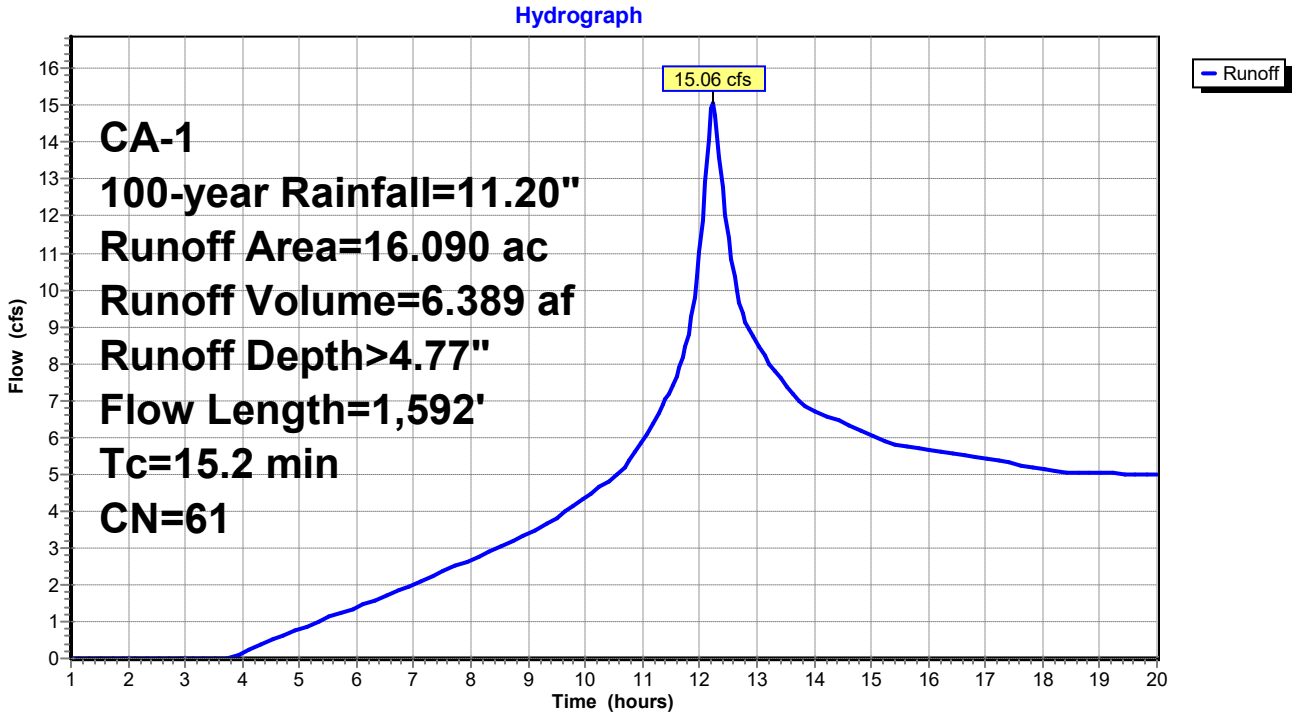
Runoff = 15.06 cfs @ 12.23 hrs, Volume= 6.389 af, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
1.540	98	Roofs, HSG B
0.190	85	Gravel roads, HSG B
0.900	61	>75% Grass cover, Good, HSG B
0.900	69	50-75% Grass cover, Fair, HSG B
1.540	61	Pasture/grassland/range, Good, HSG B
11.020	55	Woods, Good, HSG B
16.090	61	Weighted Average
14.550		90.43% Pervious Area
1.540		9.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0900	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
2.0	866	0.2000	7.20		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.7	626	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
15.2	1,592	Total			

Subcatchment 1S: WS8a - post project



Summary for Subcatchment 2S: WS8b - post project

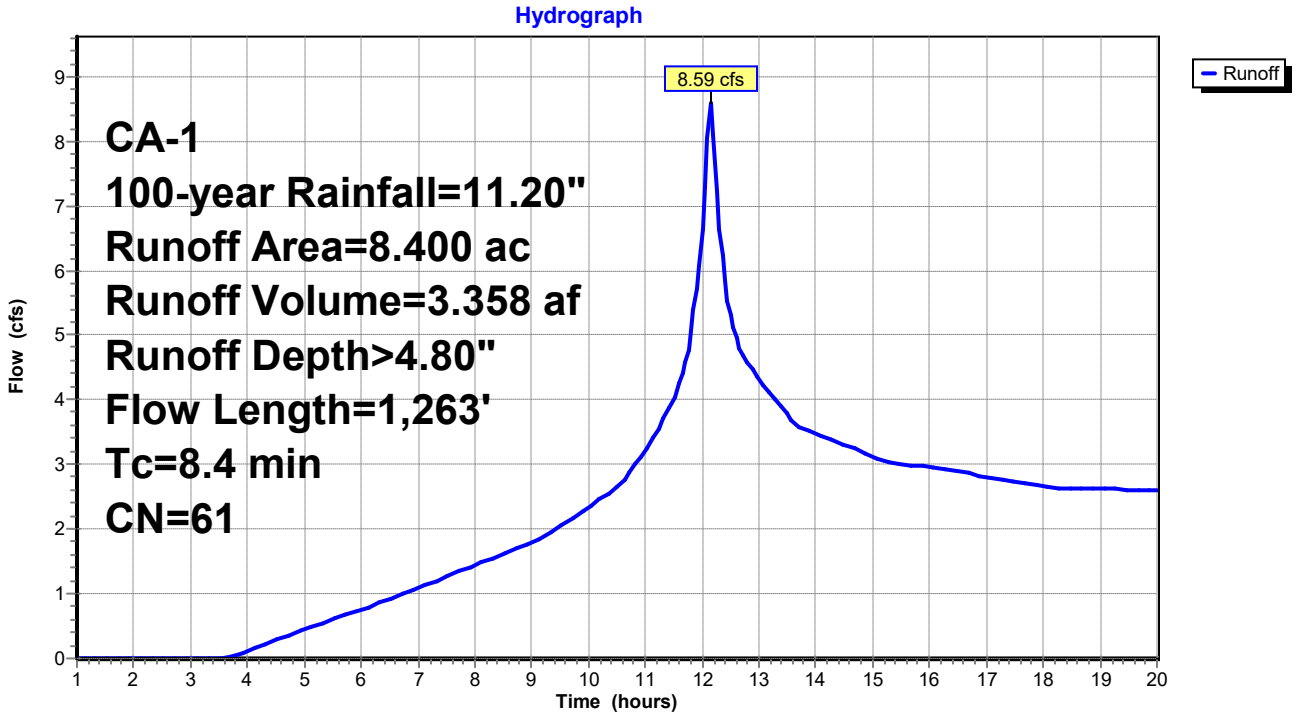
Runoff = 8.59 cfs @ 12.15 hrs, Volume= 3.358 af, Depth> 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.050	98	Roofs, HSG B
	0.030	85	Gravel roads, HSG B
	2.410	61	>75% Grass cover, Good, HSG B
*	0.940	81	>75% Grass cover, Good, HSG D
	0.050	61	Pasture/grassland/range, Good, HSG B
	4.360	55	Woods, Good, HSG B
	0.560	77	Woods, Good, HSG D
	8.400	61	Weighted Average
	8.350		99.40% Pervious Area
	0.050		0.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	100	0.1500	0.32		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
1.2	565	0.2200	7.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.1	598	0.0900	4.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.4	1,263	Total			

Subcatchment 2S: WS8b - post project



Summary for Subcatchment 3S: WS8d7 - post project

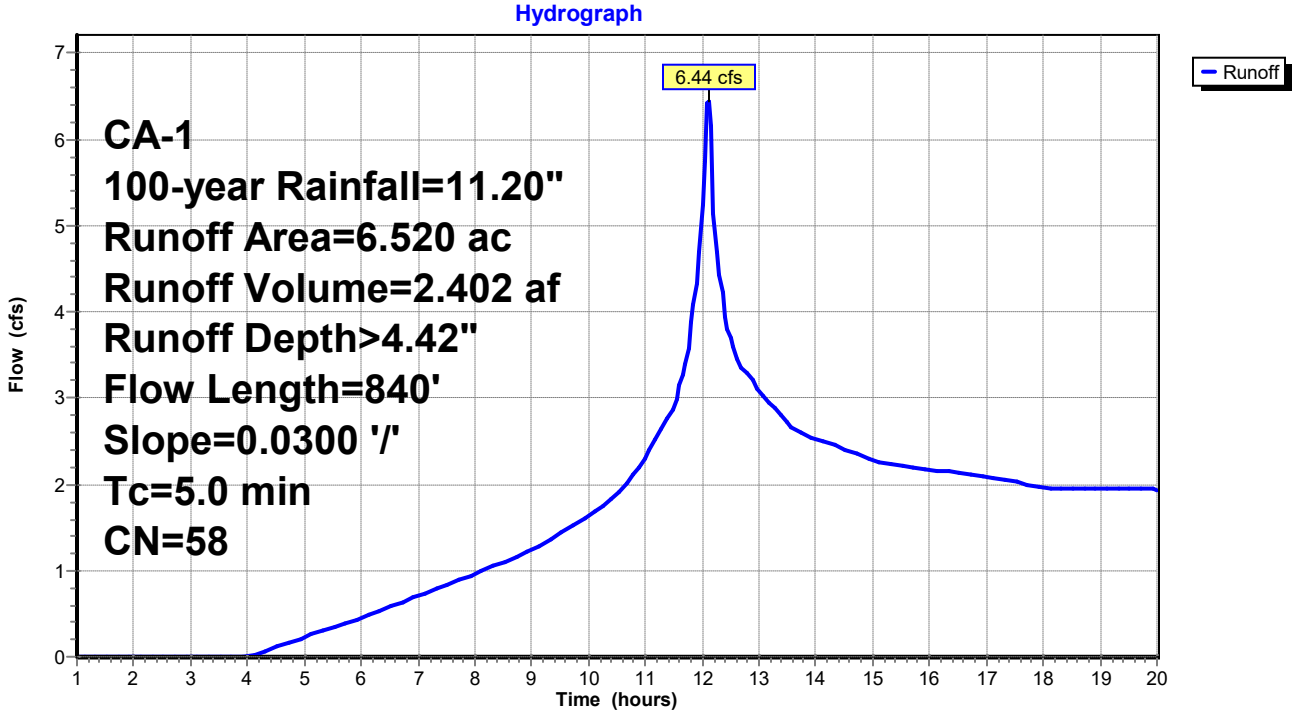
Runoff = 6.44 cfs @ 12.11 hrs, Volume= 2.402 af, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
3.480	61	>75% Grass cover, Good, HSG B
3.040	55	Woods, Good, HSG B
6.520	58	Weighted Average
6.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	840	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps

Subcatchment 3S: WS8d7 - post project

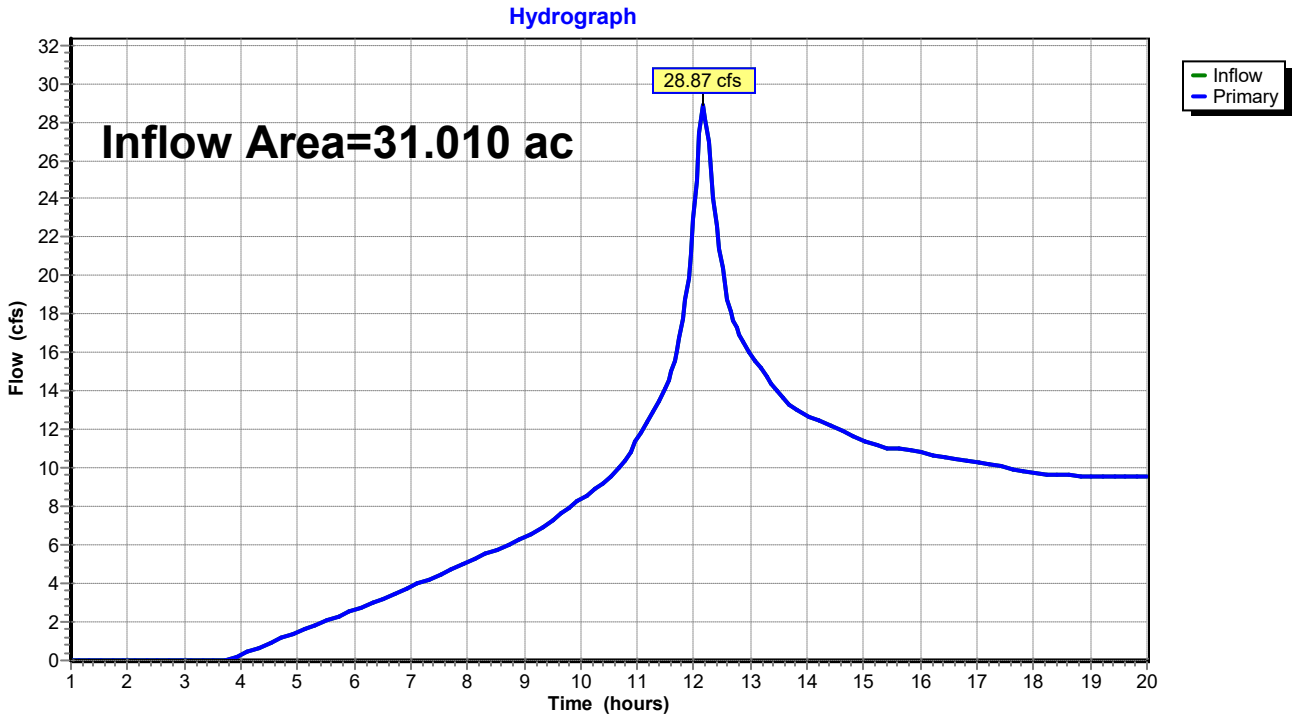


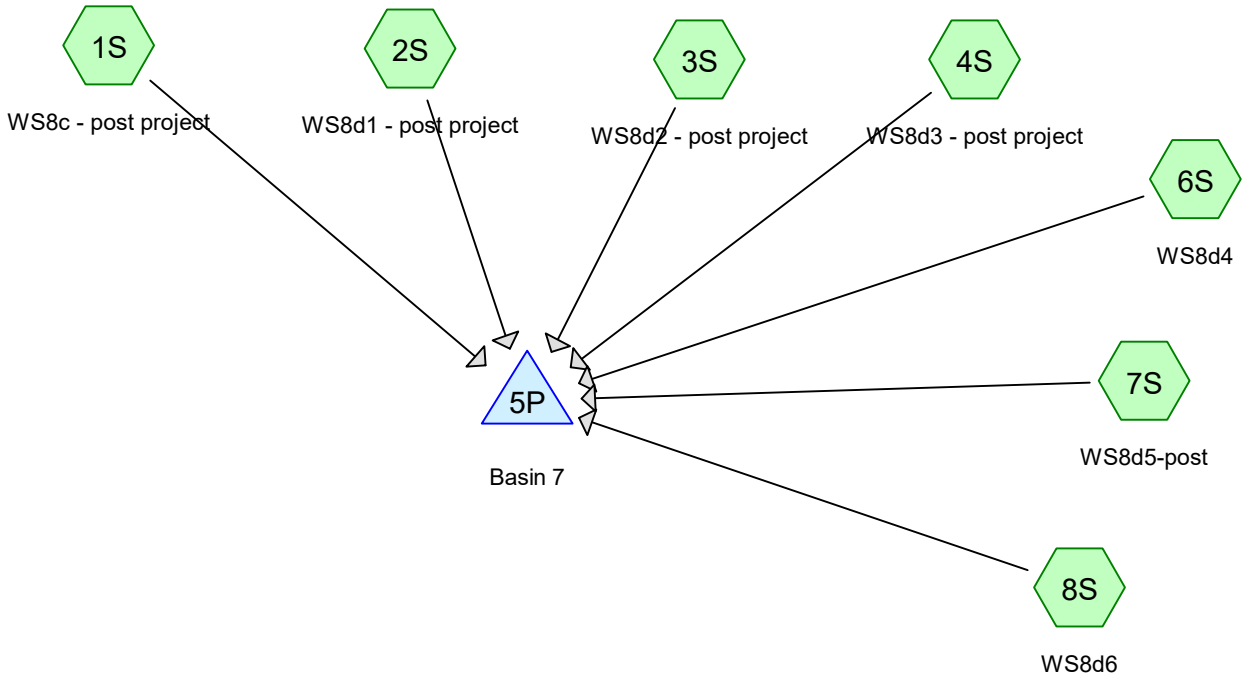
Summary for Pond 4P: POI

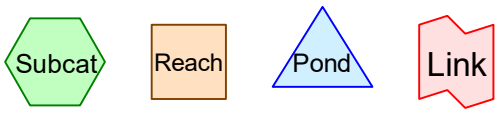
Inflow Area = 31.010 ac, 5.13% Impervious, Inflow Depth > 4.70" for 100-year event
Inflow = 28.87 cfs @ 12.16 hrs, Volume= 12.149 af
Primary = 28.87 cfs @ 12.16 hrs, Volume= 12.149 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Pond 4P: POI







Routing Diagram for WS8 post basinR4
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Summary for Subcatchment 1S: WS8c - post project

Runoff = 5.59 cfs @ 12.20 hrs, Volume= 2.301 af, Depth> 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.670	98	Roofs, HSG B
1.100	61	>75% Grass cover, Good, HSG B
0.160	61	Pasture/grassland/range, Good, HSG B
3.850	55	Woods, Good, HSG B
5.780	61	Weighted Average
5.110		88.41% Pervious Area
0.670		11.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.1400	0.21		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
1.6	720	0.2100	7.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	291	0.0800	4.55		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.0	169	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.5	230	0.0300	7.86	6.17	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.5	330	0.0300	10.30	18.19	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,840	Total			

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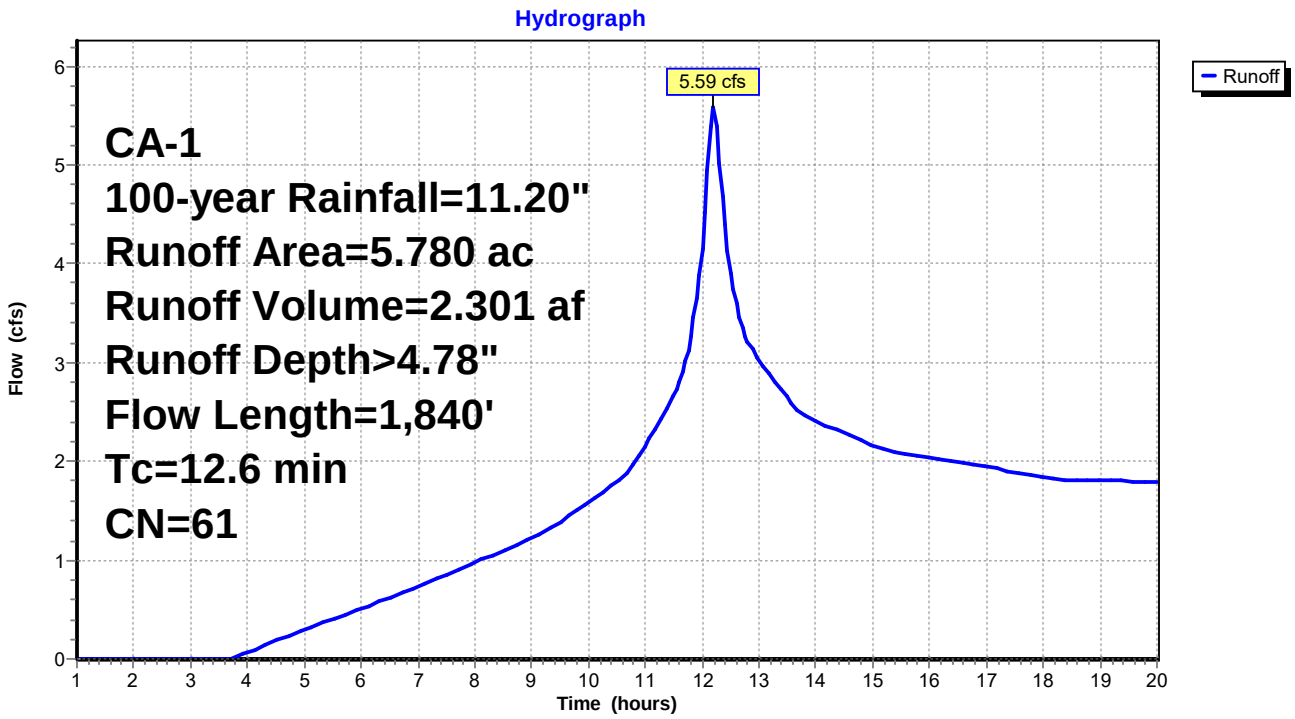
Subcatchment 1S: WS8c - post project



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Summary for Subcatchment 2S: WS8d1 - post project

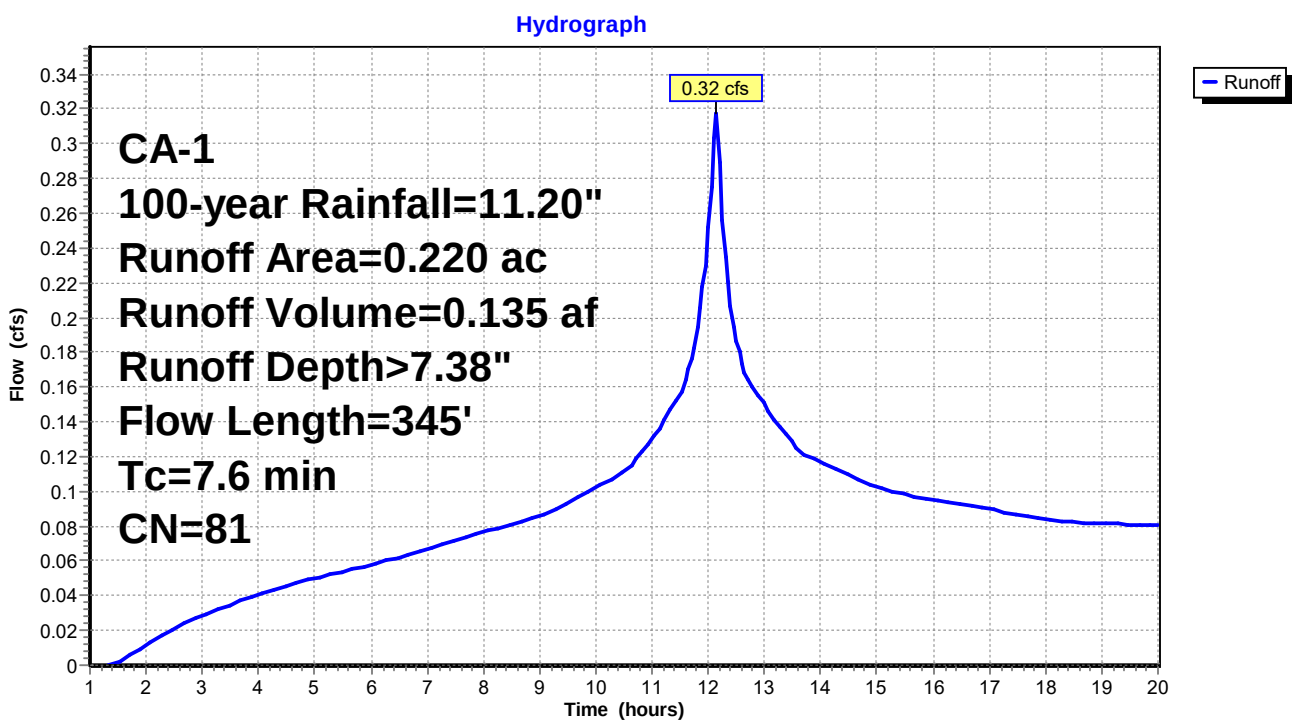
Runoff = 0.32 cfs @ 12.14 hrs, Volume= 0.135 af, Depth> 7.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
*	0.220	81	>75% Grass cover, Good, HSG D
	0.220		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0800	0.25		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.1	27	0.1100	5.34		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.8	128	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	90	0.1100	15.05	11.82	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
7.6	345	Total			

Subcatchment 2S: WS8d1 - post project



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Summary for Subcatchment 3S: WS8d2 - post project

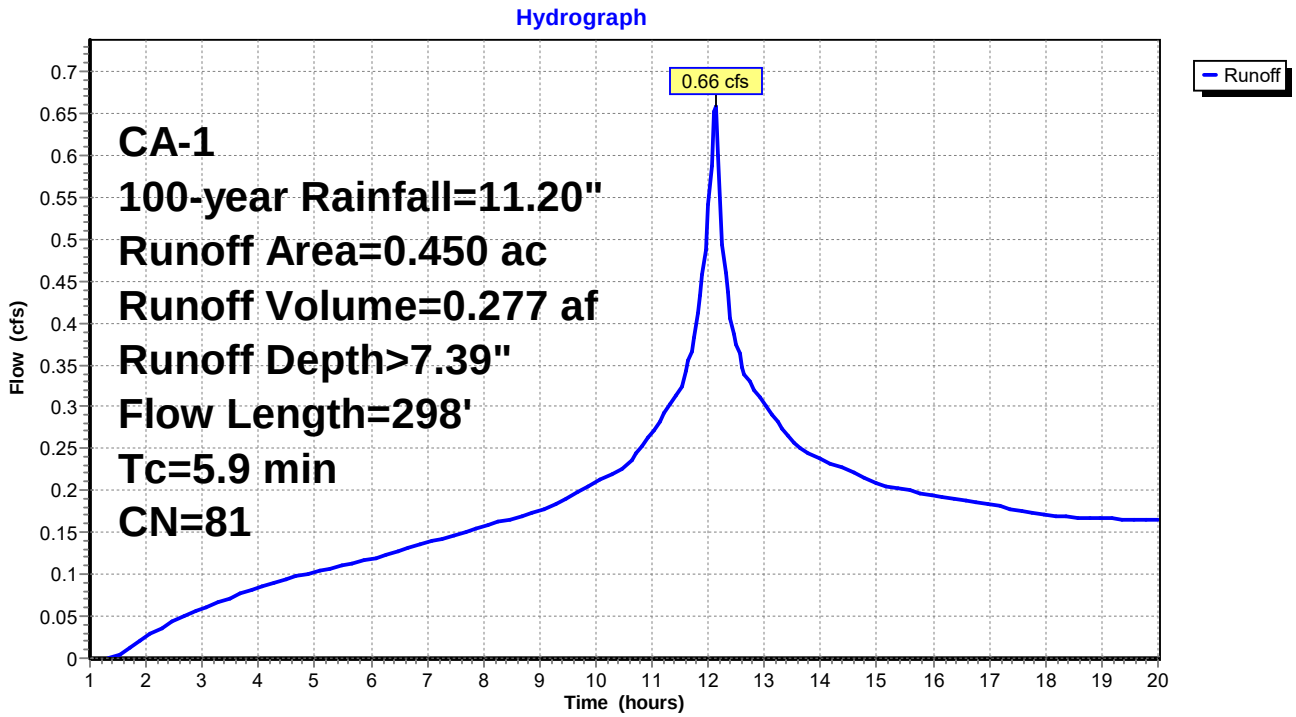
Runoff = 0.66 cfs @ 12.12 hrs, Volume= 0.277 af, Depth> 7.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.010	61	>75% Grass cover, Good, HSG B
*	0.440	81	>75% Grass cover, Good, HSG D
	0.450	81	Weighted Average
	0.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.1400	0.32		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.5	78	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	120	0.1400	16.97	13.33	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
5.9	298	Total			

Subcatchment 3S: WS8d2 - post project



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Summary for Subcatchment 4S: WS8d3 - post project

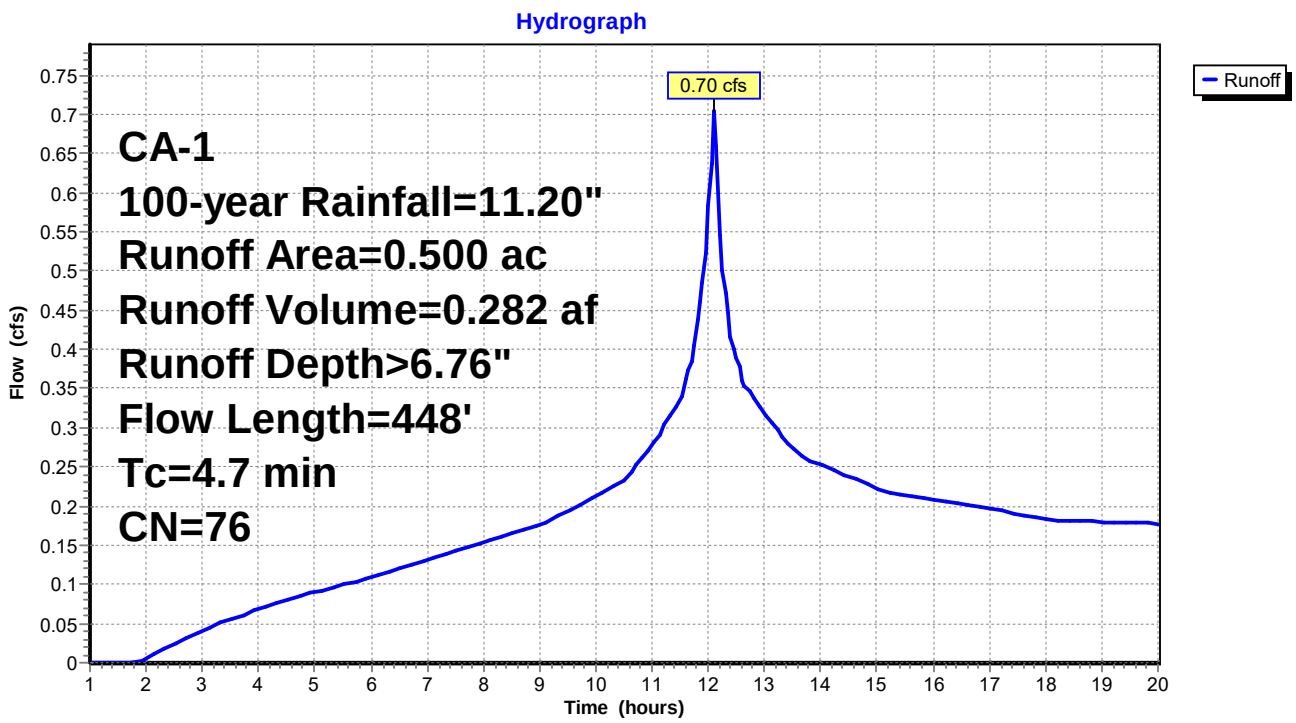
Runoff = 0.70 cfs @ 12.11 hrs, Volume= 0.282 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.110	61	>75% Grass cover, Good, HSG B
*	0.380	81	>75% Grass cover, Good, HSG D
	0.010	55	Woods, Good, HSG B
	0.500	76	Weighted Average
	0.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	83	0.2100	0.36		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.6	95	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	270	0.1700	18.70	14.69	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
4.7	448	Total			

Subcatchment 4S: WS8d3 - post project



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Summary for Subcatchment 6S: WS8d4

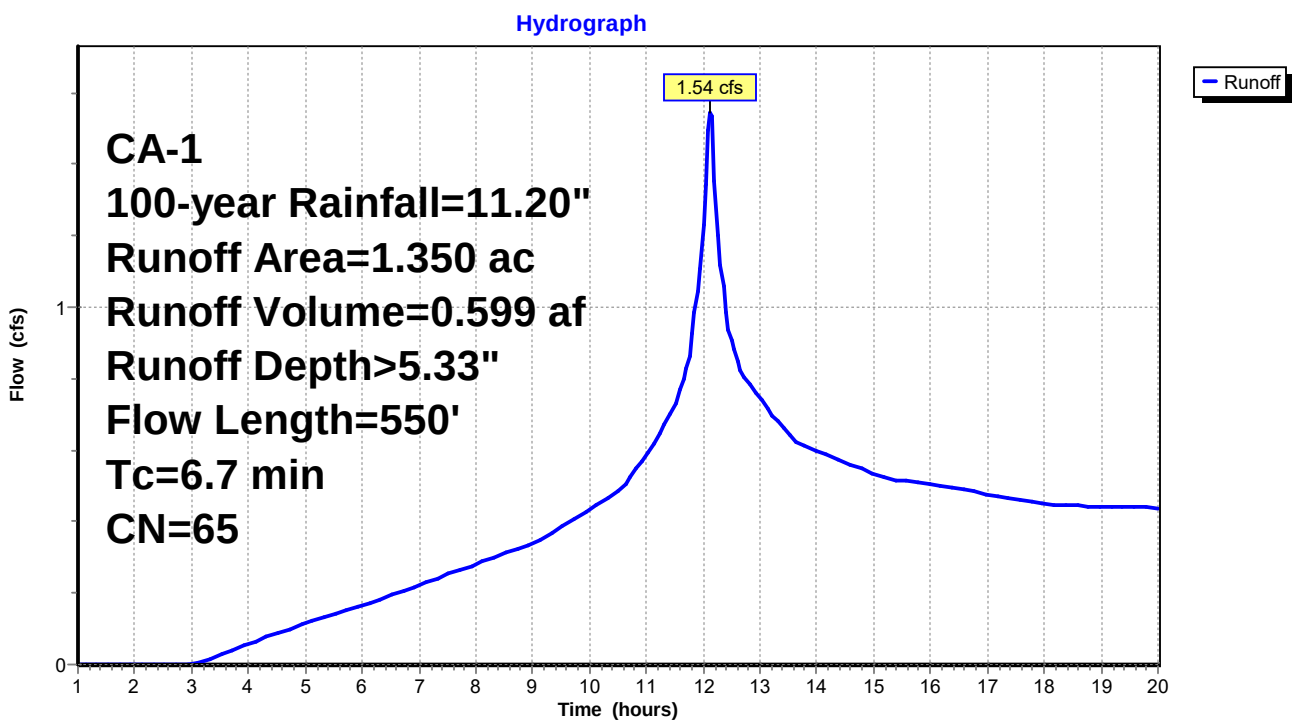
Runoff = 1.54 cfs @ 12.13 hrs, Volume= 0.599 af, Depth> 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.820	61	>75% Grass cover, Good, HSG B
*	0.350	81	>75% Grass cover, Good, HSG D
	0.180	55	Woods, Good, HSG B
	1.350	65	Weighted Average
	1.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1300	0.31		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.7	292	0.1900	7.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.5	92	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	66	0.0900	13.61	10.69	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
6.7	550	Total			

Subcatchment 6S: WS8d4



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Summary for Subcatchment 7S: WS8d5-post

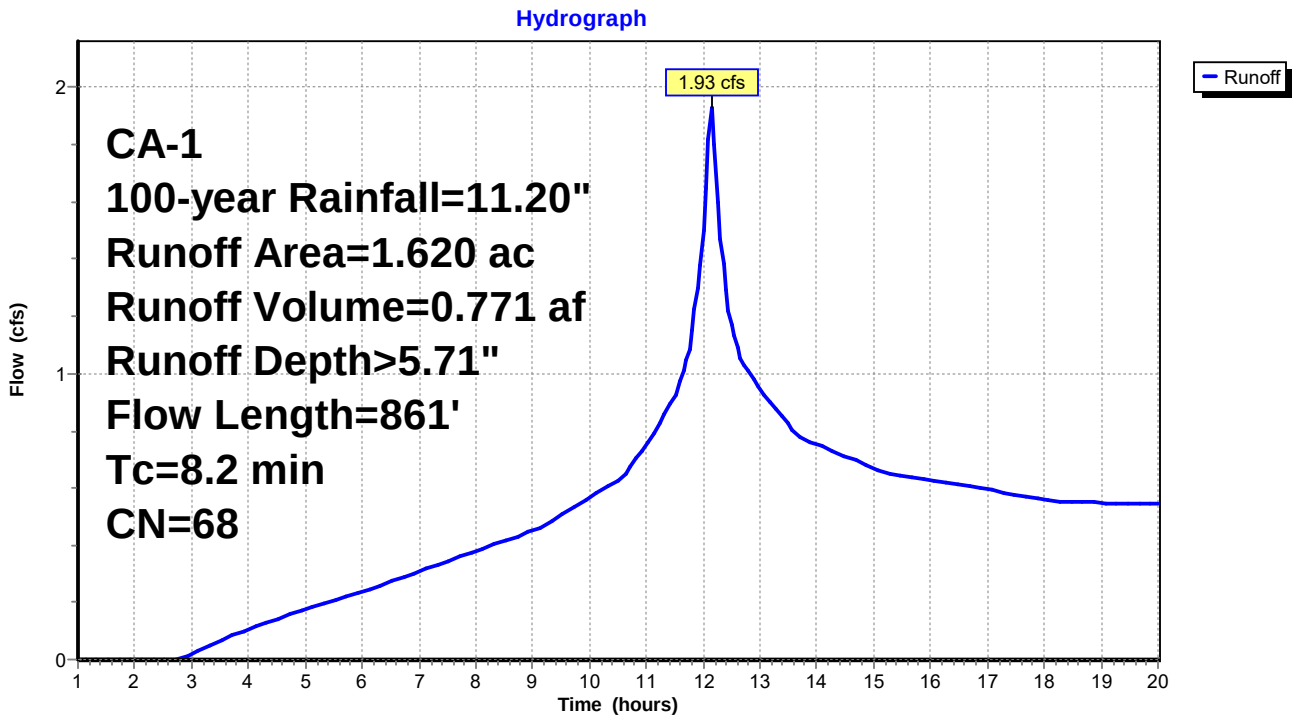
Runoff = 1.93 cfs @ 12.15 hrs, Volume= 0.771 af, Depth> 5.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

	Area (ac)	CN	Description
	0.570	61	>75% Grass cover, Good, HSG B
*	0.670	81	>75% Grass cover, Good, HSG D
	0.380	55	Woods, Good, HSG B
	1.620	68	Weighted Average
	1.620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1300	0.31		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
1.3	441	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.4	230	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	90	0.1100	15.05	11.82	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
8.2	861	Total			

Subcatchment 7S: WS8d5-post



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Summary for Subcatchment 8S: WS8d6

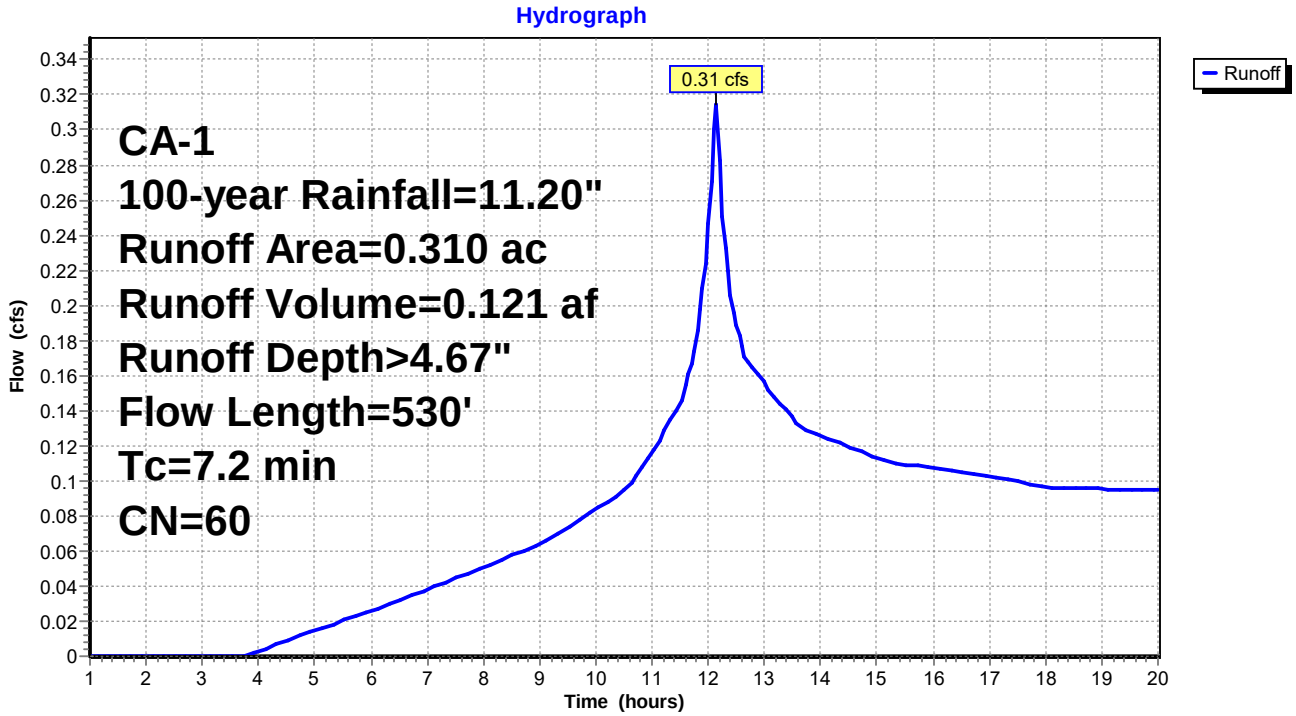
Runoff = 0.31 cfs @ 12.14 hrs, Volume= 0.121 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
0.250	61	>75% Grass cover, Good, HSG B
0.060	55	Woods, Good, HSG B
0.310	60	Weighted Average
0.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.1200	0.30		**Sheet Flow,** Grass: Dense n= 0.240 P2= 4.94"
0.1	82	0.4200	10.43		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.2	198	0.0300	2.79		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	150	0.0400	9.07	7.13	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
7.2	530	Total			

Subcatchment 8S: WS8d6



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Summary for Pond 5P: Basin 7

Inflow Area =	10.230 ac,	6.55% Impervious,	Inflow Depth >	5.26"	for 100-year event
Inflow =	10.80 cfs @	12.16 hrs,	Volume=	4.486 af	
Outflow =	7.23 cfs @	12.49 hrs,	Volume=	3.759 af,	Atten= 33%, Lag= 19.8 min
Primary =	1.21 cfs @	12.49 hrs,	Volume=	0.836 af	
Secondary =	6.02 cfs @	12.49 hrs,	Volume=	2.923 af	

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 105.84' @ 12.49 hrs Surf.Area= 7,784 sf Storage= 39,458 cf

Plug-Flow detention time= 137.9 min calculated for 3.749 af (84% of inflow)
Center-of-Mass det. time= 74.4 min (865.2 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	40,690 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	2,605	0	0
99.00	3,155	2,880	2,880
100.00	3,737	3,446	6,326
101.00	4,351	4,044	10,370
102.00	4,998	4,675	15,045
103.00	5,676	5,337	20,382
104.00	6,387	6,032	26,413
105.00	7,130	6,759	33,172
106.00	7,906	7,518	40,690

Device	Routing	Invert	Outlet Devices
#1	Secondary	97.00'	**10.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 97.00' / 96.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#2	Device 1	104.00'	**15.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	103.50'	**6.0" Round Culvert** L= 20.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 103.50' / 103.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=1.21 cfs @ 12.49 hrs HW=105.84' (Free Discharge)
└─**3=Culvert** (Inlet Controls 1.21 cfs @ 6.15 fps)

Secondary OutFlow Max=6.02 cfs @ 12.49 hrs HW=105.84' (Free Discharge)
└─**1=Culvert** (Inlet Controls 6.02 cfs @ 11.03 fps)
  └─**2=Orifice/Grate** (Passes 6.02 cfs of 6.52 cfs potential flow)

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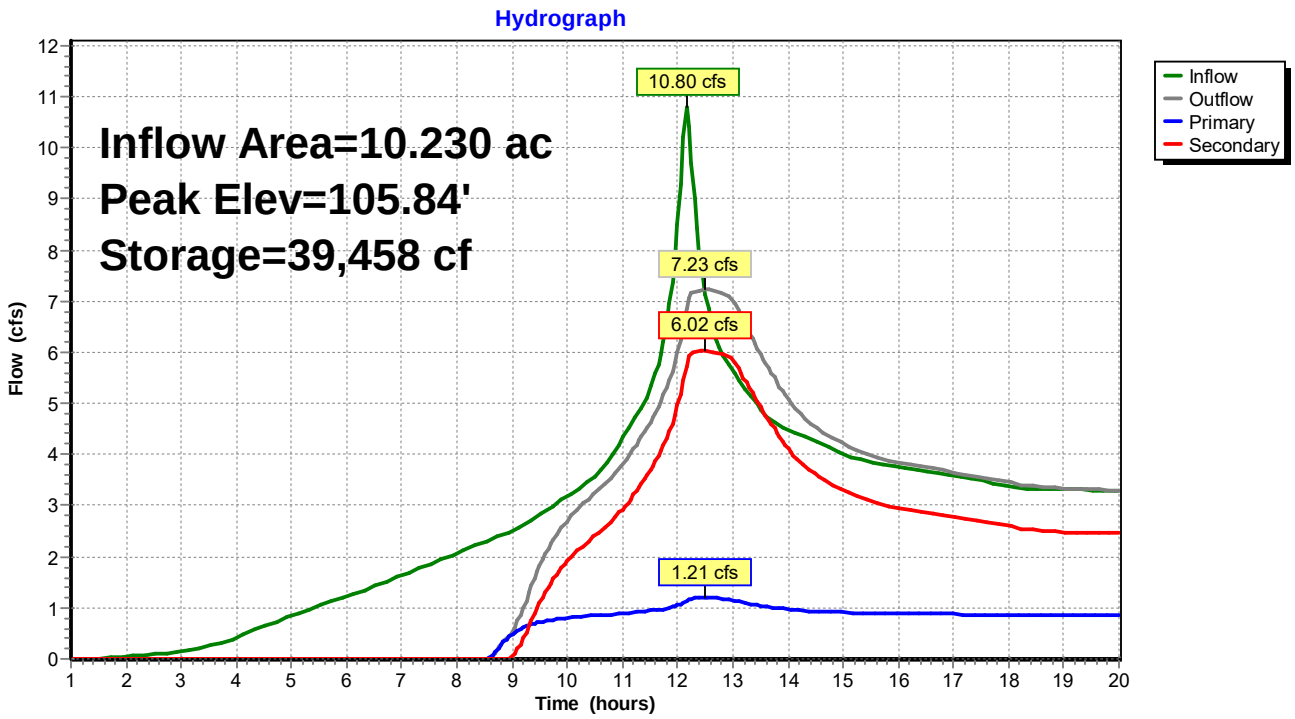
Pond 5P: Basin 7



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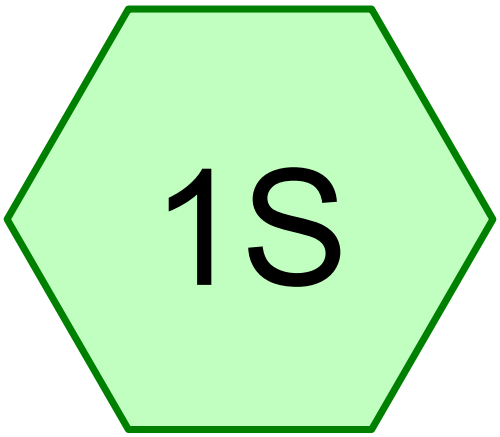
Summary for Subcatchment 1S: WS9 - pre project

Runoff = 6.62 cfs @ 12.20 hrs, Volume= 2.744 af, Depth> 5.17"

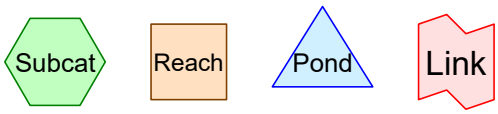
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
1.100	98	Roofs, HSG B
0.120	85	Gravel roads, HSG B
0.690	61	Pasture/grassland/range, Good, HSG B
4.460	55	Woods, Good, HSG B
6.370	64	Weighted Average
5.270		82.73% Pervious Area
1.100		17.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.1000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
1.1	342	0.1000	5.09		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.1	496	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.3	938	Total			



WS9 - post project



Routing Diagram for WS9 post
Prepared by Napa Valley Vineyard Engineering, Printed 7/18/2018
HydroCAD® 10.00-15 s/n 09167 © 2015 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: WS9 - post project

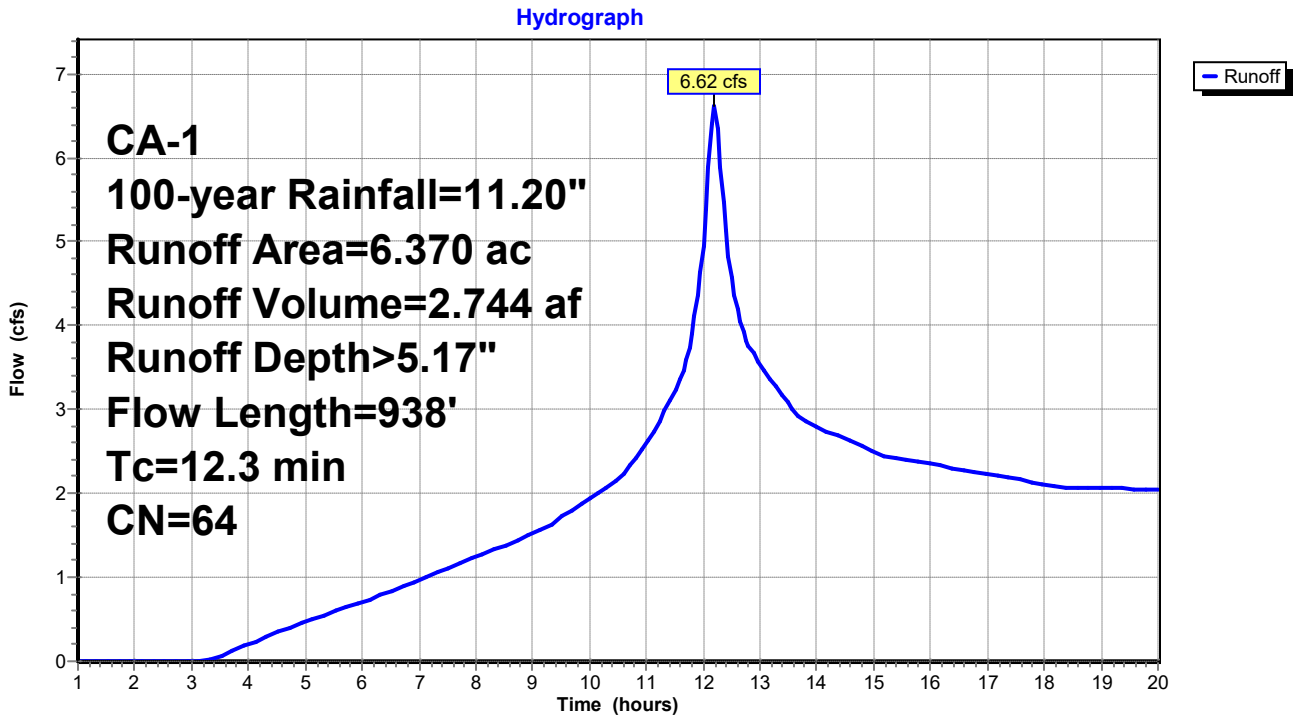
Runoff = 6.62 cfs @ 12.20 hrs, Volume= 2.744 af, Depth> 5.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs
CA-1 100-year Rainfall=11.20"

Area (ac)	CN	Description
1.100	98	Roofs, HSG B
0.120	85	Gravel roads, HSG B
0.430	61	>75% Grass cover, Good, HSG B
0.690	61	Pasture/grassland/range, Good, HSG B
4.030	55	Woods, Good, HSG B
6.370	64	Weighted Average
5.270		82.73% Pervious Area
1.100		17.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.1000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.94"
1.1	342	0.1000	5.09		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.1	496	0.0600	3.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
12.3	938	Total			

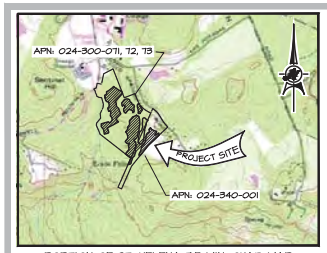
Subcatchment 1S: WS9 - post project



Appendix B

DiCesaris-Le Colline Vineyard
Erosion Control Plan
Napa Valley Vineyard Engineering

LE COLLINE VINEYARD
EROSION CONTROL PLAN
FOR NEW VINEYARD DEVELOPMENT



PORTION OF ST. HELENA 7.5 MIN. QUAD MAP

Vicinity Map

1" = 2000'

SHEET INDEX

1. TITLE SHEET
2. PLAN
3. DETAILS

Narrative

This project consists of A Timberland Conversion (pursuant to a Timber Conversion Permit) and the development of approximately 32.8 gross acres (±25.0 net acres) of new vineyard within APNS 024-300-071, 72, 73, and 024-340-001, a total holding of 88.34 acres, located at 300 Cold Springs Rd., Angwin. The project includes construction of three new access drives and improvement of an existing dirt trail, for a total project area of 33.8 acres. The parcels consist of brush and tree canopy, and existing access drives. Parcel 024-340-001 includes a residence with landscaping. There is existing access from Cold Springs Rd. and from Winding Way. Existing ground slopes within the project area range from 7% to 29%. The vinerows will run northeast/southwest and will be planted 6' apart. Blocks C & D2 shall be hand-farmed with limited use of motorized equipment. Cultivation practices are described below under Permanent Erosion Control Measures. A new drip irrigation system will be installed and an existing irrigation well will serve as the water source. Water use on the new vineyard is expected to be ±11.7 acre-feet per annum (afa); total use on the holding is expected to be 12.5 afa.

The USGS St. Helena 7.5 minute Quad Map shows one blueline stream (Conn Creek) running along the southwest property line, four county definition streams and three Class III streams (as identified by CalFire) within the parcels and appurtenant to the project. Setbacks have been provided in accordance with the Napa County Conservation Regulations. The project drains toward Conn Creek and lies within the Conn Creek-Upper Reach and Conn Creek Main Fork subwatersheds.

Soils within the block boundaries have been classified in the USDA Soil Conservation Service's Napa County Soil Survey, as Forward gravelly loam and Kidd loam.

Special Status Species identified in the Biological Report prepared by Kjeldsen Biological Consulting shall be avoided. Orange construction fence shall be placed around those plants by the owner, and the it shall be checked and approved by Napa County PBES prior to construction.

No Cultural Resources occur in the project area, as concluded in the Cultural Resources Study prepared by Origer & Associates.

No Slope Instability is evident in the project area, as concluded in the Engineering Geological Evaluation prepared by Gilpin Geosciences.

Vegetation Removal consists of brush and resident grasses, and trees as identified in the associated Timber Conversion Plan. All organic material to be burned or chipped shall be stacked at strategic locations within the cleared area. Burning of the organic material only shall take place after obtaining approval from all the governing agencies.

Ground preparation includes ripping to a maximum depth of 36" and tilling. Rock generated during land preparation will be used to construct a rock fill along the lower boundary of Block A as shown on the plan, and may be used for road surfacing and other erosion control features. Soil amendments shall be added as specified in the *Project Notes*.

Wildlife Exclusion Fencing may be installed around the vineyard, as shown on the plan, with gates and/or cattle guards provided at access locations. For convenience, the fence may be routed around trees and other imposing physical features. Fence shall be 6" min. wire mesh.

Temporary Erosion Control Measures consist of the installation of fiber rolls and the application of straw mulch where seeding occurs. The installation of all **fiber rolls** shall be completed in accordance with the appropriate detail along the contours at locations shown on the plan, prior to the rainy season at the end of years P-1 and P. They shall be left in place through the winter after planting after which they may be removed. A **straw mulch** cover shall be applied over all open and/or disturbed and seeded areas at the rate specified in the seeding requirements.

Permanent Erosion Control Measures consist of the following:

1) Clean and repair existing drainage features as needed.

2) Diversion ditches shall be constructed where shown on the plan, and maintained throughout the life of the vineyard. The ditches shall not be tilled or disked during any vineyard operations.

3) Rock lined ditches and rock stabilization at low points in the vineyard avenues shall be constructed of locally gathered fieldstone in accordance with the appropriate details. Some locations of rock stabilization are shown on the plan. Others may be discovered during construction. Rock structures shall remain in place as permanent features.

4) Construction of water bars where shown on the plan in accordance with the appropriate detail.

5) Attenuation basins shall be constructed where shown on the plan in accordance with the appropriate detail. Level water spreaders or energy dissipators shall be installed at the basin outlets in accordance with the appropriate detail.

6) A winter cover crop shall be planted within the new vineyard areas in year P-1. At the end of the growing season in year P, a permanent cover crop shall be planted within the new vineyard blocks (refer to cultivation chart under *Project Notes)*. In Blocks A thru D, the cover crop may be mowed and spot sprayed around the base of each vine using springtime applications of post-emergent contact sprays. Weeds within those blocks may also be spot sprayed, if desired. No strip spraying shall occur and NO PREEMERGENT SPRAYS SHALL BE USED. In Block E, the cover crop may be mowed, but NO SPRAYING shall occur within Block E. As a normal cultural practice no disking, ripping or other tillage shall occur within the vineyard once the permanent cover crop has been established. No areas outside the vineyard blocks, including avenues and turnspaces, shall be disked or sprayed at any time. Using this method a minimum ground cover of 80% will be obtained each winter in Blocks A thru D, and a minimum of 85% will be obtained in Block E. From time to time (every three or four years), it may be necessary to disk the cover crop to open up the ground or to re-establish proper ground cover. Should this be necessary, notification shall be provided to Napa County and Napa County RCD, and the work shall proceed as prescribed in Napa County Conservation, Development and Planning Department guidelines, dated April 8, 2004, entitled "Protocol for Replanting/Renewal of Approved Non-Tilled Vineyard Cover Crops".

7) Implementation and adherence to the **Annual Winterization** program presented in the Project Notes.

Costs: The total cost of all erosion control measures is estimated to be $1500-2000/acre including equipment, materials, and labor.

The project site was visited by the plan preparer in May, 2014 to inspect the site, and will be visited during and after development to check for proper erosion control features.

Project Notes

APN & Owner:

024-300-071, 72, 73	Le Colline LLC 5 White Pine Canyon Rd Park City, UT 84060
024-340-001	Cold Springs LLC 5 White Pine Canyon Rd Park City, UT 84060

Site Address: 300 Cold Springs Rd., Angwin

Contact:

Jim Barbour @ 257-1829 Barbour Vineyards 104 Camino Dorado Napa, CA 94558	Drew L. Aspegren, P. E. @ 963-4927 Napa Valley Vineyard Engineering, Inc. 176 Main St., Suite B St. Helena, CA 94574

Mapping: Tetra Tech, using 2003 data by the National Center for Airborne Laser Mapping

Implementation Schedule: Work may begin during the first growing season after project approval and may be completed over several years. Preplant and planting year operations may be conducted over two growing seasons or they may be conducted during the same year. The work will be scheduled as follows:

Year P-1 April 1 thru Sept 1	Clearing, rock and root removal, stacking vegetation for burning or other disposal, disking, installing permanent erosion control measures prior to vineyard layout, staking and installation of drip system, installing temporary erosion control measures. Winterization, consisting of seeding and mulching, shall be completed by September 1.
Rainy Season Sep 15 thru March 31	Maintain erosion control measures, burning as allowed by government agencies.
Year P Apr 1 thru Sept 1	Complete unfinished pre-plant operations, plant vineyard and begin cultural practices (refer to cultivation chart below). Maintain all erosion control features.

Cover Cropping and Cultivation Practices

Year	Cultivation during growing season	Cover Crop, planted at end of growing season
Pre-plant (P-1)	rip and disk	winter cover crop
Planting (P)	full till	permanent cover crop
P+1 Forward	no till, spot spray	permanent cover crop

All ground disturbing activities shall be completed by September 1 of each year, and all erosion control measures shall be in place by September 15.

Seeding Requirements: All exposed or disturbed soils shall be seeded. Seed and fertilizer shall be applied hydraulically or broadcast at the rates specified below:

Le Colline mix @ 100 lbs/ac	Annual Calif. brome	30%
	Perennial Calif. brome	20%
	Blue wild rye	15%
	3 weeks fescue	15%
	Calif. poppy	10%
	Blue lupine	10%

Fertilizer : Ammonium phosphate sulfate (16-20-0) 200-240 lbs/ac

Soil Amendments, Block E	Dolomitic Lime	6 tons/ac
	Compost	5 tons/ac

An alternate seed mix and/or fertilizer may be used after review and approval by Napa County RCD.

Straw Mulch shall be spread over all disturbed and seeded areas. The mulch shall be certified weed free and shall be spread mechanically or by hand at the rate of 2 tons/acre.

Fiber Rolls shall be installed at the locations shown on the plan in accordance with the appropriate detail. Fiber Rolls shall be maintained through the winter after planting, after which they may be removed.

Water Bars shall be constructed where shown on the Plan. Water bars shall remain as permanent structures and shall be reshaped as necessary prior to each rainy season.

Diversion Ditches and Drop Inlets shall be contructed at the locations shown on the Plan. Ditch flowline shall be sloped to drain at 3 to 6%. Ditches shall remain as permanent structures and shall be reshaped as necessary prior to each rainy season.

Rock Stabilization and Rock Lined Ditches shall be constructed of locally gathered fieldstone, or class light as defined in Caltrans Standard Specifications, Sec. 72-2.02. A non woven filter fabric (Mirafi 140N, or equal) shall be placed between all RSP and earthen material.

Maintenance: A winter cover crop shall be seeded and mulched prior to September 15 during year P-1 (refer to the cultivation chart). At the end of the growing season in year P, a permanent cover crop shall be planted within the vineyard block (refer to *Permanent Erosion Control Measures* in the *Narrative*). The cover crop may be mowed in the spring after the seed has fully matured (hard dough stage) to ensure annual grass species regeneration for the following year. Minimum mowing height of 4" shall be maintained for establishing annual and perennial grasses. As a normal cultural practice, no tillage shall take place after the vineyard has been planted, and spraying shall occur as provided in the *Narrative* under *Permanent Erosion Control Measures*. A minimum ground cover of 80% will be obtained each winter in Blocks A thru D, and a minimum of 85% will be obtained in Block E. The owner shall be responsible for reseeding and maintenance in order to reach the desired degree of cover.

Annual Winterization: After harvest and prior to first rains, but no later than September 15 each year, the following winterization shall be completed:

1) The condition of the cover crop shall be evaluated, including those areas outside the vineyard, and the suitability and effectiveness of the seed mix shall be evaluated. Weak areas shall be reseeded as necessary; if addition of soil amendments is indicated, they shall be incorporated and those areas shall be seeded and mulched.

2) All roads and avenues/turnspaces which are not rocked or paved shall be seeded as needed to maintain a minimum 80% cover, and mulched, and shall remain undisturbed throughout the rainy season.

3) All ditches, drop inlets, culverts, and other drainage and erosion control features shall be inspected and repaired as necessary.

4) All basins shall be inspected, cleaned and repaired as necessary. The rock anchoring filter fabric on interior slope of dikes shall be replaced annually, or as needed.

5) All other existing erosion control and drainage features shall be inspected and cleaned, or repaired as necessary.

All erosion control measures and drainage features shall be inspected after each storm event, and repairs shall be promptly performed.

Legend

	BLOCK BOUNDARY
	AVENUE/TURNSPACE
	VINEYARD BOUNDARY (APPROX.)
CPP	CORRUGATED POLYETHYLENE PIPE, SMOOTH WALL
O, D.I.	DROP INLET
1/3	DETAIL 1, SHEET 3
(E)	EXISTING
	FIBER ROLL
	FLOWLINE OF DIVERSION DITCHES
	GRASS ACCESS DRIVE (proposed)
	GRAVEL ACCESS DRIVE (proposed)
, HP	HIGH POINT
	IRRIGATION MAINLINE (proposed)
25' - 18" CPP	LENGTH/SIZE/KIND OF PIPE
PBES	PLANNING, BUILDING AND ENVIRONMENTAL SERVICES (Napa County)
MSB	MINIMUM SETBACK
	PROPERTY LINE
	PROPOSED WILDLIFE EXCLUSION FENCE
RSP	ROCK SLOPE PROTECTION
SCS	SOIL CONSERVATION SERVICE
159	SCS SOIL MAPPING UNIT
	SCS SOIL TYPE BOUNDARY
	SPECIAL STATUS SPECIES TO BE AVOIDED (approx. location)
	SUBSURFACE DRAINAGE PIPE
	WATER BAR

Special Notes-Attenuation Basins

1. Basin geometry shall be determined by field survey. Prior to construction, the final basin design shall be presented to NCPBES for approval. Alternates to the rock fill may be, but not limited to, rock walls, concrete walls, rock or concrete box, or earth fill. In no case shall the basin footprint extend outside the approved project limits without written approval from NCPBES.

2. Synthetic liners shall be water tight. Seams shall be lapped and bonded as recommended by manufacturer. Sleeves shall be used on all pipe penetrations. Alternates to synthetic liners may be, but not limited to, gunite facing or grouted rock facing.

LE COLLINE VINEYARD
EROSION CONTROL PLAN
FOR NEW VINEYARD DEVELOPMENT

REV 11 3-14-18 DLN Added note to Typical Section E (sheet 3)
REV 10 11-24-17 DLN Added setback from drainage in Block E (sheet 2)
REV 9 6-1-17 DLN Revised per NCPBES comments (5-18-17)
REV 8 2-22-17 DLN Revised per ongoing environmental review (sheets 2 & 3)
REV 7 1-31-17 DLN Revised per ongoing environmental review (sheets 2 & 3)
REV 6 12-14-16 DLN Revised per ongoing environmental review
REV 5 7-7-16 DLN Revised seed mix specifications in Project Notes
REV 4 2-23-16 DLN Revised cover crop specifications in Narrative and Project Notes
REV 3 2-10-16 DLN Revised per RCD memo to NPBES (1-12-16)
REV 2 11-30-15 DLN Revised per NPBES comments (10-8-15) and RCD comments (7-17-15)
REV 1 6-22-15 DLN Revised per Napa County Comments (1-15-15) and RCD comments (5-7-15)

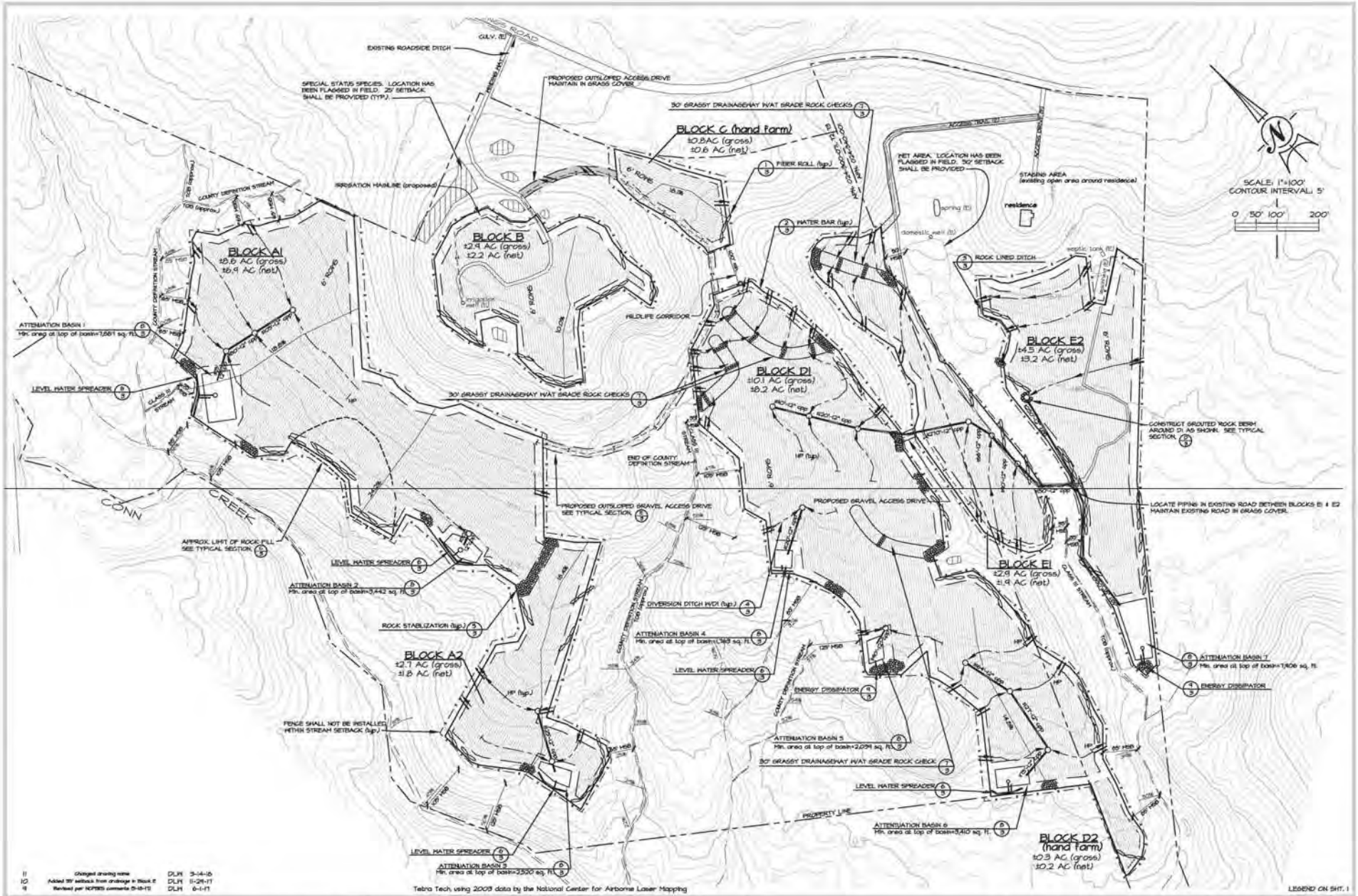
Napa Valley Vineyard Engineering, Inc.
176 Main St., Suite B
St. Helena, CA 94574
(707) 963 4927

REGISTERED PROFESSIONAL ENGINEER
DREW L. ASPEGREN
No. 31418
Exp. 12-31-18
CIVIL
STATE OF CALIFORNIA

DREW L. ASPEGREN, PE
R.C.E. 31418

December 18, 2014
DATE

THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, ARE THE PROPERTY OF NAPA VALLEY VINEYARD ENGINEERING, INC., AND ARE NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT WRITTEN AUTHORIZATION FROM NAPA VALLEY VINEYARD ENGINEERING, INC.



REV.	DESCRIPTION	BY	DATE
11	Changed drawing name	DLH	3-14-18
10	Added 35' setback from drainage in Block E	DLH	11-21-17
9	Revised per NCRWQCB comments 5-18-17	DLH	6-1-17
8	Revised per ongoing environmental review	DLH	2-22-17
7	Revised per ongoing environmental review	DLH	1-31-17
6	Revised per ongoing environmental review	DLH	12-14-16
2	Revised per NCRWQCB comments 10-6-15 & RCD comments 11-17-15	DLH	11-30-15
1	Change Block E boundary, realign road, incorporate Napa County & RCD Comments 11-13-15, 9-1-15	DLH	6-22-15

This document and the ideas and designs incorporated herein, as an instrument of professional service, are the property of Napa Valley Vineyard Engineering, Inc., and are not to be used, in whole or part, for any other project without written authorization from Napa Valley Vineyard Engineering, Inc.

Napa Valley Vineyard Engineering, Inc.
176 Main St., Suite B
St. Helena, CA 94574
(707) 963 4927

DREW L. ASPEGREN No. 31418 Exp. 12-31-18 CIVIL STATE OF CALIFORNIA

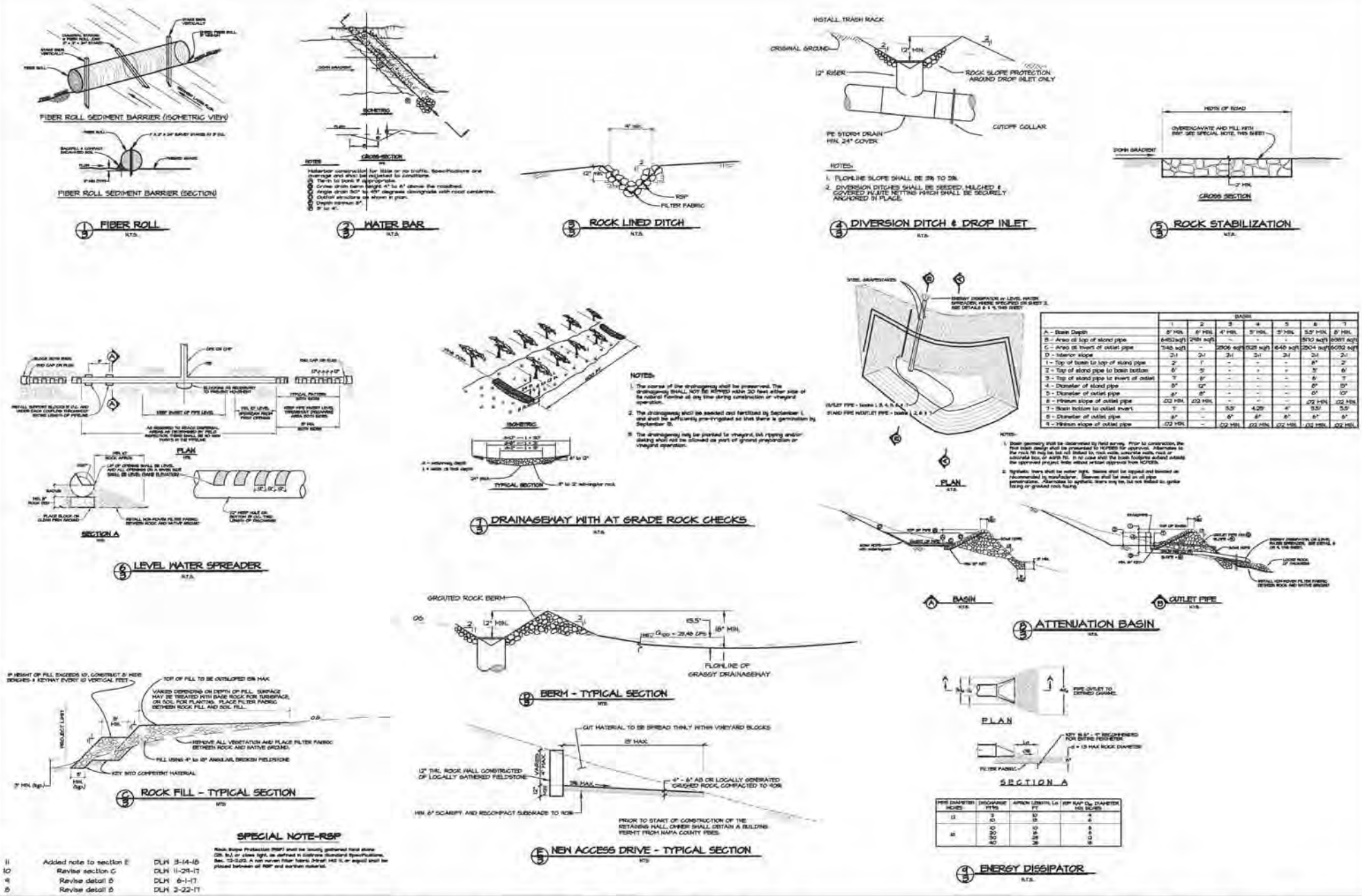
DATE	SCALE
12-18-14	AS SHOWN
DRAWN: DLH	CHECKED: DLA
APPROVED:	
DREW L. ASPEGREN, PE	R.C.E. 31418

Le Colline Vineyard

EROSION CONTROL PLAN FOR NEW VINEYARD DEVELOPMENT

PLAN

SHEET 3 OF 3



11	Added note to section E	DLH	3-14-18
10	Revise section G	DLH	11-29-17
9	Revise detail 8	DLH	6-1-17
8	Revise detail 8	DLH	3-22-17
7	Revise detail 8	DLH	1-31-17
6	Add level water spreader detail	DLH	12-14-16
5	Revise typical section E3	DLH	6-7-16
2	Add berm typical section	DLH	11-30-15
1	Add section & basin details	DLH	6-22-15
REV.	DESCRIPTION	BY	DATE

SPECIAL NOTE-RSP

Rock Slope Protection (RSP) shall be loosely gathered field stone (25 lb.) or clean light, as defined in California Standard Specifications, Sec. 72-2.02. A non-woven filter fabric (Mirafi 140 N, or equal) shall be placed between all RSP and earthen material.

This document and the ideas and designs incorporated herein, as an instrument of professional service, are the property of Napa Valley Vineyard Engineering, Inc., and are not to be used, in whole or part, for any other project without written authorization from Napa Valley Vineyard Engineering, Inc.

Napa Valley Vineyard Engineering, Inc.
176 Main St., Suite B
St. Helena, CA 94574
(707) 963 4927

REGISTERED PROFESSIONAL ENGINEER DREW L. ASPERSHON No. 31415 Exp. 12-31-18 CIVIL STATE OF CALIFORNIA

DATE 12-16-14	SCALE AS SHOWN		
REC'D(Drawn with Lay)	DRAWN DLH	CHECKED DLA	
APPROVED			
DREW L. ASPERSHON, PE	R.C.E. 31415		

Le Colline Vineyard

EROSION CONTROL PLAN FOR NEW VINEYARD DEVELOPMENT

DETAILS

SHEET 3 OF 3

Appendix C

DiCesaris-Le Colline Vineyard
Technical Adequacy Memorandum
Napa County Resource Conservation District

Napa County Resource Conservation District
1303 Jefferson St., Ste. 500B
Napa, California 94559
Phone: (707) 252-4188
Fax: (707) 252-4219
www.naparcd.org

Memorandum

Date: March 3rd, 2016

To: Napa County PBES

From: Charles Schembre, Vineyard Conservation Coordinator

Re: Erosion Control Plan for: P14-00410 Le Colline

cc: Bill Birmingham, Scott Butler, NVVE

The Napa County RCD finds the reference plan technically adequate for sediment and erosion control.

If you have any questions or concerns about the content of this memo, please contact me for clarification and discussion.

Sincerely,

Charles Schembre
Napa County RCD

Note: this finding **does not constitute Plan approval**, authority for which rests with the Napa County Department of Planning, Building, and Environmental Services.

Appendix D

DiCesaris-Le Colline Vineyard
Drainage Facility Analysis, 2017
Napa Valley Vineyard Engineering

Le Colline Vineyard
P14-00410-ECPA
Drainage Facility Analysis
Prepared by Napa Valley Vineyard Engineering, Inc
March 9, 2017

This report summarizes the proposed drainage facilities and demonstrates that they are designed to carry 100yr peak flows.

Ditches

Diversion ditches throughout the project area are to be constructed in accordance with the detail presented on sheet 3 of the ECP. The detail calls for a vee-ditch with a cross sectional area of 2 sq ft, and a wetted perimeter of 8.48 ft. Using Mannings equation, a slope of ±3%, and coefficient "n" of 0.025, the diversion ditches will carry up to 7.86 cfs. HydroCad modeling shows that the diversion ditch at the bottom of Subarea 8c captures the drainage area producing the highest peak flow. The 100yr storm event results in a peak flow of 5.80 cfs at the outlet of that diversion ditch.

Attenuation Basins

The HydroCad summaries include the peak elevation in each attenuation basin during each storm event. The peak elevations compared to the top of basin elevations during a 100yr event are as follows:

Basin #	Top Elev. (assumed)	Peak Elev.
1	107	106.87
2	106	105.94
3	103	102.88
4	103	102.68
5	104	103.61
6	104.5	104.19
7	106	105.82

Culverts

Based on HydroCad modeling, the 100yr peak flow at the inlet to each proposed culvert is as follows:

Watershed 1a = 4.21 cfs
Watershed 1b = 1.38 cfs
Watershed 3a = 3.17 cfs
Watershed 4a = 0.23 cfs
Watershed 4b = 0.58 cfs
Watershed 6a = 0.82 cfs
Watershed 6b = 0.76 cfs
Watershed 7a = 0.56 cfs
Watershed 7b = 0.61 cfs
Watershed 7c = 0.98 cfs

Watershed 8d1 = 0.31 cfs
Watershed 8d2 = 0.65 cfs
Watershed 8d3 = 0.70 cfs
Watershed 8d4 = 1.54 cfs
Watershed 8d5 = 1.91 cfs

Using Mannings equation with an “n” of 0.013, the minimum culvert slope required to carry the peak flows identified above is:

	Min. slope req’d	Ex. ground slope (±)
Watershed 1a (12” dia.)	1.25%	21%
Watershed 1b (12” dia.)	0.20%	15%
Watershed 3a (12” dia.)	0.75%	5%
Watershed 4a (12” dia.)	0.02%	20%
Watershed 4b (12” dia.)	0.04%	5%
Watershed 6a (12” dia.)	0.05%	8%
Watershed 6b (12” dia.)	0.05%	8%
Watershed 7a (12” dia.)	0.03%	11%
Watershed 7b (12” dia.)	0.04%	13%
Watershed 7c (12” dia.)	0.10%	5%
Watershed 8d1 (12” dia.)	0.02%	11%
Watershed 8d2 (12” dia.)	0.04%	14%
Watershed 8d3 (12” dia.)	0.05%	17%
Watershed 8d4 (12” dia.)	0.20%	9%
Watershed 8d5 (18” dia.)	0.05%	2%

Appendix E

DiCesaris - Le Colline Vineyard Narrative – USLE

(Spreadsheets included)

Napa Valley Vineyard Engineering

DiCesaris-Le Colline Vineyard
Narrative-USLE
Prepared by Napa Valley Vineyard Engineering, Inc
November 30, 2017 (rev 3)

INTRODUCTION

This analysis is to predict the affect the proposed vineyard development project will have on local soil erosion. Modeling of existing and proposed conditions was performed using the Universal Soil Loss Equation (USLE). Following is a summary of the data used and the results of the analysis.

RAINFALL DATA

The 2 year, 6 hour rainfall depth is used to determine the "R" value in the USLE. The rainfall depth for the project site was obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2, Precipitation Frequency Data for California, which uses the latitude and longitude of a site to interpolate rainfall depths between data points. The latitude and longitude of the project are estimated to be 38.561°, N 122.441° W, based on information obtained from All Topo V7 USGS mapping software. The 2 year, 6 hour rainfall depth at the project site ranges from 1.82-inches to 2.33-inches. This analysis conservatively uses the high end of the range (2.33-inches), which equals an "R" value of 103.7. "R" is constant in the pre-project and post-project models.

SOIL EROSIVENESS

Each soil type listed in the United States Department of Agriculture, Soil Conservation Service (SCS), Napa County Soil Survey has an erodibility factor ("K") and a tolerance factor ("T"). Soils within the project area are mapped as:

SCS #139/#140, Forward gravelly loam, "K" = 0.17, "T" = 3
SCS #155, Kidd loam, "K" = 0.28, "T" = 1

"K" and "T" are constant in the pre-project and post-project models.

SLOPE LENGTH and STEEPNESS

2003 LIDAR contour mapping was used to determine slope steepness on the project site. Transects were selected to analyze the soil loss from the longest and steepest slopes throughout the project area. Where diversion ditches are required to reach a predicted soil loss of no more than pre-project condition, the slope distance and steepness between each diversion ditch was analyzed in the post-project model. Slope lengths and gradients used in the pre-project and post-project models are identified on the USLE transect map and in the USLE spreadsheets included in the Appendix.

VEGETATIVE COVER

Cover factors ("C") for pre-project and post-project conditions were determined using the guidelines provided in the SCS pamphlet entitled "The Universal Soil Loss Equation: Special Applications For Napa County, California (guide).

Pre-Project

The existing site conditions vary between a chapparal environment consisting of 75% brush with 60% ground cover, and a forested environment consisting of 75% tree canopy with 95% or greater ground cover. Transects were selected to represent each environment and combinations thereof. Detailed cover factor information is shown on the USLE spreadsheets included in the Appendix.

Post-Project

The project proposes a no-till permanent cover crop, which may be mowed. No spraying shall occur in Blocks E1 and E2, but the remaining blocks may be spot sprayed around the base of each vine using springtime applications of post-emergent contact sprays. No pre-emergent sprays shall be used. Using these practices, a minimum ground cover of 80% will be obtained each winter in Block A thru D, and a minimum ground cover of 85% shall be obtained in Blocks E1 and E2. Using the table in the guide, "USLE "C" Factors for Vineyards", the C factor for 80% ground cover is 0.022, and the C factor for 85% ground cover is 0.017.

PRACTICE FACTOR

The accepted practice factor for the existing conditions is 1.0. Using the table in the guide, "P ("Practice") Factors for USLE in Napa Valley Vineyards, the practice factor for vineyard rows running uphill and downhill is 1.0, so the practice factor remains constant in the pre-project and post-project models.

RESULTS

Calculations to determine the predicted soil loss using the parameters described above are shown in the USLE spreadsheets and summarized in Table 1 of the Appendix.

CONCLUSION

The analysis presented above and the supporting information in the Appendix, demonstrate that the proposed vineyard development, including the construction of diversion ditches, will not increase soil loss from the project site.

APPENDIX

USLE SPREADSHEETS, TRANSECT MAP & RESULT SUMMARY

Le Colline Vineyard
USLE-TABLE 1
12-12-17

Transect	pre- project soil loss (tons/acre)	post-project soil loss (tons/acre)
A1	1.43	1.36
A2	16.36	5.37
A3	2.76	2.35
B	8.91	1.01
C	3.73	1.86
D1	1.36	1.35
D2	1.62	1.62
D3	9.48	2.10
D4	1.10	1.02
D5	0.71	0.70
D6	4.86	2.02
E1	0.47	0.41
E2	0.55	0.50
E3	0.48	0.44

Napa Valley Vineyard Engineering Inc.
USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Pre Project
DATE: 5/22/2017

	TRANSECT:	A1		A2		B		C			
	SOIL TYPE:	Forward		Kidd		Forward		Forward			
	T=	2		1		2		2			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7		103.7			
K	Soil Erosiveness	0.17		0.28		0.17		0.17			
	Slope length (ft)	450		354		369		249			
S	Gradient	20.0		24.2		10.0		18.1			
LS	Calculated LS	7.38		8.41		2.60		4.81		0.00	
C	Cover	0.011	forest	0.067	chapparal	0.033	**	0.044	***		
P	Practice	1		1		1		1			
A	Soil loss, tons/acre	1.43		16.36		8.91		3.73		0.00	

Forest = 75% tree canopy w/ 95% ground cover (100% W) C=0.011
Chapparal = 75% brush w/ 60% ground cover (25%G / 75%W) C=0.67

**40% Chapparal/60% Forest
***Disturbed Forest - 75% tree canopy w/ 70% ground cover (50%G / 50%W)

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Pre Project

DATE: 2/2/2017

	TRANSECT:	A3 upper		A3 lower							
	SOIL TYPE:	Kidd		Forward							
	T=	1		2							
# /ACRES:											
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	586		586							
S	Gradient	12.6		23.2							
LS	Calculated LS	4.51		10.24		0.00					
F	Fraction	0.35		0.65							
K	Soil Erosiveness	0.28		0.17							
C	Cover	0.032	*	0.011	forest						
	Product	0.014		0.012		0.000					
	Combined LS	0.0266									
R	Rainfall	103.7									
P	Practice	1									
A	Soil loss, tons/acre	2.76									

Forest = 75% tree canopy w/ 95% ground cover (100% W) C=0.011

Chapparal = 75% brush w/ 60% ground cover (25% G, 75% W) C=0.067

*Mix Chaparral and Forest

38% Chap	(0.067 * 0.38)	0.025
62% Forest	(0.011 * 0.62)	0.0068
		0.032

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Pre Project

DATE: 2/22/2017

	TRANSECT:	D1									
	SOIL TYPE:	Kidd		Kidd		Kidd		Kidd		Forward	
	T=	1		1		1		1		2	
# /ACRES:											
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	400		400		400		400		400	
S	Gradient	12.5		18.8		12.5		16.3		15.0	
LS	Calculated LS	3.69		6.41		3.69		5.29		4.73	
F	Fraction	0.09		0.16		0.21		0.25		0.28	
K	Soil Erosiveness	0.28		0.28		0.28		0.28		0.17	
C	Cover	0.011	forest	0.011	forest	0.0110	forest	0.011	forest	0.011	forest
	Product	0.001		0.003		0.002		0.004		0.002	
	Combined LS	0.0131									
R	Rainfall	103.7									
P	Practice	1									
A	Soil loss, tons/acre	1.36									

Forest = 75% tree canopy w/ 95% ground cover (100% W) C=0.011

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Pre Project

DATE: 2/2/2017

	TRANSECT:	D2		D3		D5					
	SOIL TYPE:	Kidd		Kidd		Kidd					
	T=	1		1		1					
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7					
K	Soil Erosiveness	0.28		0.28		0.28					
	Slope length (ft)	476		417		249					
S	Gradient	14.8		15.1		10.3					
LS	Calculated LS	5.06		4.87		2.23					
C	Cover	0.011	forest	0.067	chapparal	0.011	forest				
P	Practice	1		1		1					
A	Soil loss, tons/acre	1.62		9.48		0.71		0.00		0.00	

Forest = 75% tree canopy w/ 95% ground cover (100% W) C=0.11

Chapparal = 75% brush w/ 60% ground cover (25%G / 75%W) C=0.67

Napa Valley Vineyard Engineering Inc.
USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Pre Project
DATE: 2/22/2017

	TRANSECT:	D4		D4		D4		D4		D4	
	SOIL TYPE:	Kidd		Kidd		Kidd		Kidd		Forward	
	T=	1		1		1		1		2	
# /ACRES:											
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	334		334		334		334		334	
S	Gradient	14.9		11.9		12.0		14.9		16.4	
LS	Calculated LS	4.28		3.15		3.19		4.28		4.88	
F	Fraction	0.09		0.16		0.21		0.25		0.28	
K	Soil Erosiveness	0.28		0.28		0.28		0.28		0.17	
C	Cover	0.011	forest	0.011	forest	0.0110	forest	0.011	forest	0.011	forest
	Product	0.001		0.002		0.002		0.003		0.003	
	Combined LS	0.0106									
R	Rainfall	103.7									
P	Practice	1									
A	Soil loss, tons/acre	1.10									

Forest = 75% tree canopy w/ 95% ground cover (100% W) C=0.011

Napa Valley Vineyard Engineering Inc.
USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Pre Project
DATE: 2/22/2017

	TRANSECT:	D6									
	SOIL TYPE:	Kidd		Kidd		Kidd		Kidd		Forward	
	T=	1		1		1		1		2	
# /ACRES:											
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	412		412		412		412		412	
S	Gradient	10.9		15.8		20.6		6.0		4.9	
LS	Calculated LS	3.10		5.15		7.35		1.36		1.06	
F	Fraction	0.09		0.16		0.21		0.25		0.28	
K	Soil Erosiveness	0.28		0.28		0.28		0.28		0.17	
C	Cover	0.011	forest	0.067	chapparal	0.067	chapparal	0.011	forest	0.011	forest
	Product	0.001		0.015		0.029		0.001		0.001	
	Combined LS	0.0469									
R	Rainfall	103.7									
P	Practice	1									
A	Soil loss, tons/acre	4.86									

Forest = 75% tree canopy w/ 95% ground cover (100% W) C=0.011
Chapparal = 75% brush w/ 60% ground cover (25%G / 75%W) C=0.067

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Pre Project

DATE: 11/30/2017

	TRANSECT:	E1upper		E1lower							
	SOIL TYPE:	Forward		Forward							
	T=	2		2							
# /ACRES:											
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	523		523							
S	Gradient	13.4		5.0							
LS	Calculated LS	4.64		1.22		0.00					
F	Fraction	0.35		0.65							
K	Soil Erosiveness	0.17		0.17							
C	Cover	0.011	forest	0.011	forest						
	Product	0.003		0.001		0.000					
	Combined LS	0.0045									
R	Rainfall	103.7									
P	Practice	1									
A	Soil loss, tons/acre	0.47									

Forest = 75% tree canopy w/ 95% ground cover (100% W) C=0.011

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Pre Project

DATE: 11/30/2017

	TRANSECT:	E2upper		E2mid		E2lower					
	SOIL TYPE:	Forward		Forward		Forward					
	T=	2		2		2					
# /ACRES:											
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	189		189							
S	Gradient	18.8		10.5							
LS	Calculated LS	4.41		1.99		0.00					
F	Fraction	0.35		0.65							
K	Soil Erosiveness	0.17		0.17							
C	Cover	0.011	forest	0.011	forest						
	Product	0.003		0.002		0.000					
	Combined LS	0.0053									
R	Rainfall	103.7									
P	Practice	1									
A	Soil loss, tons/acre	0.55									

Forest = 75% tree canopy w/ 95% ground cover (100% W) C=0.011

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Pre Project

DATE: 11/30/2017

	TRANSECT:	E3upper		E3mid		E3 lower					
	SOIL TYPE:	Forward		Forward		Forward					
	T=	2		2		2					
# /ACRES:											
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	526		526		526					
S	Gradient	17.1		7.4		4.6					
LS	Calculated LS	6.47		2.04		1.11					
F	Fraction	0.19		0.35		0.46					
K	Soil Erosiveness	0.17		0.17		0.17					
C	Cover	0.011	forest	0.011	forest	0.0110	forest				
	Product	0.002		0.001		0.001					
	Combined LS	0.0046									
R	Rainfall	103.7									
P	Practice	1									
A	Soil loss, tons/acre	0.48									

Forest = 75% tree canopy w/ 95% ground cover (100% W) C=0.011

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project w/ditching

DATE: 5/22/2017

	TRANSECT:	A1upper		A1mid		A1mid		A1lower		A2	
	SOIL TYPE:	Forward		Forward		Forward		Forward		Kidd	
	T=	2		2		2		2		1	
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7		103.7		104	
K	Soil Erosiveness	0.17		0.17		0.17		0.17		0.28	
	Slope length (ft)	144		90		108		108		354	
S	Gradient	22.2		21.1		19.6		11.6		24.2	
LS	Calculated LS	4.79		3.54		3.52		1.73		8.41	
C	Cover	0.022	*	0.022	*	0.022	*	0.022	*	0.022	*
P	Practice	1		1		1		1		1	
A	Soil loss, tons/acre	1.86		1.37		1.37		0.67		5.37	

*permanent no till, spot spray (80% cover)

A1	Transect Length, ft	% Length	Segment Loss, t/a	Weighted Loss, t/a
	144	0.320	1.86	0.60
	90	0.200	1.37	0.27
	108	0.240	1.37	0.33
	108	0.240	0.67	0.16
Transect Totals	450			**1.36**

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project

DATE: 2/2/2017

	TRANSECT:		A3 complex						A3 lower	
	SOIL TYPE:	Kidd		Forward				Forward		Forward
	T=	1		2				2		2
# /ACRES:										
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe		DESCRIPTION	Value	/Describe	Value	/Describe
	Slope length (ft)	426		426			Rainfall	103.7		103.7	
S	Gradient	13.0		17.0			Soil Erosiveness	0.17		0.17	
LS	Calculated LS	4.01		5.78			Slope length (ft)	110		45	
F	Fraction	0.35		0.65			Gradient	22.7		29.0	
K	Soil Erosiveness	0.28		0.17			Calculated LS	4.31		3.78	
C	Cover	0.022	*	0.022	*		Cover	0.022		0.022	
	Product	0.009		0.014			Practice	1		1	
	Combined LS	0.0227									
R	Rainfall	103.7					Soil loss, tons/acre	1.67		1.46	
P	Practice	1									
A	Soil loss, tons/acre	2.35									

*permanent no till w/spot spray (80% cover)

Napa Valley Vineyard Engineering Inc.
USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project w/ditching
DATE: 5/22/2017

	TRANSECT:							B		C	
	SOIL TYPE:							Forward		Forward	
	T=							2		2	
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall							103.7		103.7	
K	Soil Erosiveness							0.17		0.17	
	Slope length (ft)							369		249	
S	Gradient							10.0		18.1	
LS	Calculated LS	0.00		0.00		0.00		2.60		4.81	
C	Cover							0.022	*	0.022	*
P	Practice							1		1	
A	Soil loss, tons/acre	0.00		0.00		0.00		1.01		1.86	

*permanent no till, spot spray (80% cover)

Napa Valley Vineyard Engineering Inc.
USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project w/ditching
DATE: 2/22/2017

	TRANSECT:	D1upper		D1mid		D1mid		D1lower			
	SOIL TYPE:	Kidd		Kidd		Kidd		Forward			
	T=	1		1		1		2			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7		103.7			
K	Soil Erosiveness	0.28		0.28		0.28		0.17			
	Slope length (ft)	92		79		120		110			
S	Gradient	14.1		15.8		13.8		16.8			
LS	Calculated LS	2.08		2.25		2.31		2.89		0.00	
C	Cover	0.022	*	0.022	*	0.022	*	0.022	*		
P	Practice	1		1		1		1			
A	Soil loss, tons/acre	1.33		1.44		1.48		1.12		0.00	

*permanent no till, spot spray (80% cover)

D1	Transect Length, ft	% Length	Segment Loss, t/a	Weighted Loss, t/a
	92	0.230	1.33	0.31
	79	0.198	1.44	0.28
	135	0.338	1.48	0.50
	94	0.235	1.12	0.26
Transect Totals	400			**1.35**

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project w/ditching

DATE: 2/22/2017

	TRANSECT:	D2		D2		D2		D2			
	SOIL TYPE:	Forward		Kidd		Kidd		Kidd			
	T=	2		1		1		1			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7		103.7			
K	Soil Erosiveness	0.28		0.28		0.28		0.28			
	Slope length (ft)	105		114		161		96			
S	Gradient	16.2		14.9		12.6		16.7			
LS	Calculated LS	2.69		2.50		2.36		2.68		0.00	
C	Cover	0.022	*	0.022	*	0.022	*	0.022	*		
P	Practice	1		1		1		1			
A	Soil loss, tons/acre	1.72		1.60		1.51		1.71		0.00	

*permanent no till, spot spray (80% cover)

D2	Transect Length, ft	% Length	Segment Loss, t/a	Weighted Loss, t/a
	105	0.221	1.72	0.38
	114	0.239	1.60	0.38
	161	0.338	1.51	0.51
	96	0.202	1.71	0.34
Transect Totals	476			**1.62**

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project w/ditching

DATE: 11/30/2017

	TRANSECT:	D3upper		D3lower							
	SOIL TYPE:	Kidd		Kidd							
	T=	1		1							
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7							
K	Soil Erosiveness	0.28		0.28							
	Slope length (ft)	186		231							
S	Gradient	18.8		11.2							
LS	Calculated LS	4.37		2.41		0.00		0.00		0.00	
C	Cover	0.022	*	0.022	*						
P	Practice	1		1							
A	Soil loss, tons/acre	2.79		1.54		0.00		0.00		0.00	

*permanent no till, spot spray (80% cover)

D3	Transect Length, ft	% Length	Segment Loss, t/a	Weighted Loss, t/a
	186	0.446	2.79	1.24
	231	0.554	1.54	0.85
Transect Totals	417			2.10

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project w/ditching

DATE: 2/22/2017

	TRANSECT:	D4		D4		D4		D4		D4	
	SOIL TYPE:	Kidd		Kidd		Kidd		Kidd		Forward	
	T=	1		1		1		1		2	
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7		103.7		104	
K	Soil Erosiveness	0.28		0.28		0.28		0.28		0.17	
	Slope length (ft)	55		77		74		70		57	
S	Gradient	16.3		11.7		12.2		13.6		17.5	
LS	Calculated LS	1.96		1.48		1.53		1.73		2.20	
C	Cover	0.022	*	0.022	*	0.022	*	0.022	*	0.022	
P	Practice	1		1		1		1		1	
A	Soil loss, tons/acre	1.25		0.94		0.98		1.11		0.85	

*permanent no till, spot spray (80% cover)

D2	Transect Length, ft	% Length	Segment Loss, t/a	Weighted Loss, t/a
	55	0.165	1.25	0.21
	77	0.231	0.94	0.22
	74	0.222	0.98	0.22
	70	0.210	1.11	0.23
	57	0.171	0.85	0.15
Transect Totals	333			**1.02**

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project w/ditching

DATE: 2/22/2017

	TRANSECT:	D5		D5		D5		D5			
	SOIL TYPE:	Kidd		Kidd		Kidd		Kidd			
	T=	1		1		1		1			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7		103.7			
K	Soil Erosiveness	0.28		0.28		0.28		0.28			
	Slope length (ft)	48		51		97		53			
S	Gradient	12.5		13.7		7.0		10.3			
LS	Calculated LS	1.28		1.49		0.81		1.03		0.00	
C	Cover	0.022	*	0.022	*	0.022	*	0.022	*		
P	Practice	1		1		1		1			
A	Soil loss, tons/acre	0.82		0.95		0.52		0.66		0.00	

*permanent no till, spot spray (80% cover)

D2	Transect Length, ft	% Length	Segment Loss, t/a	Weighted Loss, t/a
	48	0.193	0.82	0.16
	51	0.205	0.95	0.19
	97	0.390	0.52	0.20
	53	0.213	0.66	0.14
Transect Totals	249			**0.70**

Napa Valley Vineyard Engineering Inc.
USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project
DATE: 2/22/2017

	TRANSECT:	D6									
	SOIL TYPE:	Kidd		Kidd		Kidd		Kidd		Forward	
	T=	1		1		1		1		2	
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	412		412		412		412		412	
S	Gradient	10.9		15.8		20.6		6.0		4.9	
LS	Calculated LS	3.10		5.15		7.35		1.36		1.06	
F	Fraction	0.09		0.16		0.21		0.25		0.28	
K	Soil Erosiveness	0.28		0.28		0.28		0.28		0.17	
C	Cover	0.022	*	0.022	*	0.022	*	0.022	*	0.022	*
	Product	0.002		0.005		0.010		0.002		0.001	
	Combined LS	0.0195									
R	Rainfall	103.7									
P	Practice	1									
A	Soil loss, tons/acre	2.02									

*permanent no till w/spot spray (80% cover)

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project w/ditching

DATE: 11/30/2017

	TRANSECT:	E1		E1		E1		E1			
	SOIL TYPE:	Forward		Forward		Forward		Forward			
	T=	2		2		2		2			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7		103.7			
K	Soil Erosiveness	0.17		0.17		0.17		0.17			
	Slope length (ft)	55		66		110		292			
S	Gradient	18.2		15.1		11.8		5.1			
LS	Calculated LS	2.28		1.94		1.79		0.94		0.00	
C	Cover	0.017	*	0.017	*	0.017	*	0.017	*		
P	Practice	1		1		1		1			
A	Soil loss, tons/acre	0.68		0.58		0.54		0.28		0.00	

*permanent no till, no spray (85% cover)

E1	Transect Length, ft	% Length	Segment Loss, t/a	Weighted Loss, t/a
	55	0.105	0.68	0.07
	66	0.126	0.58	0.07
	110	0.210	0.54	0.11
	292	0.558	0.28	0.16
Transect Totals	523			**0.41**

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

FOR: DiCesaris Post Project w/ditching

DATE: 11/30/2017

	TRANSECT:	E2		E2		E2		E2			
	SOIL TYPE:	Forward		Forward		Forward		Forward			
	T=	2		2		2		2			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7		103.7			
K	Soil Erosiveness	0.17		0.17		0.17		0.17			
	Slope length (ft)	33		44		61		51			
S	Gradient	24.2		19.3		12.3		9.8			
LS	Calculated LS	2.57		2.20		1.41		0.94		0.00	
C	Cover	0.017	*	0.017	*	0.017	*	0.017	*		
P	Practice	1		1		1		1			
A	Soil loss, tons/acre	0.77		0.66		0.42		0.28		0.00	

*permanent no till, no spray (85% cover)

E2	Transect Length, ft	% Length	Segment Loss, t/a	Weighted Loss, t/a
	33	0.175	0.77	0.13
	44	0.233	0.66	0.15
	61	0.323	0.42	0.14
	51	0.270	0.28	0.08
Transect Totals	189			**0.50**

Napa Valley Vineyard Engineering Inc.

USLE CALCULATIONS A=(R)(K)(LS)(C)(P)

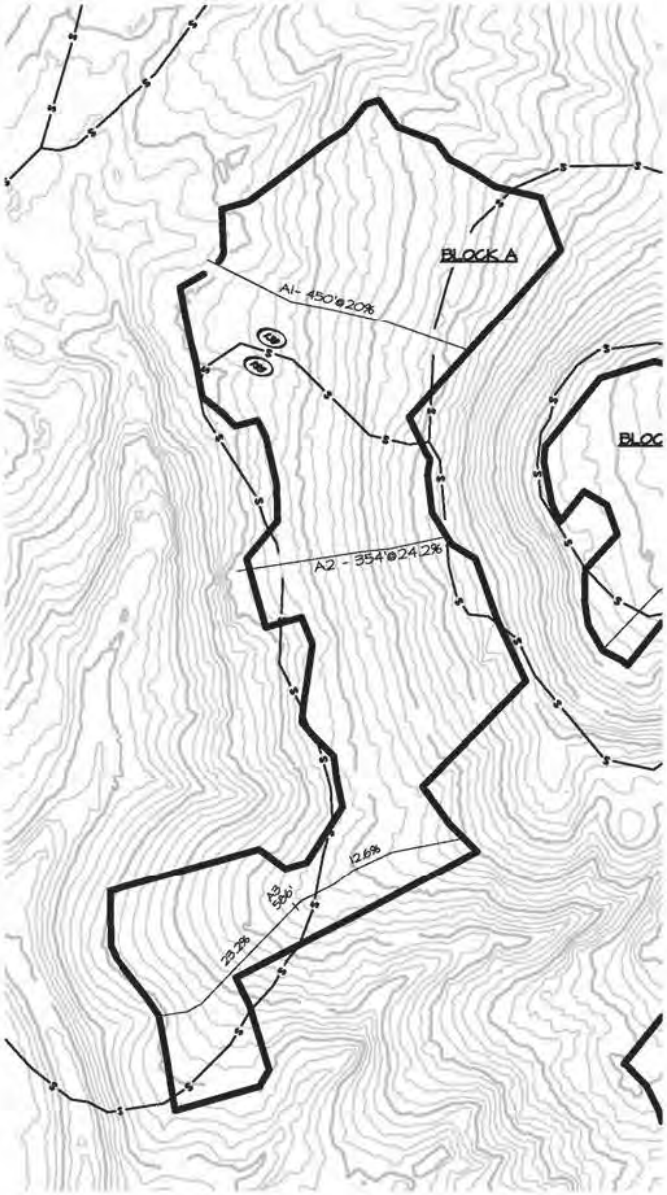
FOR: DiCesaris Post Project w/ditching

DATE: 11/30/2017

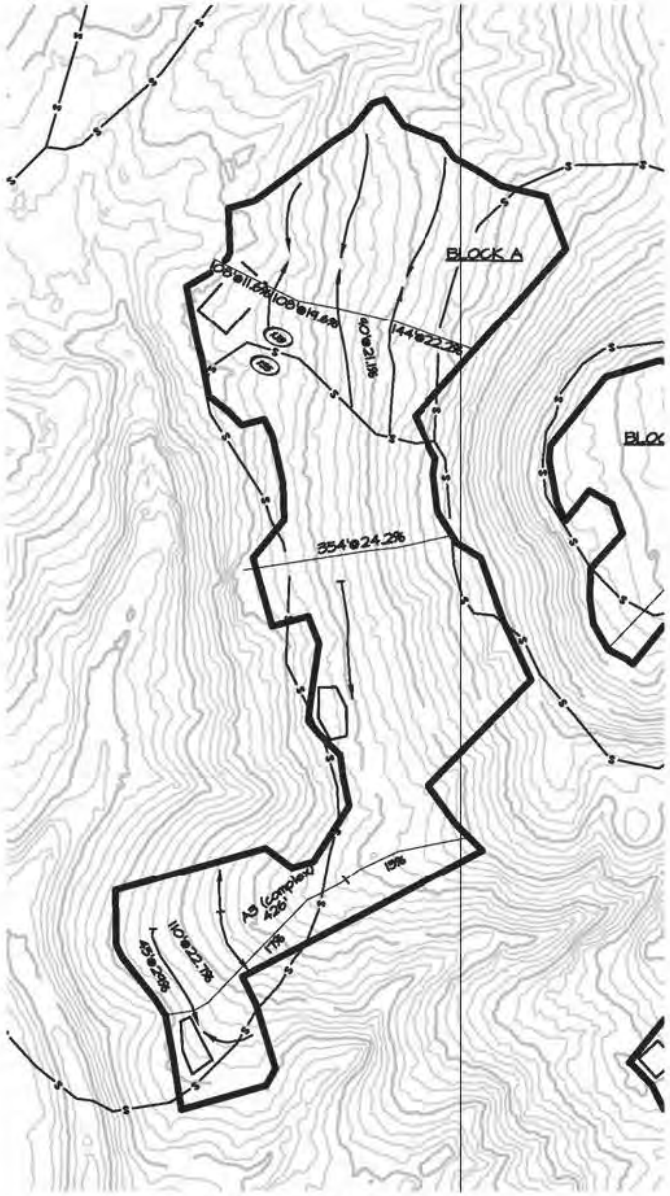
	TRANSECT:	E3		E3		E3		E3			
	SOIL TYPE:	Forward		Forward		Forward		Forward			
	T=	2		2		2		2			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	103.7		103.7		103.7		103.7			
K	Soil Erosiveness	0.17		0.17		0.17		0.17			
	Slope length (ft)	55		62		147		262			
S	Gradient	21.8		17.7		9.9		5.0			
LS	Calculated LS	2.89		2.33		1.62		0.87		0.00	
C	Cover	0.017	*	0.017	*	0.017	*	0.017	*		
P	Practice	1		1		1		1			
A	Soil loss, tons/acre	0.87		0.70		0.49		0.26		0.00	

*permanent no till, no spray (85% cover)

E3	Transect Length, ft	% Length	Segment Loss, t/a	Weighted Loss, t/a
	55	0.105	0.87	0.09
	62	0.118	0.70	0.08
	147	0.279	0.49	0.14
	262	0.498	0.26	0.13
Transect Totals	526			0.44



PRE PROJECT

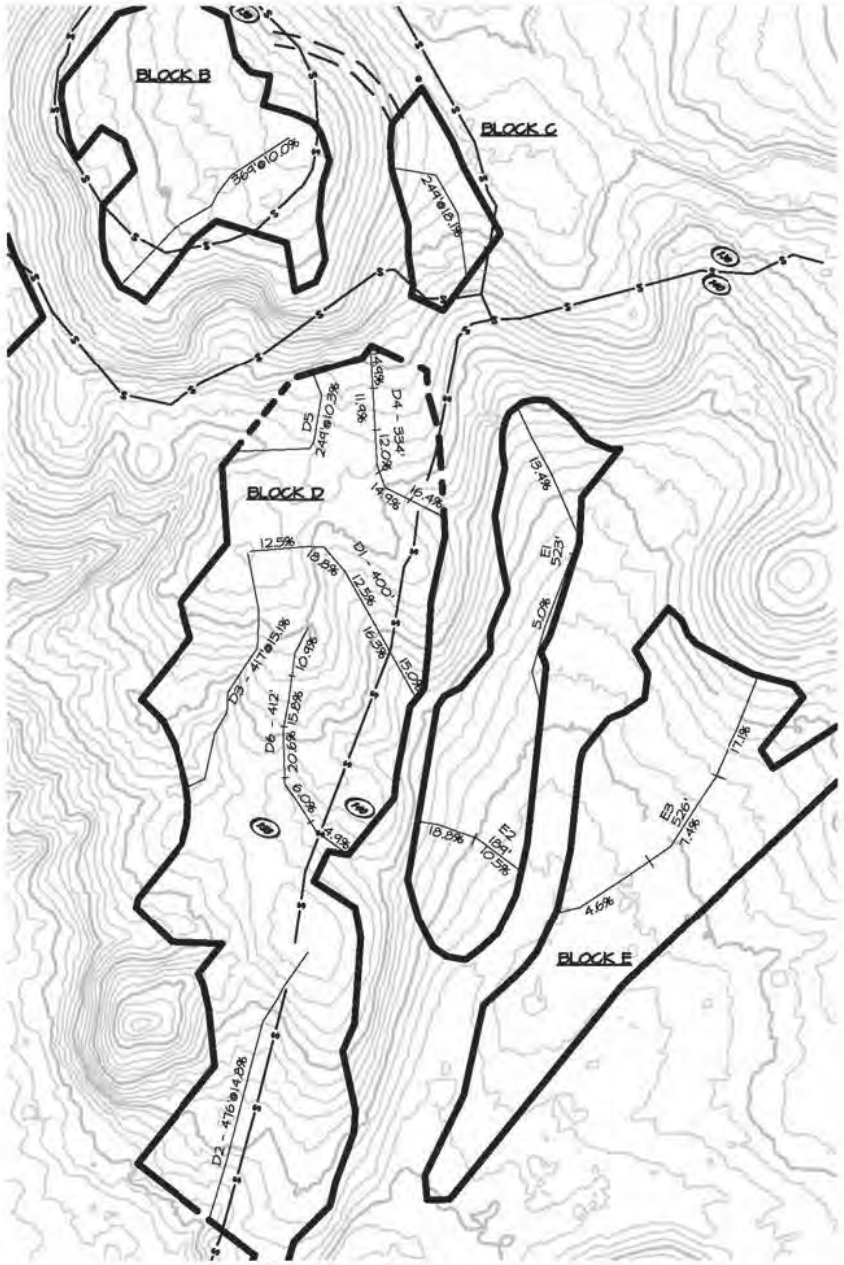


POST PROJECT

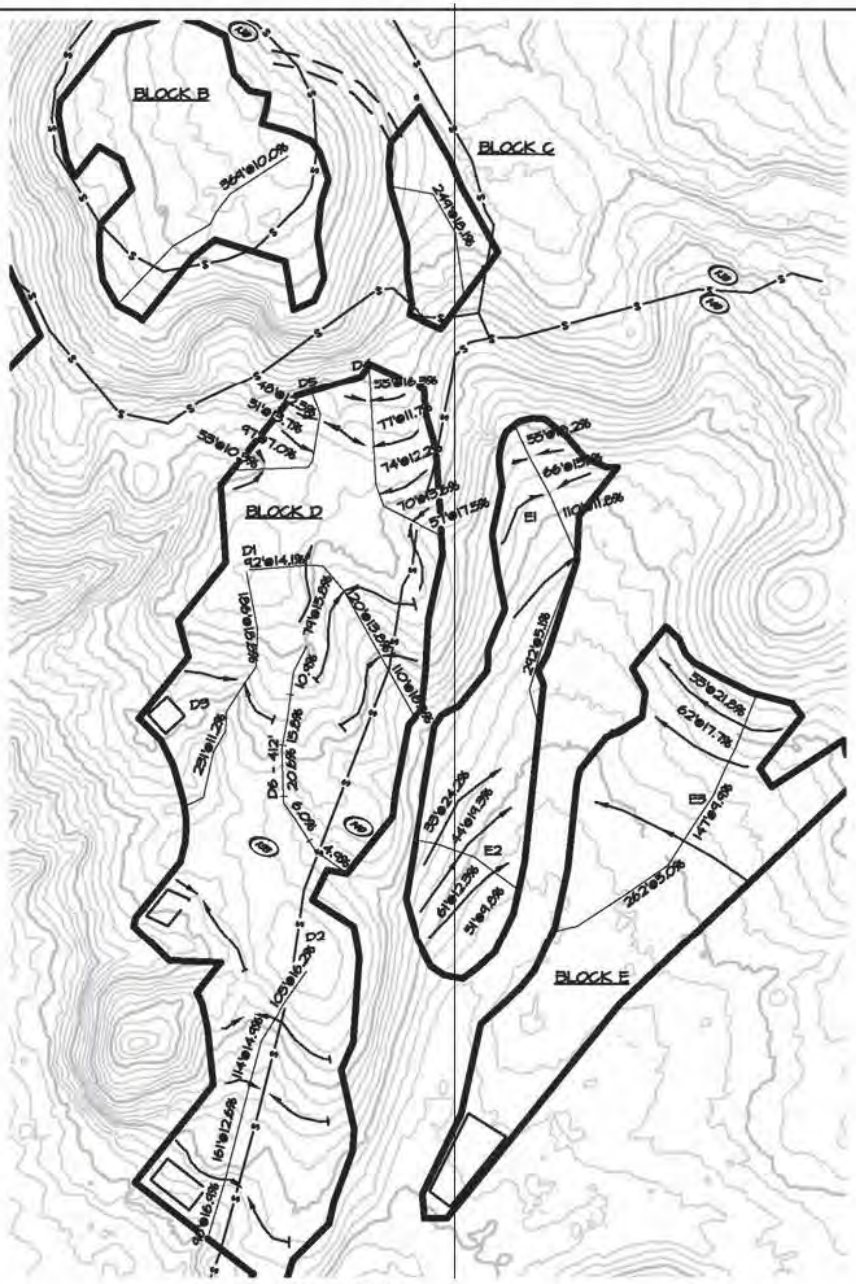
SCALE: 1"=200'
CONTOUR INTERVAL=5'

DICesaris-ECP
USLE Transects
Block A

NVVE 11-18-14
Revised 5-22-17



PRE PROJECT



POST PROJECT

SCALE: 1"=200'
CONTOUR INTERVAL=5'

DICesaris-ECP
USLE Transects
Blocks B thru E
NWE 11-18-14
Revised 11-30-17

Appendix F

DiCesaris-Le Colline Vineyard
Memorandum, Nov. 7, 2016
Napa Valley Vineyard Engineering

NAPA VALLEY VINEYARD ENGINEERING, INC.
176 MAIN STREET, SUITE B
ST. HELENA, NAPA VALLEY, CALIFORNIA 94574
(707) 963-4927 nvvedla@covad.net

DREW L. ASPEGREN, P.E.
CIVIL ENGINEER

MEMO

Date: November 7, 2016

To: Matt O'Connor, PhD
O'Connor Environmental, Inc

From: Drew L. Aspegren, P.E.
Napa Valley Vineyard Engineering, Inc.

Re: Di Cesaris Le Colline Vineyard

A site visit was conducted May 6, 2015, and participants included Napa County RCD, Napa County Planning and Engineering, Napa Valley Vineyard Engineering (plan preparer) and OEI (consulting hydrologist). The purpose of this site visit was to view the various vegetation communities and come to a consensus regarding the ground cover conditions for generating accurate, custom C-values for use in soil loss modeling. The results of the site visit are documented in a May 7, 2015 memo from Charles Schembre (RCD), a part of which is attached. It was concluded that the areas of Chapparal located throughout the proposed project area generally consist of approximately 75% canopy, with an overall 60% ground cover. There are several locations within the Chaparral community where bedrock is exposed; however, the exposed bedrock was not included in determining the overall ground cover percentage. The use of a "fair" condition in the hydrological modeling for the brush areas within the project watersheds reflects the 60% ground cover condition agreed upon during the site visit. It is important to note that with the inclusion of the exposed bedrock, the overall ground cover is actually less than 60%.

P14-00410 Le Colline Transect Cover Values

This document provides the Cover (C) values generated after a field visit at the Le Colline Project site. The site included the Napa County RCD, Napa County Planning and Engineering, NVVE, and Matt O'Conner. The USLE modeling for the Le Colline ECP uses a single C-value of 0.038 for every transect. The Napa RCD requested that each block and transect be modeled using a more specific C-value that represented the actual vegetation and ground cover. The intention of this site visit was to bring the team together to agree upon the actual ground conditions for generating more accurate and custom C-values.

Two prominent vegetation communities exist within the project site; Douglas Fir – Mix Conifer Forest, and Chamise-Manzanita dominated Chaparral. The Douglas Fir Forest has a consistent canopy of cover of 75 % and a 95 % ground cover of varying undecayed leaf and woody residues, and variable densities of understory herbaceous plants. The Chaparral community has a consistent canopy of 75%, with an overall 60 % ground cover with considerable variability of grasses, forbs, and undecayed leaf litter. There was also a large component of exposed bedrock composing the ground surface, especially in block A chaparral. The group consensus was to evaluate the soil surface coverage, and exposed bedrock was not included in the overall percent ground cover estimation.

The ground cover and canopy conditions were agree upon in the field. A weighed C-value was generated for transects that have both Forest and Chaparral vegetation communities. The weighing was determined by the percentage of each vegetation community that occupied the flow path of the transect.

Two main C-values were generated using Table 10 (USDA 1978), for each of the vegetation communities described above. These two C-values were weighed when a transect contained both vegetation communities. Block C was the exception because of a disturbed forest habitat. Transect identification in this document are the same as the Le Colline ECP USLE transect identification.

Two Main C-Values

Typical Forest with substantial duff layer, 95% ground cover

75% Tree Canopy

95% Duff Ground cover

100 W	Undecayed litter and herbaceous plants	**0.011**

Typical Chaparral Characteristics

75% Brush

60% Ground Cover

25 G Grasses

75 W weedy herbaceous plants and undecayed plant material

0.067

Cover Values by Transect

A1

Predominatly Forest Habitat

75% Tree Canopy

95% Ground cover

100 W

0.011

A2

Predominatly Chaparral Habitat

75% Brush

60 Ground Cover

25 G/ 75W

0.067

A3 Upper

62 % Forest, 38 % Chaparall

38% Chap (0.067 * 0.38)

62% Forest (0.011 * 0.62)

0.032

A3 Lower

100% Forest

75% Tree Canopy

95% Ground cover

100 W

0.011

B

60% Forest, 40% Chaparral

60% Forest (0.011*0.60)

40% Chap (0.067*.40)

0.034

C

Disturbed Forest

75% Tree Canopy

70% Ground Cover

50 G/ 50 W

0.044

D1 and D2

100% Forest

75% Tree Canopy

95% Ground cover

100 W

0.011

D3

Block D3

75% Brush

60% Ground Cover

25 G/75W

0.067

E

100% Forest

75% Tree Canopy

95% Ground cover

100 W

0.011

Appendix G

Napa County PBES Memo
May, 18 2017

A Tradition of Stewardship
A Commitment to Service

Planning, Building & Environmental Services

1195 Third Street, Suite 210
Napa, CA 94559
www.countyofnapa.org

David Morrison
Director

MEMORANDUM

To:	Brian Bordona Conservation Division	From:	Patrick C. Ryan Engineering Service
Date:	May 18, 2017	Re:	**Permit No. P14-00410** **LeColline Vineyards - ECP** APN: 024-300-071

After careful review and site evaluation of the proposed LeColline Vineyard Development – Erosion Control Plan (ECP) Track I application package the Engineering Division has determined the application package to be incomplete or lacking adequate detail. For this Division to complete its evaluation of the subject permit the following shall be prepared and submitted to this department:

I. SOIL LOSS REPORT:

1. Transect A1 – Based on RCDs Transect Cover Values letter the pre-development cover management factor for transect A1 shall be Trees with 75% canopy and 95% ground cover (100%W). Please revise Soil Loss analysis with the revised C-Factor.
2. Transect C – Revise the pre and post-development LS calculation to be consistent with USDA Soil Conservation Service's Guide for Erosion and Sediment Control, LS Area 3. Based on the provide slope length and percent slope the LS provided is under calculated and should compute to 4.80.
3. Transect C – Revise the Cover Management Factor for the pre development to represent the existing vegetated condition (i.e. based on a forest condition with 75% canopy cover and 70% ground cover (50% grass like and 50% weed like) a C-Factor shall be 0.044.

II. HYDROLOGY/HYDRAULIC REPORT:

4. Vineyard Land Use Curve Numbers (CN) shall be consistent with the Engineering Field Manual (EFM)Chapter 2, Supplement 1 – Estimating Runoff in California. Revise post-development CN for vineyards in Good Hydrologic Condition for HSG D for Watersheds 2 through 8, per the EFM table below.

VINEYARD (annual grass)	HSG A	HSG B	HSG C	HSG D
Poor	65	78	86	89
Fair	49	69	79	84

Good	38	61	75	**81**

5. Revise Post-Development Watershed 4b time of concentration computation to be consistent with the overland flow length described in the Watershed Map exhibit.
6. Revise Post-Development Watershed 6a overland flow time of concentration map exhibit to include the 118 feet of 12″ pipe flow at 8%.
7. Revise Post-Development Watershed 6b overland flow time of concentration map exhibit to reflect the modeled time of concentration.
8. Revise model or ECP plan to reflect the appropriate pipe size for the overland flow of Watershed 8 subarea D4. Model reflects an 18″ CPP and the plan illustrates a 12″ CPP.
9. Revise model or ECP plan to reflect the appropriate pipe size for the overland flow of Watershed 8 subarea d5. Model reflects a 12″ CPP and the plan illustrates an 18″ CPP.
10. Please include on the ECP Plan the 35 feet of 12″ CPP for Watershed 8 subarea 8C.

III. GEOTECHNICAL EVALUATION REQUIRED

11. Provide the Gilpin Geosciences, Inc. August 22, 2016 memo.
12. Based on the CGS September 14, 2016 memo; including Napa County's Guidelines for Preparing Landslide Hazard Evaluations (Attachment F) and the 2016 California Building Code Appendix J. Please provide an updated Geotechnical Evaluation for the following items:
    - **i.** Description of the slope above the residences of concern, as identified in the CGS memo. The description shall include slope steepness, slope aspects in relation to the residence, anticipated soil thickness and morphology.
    - **ii.** Evaluation of the described translational landslide feature, including potential impacts associated with the development of the vineyard which may contribute to instability of the existing landslide feature, and recommendations on appropriate setbacks.
    - **iii.** Provide updated evaluation of the proposed rock fill area including but not limited to recommended keyway (typical keyway width of 10′, per 2016 CBC Appendix J), benching and fill slope gradients.
    - **iv.** Provide geotechnical review and recommendations of the proposed 5′ tall rock retaining walls including design details and erosion and sediment controls. Prior to construction of the proposed retaining walls building permits shall be obtained from Napa County's PBES Building Division.

Please note that the comments noted above are based on Engineering review only. There may be additional comments or information requested from other County Departments or Divisions reviewing this application. Please resubmit to the County's Engineering/Conservation Division when all Department and Division's comments are addressed. Should you have any questions of me, please feel free to contact me at (707) 253.4892 or via e-mail at Patrick.Ryan@countyofnapa.org.

APPENDIX K

ENGINEERING GEOLOGICAL EVALUATION

NAPA VALLEY VINEYARD ENGINEERING, INC.
176 MAIN STREET, SUITE B
ST. HELENA, NAPA VALLEY, CALIFORNIA 94574
(707) 963-4927 nvvedla@covad.net

DREW L. ASPEGREN, P.E.
CIVIL ENGINEER

January 3, 3018

Mr. Brian Bordona
NAPA COUNTY PLANNING, BUILDING
AND ENVIRONMENTAL SERVICES
1195 Third St. Suite 210
Napa, CA 94559

Re: #P14-00410-ECPA
Le Colline Vineyard

Dear Mr. Bordona:

Attached area five copies of the revised Erosion Control Plan (November 29, 2017). The revision is in response to comments from reviewing agencies, and incorporates Patrick Ryan's comments in the memorandum to you dated May 18, 2017. Also attached are the following:

- Revised USLE analysis (November 30, 2017)
- Revised Hydrological Analysis (December 12, 2017)
- Gilpin Geosciences memo dated August 22, 2016 (as requested in Patrick Ryan's memo)
- Gilpin Geosciences updated Engineering Geological Evaluation (November 3, 2016)
- Gilpin Geosciences Memorandum regarding the rock fill (December 29, 2017)

Please note that item 12 iv. of Patrick Ryan's memo is not applicable to this project. The only proposed rock retaining wall is along the access road, and the detail clearly indicates a maximum height of 4 feet.

Thank you for your continued review of this project.

Sincerely,
NAPA VALLEY VINEYARD ENGINEERING, INC.
Drew L. Aspegren, P.E.

Diane L. Willson

By Diane L. Willson

DLW/jw
encl.

Cc: Dave DiCesaris w/o encl.
Scott Butler w/o encl.

GILPIN GEOSCIENCES, INC.
Earthquake & Engineering Geology

MEMORANDUM

To: Diane Wilson, Napa Valley Vineyard Engineering

From: Lou Gilpin, Gilpin Geosciences, Inc.,
Craig Shields, Rockridge Geotechnical

Date: December 29, 2017

Project: Le Colline Vineyard (T8N, R5W)
APN 024-300-070, 071, 072, & 024-340-001
Timber Harvest Plan 1-16-079 NAP
Cold Springs Road
Angwin, California

Project No.: 91589.01
Subject: Rock Fill Detail

This memorandum summarizes our review of the Napa Valley Vineyard Engineering (NVVE) ECP for the subject project. We have previously submitted an updated engineering geology evaluation report dated 3 November 2016.

We have reviewed the C/3 Rock Fill – Typical Section detail, part of the NVVE – ECP on the basis of engineering geological and geotechnical considerations and we find the detail to be adequate and appropriate for the site conditions.

3226 Silverado Trail N.St Helena, CA 94574 • Tel. 415-686-0584

We trust this memorandum provides you with the information you require at this time. If you have any questions regarding this memorandum, please call or email.

REGISTERED GEOLOGIST
L. M. GILPIN
No. 1518
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. SHIELOS
GE2116
3/31/19
GEOTECHNICAL
STATE OF CALIFORNIA

Gilpin Geosciences, Inc
Earthquake & Engineering Geology

August 22, 2016
91589.01

Drew Aspegren
Napa Valley Vineyard Engineering, Inc.
176 Main Street
St Helena, California 94574

Subject: **Response to Comments**
Engineering Geological Evaluation
Le Colline Vineyard
APN 024-300-070, 071, 072, & 024-340-001
Cold Springs Road
Angwin, California

Dear Mr. Aspegren:

We are responding to comments submitted for the Timber Harvest Plan[1] for the development of the Le Colline Vineyard on Cold Springs Road near Angwin, California. We previously presented our Engineineering Geological Evaluation dated 25 November 2014. The proposed vineyard consists of five blocks and internal acccess roads totalling 34.9 acres, of moderate to gentle west- and south-sloping forested upland area.

The comments submitted by the California Geological Survey are copied here for convenience. Our response follows each comment.

18) The THP identifies existing residential structures directly adjacent to and downslope of proposed conversion harvesting in timber conversion blocks B and C. It does not appear that potential impacts to the residential structures are discussed in the plan attached geologic report (Gilpin Geosciences, 2014). Please have the project geologist (Gilpin) comment about possible potential adverse impacts to slope stability adjacent to and above the residential structures resulting from proposed operations. (CGS)

We concluded that the rock at the site is little fractured, hard, very strong and little weathered. We noted a drainage swale on the south side of the prominent knoll at the site. The residences noted in the review comments lie along Cold Springs Road, north of the site property boundary. We noted no evidence of slope instability along this flank of knoll above the residences. No additional mitigation is necessary.

---

[1] ATTACHMENT A REVIEW TEAM QUESTIONS THP#: 1-16- 079 NAP (LeColline LLC and Cold Springs LLC) RPF: S. Butler: CGS, CALFIRE, RWB, and CDFW, Filing Date: August 04, 2016

Agency Questions to be addressed at PHI:

1) The THP proposes conversion harvesting directly adjacent to and upslope of what appear to be existing residential structures. The plan attached geologic report (Gilpin Geosciences, 2014) does not discuss potential impacts to the structures from harvesting. Are additional mitigations necessary to minimize adverse impacts to the slope stability above the residential structures? (CGS)

Same as above.

2) The THP proposes to construct a new road below an erosional feature identified in the plan attached geologic report (Gilpin Geosciences, 2014) located above the head of a mapped Class III watercourse. Are additional mitigations needed to minimize adverse impacts to slope stability and sediment delivery? (CGS)

The noted erosional feature is a drainage swale that shows no evidence of instability. We identified no features associated with landslide deposits such as head or lateral scarps and ground cracking or hummocky topography usually found near the toe of landslide deposits. No additional mitigation is necessary.

We trust that this provides you with the information you need. If you have any questions, please call.

Sincerely,

GILPIN GEOSCIENCES, INC.

REGISTERED GEOLOGIST
L. M. GILPIN
No. 1518
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Lou M. Gilpin, PhD
Engineering Geologist

ROCKRIDGE GEOTECHNICAL, INC.

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. SHIELDS
612116
3/31/17
GEOTECHNICAL
STATE OF CALIFORNIA

Craig S. Shields
Geotechnical Engineer

Gilpin Geosciences, Inc
Earthquake & Engineering Geology

November 3, 2016
91589.01

Drew Aspegren
Napa Valley Vineyard Engineering, Inc.
176 Main Street
St Helena, California 94574

Subject: **UPDATED**
Engineering Geological Evaluation
Le Colline Vineyard (T8N, R5W)
APN 024-300-070, 071, 072, & 024-340-001
Timber Harvest Plan 1-16-079 NAP
Cold Springs Road
Angwin, California

Dear Mr. Aspegren:

We are pleased to present the results of our updated engineering geological evaluation of the proposed Le Colline Vineyard Blocks A through E. We understand that this geological evaluation will supplement the Erosion Control Plan, prepared by Napa Valley Vineyard Engineering, Inc. (NVVE, 2014). The site is located on Cold Springs Road and the northwest extent of the property abuts Howell Mountain Road near the Town of Angwin, as shown on Figure 1. The vineyard consists of five blocks and internal access roads encompassing 34.9 acres of moderate to gentle west- and south-sloping forested upland area.

We have referred to the California Geological Survey Guidelines for Engineering Geologic Reports for Timber Harvesting Plans, Note 45, and Factors Affecting Landslides in Forested Terrain, Note 50 (California Geological Survey, 2013a, 2013b) during our preparation of the updated report presented here. We originally issued this report on 25 November 2014. We have reviewed comments provided by California Geological Survey (CGS) (2016) presented in a memorandum "Engineering Geologic Review of Timber Harvest Plan 1-16-079 NAP" dated 14 September 2016.

SCOPE OF SERVICES

The purpose of this evaluation was to review the proposed vineyard development and to assess the potential impact to local surface erosion and slope stability. In order to accomplish this, we performed the following tasks:

- reviewed published and unpublished reports and maps of the site;

- reviewed aerial photographs in order to identify surface conditions and slope stability concerns;
- reviewed the Napa Valley Vineyard Engineering, Inc. Erosion Control Plan, and,
- performed a geologic reconnaissance on 7 October 2014; subsequent site visits to perform additional slope evaluation were performed on 24 September and 13 October 2016.

REGIONAL AND SITE GEOLOGY

The site is located in the Coast Ranges geomorphic province, which is characterized by northwest-southeast trending valleys and ridges. These are controlled by folds and faults that resulted from the collision of the Farallon and North American plates and subsequent shearing along the San Andreas fault. The bedrock in the site vicinity is mapped as Sonoma Volcanics ash-flow tuff with pumice that is locally welded or partly welded and locally interbedded with lava flows, as shown on Figure 2 (Fox and others, 1973).

The upland on which the vineyards are located is formed by a large outcrop of rhyolitic, andesitic and basaltic lava, as shown on Figures 2 and 3. The upland lava outcrop is flanked by, and interbedded with, a more heterogeneous volcanic ash-flow tuff deposit that generally crops out at lower elevations on the uplands of Howell Mountain. We observed abundant float and field stones as well as spoils from soil test pits on the site that were composed of weathered blocks of rhyolitic and andesitic lavas and ashflow tuff. The lava rock is little fractured, hard, very strong and little weathered. The lava bedrock is characterized by fresh phenocrysts and frequent vesicles. The ashflow tuff exposed in test pits is friable to weak and moderately to deeply weathered. No landslides have been mapped in the site vicinity (Dwyer and others, 1976).

Forward gravelly loam soils on 9 to 75% slopes are mapped at a little over half of the site. This soil is well drained, which is characteristic of weathered rhyolite bedrock on upland surfaces, and has an elevated erosion hazard on steeper slopes (USDA, 1978). Kidd Loam soils are mapped on the rest of the proposed vineyard blocks (USDA, 1978). This soil is characterized by developing on rhyolite bedrock and is usually well drained and the erosion is moderate to high on steeper slopes.

Active faults have been mapped in the vicinity. The closest active fault to the site is the Hunting Creek-Berryessa Fault approximately 6.5 miles northeast of the site. The Hunting Creek-Berryessa fault is classified as a type B fault by the UBC, (ICBO, 1988) and is capable of generating a Moment Magnitude 6.9 earthquake.

SITE CONDITIONS

We evaluated site conditions based on air photo interpretation and a geological reconnaissance. We have performed a geologic reconnaissance and compiled our field observations on a Partial Geologic Site Map, shown on Figure 4. In order to evaluate the slope stability of the steep slopes of the basin-shaped drainage, we constructed a cross section designated A-A', as shown on Figure 6, through the prominent basin-shaped drainage. We used a wheel distance measuring devise in combination with a hand level and a Brunton compass to construct an accurate cross section.

We logged a test pit labelled as GGI-1 on our Figure 4, Partial Site Geologic Map. The test pit log is shown on Figure 5. Test pit GGI-1 is also shown on Cross Section A-A', Figure 6. The existing test pit excavation is the only subsurface information we used for the cross section.

Test pits for agricultural soil studies (Crop Care, 2014) were excavated to depths of between 38 and 63 inches below ground surface (bgs) at numerous locations across the site. The test pits appear to have been excavated to refusal in the volcanic bedrock. Although no subsurface exploration was conducted, we logged an existing test pit excavation located at the base of the steep slope below Block B and upslope of Block D (see Figure 4).

The proposed vineyard improvements are located at the southern extent of a broad upland surface that incorporates the Angwin airstrip to the north of the site and rises from 40 to 120 feet above the surrounding upland areas of Howell Mountain. The vineyards lie on topography similar to the upland pleateau surrounding Angwin at between approximate Elevations 1475 to 1742 feet (NVVE, 2014). The proposed vineyard blocks occupy near level to gently sloping ground on the main knoll and spur ridges and their flanks. The knoll is incised by an erosion channel that forms a large bowl-shaped basin on the southern slopes of the knoll, as shown on Figure 3.

The proposed vineyard blocks are separated by steeper slopes of the knoll flanks and a prominent basin-shaped drainage incised in its southern slope. Cross Section A-A', Figure 6, shows the steep slope below vineyard Block B. We identified several large douglas firs as well as sizeable bay trees that are growing straight and appear unaffected by any slope instability. Several trees that lie east and west of the cross section appear to have growth irregularities, especially to the west where we mapped a tongue of colluvium that appears to be subject to shallow creep. The steepest slopes within the basin appear to be stable and not subject to soil creep. We identified a fallen tree root throw along the A-A' section that exposed ash flow tuff float, indicating a shallow forest duff layer, not a thick accumulation of colluvium.

We encountered one open test pit excavated to a depth of approximately 4 feet below ground surface. The excavation exposes shallow ashflow tuff bedrock near the mouth of the basin-shaped feature. There is a thin upper layer of forest top soil overlying ash flow tuff that is decreasingly weathered with depth. We observed roots and frequent orange-yellow mottling in the upper 2-3 feet of the excavation. The bedrock was poorly consolidated and friable.

We identified bedrock exposed within and on the western flanks of the channels below the erosion-resistant bench, Elevation 1625 feet, of the basin-shaped drainage.

The Partial Site Geologic Map, Figure 4, shows a prominent topographic bench that extends at approximately mid-slope level of the property. This bench is highlighted by the colored 1625- and 1640-foot contours which encapsulate a large portion of the gently inclined bench topographic feature. We interpret this topographic bench as a bedrock-controlled feature that appears to form the "erosion-resistant floor" of the basin-shaped drainage feature. The erosion resistent nature of this bedrock bench has contributed to the unique shape and geometery of the basin-shape drainage.

We mapped moderate to gentle slopes overlooking vineyard Block C and off-site residential parcels at the northern edge of the site. Lava bedrock outcrops and field stones occur locally on the northeast-facing slope. We did not observe any slope instability on this slope. The existing access/entry road appears to be performing adequately. Drainage improvments proposed for the new vineyard roads as designed should not impact the existing slope conditions.

CONCLUSIONS

Based on our research and review of the site conditions, the proposed vineyard development appears feasible from the standpoint of erosion control and slope stability. We observed favorable slope stability conditions within the proposed block boundaries with low inclinations, combined with very strong and little weathered andesite and friable to weak ashflow tuff underlying the site. Steep slopes adjacent to Block B should be avoided during construction and we recommend a setback from the top of the slope at the southern limit of the block.

Comments we received from California Geological Survey representatives suggested that the basin-shaped drainage is associated with past landsliding and the vineyard adjacent to the drainage should be set back from the top of the slope a minimum of 50 feet horizontal. Although the bowl-shaped drainage on the southern slopes of the knoll is an erosional feature often associated with landsliding, we did not observe any landslide debris associated with it and we believe it is the result of long-term spring sapping erosion of the local hillside. A similar, if somewhat more advanced erosional feature is associated with Linda

Falls southwest of the site as shown on Figure 3. Cross Section A-A' highlights the steep slopes, however several four-foot-plus-diameter trees that appear to have been stable on the slopes for an estimated 50 to 90 years. Although some trees appear to have curved trunks, these appear to be poorly developed or dead. We also noted a prominent tree root throw along our slope traverse, shown on the Cross Section, Figure 6, that exposed ashflow tuff bedrock float, not a deep soil profile of forest soils and suspicious colluvium.

RECOMMENDATIONS

We make the following recommendations for the proposed vineyard improvements. Although we did not observe any evidence of active global slope instability in the basin-shaped drainage or near the top of the steep slope adjacent to the vineyard Block B, we concurr with the CGS reviewers (CGS, 2016)that a set back would be prudent.

1. Since the erosion control plan design incorporates surface runoff control elements such as rolling dips in the vineyard access roads and wattles that direct water flow away from the steepest slopes, we believe a set back is appropriate. The set back should be established for the south side of Block B by representing an imagininary line inclined at 2:1 horizontal to vertical extending from the base of the basin-shaped drainage and intersecting the level area presently planned for vineyard block. This corresponds to a set back of approximately 30 feet horizontal from the top of the slope (Figure 6).

In our opinion, the proposed improvements that include vineyard development and road constrtuction will not adversely impact the existing slope stability nor pose a hazard for residences downslope and north of the site. The erosion control improvements and proper road construction will improve the existing slope stability. Any small changes in the evapotranspiration caused by the tree removal and soil disturbance will be offset by the proposed surface runoff controls, permanent ground cover requirements, and agricultural mangement best practices.

In our opinion, the road alignment on the north and south sides of the project are in stable slope conditions. On the south side of the project, the alignment above the Class III drainage is on a well-defined bedrock bench. The alignment on the north side crosses the gentle slope above the residences. Bedrock outcrops and gentle slope inclinations indicate stable conditions.

2. Road construction should include excavation of a keyway a minimum of 2 feet into firm soil or bedrock. Road fill should be placed in 8-inch maximum lifts and compacted to a minimum of 90% relative compaction.

LIMITATIONS

Our services have been performed in accordance with generally accepted principles and practices of the geological and geotechnical profession. This warranty is in lieu of all other warranties, either expressed or implied. In addition, the conclusions and recommendations presented in this report are professional opinions based on the indicated project criteria and data described in this report. They are intended only for the purpose, site location and project indicated.

We trust that this provides you with the information you need. If you have any questions, please call.

Sincerely,

GILPIN GEOSCIENCES, INC.

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L. M. GILPIN
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Lou M. Gilpin, PhD
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STATE OF CALIFORNIA

Craig S. Shields
Geotechnical Engineer

Attachments:

References	
Figure 1	Location Map
Figure 2	Regional Geology Map
Figure 3	Lidar Google Earth Image
Figure 4	Partial Site Geologic Map
Figure 5	Log of GGI-1 Test Pit
Figure 6	Cross Section A-A'

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Aerial Photographs

Date	Photo Number	Scale	Source
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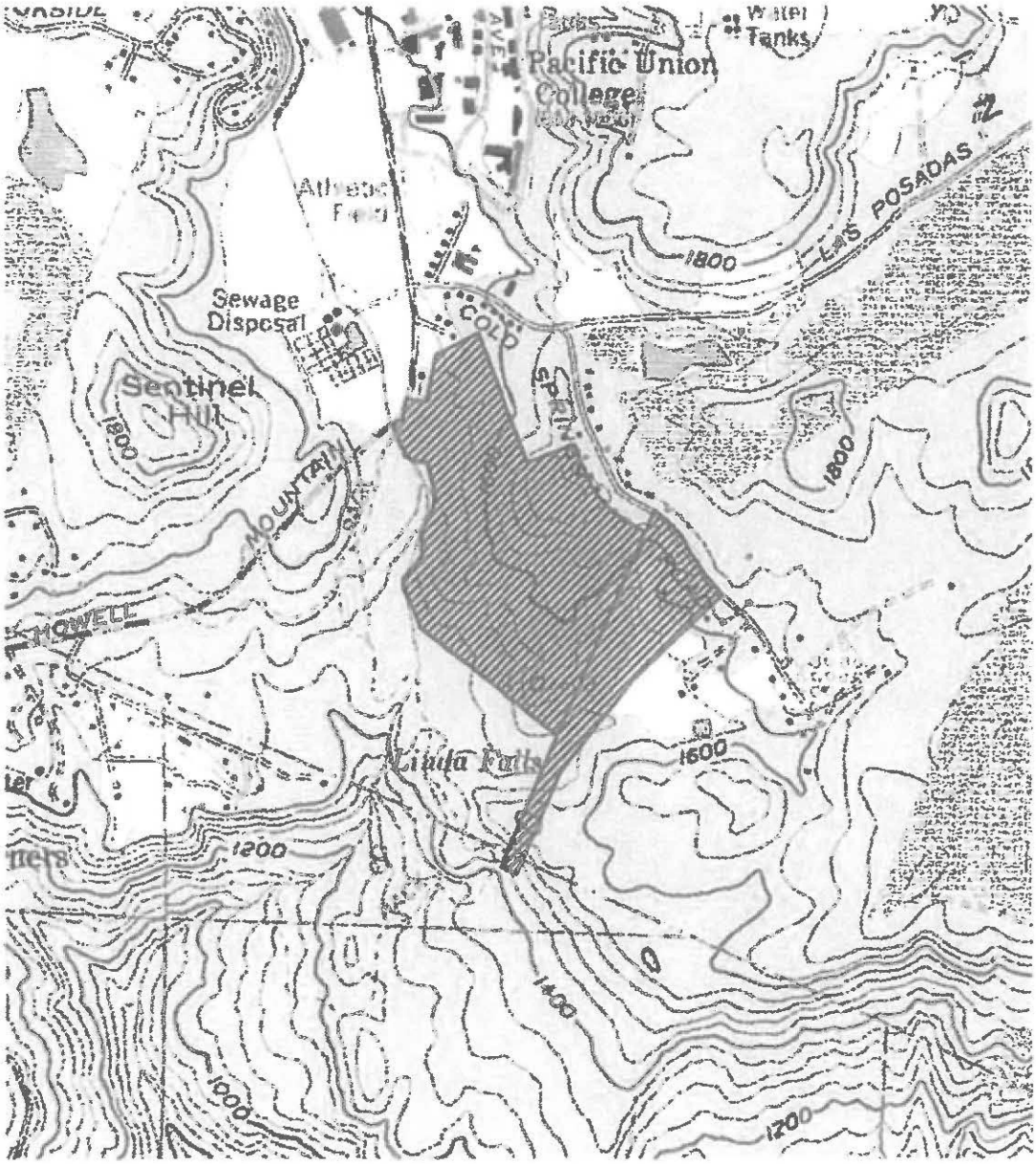
10/8/91	AV4070-10-7, 8	1:12,000	Pacific Aerial Survey



0 1000 Ft

Approximate Scale

N

Base Map: U.S.G.S. St Helena Quad

SITE LOCATION MAP

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

Le Colline Vineyards
Angwin, California

JOB NUMBER 91589.01

DATE 11/3/16

FIGURE 1

EXPLANATION

Geologic Units

- Qal - Aluvium
- Qls - landslide deposits

Sonoma Volcanics

- Tsft - ash-flow tuff
- Tsa - andesitic lava
- Tst - pumucitic ash-flow tuff
- Tsr - rhyolite lava flows

0 — 1 mile

Approximate Scale

N

Base Map Fox, et al., 1973, U S G.S St Helena Quad

REGIONAL GEOLOGY MAP

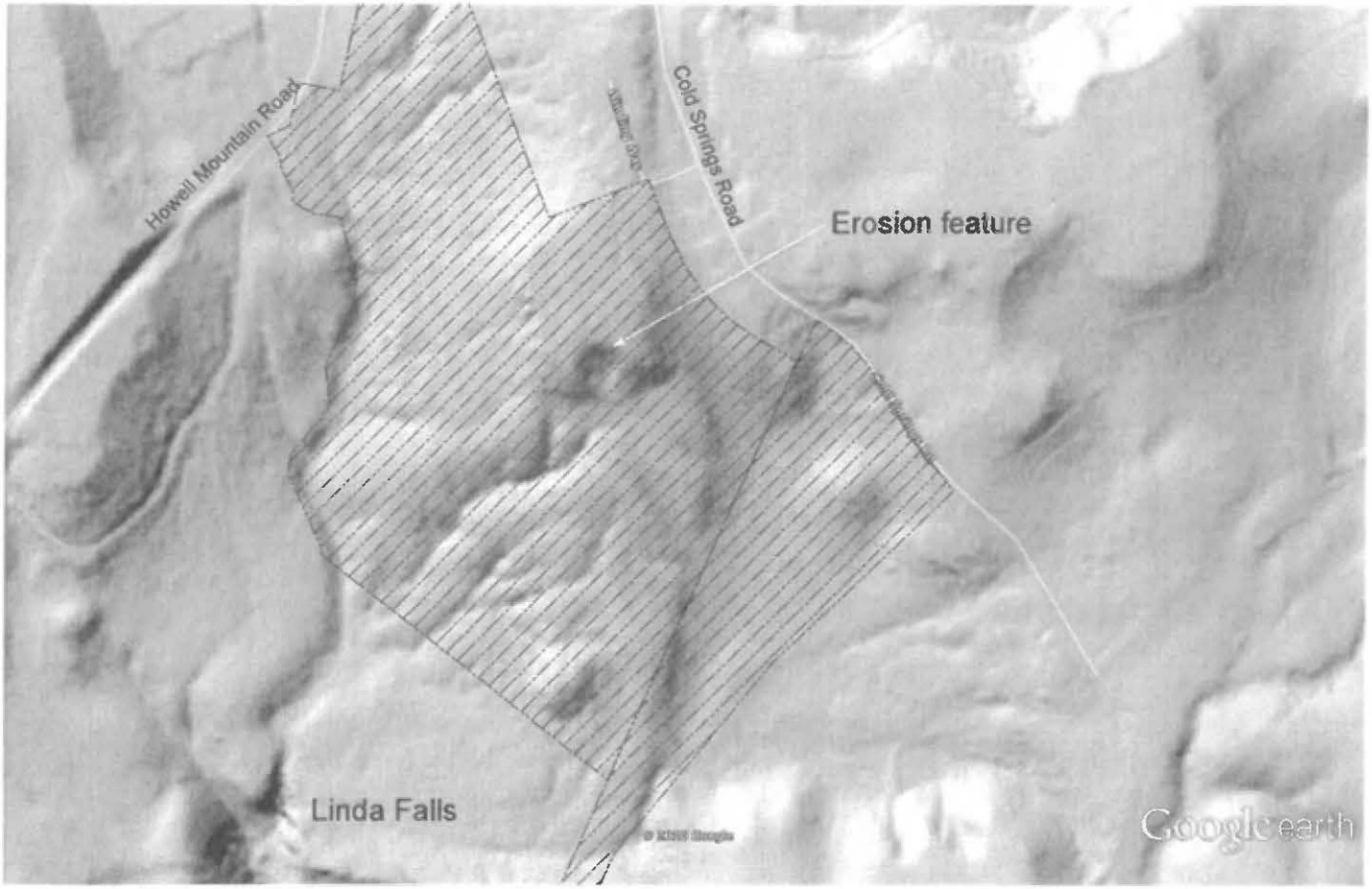
Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

Le Colline Vineyards
Angwin, California

JOB NUMBER 91589 01

DATE 11/3/16

FIGURE 2



Google earth

feet 2000

meters 700

KEY

Site Boundary

LIDAR
Google Earth Image

Le Colline Vineyard
Cold Springs Road
Angwin, CA

Date 11/3/2016	Project No. 91589.01	Figure 3

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

EXPLANATION

Geologic Units

Qc Colluvium > 3' thickness

Tst Sonoma Volcanics
Pumicitic Ash-flow Tuff with interbedded lava flows

Key

Geologic Contact

25 Slope inclination with angle in degrees

Soil Creep, disturbed or hummocky surface

> > > Erosion Gully with depth in feet

A A' Line of Cross Section

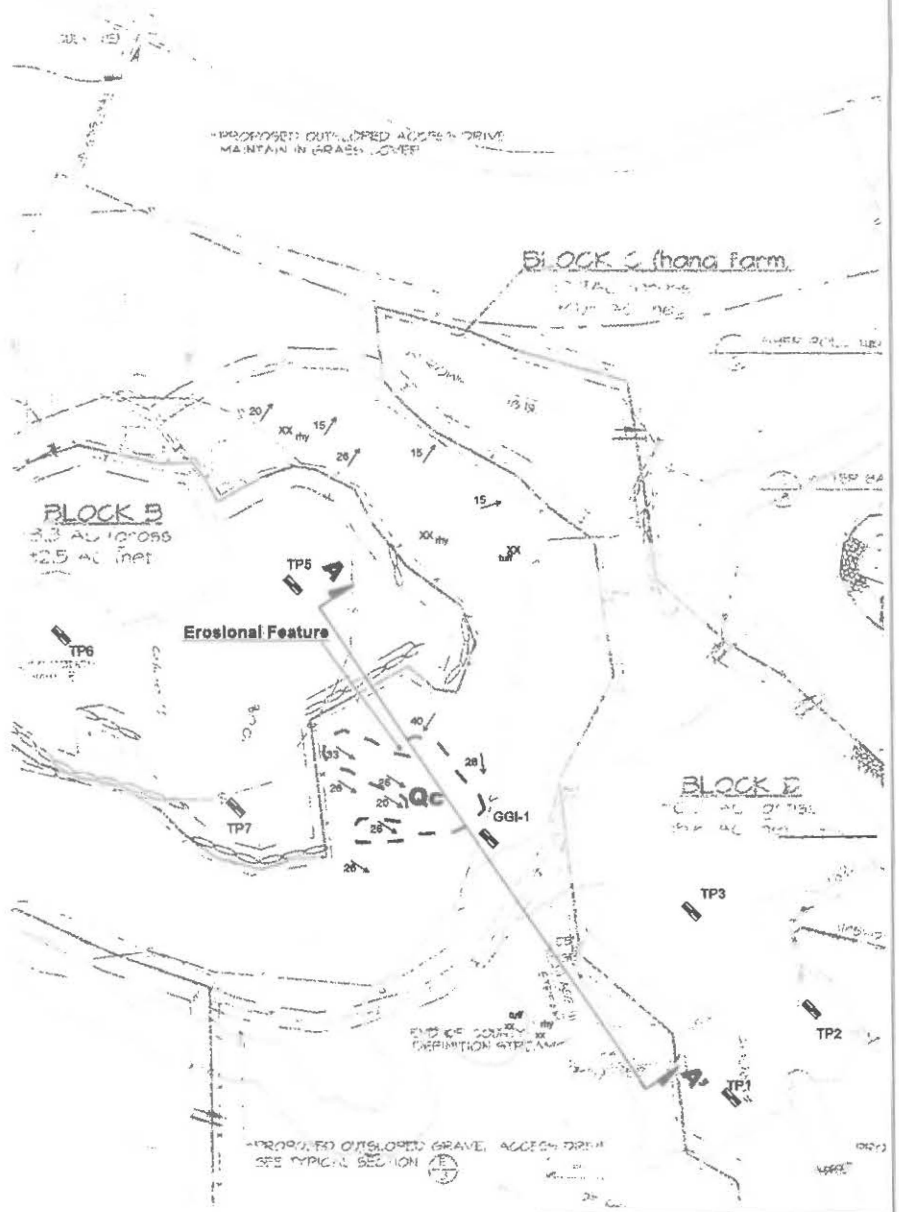
TP-2 Test Pit location

rhy xx Bedrock outcrop, tf=tuff, rhy=rhyolite and=andesite

N

0 50' 100' 200'

Scale

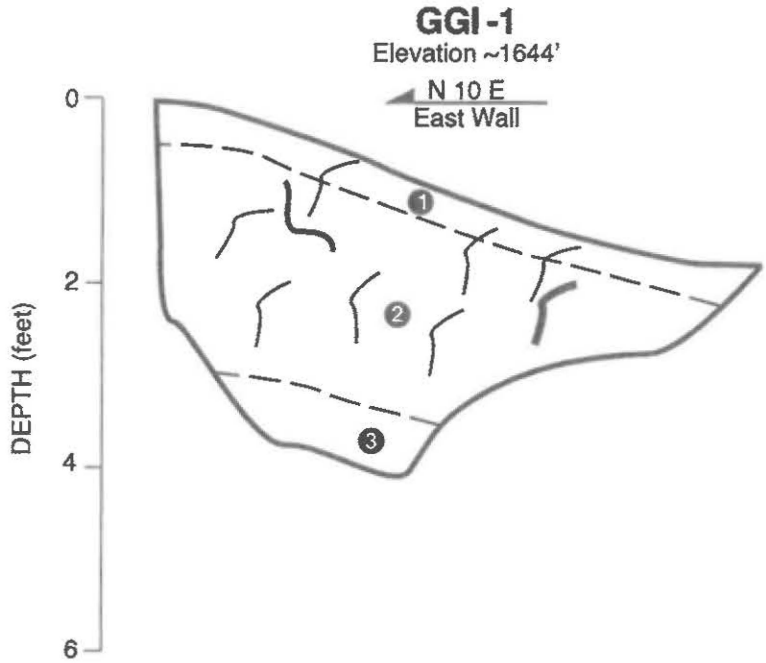


PARTIAL SITE PLAN

Le Colline Vineyard
Cold Springs Road
Angwin, CA

Date 11/3/2016	Project No. 91589.01	Figure 4

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants



UNIT DESCRIPTIONS

1. SANDY SILT (ML), medium gray, loose to medium dense, dry, (Forest topsoil)

2. ASHFLOW TUFF , light gray with yellow-orange mottles, faint bedding, no fractures, low hardness, friable, moderately to deeply weathered with frequent roots, no pores (Sonoma Volcanics)

3. ASHFLOW TUFF , light gray with few yellow-orange mottles, faint bedding, no fractures, low hardness, friable, moderately weathered (Sonoma Volcanics)

Notes:
1. See figure 4 for test pit locations.
2. Ground surface profiles constructed using hand level and tape.
3. Horizontal = Vertical Scale.
4. Excavated by others

LOG OF TEST PIT GGI - 1

Le Colline Vineyard
Cold Springs Road
Angwin, California

Date 11/3/16	Project No. 91589.01	Figure 5

Gilpin Geosciences, Inc.
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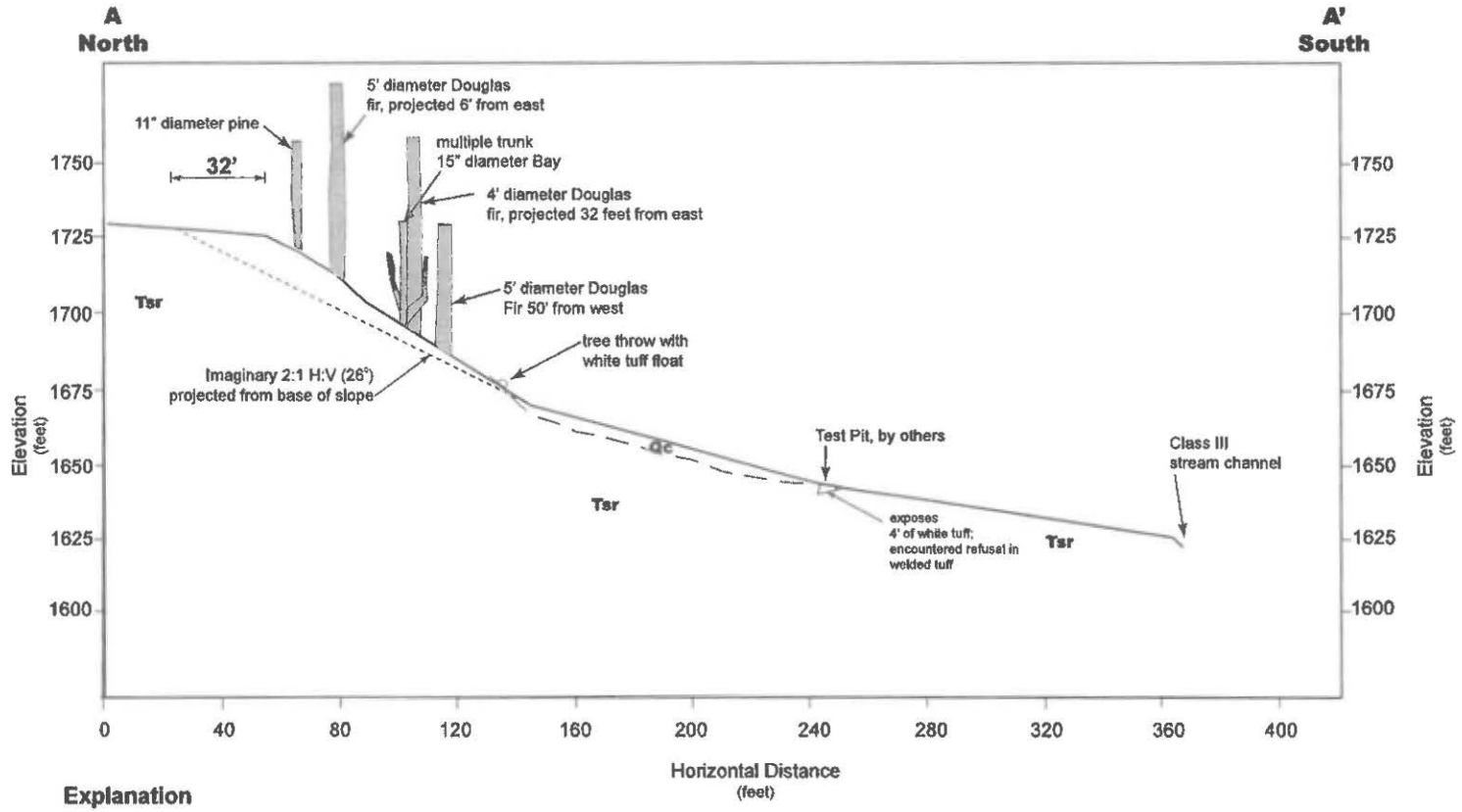

Explanation

Geologic Units

Qc Colluvium - >3'deep

Tsr Rhyolite tuffs and lavas

Notes:
(1) Line of section shown on Figure 1.
(2) Section constructed using a hand level, Brunton Compass, and measuring wheel.
(3) Elevations beyond horizontal station 240 are approximated because of heavy brush.

CROSS SECTION
A-A'

Le Colline Vineyard
Cold Springs Road
Angwin, CA

Date 11/3/2016	Project No. 91589.01	Figure 6

Gilpin Geosciences, Inc.
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DiCesaris-Le Colline Vineyard
Narrative-USLE
Prepared by Napa Valley Vineyard Engineering, Inc
November 30, 2017 (rev 3)

INTRODUCTION

This analysis is to predict the affect the proposed vineyard development project will have on local soil erosion. Modeling of existing and proposed conditions was performed using the Universal Soil Loss Equation (USLE). Following is a summary of the data used and the results of the analysis.

RAINFALL DATA

The 2 year, 6 hour rainfall depth is used to determine the "R" value in the USLE. The rainfall depth for the project site was obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2, Precipitation Frequency Data for California, which uses the latitude and longitude of a site to interpolate rainfall depths between data points. The latitude and longitude of the project are estimated to be 38.561°, N 122.441° W, based on information obtained from All Topo V7 USGS mapping software. The 2 year, 6 hour rainfall depth at the project site ranges from 1.82-inches to 2.33-inches. This analysis conservatively uses the high end of the range (2.33-inches), which equals an "R" value of 103.7. "R" is constant in the pre-project and post-project models.

SOIL EROSIVENESS

Each soil type listed in the United States Department of Agriculture, Soil Conservation Service (SCS), Napa County Soil Survey has an erodibility factor ("K") and a tolerance factor ("T"). Soils within the project area are mapped as:

SCS #139/#140, Forward gravelly loam, "K" = 0.17, "T" = 3
SCS #155, Kidd loam, "K" = 0.28, "T" = 1

"K" and "T" are constant in the pre-project and post-project models.

SLOPE LENGTH and STEEPNESS

2003 LIDAR contour mapping was used to determine slope steepness on the project site. Transects were selected to analyze the soil loss from the longest and steepest slopes throughout the project area. Where diversion ditches are required to reach a predicted soil loss of no more than pre-project condition, the slope distance and steepness between each diversion ditch was analyzed in the post-project model. Slope lengths and gradients used in the pre-project and post-project models are identified on the USLE transect map and in the USLE spreadsheets included in the Appendix.

VEGETATIVE COVER

Cover factors ("C") for pre-project and post-project conditions were determined using the guidelines provided in the SCS pamphlet entitled "The Universal Soil Loss Equation: Special Applications For Napa County, California (guide).

Pre-Project

The existing site conditions vary between a chapparal environment consisting of 75% brush with 60% ground cover, and a forested environment consisting of 75% tree canopy with 95% or greater ground cover. Transects were selected to represent each environment and combinations thereof. Detailed cover factor information is shown on the USLE spreadsheets included in the Appendix.

Post-Project

The project proposes a no-till permanent cover crop, which may be mowed. No spraying shall occur in Blocks E1 and E2, but the remaining blocks may be spot sprayed around the base of each vine using springtime applications of post-emergent contact sprays. No pre-emergent sprays shall be used. Using these practices, a minimum ground cover of 80% will be obtained each winter in Block A thru D, and a minimum ground cover of 85% shall be obtained in Blocks E1 and E2. Using the table in the guide, "USLE "C" Factors for Vineyards", the C factor for 80% ground cover is 0.022, and the C factor for 85% ground cover is 0.017.

PRACTICE FACTOR

The accepted practice factor for the existing conditions is 1.0. Using the table in the guide, "P ("Practice") Factors for USLE in Napa Valley Vineyards, the practice factor for vineyard rows running uphill and downhill is 1.0, so the practice factor remains constant in the pre-project and post-project models.

RESULTS

Calculations to determine the predicted soil loss using the parameters described above are shown in the USLE spreadsheets and summarized in Table 1 of the Appendix.

CONCLUSION

The analysis presented above and the supporting information in the Appendix, demonstrate that the proposed vineyard development, including the construction of diversion ditches, will not increase soil loss from the project site.

DiCesaris-Le Colline Vineyard
Hydrology Study
Prepared by Napa Valley Vineyard Engineering, Inc
December 12, 2017 (rev 5)

INTRODUCTION

DiCesaris seeks a permit to develop approximately 33.4 gross acres of new vineyard including three new access drives. The project lies within APNs 024-300-071, 72, 73 and 024-340-001 located at 300 Cold Springs Road, St. Helena.

This hydrology study is to determine the anticipated affect the proposed vineyard development project will have on local hydrology and runoff patterns. Hydrologic modeling of existing and proposed conditions was performed using HydroCad software with the CA-1 rainfall distribution curve. Following is a summary of the data used to complete the hydrologic analysis and the results of this analysis.

RAINFALL DATA

Rainfall depths for the project site were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2, Precipitation Frequency Data for California, which uses the latitude and longitude of a site to determine rainfall depths. The latitude and longitude of the DiCesaris project are estimated to be 38.561° N, 122.441° W, based on information obtained from All Topo V7 USGS mapping software.

The following rainfall data from the NOAA website was used in the analysis:

2 year, 24 hour	4.94 inches
5 year, 24 hour	6.21 inches
10 year, 24 hour	7.25 inches
25 year, 24 hour	8.80 inches
50 year, 24 hour	9.98 inches
100 year, 24 hour	11.20 inches

WATERSHED AREAS

The project site is located within nine small watersheds as shown on the Drainage Area Maps in the Appendix. Watersheds 1 thru 7, and watershed 9 are modeled as one simple watershed in pre-project condition. Because of the complexity of Watershed 8, it is broken into four subareas which all flow to a common point of interest (POI). Each watershed was determined based on 2003 LIDAR mapping.

PRE-PROJECT WATERSHED CONDITIONS

Soil Types

The United States Department of Agriculture Soil Conservation Service Soils Map for Napa County, August 1978, maps the following soil types within the watersheds:

SCS #139/#140, Forward gravelly loam (Hydrologic Soil Group(HSG) B)
SCS #155, Kidd loam (HSG D)

Land Use

Land use within each watershed was analyzed based on the 2011 aerial photograph obtained from the Napa County GIS website. All watersheds include tree and brush canopy with pockets of open grassland, and the watersheds encompassing the residential areas along Cold Springs Road include impervious surfaces and residential landscaping. Wooded areas within the watershed is considered in "good" hydrologic condition. Areas of brush and open grassland is considered to be in "fair condition", except where there are residential lawns, which are considered to be in "good condition". There is a small pocket of existing vineyard in Watershed 8 which is considered in "fair" condition. A detailed breakdown of land uses by area and hydrologic soil group is included in the HydroCad reports in the Appendix, and is shown on the Drainage Area Map.

Time of Concentration

The time of concentration represents the time it takes for rainfall in the most hydraulically remote portion of the watershed to reach the point of interest.
The time of concentration is estimated assuming sheet flow up to 100 feet in the uppermost reaches of each watershed. A shallow concentrated flow regime is used to model the runoff down to a channel if one exists, or to the POI. Channel flow data was determined using a typical cross section of each channel. A detailed breakdown of the time of concentration parameters is included in the TR55 reports, and is shown on the Drainage Area Map.

POST-PROJECT WATERSHED CONDITIONS

Soil Types

Post-project soils are considered to be the same HSG as pre-project conditions.

Land Use

The proposed project will convert approximately 25 acres of tree canopy and approximately 15 acres of brush and grasses to vineyard and rocked, or grass, access drives. All other areas within the subject watersheds remain unchanged. The project proposes a no-till cover crop with spot spray only, which is considered a "good" hydrologic condition. Vineyard avenues/turnspaces and the new access drive from Winding Way will be maintained in no-till cover and are modeled as part of the vineyard. Rocked access drives and the rocked avenue in Block A are modeled as gravel roads. A detailed breakdown of land uses by area and hydrologic soil group is included in Appendix A.

Time of Concentration

Time of concentration under post-project conditions will increase in watersheds that include construction of diversion ditches within the proposed vineyard blocks. The increased time of concentration typically reduces peak flows at the POI, so this analysis conservatively excludes the ditching from the modeling, unless the ditches outlet to a pipe. Because piping will tend to increase rate of flow, the blocks that include piping are broken into smaller subareas created by the diversion ditches and flow is modeled through the pipes to the attenuation basins. A detailed breakdown of time of concentration and attenuation basin design criteria is included in Appendix A.

CALCULATED RUNOFF RATE/VOLUME

Using the rainfall data, watershed area, land use and time of concentration parameters described above and included in the Appendix, the following runoff rates (cfs), and volume (af) were calculated:

Rate

24 hr. storm event	2 yr.		5 yr.		10 yr.		25 yr.		50 yr.		100 yr.	
Project Condition	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Watershed 1	0.67	0.24	1.34	0.90	1.97	1.55	2.98	2.24	3.81	2.93	4.70	3.81
Watershed 2	1.37	1.36	2.27	2.13	3.07	2.80	4.33	3.85	5.28	4.66	6.37	5.51
Watershed 3	2.61	2.42	4.31	3.88	5.81	5.30	8.18	8.02	10.05	9.84	12.02	11.67
Watershed 4	0.30	0.27	0.58	0.50	0.83	0.76	1.24	1.20	1.58	1.51	1.94	1.88
Watershed 5	3.80	3.61	5.59	5.36	7.11	6.85	9.42	9.13	11.20	10.88	13.04	12.70
Watershed 6	2.04	1.86	2.89	2.67	3.61	3.38	4.69	4.64	5.51	5.51	6.36	6.33
Watershed 7	1.57	1.57	2.40	2.38	3.12	3.11	4.23	4.23	5.09	5.04	5.99	5.96
Watershed 8	7.62	6.60	13.25	11.48	18.31	16.69	26.39	24.83	32.82	30.52	39.63	36.10
Watershed 9	1.48	1.48	2.41	2.41	3.24	3.24	4.53	4.53	5.54	5.54	6.62	6.62

Volume

24 hr. storm event	2 yr.		5 yr.		10 yr.		25 yr.		50 yr.		100 yr.	
Project Condition	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Watershed 1	0.31	0.09	0.57	0.18	0.81	0.48	1.22	1.00	1.56	1.42	1.93	1.89
Watershed 2	0.56	0.53	0.91	0.83	1.23	1.10	1.75	1.52	2.17	1.86	2.61	2.23
Watershed 3	0.93	0.80	1.52	1.42	2.06	1.98	2.92	2.87	3.62	3.59	4.37	4.35
Watershed 4	0.13	0.10	0.22	0.18	0.32	0.25	0.48	0.42	0.61	0.57	0.75	0.72
Watershed 5	1.47	1.39	2.19	2.09	2.81	2.70	3.79	3.65	4.56	4.41	5.37	5.20
Watershed 6	0.79	0.64	1.14	1.00	1.44	1.31	1.90	1.79	2.26	2.15	2.65	2.48
Watershed 7	0.63	0.55	0.98	0.91	1.28	1.22	1.78	1.71	2.14	2.10	2.54	2.50
Watershed 8	3.14	2.76	5.30	4.97	7.29	7.00	10.55	10.32	13.21	13.01	16.08	15.91
Watershed 9	0.60	0.60	0.97	0.97	1.31	1.31	1.85	1.85	2.28	2.28	2.74	2.74

CONCLUSION

Peak flows and total volume during each storm event either remain constant or decrease in the post- project models. This analysis, and supporting information in the Appendix, demonstrate that with the inclusion of diversion ditches and attenuation basins, peak runoff rates and runoff volume will not increase as a result of this vineyard development project.

APPENDIX L

INTEGRATED PEST MANAGEMENT PLAN

Integrated Pest Management

Prepared by Barbour Vineyards
For Le Colline Vineyard project, Angwin
2016

The purpose of this document is to outline the general growing practices and procedures implemented by Barbour Vineyards for the production of winegrapes and development of vineyards. Our philosophy and belief is to farm in a sustainably organic manner, using a combination of best practices pulled from sustainable and organic farming structured around IPM strategies defined by the University of California system. Farming decisions are carefully selected taking in consideration what is best for the production and development of winegrapes, as well as the surrounding environment. The goal is not to impact the natural habitat in a disruptive or negative way, but to create a balanced ecosystem that will enhance and compliment the natural and surrounding environment. They define IPM as follows:

"**Integrated pest management** (IPM) is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment."

Outline:

1. Pest Management
2. Virus and Disease Management
3. Soil and Vine Fertility Management
4. Irrigation Management
5. Weed Management and Cultivation
6. Erosion Control

1. Pest Management

Regular monitoring of vineyards will be conducted by field scouts trained and overseen by a California Licensed Pest Control Advisor (PCA) at least once per week. The PCA will frequently visit and scout the vineyard, especially in more challenging areas. Field scouting will entail a thorough assessment of the vineyard and vineyard blocks, monitoring pest population levels visually and with field notes. If regular monitoring indicates that a pest or pathogen is reaching a level where mitigation is recommended (economic threshold), the following actions will be evaluated and implemented where appropriate.

Organic and sustainable methods are implemented to keep pest populations below thresholds in order to reduce the use of spray material and off site inputs. These organic and sustainable methods are used to encourage the established populations of **natural enemies**, and to introduce beneficial and predatory insects to assist in maintaining a balanced ecosystem. Natural enemies are organisms that kill, decrease the reproductive potential of, or otherwise reduce the numbers of another organism. Natural enemies that limit pests are key components of integrated pest management programs. Important natural enemies of insect and mite pests include predators, parasites, and pathogens.

The following are common biological control practices:

- Provide a natural habitat consisting of native plant species with overlapping flowering periods to provide refuge and a constant food supply year-round for natural enemies. (e.g. insectaries, hedge rows, cover crops, buffer strips, etc.)
- Predatory insect release (mites, lacewings, wasps, beetles, etc.)
- Artificial Habitats (owl, blue bird, and bat boxes, raptor perches)

The following are common pests and pathogens that affect grapevines and how to control them:

Spider Mites: Pacific spider mite damage begins as yellow spots. As damage progresses, dead (necrotic) areas appear on the leaves. High populations can render the leaves nonfunctional with leaf burning and bronzing and copious amounts of webbing. Damage is worse along the shoulder and tops of the vine canopies. Willamette spider mite feeding in mid- or late season causes foliage to turn yellowish bronze, but usually no burn occurs unless vines are weak. In red varieties, infested leaves may turn reddish.

- Control: predatory mite release, dust suppression (via gravel, water, organic dust off), organic oils or organic miticides.

Leafhoppers: Nymphs and adults of all three species (Grape, Variegated, Virginia Creeper) remove the contents of leaf cells, leaving behind empty cells that appear as pale yellow spots or stippling. If populations are high, the entire leaf may be pale yellow or white. Loss of leaf efficiency and leaf drop can occur when

leafhopper densities are extremely high. This can result in fruit sunburn and may delay fruit ripening, especially in young vines. If there is a significant reduction in the overall photosynthetic capacity of the vine, young or stressed vines may have less shoot growth the following season. The accumulation of small droplets of excrement on berries and the associated growth of sooty mold results in berry spotting that is a concern in table grapes. Adult leafhoppers are also a nuisance to workers when populations are high at harvest time. Their excrement appears as minute, sticky clumps that darken with age.

- Control: Predatory insect release (lacewings), blue birds, bats, physical pest removal while in a low motility stage by leaf removal, organic oils or Pyrethrin insecticides.

Thrips: In the North Coast, western flower thrips can feed in emerging shoots in early spring and stunt shoots and cause leaves to cup, especially during cool, rainy springs. Grape thrips may attack shoot tips in late spring or early summer although damage does not become apparent until the population has already decreased. While summer damage of leaves by thrips is common, it is not considered a problem for most varieties.

- Control: Organic oils

Vine and Grape Mealybug: Damage by the vine mealybug is similar to that of other grape-infesting mealybugs in that it produces honeydew that drops onto the bunches and other vine parts and serves as a substrate for black sooty mold. If ants are not present, a vine with a large population of this pest can have so much honeydew that it resembles candle wax. Also, the mealybug itself will be found infesting bunches making them unfit for consumption. Like the grape, obscure, and longtailed mealybugs, vine mealybug can transmit grapevine leafroll-associated viruses.

- Control: pheromone mating disruption, predatory insect release (mealybug destroyer), ant bait stations, bark removal, tangle foot, organic oils.

Nematodes: Plant parasitic nematodes feed on roots, reducing vigor and yield of the vine usually in irregular patterns across the vineyard. Damage patterns are frequently associated with soil textural differences. Root knot nematodes penetrate into roots and induce giant cell formation, usually resulting in root galls. Giant cells and galls disrupt uptake of nutrients and water, and interfere with plant growth. *Xiphinema americanum,* the most common species of dagger nematode, weakens vines by feeding near the root tip and is a specific vector of yellow vein virus (also known as tomato ringspot virus). The dagger nematode, *Xiphinema index,* can cause yield reduction in some varieties, but is more important for its transmission of grapevine fanleaf virus. Both ring and dagger nematodes feed from outside the roots, but can reach the vascular tissues with their long stylet. Root lesion nematode restricts the growth of roots as it

feeds and migrates in and out of roots; it can be especially damaging to newly planted vines. Citrus nematodes establish feeding sites with their heads embedded in cortical tissue and their posterior ends outside the roots. Their feeding disrupts the uptake of nutrients and water, and interferes with plant growth.

- Control: brassica cover crops, predatory nematode release, organic nematicides.
- Improve the soil structure and root development to combat nematodes with amendments, compost, fish fertilizers, seaweed and humic acid products.
- Appropriate rootstock selection

Lepidopteran pests such as Orange Tortrix, Light Brown Apple Moth, or European Grapevine Moth:

- Control: pheromone mating disruption, predatory insect release, organic oils and organic insecticides.
- Insects such as LBAM or EGVM which are under quarantine requirement will be treated according to established protocol.

2. Virus and Disease Management

The largest contributing factor to vineyard decline and redevelopment is virus and disease. Most known viruses are vectored by pest insects. These pest insects are mentioned in **Section 1. Pest Management** and how they are controlled.

Virus and Plant Material: Plant material for all vineyard developments are certified clean by the nursery they are sourced from, and have gone through rigorous virus testing protocols. Annual nursery visits are performed by Barbour Vineyards to inspect contracted plant material (budwood, rootstock, bench grafts, green potted vines, etc.) and to take additional virus samples. If we decide to source budwood material from a Barbour in-house vineyard block, the block is visually assessed the year before and goes through extensive virus testing. We have adopted a zero tolerance protocol for virus infected vines in newly planted vineyards to keep the presence of virus as low as possible during the lifespan of the vineyard. This also helps keep the spread of virus low from one vineyard to the next. Any vine expressing virus symptoms is immediately tested and rogued out if tested positive. Annual rogueing in developed vineyards is also a standard protocol, but only severely diseased vines are targeted.

Trunk Diseases: Trunk diseases such as Eutypa, Botryosphaeria, and Esca are also major contributing factors in triggering a vineyard redevelopment. The following practices are executed to reduce trunk disease infection.

- Pruning strategies: Pre-pruning, late pruning, and pruning around rain events. Large pruning cuts are made during the dry summer months.

- Wound treatments: Every pruning wound is immediately painted with a pruning wound sealant (e.g. Vitiseal) to prevent infection.
- Vine surgery: Infected wood is cut out by removing a section of the cordon, complete cordon arm, or lopping the vine at the trunk depending on severity. A non-infected healthy cordon or trunk sucker is left to retrain the vine.
- All infected wood that is removed from a vine is either burned or taken offsite to reduce spore populations.
- All pruning brush is removed from vineyards under a permanent cover crop and is composted or mulched through a wood chipper.

Fungal Spray Program: Similar to treating pest insects with organic products, we use organic certified products to control and prevent the infection of fungal outbreaks such as powdery mildew or botrytis. All vineyard and canopy passes (shoot thinning, shoot positioning, lateral and leaf removal, fruit thinning) are timed and implemented for fruit quality and to reduce disease pressure.

- Powdery mildew sprays typically occur early season between budbreak and veraison. Sprays are structured around the powdery mildew index, length of spray interval, and canopy management practices. Organic fungicides in the spray tank for powdery mildew are singular or a combination of: wettable sulfur, stylet oil, biological fungicides (Serenade Opti, Sonata), Oxidate, Kaligreen.
- Botrytis sprays typically occur around bloom for all varieties and again late season for tight bunched clusters varieties. In the event we experience cool and wet weather between veraison to harvest (e.g. 2011) preventative sprays for botrytis may be implemented. Organic fungicides in the spray tank for botrytis are singular or a combination of: stylet oil, biological fungicides (Serenade Opti).
- Dormant applications of lime sulfur to reduce overwintering fungal spores is an organic practice, but only in severe cases of disease infection the previous year.

3. Soil and Vine Fertility Management

In order to produce winegrapes of the highest quality, the level of attention to detail that takes place above ground is also be taken below ground. Our goal to create a balanced ecosystem that will have zero negative impact and only enhance the surrounding environment also applies when executing soil and vine fertility practices. From vineyard development to vineyard maintenance, the following steps will be taken to achieve a balanced soil system, providing the needs to maintain a healthy vine. For hillside developments or anything over 5% slope, all vineyard installation practices will be compliant with the approved Napa County erosion control plan (ECP).

- Pre planting soil analysis: A soil analysis will be performed by Barbour Vineyards along with an agricultural technology consulting firm (e.g. Crop Care Associates) to provide recommendations on pre planting soil amendments, rootstock selection, soil prep, ripping recommendations, etc.
- Nematode analysis: A nematode analysis will also be performed at the same time as the soil analysis to assist rootstock and vineyard development decisions.
- Amendments and Compost: Typically, a large organic compost application is initially implemented (10-20 t/a) before ripping to stimulate soil microbial activity and to provide readily available soil

nutrients when vines are planted. If the soil analysis shows an imbalance between the cation ratios, basic soil amendments will also be applied at this time (e.g. gypsum, lime, dolomite, potash).

- Petiole testing and periodic soil testing: Bloom and veraison time petiole testing is performed annually to determine nutrient levels in the vines. These reports act as an important tool when making fertility decisions, especially if leaf symptoms are expressing nutrient deficiencies. If petiole analyses show an imbalance in cations, a soil test may be taken and used as another tool when making amendment decisions.
- Annual Maintenance: Organic compost applications or amendments will be applied as needed throughout the life span of the vineyard. These can be applied by broadcast, banding, placed under emitters, or in planting holes for replants.
- Organic Fertilizers: Soil and foliar fertilizer selections will be organic certified (OMRI, Washington State, or equivalent). There are currently several organic fertilizer options available that allow us to address and correct nutrient deficiencies. Liquid organic products may include: fish, soy, compost teas, seaweed, and humic acid products. Dry and granular organic products may include: bone meal, blood meal, feather meal, soy, fish, and alfalfa meal. Organic nitrogen based fertilizers are considered to have slow release and low ratios of nitrogen to prevent leaching. No materials will be used if there is a potential for groundwater contamination.
- Cover Cropping: Cover cropping is a powerful tool that it used on all Barbour vineyards. Cover crops used in the winter and spring months are considered a plow down cover crop, and cover crops used for the duration of the whole season are considered a permanent cover crop. All seed blends are selected to meet the needs of the vineyard for erosion control prevention (ECP compliant), controlling vine vigor, improving soil health and structure, fixing nutrients, attracting and enhancing beneficial insect populations, weed suppression, etc.

4. Irrigation Management

Due to a number of reasons, such as climate change and periodic drought conditions in California, we have adopted a philosophy to only use water when necessary and to farm in a fashion that allows us to use minimal water inputs. The following tools allow us to achieve this:

- Leaf Water Potentials (LWP): This gives us a real time reading of how much water stress the vine is experiencing.
- Weather Stations (Picovale): Weather stations are installed in the vineyards to monitor air temperature, humidity, wind speed and direction, solar radiation, soil temperature, dew point, wet bulb, leaf wetness, and rainfall.
- Neutron Probes are installed in the ground to monitor the quantity of water in the soil.
- Evapotranspiration Monitoring (Tule): This is used to give us an idea how much water the vine is using.
- Visual Assessment: Weekly scouting to visually assess vine water stress.
- Water test analysis: Occasionally a water analysis is taken to monitor any changes in groundwater nutrient levels and water quality.

Every vine is set up on a primary drip system to receive 2L/hour on each side of the root system, or a total of 4L/hour of water per vine. Each irrigation system is designed with a fertigation port giving us the

freedom to inject fertilizers when needed. Irrigation timer systems are also part of the irrigation design which allows us to time irrigation cycles during the evening hours. Night time irrigating reduces the amount of evaporation that occurs when water drips from the emitter to the soil. Irrigation strategies are designed to match each soil type (e.g. deep less frequent irrigations for deep soils, and short more frequent irrigations for shallow soils). Strategies are also designed to train vines to use less overall water, while maintaining a healthy vine that is performing to its full potential. Secondary irrigation lines are installed in all new developments to give us the freedom to target irrigate and/or fertilize weak areas and replants separately and more frequently. All irrigation systems receive regular monitoring to repair any breaks, leaks, or clogged emitters/hoses.

5. Weed Management and Cultivation

Our current practices include moving away from pre-emergent herbicides or other herbicides that have a long residual period in the soil. During the early developmental stages of a vineyard, hand weeding is used because of the sensitive nature of young grapevines.
As the vineyards mature, a combination of mechanical and hand weeding techniques are used to clean weeds in the vine rows. Perennial cover crops are also a consideration for reducing weed growth in the vine rows in those vineyards where the direct competition for water and nutrients can be controlled.

Weed growth in the tractor row is controlled either by the use of perennial cover crops, or tillage to suppress weed growth and competition. Soil tillage in the vineyard also is an important factor in irrigation management. Some spot treatment of encroaching brush of serious weeds may be required, but no preemergent herbicides will be used.

6. Erosion Control

Erosion control is an ongoing concern in all our vineyards, not just those under engineered erosion control plans.

Any vineyard projects or developments that are over 5% slope have an approved, engineered erosion control plan (ECP). All aspects of these plans are adhered to as required. After final inspections by County personnel, we continue to maintain these vineyards as required by law, and their design.

Cover cropping as mentioned earlier in this document also plays a significant role in erosion control. Vineyards that are not required to have perennial cover crops are seeded with cover crops in the Fall, both to enhance soil fertility, and to prevent unneeded runoff. Vineyard avenues and headlands are generally seeded and strawed postharvest to reduce runoff from roads.

During significant rain events, ranches are monitored by Barbour personnel to assure problems such as blocked drains, over flowing ditches, and rill erosion are repaired immediately, or as soon as possible to avoid compounding problems.
We are also working this year with Resource Conservation District personnel to review our ranches improve our erosion control practices.

For the Le Colline project, at the completion of each year's work a winter cover crop will be planted. As soon as possible after the first planting year, a perennial cover crop will be planted no later than September 15. Temporary sprinklers will be used to germinate the cover crop immediately after it is sown. At all times we will try and maintain a minimum 80% cover. Vineyard avenues will also be kept in perennial cover. At all times we will adhere to all requirements of the Annual Winterization notes.

All permanent erosion control features will be maintained according to the approved erosion control plan.

APPENDIX M

ARCHEOLOGICAL SURVEY REPORT, CAA
(CONFIDENTIAL)

APPENDIX M

Native American Correspondence

and

Cultural Resources Survey for the
Le Colline Vineyard Project
Napa County, California
Confidential

Sensitive archaeological material may have been removed from this EIR. The legal authority to restrict cultural resource information can be found in California Government Code sections 6254.10 and 6254(r); California Code of Regulations Section 15120(d); and Section 304 of the National Historic Preservation Act of 1966.

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Planning, Building & Environmental Services

1195 Third Street, Suite 210
Napa, CA 94559
www.countyofnapa.org

David Morrison
Director

August 1, 2018

Stephanie L. Reyes, Tribal Historic Preservation Officer
Middletown Rancheria
P.O. Box 1035
Middletown, CA 95461

Certified Mail

Re: Closed Status of Tribal Consultation Invitation Pursuant to Public Resources Code 21080.3.1 (Assembly Bill 52 [Gatto])
Le Colline Vineyard Conversion, File No. P14-00410-ECPA
300 Cold Springs Road, Angwin, Assessor Parcel No. 024-300-070, -071, -072, and 024-340-001

Dear Ms. Reyes,

On June 12, 2018, the Napa County Planning Division mailed you, via certified delivery, notification of an invitation to consult on a pending request for an Agricultural Erosion Control Plan (#P14-00410-ECPA) to develop an approximate 32.8-acre vineyard located on Soda canyon Road in Napa.

More than 30 days have elapsed since your confirmed receipt of the Planning Division's letter of invitation to consult on this proposed project, and staff has not received from you a written response with a request for consultation. Therefore, the Planning Division has concluded that consultation proceedings with your organization will not be initiated for this proposal.

Thank you for your ongoing interest in development projects in Napa County. If you have any questions, please feel free to contact me by telephone at 707-259-5935 or via email at brian.bordona@countyofnapa.org.

Sincerely,

Brian Bordona
Supervising Planner

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Planning, Building & Environmental Services

1195 Third Street, Suite 210
Napa, CA 94559
www.countyofnapa.org

David Morrison
Director

Certified Mail

August 1, 2018

Scott Gabaldon, Chairman
Mishewal Wappo Tribe of Alexander Valley
P.O.Box 1086
Santa Rosa, CA 95402

Re: Closed Status of Tribal Consultation Invitation
Pursuant to Public Resources Code 21080.3.1 (Assembly Bill 52 [Gatto])
Le Colline Vineyard Conversion, File No. P14-00410-ECPA
300 Cold Springs Road, Angwin, Assessor Parcel No. 024-300-070, -071, -072, and 024-340-001

Dear Chairman Gabaldon,

On June 12, 2018, the Napa County Planning Division mailed to you, via certified delivery, notification of an invitation to consult on a pending request for an Agricultural Erosion Control Plan (#P14-00410-ECPA) to develop an approximately 32.8-acre vineyard located at 300 Cold Springs Road in Angwin.

More than 30 days have elapsed since your confirmed receipt of the Planning Division's letter of invitation to consult on this proposed project, and staff has not received from you a written response with a request for consultation. Therefore, the Planning Division has concluded that consultation proceedings with your organization will not be initiated for this proposal.

Thank you for your ongoing interest in development projects in Napa County. If you have any questions, please feel free to contact me by telephone at 707-259-5935 or via email at brian.bordona@countyofnapa.org.

Sincerely,

Brian Bordona
Supervising Planner

YOCHA DEHE
CULTURAL RESOURCES

RECEIVED
JUL 23 2018 CT
Napa County Planning, Building & Environmental Services

July 17, 2018

Napa County
Attn: Kyra Purvis, Planner II
1195 Third Street, Suite 210
Napa, CA 94559

RE: Le Colline Vineyard Conversion Project

Dear Ms. Purvis:

Thank you for your comment request regarding the proposed Le Colline Vineyard Conversion Project, Angwin, Napa County. We appreciate your effort to contact us and wish to respond.

The Cultural Resources Department has reviewed the project and concluded that it is within the aboriginal territories of the Yocha Dehe Wintun Nation. Therefore, we have cultural interest and authority in the proposed project area. However based on the information provided, please defer correspondence to the following:

Middletown Rancheria
Attn: Stephanie L. Reyes, Tribal Historic Preservation Officer
PO Box 1035
Middletown, CA 95461

Please refer to identification number YD –07172018-02 in any future correspondence with Yocha Dehe Wintun Nation regarding this project.

Thank you for providing us with this notice and the opportunity to comment.

Sincerely,

Marilyn Delgado
Director of Cultural Resources

Yocha Dehe Wintun Nation
PO Box 18 Brooks, California 95606 p) 530.796.3400 f) 530.796.2143 www.yochadehe.org

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1195 Third Street, Suite 210
Napa, CA 94559
www.countyofnapa.org

David Morrison
Director

Certified Mail

August 1, 2018

Marilyn Delgado, Director of Cultural Resources
Yocha Dehe Wintun Nation
P.O. Box 18
Brooks, CA 95606

Re: Closed Status of Tribal Consultation Invitation
Pursuant to Public Resources Code 21080.3.1 (Assembly Bill 52 [Gatto])
Le Colline Vineyard Conversion, File No. P14-00410-ECPA
300 Cold Springs Road, Angwin, Assessor Parcel No. 024-300-070, -071, -072, and 024-340-001

Dear Ms. Delgado,

On June 12, 2018, the Napa County Planning Division mailed to you, via certified delivery, notification of an invitation to consult on a pending request for an Agricultural Erosion Control Plan (#P14-00410-ECPA) to develop an approximately 32.8-acre vineyard located at 300 Cold Springs Road in Angwin. Thank you and the Tribe for the response letter dated July 17, 2018, indicated that the Tribe does not have any specific comments at this time.

Because more than 30 days have elapsed since your confirmed receipt of the Planning Division's letter of invitation to consult on this proposed project, and that consultation was not requested in the aforementioned response letter, the Planning Division has concluded that consultation proceedings with your organization will not be initiated for this proposal. Please note that the County will provide notice to the Tribe of the CEQA document currently underway.

Thank you for your ongoing interest in development projects in Napa County. If you have any questions, please feel free to contact me by telephone at 707-259-5935 or via email at brian.bordona@countyofnapa.org.

Sincerely,

Brian Bordona
Supervising Planner

APPENDIX N

TECHNICAL ADEQUACY LETTER FOR ECP

Subject:	P14-00410-ECPA / Le Colline Vineyard / Engineering Review
From:	Ryan, Patrick C. (Patrick.Ryan@countyofnapa.org)
To:	nvvedla@covad.net; nvvedlw@covad.net; scott.butler@sbcglobal.net;
Cc:	Kyra.Purvis@countyofnapa.org; Brian.Bordona@countyofnapa.org;
Date:	Friday, February 23, 2018 11:07 AM

Diane and Drew,

I have completed my review of the proposed Le Colline Vineyard development and have concluded that the technical adequacy of the project has been adequately met.

One aspect of the project shall be revised to satisfy and address Comment 12(iv) from my May 18, 2017, memo. In NVVE response to comments, Jan. 3, 2018, states item 12(iv) is not applicable; attached please find a copy of Napa County's design information on retaining walls for your use and review. Detail E.3 (sheet 3 of 3) illustrates a retaining wall with approx. 4' of retained height and a total height of 5' from bottom of footing to top of retaining wall with sloped backfill. As illustrated in the attachment the proposed retaining wall requires a permit from the Building Division.

Please revise Detail E.3 to state the following or similar to the following: "Prior to the start of construction of the proposed retaining walls the applicant shall obtain a building permit from Napa County PBES."

If you have any questions or concerns please feel free to contact me directly.

Regards,

Patrick C. Ryan

Engineering Manager

A Tradition of Stewardship
A Commitment to Service

County of Napa | Engineering Division

Planning, Building & Environmental Services Department

1195 Third Street, 2nd Floor | Napa | CA | 94559

'ph: (707) 253.4892 | 6fax: (707) 299.4049

*: Patrick.Ryan@countyofnapa.org

P Please consider your responsibility to the environment before printing this e-mail.

CONFIDENTIALITY NOTICE: This email message is intended only for the use of the individual or entity to which it is addressed, and may contain information that is privileged, confidential, and/or exempt from disclosure under applicable law. If you are not the intended recipient of the message, please contact the sender immediately and delete this message and any attachments. Thank you.

Attachments

- Napa County_Retaining Walls Design Information.pdf (339.58KB)
- image001.jpg (5.59KB)

County *of* Napa
Building Division

RETAINING WALLS

The purpose of this policy is to clarify when a building permit is required for the installation of a retaining wall.

DEFINITIONS:

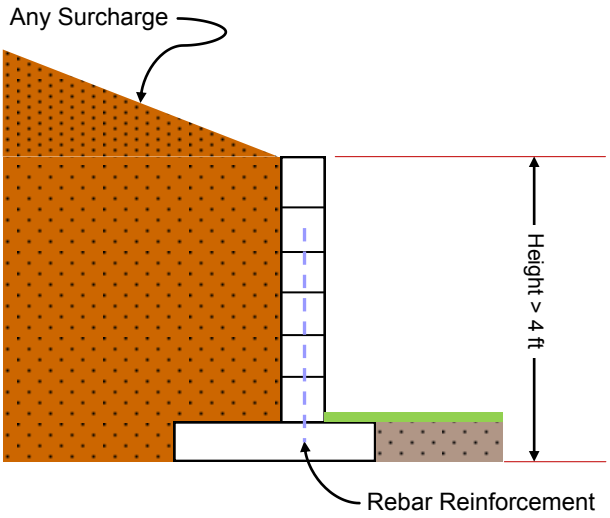
Retaining Wall: A wall designed to resist earth and/or fluid pressure, including any surcharge in accordance with acceptable engineering practices.

Surcharge: The vertical load imposed on retained soil that may impose a lateral force in addition to lateral earth pressure of retained soil. For example: Sloping retained soil; structure footings supported by the retained soil; adjacent vehicle loads supported by retained soil.

Retaining Wall Height: The vertical distance measured from the bottom of the footing to the finish grade at the top of the wall (i.e. upper grade). This is the height reflected in CBC Sec. 105.2 item 4 and it includes the wall and depth of the footing below grade.

Exposed Wall Height: The vertical distance measured from the finish grade at the bottom of the wall (i.e. lower soil grade) to the foundation grade at the top of the wall (i.e. upper soil grade). The height does not include the wall depth of footing below grade.

WHEN IS A PERMIT REQUIRED?



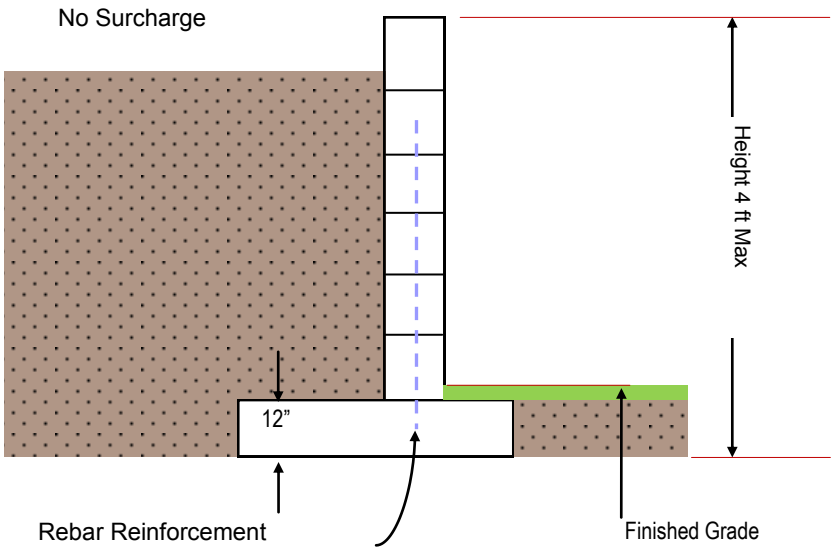
- Total wall height is greater than 4 feet measured from the bottom of the footing to the top of the retaining wall.
- Any back slope adjacent to the retaining wall.
- Surcharge load conditions exist as defined (buildings, roads, vehicle loads or sloped conditions).
- Solid fences are attached (or directly adjacent) to the proposed retaining wall.

County *of* Napa
Building Division

RETAINING WALLS

The purpose of this policy is to clarify when a building permit is required for the installation of a retaining wall.

WHEN IS A PERMIT NOT REQUIRED?



A construction permit is NOT required for retaining walls which:

- Are constructed of reinforced concrete or reinforced masonry and do not retain more than 36" of earth (exposed wall height).
- Are constructed of precast block wall systems that are installed as per manufacturer's listing and instructions which do not retain more than 36" of earth (exposed wall height).
- Are constructed of decay resistant material or treated wood and do not retain more than 24" of earth.
- Do not impound Class I, II or III liquids.
- Do not support surcharge loads as defined (building roads and terraced or tiered slopes).

APPENDIX O

PHASE 1 WATER AVAILABILITY ANALYSIS

NAPA VALLEY VINEYARD ENGINEERING, INC.

176 MAIN STREET, SUITE B
ST. HELENA, NAPA VALLEY, CALIFORNIA 94574
(707) 963-4927 nvvedla@covad.net

DREW L. ASPEGREN, P.E.
CIVIL ENGINEER

LE COLLINE EROSION CONTROL PLAN FILE #P14-00410-ECPA

WATER DEMAND AND WATER AVAILABILITY ANALYSIS
June 25, 2015, Revised 4-3-18

It is proposed that the new vineyard (25.0 net acres) will be irrigated using groundwater. This analysis presents water demand for all uses on the holding.

Water Demand

The average annual water demand is:
(25.0 net vine acres)(1,815 vines/ac) = 45,375 vines
(45,375 vines)(80 gal/vine/yr)/(325,851 gal/af) = 11.14 afa (acre-feet per annum)

Allowing .01 afa for other minor agricultural uses, total vineyard water use is expected to be 11.15 afa.

Peak vineyard irrigation is expected to be 5 gallons/vine/week. Assuming a 5 day irrigation cycle, average daily operation will irrigate 9,075 vines (45,375 vines/5 days); allowing for 10% increase because of varying convenient irrigation set sizes, peak daily vineyard irrigation will cover 9,985 vines. Peak daily vineyard demand is then ±49,925 gallons (9,985 vines x 5 gal).

Also on the holding is a small residence with minor landscaping. Using Guidelines from Appendix B of Napa County Water Availability Analysis, water use for the residence is estimated to be 0.50 afa with a peak use of 500 gallons per day (gpd). Total demand is 11.55 afa, with peak demand is 50,425 gpd. Water for all uses will be drawn from groundwater.

Water Availability

The soils mapped for the subject property are Kidd loam and Forward gravelly loam, both of which are derived from the underlying volcanic parent material. It has been estimated that only about 9-13% of rainfall which falls on these volcanics can percolate into the underlying formation and appear in the deep aquifers (USGS Water Resources Investigation 77-82 Michael Johnson, 1977); the remaining 87-91% flows off site as direct runoff or is held in the topsoils to be evapotransported by surface vegetation.

The holding totals 88.34 acres overlying these volcanic formations, and the average annual rainfall is 33" (Napa County Flood Control and Water Conservation District Isohyetal Rainfall Map, 1975). On average, the property will receive ±243 af of rainfall (88.34 ac x 33" = 242.93 af). Using a conservative estimate of 10% appearing as annual groundwater recharge, it is expected that the Le Colline holding will contribute about 24.3 af to the groundwater supply annually.

The Isohyetal Rainfall map shows that, on average, Le Colline receives about 103% of St. Helena rainfall (St. Helena = 32"/yr). NOAA rainfall records for St. Helena show that 18.15" fell during 2013-14 and 26.27" during 2014-15. We consider 2014-15 to be a "dry year"(±77% of average), and 2013-14 to be an "extremely dry year" (±53% of average). Assuming 103% of that rainfall at Le Colline, and using the same analysis presented above, it is expected that for 2013-14, ±137.6 acre-feet (af) would fall on the 88.34 acre property, and 13.76 af would appear as groundwater. Similarly, for 2014-15, 193.4 af would fall on the property and ±19.4 af would appear as groundwater.

Attached is the driller's log and a production test (Exhibit A-1 thru A-3), for the irrigation well which indicate a production of 284 gallons per minute (gpm), but a 150 gpm pump will be installed in the well. At 150 gpm, the irrigation well will need to operate less than 7 hours/day to meet peak vineyard demand. The domestic well will continue with its existing operations.

Conclusions

Total average annual water demand is ±11.55 afa, or about 48% of the subject property's average annual groundwater recharge (11.55/24.3=47.5%). Further, the 11.55 afa vineyard water demand then would be ±84% (11.55/13.76) of the 2013-14 rainfall contribution to groundwater, and ±60% (11.55/19.4=59.5%) during 2014-15. Over the long term, it is expected that using groundwater to support the proposed project will not diminish the underlying aquifer. Even during those back to back dry years, it is expected that vineyard irrigation would not have diminished the underlying aquifer nor impacted other wells.

Attached is a portion of the St. Helena Quad sheet (Exhibit B) showing the project site and the existing irrigation well which supports the vineyard. A 500' radius circle has been drawn, centered on the irrigation well, demonstrating that no wells fall within 500' of the existing irrigation well. Further, the distance to the nearest onsite well is ±1,131', and to the nearest known offsite well is ±529'.

REGISTERED PROFESSIONAL ENGINEER
DREW ASPEGREN
No. 81418
Exp. 12/31/24
CIVIL
STATE OF CALIFORNIA

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0236904

Page _____ of _____

Owner's Well Number _____

Date Work Began 09/26/2014 Date Work Ended 10/8/2014

Local Permit Agency Napa County

Permit Number E14-00508 Permit Date 7/16/14

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify _____

Drilling Method Direct Rotary Drilling Fluid Air/mud

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0	4	Red Clay with Gray Rock
4	60	Red Clay with Red Ash
60	80	Yellow Ash
80	240	Hard Gray Rock
240	260	Black Ash
260	345	Hard Gray Rock
345	400	Loss Circulation
400	550	Green & Black Ash
550	575	Hard Gray Rock
		Perforation Lay Out
		P = perforation
		B = blank
		0 to 270 blank
		P
		B
		P
		B
		P
		B 390 ft WELL TEST
		P 100 GPM at 420 ft
		B 150 GPM at 560 ft
		P
		B
		P 490 ft
		B
		P
		B
		P 570 ft

Total Depth of Boring 575 Feet

Total Depth of Completed Well 570 Feet

Well Owner

Name David DiCesaris

Mailing Address 5 White Pine Canyon Road

City ~~Pine City~~ PARK City State UT Zip 84060

Well Location

Address Cold Springs Road

City Angwin County Napa

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum _____ Dec. Lat. _____ Dec. Long. _____

APN Book 024 Page 300 Parcel 070-000

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

⦿ New Well

○ Modification/Repair

○ Deepen

○ Other _____

○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

⦿ Water Supply

☐ Domestic ☐ Public

☑ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

○ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other _____

Water Level and Yield of Completed Well

Depth to first water 260 (Feet below surface)

Depth to Static Water Level 240 (Feet) Date Measured 10/08/2014

Estimated Yield * 150 (GPM) Test Type Air Lift

Test Length 4.0 (Hours) Total Drawdown 310 (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)
0	60	14	Blank	PVC Sch. 40	R21	8		
60	270	12.5	Blank	PVC Sch. 40	R21	8		
270	570	12.5	Screen	PVC Sch. 40	R21	8	Milled Slots	0.032

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	57	Cement	
57	570	Filter Pack	# 6 well pack

Attachments

☐ Geologic Log

☐ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☐ Other _____

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Pulliam Well Exploration Inc (Person, Firm or Corporation)

4371 Cantelow Road (Address) Vacaville (City) CA (State) 95688 (Zip)

Signed _____ (C-57 Licensed Water Well Contractor) 10/15/2014 (Date Signed) 808-508 (C-57 License Number)

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

EXHIBIT A-1

Ray's Well Testing Service Inc.
4031 Shadowhill Dr, Santa Rosa Ca 95404
Phone 707 823 3191 **Fax** 707 317 0057 **Lic#** 903708

WELL TESTING SERVICE

CUSTOMER INFORMATION

REPORT #: 6827	DATE OF TEST: 10/30/14
CUSTOMER NAME: Barbour Vineyards LLC	CONTACT: Nate George - 707 974 5307
AGENT NAME:	CONTACT:
PROPERTY ADDRESS: Winding Way, Angwin Ca 94508. AP# 024 300 070	SENT TO: nate@barbourvineyards.com

WELL DATA

LOCATION OF WELL:	Le Colline Ranch.
TYPE OF WELL:	Drilled
DEPTH OF COMPLETED WELL:	570 Feet per drill log. Measured 567 Feet.
DIAMETER OF WELL CASING:	8" PVC
SANITARY WELL SEAL (PLATE SEAL AT OPENING OF WELL CASING):	Capped
ANNULAR SEAL (IN-GROUND SEAL OF BOREHOLE):	Yes - 57 Feet Cement
PUMP HP AND TYPE:	Temporary pump
DEPTH OF PUMP SUCTION:	504 Feet

WATER PRODUCTION RESULTS

WATER LEVEL AT START (STATIC LEVEL):	224.7 Feet	FLOW RATE AT START:	398 GPM
FINAL PUMPING LEVEL:	292.8 Feet	FINAL FLOW RATE:	**284 GPM**
WATER LEVEL DRAWDOWN:	68.1 Feet	TOTAL LENGTH OF TEST:	5 Hours

CONSTANT PUMPING LEVEL INFORMATION

STABILIZED PUMPING LEVEL:	292.8 Feet	STABILIZED FLOW RATE (YIELD):	**284 GPM**
DURATION OF CONSTANT PUMPING LEVEL:	1.5 Hours	TOTAL YIELD:	25,560 Gallons

WATER SYSTEM INSPECTION

WELL PUMP	None	TECHNICAL INFO: Temporary pump installed for test.
ELECTRICAL	None	TECHNICAL INFO: Generator provided for test.
PRESSURE TANK	None	TECHNICAL INFO:
STORAGE TANK	None	TECHNICAL INFO:
BOOSTER PUMP	None	TECHNICAL INFO:

WATER QUALITY TESTING

THE FOLLOWING SAMPLES ARE BEING ANALYZED. PLEASE REFER TO FOLLOW-UP REPORT FOR RESULTS.		
Bacteria - Coliform & E.Coli	DATED: 10/30/14	TURNAROUND: Standard
Arsenic	DATED: 10/30/14	TURNAROUND: Standard
Irrigation package	DATED: 10/30/14	TURNAROUND: Standard
	DATED:	TURNAROUND:

SEE NEXT PAGE FOR FURTHER INFORMATION...

EXHIBIT A-2

DATE: 10/30/14

ADDRESS: Winding Way, Angwin Ca 94508. AP# 024 300 070

Le Colline Ranch

COMMENTS:

10/30/14 PUMPING LOG:

TIME	WATER LEVEL	BACKPRESSURE	WATER COLOR	ODOR	SAND	GPM
10:00AM	224.7'	0 psi	Brown	No	Trace black sand	398
10:05AM	264.1'	50 psi	Brown	No	Trace black sand	342
10:15AM	270.9'	50 psi	Light Yellow	No	Trace black sand	338
10:30AM	277.9'	50 psi	Clear	No	No	334
11:00AM	284.8'	50 psi	Clear	No	No	334
11:30AM	287.1'	50 psi	Clear	No	No	334
12:00PM	289.4'	60 psi	Clear	No	No	313
12:30PM	290.5'	65 psi	Clear	No	No	302
1:00PM	290.5'	65 psi	Clear	No	No	302
1:30PM	292.8'	70 psi	Clear	No	No	284
2:00PM	292.8'	70 psi	Clear	No	No	284
2:30PM	292.8'	70 psi	Clear	No	No	284
3:00PM	292.8'	70 psi	Clear	No	No	284

10/30/14 WATER LEVEL RECOVERY

3:15 PM	252.4'	59.3%
3:30 PM	245.5'	69.4%
3:45 PM	245.1'	70%

10/31/14 WATER LEVEL RECOVERY

5:00 PM	230'	92.2%

Thank you for allowing us to do your well inspection!

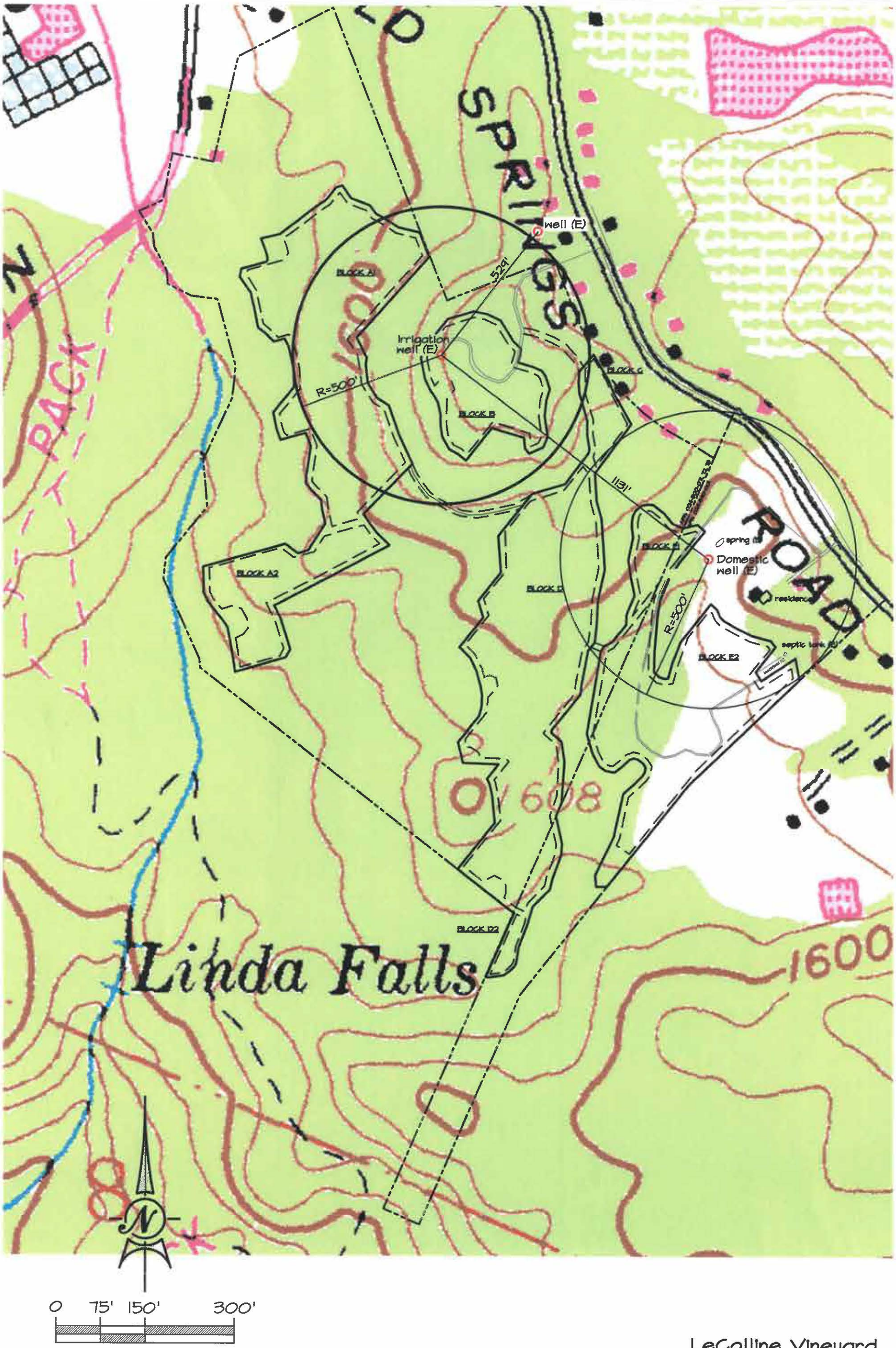
APPROVED BY: NICK BRASESCO

Water levels and well depth are measured as feet below top of well casing unless otherwise noted.

All wells and springs are subject to seasonal and yearly changes in regards to water yield, production and quality. Wells may be influenced by creeks or other water sources and are likely to yield less water during dry months of the year; typically August, September, & October. We make no predictions of future water production or water quality.

This report is for informational use only and is in lieu of and supercedes any other representation or statements of the agent or employee of the company, and all other such representations or statements shall be relied upon at the customer's own risk. The data and conclusions provided herein are based upon the best information available to the company using standard and accepted practices of the water well drilling industry. However, conditions in water wells are subject to dramatic changes in short periods of time. Therefore, the data and conclusions are valid only as of the date of the test and should not be relied upon to predict either the future quantity or quality the well will produce. The company makes no warranties either expressed or implied as to future water production and expressly disclaims and excludes any liability for consequential or incidental damages arising out of the breach of any expressed or implied warranty of future water production or out of any further use of the report by the customer.

EXHIBIT A-3



SCALE: 1"=300'
CONTOUR INTERVAL: 40'

LeColline Vineyard
WELL LOCATION MAP

EXHIBIT B

NWE 6-23-15
REVISION: 4-2-18

APPENDIX P

NORTHERN SPOTTED OWL SURVEY RESULTS

Forest Ecosystem Management, PLLC
PO Box 455; Potomac, MT 59823
(406) 490-7427 * cptown@blackfoot.net

June 14, 2016

Scott Butler, RPF
Environmental Resource Management
7000 Leicester CT.
Castle Pines, CO 80180

RE: Le Colline Vineyards THP (new plan)

Scott,

Enclosed is the northern spotted owl (NSO) information for the above mentioned timber harvest plan (THP). This is a 36 acre THP Conversion located in Section 8 T8N, R5W, MDB&M in Napa County. The property is located off Cold Springs Road just south of the town of Angwin, California. The property ownership is approximately 88 acres, so there are 52 acres that are out of the THP Conversion area.

I have included is the following information, which replaces previous years' information that I have provided you. This should be included within the THP.

- Map of THP/Conversion Area – Created by you.
- Map of NSO territories within the 1.3 mile assessment area.
- Spotted Owl Database – Reports #1 and #2 (dated 13JUN16).
- Map of the NSO survey stations.
- Northern Spotted Owl History including a protocol review.
- Field Map of NSO Survey Stations showing NSO Detections.
- Map of pre and post- harvest habitat of the THP Conversion. The pre-harvest map is an aerial photo of the property and post-harvest map is topographical.
- Map of NSO habitat within 1.3 miles of the Le Colline Vineyard.
- Map of pre and post-harvest maps of NAP0014. The pre-harvest map is an aerial photo and the post-harvest map is topographical.
- Map of pre and post-harvest maps of NAP0028. The pre-harvest map is an aerial photo and the post-harvest map is topographical.
- Habitat analysis for NAP0014 and NAP0028.

Northern Spotted Owl Habitat

Pre-harvest, the THP area is approximately 32 acres forested and 4 acres of non-forested habitat. Of the 32 acres of forest-land, not all meet the definition of USFWS northern spotted owl habitat, primarily due to canopy closure. The vegetation includes Douglas-fir, oak, madrone, and manzanita with a dense understory in some areas. The conversion area is primarily on ridge tops with a relatively flat topography. Post- harvest, the plan area will be converted to vineyards.

Northern Spotted Owl Habitat on Le Colline Vineyard THP/Conversion

Habitat Type	Pre-Harvest	Post-Harvest
Nesting/Roosting	3	0
Foraging	17	0
Unsuitable	16	36
Total # Acres in THP	**36**	**36**

The ownership outside the THP/Conversion area is examining a Habitat Enhancement Plan (HEP) which will include approximately 18 acres of Fire Hazard Reduction, 12 acres of forestation (planting 1000 conifer seedlings), and 22 acres of Wildlife Enhancement (including the presence/management of at least 1 snag/acre).

The 1.3 mile assessment area is a mix of forested and open landscape. The forested landscape is primarily 2nd growth Douglas-fir forests, with a component of oak, tanoak, manzanita, and madrone. The open landscape includes vineyards, shrub-land, grassland/agricultural, town of Angwin, small lakes, and residential houses.

Definitions & Retention Requirements

Referenced from USFWS NSO for Interior:

Definitions:

- Nesting/Roosting Habitat: High Quality Nesting/Roosting Habitat: Mixed tree species with basal area of 210+ ft2 and ≥ 15" quadratic mean diameter, and ≥ 8 trees per acre of trees ≥ 26" in diameter at breast height, and ≥ 60% canopy closure.
- Suitable Nesting/Roosting Habitat: Mixed tree species with basal area ranging from 150 - 180+ ft2 and ≥ 15" quadratic mean diameter, and ≥ 8 trees per acre of trees ≥ 26" in diameter at breast height, and ≥ 60% canopy closure.
- Suitable Forging Habitat: Mixed tree species with basal area ranging from 120 - 180+ ft2 and ≥ 13" quadratic mean diameter, and ≥ 5 trees per acre of trees ≥ 26" in diameter at breast height, and a mix of ≥ 40% to 100% canopy closure.
- Low Quality Foraging Habitat: Mixed tree species with basal area ranging from 80 - 120+ ft2 and ≥ 11" quadratic mean diameter, and ≥ 40% canopy closure.

The quality of the NSO habitat (high quality vs. regular/low quality) is impossible to verify through aerial photos (we do not own the watershed and cannot cruise

the timber); therefore, habitat has been classified as nesting/roosting, foraging, or unsuitable NSO habitat using the minimum requirements for each category.

Habitat Quantities:

a. Within 1,000' of each activity center:
    a. Outside the breeding season (01SEP – 31JAN), no timber operations shall occur within 1,000' of an activity center other than use of existing roads.
    b. During the breeding season (01FEB – 31AUG), no timber operations shall occur within 1,000' of an activity center other than the use of existing permanent, year-round roads.

b. Within 0.5 mile radius (502 acres) centered on activity center
    a. At least 250 acres nesting/roosting habitat present, as follows:
        i. 100 acres of High Quality Nesting/Roosting Habitat, and
        ii. 150 acres of Nesting/Roosting Habitat. AND
    b. At least 150 acres foraging habitat (or better) must be present, as follows:
        i. 100 acres Foraging Habitat, and
        ii. 50 acres Low Quality Foraging Habitat
        iii. No more than 1/3 of the remaining suitable habitat may be harvested during the life of this THP.
c. Between 0.5 mile radius and 1.3 mile radius circles centered on activity center:
    a. >935 acres suitable habitat must be present, as follows:
        i. At least 655 acres Foraging Habitat, and
        ii. At least 280 acres of Low Quality Foraging, and
        iii. No more than 1/3 of the remaining suitable habitat may be harvested during the life of the THP.

This THP falls between the 0.5 mile and 1.3 mile radius circle centered on the activity center for both known NSOs within 1.3 miles.

Northern Spotted Owl Territories

According to the CNDDB Spotted Owl Database dated 13JUN16, there are two known NSO territories (NAP0014 & NAP0028) within 1.3 miles of the THP/Conversion.

NAP0014: This territory was generally active with at least a single NSO detected in the 2000s, with a pair detected in 2012. Surveys for this plan began in 2014 with a survey station placed on Howell Mountain Road in attempts to detect this territory.

- In 2014, no NSOs were detected.
- In 2015, a single NSO was detected during the evening on 17APR15.
- In 2016, a pair of NSOs was detected on 24FEB16, 17MAR16, and 05APR16. All three detections were in the similar area and completed by three different surveyors. As this territory is located on private property, with no trespassing signs and locked gates, surveyors were unable to complete a daytime follow-up.

The best NSO habitat for this activity center is located around the historic activity center in the Conn Creek Drainage. Outside this drainage, the habitat quality drastically declines primarily due to scrub-land, grassland, agricultural production, and housing.

There is some foraging habitat to the east that may allow corridors for dispersing owls and would lead to NAP0028.

Northern Spotted Owl Habitat Around NAP0014 (Pre & Post-Harvest)

Description	**Pre Harvest (Acres)**	**Post-Harvest (Acres)**
1,000' Assessment Area *		
Nesting/Roosting Habitat	61 acres	61 acres
Foraging Habitat	4 acres	4 acres
Unsuitable Habitat	7 acres	7 acres
Total Acres	**72 Acres**	**72 Acres**
0.5 Mile Assessment Area *		
Nesting/Roosting NSO Habitat	399 acres	399 acres
Foraging NSO Habitat	82 acres	82 acres
Unsuitable NSO Habitat	21 acres	21 acres
Total Acres	**502 Acres**	**502 Acres**
1.3 Mile Assessment Area		
Nesting/Roosting NSO Habitat	1175 acres	1172 acres
Foraging NSO Habitat	1035 acres	1018 acres
Unsuitable NSO Habitat	1188 acres	1208 acres
Total Acres	**3398 Acres**	**3398 Acres**

NOTE (*): This THP is outside the 1,000' and ½ Mile Assessment Areas and will have no impact on these areas.

Verification & Mitigation:

1,000' Assessment Area: No Harvest Operations shall occur other than the use of existing, permanent, year-round roads. ***This THP/Conversion is outside this Assessment Area and there are no roads within this area.***

0.5 Mile Assessment Area: ***This THP/Conversion is outside this Assessment Area; therefore, will have no impact on this area.***

> Although this THP/Conversion is outside this Assessment Area, there are at least 250 acres of nesting/roosting (399 acres) and at least 150 acres of foraging habitat [399 n/r – 250 = 149 + 82 = 231 acres] of available habitat (including nesting/roosting and foraging).

0.5 Mile to 1.3 Mile Assessment: This THP/Conversion falls within this Assessment Area, with the requirements met post-harvest. This THP will affect only 20 acres of

northern spotted owl habitat within this assessment area, as the remaining 16 acres is unsuitable habitat.

1/3 of Remaining Habitat may be harvested during the life of the THP: ***This THP is only a small fraction of the 1.3 mile assessment area (36 acres of the 3,398 acres); way below 1/3 (1,133 acres) of the assessment area. Once operations begin, they should be completed in one to two seasons. The area surrounding the THP is private property. The property owners have no control over operations outside their property boundary.***

The Le Colline property is located next to a larger unsuitable habitat patch due to residential houses, scrub-land, and agriculture. The THP will not fragment existing nesting/roosting habitat.

NAP0028: This territory was generally active in the 1990s and then went quiet. In 2015, CalFire reported a detection close to the historic activity center. This territory is topographically isolated from this THP; however, two of our survey stations (STA#1 and STA#2) may have detected this territory.

- In 2014, no NSOs were detected during our surveys.
- In 2015, no NSOs were detected during our surveys.
- We were notified by CalFire, that while surveying Las Posadas State Forest, they detected a NSO on 09APR15 (see field map). Five surveys after that date did not detect any NSOs.
- In 2016, no NSOs were detected during our surveys.

The best NSO habitat for this activity center is located around the historic activity center and to the north. Outside this area, the habitat quality drastically declines primarily due to scrub-land, grassland, and agricultural production. There is some foraging habitat to the west that may allow corridors for dispersing owls and would lead to NAP0014, while further east leads to more unsuitable habitat (scrub-land and open).

Northern Spotted Owl Habitat Around NAP0028 (Pre & Post-Harvest)

Description	**Pre Harvest (Acres)**	**Post-Harvest (Acres)**
1,000' Assessment Area *		
Nesting/Roosting Habitat	68 acres	68 acres
Foraging Habitat	3 acres	3 acres
Unsuitable Habitat	1 acres	1 acres
Total Acres	**72 Acres**	**72 Acres**
0.5 Mile Assessment Area *		
Nesting/Roosting NSO Habitat	245 acres	245 acres
Foraging NSO Habitat	111 acres	111 acres
Unsuitable NSO Habitat	146 acres	146 acres
Total Acres	**502 Acres**	**502 Acres**

1.3 Mile Assessment Area		
Nesting/Roosting NSO Habitat	562 acres	562 acres
Foraging NSO Habitat	1531 acres	1529 acres
Unsuitable NSO Habitat	1305 acres	1307 acres
Total Acres	**3398 Acres**	**3398 Acres**

NOTE (*): This THP is outside the 1,000' and ½ Mile Assessment Areas and will have no impact on these areas.

Verification & Mitigation:

1,000' Assessment Area: No Harvest Operations shall occur other than the use of existing, permanent, year-round roads. ***This THP/Conversion is outside this Assessment Area.***

0.5 Mile Assessment Area: ***This THP/Conversion is outside this Assessment Area; therefore, will have no impact on this area.***

> The habitat quantities for this assessment area are not met. This THP is outside this assessment area and will have no impact on this habitat deficiency.

0.5 Mile to 1.3 Mile Assessment: This THP/Conversion falls within this Assessment Area, with the requirements met post-harvest. This THP will affect only 2 acres of northern spotted owl habitat within this assessment area, as the remaining THP is outside this assessment area.

1/3 of Remaining Habitat may be harvested during the life of the THP: ***This THP is only a small fraction of the 1.3 mile assessment area (2 acres of the 3,398 acres); way below 1/3 (1,133 acres) of the assessment area. Once operations begin, they should be completed in one to two seasons. The area surrounding the THP is private property. The property owners have no control over operations outside their property boundary.***

Northern Spotted Owl Surveys

This is the third year the THP has been surveyed, with six survey visits conducted in 2014 and 2015 and three survey visits (spot checks) in 2016. The surveyors included: Scott Butler, RPF; Theodore Wooster, Retired Wildlife Biologist Consultant; and Pamela Town, Consulting Wildlife Biologist. In 2014, no northern spotted owls were detected. In 2015, NAP0014 was detected once, and in 2016, NAP0014 was detected three times. CalFire surveyors notified us of a single detection on NAP0028 in 2015.

The nesting/roosting habitat within the 1.3 mile assessment area is primarily around NAP0014 and NAP0028. The remaining habitat is foraging or unsuitable. We were able to survey the majority of nesting/roosting habitat around this THP.

The attached Northern Spotted Owl History shows the survey history for this THP including protocol compliance.

Proposed Operations

At this time, there are no known northern spotted owls within ¼ mile of this THP, and habitat requirements are met within the assessment areas that this THP falls on existing NSOs. Therefore there are no seasonal or harvest restrictions proposed at this time.

If a new territory is found in the future, a habitat analysis and the standards set forth under Forest Practice Rules 14 CCR 919.9(e) using programmatic Scenario 4 (Attachment B – Take Avoidance Analysis Interior) will be required.

Please feel free to contact me at (406) 490-7427 (cptown@blackfoot.net) if you have any questions.

Sincerely,

Pamela Town
Consulting Wildlife Biologist

Date	Weather	Station #	Survey Time	Owl Response or Notes
	2016 – Year #3			
24FEB16	Clear & Calm	6	1855 – 1911	NAP0014 Pair
01MAR16	Cloudy & lt breeze	1	1825 – 1835	N/R
	Survey #1	2	1841 – 1851	N/R
		3	1856 – 1906	N/R
		4	1913 – 1924	N/R (dogs)
		5	1928 – 1944	N/R
		6	2208 – 2218	N/R – Cars
17MAR16	Clear & Lt Breeze	1	1930 – 1940	N/R (SWOW)
	Survey #2	2	1945 – 1955	N/R
		3	2010 – 2020	N/R
		4	2026 – 2036	N/R (dogs)
		5	2045 – 2055	N/R – car
		6	2115 – 2125	NAP0014 - Pair
05APR16	Clear & Calm	1	1952 – 2003	N/R
	Survey #3	2	1917 – 1927	N/R (Meet CalFire Biologist)
		3	2030 – 2040	N/R
		4	2045 – 2055	N/R (cars)
		5	2100 – 2110	N/R
		6	2116 – 2126	NAP0014 – Down by Creek
	2015 – Year #2			
10MAR15	Ptly Cloudy & Calm	1	1920 – 1930	N/R (SWOW)
	Survey #1	2	1934 – 1944	N/R
		3	1953 – 2003	N/R
		5	2009 – 2019	N/R
		4	2145 – 2155	N/R
		6	2209 – 2219	N/R
18MAR15		2	2031 – 2041	N/R
	Survey #2	1	2049 – 2059	N/R (SWOW)
		3	2131 – 2141	N/R
		4	2147 – 2157	N/R
		5	2203 – 2213	N/R (cars)
		6	2230 – 2240	N/R
05APR15	Cloudy & Lt Wind	2	2030 – 2040	N/R
	Survey #3	1	2050 – 2100	N/R
		3	2131 – 2141	N/R
		4	2150 – 2200	N/R
		5	2208 – 2218	N/R (cars)
		6	2224 – 2234	N/R
17APR15	Calm	6	2000 – 2023	NAP0014 Single Response
	Survey #4	5	2032 – 2042	N/R (cars)
		4	2126 – 2139	N/R

		3	2142 – 2152	N/R (people talking)
		2	2157 – 2208	N/R
		1	2215 – 2225	N/R
06MAY15		6	2143 – 2155	N/R
	Survey #5	4	2205 – 2217	N/R (people talking)
		3	2220 – 2230	N/R
		5	2314 – 2325	N/R
		2	2235 – 2245	N/R
		1	2252 – 2303	N/R
19MAY15	Cloudy & lt Breeze	1	2210 – 2220	N/R
	Survey #6	2	2227 – 2237	N/R
		3	2250 – 2300	N/R
		4	2306 – 2316	N/R
		5	2327 – 2337	N/R (cars)
		6	2350 – 0000	N/R (car)
	2014 – Year #1			
15APR14	Clear & Calm	1	2005 – 2015	N/R (PYOW & dogs)
	Survey #1	2	2020 – 2030	N/R (wind machine)
		3	2037 – 2047	N/R (wind machine)
		4	2052 – 2102	N/R
		5	2110 – 2120	N/R (dogs)
		6	2235 – 2245	N/R (wind machine)
15MAY14	Clear & lt breeze	6	2210 – 2220	N/R
	Survey #2	5	2226 - 2236	N/R (traffic)
		4	2239 – 2251	N/R
		3	2253 – 2303	N/R (traffic)
		2	2308 – 2318	N/R
		1	2325 – 2338	N/R
02JUN14	Cloudy & Lt Breeze	1	2320 – 2330	N/R
	Survey #3	2	2338 – 2348	N/R
		3	2355 - 0005	N/R (car)
		5	0015 - 0025	N/R (cars)
		4	0034 – 0044	N/R
		6	0048 - 0058	N/R
11JUN14	Clear & lt breeze	6	2100 - 2110	N/R
	Survey #4	4	2116 - 2126	N/R
		5	2130 - 2140	N/R (traffic)
		3	2158 – 2208	N/R
		2	2220 - 2230	N/R
		1	2250 - 2300	N/R
29JUN14	Clear & lt breeze	6	2106 – 2116	N/R
	Survey #5	4	2129 – 2139	N/R
		5	2145 - 2155	N/R (traffic)
		3	2210 – 2220	N/R
		2	2234 – 2244	N/R

		1	2253 – 2303	N/R
14JUL14	Clear & Calm	6	2150 - 2200	N/R (car)
	Survey #6	4	2205 – 2215	N/R
		5	2230 - 2240	N/R (traffic)
		3	2300 – 2310	N/R
		2	2325 – 2335	N/R
		1	2347 – 0000	N/R

Owl Response: N/R from Northern Spotted Owls (all other owls identified)

NSO Protocol Review

- Surveys completed by three different surveyors (Scott Butler, Theodore Wooster, and Pam Town).

- Protocol Followed: 2011 Protocol for Surveying Proposed Management Activity that may impact NSOs.
  - 2014 is Year 1 – 6 Surveys
  - 2015 is Year 2 – 6 Surveys
  - 2016 is Year 3 – 3 Surveys (spot checks)

- 10 – Minute Point Count Survey Used
- Digital Recording Used

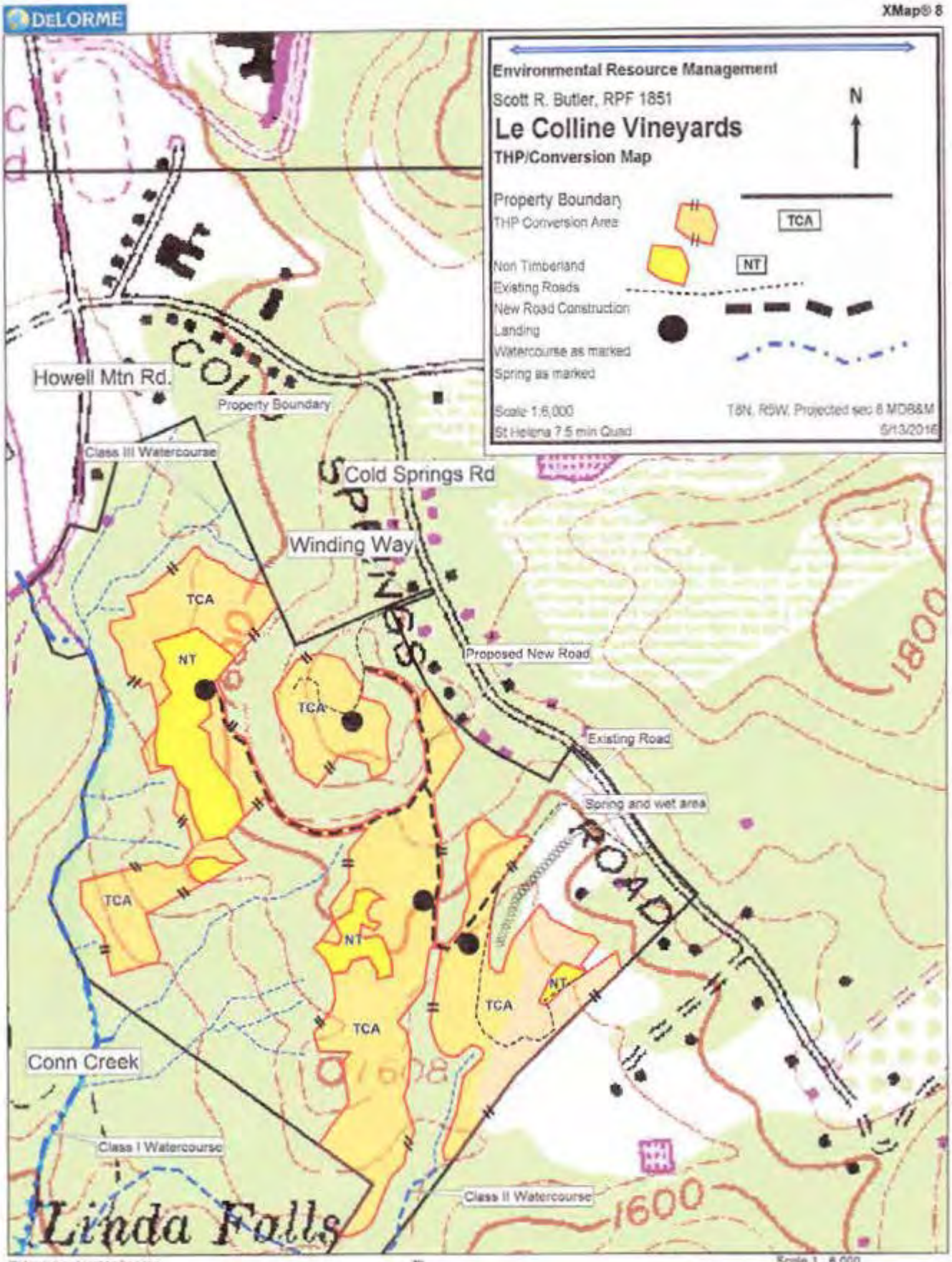
- Barred Owls Detected: None
- Years Northern Spotted Owls were Detected:
  - NAP014: Detected in 2015 & 2016
  - NAP028: Detected in 2015 (CalFire)
- Other Owl Species Detected: PYOW, SWOW

- Survey Stations ¼ to ½ mile apart: Yes
- Surveys Spread over Breeding Season: Yes
- 7 Days between Surveys: Yes
- Surveys completed between 01MAR – 31JUL: Yes
- Surveys Between Sunset and Sunrise: Yes
- Spot Check Surveys Completed Prior to 15APR: Yes in 2016

- Daytime follow-up within 48 hours if NSO Detected: No
  - NAP0014 was detected in 2015 & 2016. The owl was detected within the historic territory, in both years. The territory is on private property (no trespassing signs & locked gates) so a daytime visit is not possible.
  - NAP028 was detected in 2015 by CalFire while surveying Las Posadas State Forest. The detection was on 09APR15 between 2109 – 2358 hours from various survey stations. Unknown if daytime follow-up was completed but 5 surveys after that date did not detect any NSOs. We did not detect this owl while surveying for this plan.

- Activity Center Survey (ACS) Completed: There are 2 known NSO territories within 1.3 miles (NAP014 & NAP0028). NAP014 is on private property with no trespassing signs and locked gates, so ACS is not possible. NAP028 is being monitored by CalFire on Las Posadas State Forest.

- Survey Coverage to 1.3 miles of Harvest Boundary: The area surrounding the project is private property (gated property) and no access is possible. The survey stations used were for two different projects; therefore we were able to survey a good portion of the assessment area. The area to the north of the project is unsuitable due to College and Town of Angwin.


DELORME
XMap® 8
Environmental Resource Management
Scott R. Butler, RPF 1851
Le Colline Vineyards
THP/Conversion Map
N
Property Boundary
THP Conversion Area
TCA
Non Timberland
NT
Existing Roads
New Road Construction
Landing
Watercourse as marked
Spring as marked
Scale 1:6,000
T8N, R5W, Projected sec 8 MDB&M
St Helena 7.5 min Quad
5/13/2016
Howell Mtn Rd.
Property Boundary
Class III Watercourse
Cold Springs Rd
Winding Way
Proposed New Road
Existing Road
Spring and wet area
TCA
NT
Conn Creek
Class I Watercourse
Class II Watercourse
Linda Falls
1800
1600
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Scale 1 : 6,000
1" = 56.8 ft
Data Zoom 15-7

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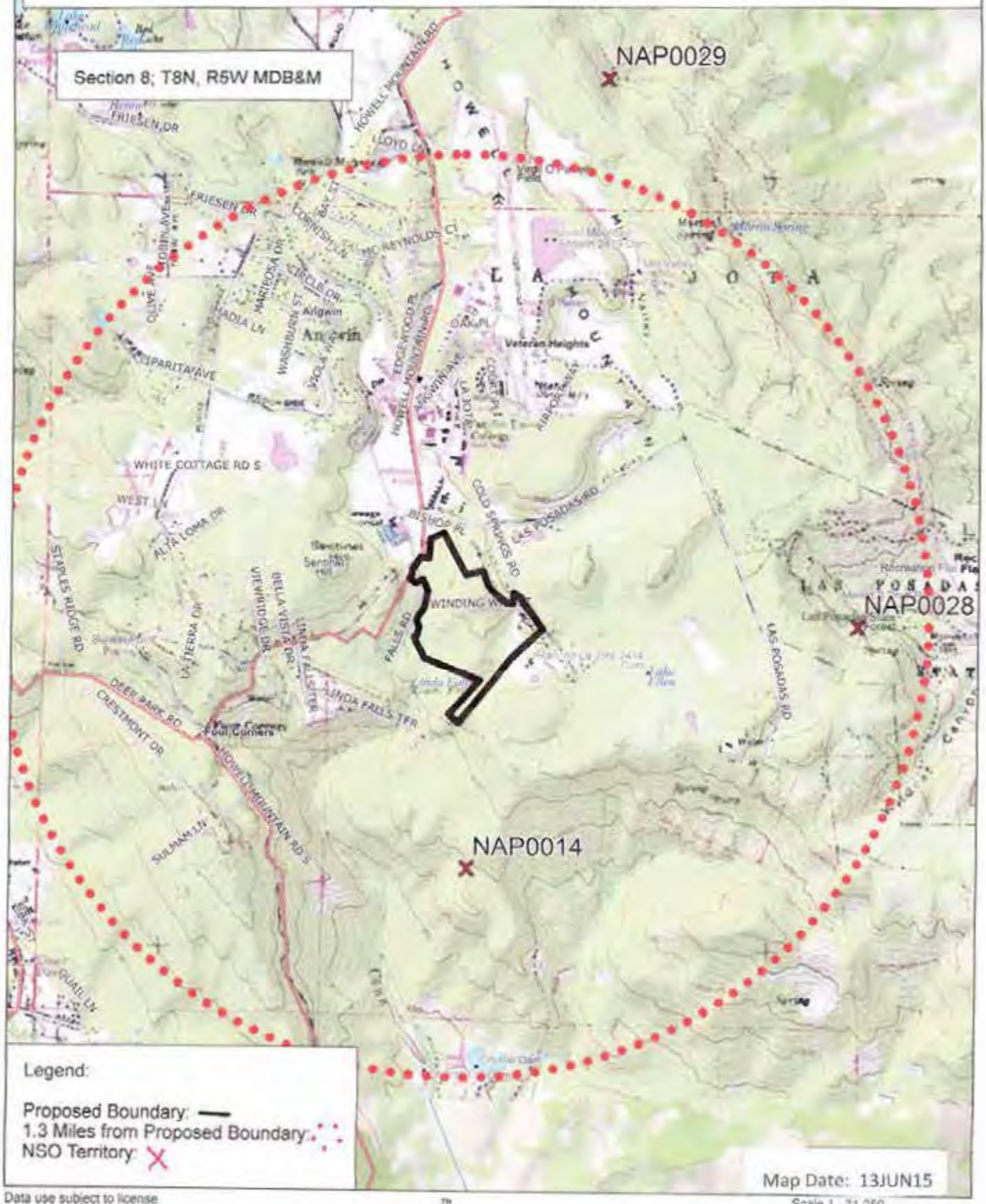
Northern Spotted Owls within 1.3 Miles of LeColline Vineyards



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Scale 1 : 31,250

1" = 2,604.2 ft

Data Zoom 12-6

Data Version Date:
06/03/2016

Report Generation Date:
6/13/2016

Report #1 - Spotted Owl Sites Found
Known Spotted Owl sites having observations within the search area.

Meridian, Township, Range, Section (MTRS) searched:

M_08N_05W Sections(02,03,04,05,06,07,08,09,10,11,14,15,16,17,18,19,20,21,22,23);

M_08N_06W Sections(01,12,13,24);

NOTES:

Le Colline Vineyards

Masterowl	*Subspecies*	*LatDD NAD83*	*LonDD NAD83*	*MTRS*	*AC Coordinate Source*	
NAP0014	NORTHERN	38.545901	-122.438464	M 08N 05W 17	Contributor	2838'
NAP0028	NORTHERN	38.559198	-122.411848	M 08N 05W 09	Contributor	1.17 Mile
NAP0029	NORTHERN	38.587141	-122.427051	M 09N 05W 33	Contributor	1.79 Mile

Owls in 1.3 Miles: NAP014
NAP028

Data Version Date:
06/03/2016

Report Generation Date:
6/13/2016

Report #2 - Observations Reported

List of observations reported by site.

Meridian, Township, Range, Section (MTRS) searched:

M_08N_05W Sections(02,03,04,05,06,07,08,09,10,11,14,15,16,17,18,19,20,21,22,23);

M_08N_06W Sections(01,12,13,24);

NOTES:

Le Colline Vineyards

Only Relevant Pages are Submitted.

NAP014 - Generally active 2000s w/single Pair - 2012
2016 - Pair

NAP028 - Active in early 1990s & quiet

2015 - CALFIRE detection

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
Masterowl: NAP0014 Subspecies: NORTHERN											
POS	1989-11-24	1425	1	UM				38.548502	-122.443344	M 08N 05W 17	Quarter-section centroid
NEG	1990		0					38.545218	-122.457840	M 08N 05W 18	Section centroid
AC	1990-03-10	2315	2	UMUF	Y			38.545901	-122.438464	M 08N 05W 17	Contributor
NEG	1990-11-16		0					38.544840	-122.438863	M 08N 05W 17	Section centroid
POS	1990-12-06	1856	1	UF				38.548682	-122.452799	M 08N 05W 18	Quarter-section centroid
POS	1992		1	UF				38.548323	-122.434337	M 08N 05W 17	Quarter-section centroid
NEG	1993-11-07	1816	0					38.545149	-122.452883	M 08N 05W 18	Half-section centroid
POS	1994-01-02	0345	1	UF				38.548809	-122.462702	M 08N 05W 18	Quarter-section centroid
NEG	1995-06-24	2142	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
POS	1998	0500	1	UU				38.548682	-122.452799	M 08N 05W 18	Quarter-section centroid
NEG	2000-03-11	1845	0					38.545218	-122.457840	M 08N 05W 18	Section centroid
NEG	2000-03-11	1900	0					38.541626	-122.452967	M 08N 05W 18	Quarter-section centroid
NEG	2000-04-12	2026	0					38.545218	-122.457840	M 08N 05W 18	Section centroid
NEG	2000-04-12	2030	0					38.541626	-122.452967	M 08N 05W 18	Quarter-section centroid
NEG	2000-04-24	2045	0					38.541626	-122.452967	M 08N 05W 18	Quarter-section centroid
NEG	2000-04-24	2035	0					38.545218	-122.457840	M 08N 05W 18	Section centroid

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
NEG	2000-04-25	2200	0					38.541626	-122.452967	M 08N 05W 18	Quarter-section centroid
NEG	2000-05-09	2300	0					38.541626	-122.452967	M 08N 05W 18	Quarter-section centroid
NEG	2000-05-15	2019	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2000-06-22		0					38.559582	-122.457674	M 08N 05W 07	Section centroid
POS	2001-01-01	0353	1	UM				38.544840	-122.438863	M 08N 05W 17	Section centroid
POS	2001-02-01	1928	1	UM				38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2001-02-01		0					38.559656	-122.439000	M 08N 05W 08	Section centroid
NEG	2001-03-05		0					38.559656	-122.439000	M 08N 05W 08	Section centroid
POS	2001-03-16	2143	1	UU				38.544840	-122.438863	M 08N 05W 17	Section centroid
POS	2001-04-05	2030	1	UM				38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2001-04-05		0					38.559656	-122.439000	M 08N 05W 08	Section centroid
POS	2001-05-26	2221	1	UM				38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-02-02	2400	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-02-14	1200	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-02-26	2400	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-03-10	2400	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-04-20	2015	0					38.544840	-122.438863	M 08N 05W 17	Section centroid

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
NEG	2002-04-28		0					38.545901	-122.438464	M 08N 05W 17	Activity center
NEG	2002-04-28	2400	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-05-09	2400	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-05-09		0					38.545901	-122.438464	M 08N 05W 17	Activity center
NEG	2002-05-12	2400	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-05-12		0					38.545901	-122.438464	M 08N 05W 17	Activity center
NEG	2002-05-30		0					38.545901	-122.438464	M 08N 05W 17	Activity center
NEG	2002-05-30	2400	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-06-29	2400	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-06-29	2400	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2002-06-29		0					38.545901	-122.438464	M 08N 05W 17	Activity center
NEG	2003-02-07	2203	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
POS	2003-03-12	2042	1	UM				38.541464	-122.443468	M 08N 05W 17	Quarter-section centroid
NEG	2003-04-07	2116	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2003-04-14	2100	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2003-04-22	1944	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
NEG	2003-04-23	2214	0					38.544840	-122.438863	M 08N 05W 17	Section centroid

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
NEG	2003-05-12	2234	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2003-05-12	2147	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2003-05-13	2015	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
NEG	2003-06-06	2103	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
POS	2003-06-07	0019	1	UM				38.541626	-122.452967	M 08N 05W 18	Quarter-section centroid
NEG	2003-06-13	2044	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
NEG	2003-06-19	2103	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
NEG	2003-06-21	2105	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2004-02-08	1937	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
NEG	2004-02-29	1729	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
NEG	2004-02-29	1901	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2004-03-29	2132	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
NEG	2004-03-29	2018	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2004-04-04	1931	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
NEG	2004-04-04	2026	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2004-05-08	2253	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2004-05-13	2213	0					38.544840	-122.438863	M 08N 05W 17	Section centroid

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
NEG	2004-05-15	2318	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2004-05-15	2225	0					38.544768	-122.420595	M 08N 05W 16	Section centroid
POS	2005-02-05	1821	1	UM				38.545218	-122.457840	M 08N 05W 18	Section centroid
NEG	2005-02-24	1754	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2005-03-11	1833	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2005-04-02	1859	0					38.545218	-122.457840	M 08N 05W 18	Section centroid
NEG	2005-04-11	1930	0					38.545218	-122.457840	M 08N 05W 18	Section centroid
NEG	2005-05-11	2056	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2005-05-19	2106	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2005-05-19	2106	0					38.545218	-122.457840	M 08N 05W 18	Section centroid
NEG	2006-02-12	1941	0					38.545218	-122.457840	M 08N 05W 18	Section centroid
NEG	2006-02-15	1131-1421	0					38.555762	-122.434404	M 08N 05W 08	Quarter-section centroid
NEG	2006-02-16	1827	0					38.545218	-122.457840	M 08N 05W 18	Section centroid
POS	2006-02-21	1918	1	UM				38.545218	-122.457840	M 08N 05W 18	Section centroid
NEG	2006-05-18	2125	0					38.545218	-122.457840	M 08N 05W 18	Section centroid
POS	2007-02-06	2014	1	UM				38.548502	-122.443344	M 08N 05W 17	Quarter-section centroid
POS	2007-02-06	2004	1	UF				38.544840	-122.438863	M 08N 05W 17	Section centroid

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
POS	2007-03-06	1944	1	UU				38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2007-04-07	2020	0					38.544840	-122.438863	M 08N 05W 17	Section centroid
POS	2007-05-25	2259	1	UM				38.544840	-122.438863	M 08N 05W 17	Section centroid
NEG	2008-02-09	2047-2057	0					38.549222	-122.452361	M 08N 05W 18	Contributor
NEG	2008-02-09	2032-2042	0					38.541222	-122.450583	M 08N 05W 18	Contributor
NEG	2008-02-16	2035-2045	0					38.549222	-122.452361	M 08N 05W 18	Contributor
NEG	2008-02-16	2020-2030	0					38.541222	-122.450583	M 08N 05W 18	Contributor
NEG	2008-02-27	1923-1933	0					38.549222	-122.452361	M 08N 05W 18	Contributor
POS	2008-02-27	1946	1	UU				38.549222	-122.452361	M 08N 05W 18	Contributor
NEG	2010-01-02	0709-0719	0					38.547141	-122.451622	M 08N 05W 18	Contributor
NEG	2010-01-02	0736-0746	0					38.541222	-122.450528	M 08N 05W 18	Contributor
NEG	2010-01-02	0722-0732	0					38.547277	-122.452083	M 08N 05W 18	Contributor
NEG	2010-02-03	1855-1905	0					38.547141	-122.451622	M 08N 05W 18	Contributor
POS	2010-02-03	1907	1	UM				38.547259	-122.443938	M 08N 05W 17	Contributor
NEG	2010-02-03	1944-1954	0					38.515666	-122.438360	M 08N 05W 29	Contributor
NEG	2010-03-27	2109-2119	0					38.515666	-122.438360	M 08N 05W 29	Contributor
NEG	2010-03-27	2055-2105	0					38.541222	-122.450528	M 08N 05W 18	Contributor

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
NEG	2010-03-27	2041-2051	0					38.547141	-122.451622	M 08N 05W 18	Contributor
NEG	2010-04-23	2013-2023	0					38.547141	-122.451622	M 08N 05W 18	Contributor
NEG	2010-04-23	2102-2112	0					38.515666	-122.438360	M 08N 05W 29	Contributor
POS	2010-04-23	2031-2045	1	UM				38.541124	-122.451622	M 08N 05W 18	Contributor
NEG	2010-05-18	2127-2137	0					38.541200	-122.450583	M 08N 05W 18	Contributor
NEG	2010-05-18	2035-2045	0					38.521266	-122.404900	M 08N 05W 27	Contributor
NEG	2010-05-18	2052-2102	0					38.518766	-122.409366	M 08N 05W 27	Contributor
NEG	2010-05-18	2143-2153	0					38.546266	-122.451500	M 08N 05W 18	Contributor
NEG	2010-05-18	2107-2117	0					38.516482	-122.438653	M 08N 05W 29	Contributor
NEG	2010-05-29	2112-2123	0					38.541200	-122.450583	M 08N 05W 18	Contributor
NEG	2010-05-29	2052-2102	0					38.516482	-122.438653	M 08N 05W 29	Contributor
NEG	2010-05-29	2022-2032	0					38.521266	-122.404900	M 08N 05W 27	Contributor
NEG	2010-05-29	2036-2046	0					38.518766	-122.409366	M 08N 05W 27	Contributor
NEG	2010-05-29	2127-2137	0					38.546266	-122.451500	M 08N 05W 18	Contributor
NEG	2011-02-06	1820-1840	0					38.541283	-122.450533	M 08N 05W 18	Contributor
NEG	2011-02-06	1921-1931	0					38.522300	-122.404900	M 08N 05W 27	Contributor
NEG	2011-02-06	1804-1814	0					38.549183	-122.452366	M 08N 05W 18	Contributor

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
NEG	2011-02-06	1935-1945	0					38.519216	-122.406049	M 08N 05W 27	Contributor
NEG	2011-02-06	1857-1907	0					38.515683	-122.438533	M 08N 05W 29	Contributor
NEG	2011-02-06	1948-1958	0					38.518200	-122.410283	M 08N 05W 27	Contributor
NEG	2011-03-04	2002-2012	0					38.549183	-122.452366	M 08N 05W 18	Contributor
NEG	2011-03-04	2029-2039	0					38.541266	-122.450550	M 08N 05W 18	Contributor
NEG	2011-03-04	2014-2024	0					38.547933	-122.451899	M 08N 05W 18	Contributor
NEG	2011-12-30	1131-1144	0					38.547968	-122.451816	M 08N 05W 18	Contributor
NEG	2011-12-30	1150-1203	0					38.541166	-122.450583	M 08N 05W 18	Contributor
NEG	2012-01-30	1754-1804	0					38.541167	-122.450583	M 08N 05W 18	Contributor
NEG	2012-01-30	1736-1747	0					38.547967	-122.451817	M 08N 05W 18	Contributor
POS	2012-03-09	1841	2	UMUF	Y			38.548950	-122.452083	M 08N 05W 18	Contributor
POS	2012-04-18	2035	2	UMUF	Y			38.549000	-122.452133	M 08N 05W 18	Contributor
POS	2012-05-07	2116	1	UU				38.548950	-122.452084	M 08N 05W 18	Contributor
POS	2012-05-21	2121	1	UU				38.548933	-122.452100	M 08N 05W 18	Contributor
POS	2013-04-28	2213	1	UF				38.545345	-122.444046	M 08N 05W 17	Contributor
NEG	2014-03-19	1955-2005	0					38.548480	-122.451830	M 08N 05W 18	Contributor
NEG	2014-03-19	2011-2021	0					38.541233	-122.450450	M 08N 05W 18	Contributor

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
NEG	2014-09-29	1948-1958	0					38.541233	-122.450450	M 08N 05W 18	Contributor
NEG	2014-09-29	1929-1944	0					38.548950	-122.452017	M 08N 05W 18	Contributor
NEG	2014-10-29	1835-1849	0					38.548480	-122.451830	M 08N 05W 18	Contributor
NEG	2014-10-29	1900-1912	0					38.541233	-122.450450	M 08N 05W 18	Contributor
NEG	2015-02-04	1804-1816	0					38.555806	-122.438920	M 08N 05W 08	Half-section centroid
NEG	2015-02-04	1845-1855	0					38.548930	-122.452020	M 08N 05W 18	Contributor
NEG	2015-02-04	1905-1915	0					38.541222	-122.450528	M 08N 05W 18	Contributor
NEG	2015-03-17	2133-2143	0					38.541222	-122.450528	M 08N 05W 18	Contributor
NEG	2015-03-17	2120-2130	0					38.548930	-122.452020	M 08N 05W 18	Contributor
NEG	2015-04-16	2017-2037	0					38.548870	-122.452000	M 08N 05W 18	Contributor
Masterowl: NAP0028 Subspecies: NORTHERN											
NEG	1990-03-10	1930	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	1990-12-04		0					38.544590	-122.383922	M 08N 05W 14	Section centroid
POS	1992-02-09	1410	2	UMUF				38.559198	-122.411848	M 08N 05W 09	Contributor
POS	1992-03-01	1618	1	UU				38.559198	-122.411848	M 08N 05W 09	Contributor
POS	1992-03-11	1530	2	UMUF				38.559198	-122.411848	M 08N 05W 09	Contributor
AC	1992-04-08	1100	2	UMUF	Y	Y		38.559198	-122.411848	M 08N 05W 09	Contributor

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
POS	1992-05-10	1145	1	UM				38.559198	-122.411848	M 08N 05W 09	Contributor
POS	1992-06-24	1719	2	UMUF	Y		1	38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	1992-07-26	1127	0					38.559930	-122.406884	M 08N 05W 10	Half-section centroid
NEG	1992-08-26	1406	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	1993-04-04	1533	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	1993-05-16	0536	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	1994-04-01	2008	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2001-02-01	2004	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2003-04-07	2013	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2003-04-14	2006	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2003-04-22	2117	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2003-05-12	2031	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2003-06-06	2234	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2004-02-18	1835	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2004-05-08	2031	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2004-05-23	2155	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2007-03-22	2100	0					38.559961	-122.402350	M 08N 05W 10	Section centroid

Type	Date	Time	#Adults	Age/Sex	Pair	Nest	#Young	Latitude DD NAD83	Longitude DD NAD83	MTRS	Coordinate Source
NEG	2007-04-07	2059	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2007-05-25	2055	0					38.559961	-122.402350	M 08N 05W 10	Section centroid
NEG	2008-02-27	1902-1912	0					38.569205	-122.423655	M 08N 05W 04	Contributor
NEG	2008-03-31	2125-2135	0					38.569205	-122.423655	M 08N 05W 04	Contributor
NEG	2008-05-20	2149-2159	0					38.569205	-122.423655	M 08N 05W 04	Contributor
NEG	2012-05-07	2010-2020	0					38.569283	-122.423667	M 08N 05W 04	Contributor
NEG	2012-05-07	1953-2003	0					38.561734	-122.419483	M 08N 05W 09	Contributor
NEG	2012-05-14	2251-2301	0					38.569283	-122.423667	M 08N 05W 04	Contributor
NEG	2012-05-14	2238-2248	0					38.561633	-122.419450	M 08N 05W 09	Contributor
NEG	2012-05-21	2003-2013	0					38.561633	-122.419450	M 08N 05W 09	Contributor
NEG	2012-05-21	2018-2028	0					38.569283	-122.423667	M 08N 05W 04	Contributor
Masterowl: NAP0029 Subspecies: NORTHERN											
POS	1993		1	UU				38.590036	-122.433642	M 09N 05W 32	Contributor
NEG	1993-05-16	0713	0					38.589320	-122.434773	M 09N 05W 32	Half-section centroid
POS	1995-06-04		2	UMUF	Y			38.590036	-122.433642	M 09N 05W 32	Contributor
POS	1995-06-26	1155	2	UMUF	Y		0	38.589320	-122.434773	M 09N 05W 32	Half-section centroid
NEG	1996-03-22	0938	0					38.589307	-122.439504	M 09N 05W 32	Section centroid

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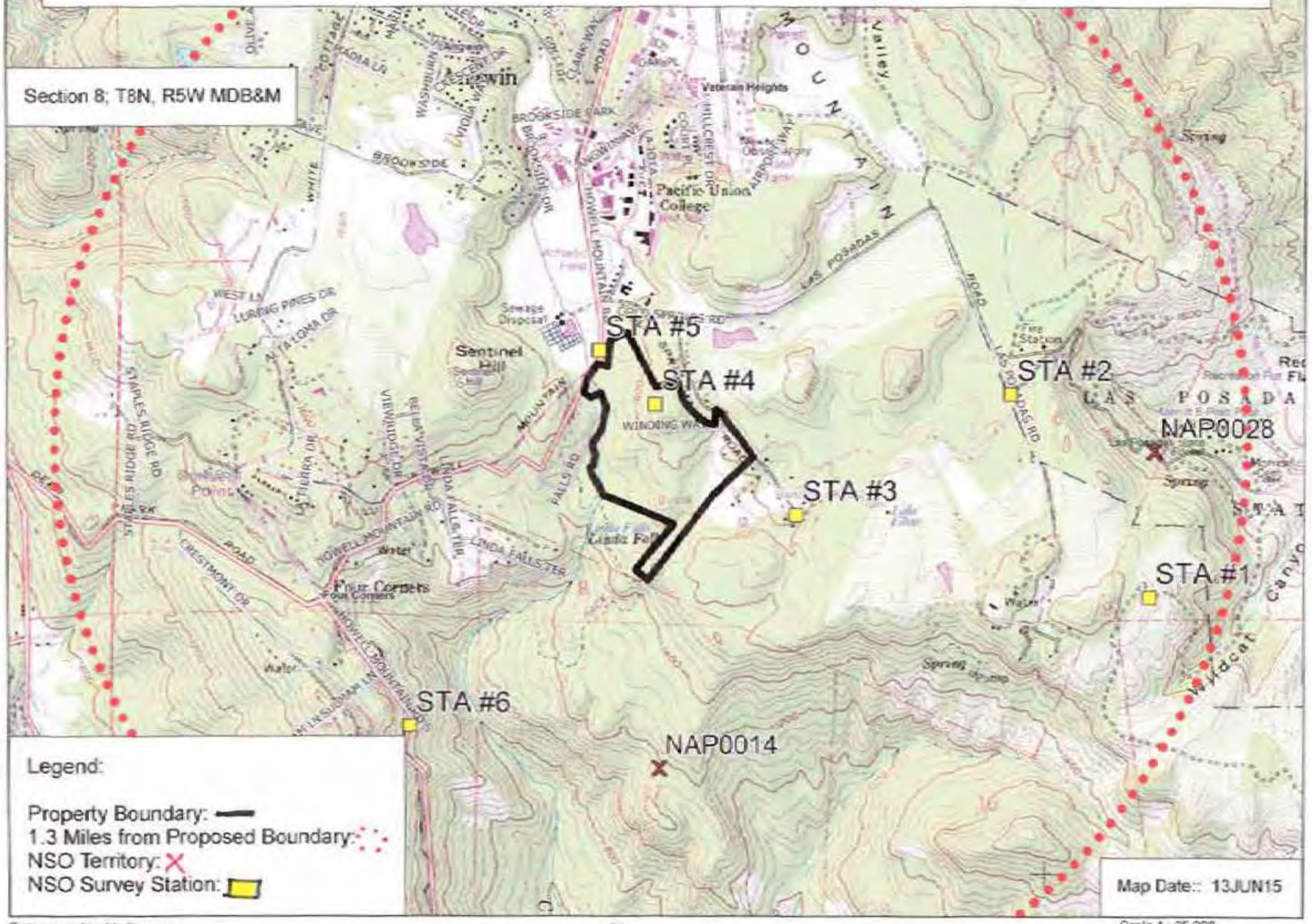
Northern Spotted Owl Survey Stations for Le Colline Vineyards



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Scale 1 : 25,000

1" = 2,083.3 ft

Data Zoom 13-0

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Northern Spotted Owl Survey Stations for Le Colline Vineyards

Field MAP

Section 8; T8N, R5W MDB&M

STA #5

STA #4

STA #3

STA #2

STA #1

STA #6

NAP0028

NAP0014

4/9/15 evening owl moving around

2/24/16 Pair 1908 HRS

Pair 3/17/16 at 2115 HRS

4/5/16 Pair at 2116 HRS

Legend:

Property Boundary:

1.3 Miles from Proposed Boundary:

NSO Territory:

NSO Survey Station:

Map Date:: 13JUN15

Scale 1 : 25,000

1" = 2,083.3 ft

Data Zoom 13-0

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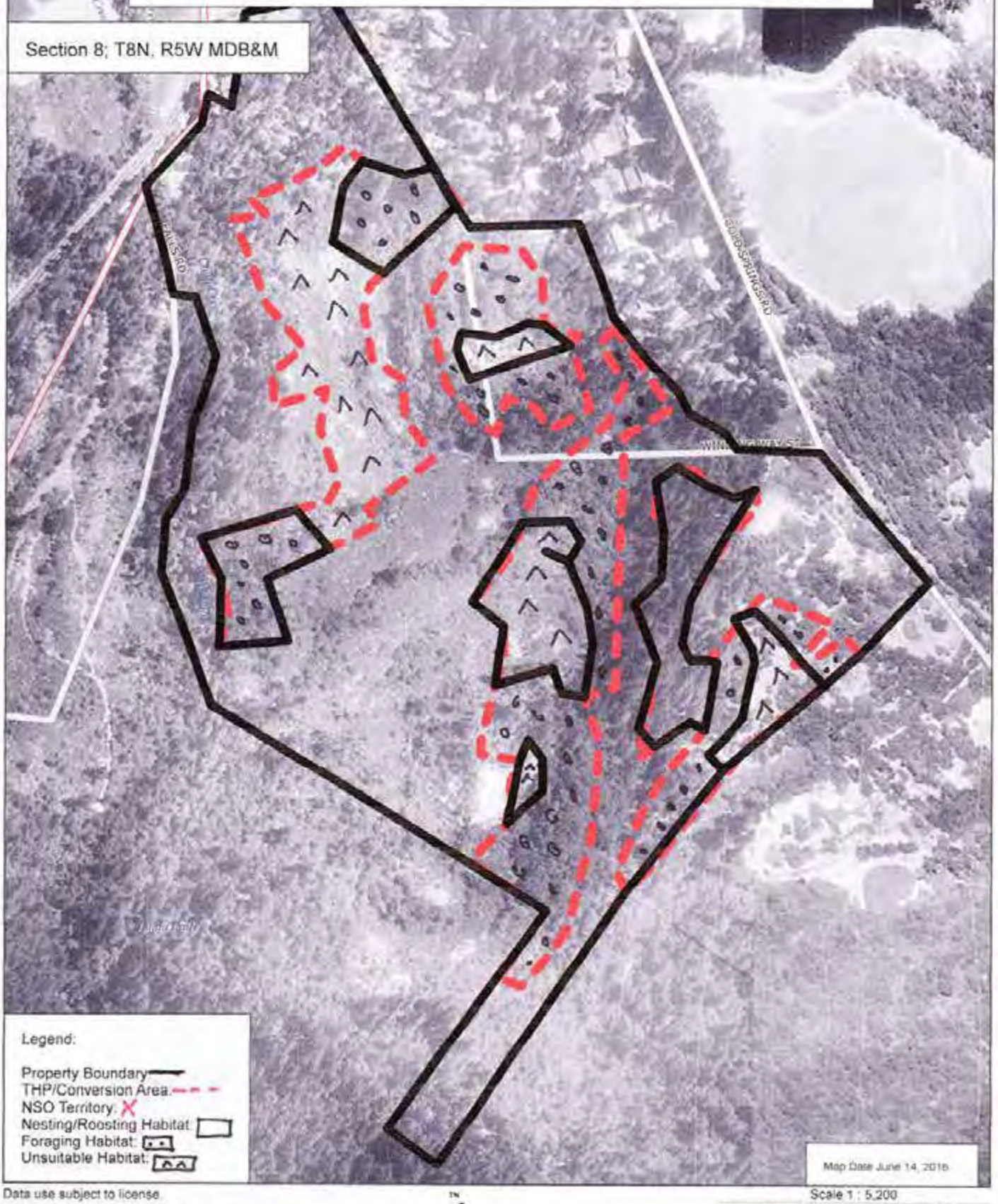
Northern Spotted Owl Habitat for Le Colline Vineyards
Pre-Harvest Habitat

Section 8; T8N, R5W MDB&M



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1" = 433.3 ft

Data Zoom 15-3

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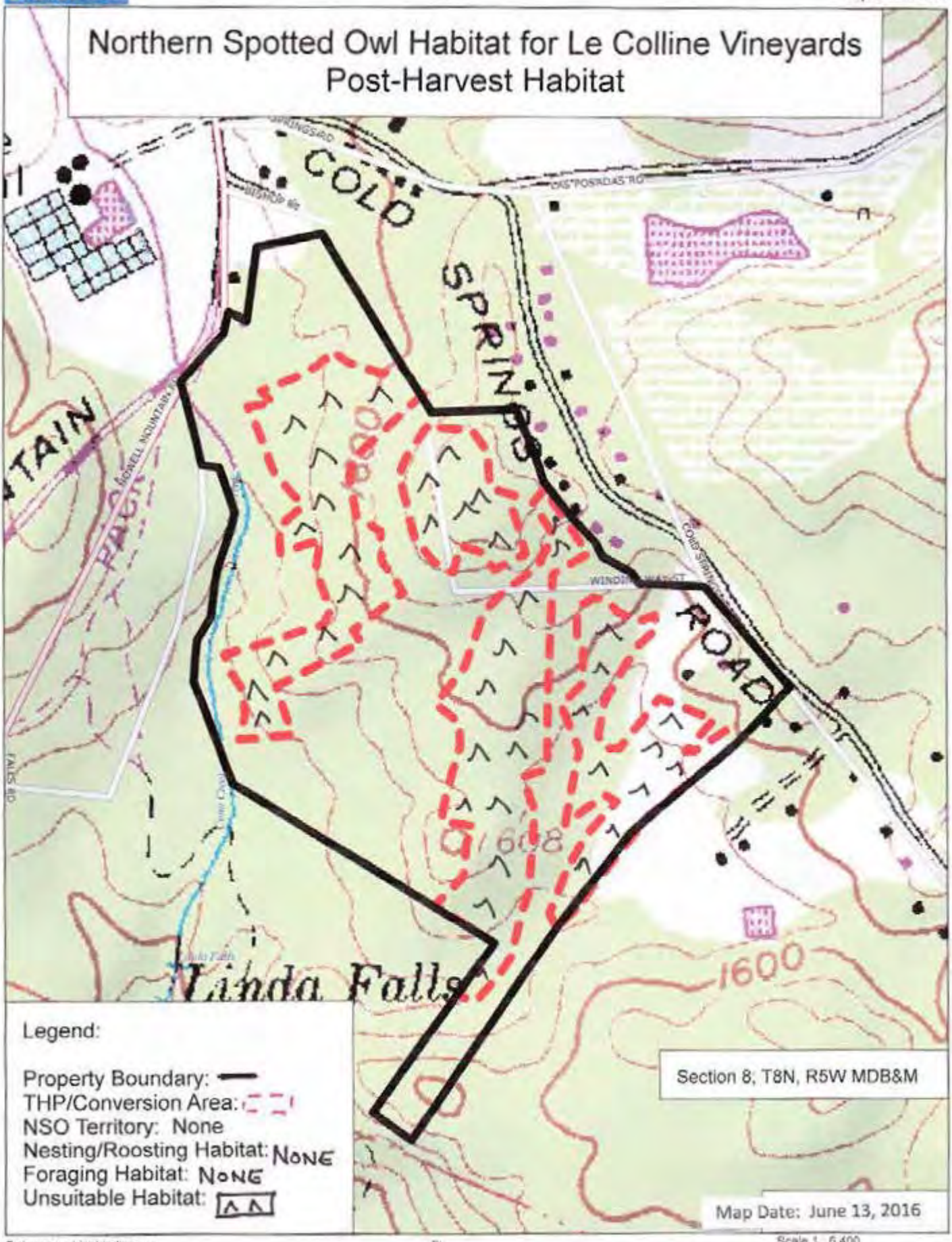
Northern Spotted Owl Habitat for Le Colline Vineyards
Post-Harvest Habitat



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Scale 1 : 6,400

1" = 533.3 ft

Data Zoom 15-0

Habitat Typing on this Map is for THP Area Only

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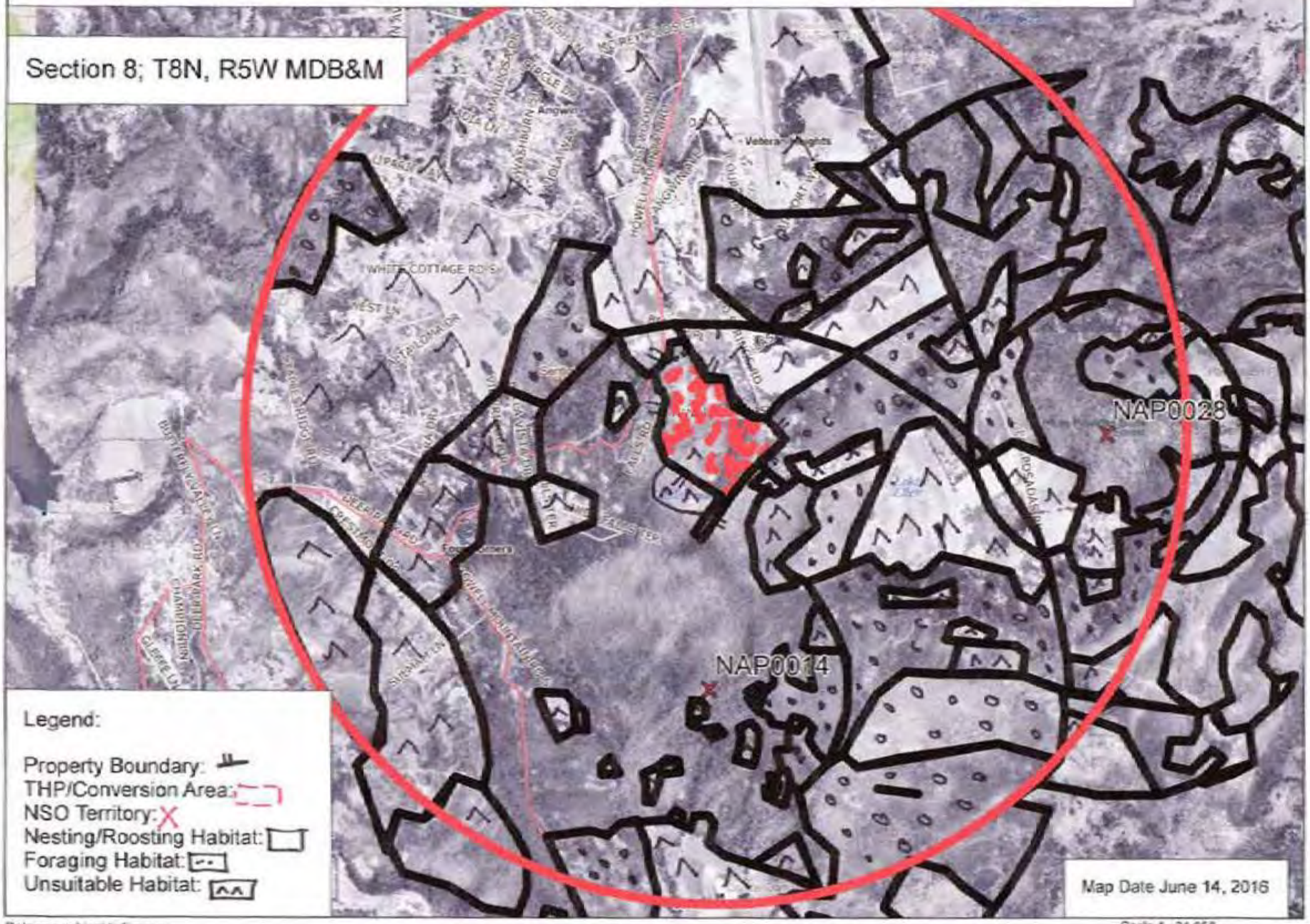
Northern Spotted Owl Habitat Around Le Colline Vineyard



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Scale 1 : 31,250

1" = 2,604.2 ft

Data Zoom 12-6

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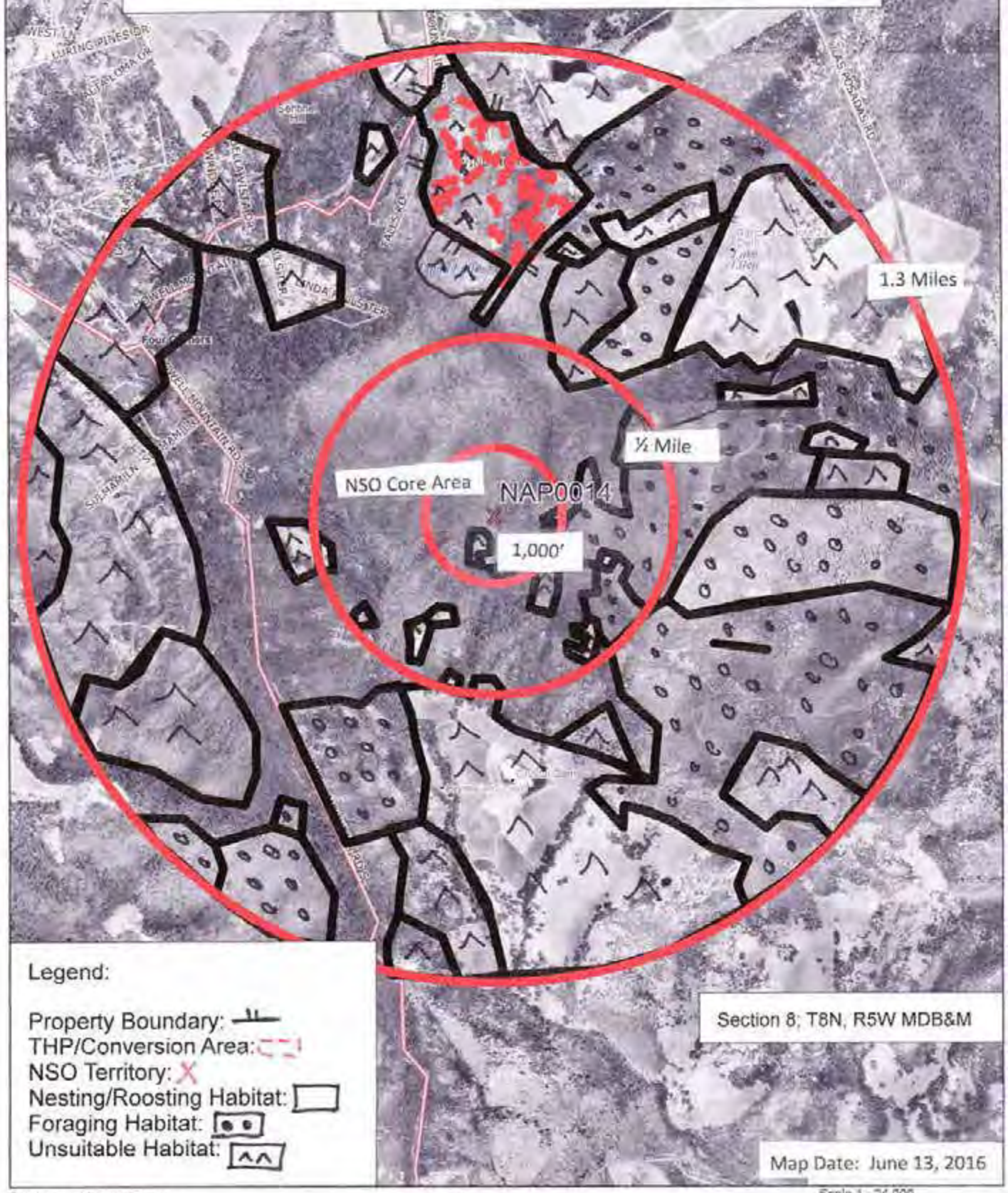
Northern Spotted Owl Habitat Around NAP0014 Pre-Harvest on Le Colline Vineyard



Legend:

Property Boundary:
THP/Conversion Area:
NSO Territory: X
Nesting/Roosting Habitat:
Foraging Habitat:
Unsuitable Habitat:

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Scale 1 : 24,000

1" = 2,000.0 ft

Data Zoom 13-1

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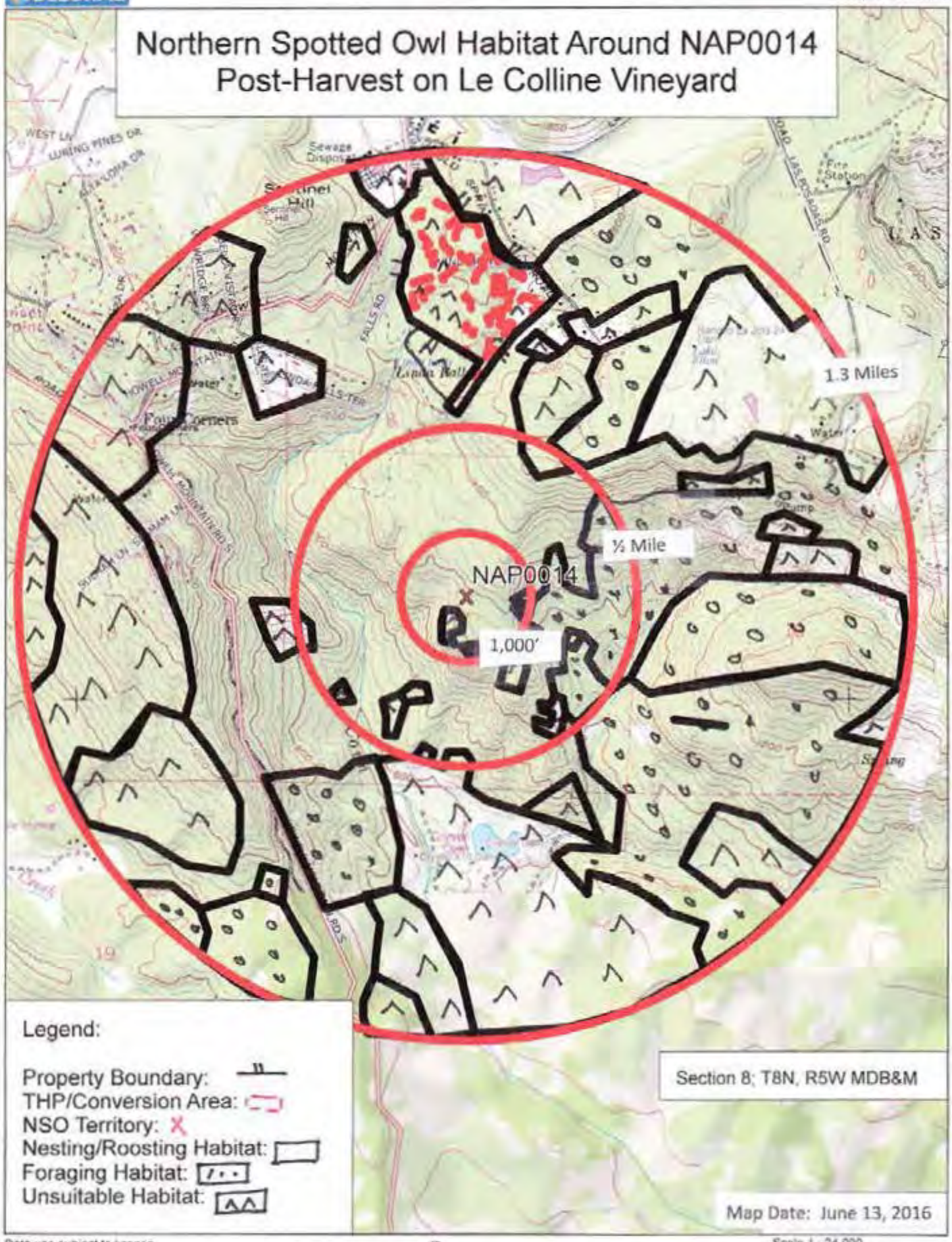
Northern Spotted Owl Habitat Around NAP0014 Post-Harvest on Le Colline Vineyard



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Scale 1 : 24,000

1" = 2,000.0 ft

Data Zoom 13-1

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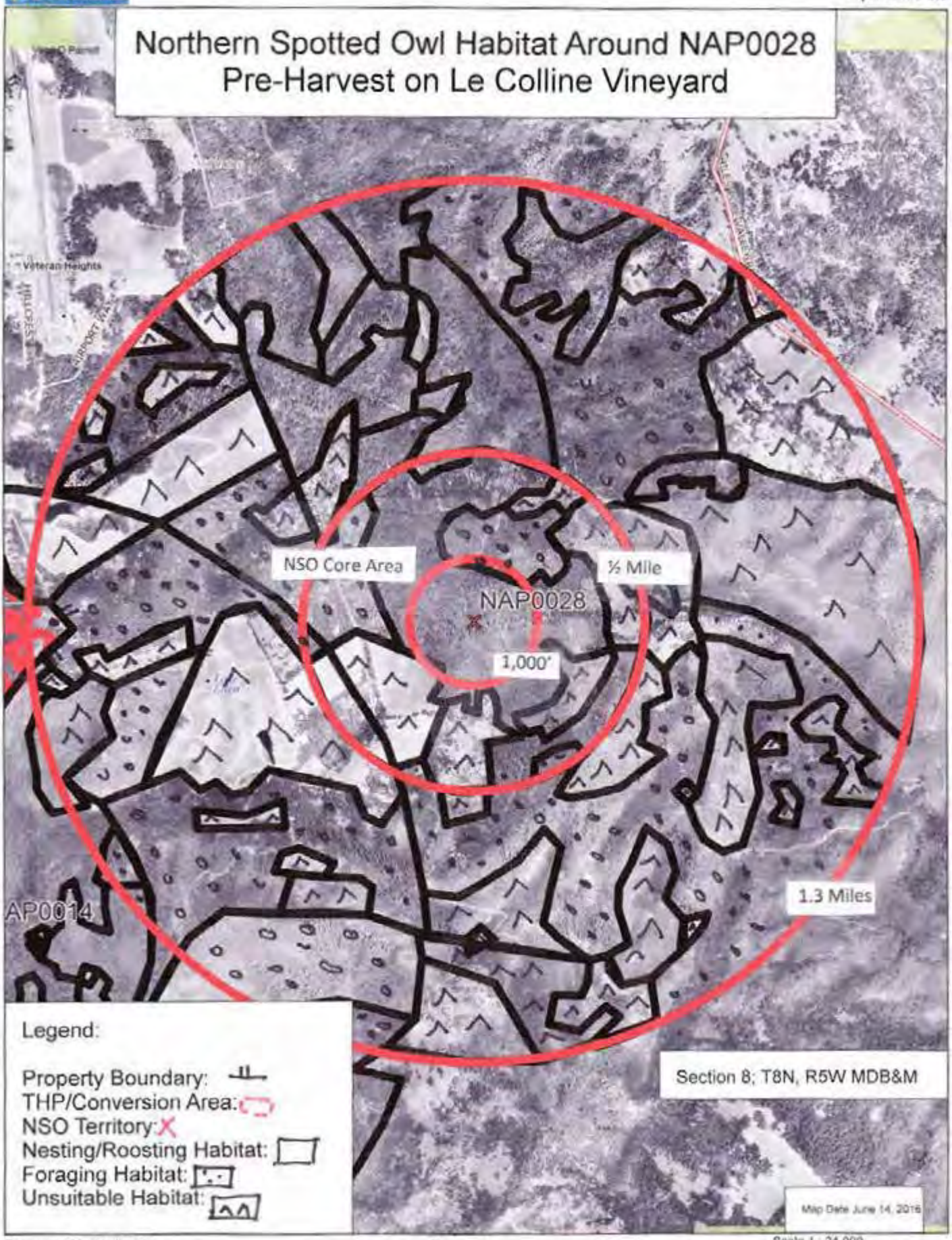
Northern Spotted Owl Habitat Around NAP0028 Pre-Harvest on Le Colline Vineyard



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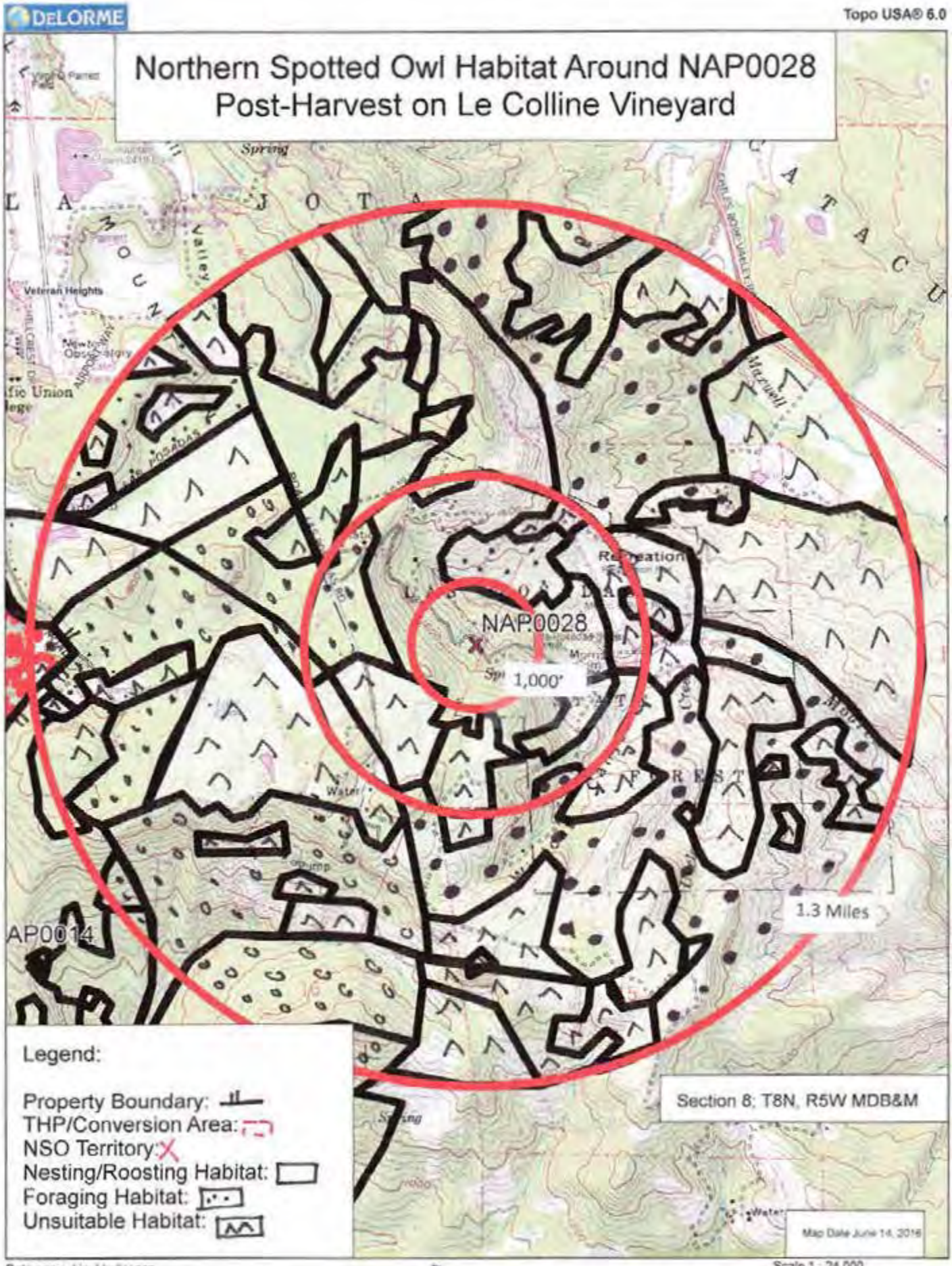
1" = 2,000.0 ft

Data Zoom 13-1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Topo USA® 6.0
Northern Spotted Owl Habitat Around NAP0028
Post-Harvest on Le Colline Vineyard
NAP0028
1,000'
1.3 Miles
AP0014
Veteran Heights
Legend:
Property Boundary:
THP/Conversion Area:
NSO Territory:
Nesting/Roosting Habitat:
Foraging Habitat:
Unsuitable Habitat:
Section 8; T8N, R5W MDB&M
Map Date June 14, 2016
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Scale 1 : 24,000
1" = 2,000.0 ft
Data Zoom 13-1

Forest Ecosystem Management, PLLC

Pamela J. Town, Consulting Wildlife Biologist
PO Box 455; Potomac, MT 59823
(406) 490-7427 * cptown@blackfoot.net

14-Jun-16

Scott Butler
7000 Leicester Ct.
Castle Pines, CO 80108

Client: **Le Colline Vineyards**

Date	Work Completed	Number Hours	Rate @ $60/hr	Number Miles	Rate $0.60/mi	Total
3/1/2016	NSO Survey #1 - Completed by Scott	0	$ -	0	$ -	$ -
3/17/2016	NSO Survey #2	2.5	$ 150.00	40	$ 24.00	$ 174.00
4/5/2016	NSO Survey #3 - Completed by Scott	0	$ -	0	$ -	$ -
6/13/2016	NSO Habitat Mapping	5	$ 300.00	0	$ -	$ 300.00
6/14/2016	Mapping, Analysis of NSO NSO Write-up	6.5	$ 390.00	0	$ -	$ 390.00
				Amount Due:		**$ 864.00**

Note: All Reports Submitted to Scott Butler

Forest Ecosystem Management, PLLC

Pamela J. Town, Consulting Wildlife Biologist
PO Box 455; Potomac, MT 59823
(406) 490-7427 * cptown@blackfoot.net

8-Jun-16

Scott Butler
7000 Leicester Ct.
Castle Pines, CO 80108

Client: **Ciminelli THP**

Date	Work Completed	Number Hours	Rate @ $60/hr	Number Miles	Rate $0.60/mi	Total
3/1/2016	NSO Survey #1 - Completed by Scott	0	$ -	0	$ -	$ -
3/16/2016	NSO Survey #2	3	$ 180.00	40	$ 24.00	$ 204.00
4/6/2016	NSO Survey #3 - Completed by Scott	0	$ -	0	$ -	$ -
5/19/2016	Ink Grade Survey	1.5	$ 90.00	40	$ 24.00	$ 114.00
5/26/2016	Ink Grade Survey	1	$ 60.00	40	$ 24.00	$ 84.00
6/3/2016	Review Questions/NSO Write-up	4	$ 240.00	0	$ -	$ 240.00
				Amount Due:		**$ 642.00**

Note: All Reports Submitted to Scott Butler

Forest Ecosystem Management, PLLC
PO Box 455; Potomac, MT 59823
(406) 490-7427 * cptown@blackfoot.net

September 21, 2016

Scott Butler, RPF
Environmental Resource Management
7000 Leicester CT.
Castle Pines, CO 80180

RE: Le Colline Vineyards THP (1-16-079 NAP)

Scott,

This is in response to the question posed by CDFW during the PHI regarding northern spotted owls. When habitat typing NSO habitat, Google Earth and DeLorme Mapping aerial photos were used. Aerial imagery is dated December 2015, and show the completed historic vineyard conversions, which would be classified as unsuitable habitat.

The pre-harvest and post-harvest habitat maps and table indicating the number of habitat acres for the NSOs within 1.3 mile of the Project Boundary, which was included within the NSO Report, do demonstrate the NSO habitat quantities that included the historic vineyard conversions, as well as any other completed THP, mentioned by CDFW. Therefore, the cumulative effects of other conversions within 1.3 miles of a known NSO activity center, has been addressed. This meets the USFWS guidelines to demonstrate that NSO habitat quantities will be retained at or above the habitat threshold to avoid a take under the Endangered Species Act.

While re-examining the aerial photos to assure all historic THPs have been addressed, an error in habitat typing was noted (polygons miss-labeled) and have been corrected and are being re-submitted.

The comment regarding "no control over future land-uses of the landscape outside their ownership" applies to future conversions or other land-uses that are unknown at this time.

This should answer one of the PHI questions, and if you have other questions or comments, feel free to let me know.

Gone Hooting,

Pamela Town
Consulting Wildlife Biologist

This Page is the same as reported in 6/14/16 NSO Report

Habitat Quantities:

a. Within 1,000' of each activity center:
    a. Outside the breeding season (01SEP – 31JAN), no timber operations shall occur within 1,000' of an activity center other than use of existing roads.
    b. During the breeding season (01FEB – 31AUG), no timber operations shall occur within 1,000' of an activity center other than the use of existing permanent, year-round roads.

b. Within 0.5 mile radius (502 acres) centered on activity center
    a. At least 250 acres nesting/roosting habitat present, as follows:
        i. 100 acres of High Quality Nesting/Roosting Habitat, and
        ii. 150 acres of Nesting/Roosting Habitat. AND
    b. At least 150 acres foraging habitat (or better) must be present, as follows:
        i. 100 acres Foraging Habitat, and
        ii. 50 acres Low Quality Foraging Habitat
        iii. No more than 1/3 of the remaining suitable habitat may be harvested during the life of this THP.
c. Between 0.5 mile radius and 1.3 mile radius circles centered on activity center:
    a. >935 acres suitable habitat must be present, as follows:
        i. At least 655 acres Foraging Habitat, and
        ii. *At least 280 acres of Low Quality Foraging, and*
        iii. No more than 1/3 of the remaining suitable habitat may be harvested during the life of the THP.

This THP falls between the 0.5 mile and 1.3 mile radius circle centered on the activity center for both known NSOs within 1.3 miles.

NAP0014 (Corrected Habitat Map Submitted – Some of the polygons on the 6/2016 map were incorrectly marked – changes are within the 1.3 mile assessment area only):

The best NSO habitat for this activity center is located around the activity center in the Conn Creek Drainage. Outside this drainage, the habitat quality drastically declines primarily due to scrub-land, grassland, agricultural production, and housing. There is some foraging habitat to the east that may allow corridors for dispersing owls and would lead to NAP0028.

Northern Spotted Owl Habitat Around NAP0014 (Pre & Post-Harvest)

Description	Pre Harvest (Acres)	Post-Harvest (Acres)
1,000' Assessment Area *		
Nesting/Roosting Habitat	61 acres	61 acres
Foraging Habitat	4 acres	4 acres
Unsuitable Habitat	7 acres	7 acres
Total Acres	**72 Acres**	**72 Acres**
0.5 Mile Assessment Area *		
Nesting/Roosting NSO Habitat	399 acres	399 acres
Foraging NSO Habitat	82 acres	82 acres
Unsuitable NSO Habitat	21 acres	21 acres
Total Acres	**502 Acres**	**502 Acres**
1.3 Mile Assessment Area		
Nesting/Roosting NSO Habitat	1175 acres	1172 acres
Foraging NSO Habitat	831 acres	814 acres
Unsuitable NSO Habitat	1392 acres	1412 acres
Total Acres	**3398 Acres**	**3398 Acres**

NOTE: This THP is outside the 1,000' and ½ Mile Assessment Areas and will have no impact on these areas.

Verification & Mitigation:

1,000' Assessment Area: No Harvest Operations shall occur other than the use of existing, permanent, year-round roads. ***This THP/Conversion is outside this Assessment Area and there are no roads within this area.***

0.5 Mile Assessment Area: ***This THP/Conversion is outside this Assessment Area; therefore, will have no impact on this area.***

Although this THP/Conversion is outside this Assessment Area, there are at least 250 acres of nesting/roosting (399 acres) and at least 150 acres of foraging habitat (or

better) [399 n/r – 250 = 149 + 82 = 231 acres] of available habitat (including nesting/roosting and foraging).

0.5 Mile to 1.3 Mile Assessment: This THP/Conversion falls within this Assessment Area, with the requirements met post-harvest. This THP will affect only 20 acres of northern spotted owl habitat within this assessment area, as the remaining 16 acres is unsuitable habitat pre-harvest.

399 acres + 82 acres = 481 acres suitable NSO Habitat in ½ mile
1172 acres + 814 acres = 1986 acres suitable NSO Habitat in 1.3 miles
1986 acres – 481 acres = 1505 acres suitable NSO Habitat in ½ to 1.3 Mile Assessment Area
1505 acres is above the required 935 acres – Habitat Requirements are met

1/3 of Remaining Habitat may be harvested during the life of the THP: This THP is only a small fraction of the 1.3 mile assessment area (36 acres of the 3,398 acres); way below 1/3 (1,133 acres) of the assessment area. Once operations begin, they should be completed in one to two seasons. The area surrounding the THP is private property. The property owners have no control over operations outside their property boundary.

The Le Colline property is located next to a larger unsuitable habitat patch due to residential houses, scrub-land, and agriculture. The THP will not fragment existing nesting/roosting habitat.

NAP0028 (Corrected Habitat Map Submitted – Some of the polygons on the 6/2016 map were *incorrectly marked*):

The best NSO habitat for this activity center is located around the historic activity center and to the north. Outside this area, the habitat quality drastically declines primarily due to scrub-land, grassland, and agricultural production. There is some foraging habitat to the west that may allow corridors for dispersing owls and would lead to NAP0014, while further east leads to more unsuitable habitat (scrub-land and open).

Northern Spotted Owl Habitat Around NAP0028 (Pre & Post-Harvest)

Description	Pre Harvest (Acres)	Post-Harvest (Acres)
1,000' Assessment Area *		
Nesting/Roosting Habitat	68 acres	68 acres
Foraging Habitat	3 acres	3 acres
Unsuitable Habitat	1 acres	1 acres
Total Acres	**72 Acres**	**72 Acres**
0.5 Mile Assessment Area *		
Nesting/Roosting NSO Habitat	232 acres	232 acres
Foraging NSO Habitat	113 acres	113 acres
Unsuitable NSO Habitat	157 acres	157 acres
Total Acres	**502 Acres**	**502 Acres**

1.3 Mile Assessment Area		
Nesting/Roosting NSO Habitat	629 acres	629 acres
Foraging NSO Habitat	1279 acres	1277 acres
Unsuitable NSO Habitat	1490 acres	1492 acres
Total Acres	**3398 Acres**	**3398 Acres**

NOTE (*): This THP is outside the 1,000' and ½ Mile Assessment Areas and will have no impact on these areas.

Verification & Mitigation:

1,000' Assessment Area: No Harvest Operations shall occur other than the use of existing, permanent, year-round roads. ***This THP/Conversion is outside this Assessment Area.***

0.5 Mile Assessment Area: ***This THP/Conversion is outside this Assessment Area; therefore, will have no impact on this area.***

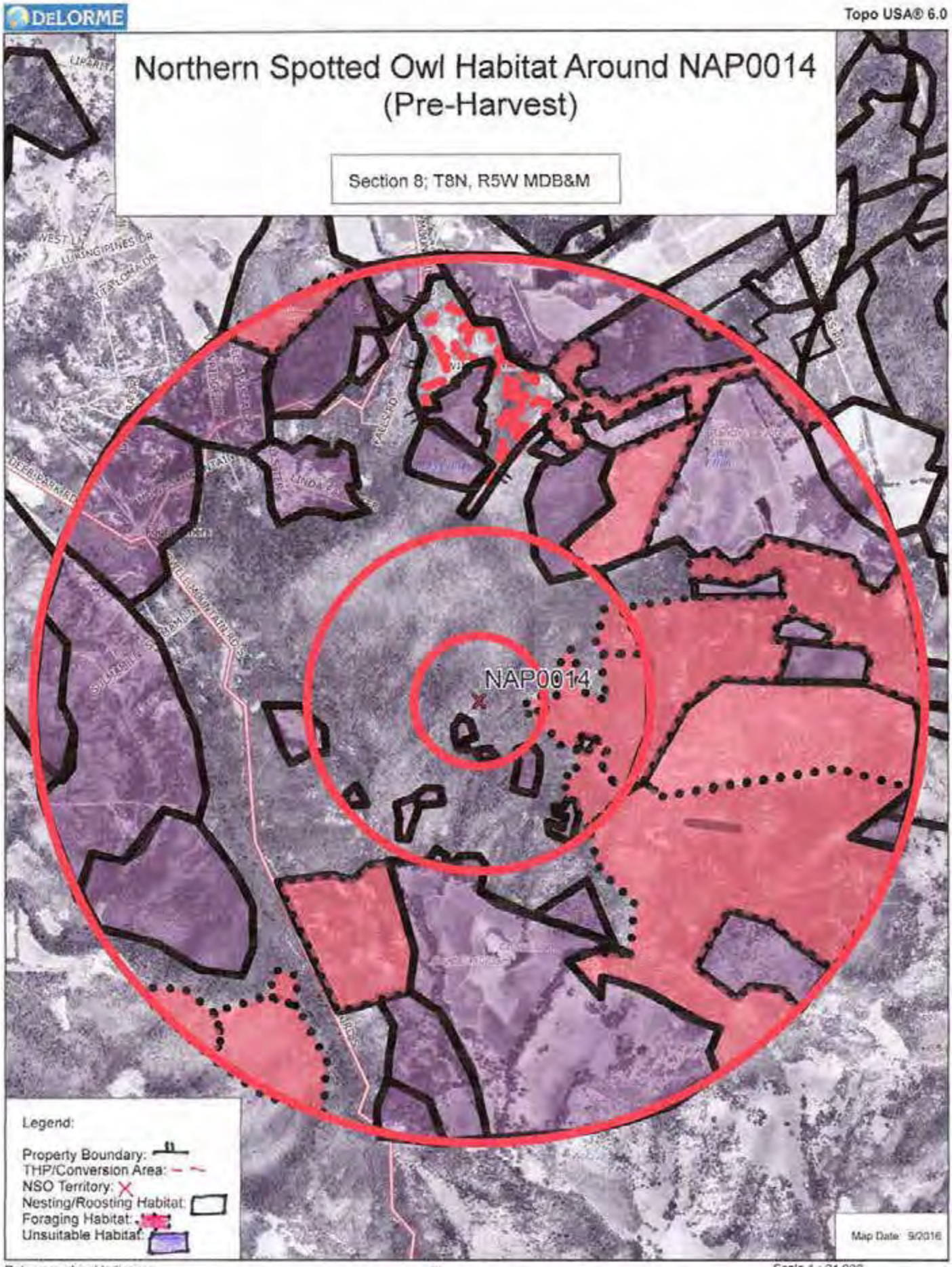
> The habitat quantities for this assessment area are not met. This THP is outside this assessment area and will have no impact on this habitat deficiency.

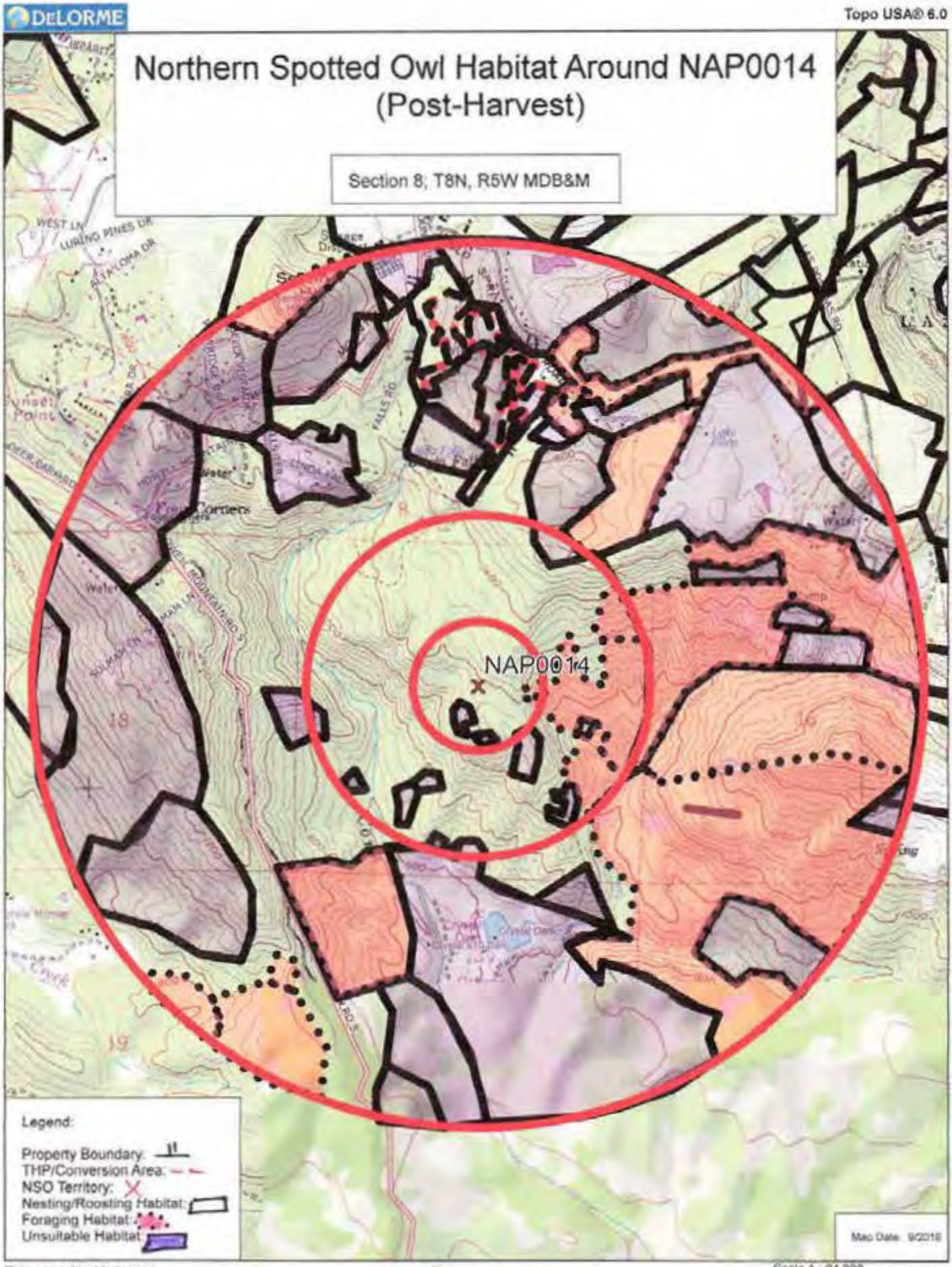
0.5 Mile to 1.3 Mile Assessment: This THP/Conversion falls within this Assessment Area, with the requirements met post-harvest. This THP will affect only 2 acres of northern spotted owl habitat within this assessment area, as the remaining THP is outside this assessment area.

232 acres + 113 acres = 345 acres suitable NSO habitat in ½ mile
629 acres + 1277 acres = 1906 acres suitable NSO habitat in 1.3 miles
1906 acres – 345 acres = 1561 acres suitable NSO habitat in ½ - 1.3 mile assessment area
1561 acres is above required 935 acres – Habitat Requirements are met

1/3 of Remaining Habitat may be harvested during the life of the THP: This THP is only a small fraction of the 1.3 mile assessment area (2 acres of the 3,398 acres), way below 1/3 (1,133 acres) of the assessment area. Once operations begin, they should be completed in one to two seasons. *The area surrounding the THP is private property. The property owners have no* control over operations outside their property boundary.

Special Note: This territory (NAP0028) is based on a 1992 nest site w/one young fledged. This territory has not had a resident owl within this activity site since. On 09APR15, a NSO was detected within the vicinity on one evening; however, daytime follow-up and additional nocturnal surveys did not detect any NSOs. It is likely that the owls, once residents at this site, have moved north to more suitable habitat (probably NAP0029 – nesting pair in 2015). However, even though habitat suitability is low; the habitat requirements within the assessment area that this project falls within are met post-harvest.


DeLORME
Topo USA® 6.0
Northern Spotted Owl Habitat Around NAP0014
(Pre-Harvest)
Section 8; T8N, R5W MDB&M
NAP0014
Legend:
Property Boundary:
THP/Conversion Area:
NSO Territory:
Nesting/Roosting Habitat:
Foraging Habitat:
Unsuitable Habitat:
Map Date: 9/2016
Data use subject to license.
© 2006 DeLorme. Topo USA® 6.0.
www.delorme.com
Scale 1 : 24,000
1" = 2,000.0 ft
Data Zoom 13-1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Northern Spotted Owl Habitat Around NAP0014
(Post-Harvest)
Section 8; T8N, R5W MDB&M
NAP0014
Legend:
Property Boundary:
THP/Conversion Area:
NSO Territory:
Nesting/Roosting Habitat:
Foraging Habitat:
Unsuitable Habitat:
Map Date: 9/2016
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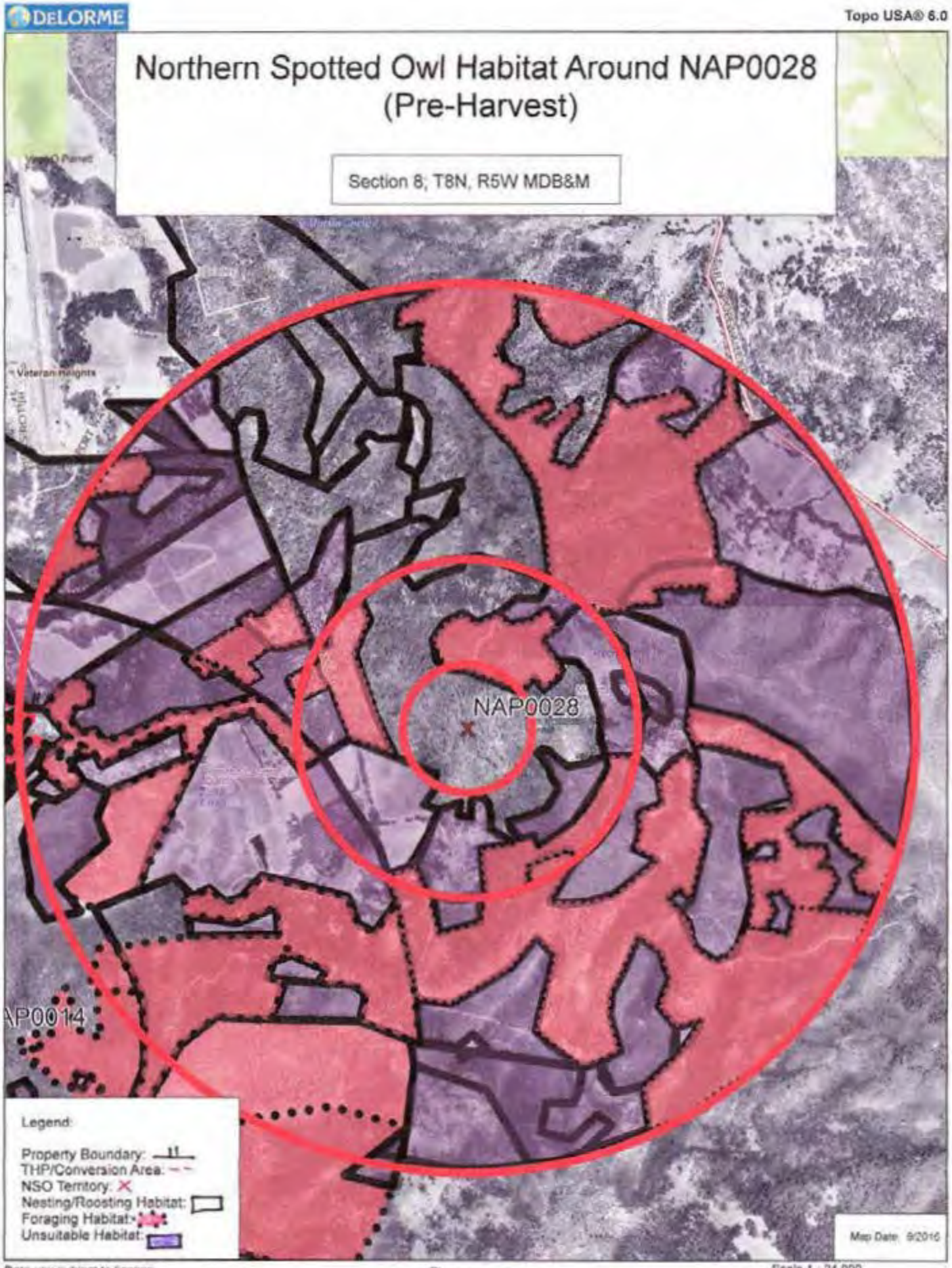
Scale 1 : 24,000
1" = 2,000.0 ft
Data Zoom 13-1


DeLORME
Topo USA® 6.0
Northern Spotted Owl Habitat Around NAP0028
(Pre-Harvest)
Section 8; T8N, R5W MDB&M
NAP0028
AP0014
Legend:
Property Boundary:
THP/Conversion Area:
NSO Territory:
Nesting/Roosting Habitat:
Foraging Habitat:
Unsuitable Habitat:
Map Date: 9/2016
Data use subject to license.
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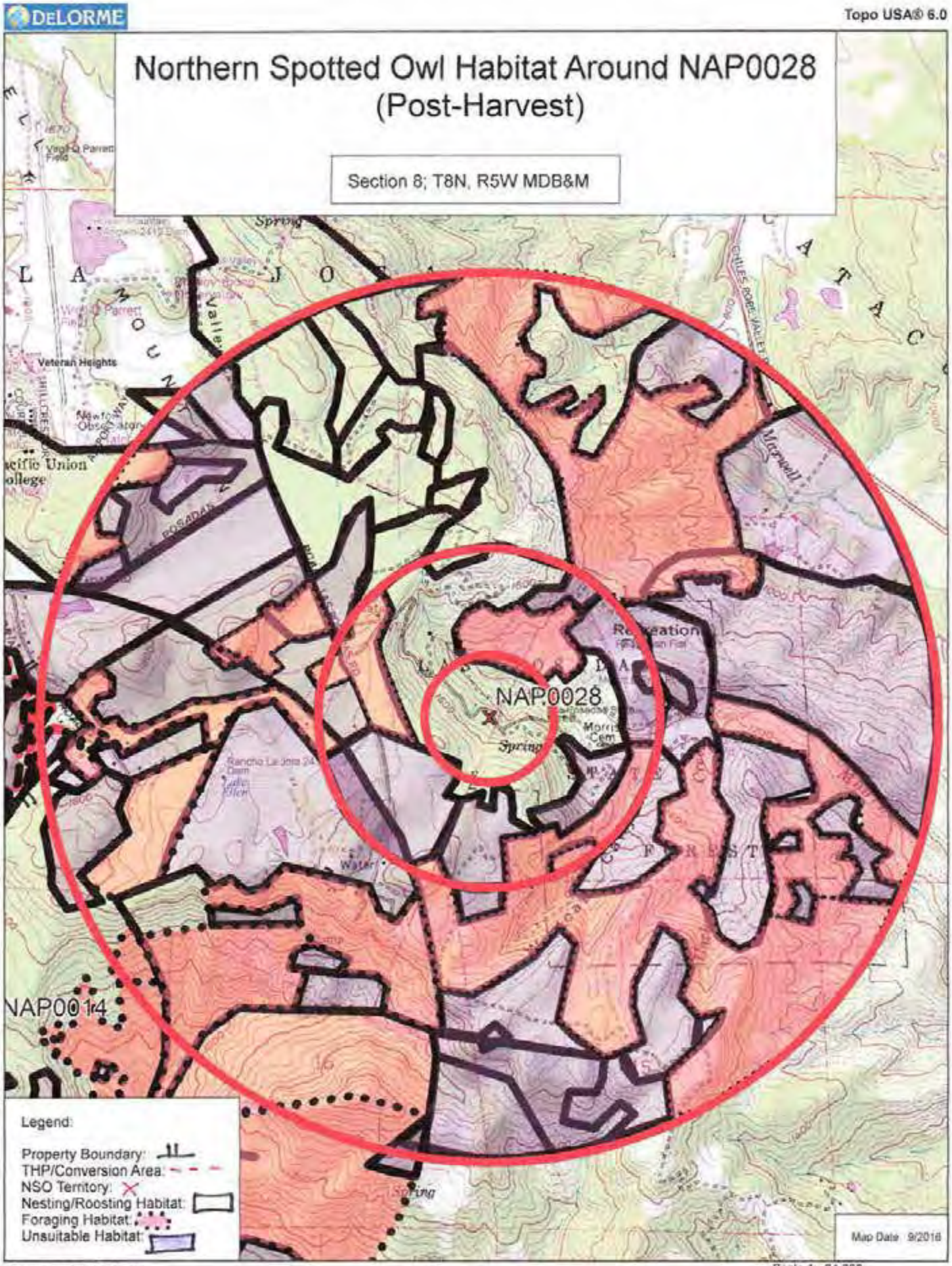
Scale 1 : 24,000
1" = 2,000.0 ft
Data Zoom 13-1


DeLORME
Topo USA® 6.0
Northern Spotted Owl Habitat Around NAP0028
(Post-Harvest)
Section 8; T8N, R5W MDB&M
NAP0028
NAP0014
Veteran Heights
Legend:
Property Boundary:
THP/Conversion Area:
NSO Territory:
Nesting/Roosting Habitat:
Foraging Habitat:
Unsuitable Habitat:
Map Date 9/2016
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Scale 1 : 24,000
1" = 2,000.0 ft
Data Zoom 13-1

APPENDIX Q

BAT HABITAT ASSESSMENT MEMORANDUM

TECHNICAL MEMORANDUM

TO:	Dave DiCesaris
FROM:	Pete Bontadelli
PROJECT:	Le Colline Vineyard Conversion Project
SUBJECT:	Bat Surveys
DATE:	June 23, 2017

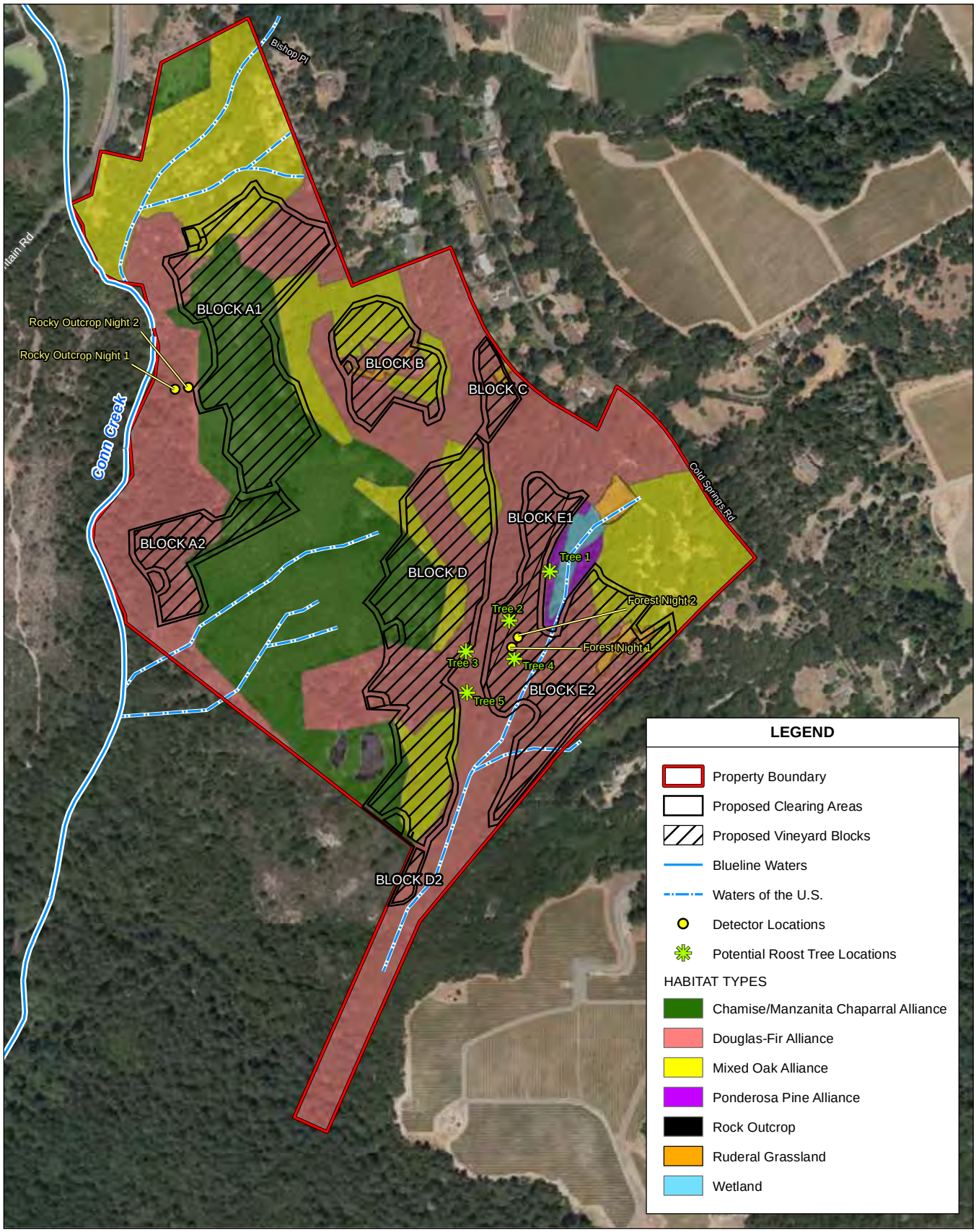
INTRODUCTION

The purpose of this memorandum is to document the results of the acoustic bat survey conducted from September 2 through 4, 2015 at the Le Colline Vineyard Conversion Project site located at 115 Cold Springs Road, Angwin in Napa County, California. This memorandum describes survey methodologies and results, and provides recommendations consistent with protective measures for biological resources specified by federal and state regulatory agencies.

METHODOLOGY

Bat Habitat Assessment Survey

AES biologists Katelyn Peterson and Justin Demianew, along with Scott Butler, R.P.F. #1851, of Environmental Resource Management conducted a bat habitat assessment survey within the project site from June 24 to 25, 2015. The goal of this survey was to assess the project site for the potential to support regionally occurring special status bat species, including the pallid bat (*Antrozous pallidus*), a species of special concern, and Townsend's big-eared bat (*Corynorhinus townsendii*), a candidate species for listing as threatened. The biological field surveys consisted of Ms. Peterson, Mr. Demianew, and Mr. Butler walking on foot meandering transects throughout the property. The two areas identified as containing potential bat habitat included the rocky outcrops located on the western edge of the property limit west of Block A, and areas of Douglas Fir Alliance located east/southeast of the wetland (**Figure 1**). The rocky outcrops could provide roost habitat for bats in the cavities between the rocks, whereas the Douglas Fir Alliance contains potential bat roosts in the trees. Ms. Peterson and Mr. Demianew identified five large, mature trees that possessed exfoliating bark and/or cavities, all characteristics that could provide potential bat roosting habitat in the trees (**Figure 1**). The five trees were flagged at breast height and marked with a Trimble Geo XH® Global Positioning System (GPS) unit for future identification. The rocky outcrops were also marked with the Trimble GPS. **Table 1** describes each tree in detail. Based on the results of these habitat surveys, follow up acoustical surveys were conducted.



SOURCE: Kjeldsen Biological Consulting, 7/2015; Napa Valley Vineyard Engineering, Inc., 2015; Napa County Orthophoto, 2014; AES, 9/15/2015

Figure 1
Bat Survey

TABLE 1
POTENTIAL ROOST TREES IDENTIFIED IN THE DOUGLAS FIR ALLIANCE AREA

Tree Number	Species	Description	Scheduled for Removal?
1	Douglas fir (*Pseudotsuga menziesii*)	This tree is an approximately 12 foot tall snag that has furrows on the northeast side of the tree running the entire height.	**No**. Just outside of Block E1. Construction may disturb.
2	Douglas fir	This tree has a large hallow approximately 15 foot from the base of the tree where a limb ripped out and fell. This hollow faces southeast.	**Yes.** Contained within Block E1.
3	One Douglas fir; One Unknown tree species	Tree point 3 describes one Douglas fir and one unknown tree both with cavities and loose bark.	**Yes.** Contained within Block D.
4	Black oak (*Quercus velutina*)	This tree has cavities in the broken limbs as well as loose bark. There is also a bee hive in it approximately 15 foot up from the base.	**Yes.** Contained within Block E2.
5	Ponderosa pine (*Pinus ponderosa*)	This tree is a snag with larger and longer cavities that the other potential roost trees. There are no remaining branches.	**No**. Located between Blocks D and E. Construction may disturb.

Acoustic Bat Survey and Sunset Fly-out Survey

AES biologists Katelyn Peterson and Nicholas Bonzey conducted an acoustic bat survey within the project site from September 2 through 4, 2015. The surveys consisted of two nights of focused bat acoustic surveys and nighttime sunset fly-out surveys. The goal of these surveys was to further assess the project site for the potential to support roosting habitat for these regionally occurring special status bat species. During the daytime hours on September 2 and 3, Ms. Peterson and Mr. Bonzey evaluated both the rocky outcrop area and the Douglas Fir Alliance area to determine the best locations to place the acoustic detector. Both the rocky outcrop area and the Douglas Fir Alliance area had a SM3BAT monitor (including the SMM-U1 microphone, and windscreen) placed at optimal locations to record bat species present in the area (**Figure 1**). The photos in **Figure 2** show the setups for the monitors with the SMM-U1 microphones extending from the SM3BAT monitor located in the ammo box. Each monitor was set to record from 15 minutes before sunset to 30 minutes before sunrise. Recordings were then analyzed using the SonoBat 3.2.2 US West software and manually vetted to determine which species were recorded. Additionally, Ms. Peterson and Mr. Bonzey performed sunset fly-out surveys on September 2 for the rocky outcrop area and September 3 for the Douglas Fir Alliance Area. These survey consisted of observing the rocky outcrops/potential roost trees, and surrounding areas prior to and after sunset to evaluate if any bats could be roosting in these locations.

RESULTS

Sunset Fly-out Survey

The sunset fly-out survey on September 2 identified one bat in the area immediately adjacent to the largest rocky outcrop; the acoustic data later confirmed this bat to be a California myotis (*Myotis californicus*). It was unclear if this bat emerged from a roost in the rocky outcrop, but its presence was confirmed at the base of the rocky outcrop. Additionally, Mr. Bonzey and Ms. Peterson both observed

PHOTO 1: Detector set up on September 2, 2015 above the rocky outcrop.

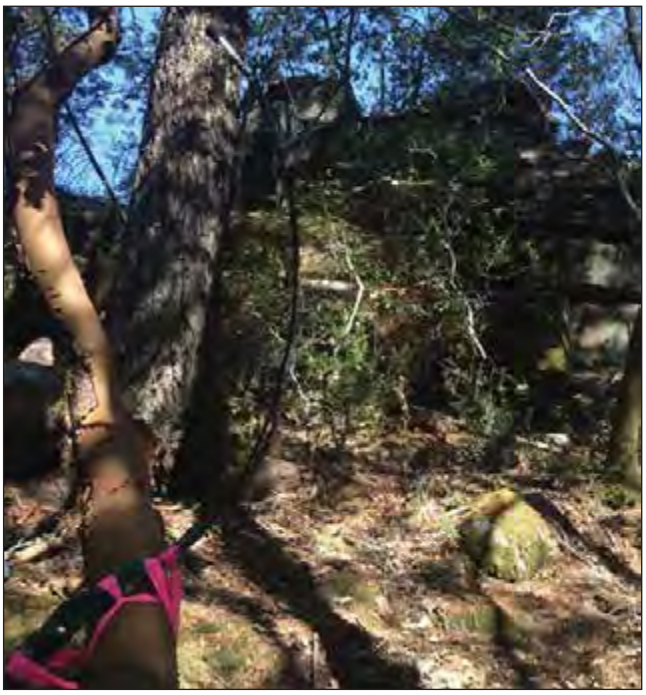


PHOTO 2: Detector set up on September 3, 2015 facing the rocky outcrop.

PHOTO 3: -Detector set up on September 2, 2015 in the Douglas Fir Alliance area.

PHOTO 4: Detector set up on September 3, 2015 in the Douglas Fir Alliance area.

SOURCE: AES, 9/15/2015

Figure 2
Site Photographs

bats flying in the trees at the top of the rocky outcrop and along Conn Creek, east of the rocky outcrop. Thus, while this survey failed to confirm or deny roost presence, it did confirm the presence of bats in the immediate vicinity of the rocky outcrop around sunset when the bats could be emerging from roosts.

The sunset fly-out survey on September 3 at the Douglas Fir Alliance location was less conclusive. As the forested area provided less contrast between the sky and the trees due to tree density, bats were a lot more difficult to decipher against the background. Both Mr. Bonzey and Ms. Peterson believe they saw bats flying in the tree canopy but their confidence in these sightings was less that at the previous site. Thus, this survey failed to confirm or deny the presence of bats emerging from roosts.

Acoustic Bat Survey

At the rocky outcrop area, the bat acoustic surveys detected the presence of several bat species including: Townsend's big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), California myotis (*Myotis californicus*), long-eared myotis (*Myotis evotis*), fringed myotis (*Myotis thysanodes*), Yuma myotis (*Myotis yumanensis*), and Mexican free-tailed bat (*Tadarida brasiliensis*).

At the Douglas Fir Alliance area, the bat acoustic surveys detected the presence of several bat species including: pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), California myotis (*Myotis californicus*), fringed myotis (*Myotis thysanodes*), and Yuma myotis (*Myotis yumanensis*).

RECOMMENDATIONS FOR IMPACT AVOIDANCE

Recommendations for the Rocky Outcrop Area

The rocky outcrops on the western edge of the property could provide roost habitat for one protected bat species; the pallid bat (*Antrozous pallidus*), which is listed as a species of special concern (SSC) by the California Department of Fish and Wildlife (CDFW). The nearest recorded occurrences of the pallid bat are approximately 1.5 to 2 miles away occurring both northwest and southwest of the project site (CDFW, 2015).

The initial bat habitat assessment found that the rocky outcrop area has low probability to support roosts for the Townsend's big-eared bat as this species uses cave analogs and other man-made structures, with the roost entrance average being a minimum of 6 inches tall and 12 inches wide (Pierson and Rainey, 1998). Therefore, the likelihood of this species to roost within the project boundaries is low to nonexistent. However, the acoustic monitoring surveys did record the presence of Townsend's big-eared bats (calls identified using SonoBat 3.2.2 software) near the rocky outcrop. This finding indicates that this species forages within the project site but does not indicate that it roosts within the project site.

This habitat could support pallid bat roosts as this species can utilize smaller entrances to roost sites, and because they can also roost under exfoliating bark. However, the acoustic monitoring surveys did not record the presence of pallid bats near the rocky outcrop. As a precautionary measure, because of the potential presence of this species nearby and with the acoustic monitoring, it is recommended that biologists preform one preconstruction sunset fly-out survey and one acoustic bat survey prior to

construction occurring within 200 feet to ensure no potential roosting pallid bats are disturbed. If bats are found to be using the site as a roost, and pallid bat calls are recorded during the preconstruction survey, CDFW should be contacted about confirming the identity of the roosting species and about protecting the roost site. If however, the surveys again do not document bat emergence from the rocky outcrop, potential impacts to this species should be drastically reduced to no or minimal impact. If these surveys are performed prior to construction and bats are not observed emerging from the rocky outcrop, impacts to the pallid bat would be reduced to less-than significant levels.

Recommendations for the Douglas Fir Alliance (Forest) Area

The Douglas Fir Alliance (forest) area could support the Townsend's big-eared bat and the pallid bat. This habitat could support pallid bat roosts as this species can roost under the exfoliating bark present on some of the trees in the Douglas Fir Alliance area. The acoustic monitoring surveys did record the presence of pallid and Townsend's big-eared bats, although the identified calls were not of the best quality. This finding indicates that these species may roost within this area of the project site. As the previous sunset fly-out surveys indicated, the characteristics of this habitat make identifying emerging bats extremely difficult. As a precautionary measure to ensure no roosting pallid or Townsend's big-eared bats are harmed by the timber harvest in this area, it is recommended that biologists preform one preconstruction sunset fly-out survey and one acoustic bat survey prior to construction occurring within 200 feet to ensure no potential roosting pallid or Townsend's big-eared bats are disturbed. To improve accurate detection of bat species recording devices will be setup closer to potential roosting areas and microphones will be placed at higher elevations for better sonar detection (SonoBat, 2016).

If bats are found to be using the site as a roost, and additional calls or pallid or Townsend's big-eared bats are recorded during the preconstruction survey, CDFW should be contacted about confirming the identity of the roosting species and about protecting the roost site. If however, the surveys do not document bat emergence, potential impacts to these species should be drastically reduced to no or minimal impact. If these surveys are performed prior to construction and bats are not observed emerging from the Douglas Fir Alliance, impacts to the pallid and Townsend's big-eared bat would be reduced to less-than significant levels.

In addition, if any of the five trees identified as potential roost trees will be removed as part of the Proposed Project they should be removed over the course of two days. On the first day, some limbs may be removed (if there are any remaining) as well as other nearby trees not flagged as potential bat roosting habitat as late in the day as possible. This amount of disturbance should cause any roosting bats to find another roost during their nighttime foraging. As the potentially roosting bats will have left over the course of the night, the rest of the tree can be harvested on the second day as late in the day as possible. It is also recommended that biologist with bat identification skills and an up-to-date rabies vaccine be present for the removal of these trees in the event that any bats are found to have been roosting. This will allow the biologist to collect any injured bats and identify if they are a special status species. If any special status bats are injured during the timber harvest, CDFW will be notified immediately to consult regarding the next steps. With the recommendations provided above, impacts to the pallid bat should be reduced to less-than significant.

The initial bat habitat assessment found that the Douglas Fir Alliance area did not contain ideal roost habitat for the Townsend's big-eared bat, as this species uses cave analogs and other man-made

structures, with an average roost entrance being a minimum of 6 inches tall and 12 inches wide. However, the acoustic monitoring surveys did record the presence of pallid and Townsend's big-eared bats (calls identified using SonoBat 3.2.2 software) in the Douglas Fir Alliance area. This finding indicates that these species forage within the project site. The above precautionary measure of performing preconstruction surveys and removing the flagged trees over two days and as late in the day as possible will further ensure that there will be no impacts to the pallid or Townsend's big-eared bat in the Douglas Fir Alliance area.

REFERENCES

Pierson, E.D., and W.E. Rainey, 1998. Distribution, Status, and Management of Townsend's Big-eared Bat (*Corynorhinus townsendii*) in California. California Department of Fish and Wildlife, Wildlife Management Division, Bird and Mammal Conservation Program. BMCP Technical Report Number 96-7. Accessed online: http://www.dfg.ca.gov/wildlife/nongame/publications/bm_research/docs/96_07.pdf

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APPENDIX R

WATER QUALITY MONITORING PROGRAM

EXHIBIT NO. 1

Sampling and Analyses Plan for Le Colline LLC Vineyard Conversion Project

In order for the property owner of the Le Colline LLC Vineyard Conversion (P14-00410-ECPA) Project "Project" to provide water quality information to City of Napa ("City") regarding water supply in Lake Hennessey, samples of the adjacent Conn Creek shall be analyzed both upstream and downstream of the Project outfalls as described below.

At owner's expense, the samples shall be analyzed at minimum for the following parameters:

Stream discharge	Total Kjeldahl nitrogen (organic N + ammonia + ammonium)
Water temperature	Soluble Kjeldahl nitrogen
Air temperature	Nitrate + nitrite
Specific conductance	Ammonia, Ammonium
Dissolved Oxygen	Total phosphorus
Turbidity	Orthophosphate
	Total organic carbon
	Dissolved organic carbon
	Total suspended solids
	Total dissolved solids
	Total volatile suspended solids
	Carbonaceous biochemical oxygen demand (CBOD5)
	Sulfate
	Chloride
	Total hardness
	Alkalinity
	Calcium
	Pesticides and Herbicides*

* If pesticides or herbicides are applied on the site, then one sample above and below the Project site will be taken and analyzed for pesticides/herbicides following the first rain event during the winter. The sampling will be representative of a readily-identifiable constituent of the pesticide/herbicide applications. If no pesticides nor herbicides are applied, then analyses for said constituents are not required.

Frequency. One sample event indicates a sample is gathered at both the upstream and downstream locations. Samples shall be collected as follows:

- Within the first 48 hours after the first significant rain event of the wet season (Oct 1 – April 30.)
- Within 48 hours of at least one major storm event. A major event is defined as 1-inch or more of rain within a 24-hour period.
- Once every two months (bimonthly) for the rainy period from Dec 1 – May 1 (so long as creek flow is sufficient to grab a sample.) The two samples described above may qualify as a bimonthly sample event.

Sampling and analysis required by this plan shall commence when construction activities begin and shall end 2 years after all improvements and plantings have been completed. Upon completion of sampling and analysis requirements, the owner shall grant the City- a right of entry to the sampling sites to allow the City to continue using the sites to monitor water quality long term.

Location. Upstream of the project site and downstream of the outfall and runoff area of the project site. See Exhibit A for sampling locations. Sampling locations identified in Exhibit A shall not change unless agreed to by both the City and the property owner.

Sampling and Analysis.
Sampling and analysis shall be performed by either City staff or through a third-party entity under contract with the City. Owner shall pay all costs of sampling and analysis and shall enter into a contract with the City to establish payment terms and conditions. Owner and City shall coordinate sampling events and property access, including reasonable advanced notice to owner prior to accessing the property. Owner shall provide free and clear access to sampling sites as agreed upon with the City. Analyses must be performed at an ELAP-certified laboratory and include the chain of custody. Results shall be provided to owner within 30 days of samples being gathered.

Corrective Actions. If analyses indicate constituents are elevated downstream of the Project when compared to upstream, the owner shall examine the BMPs it is implementing to control discharge of constituents from the Project site. They shall try to identify the actual or suspected cause of the elevated constituent(s) and shall either modify relevant BMPs or add one or more new BMPs in order to eliminate the cause of the elevated constituent(s). Owner shall make every effort to complete the BMP review within 72 hours of notification of the elevated constituent.

Owner shall provide the City Water Division with a Corrective Action Memorandum describing its BMP review and modification(s) within 30 days after receiving a sample test result with elevated constituent(s). Sampling and analyses will be extended until consecutive annual sets of monitoring data show no elevated levels of constituents.

If unexpected site discharge due to over irrigation, production of agricultural tailwater or site run-off caused for any reason other than natural rainfall is observed in otherwise dry/non-discharge period (typically May – October), immediate monitoring of such discharge must commence.