

Moshkelani Family Vineyard, LLC
805 Greenfield Road
APN: 025-380-016 & 025-390-009
USLE - Analysis

Prepared by Napa Valley Vineyard Engineering, Inc

INTRODUCTION

Moshkelani Family Vineyards, LLC seeks approval of approximately 11.98 gross acres of proposed vineyard. The project lies within APN 025-380-016 & 025-390-009, two parcels totaling about 48.52 acres, located at 805 Greenfield Road, St. Helena.

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 Moshkelani Family Vineyards project are estimated to be, 38.5169° N, -122.3907° W, based on information obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Precipitation Frequency Data. The 2 year, 6 hour rainfall depth at the project site ranges from 1.73-inches to 2.22-inches. This analysis conservatively uses the high end of the range (2.22-inches), which equals an “R” value of 90. “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”). The SCS soil maps indicate that soils on the project site as:

SCS# 146, Haire loam - K value of 0.32

SCS# 179, Sobrante loam - K value of 0.32

“K” is constant in the pre-project and post-project models.

SLOPE LENGTH and STEEPNESS

Napa County GIS database 2002 contour mapping was used to determine slope steepness on the project site. The Slope lengths were selected to analyze the soil loss from the longest and steepest slopes in the blocks for the project area, as shown on the map included in the Appendix. The slope lengths and gradients for the blocks from the pre-project to the post-project models do not change and are identified on the map and in the USLE worksheets 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 for Blocks A Transect 1 consists of approximately 25% tree canopy with grass. The ground cover for this block is approximately 70% grass-like herbaceous plants (grassy) and 30% broadleaf herbaceous plants (woody), and covers approximately 80% of the area.

The existing site conditions for Block A Transect 2 consists of approximately 20% tree canopy with grass. The ground cover for this block is approximately 80% grass-like herbaceous plants (grassy) and 20% broadleaf herbaceous plants (woody), and covers approximately 70% of the area.

The existing site conditions for Block A Transect 3 consists of approximately 50% tree canopy with grass. The ground cover for this block is approximately 60% grass-like herbaceous plants (grassy) and 40% broadleaf herbaceous plants (woody), and covers approximately 70% of the area.

The existing site conditions for Blocks B consists of approximately 65% tree canopy with grass. The ground cover for this block is approximately 60% grass-like herbaceous plants (grassy) and 40% broadleaf herbaceous plants (woody), and covers approximately 70% of the area.

The existing site conditions for Block C consists of approximately 65% tree canopy with grass. The ground cover for this block is approximately 60% grass-like herbaceous plants (grassy) and 40% broadleaf herbaceous plants (woody), and covers approximately 60% of the area.

The existing site conditions for Block D consists of approximately 40% tree canopy with grass. The ground cover for this block is approximately 50% grass-like herbaceous plants (grassy) and 50% broadleaf herbaceous plants (woody), and covers approximately 70% of the area.

Post Project

The project proposes a “permanent non-till cover crop with strip spray cultivation scheme with no ripping or tillage” (refer to ECP narrative). Using the table in the guide, “USLE ‘C’ Factors for Vineyards”, the post-project C factor for a no till with strip spray assuming 75% ground cover (0.035).

PRACTICE FACTOR

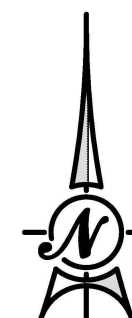
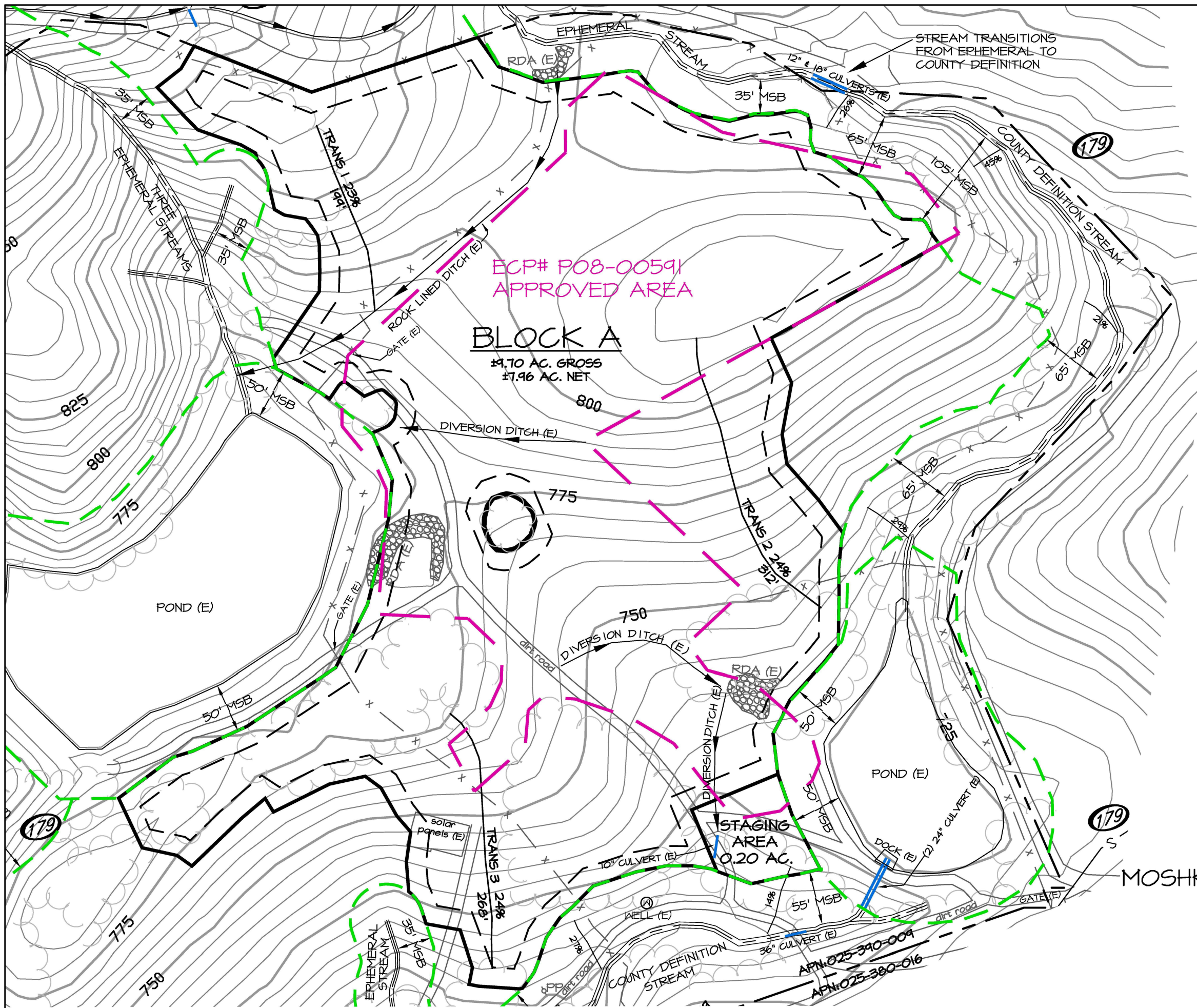
The accepted practice factor for the existing conditions is 1.0. Using the table in the guide, “P (“Practice”) Factors for USLE in Napa Valley Vineyards, the practice factor for vineyard rows running up and downhill is 1.0. The practice factor of 1.0 was used for post project conditions in all Blocks.

RESULTS, CONCLUSION

The pre-project and post-project modeling is presented with Appendix. A comparison of pre-project and post-project modeling shown:

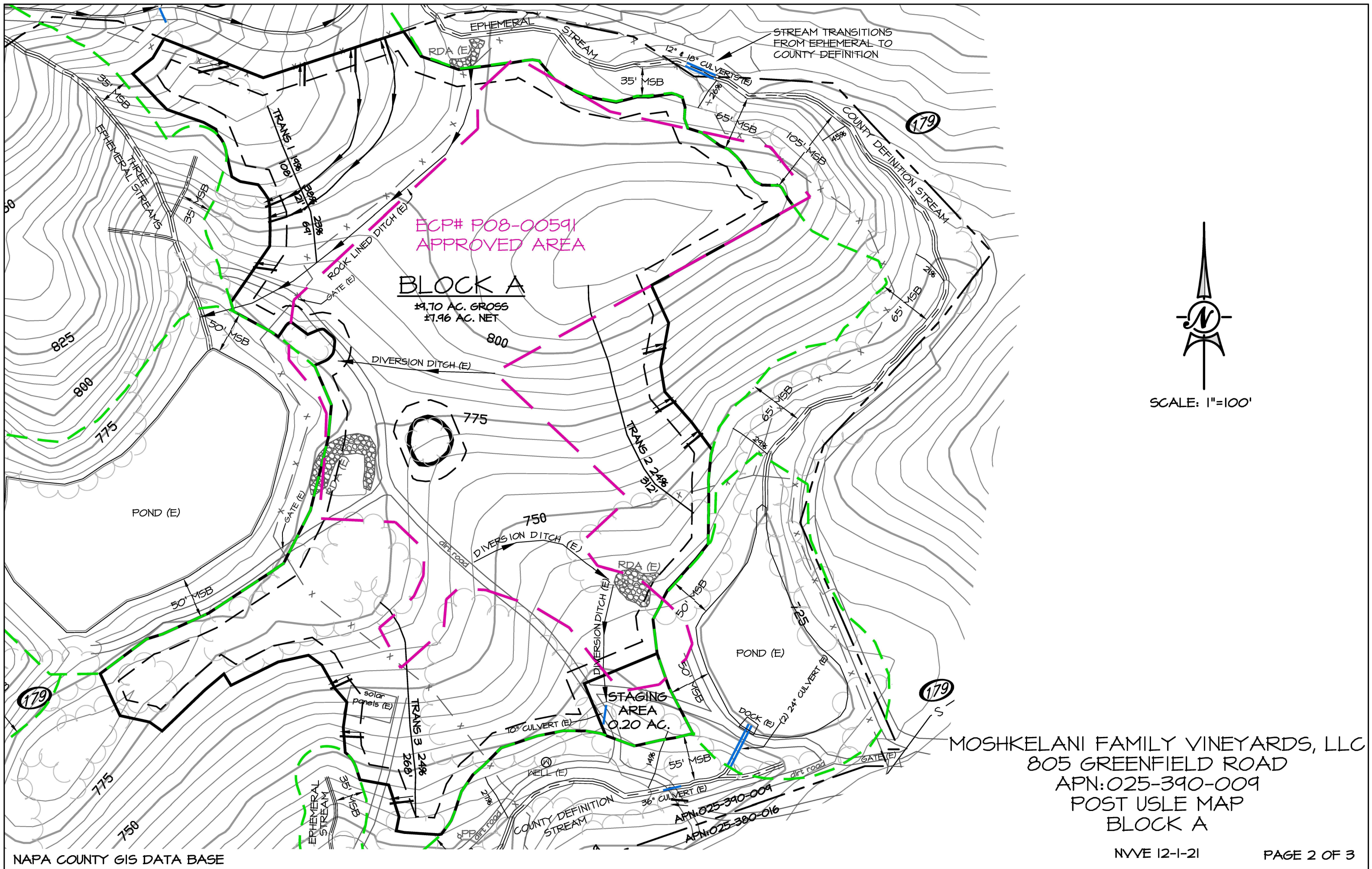
<u>Blocks</u>	<u>Soil Loss (tons/ac.)</u>	
	Pre Project	Post Project
A1	3.74	3.61
A2	7.87	7.87
A3	8.75	7.30
B	5.34	4.67
C	1.72	1.06
D	8.04	6.12

The analysis shows, in each case, that the estimated post-project soil loss is less than or equal to the pre-project condition, and that the proposed vineyard project will not result in increased soil loss.

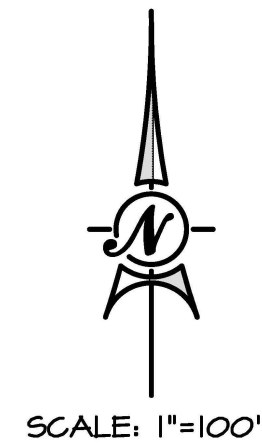
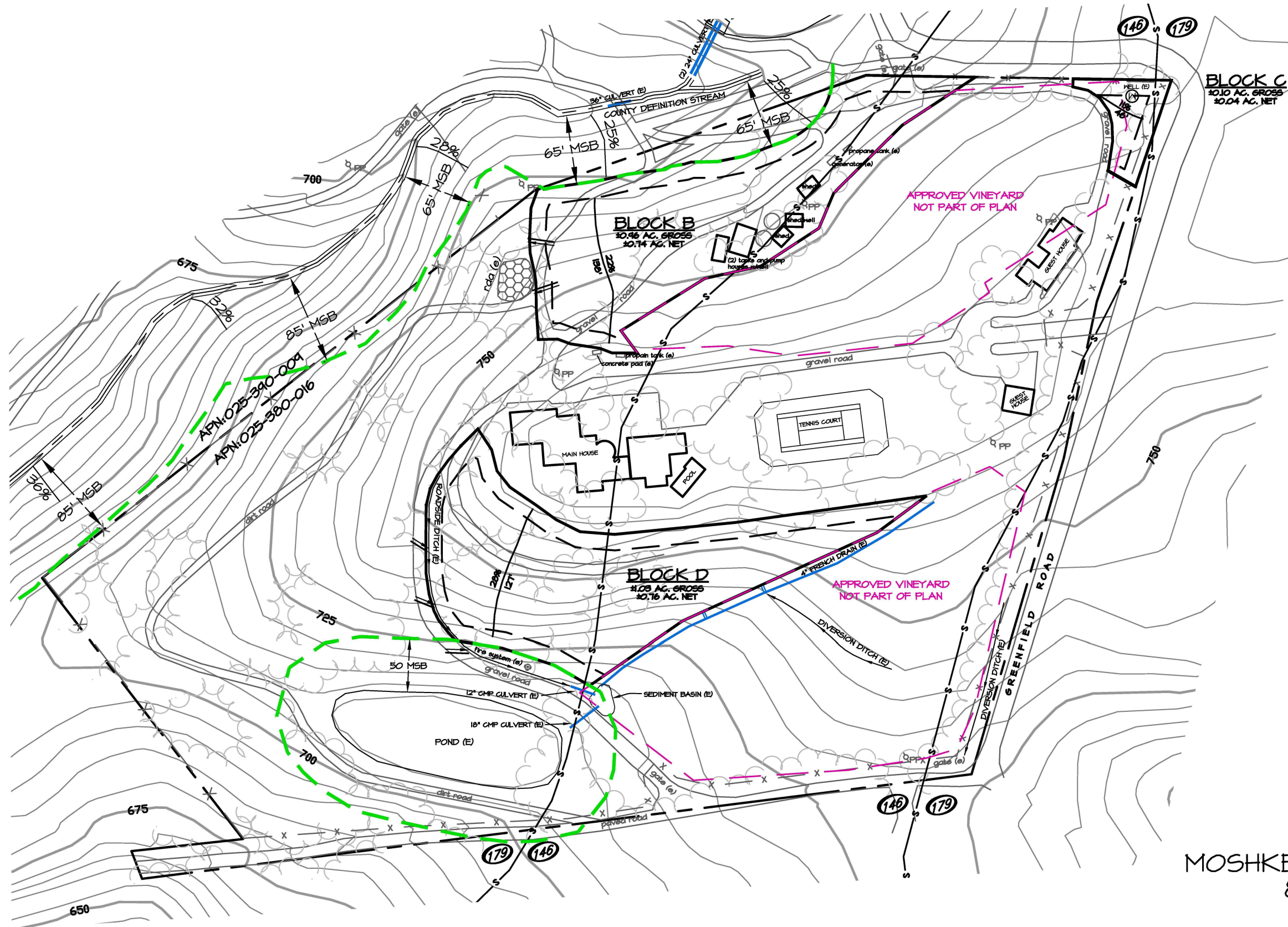


SCALE: 1"=100'

MOSHKELANI FAMILY VINEYARDS, LLC
805 GREENFIELD ROAD
APN: 025-390-009
PRE USLE MAP
BLOCK A



MOSHKELANI FAMILY VINEYARDS, LLC
805 GREENFIELD ROAD
APN:025-390-009
POST USLE MAP
BLOCK A



MOSHKELANI FAMILY VINEYARDS, LLC
 805 GREENFIELD ROAD
 APN: 025-380-016
 PRE & POST USLE MAP
 BLOCKS B, C, & D

		Napa Valley Vineyard Engineering								Page 1 of 4	
		Pre Project - USLE Worksheet									
FOR:	Moshkelani Family Vineyards, LLC										
DATE:	12/1/2021										
		Ranch: 805 Greenfield Road (025-390-009)									
		SOIL TYPE: 146		179							
		T= 4		2							
		Soil = 179		Soil = 179		Soil = 179					
		Transect 1		Transect 2		Transect 3					
# /ACRES:		1.00	Block A	1.00	Block A	1.00	Block A				
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	90		90		90					
K	Soil Erosiveness	0.32		0.32		0.32					
	Slope length (ft)	199		312		268					
S	Gradient	23.0		24.0		24.0					
LS	Calculated LS	5.90		7.81		7.24		0.00		0.00	
C	Cover	0.022	(1)	0.035	(2)	0.042	(3)				
P	Practice	1		1		1					
A	Soil loss, tons/acre	3.74		7.87		8.75		0.00		0.00	
	Soil loss, tons	3.74		7.87		8.75		0.00		0.00	
		(1) 25% Trees with 80% Ground Cover				(2) 20% Trees with 70% Ground Cover					
		70% Grass (0.70)(.013)= 0.0091				80% Grass (0.80)(.027)= 0.0216					
A=(R) (K) (LS) (C) (P)		30% Broadleaf Cover (0.30)(.042)= 0.0126				20% Broadleaf Cover (0.20)(.0655)= 0.0131					
		Weighted Avg C= 0.022				Weighted Avg C= 0.035					
		(3) 50% Trees with 70% Ground Cover									
		60% Grass (0.60)(.026)= 0.0156									
		40% Broadleaf Cover (0.40)(.065)= 0.026									
		Weighted Avg C= 0.042									

		Napa Valley Vineyard Engineering								Page 2 of 4	
		Pre Project - USLE Worksheet									
FOR:	Moshkelani Family Vineyards, LLC										
DATE:	12/1/2021										
		Ranch: 805 Greenfield Road (025-380-016)									
		SOIL TYPE:	146	179							
		T=	4	2							
		Soil = 179		Soil = 146		Soil = 179					
# /ACRES:		1.00	Block B	1.00	Block C	1.00	Block D				
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
R	Rainfall	90		90		90					
K	Soil Erosiveness	0.32		0.32		0.32					
	Slope length (ft)	138		46		127					
S	Gradient	22.0		11.0		28.0					
LS	Calculated LS	4.64		1.05		6.07		0.00		0.00	
C	Cover	0.040	(1)	0.057	(2)	0.046	(3)				
P	Practice	1		1		1					
A	Soil loss, tons/acre	5.34		1.72		8.04		0.00		0.00	
	Soil loss, tons	5.34		1.72		8.04		0.00		0.00	
		(1) 65% Trees with 70% Ground Cover				(2) 65% Trees with 60% Ground Cover					
		60% Grass (0.60)(.0255)= 0.015				60% Grass (0.60)(.039)= 0.023					
A=(R) (K) (LS) (C) (P)		40% Broadleaf Cover (0.40)(.0625)= 0.025				40% Broadleaf Cover (0.40)(.084)= 0.034					
		Weighted Avg C= 0.040				Weighted Avg C= 0.057					
		(3) 40% Tree with 70% Ground Cover									
		50% Grass (0.50)(.026)= 0.013									
		50% Broadleaf Cover (0.50)(.065)= 0.0325									
		Weighted Avg C= 0.046									

