



VINEYARD DESIGN  
EROSION CONTROL  
WATER DEVELOPMENT  
DRAINAGE  
PERMITTING  
GPS/GIS

2800 Jefferson Street  
Napa, California 94558  
707-253-1806  
www.ppiengineering.com

## MEMORANDUM

Date: November 9, 2018

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

From: James R. Bushey, P.E.  
Cody J. Corsetti, P.E.

Cc: Brian Bordona, Napa County Planning, Building and Environmental Services

Re: Three Twins Vineyard Track I ECP  
APN 025-380-017  
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 August 2, 2018 by Cody Corsetti of PPI Engineering to determine the pre-project cover values for each transect area. The entire proposed development area was 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 area as well as vineyard avenues (2.5 gross acres).

The model, summarized on page 1 of Attachment A, predicts a net decrease of approximately 14.7 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-increases in soil loss for post-project conditions. Please see the following supporting documents that contain data tables, calculations, photos, maps of transect locations, and results from the analysis.



# **ATTACHMENT A**

## **USLE CALCULATIONS**

Three Twins LLC Track I ECP  
USLE Calculations Summary Sheet  
PPI Engineering  
11/9/2018  
CC

**USLE Calculations - Transect Summary Sheet**

Transect	Proposed Development Acres	Pre-Project Soil Loss (tons/year)	Post-Project Soil Loss (tons/year)	Net Increase/Decrease (tons/year)
1A	0.54	4.68	2.22	2.47
1B	1.93	16.46	4.25	12.21
<b>Totals</b>	2.47	21.14	6.47	14.67

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

Three Twins LLC Track I ECP  
 USLE Calculations **Pre-Project**  
 PPI Engineering  
 11/9/2018  
 CC

## Block 1, Transect 1A

---

Proposed Development Acres:	0.54		
Soil Unit No. (100-182):	179		
Soil Name:	Sobranite		
K, Soil Erodibility:	0.32		
T, Soil Loss Tolerance (tons/acre):	2		
R, Rainfall:	90		
Total Transect Length (ft):	203		
Number of Segments:	3		
Individual Segment Lengths (ft):	68		
Segment:	1	2	3
Gradient (%):	12	24	30
m:			
Individual LS:	2.48	6.30	8.37
Factor:	0.19	0.35	0.46
Product:	0.47	2.20	3.85
LS, Length and Steepness:	6.52		
Total Transect Average Gradient (%):	22		
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6) <sup>1</sup> :	1.00		
Segmented C-Value			
Segment:	1	2	3
Vegetative Canopy:	No Canopy	Trees 13' Tall	Trees 13' Tall
Canopy Cover:	0%	75%	75%
Ground Cover:	65%	70%	70%
Percent Grass:	50%	50%	50%
Percent Weeds:	50%	50%	50%
C, Cover (Table 5) <sup>1</sup> :	0.057	0.044	0.044
Segment Factor:	0.19	0.35	0.46
Segmented C:	0.046		
A, Soil Loss (tons/acre):	8.73		
Soil Loss in Proposed Development (tons):	4.68		

<sup>1</sup> Tables 5 & 6 - USLE Special Applications for Napa County



Three Twins LLC Track I ECP  
 USLE Calculations **Post-Project**  
 PPI Engineering  
 11/9/2018  
 CC

## Block 1, Transect 1A

---

Proposed Development Acres:	0.54		
Soil Unit No. (100-182):	179		
Soil Name:	Sobranite		
K, Soil Erodibility:	0.32		
T, Soil Loss Tolerance (tons/acre):	2		
R, Rainfall:	90		
Total Transect Length (ft):	203		
Number of Segments:	3		
Individual Segment Lengths (ft):	68		
Segment:	1	2	3
Gradient (%):	12	24	30
m:			
Individual LS:	2.48	6.30	8.37
Factor:	0.19	0.35	0.46
Product:	0.47	2.20	3.85
LS, Length and Steepness:	6.52		
Total Transect Average Gradient (%):	22		
Farming Practice:	Up & Down Hill		
P, Practice Factor (Table 6) <sup>1</sup> :	1.00		
Cover Strategy:	Permanent		
Age of Development:	Over 3 Years		
Ground Cover:	80%		
C, Cover (Table 4) <sup>1</sup> :	0.022		
A, Soil Loss (tons/acre):	4.13		
Soil Loss in Proposed Development (tons):	2.22		

<sup>1</sup> Tables 4 & 6 - USLE Special Applications for Napa County

Three Twins LLC Track I ECP  
 USLE Calculations **Pre-Project**  
 PPI Engineering  
 11/9/2018  
 CC

## Block 1, Transect 1B

Proposed Development Acres:	1.93			
Soil Unit No. (100-182):	179			
Soil Name:	Sobranite			
K, Soil Erodibility:	0.32			
T, Soil Loss Tolerance (tons/acre):	2			
R, Rainfall:	90			
Total Transect Length (ft):	444			
Number of Segments:	4			
Individual Segment Lengths (ft):	111			
Segment:	1	2	3	4
Gradient (%):	14	23	16	14
m:				
Individual LS:	4.54	8.81	5.44	4.54
Factor:	0.12	0.23	0.30	0.35
Product:	0.54	2.03	1.63	1.59
LS, Length and Steepness:	5.79			
Total Transect Average Gradient (%):	17			
Farming Practice:	Up & Down Hill			
P, Practice Factor (Table 6) <sup>1</sup> :	1.00			
Segmented C-Value				
Segment:	1	2	3	
Vegetative Canopy:	No Canopy	Trees 13' Tall	No Canopy	
Canopy Cover:	0%	75%	0%	
Ground Cover:	65%	80%	60%	
Percent Grass:	50%	50%	50%	
Percent Weeds:	50%	50%	50%	
C, Cover (Table 5) <sup>1</sup> :	0.057	0.027	0.067	
Segment Factor:	0.19	0.35	0.46	
Segmented C:	0.051			
A, Soil Loss (tons/acre):	8.52			
Soil Loss in Proposed Development (tons):	16.46			

<sup>1</sup> Tables 5 & 6 - USLE Special Applications for Napa County

Three Twins LLC Track I ECP  
 USLE Calculations **Post-Project**  
 PPI Engineering  
 11/9/2018  
 CC

## Block 1, Transect 1B

Proposed Development Acres:	1.93			
Soil Unit No. (100-182):	179			
Soil Name:	Sobranite			
K, Soil Erodibility:	0.32			
T, Soil Loss Tolerance (tons/acre):	2			
R, Rainfall:	90			
Total Transect Length (ft):	444			
Number of Segments:	4			
Individual Segment Lengths (ft):	111			
Segment:	1	2	3	4
Gradient (%):	14	23	16	14
m:				
Individual LS:	4.54	8.81	5.44	4.54
Factor:	0.12	0.23	0.30	0.35
Product:	0.54	2.03	1.63	1.59
LS, Length and Steepness:	5.79			
Total Transect Average Gradient (%):	17			
Farming Practice:	Cross Slope With Strips			
P, Practice Factor (Table 6) <sup>1</sup> :	0.60			
Cover Strategy:	Permanent			
Age of Development:	Over 3 Years			
Ground Cover:	80%			
C, Cover (Table 4) <sup>1</sup> :	0.022			
A, Soil Loss (tons/acre):	2.20			
Soil Loss in Proposed Development (tons):	4.25			

<sup>1</sup> Tables 4 & 6 - USLE Special Applications for Napa County

Three Twins LLC Track I ECP  
 USLE Calculations  
 PPI Engineering  
 11/9/2018  
 CC

**SCS MAPPING UNIT**

#	K	T	SOIL NAME
100	0.24	3	Aiken
101	0.24	3	Aiken
102	0.24	3	Aiken
103	0.24	5	Bale
104	0.2	5	Bale
105	0.2	5	Bale
106	0.24	5	Bale
107	0.32	4	Boomer
108	0.15	4	Boomer
109	0.15	4	Boomer
110	0.28	4	Boomer-Forward-Felta
111	0.28	4	Boomer-Forward-Felta
112	0.43	3	Bressa-Dibble
113	0.43	3	Bressa-Dibble
114	0.43	3	Bressa-Dibble
115	0.43	3	Bressa-Dibble
116	0.17	5	Clear Lake
117	0.32	3	Clear Lake
118	0.43	5	Cole
119	0.43	5	Cole
120	0.37	3	Contra Costa
121	0.24	2	Contra Costa
122	0.2	4	Coombs
123	0.2	4	Coombs
124	0.15	2	Cortina
125	0.1	5	Cortina
126	0.2	5	Diablo
127	0.2	5	Diablo
128	0.2	5	Diablo
129	0.24	5	Diablo
130	0.32	5	Egbert
131	0.32	4	Fagan
132	0.32	4	Fagan
133	0.32	4	Fagan
134	0.32	4	Fagan
135	0.15	3	Felton
136	0.15	3	Felton
137	0.15	3	Felton
138	0.2	3	Forward

Three Twins LLC Track I ECP  
 USLE Calculations  
 PPI Engineering  
 11/9/2018  
 CC

**SCS MAPPING UNIT**

#	K	T	SOIL NAME
139	0.17	3	Forward
140	0.17	3	Forward
141	0.17	3	Forward-Kidd
142	0.37	2	Guenoc
143	0.37	2	Guenoc-Rock Outcrop
144	0.37	2	Guenoc-Rock Outcrop
145	0.32	4	Haire
146	0.32	4	Haire
147	0.28	4	Haire
148	0.28	4	Haire
149	0.28	4	Haire
150	0.28	4	Haire
151	0.1	1	Hambright-Rock Outcrop
152	0.1	1	Hambright-Rock Outcrop
153	0.1	1	Henneke
154	0.1	1	Henneke
155	0.28	2	Kidd
156	0.28	2	Kidd
157	0.24	1	Lodo-Maymen-Felton
158	0.28	2	Los Gatos
159	0.28	2	Los Gatos
160	0.28	2	Los Gatos
161	0.24	5	Maxwell
162	0.17	1	Maymen-Los Gatos
163	0.32	1	Maymen-Millsholm-Lodo
164	0.32	1	Millsholm
165	0.32	1	Millsholm
166	0.28	1	Montara
167	0.28	1	Montara
168	0.15	5	Perkins
169	0.15	5	Perkins
170	0.43	5	Pleasanton
171	0.28	4	Pleasanton
172	0.28	5	Reyes
173	0.28	5	Reyes
174	0.05	5	Riverwash
175		1	Rock Outcrop
176	0.28	1	Rock Outcrop-Hambright
177	0.28	1	Rock Outcrop-Kidd

Three Twins LLC Track I ECP  
USLE Calculations  
PPI Engineering  
11/9/2018  
CC

**SCS MAPPING UNIT**

#	K	T	SOIL NAME
178	0.32	2	Sobrante
179	0.32	2	Sobrante
180	0.55	5	Tehama
181	0.43	5	Yolo
182	0.43	5	Yolo

# **ATTACHMENT B**

## **PHOTOGRAPHIC DOCUMENTATION**





**Photo 1**

8/2/2018



**Photo 2**

8/2/18





**Photo 3**

8/2/2018



**Photo 4**

8/2/18





**Photo 5**

8/2/2018



**Photo 6**

8/2/18





**Photo 7**

8/2/2018



**Photo 8**

8/2/18

## **ATTACHMENT C**

USLE MAP



