

Exhibit F

Atlas View LLC Atlas View II Vineyard Soil Loss Analysis

Prepared by Napa Valley Vineyard Engineering, Inc
January 23, 2019
Revised September 13, 2019

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 38.435° N 122.237° 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 1.68-inches to 2.15-inches. This analysis conservatively uses the high end of the range (2.15-inches), which equals an “R” value of 87.13. “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”). Soils within the project area are mapped as:

SCS #100/102, Aiken loam (K=0.24)
SCS #139/140, Forward gravelly loam (K=0.17)

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

SLOPE LENGTH and STEEPNESS

Topographic mapping from the Napa County GIS database, 2002, 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 slope steepness, vegetative cover, or soil type along a transect varies significantly, complex slope equations were used to estimate soil loss. Slope lengths and gradients used in

the pre-project and post-project models are identified on the USLE transect maps 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

Most of the project area is open grassland with no canopy, but there are areas of tree canopy in Blocks C & D. Ground cover is 75 to 80% throughout the project. Site observation and air photos were used to determine ground cover and canopy cover, as well as the percentage of “woody” vegetation vs. “grassy” vegetation along each selected transect. Detailed “C” factor calculations for each transect are shown on the USLE spreadsheets included in the Appendix.

Post-Project

The project proposes a no-till permanent cover crop, which may be mowed and may be mechanically cultivated, or 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. Using the table in the guide, “USLE “C” Factors for Vineyards”, the C factor for 80% ground cover is 0.022.

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. 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 results are summarized as follows:

Transect	pre- project soil loss (tons/acre)	post-project soil loss (tons/acre)
A	2.51	1.73
B	1.66	1.14
C1	3.65	2.97
C2	2.23	1.88
D	3.55	2.49
E/G	1.74	1.74
H	1.65	1.65

CONCLUSION

The analysis presented above and the supporting information in the Appendix, demonstrate that the proposed vineyard development will not increase soil loss from the project site.

APPENDIX

USLE SPREADSHEETS & TRANSECT MAP

Napa Valley Vineyard Engineering Inc.											
USLE CALCULATIONS A=(R)(K)(LS)(C)(P)											
FOR:	Atlas View II-Pre										
DATE:	9/13/2019										
	TRANSECT:	C1									
	SOIL TYPE:	100		100		100		140			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	458		458		458		458			
S	Gradient	18.3		16.2		25.3		15.7			
LS	Calculated LS	6.62		5.62		10.13		5.38			
F	Fraction	0.12		0.23		0.30		0.35			
K	Soil Erosiveness	0.24		0.24		0.24		0.17			
C	Cover	0.028*		0.028*		0.026**		0.028*			
	Product	0.005		0.009		0.019		0.009			
	Combined LS	0.0419									
R	Rainfall	87.13									
P	Practice	1									
A	Soil loss, tons/acre	3.65									
		*25% canopy, 80%cover				**50%tall grasses/bushes, 80% cover					
		50%G	.013(.5)=	0.007		50%G	.012(.5)=	0.006			
		50%W	.042(.5)=	0.021		50%W	.039(.5)=	0.020			
				0.028				0.026			

Napa Valley Vineyard Engineering Inc.									
USLE CALCULATIONS A=(R)(K)(LS)(C)(P)									
FOR:	Atlas View II-Pre								
DATE:	9/13/2019								
	TRANSECT:	C2							
	SOIL TYPE:	140		100		100		100	
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	330		330		330		330	
S	Gradient	21.8		21.8		17.0		4.9	
LS	Calculated LS	7.08		7.08		5.09		0.95	
F	Fraction	0.12		0.23		0.30		0.35	
K	Soil Erosiveness	0.17		0.24		0.24		0.24	
C	Cover	0.028*		0.028*		0.023**		0.028**	
	Product	0.004		0.011		0.008		0.002	
	Combined LS	0.0256							
R	Rainfall	87.13							
P	Practice	1							
A	Soil loss, tons/acre	2.23							
		*25% canopy, 80%cover				**50%tall grasses/bushes, 90% cover			
		50%G	.013(.5)=	0.007		40%G	.006(.4)=	0.002	
		50%W	.042(.5)=	0.021		60%W	.011(.6)=	0.020	
				0.028				0.023	

Napa Valley Vineyard Engineering Inc.											
USLE CALCULATIONS A=(R)(K)(LS)(C)(P)											
FOR:	Atlas View II-Pre										
DATE:	9/13/2019										
	TRANSECT:	D									
	SOIL TYPE:	100	100	100	140						
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	626		626		626		626			
S	Gradient	17.9		16.9		13.7		14.1			
LS	Calculated LS	7.51		6.95		5.23		5.44			
F	Fraction	0.12		0.23		0.30		0.35			
K	Soil Erosiveness	0.24		0.24		0.24		0.17			
C	Cover	0.026*		0.035**		0.031***		0.031***			
	Product	0.006		0.013		0.012		0.010			
	Combined LS	0.0408									
R	Rainfall	87.13									
P	Practice	1									
A	Soil loss, tons/acre	3.55									
		*50%tall grasses/bushes, 80% cover			**no canopy, 75%cover			***50% canopy, 75%cover			
		50%G	.012(.5)=	0.006	60%G	.021(.6)=	0.013	60%G	.019(.6)=	0.011	
		50%W	.039(.5)=	<u>0.020</u>	40%W	.055(.4)=	<u>0.022</u>	40%W	.051(.4)=	<u>0.020</u>	
				0.026			0.035			0.031	

		Napa Valley Vineyard Engineering Inc.											
		USLE CALCULATIONS				A=(R)(K)(LS)(C)(P)							
FOR:	Atlas View II-Pre												
DATE:	9/13/2019												
	TRANSECT:	F/G											
	SOIL TYPE:	139											
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	552		552		552							
S	Gradient	17.1		9.0		17.4							
LS	Calculated LS	6.63		2.75		6.79							
F	Fraction	0.19		0.35		0.46							
K	Soil Erosiveness	0.17		0.17		0.17							
C	Cover	0.022		0.022		0.022							
	Product	0.005		0.004		0.012							
	Combined LS	0.0200											
R	Rainfall	87.13											
P	Practice	1											
A	Soil loss, tons/acre	1.74											
		*no canopy, 80%cover											
		70%G	.013(.7)=	0.009									
		30%W	.043(.3)=	0.013									
				0.022									

		Napa Valley Vineyard Engineering Inc.									
		USLE CALCULATIONS					A=(R)(K)(LS)(C)(P)				
FOR:	Atlas View II-Pre										
DATE:	9/13/2019										
	TRANSECT:	H									
	SOIL TYPE:	139		139		139		139		139	
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	448		448		448		448		448	
S	Gradient	17.9		16.9		13.7		14.1			
LS	Calculated LS	6.35		5.88		4.42		4.60			
F	Fraction	0.12		0.23		0.30		0.35			
K	Soil Erosiveness	0.17		0.17		0.17		0.17			
C	Cover	0.022 *		0.022 *		0.022		0.022 *			
	Product	0.003		0.005		0.005		0.006			
	Combined LS	0.0189									
R	Rainfall	87.13									
P	Practice	1									
A	Soil loss, tons/acre	1.65									
		*no canopy, 80%cover									
		70%G	.013(.7)=	0.009							
		30%W	.043(.3)=	0.013							
				0.022							

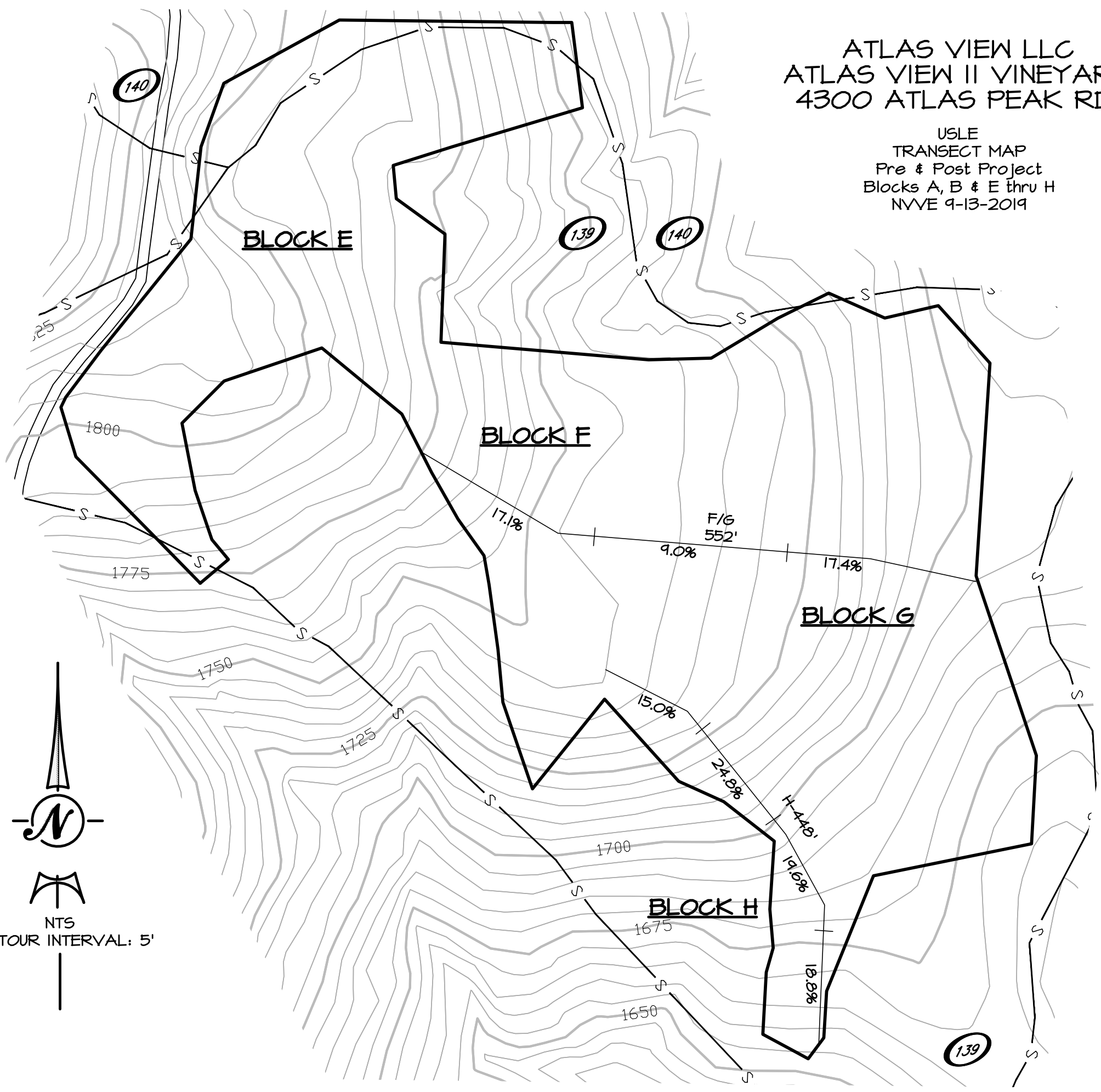
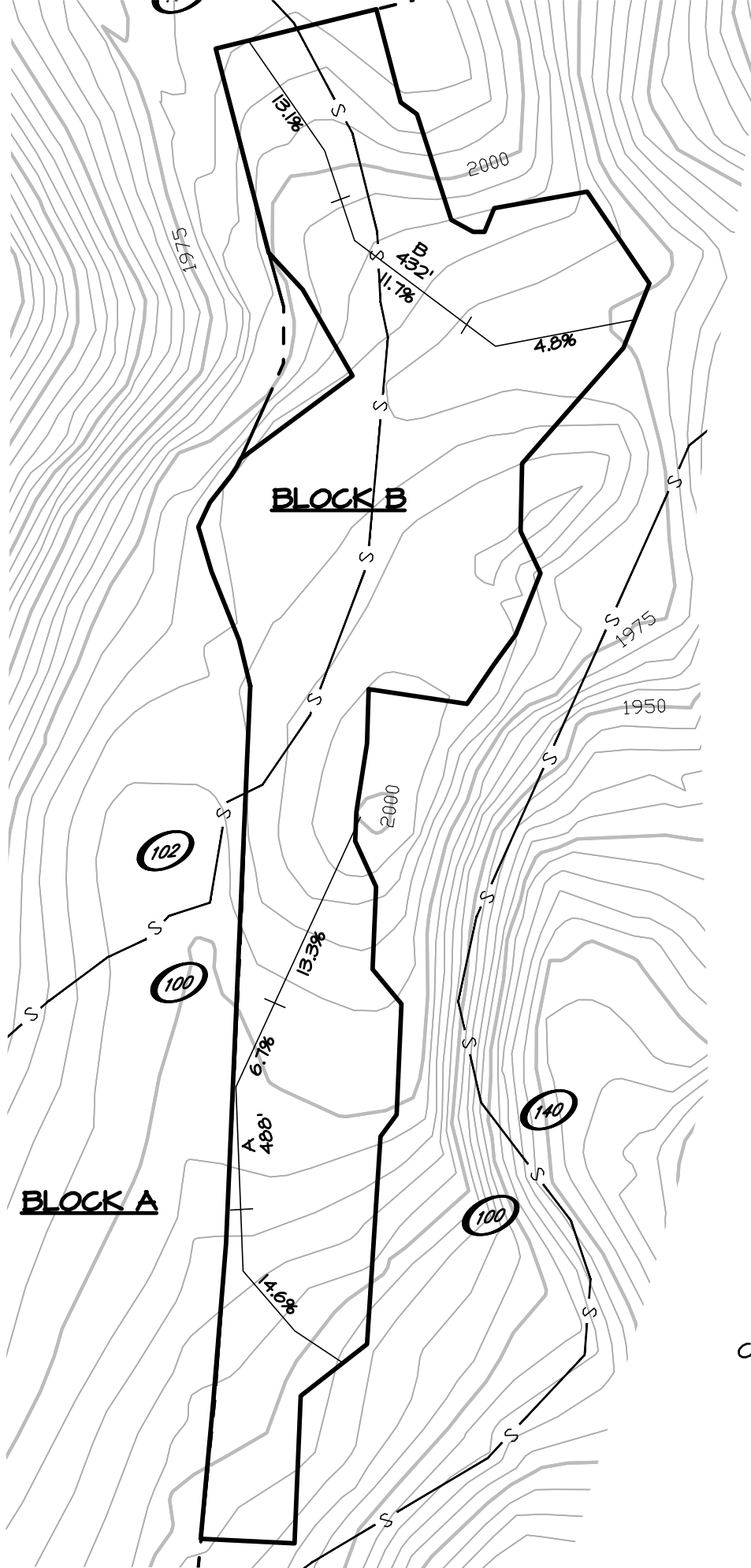
		Napa Valley Vineyard Engineering Inc.									
		USLE CALCULATIONS				A=(R)(K)(LS)(C)(P)					
FOR:	Atlas View II-Post										
DATE:	1/23/2019										
	TRANSECT:	C1									
	SOIL TYPE:	100		100		100		140			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	458		458		458		458			
S	Gradient	18.3		16.2		25.3		15.7			
LS	Calculated LS	6.62		5.62		10.13		5.38			
F	Fraction	0.12		0.23		0.30		0.35			
K	Soil Erosiveness	0.24		0.24		0.24		0.17			
C	Cover	0.022*		0.022		0.022		0.022			
	Product	0.004		0.007		0.016		0.007			
	Combined LS	0.0341									
R	Rainfall	87.13									
P	Practice	1									
A	Soil loss, tons/acre	2.97									
		*no till, spot spray or mechanical cultivation around base of vine									

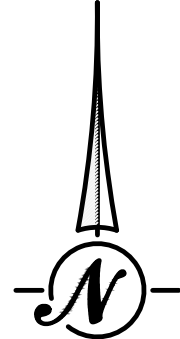
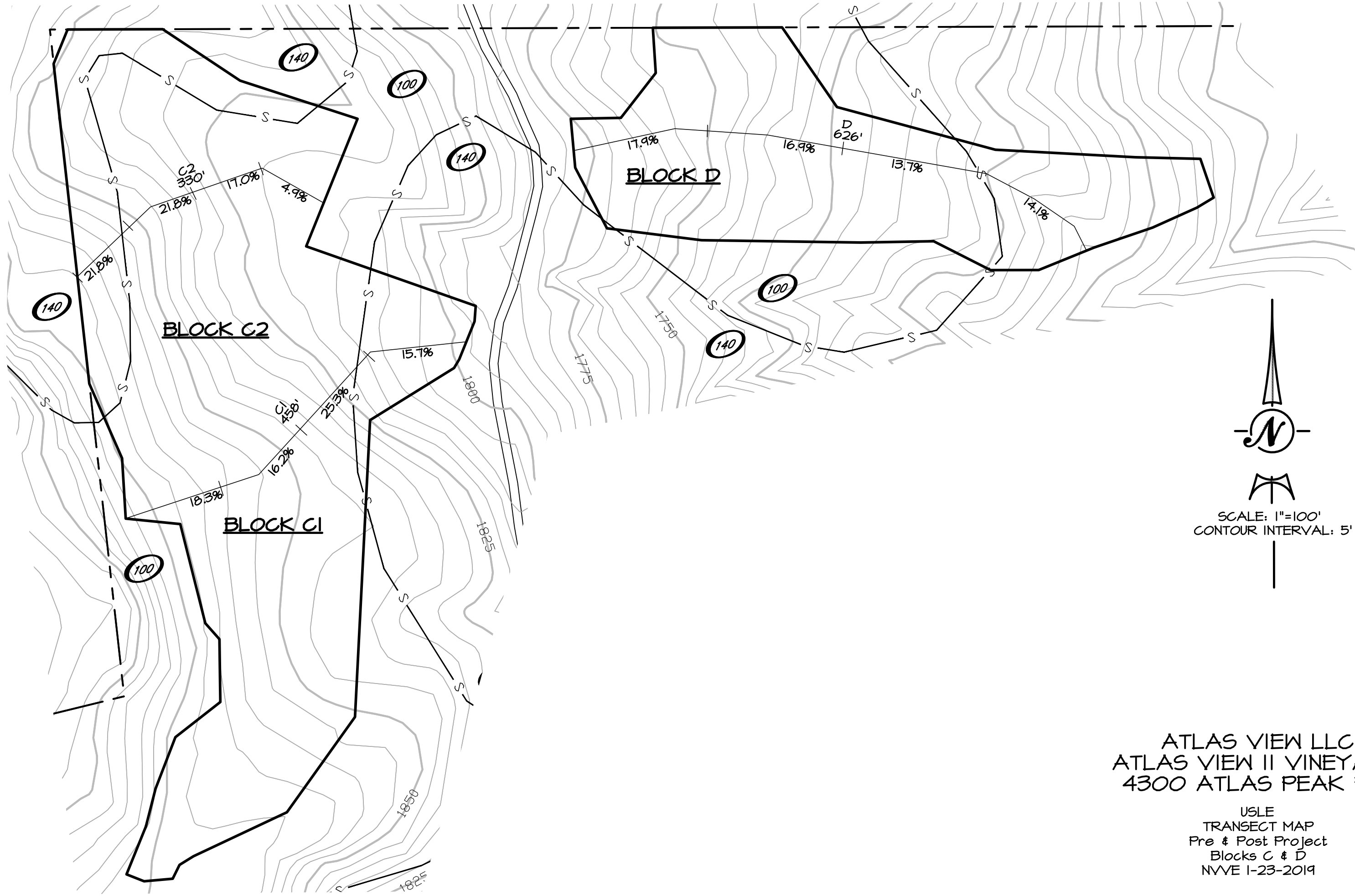
		Napa Valley Vineyard Engineering Inc.									
		USLE CALCULATIONS					A=(R)(K)(LS)(C)(P)				
FOR:	Atlas View II-Post										
DATE:	9/13/2019										
	TRANSECT:	F/G									
	SOIL TYPE:	139									
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	552		552		552					
S	Gradient	17.1		9.0		17.4					
LS	Calculated LS	6.63		2.75		6.79					
F	Fraction	0.19		0.35		0.46					
K	Soil Erosiveness	0.17		0.17		0.17					
C	Cover	0.022	*	0.022		0.022					
	Product	0.005		0.004		0.012					
	Combined LS	0.0200									
R	Rainfall	87.13									
P	Practice	1									
A	Soil loss, tons/acre	1.74									
		*no till, spot spray or mechanical cultivation around base of vine									

Napa Valley Vineyard Engineering Inc.											
USLE CALCULATIONS $A=(R)(K)(LS)(C)(P)$											
FOR:	Atlas View II-Post										
DATE:	9/13/2019										
	TRANSECT:	H									
	SOIL TYPE:	139		139		139		139			
FACTOR:	DESCRIPTION	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe	Value	/Describe
	Slope length (ft)	448		448		448		448			
S	Gradient	17.9		16.9		13.7		14.1			
LS	Calculated LS	6.35		5.88		4.42		4.60			
F	Fraction	0.12		0.23		0.30		0.35			
K	Soil Erosiveness	0.17		0.17		0.17		0.17			
C	Cover	0.022*		0.022		0.022		0.022			
	Product	0.003		0.005		0.005		0.006			
	Combined LS	0.0189									
R	Rainfall	87.13									
P	Practice	1									
A	Soil loss, tons/acre	1.65									
*no till, spot spray or mechanical cultivation around base of vine											

ATLAS VIEW LLC
ATLAS VIEW II VINEYARD
4300 ATLAS PEAK RD.

USLE
TRANSECT MAP
Pre & Post Project
Blocks A, B & E thru H
NVVE 9-13-2019





SCALE: 1"=100'
 CONTOUR INTERVAL: 5'

**ATLAS VIEW LLC
 ATLAS VIEW II VINEYARD
 4300 ATLAS PEAK RD.**

USLE
 TRANSECT MAP
 Pre & Post Project
 Blocks C & D
 NVVE 1-23-2019