

**NARRATIVE SUPPLEMENT
TO THE
TRACK I VINEYARD EROSION CONTROL PLAN
FOR
MATTHES VINEYARD
MEADOWOOD ROAD
NAPA COUNTY, CA
APN 025-070-043**

Prepared For:

**William & Leigh Matthes
1508 Spring Street
St. Helena, CA 94574**

Prepared By:

**Bartelt Engineering
1303 Jefferson Street, 200 B
Napa, CA 94559
(707) 258-1301**

**Paul N. Bartelt, P.E.
Principal Engineer**



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February 2023 – Revised
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September 2022 - Revised
March 2021
Job No. 20-01**

**BARTELT
ENGINEERING**

Project Name: Matthes Vineyards
User: RP/SC
APN: 025-070-043
2-YR, 6-HR RAINFALL (INCHES): 2.14

SOIL TYPE(s): 140 Forward silt loam, 12 to 57% slopes
177 Rock outcrop-Kidd complex, 50 to 75% slopes

Erosion Factor (K)	Tolerance Factor (T)
0.43	3
0.49	2

Block ID	A		A	
Transect ID	A-A		B-B	
Block Area (acre)	9.8		9.8	
Development Phase	Pre-Development	Post-Development	Pre-Development	Post-Development
Rainfall (R-Factor)	90	90	90	90
Soil Parameters				
Map Unit	177	177	177	177
Soil Erodibility (K-Factor)	0.49	0.49	0.49	0.49
Soil Loss Tolerance (T)	2	2	2	2
Slope Effect				
Type of Slope (Regular or Irregular)	Regular	Regular	Regular	Regular
Total Slope Length	292	292	593	593
Diversion Swales	0	4	0	8
Overland Flow Length (ft)	292	58	593	66
Percent Slope (%)	21	21	25	25
Topographic Factor (LS)	6.34	2.83	11.46	3.82
Cover Factor & Management Factor				
Support Practice Factor (P)	Up & Down Hill	Up & Down Hill	Up & Down Hill	Up & Down Hill
Support Practice Factor (P)	1.00	1.00	1.00	1.00
Vegetative Community	Woodland	Vineyard	Woodland	Vineyard
Vegetal Canopy	Tall grassy weeds or bushes with average drop fall height of less than 3 ft.	Vineyard - Nontilled	Tall grassy weeds or bushes with average drop fall height of less than 3 ft.	Vineyard - Nontilled
Canopy Cover	50		50	
Percent Cover	60	90	60	90
Percent grasslike plants; decaying compacted duff (G)	100	100	100	100
Percent broadleaf Herbaceous plants; undecayed residue (W)	0		0	
Cover Factor (C)	0.0350	0.0113	0.0350	0.0113
Soil Loss $A=(R)(K)(LS)(C)(P)$				
Soil Loss Rate (tons/acre/year)	9.78	1.42	17.69	1.91

Project Name: Matthes Vineyards
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APN: 025-070-043
2-YR, 6-HR RAINFALL (INCHES): 2.14
SOIL TYPE(s): Map Unit Symbol 140 177
Map Unit Description
Forward silt loam, 12 to 57% slopes
Rock outcrop-Kidd complex, 50 to 75% slopes

Erosion Factor (K)	Tolerance Factor (T)
0.43	3
0.49	2

Block ID	A		A	
Transect ID	C1-C1		C2-C2	
Block Area (acre)	2.06		2.06	
Development Phase	Pre-Development	Post-Development	Pre-Development	Post-Development
Rainfall (R-Factor)	90	90	90	90
Soil Parameters				
Map Unit	140	140	177	177
Soil Erodibility (K-Factor)	0.43	0.43	0.49	0.49
Soil Loss Tolerance (T)	3	3	2	2
Slope Effect				
Type of Slope (Regular or Irregular)	Irregular	Regular	Irregular	Regular
Total Slope Length		230		372
Diversion Swales		1		4
Overland Flow Length (ft)	0	115	0	74
Percent Slope (%)	10.0	10.0	24.0	24.0
Topographic Factor (LS)	0.00	1.45	0.00	3.81
Cover Factor & Management Factor				
Support Practice Factor (P)	Up & Down Hill	Up & Down Hill	Up & Down Hill	Up & Down Hill
Support Practice Factor (P)	1.00	1.00	1.00	1.00
Vegetative Community	Permanent Pasture, Range, Idle Land, or Grazed Woodland	Vineyard	Permanent Pasture, Range, Idle Land, or Grazed Woodland	Vineyard
Vegetal Canopy	Tall grassy weeds or bushes with average drop fall height of less than 3 ft.	Vineyard - Nontilled	Tall grassy weeds or bushes with average drop fall height of less than 3 ft.	Vineyard - Nontilled
Canopy Cover	50		50	
Percent Cover	40	90	40	90
Percent grasslike plants; decaying compacted duff (G)	100	100	100	100
Percent broadleaf Herbaceous plants; undecayed residue (W)	0		0	
Cover Factor (C)	0.0700	0.0113	0.0700	0.0113
Soil Loss $A=(R)(K)(LS)(C)(P)$				
Soil Loss Rate (tons/acre/year)		0.64		1.90

Block ID	A
Transect ID	C-C
Overland Flow Length (ft)	602
Number of Segments	2

Irregular Slope Evaluation						
Segment No.	Percent Slope	Topo Factor (LS)	Fraction of Soil Loss (Table 4)	Soil Erodibility (K Factor)	Cover Factor (C Factor)	Product
1	10.0	3.324	0.35	0.43	0.0700	0.0354
2	24.0	10.839	0.65	0.49	0.0700	0.2403
$\Sigma(K)(LS)(C)$						0.2757
$A=(R)[\Sigma(K)(LS)(C)](P)$						
Soil Loss Rate (tons/acre/year)						24.81

Project Name: Matthes Vineyards
User: RP/SC
APN: 025-070-043
2-YR, 6-HR RAINFALL (INCHES): 2.14
SOIL TYPE(s): Map Unit Symbol Map Unit Description
 140 Forward silt loam, 12 to 57% slopes
 177 Rock outcrop-Kidd complex, 50 to 75% slopes

Erosion Factor (K)	Tolerance Factor (T)
0.43	3
0.49	2

Block ID	B1	
Transect ID	D-D	
Block Area (acre)	0.7	
Development Phase	Pre-Development	Post-Development
Rainfall (R-Factor)	90	90
Soil Parameters		
Map Unit	177	177
Soil Erodibility (K-Factor)	0.49	0.49
Soil Loss Tolerance (T)	2	2
Slope Effect		
Type of Slope (Regular or Irregular)	Regular	Regular
Total Slope Length	265	265
Diversion Swales		2
Overland Flow Length (ft)	265	88
Precent Slope (%)	19	19
Topographic Factor (LS)	5.29	3.05
Cover Factor & Management Factor		
Support Practice Factor (P)	Up & Down Hill	Up & Down Hill
Support Practice Factor (P)	1.00	1.00
Vegetative Community	Permanent Pasture, Range, Idle Land, or Grazed Woodland	Vineyard
Vegetal Canopy	Tall grassy weeds or bushes with average drop fall height of less than 3 ft.	Vineyard - Nontilled
Canopy Cover	50	
Percent Cover	60	88
Percent grasslike plants; decaying compacted duff (G)	100	100
Percent broadleaf Herbaceous plants; undecayed residue (W)	0	
Cover Factor (C)	0.0350	0.0135
Soil Loss $A=(R)(K)(LS)(C)(P)$		
Soil Loss Rate (tons/acre/year)	8.16	1.81

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2-YR, 6-HR RAINFALL (INCHES): 2.14
SOIL TYPE(s):
Map Unit Symbol Map Unit Description
140 Forward silt loam, 12 to 57% slopes
177 Rock outcrop-Kidd complex, 50 to 75% slopes

Erosion Factor (K)	Tolerance Factor (T)
0.43	3
0.49	2

Block ID	B1		B1	
Transect ID	E1-E1		E2-E2	
Block Area (acre)	0.7		0.7	
Development Phase	Pre-Development	Post-Development	Pre-Development	Post-Development
Rainfall (R-Factor)	90	90	90	90
Soil Parameters				
Map Unit	177	177	140	140
Soil Erodibility (K-Factor)	0.49	0.49	0.43	0.43
Soil Loss Tolerance (T)	2	2	3	3
Slope Effect				
Type of Slope (Regular or Irregular)	Irregular	Regular	Irregular	Regular
Total Slope Length		98		98
Diversion Swales		1		1
Overland Flow Length (ft)	0	49	0	49
Percent Slope (%)	21.6	21.6	26.0	26.0
Topographic Factor (LS)	0.00	2.69	0.00	3.43
Cover Factor & Management Factor				
Support Practice Factor (P)	Up & Down Hill	Up & Down Hill	Up & Down Hill	Up & Down Hill
Support Practice Factor (P)	1.00	1.00	1.00	1.00
Vegetative Community	Permanent Pasture, Range, Idle Land, or Grazed Woodland	Vineyard	Woodland	Vineyard
Vegetal Canopy	Tall grassy weeds or bushes with average drop fall height of less than 3 ft.	Vineyard - Nontilled	Tall grassy weeds or bushes with average drop fall height of less than 3 ft.	Vineyard - Nontilled
Canopy Cover	50		50	
Percent Cover	60	88	60	88
Percent grasslike plants; decaying compacted duff (G)	100	100	100	100
Percent broadleaf Herbaceous plants; undecayed residue (W)	0		0	
Cover Factor (C)	0.0350	0.0135	0.0350	0.0135
Soil Loss $A=(R)(K)(LS)(C)(P)$				
Soil Loss Rate (tons/acre/year)		1.60		1.79

Block ID	B1
Transect ID	E-E
Overland Flow Length (ft)	179
Number of Segments	2

Irregular Slope Evaluation						
Segment No.	Percent Slope	Topo Factor (LS)	Fraction of Soil Loss (Table 4)	Soil Erodibility (K Factor)	Cover Factor (C Factor)	Product
1	21.6	5.151	0.35	0.49	0.0350	0.0312
2	26	6.553	0.65	0.43	0.0350	0.0638
$\Sigma(K)(LS)(C)$						0.0950
$A=(R)[\Sigma(K)(LS)(C)](P)$						
Soil Loss Rate (tons/acre/year)						8.55

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SOIL TYPE(s): 140
 177

Map Unit Symbol Map Unit Description
 140 Forward silt loam, 12 to 57% slopes
 177 Rock outcrop-Kidd complex, 50 to 75% slopes

Erosion Factor (K)	Tolerance Factor (T)
0.43	3
0.49	2

Block ID	B2		B2	
Transect ID	F-F		G-G	
Block Area (acre)	0.6		0.6	
Development Phase	Pre-Development	Post-Development	Pre-Development	Post-Development
Rainfall (R-Factor)	90	90	90	90
Soil Parameters				
Map Unit	140	140	140	140
Soil Erodibility (K-Factor)	0.43	0.43	0.43	0.43
Soil Loss Tolerance (T)	3	3	3	3
Slope Effect				
Type of Slope (Regular or Irregular)	Regular	Regular	Regular	Regular
Total Slope Length	281	281	106	106
Diversion Swales		4		2
Overland Flow Length (ft)	281	56	106	35
Percent Slope (%)	28	28	25	25
Topographic Factor (LS)	9.02	4.03	4.79	2.77
Cover Factor & Management Factor				
Support Practice Factor (P)	Up & Down Hill	Up & Down Hill	Up & Down Hill	Up & Down Hill
Support Practice Factor (P)	1.0	1.0	1.00	1.00
Vegetative Community	Woodland	Vineyard	Woodland	Vineyard
Vegetal Canopy	Trees, but no appreciable low brush. Average drop fall height of 13 ft.	Vineyard - Nontilled	Trees, but no appreciable low brush. Average drop fall height of 13 ft.	Vineyard - Nontilled
Canopy Cover	75		75	
Percent Cover	60	83	60	83
Percent grasslike plants; decaying compacted duff (G)	100	100	100	100
Percent broadleaf Herbaceous plants; undecayed residue (W)	0		0	
Cover Factor (C)	0.0390	0.0188	0.039	0.0188
Soil Loss A=(R)(K)(LS)(C)(P)				
Soil Loss Rate (tons/acre/year)	13.62	2.94	7.24	2.01

TABLE A-1: R FACTOR	
R Zone 1	2-Year/6-Hour Precipitation (Inches)
10	<0.7
10	0.7
10	0.8
15	0.9
15	1
20	1.1
25	1.2
30	1.3
35	1.4
40	1.5
45	1.6
50	1.7
60	1.8
65	1.9
75	2
85	2.1
90	2.2
100	2.3
110	2.4
120	2.5
130	2.6
145	2.7
155	2.8
165	2.9
180	3
195	3.1
205	3.2
220	3.3
235	3.4
250	3.5
265	3.6
285	3.7
300	3.8
315	3.9
335	4

Reference: Table A-1 "Guides for Erosion and Sediment Control in California", USDA-SCS, Davis CA, 1996, pg. A-3

TABLE 6: "P" Vineyard and Permanent Crops							
Slope (%)		Up & Down Hill	Cross Slope Farming Without Strips	Contour Tillage	Cross Slope Farming With Strips	Disc-Terrace	Contour Stripcropping
2	7	1.0	0.75	0.50	0.37		0.25
7.1	12	1.0	0.80	0.60	0.45		0.30
12.1	18	1.0	0.90	0.80	0.60		0.40
18.1	24	1.0	0.95	0.90	0.67	0.50	0.45
Reference: United States Department of Agriculture (USDA) - Soil Conservation Service. The Universal Soil Loss Equation USLE Special Applications for Napa County California. 1994.							

VEGETATIVE CANOPY			COVER THAT CONTACTS THE SOIL SURFACE																			
TYPE & HEIGHT	PERCENT COVER	TYPE	PERCENT GROUND COVER																			
			0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
No Appreciable Canopy		G	0.450	0.388	0.325	0.263	0.200	0.175	0.150	0.125	0.100	0.086	0.071	0.057	0.042	0.035	0.028	0.020	0.013	0.010	0.006	0.003
		W	0.450	0.398	0.345	0.293	0.240	0.218	0.195	0.173	0.150	0.135	0.121	0.106	0.091	0.079	0.067	0.055	0.043	0.032	0.022	0.011
Tall grassy weeds or bushes with average drop fall height of less than 3 ft.	25	G	0.360	0.313	0.265	0.218	0.170	0.150	0.130	0.110	0.090	0.077	0.064	0.051	0.038	0.032	0.026	0.019	0.013	0.010	0.006	0.003
		W	0.360	0.320	0.280	0.240	0.200	0.183	0.165	0.148	0.130	0.118	0.107	0.095	0.083	0.073	0.062	0.052	0.041	0.031	0.021	0.011
	50	G	0.260	0.228	0.195	0.163	0.130	0.115	0.100	0.085	0.070	0.061	0.053	0.044	0.035	0.029	0.024	0.018	0.012	0.009	0.006	0.003
		W	0.260	0.235	0.210	0.185	0.160	0.148	0.135	0.123	0.110	0.102	0.093	0.085	0.076	0.067	0.058	0.048	0.039	0.030	0.020	0.011
	81	G	0.170	0.153	0.135	0.118	0.100	0.090	0.080	0.070	0.060	0.053	0.046	0.039	0.032	0.027	0.022	0.016	0.011	0.008	0.006	0.003
		W	0.170	0.158	0.145	0.133	0.120	0.113	0.105	0.098	0.090	0.085	0.079	0.074	0.068	0.061	0.053	0.046	0.038	0.029	0.020	0.011
Appreciable brush or bushes, with average drop fall height of 6.5 ft.	25	G	0.400	0.345	0.290	0.235	0.180	0.158	0.135	0.113	0.090	0.078	0.065	0.053	0.040	0.033	0.027	0.020	0.013	0.010	0.006	0.003
		W	0.400	0.355	0.310	0.265	0.220	0.200	0.180	0.160	0.140	0.127	0.114	0.100	0.087	0.076	0.065	0.053	0.042	0.032	0.021	0.011
	50	G	0.340	0.295	0.250	0.205	0.160	0.140	0.120	0.100	0.080	0.070	0.059	0.049	0.038	0.032	0.025	0.019	0.012	0.009	0.006	0.003
		W	0.340	0.303	0.265	0.228	0.190	0.175	0.160	0.145	0.130	0.118	0.106	0.094	0.082	0.072	0.062	0.051	0.041	0.031	0.021	0.011
	75	G	0.280	0.245	0.210	0.175	0.140	0.125	0.110	0.095	0.080	0.069	0.058	0.047	0.036	0.030	0.024	0.018	0.012	0.009	0.006	0.003
		W	0.280	0.253	0.225	0.198	0.170	0.158	0.145	0.133	0.120	0.110	0.099	0.089	0.078	0.069	0.059	0.050	0.040	0.030	0.021	0.011
Trees, but no appreciable low brush. Average drop fall height of 13 ft.	25	G	0.420	0.363	0.305	0.248	0.190	0.168	0.145	0.123	0.100	0.085	0.071	0.056	0.041	0.034	0.027	0.020	0.013	0.010	0.006	0.003
		W	0.420	0.373	0.325	0.278	0.230	0.208	0.185	0.163	0.140	0.127	0.115	0.102	0.089	0.077	0.066	0.054	0.042	0.032	0.021	0.011
	50	G	0.390	0.338	0.285	0.233	0.180	0.158	0.135	0.113	0.090	0.078	0.065	0.053	0.040	0.033	0.027	0.020	0.013	0.010	0.006	0.003
		W	0.390	0.345	0.300	0.255	0.210	0.193	0.175	0.158	0.140	0.127	0.114	0.100	0.087	0.076	0.065	0.053	0.042	0.032	0.021	0.011
	75	G	0.360	0.313	0.265	0.218	0.170	0.150	0.130	0.110	0.090	0.077	0.065	0.052	0.039	0.032	0.026	0.019	0.012	0.009	0.006	0.003
		W	0.360	0.320	0.280	0.240	0.200	0.183	0.165	0.148	0.130	0.119	0.107	0.096	0.084	0.073	0.063	0.052	0.041	0.031	0.021	0.011

Vineyard - Tilled

Vine Row Tilled			
% Ground Cover	Clearing to 1 Year Old	1-3 Years Old	3+ Years Old
0	1.00	0.92	0.85
5	0.86	0.79	0.74
10	0.72	0.67	0.62
15	0.58	0.54	0.51
20	0.44	0.41	0.39
25	0.39	0.36	0.34
30	0.31	0.31	0.30
35	0.28	0.26	0.25
40	0.22	0.21	0.2
45	0.19	0.18	0.17
50	0.16	0.15	0.14
55	0.12	0.12	0.12
60	0.092	0.09	0.088
65	0.076	0.075	0.073
70	0.061	0.059	0.058
75	0.045	0.0435	0.043
80	0.029	0.028	0.028
85	0.022	0.021	0.021
90	0.014	0.014	0.014
95	0.007	0.007	0.007

Vineyard - Nontilled

Vine Row Non-Tilled			
% Ground Cover	Clearing to 1 Year Old	1-3 Years Old	3+ Years Old
0	0.80	0.74	0.68
5	0.69	0.64	0.59
10	0.58	0.54	0.50
15	0.46	0.43	0.40
20	0.35	0.33	0.31
25	0.31	0.29	0.27
30	0.265	0.25	0.24
35	0.22	0.21	0.20
40	0.18	0.17	0.16
45	0.15	0.15	0.138
50	0.13	0.12	0.12
55	0.10	0.097	0.093
60	0.074	0.072	0.070
65	0.061	0.060	0.058
70	0.049	0.047	0.046
75	0.036	0.035	0.034
80	0.023	0.022	0.022
85	0.017	0.017	0.017
90	0.012	0.011	0.011
95	0.006	0.006	0.006

Vineyard - Alternating Tilled

Vine Row Alternating-Tilled			
% Ground Cover	Clearing to 1 Year Old	1-3 Years Old	3+ Years Old
0	0.90	0.83	0.77
5	0.78	0.72	0.67
10	0.65	0.60	0.56
15	0.53	0.49	0.46
20	0.4	0.37	0.35
25	0.35	0.325	0.31
30	0.3	0.28	0.27
35	0.25	0.235	0.22
40	0.2	0.19	0.18
45	0.17	0.16	0.15
50	0.14	0.14	0.13
55	0.11	0.108	0.104
60	0.083	0.081	0.079
65	0.069	0.067	0.066
70	0.055	0.053	0.052
75	0.040	0.039	0.0385
80	0.026	0.025	0.025
85	0.020	0.019	0.019
90	0.013	0.013	0.013
95	0.007	0.007	0.007



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Napa County, California**

Matthes Vineyards



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Napa County, California

Survey Area Data: Version 12, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2019—Apr 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140	Forward silt loam, 12 to 57 percent slopes, MLRA 15	21.2	53.0%
177	Rock outcrop-Kidd complex, 50 to 75 percent slopes	18.8	47.0%
Totals for Area of Interest		39.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Napa County, California

140—Forward silt loam, 12 to 57 percent slopes, MLRA 15

Map Unit Setting

National map unit symbol: 2xc9y
Elevation: 310 to 2,370 feet
Mean annual precipitation: 33 to 56 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 260 to 338 days
Farmland classification: Not prime farmland

Map Unit Composition

Forward and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Forward

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Rhyolitic residuum weathered from volcanic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 6 inches: silt loam
BA - 6 to 12 inches: silt loam
Bw1 - 12 to 19 inches: silt loam
Bw2 - 19 to 28 inches: silt loam
Bw3 - 28 to 37 inches: gravelly silt loam
Cr - 37 to 51 inches: bedrock

Properties and qualities

Slope: 12 to 57 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.14 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.2 to 0.5 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Aiken

Percent of map unit: 5 percent

Boomer

Percent of map unit: 5 percent

Kidd

Percent of map unit: 3 percent

Sobrante

Percent of map unit: 2 percent

177—Rock outcrop-Kidd complex, 50 to 75 percent slopes

Map Unit Setting

National map unit symbol: hdmh

Elevation: 500 to 4,300 feet

Mean annual precipitation: 30 to 60 inches

Mean annual air temperature: 50 to 57 degrees F

Frost-free period: 220 to 260 days

Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 70 percent

Kidd and similar soils: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting

Landform: Hills

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Free face

Down-slope shape: Convex

Across-slope shape: Convex

Properties and qualities

Slope: 50 to 75 percent

Depth to restrictive feature: About 0 inches to lithic bedrock

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: No

Description of Kidd

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from rhyolite

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 14 to 18 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Erosion Hazard (Road, Trail)

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails. The ratings are based on soil erosion factor K, slope, and content of rock fragments.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

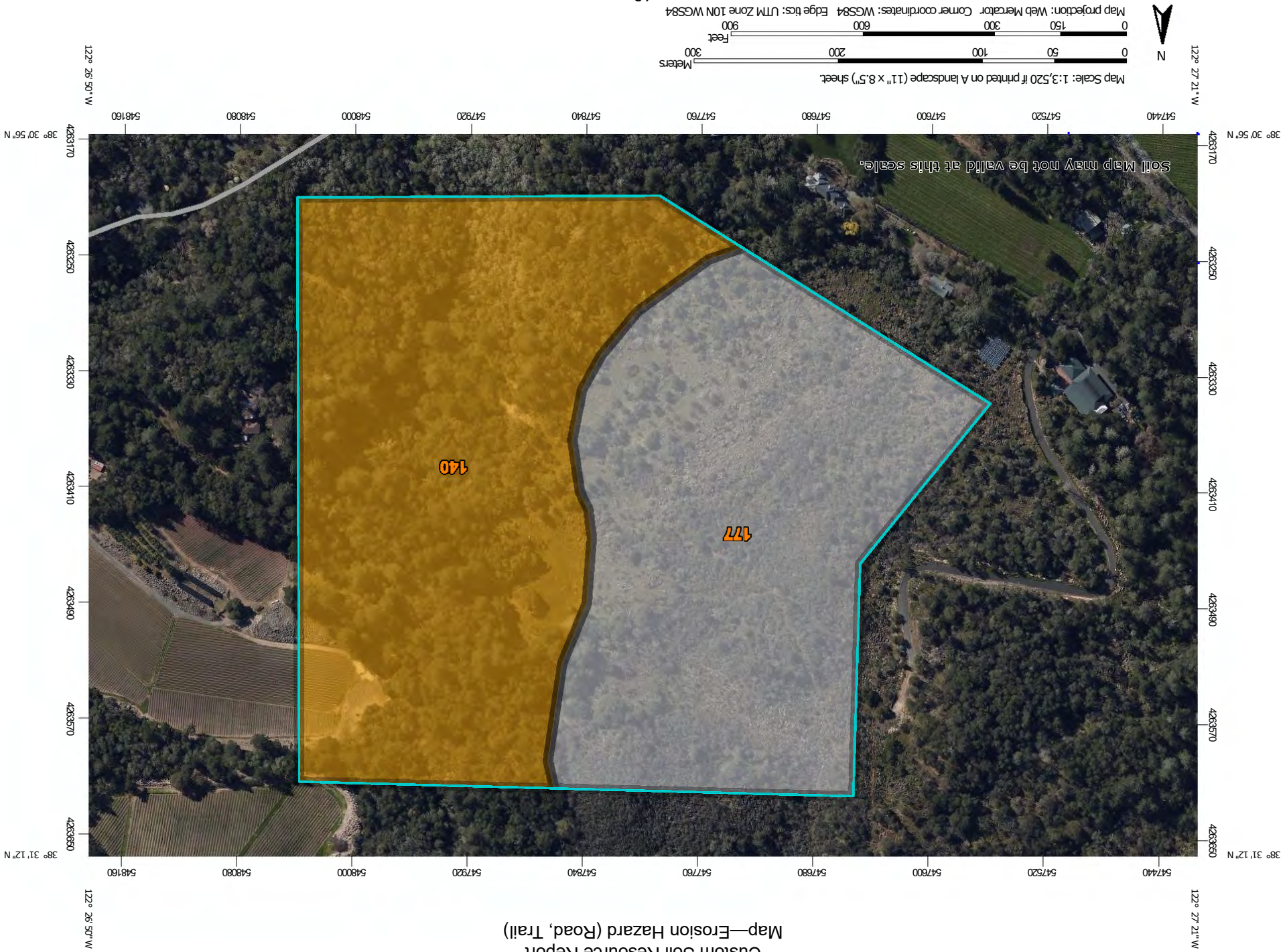
Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

Custom Soil Resource Report

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Erosion Hazard (Road, Trail)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 Very severe
 Severe
 Moderate
 Slight
 Not rated or not available

Soil Rating Lines

 Very severe
 Severe
 Moderate
 Slight
 Not rated or not available

Soil Rating Points

 Very severe
 Severe
 Moderate
 Slight
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways

 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Napa County, California
Survey Area Data: Version 12, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2019—Apr 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Erosion Hazard (Road, Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
140	Forward silt loam, 12 to 57 percent slopes, MLRA 15	Severe	Forward (85%)	Slope/erodibility (0.95)	21.2	53.0%
177	Rock outcrop-Kidd complex, 50 to 75 percent slopes	Not rated	Rock outcrop (70%)		18.8	47.0%
Totals for Area of Interest					39.9	100.0%

Rating	Acres in AOI	Percent of AOI
Severe	21.2	53.0%
Null or Not Rated	18.8	47.0%
Totals for Area of Interest	39.9	100.0%

Rating Options—Erosion Hazard (Road, Trail)*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Erosion Factors

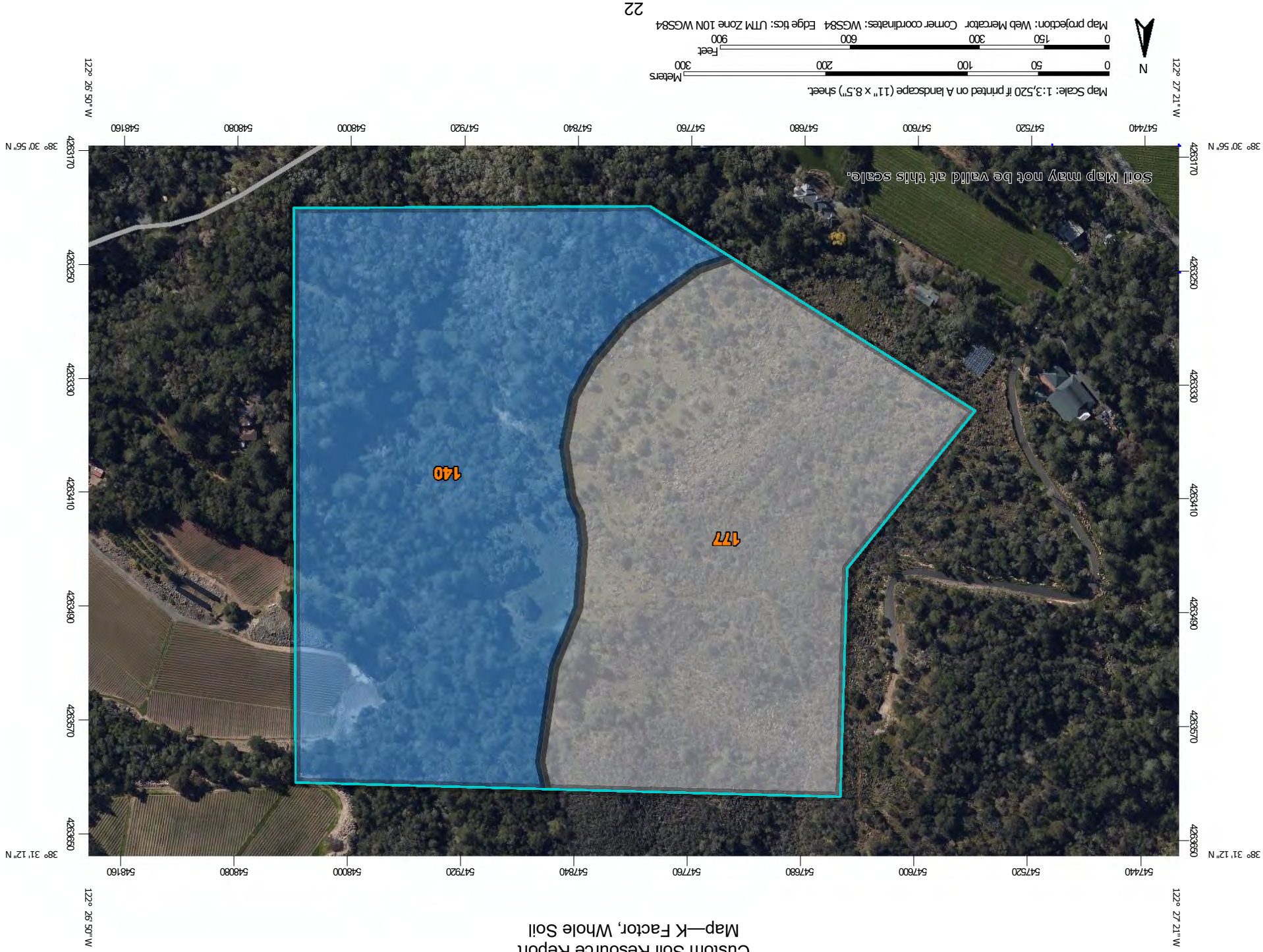
Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

K Factor, Whole Soil

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Custom Soil Resource Report
Map—K Factor, Whole Soil



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Lines

	.02
	.05
	.10
	.15
	.17
	.20

	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Points

	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Water Features

	Streams and Canals
	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads
	Background
	Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Napa County, California
Survey Area Data: Version 12, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2019—Apr 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—K Factor, Whole Soil

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
140	Forward silt loam, 12 to 57 percent slopes, MLRA 15	.43	21.2	53.0%
177	Rock outcrop-Kidd complex, 50 to 75 percent slopes		18.8	47.0%
Totals for Area of Interest			39.9	100.0%

Rating Options—K Factor, Whole Soil

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 36

Units of Measure: Inches

T Factor

The T factor is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Custom Soil Resource Report
Map—T Factor



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

-  1
-  2
-  3
-  4
-  5
-  Not rated or not available

Soil Rating Lines

-  1
-  2
-  3
-  4
-  5
-  Not rated or not available

Soil Rating Points

-  1
-  2
-  3
-  4
-  5
-  Not rated or not available

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Date(s) aerial images were photographed: Mar 15, 2019—Apr 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—T Factor

Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
140	Forward silt loam, 12 to 57 percent slopes, MLRA 15	3	21.2	53.0%
177	Rock outcrop-Kidd complex, 50 to 75 percent slopes		18.8	47.0%
Totals for Area of Interest			39.9	100.0%

Rating Options—T Factor

Units of Measure: tons per acre per year

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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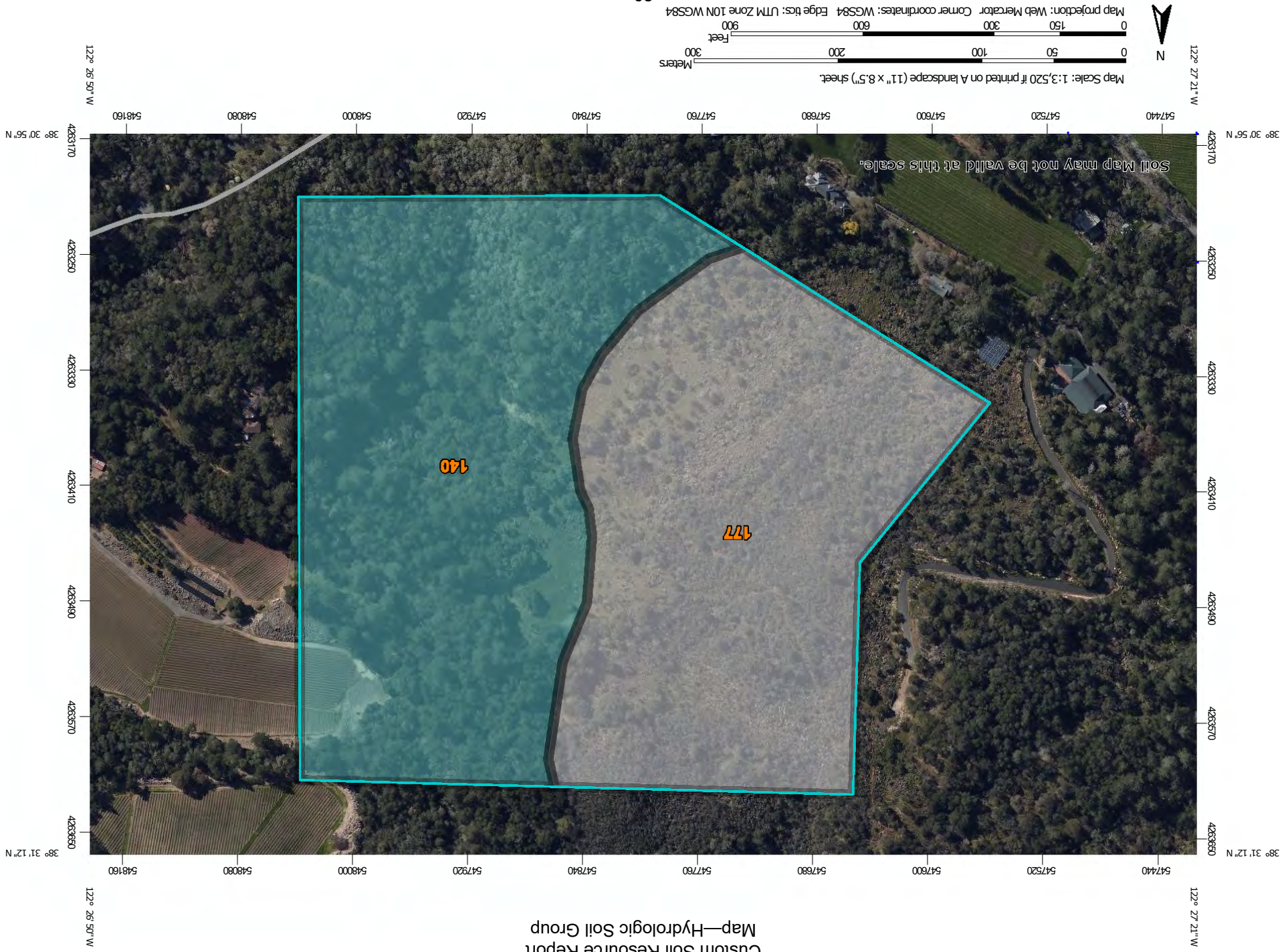
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

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Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Napa County, California
 Survey Area Data: Version 12, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2019—Apr 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
140	Forward silt loam, 12 to 57 percent slopes, MLRA 15	C	21.2	53.0%
177	Rock outcrop-Kidd complex, 50 to 75 percent slopes		18.8	47.0%
Totals for Area of Interest			39.9	100.0%

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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