Exhibit C-2

LincolnAE LLC
AGRICULTURAL ENGINEERING

Soil Loss Analysis – Cathiard Vineyard

Includes: USLE Calculations
March 5, 2021

The NRCS web soil survey lists the soil type in the vineyard area as 166 Montara clay loam [1]; see Site Plan – Aerial Map for soil boundaries. Soils data were obtained from the NRCS web soil survey, which notes that map data may not be valid the map scale for this project (1:6,000 or 1 in = 500 ft). The soils map was created at a scale of 1:24,000 or 1 in = 2,000 ft. Enlarged maps can cause misunderstandings of the accuracy of soil line placement. The NRCS Web Soil Survey lists the following soil properties:

Soil Type	Soils description	K	T
166	Montara clay loam, 5 to 30 percent slopes	.28	1

The Napa County Soil Survey [3] describes the Montara series as well-drained soils on uplands derived from weathered serpentine. Plant cover is typically grassland and digger pine. Run-off is rapid and the hazard of erosion is moderate. **Potential Hazard: Serpentine rock contains asbestos (a group of naturally-occurring minerals). If serpentine bedrock or boulders are encountered and disturbed during grading, then make sure that the material is thoroughly wetted to avoid any airborne particles.**

Average slope across vineyard blocks range from 4% to 23% with an average of 14%.

The energy of precipitation (R) value was determined by getting the Point Precipitation Frequency Estimate for the subject site from the NOAA PFDS site. The value of 1.93 was converted to an R value of 65 from Table A-1 [4].

Current groundcover is comprised of a mix of woods, rangeland, and brush. Existing cover conditions were evaluated in the field on December 6, 2019 with Daniel Basore of the Napa County Engineering Department (see attached Map, Cover Properties, rev 12/10/19). Please refer to Application Section 7: Photos for visual documentation of existing cover crop in each block. Post-cover conditions will establish an 80% cover crop throughout; Blocks Q and R were removed from plan. C-factors were assigned based on factors listed in Table 2 and Table 3.

SARAH PISTONE CPESC #9225
PO Box 1686 (707) 533-3511
Middletown, CA 95461 sarah@LincolnAE.com

An up/down-hill row direction for a P factor of 1 was assumed for soil loss calculations. An up-downhill row direction represents the "worst-case" scenario and any row direction that deviates from up/down-hill and approaches parallel to contours would *improve* (i.e. reduce) soil loss.

Erosion Calculation Results

Soil Loss in tons/acre were computed using the following formula [2]:

$$A = (R) \times (K) \times (LS) \times (C) \times (P) \qquad \text{with } A < T+2$$

Where:

A = Predicted Soil Loss (tons/acre)
R = Rainfall & Runoff Factor (energy of precipitation)
K = Soil Erosiveness (NRCS whole soil, surface layer, dominant condition)
LS = Erosion Energy (function of line length and steepness)
C = Factor for cover crop, surface residue, roughness, and canopy
P = Factor for contouring or cross-slope farming (1.0 if contouring is not applicable)
T = Soil Loss Tolerance

Flow line locations are shown on Site Plan: Topo and ECP Detail. As presented, there will be no net increase in soil loss from the site. Erosion calculations for the pre and post project site are summarized in TABLE 1.

References

1. *Custom Soil Reource Report for Napa County, California, Komes Ranch*, from USDA NRCS Web Soil Survey, January 2019
2. *Guides for Erosion & Sediment Control*, USDA Soil Conservation Service, Davis, CA, 1991
3. Lambert, G., Kashiwagi, J. et al., *Soil Survey of Napa County, California*, USDA in cooperation with UC Agricultural Experiment Station, August 1978
4. *USLE Special Applications for Napa County*, USDA, NRCS, May 2014
5. Wischmeier, W.H., and Smith, D.D. *Predicting rainfall erosion losses – a guide to conservation planning.* USDA, Agriculture Handbook No. 537. 1978

[1] ~~LS~~	~~"Predicting rainfall erosion losses -- a guide to conservation planning." USDA, Agriculture Handb~~						Cover	C
[2] LS	Guides for Erosion & Sediment Control, USDA Soil Conservation Service, Davis, CA, 1991						Straw	0.18
							60%	0.066
							70%	0.046
							75%	0.034
							80%	0.022
		Cathiard 2019					90%	0.011
		ESTABLISHED VEGETATION					95%	0.006
	A=(R)(K)(LS)(C)(P)						Manual	0.017
	Flowline FID	M	O-1	O-2	O-3a	O-3b	O-4a	O-4b
Var	DESCRIPTION							
R	Rainfall & Runoff Factor	65	65	65	65	65	65	65
K	Soil Erosiveness	0.28	0.28	0.28	0.28	0.28	0.28	0.28
	Slope length (ft)	294	232	348	218	257	513	230
	Δelevation (ft)							
S	Gradient (%)	15	9	13	23	7	20	4
LS^2	Calculated LS (Napa Equ.)	4.051	1.783	3.626	6.172	1.320	7.877	0.558
C	Cover PRE	Table Lookup						
	Drop Fall Height (ft)	0.0	0.0	0.0	13.0	0.0	0.0	0.0
	% Canopy Cover	0%	0%	0%	75%	0%	0%	0%
	% Ground Cover	85%	80%	60%	80%	60%	60%	60%
	% W	33%	40%	40%	100%	10%	10%	10%
	% G	33%	60%	60%	0%	90%	90%	90%
C	Cover PRE	0.031	0.025	0.062	0.041	0.047	0.047	0.047
C	Cover POST	80%	80%	80%	80%	80%	80%	80%
C	Cover POST	0.022	0.022	0.022	0.022	0.022	0.022	0.022
P	Cover PRE	1	1	1	1	1	1	1
P	Cover POST	1	1	1	1	1	1	1
A	Soil loss, tons/acre PRE	2.26	0.81	4.07	4.61	1.13	6.72	0.48
A	Soil loss, tons/acre POST	1.62	0.71	1.45	2.47	0.53	3.15	0.22
	T =	1	1	1	1	1	1	1
	T + 2 =	3	3	3	3	3	3	3
	W	0.01						
	G	0.032						
	gravel	0.05						

TABLE 1 Calculation table and results

SARAH PISTONE CPESC #9225
PO Box 1686 (707) 533-3511
Middletown, CA 95461 sarah@LincolnAE.com

Vegetative Canopy			Cover that contacts the soil surface					
			Percent Ground Cover					
Type and height	Percent cover	Type	0	20	40	60	80	95+
No appreciable canopy		G	.45	.20	.10	.042	.013	.003
		W	.45	.24	.15	.091	.043	.011
Tall grassy weeds or bushes with average drop fall height of less than 3 ft.	25	G	.36	.17	.09	.038	.013	.003
		W	.36	.20	.13	.083	.041	.011
	50	G	.26	.13	.07	.035	.012	.003
		W	.26	.16	.11	.076	.039	.011
	75	G	.17	.10	.06	.032	.011	.003
		W	.17	.12	.09	.038	.038	.011
Appreciable brush or bushes, with average drop fall height of 6 1/2 ft.	25	G	.40	.18	.09	.040	.013	.003
		W	.40	.22	.14	.087	.042	.011
	50	G	.34	.16	.08	.038	.012	.003
		W	.34	.19	.13	.082	.041	.011
	75	G	.28	.14	.08	.036	.012	.003
		W	.28	.17	.12	.078	.040	.011
Trees, but no appreciable low brush. Average drop fall height of 13 ft.	25	G	.42	.19	.10	.041	.013	.003
		W	.42	.23	.14	.089	.042	.011
	50	G	.39	.18	.09	.040	.013	.003
		W	.39	.21	.14	.087	.042	.011
	75	G	.36	.17	.09	.039	.012	.003
		W	.36	.20	.13	.084	.041	.011

The listed C values assume that the vegetation and mulch are randomly distributed over the entire area. For grazed woodland with high buildup of organic matter in the topsoil under permanent forest conditions, multiply the table values by 0.1. For areas that have been mechanically disturbed by root plowing, implement traffic, or other, use table 5 or 12.

Table 2 C values for non-farmed, natural vegetation [4]

SARAH PISTONE CPESC #9225
PO Box 1686 (707) 533-3511
Middletown, CA 95461 sarah@LincolnAE.com

TABLE 9.—*Mulch factors and length limits for construction slopes*[1]

Type of mulch	Mulch Rate	Land Slope	Factor C	Length limit[2]
	Tons per acre	*Percent*		*Feet*
None	0	all	1.0	—
Straw or hay,	1.0	1-5	0.20	200
tied down by	1.0	6-10	.20	100
anchoring and				
tacking	1.5	1-5	.12	300
equipment[3]	1.5	6-10	.12	150
Do.	2.0	1-5	.06	400
	2.0	6-10	.06	200
	2.0	11-15	.07	150
	2.0	16-20	.11	100
	2.0	21-25	.14	75
	2.0	26-33	.17	50
	2.0	34-50	.20	35
Crushed stone,	135	<16	.05	200
¼ to 1½ in	135	16-20	.05	150
	135	21-33	.05	100
	135	34-50	.05	75
Do.	240	<21	.02	300
	240	21-33	.02	200
	240	34-50	.02	150
Wood chips	7	<16	.08	75
	7	16-20	.08	50
Do.	12	<16	.05	150
	12	16-20	.05	100
	12	21-33	.05	75
Do.	25	<16	.02	200
	25	16-20	.02	150
	25	21-33	.02	100
	25	34-50	.02	75

[1] From Meyer and Ports (24). Developed by an interagency workshop group on the basis of field experience and limited research data.

[2] Maximum slope length for which the specified mulch rate is considered effective. When this limit is exceeded, either a higher application rate or mechanical shortening of the effective slope length is required.

[3] When the straw or hay mulch is not anchored to the soil, C values on moderate or steep slopes of soils having K values greater than 0.30 should be taken at double the values given in this table.

Table 3 C values for mulch cover [5]

SARAH PISTONE CPESC #9225
PO Box 1686 (707) 533-3511
Middletown, CA 95461 sarah@LincolnAE.com