

MEMORANDUM

Date: November 10, 2022

To: Patrick Ryan, Napa County Planning, Building, and Environmental Services

From: Matthew S. Bueno, P.E.
Rachel L. Rosasco, E.I.T.

Re: Dry Creek Vineyard Track I ECP
APN 027-070-036
Soil Loss Analysis

This memo transmits the findings of a soil loss modeling analysis for the above-referenced Track I Erosion Control Plan (ECP). The Universal Soil Loss Equation (USLE) was used to predict pre-project and post-project soil loss from within the proposed vineyard development areas. A combination of topographic maps, aerial imagery, and a site visit were used to determine pre-project transect locations, slopes, and cover values. Pre-project and post-project cover values are consistent with the United States Department of Agriculture (USDA) – Natural Resource Conservation Service (NRCS) publication titled “The Universal Soil Loss Equation Special Applications for Napa County, California” (May 1994).

A site visit was conducted on April 26, 2022 by PPI Engineering staff to determine the pre-project cover values for each block and/or transect area. All proposed development areas were inspected, and the cover values used in this analysis represent existing conditions at the time of the site visit. Post-project cover values were calculated using the percent cover specified in the ECP. This analysis is limited to the proposed vineyard areas as well as vineyard avenues (1.7 gross acres).

The model, summarized on page 2 of the supporting documents (attached), predicts a net decrease of approximately 6.7 tons of soil loss per year for the project as a whole. The ECP has been designed to ensure compliance with Napa County policies requiring no-net-increase in soil loss for post-project conditions. Please see the following supporting documents that contain data tables, calculations, maps of transect locations, and results from the analysis.

Dry Creek Vineyard Track I ECP
USLE Calculation Sheets

Dry Creek Vineyard Track I ECP
USLE Calculations
PPI Engineering
11/10/2022
RR

USLE Calculations - Block Summary Sheet

Proposed Block	Proposed Development Acres	Pre-Project Soil Loss (tons/year)	Post-Project Soil Loss (tons/year)	Net Increase/Decrease (tons/year)
A	1.66	10.33	3.64	6.68
Totals	1.66	10.33	3.64	6.68

Note: Individual estimates may not add to the totals due to rounding

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USLE Calculations - Transect Summary Sheet

Proposed Block Transect	Proposed Development Acres	Pre-Project Soil Loss (tons/year)	Post-Project Soil Loss (tons/year)	Net Increase/Decrease (tons/year)
A1	1.16	7.79	2.75	5.04
A2	0.51	2.53	0.89	1.64
Totals	1.66	10.33	3.64	6.68

Note: Individual estimates may not add to the totals due to rounding

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Pre-Project Block A, Transect A1

Proposed Development Acres:	1.16		
Soils Present:			
Soil Unit No. (100-182):	107		CmEsn
Soil Name:	Boomer		Cohasset
R, Rainfall:	110		
Total Transect Length (ft):	340		
Number of Segments:	3		
Individual Segment Lengths (ft):	113		
Segment:	1	2	3
Segment Soil:	107	CmEsn	CmEsn
K, Soil Erodibility:	0.32	0.1	0.1
T, Soil Loss Tolerance (tons/acre):	4	4	4
Gradient (%):	30	29	19
m:			
Individual LS:	10.83	10.38	5.99
Factor:	0.19	0.35	0.46
Indiivudal K*(LS)*Factor:	0.66	0.36	0.28
Sum K*LS:	1.30		
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6) ¹ :	1.00		
Vegetative Canopy:	No Canopy		
Canopy Cover:	0%		
Ground Cover:	70%		
Percent Grass:	50%		
Percent Weeds:	50%		
C, Cover (Table 5) ¹ :	0.047		
A, Soil Loss (tons/acre):	6.74		
Soil Loss in Proposed Development (tons) ² :	7.79		

¹ Tables 5 & 6 - USLE Special Applications for Napa County

² Estimates may vary slightly due to rounding

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Post-Project Block A, Transect A1

Proposed Development Acres:	1.16		
Soils Present:			
Soil Unit No. (100-182):	107		CmEsn
Soil Name:	Boomer		Cohasset
R, Rainfall:	110		
Total Transect Length (ft):	340		
Number of Segments:	3		
Individual Segment Lengths (ft):	113		
Segment:	1	2	3
Segment Soil:	107	CmEsn	CmEsn
K, Soil Erodibility:	0.32	0.1	0.1
T, Soil Loss Tolerance (tons/acre):	4	4	4
Gradient (%):	30	29	19
m:			
Individual LS:	10.83	10.38	5.99
Factor:	0.19	0.35	0.46
Individual K*(LS)*Factor:	0.66	0.36	0.28
Sum K*LS:	1.30		
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6) ¹ :	1.00		
Cover Strategy:	Permanent		
Age of Development:	Over 3 Years		
Ground Cover:	85%		
C, Cover (Table 4) ¹ :	0.017		
A, Soil Loss (tons/acre):	2.38		
Soil Loss in Proposed Development (tons) ² :	2.75		

¹ Tables 5 & 6 - USLE Special Applications for Napa County

² Estimates may vary slightly due to rounding

Dry Creek Vineyard Track I ECP
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Pre-Project Block A, Transect A2

Proposed Development Acres:	0.51				
Soils Present:					
Soil Unit No. (100-182):	107			CmEsn	
Soil Name:	Boomer			Cohasset	
R, Rainfall:	110				
Total Transect Length (ft):	208				
Number of Segments:	5				
Individual Segment Lengths (ft):	42				
Segment:	1	2	3	4	5
Segment Soil:	CmEsn	CmEsn	CmEsn	CmEsn	107
K, Soil Erodibility:	0.1	0.1	0.1	0.1	0.32
T, Soil Loss Tolerance (tons/acre):	4	4	4	4	4
Gradient (%):	17	20	29	28	21
m:					
Individual LS:	4.04	5.02	8.12	7.77	5.35
Factor:	0.09	0.16	0.21	0.25	0.28
Indiivudal K*(LS)*Factor:	0.04	0.08	0.17	0.19	0.48
Sum K*LS:	0.96				
Farming Practice:	Up & Down Hill				
P, Practice Factor (Table 6) ¹ :	1.00				
Vegetative Canopy:	No Canopy				
Canopy Cover:	0%				
Ground Cover:	70%				
Percent Grass:	50%				
Percent Weeds:	50%				
C, Cover (Table 5) ¹ :	0.047				
A, Soil Loss (tons/acre):	4.99				
Soil Loss in Proposed Development (tons) ² :	2.53				

¹ Tables 5 & 6 - USLE Special Applications for Napa County

² Estimates may vary slightly due to rounding

Dry Creek Vineyard Track I ECP
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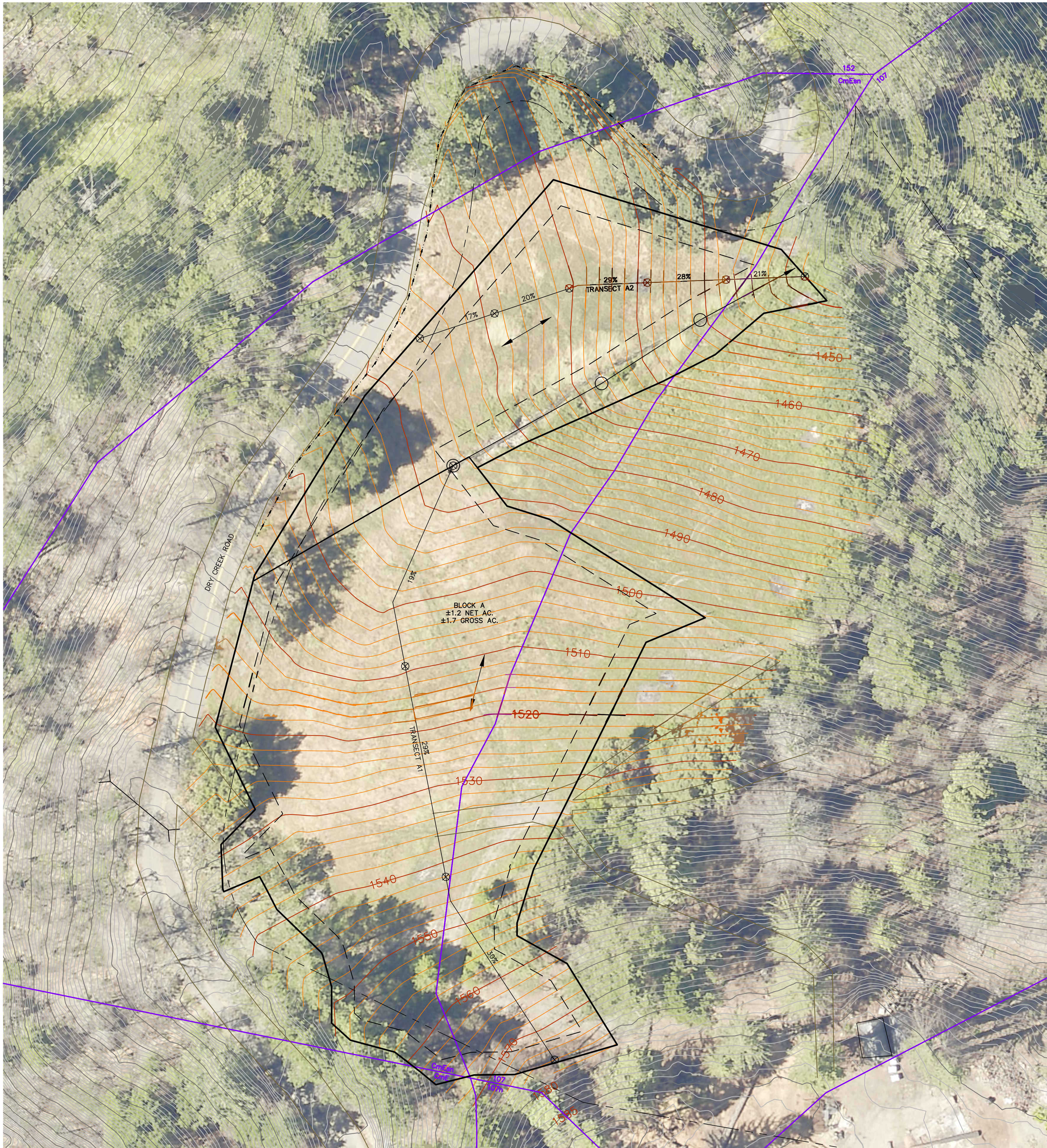
Post-Project Block A, Transect A2

Proposed Development Acres:	0.51				
Soils Present:					
Soil Unit No. (100-182):	107		CmEsn		
Soil Name:	Boomer		Cohasset		
R, Rainfall:	110				
Total Transect Length (ft):	208				
Number of Segments:	5				
Individual Segment Lengths (ft):	42				
Segment:	1	2	3	4	5
Segment Soil:	CmEsn	CmEsn	CmEsn	CmEsn	107
K, Soil Erodibility:	0.1	0.1	0.1	0.1	0.32
T, Soil Loss Tolerance (tons/acre):	4	4	4	4	4
Gradient (%):	17	20	29	28	21
m:					
Individual LS:	4.04	5.02	8.12	7.77	5.35
Factor:	0.09	0.16	0.21	0.25	0.28
Individual K*(LS)*Factor:	0.04	0.08	0.17	0.19	0.48
Sum K*LS:	0.96				
Farming Practice:	Up & Down Hill				
P, Practice Factor (Table 6) ² :	1.00				
Cover Strategy:	Permanent				
Age of Development:	Over 3 Years				
Ground Cover:	85%				
C, Cover (Table 4) ² :	0.017				
A, Soil Loss (tons/acre):	1.76				
Soil Loss in Proposed Development (tons) ³ :	0.89				

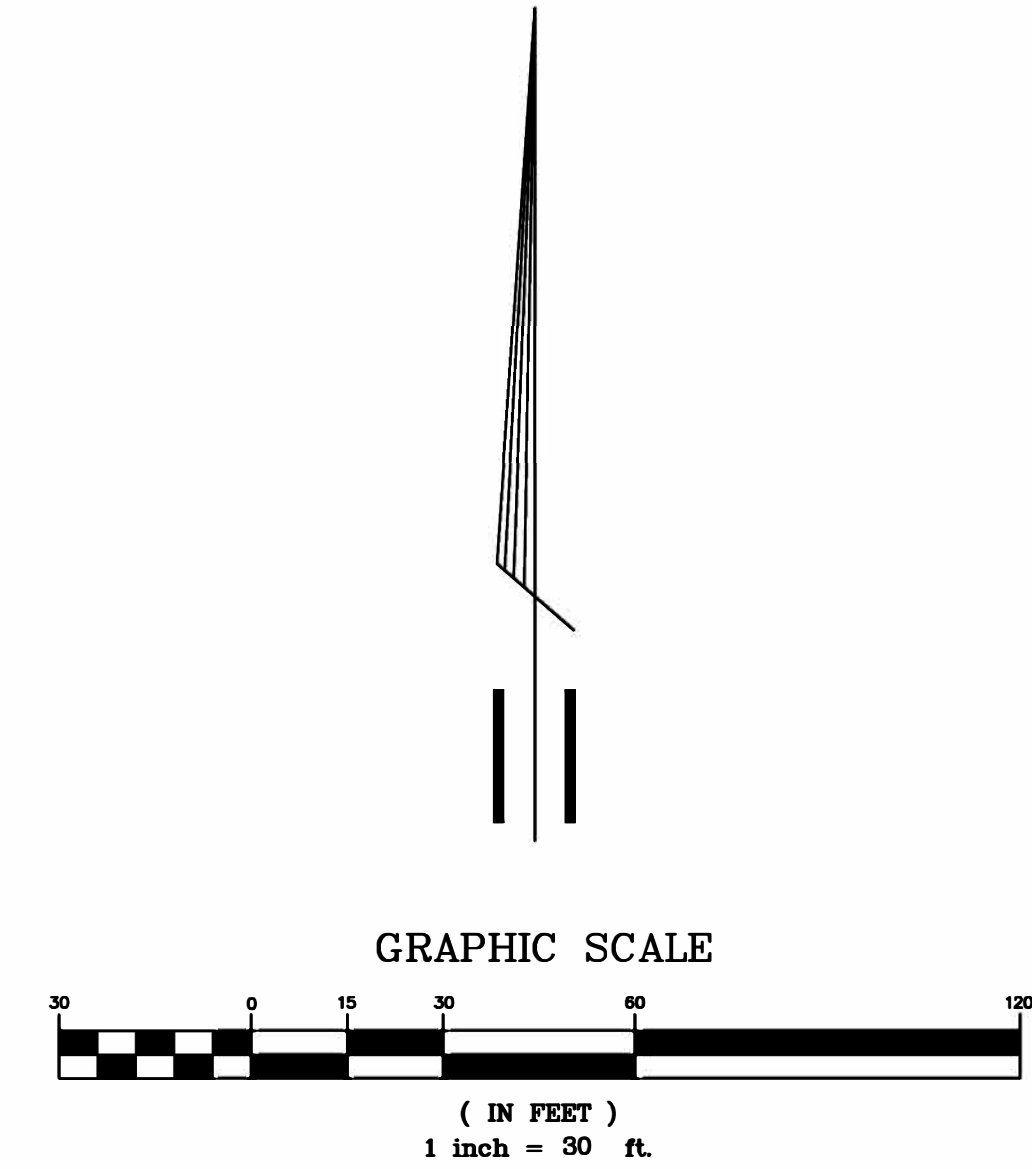
¹Boomer-Forward-Felta

² Tables 4 & 6 - USLE Special Applications for Napa County

³Estimates may vary slightly due to rounding



TOPOGRAPHIC MAPPING SOURCE: PPI ENGINEERING, 2' CONTOUR INTERVAL, DECEMBER 2021
SUPPLEMENTAL TOPOGRAPHIC MAPPING SOURCE: SONOMA COUNTY LIDAR-GENERATED CONTOURS, 1' CONTOUR INTERVAL, NOVEMBER 2013



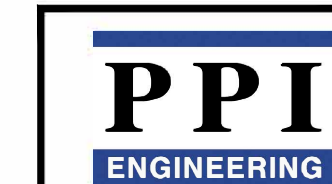
LEGEND

- PPI ENGINEERING INDEX CONTOUR
- PPI ENGINEERING INTERMEDIATE CONTOUR
- SONOMA COUNTY LIDAR-GENERATED INDEX CONTOUR
- SONOMA COUNTY LIDAR-GENERATED INTERMEDIATE CONTOUR
- EXISTING ROAD
- EXISTING BUILDING
- EXISTING SURFACE DRAINAGE LINE, APPROXIMATE LOCATION
- EXISTING DITCH, APPROXIMATE LOCATION
- EXISTING DROP INLET, APPROXIMATE LOCATION
- EXISTING CULVERT
- PROPOSED VINEYARD DEVELOPMENT AREA BY TRANSECT
- PROPOSED VINEYARD BLOCK BOUNDARY
- USLE TRANSECT SEGMENT WITH SLOPE
- PROPOSED VINEROW DIRECTION
- SOIL TYPE BOUNDARY

USDA SOIL CLASSIFICATIONS:

- 107 BOOMER LOAM, VOLCANIC BEDROCK, 2-35% SLOPE
- 107n BOOMER LOAM, 2-15% SLOPE
- 152 HAMBRIGHT ROCK-OUTCROP COMPLEX, 30-75% SLOPE
- CmE COHASSET GRAVELLY LOAM, 15-30% SLOPE
- CmEan COHASSET GRAVELLY LOAM, 15-30% SLOPE

DRY CREEK LLC DRY CREEK VINEYARD SOIL LOSS ANALYSIS SITE PLAN



2800 JEFFERSON STREET
NAPA, CA 94558
707/253-1808 FAX 707/253-1804

JOB NO: 12112001

DWG. NO: 12112001U

DESIGN ENGINEER:
M. BUENO, J. BUSHEY

SCALE: AS SHOWN

DRAWN BY: JCJ, SM

DATE: 11-10-22

SHEET: 1

OF: 1

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