Hydrologic Analysis, Revised
Proposed Vineyard Expansion
Schramsberg Vineyards
1400 Schramsberg Road
St. Helena, CA 94574
020-390-007, 008, 011, 014, 015
May 15, 2024

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No. 710
EXP. 12/31/24

The following analysis evaluates a vineyard planting proposal, to determine the project's potential to increase peak flow or runoff from the various parts of the site. The project proposes development of approximately 14.1 acres of vineyard, south of the city of Calistoga, California. This analysis, prepared by David Steiner, CPESC, CPSWQ, at the request of and under the supervision of Mike Muelrath of Applied Civil Engineering, relies on the basic methodology of USDA Technical Release 55, as modeled in Version 1.00.10 of WinTR-55 "Small Watershed Hydrology", a Windows-based application. The proposal's seven blocks are divided into seven watersheds on the applicant's owned or leased property, all draining generally northwesterly into the Napa River. Watersheds A, B, C, and D drain to the Napa River via Nash Creek; Watersheds E and F, to the River via Schramsberg Creek and a complex of man-made drains traversing vineyards on the northeast side of Highway 29; and Watershed G, to the River via Ritchie Creek.

Times of Concentration (Tc) for each of the seven watersheds were determined by plotting flowpaths from the hydrologically most remote points to designated outlets, or points of interest. Each component's data is entered into the model as slope length, gradient, and Manning's "N" roughness factor. Additional characteristics—cross-sectional area and wetted perimeter, or a known velocity— are required for channel flow. Watersheds B and C are further divided into two "Sub-Areas", ~~each~~ with its own Time of Concentration. As Block 1--overlying Sub-Area C-2 (west side) and Watershed D (east side)--will require runoff control (diversions and storm drains) to appropriately reduce potential soil loss, those structures will interrupt the post-project Time of Concentration flowpaths . Thus data entered into the model's Tc table track and calculate the attendant slowing and acceleration of flow within those runoff control structures. In some cases a flowpath's on-the-ground sequence may differ from that implied in the application's data entry but, as total Tc determinations are additive, the order in which Tc data are entered is unimportant.

In addition, the analyses of Watersheds B, C and D include calculated travel times in stream reaches that begin at the downstream end of the Tc flowpaths, and extend to each watershed's outlet.

Each watershed is modeled to compare predicted peak flows, under pre- and post-project conditions, of 24-hour storms of 2, 10, 50, and 100-year return intervals, as published online in NOAA Atlas 14. Mapping Units (soil types) and their corresponding Hydrologic Soil Groups were determined with reference to the USDA Web Soil Survey. Printouts from these respective website authorities accompany this submittal.

The watersheds include riparian areas, timber land, mixed hardwood woodland, chaparral or brushland, grassland, existing vineyards, and small areas of rock outcrop with little or no topsoil or vegetation. Two wineries, and several residences with landscaping and outbuildings, with access via asphalt and gravel driveways, complete the area's land use picture. Pre- and post-project runoff curve numbers (**CN**) are assigned based on hydrologic soil group (**HSG**),

land use, and hydrologic condition. Estimates of land use, cover, and hydrologic condition were aerial photographic images on Google Earth, Napa County GIS, and the OnX GIS application.

As vineyards are not included among WinTR-55's land use alternatives, the application's "custom CN" field is used to enter selections from a California-specific table found in the NRCS Engineering Field Handbook.[1] This table's guidance calls for vineyard Curve Numbers equivalent to those of "annual grass." Data for all proposed vineyards are entered into the post-project modeling to indicate "good" hydrologic condition, to reflect the specifications of the Erosion Control Plan. CN printouts have been edited as pdf documents, where necessary to reflect the actual land uses.

Note: Block 1A is a small (.7-acre) area that was inadvertently included as an extension of the adjacent vineyard block immediately to its west, when it was planted. This existing vineyard area is included in the current submittal in order to bring it into compliance with the Conservation Regulations. It is not included in any complete hydrologic analysis, because it is too small to affect a post-project Weighted Curve Number analysis on any hypothetical "model-able" watershed; this analysis evaluates pre- and post-project runoff based on site-specific CN determinations only. Historic aerial photography shows this area to have been cleared at least as early as 1973, and either remnant vineyard or re-emergent native brush appears to have dominated at the critical 1993 time threshold; a reasonable pre-project CN would be for "Broadleaf Chaparral in fair hydrologic condition" with a CN of 75 (HSG C). The current Erosion Control Plan specifies management of this block as non-tilled, with 75% cover, calling for hydrologic parity, i.e., a post-project Curve Number of 75 "Vineyard, annual grass, good condition"—implying no increase in peak flow or runoff.

Similarly, a small area in the southwest corner of the proposed Block 4 lies just outside the boundary of Watershed G. This area was cleared for vineyard prior to any existing photographic record, showing limited cover prior to the existing planting. This analysis, again, assigns identical pre- and post-project Curve Numbers—implying no increase in peak flow or runoff.

Summary of the Results of Initial Analysis: (Please see accompanying WinTR-55 printouts and electronic files for complete reports, including those of storms of more frequent return intervals.)

• Watershed A:	Pre-project 100-year peak flow:	17.35 cfs
	Post-project 100-year peak flow:	17.35 cfs
	Increase:	0 cfs
• Watershed B:	Pre-project 100-year peak flow:	12.23 cfs
	Post-project 100-year peak flow:	12.35 cfs
	Increase:	.12 cfs

[1]Engineering Field Handbook, Part 650, Chapter 2, Supplement 1, USDA/NRCS, Oct 2008.

- Watershed C: Pre-project 100-year peak flow: 20.29 cfs
  Post-project 100-year peak flow: 20.32 cfs
  Increase: .03 cfs

- Watershed D: Pre-project 100-year peak flow: 15.49 cfs
  Post-project 100-year peak flow: 15.45 cfs
  Increase: <.04 cfs>

- Watershed E: Pre-project 100-year peak flow: .31 cfs
  Post-project 100-year peak flow: .32 cfs
  Increase: .01 cfs

- Watershed F: Pre-project 100-year peak flow: 7.89 cfs
  Post-project 100-year peak flow: 7.89 cfs
  Increase: 0 cfs

- Watershed G: Pre-project 100-year peak flow: 4.78 cfs
  Post-project 100-year peak flow: 4.78 cfs
  Increase: 0 cfs

No increase is predicted in Watersheds A, F, and G. A slight peak flow decrease is predicted in Watershed D, owing to the slowing of flow (Tc increase) in the proposed diversions.

Storage Volume Required to Mitigate Predicted Peak Flow Increases in Watersheds B, C, and E.

Watershed B

- A manually-entered Tc increase of .056 hours to Sub-Area B-1 brings the post-project, 100-year peak of WS-B (12.35) to parity with the pre-project peak (12.22 cfs).
- Sub WS B-1-A will generate a 100-year post-project peak of .95 cfs.
- .056 hours x 3600 seconds/hour = 201.6 seconds
- 201.6 seconds x .95 cfs = 191.5 cubic feet of storage volume, required to provide on the ground the hypothesized, .056-hour Tc increase.
- 574.6 cubic feet of rock fill with a void ratio of .33, will be required in the retention structure.
- A manually-entered Tc increase of .100 hours to Sub-Area B-1 brings the post-project, 2-year peak of WS-B (3.84 cfs) to parity with the pre-project peak (3.76 cfs).
- Sub WS B-1-A will generate a 2-year post-project peak of .31 cfs.
- .100 hours x 3600 seconds/hour = 360 seconds
- 360 seconds x .31 cfs = 111.6 cubic feet of storage volume, required to provide on the ground the hypothesized, .100-hour Tc increase.

- 334.8 cubic feet of rock fill with a void ratio of .33, will be required in the retention structure. (100-year peak determines design requirement.)

Watershed C

- A manually-entered Tc increase of .003 hours to Sub-Area C-2 brings the post-project, 100-year peak of WS-C (20.32) to parity with the pre-project peak (20.29 cfs).
- Sub WS C-2-A will generate a 100-year post-project peak of 2.06 cfs.
- .003 hours x 3600 seconds/hour = 5.24 seconds
- 5.24 x 2.06 cfs = 10.8 cubic feet of storage volume, required to provide on the ground the hypothesized, .003-hour Tc increase.
- 32.4 cubic feet of rock fill with a void ratio of .33, will be required in the retention structure.
- A manually-entered Tc increase of .004 hours to Sub-Area C-2 brings the post-project, 2-year peak of WS-C (6.43) to parity with the pre-project peak (6.42 cfs).
- Sub WS C-2-A will generate a 2-year post-project peak of .68 cfs.
- .004 hours x 3600 seconds/hour = 14.4 seconds
- 14.4 x .68 cfs = 9.8 cubic feet of storage volume, required to provide on the ground the hypothesized, .004-hour Tc increase.
- 29.4 cubic feet of rock fill with a void ratio of .33, will be required in the retention structure. (100-year peak determines design requirement.)

Watershed E

- A manually-entered Tc increase of .014 hours to WS E brings the post-project, 100-year peak of WS-E (.32 cfs) to parity with the pre-project peak (.31 cfs).
- WS E will generate a 100-year post-project peak of .32 cfs.
- .014 hours x 3600 seconds/hour = 50.4 seconds
- 50.4 x .32 cfs = 16.1 cubic feet of storage volume, required to provide on the ground the hypothesized, .014-hour Tc increase.
- 48.4 cubic feet of rock fill with a void ratio of .33, will be required in the retention structure.
- A manually-entered Tc increase of .111 hours to WS E brings the post-project, 2-year peak of WS-E (.10 cfs) to parity with the pre-project peak (.09 cfs).
- WS E will generate a 100-year post-project peak of .10 cfs.
- .111 hours x 3600 seconds/hour = 399.6 seconds
- 399.6 x .10 cfs = 40 cubic feet of storage volume, required to provide on the ground the hypothesized, .111-hour Tc increase.
- 120 cubic feet of rock fill with a void ratio of .33, will be required in the retention structure. (2-year peak determines design requirement.)

Conclusion: The specifications of the Erosion Control Plan, including planting and maintenance of the cover crops and the appropriate design and installation of the retention structures described above, assure that the project will not increase peak flow or runoff.

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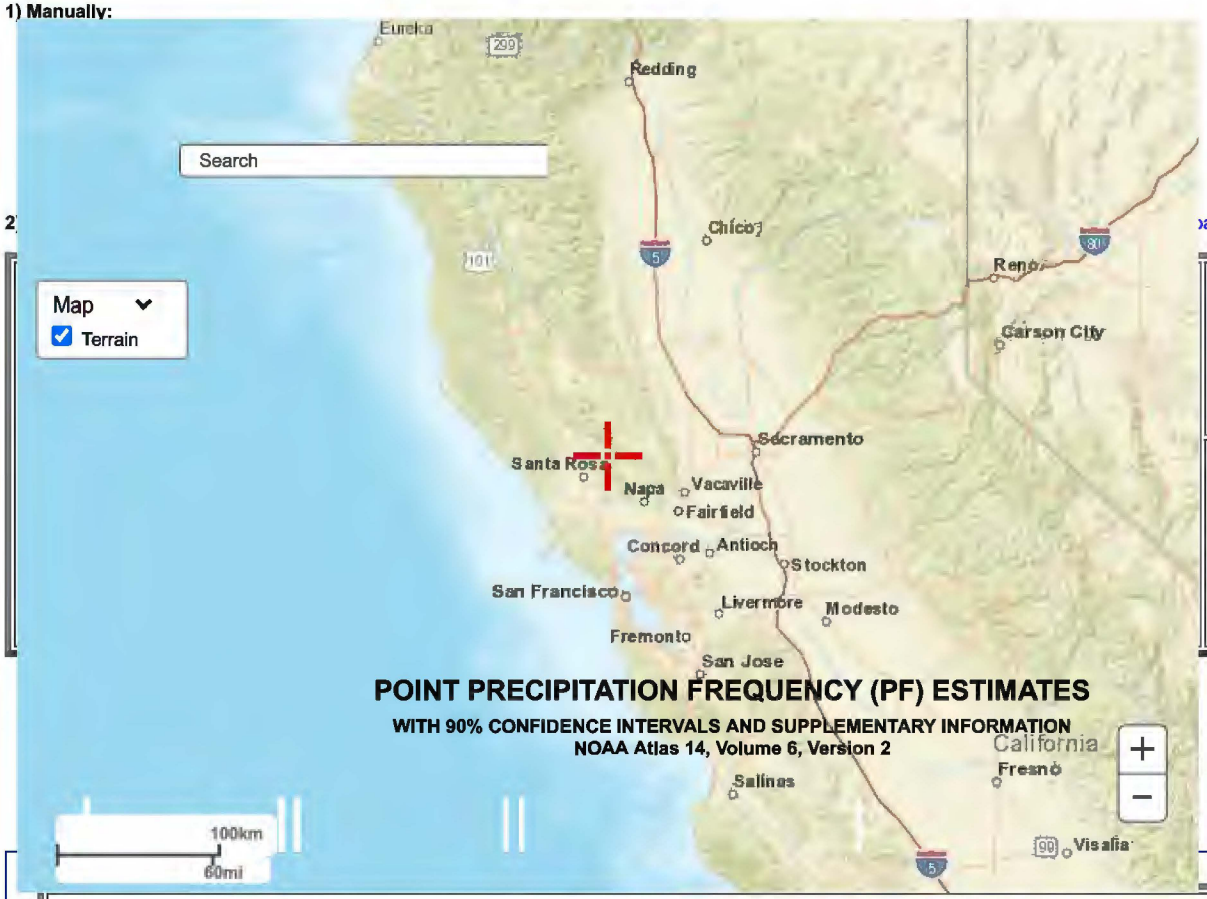
NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

Data description

Data type: Precipitation depth **Units:** English **Time series type:** Partial duration

Select location

1) Manually:



aa.gov):

a) Select location
Move crosshair or double click

b) Click on station icon
☐ Show stations on map

Location information:
Name: Calistoga, California, USA*
Latitude: 38.5530°
Longitude: -122.5390°
Elevation: 733.32 ft **
* Source: ESRI Maps
** Source: USGS

Print page

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.155** (0.138-0.176)	**0.187** (0.166-0.213)	**0.229** (0.203-0.261)	**0.264** (0.231-0.304)	**0.312** (0.264-0.374)	**0.351** (0.289-0.430)	**0.390** (0.313-0.492)	**0.432** (0.335-0.563)	**0.492** (0.364-0.671)	**0.540** (0.384-0.766)

10-min	**0.223** (0.198-0.253)	**0.268** (0.238-0.305)	**0.328** (0.291-0.375)	**0.378** (0.332-0.436)	**0.448** (0.378-0.536)	**0.502** (0.414-0.616)	**0.559** (0.448-0.705)	**0.620** (0.481-0.807)	**0.705** (0.522-0.962)	**0.774** (0.551-1.10)
15-min	**0.269** (0.239-0.306)	**0.324** (0.288-0.369)	**0.397** (0.352-0.453)	**0.457** (0.401-0.527)	**0.541** (0.457-0.648)	**0.608** (0.500-0.745)	**0.676** (0.542-0.853)	**0.750** (0.582-0.976)	**0.852** (0.631-1.16)	**0.935** (0.666-1.33)
30-min	**0.395** (0.352-0.449)	**0.476** (0.423-0.541)	**0.583** (0.516-0.665)	**0.672** (0.589-0.774)	**0.795** (0.671-0.952)	**0.892** (0.735-1.09)	**0.993** (0.796-1.25)	**1.10** (0.854-1.43)	**1.25** (0.926-1.71)	**1.37** (0.978-1.95)
60-min	**0.580** (0.516-0.659)	**0.698** (0.620-0.794)	**0.855** (0.757-0.976)	**0.986** (0.864-1.14)	**1.17** (0.984-1.40)	**1.31** (1.08-1.61)	**1.46** (1.17-1.84)	**1.62** (1.25-2.10)	**1.84** (1.36-2.51)	**2.02** (1.44-2.86)
2-hr	**0.878** (0.781-0.997)	**1.06** (0.940-1.20)	**1.29** (1.14-1.47)	**1.48** (1.30-1.70)	**1.73** (1.46-2.07)	**1.93** (1.59-2.36)	**2.12** (1.70-2.67)	**2.32** (1.80-3.02)	**2.59** (1.92-3.54)	**2.80** (1.99-3.97)
3-hr	**1.13** (1.00-1.28)	**1.36** (1.21-1.55)	**1.66** (1.47-1.89)	**1.90** (1.67-2.19)	**2.21** (1.87-2.65)	**2.45** (2.02-3.01)	**2.69** (2.15-3.39)	**2.93** (2.27-3.81)	**3.25** (2.40-4.43)	**3.49** (2.48-4.95)
6-hr	**1.71** (1.52-1.95)	**2.07** (1.84-2.36)	**2.53** (2.24-2.88)	**2.88** (2.53-3.32)	**3.35** (2.83-4.01)	**3.70** (3.05-4.54)	**4.04** (3.24-5.10)	**4.39** (3.40-5.71)	**4.83** (3.58-6.60)	**5.17** (3.68-7.34)
12-hr	**2.47** (2.20-2.81)	**3.03** (2.69-3.45)	**3.73** (3.30-4.26)	**4.29** (3.76-4.93)	**5.01** (4.23-6.00)	**5.54** (4.57-6.80)	**6.07** (4.86-7.66)	**6.60** (5.12-8.59)	**7.29** (5.40-9.95)	**7.81** (5.56-11.1)
24-hr	**3.50** (3.15-3.98)	**4.37** (3.92-4.96)	**5.46** (4.89-6.22)	**6.32** (5.62-7.25)	**7.45** (6.45-8.78)	**8.29** (7.06-9.94)	**9.12** (7.61-11.2)	**9.96** (8.11-12.5)	**11.1** (8.70-14.3)	**11.9** (9.08-15.9)
2-day	**4.55** (4.09-5.16)	**5.74** (5.16-6.53)	**7.26** (6.50-8.27)	**8.46** (7.52-9.70)	**10.0** (8.69-11.8)	**11.2** (9.54-13.4)	**12.4** (10.3-15.1)	**13.5** (11.0-17.0)	**15.1** (11.9-19.5)	**16.2** (12.4-21.7)
3-day	**5.25** (4.72-5.96)	**6.67** (5.99-7.58)	**8.48** (7.60-9.66)	**9.91** (8.82-11.4)	**11.8** (10.2-13.9)	**13.2** (11.2-15.8)	**14.6** (12.2-17.9)	**16.0** (13.1-20.1)	**17.9** (14.1-23.2)	**19.3** (14.8-25.8)
4-day	**5.84** (5.24-6.63)	**7.44** (6.68-8.46)	**9.48** (8.49-10.8)	**11.1** (9.87-12.7)	**13.2** (11.5-15.6)	**14.8** (12.6-17.8)	**16.4** (13.7-20.1)	**18.0** (14.7-22.5)	**20.1** (15.8-26.0)	**21.7** (16.6-28.9)
7-day	**7.21** (6.48-8.19)	**9.18** (8.24-10.4)	**11.7** (10.5-13.3)	**13.6** (12.1-15.6)	**16.2** (14.1-19.1)	**18.2** (15.5-21.8)	**20.1** (16.8-24.6)	**22.0** (17.9-27.6)	**24.5** (19.3-31.8)	**26.5** (20.2-35.3)
10-day	**8.22** (7.39-9.33)	**10.5** (9.39-11.9)	**13.3** (11.9-15.1)	**15.5** (13.8-17.8)	**18.4** (15.9-21.6)	**20.5** (17.5-24.6)	**22.6** (18.9-27.7)	**24.7** (20.1-30.9)	**27.5** (21.6-35.6)	**29.5** (22.6-39.4)
20-day	**10.8** (9.74-12.3)	**13.8** (12.4-15.7)	**17.5** (15.7-19.9)	**20.3** (18.1-23.3)	**23.9** (20.7-28.2)	**26.5** (22.6-31.8)	**29.0** (24.2-35.5)	**31.5** (25.6-39.4)	**34.6** (27.2-44.9)	**36.9** (28.2-49.3)
30-day	**13.0** (11.7-14.8)	**16.6** (14.9-18.9)	**20.9** (18.8-23.8)	**24.2** (21.6-27.8)	**28.4** (24.6-33.4)	**31.3** (26.6-37.5)	**34.1** (28.4-41.7)	**36.8** (30.0-46.1)	**40.2** (31.6-52.1)	**42.7** (32.6-56.9)
45-day	**15.9** (14.3-18.1)	**20.2** (18.1-23.0)	**25.3** (22.7-28.8)	**29.1** (25.9-33.4)	**33.8** (29.3-39.9)	**37.1** (31.6-44.5)	**40.2** (33.6-49.2)	**43.2** (35.2-54.1)	**46.9** (36.9-60.8)	**49.5** (37.8-66.1)
60-day	**18.8** (16.9-21.4)	**23.7** (21.3-27.0)	**29.5** (26.5-33.6)	**33.8** (30.1-38.8)	**39.1** (33.8-46.0)	**42.7** (36.3-51.2)	**46.1** (38.4-56.4)	**49.3** (40.2-61.7)	**53.2** (41.9-69.0)	**55.9** (42.8-74.7)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Estimates from the table in CSV format: Precipitation frequency estimates Submit

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- **Soil Qualities and Features**
  - AASHTO Group Classification (Surface)
  - AASHTO Group Index
  - Depth to a Selected Soil Restrictive Layer
  - Depth to Any Soil Restrictive Layer
  - Depth to Bedrock
  - Drainage Class
  - Frost Action
  - Frost-Free Days
  - Hydrologic Soil Group

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Map ☑

Table ☑

Description of Rating ☑

Rating Options ☐

Detailed Description ☐

Advanced Options

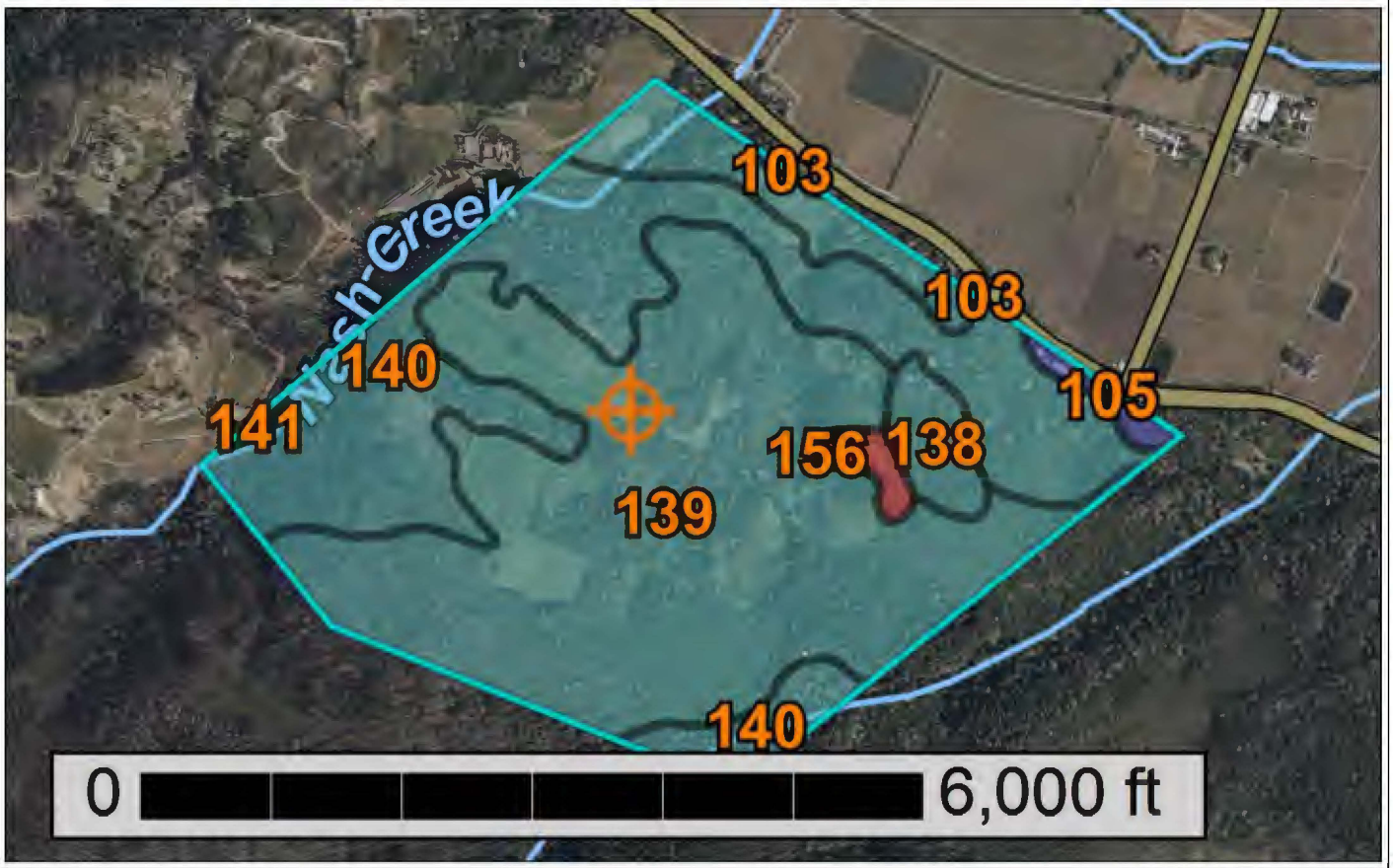
Aggregation Method: Dominant Condition

Component Percent Cutoff

Tie-break Rule: Lower / Higher

Map — Hydrologic Soil Group

Scale 1:41,600 ±1%



Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — Napa County, California (CA055)

Summary by Map Unit — Napa County, California (CA055)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
103	Bale loam, 0 to 2 percent slopes	B	0.6	0.1%
105	Bale clay loam, 2 to 5 percent slopes	B	5.5	1.1%
Totals for Area of Interest			**498.9**	**100.0%**

View Description	View Rating
Map Unit Name	
Parent Material Name	
Representative Slope	
Soil Slippage Potential	
Subsidence, Initial	
Subsidence, Total	
Unified Soil Classification (Surface)	
Water Features	

Summary by Map Unit — Napa County, California (CA055)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
138	Forward silt loam, 3 to 26 percent slopes, MLRA 15	C	14.0	2.8%
139	Forward silt loam, 5 to 39 percent slopes, MLRA 15	C	304.0	60.9%
140	Forward silt loam, 12 to 57 percent slopes, MLRA 15	C	167.5	33.6%
141	Forward-Kidd complex, 11 to 60 percent slopes, MLRA 15	C	1.0	0.2%
156	Kidd loam, 30 to 75 percent slopes	D	6.3	1.3%
Totals for Area of Interest			**498.9**	**100.0%**

Description — 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.

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.

Rating Options — Hydrologic Soil Group

Aggregation Method: Dominant Condition

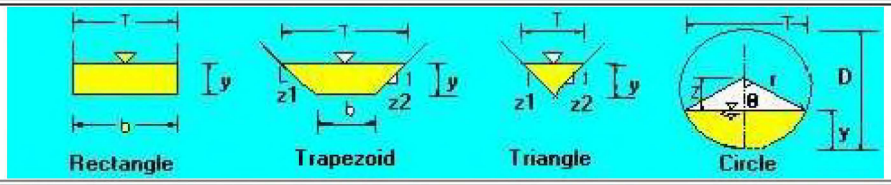
Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

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The open channel flow calculator

Select Channel Type: Circle



Velocity(V)&Discharge(Q)

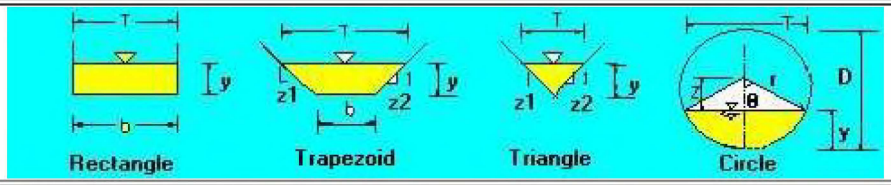
Select unit system: Feet(ft)

Channel slope: .195 ft/ft	Water depth(y): .5 ft	Radius (r) .5 ft
Flow velocity 21.7011 ft/s	LeftSlope (Z1): to 1 (H:V)	RightSlope (Z2): to 1 (H:V)
Flow discharge 8.522 ft^3/s	Input n value .012 or select r	
Calculate!	Status: Calculation finished	Reset
Wetted perimeter 1.57 ft	Flow area 0.39 ft^2	Top width(T) 1 ft
Specific energy 7.81 ft	Froude number 6.1	Flow status Supercritical flow
Critical depth 0.99 ft	Critical slope 0.045 ft/ft	Velocity head 7.31 ft

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The open channel flow calculator

Select Channel Type: Circle



Velocity(V)&Discharge(Q) | Select unit system: Feet(ft)

Channel slope: .299 ft/ft	Water depth(y): .5 ft	Radius (r) .5 ft
Flow velocity 26.872 ft/s	LeftSlope (Z1): to 1 (H:V)	RightSlope (Z2): to 1 (H:V)
Flow discharge 10.5526 ft^3/s	Input n value .012 or select r	
Calculate!	Status: Calculation finished	Reset
Wetted perimeter 1.57 ft	Flow area 0.39 ft^2	Top width(T) 1 ft
Specific energy 11.71 ft	Froude number 7.56	Flow status Supercritical flow
Critical depth 1 ft	Critical slope 0.0716 ft/ft	Velocity head 11.21 ft

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DAS

Schramsberg
Watershed A, pre-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)
SUBAREAS						
Main	4.90 12.13	7.55 12.13	9.76 12.13	12.77 12.13	15.06 12.12	17.35 12.12
REACHES						
OUTLET	4.90	7.55	9.76	12.77	15.06	17.35

DAS

Schramsberg
Watershed A, pre-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

DAS

Schramsberg
Watershed A, pre-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Woods (good)	C	18.3	70
	Total Area / Weighted Curve Number		18.3	70

DAS

Schramsberg
Watershed A, pre-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.1900	0.150				0.057
SHALLOW	643	0.1160	0.050				0.033
SHALLOW	438	0.4690	0.050				0.011
CHANNEL	914	0.1040	0.045	12.00	10.00	12.090	0.021
					Time of Concentration		.122

DAS

Schramsberg
Watershed A, post-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
	(hr)	(hr)	(hr)	(hr)	(hr)	(hr)
SUBAREAS						
Main	4.90	7.55	9.76	12.77	15.06	17.35
	12.13	12.13	12.13	12.13	12.12	12.12
REACHES						
OUTLET	4.90	7.55	9.76	12.77	15.06	17.35

Schramsberg
Watershed A, post-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

DAS

Schramsberg
Watershed A, post-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.1900	0.150				0.057
SHALLOW	643	0.1160	0.050				0.033
SHALLOW	438	0.4690	0.050				0.011
CHANNEL	914	0.1040	0.045	12.00	10.00	12.090	0.021
					Time of Concentration		.122

DAS

Schramsberg
Watershed A, post-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	User defined urban (Click button or	C	1.2	75
	Woods (good)	C	17.1	70
	Total Area / Weighted Curve Number		18.3	70

DAS

Schramsberg
Watershed A, post-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	UserVineyard (annual grass)	(good)	C	1.2	75
	Woods	(good)	C	17.1	70
	Total Area / Weighted Curve Number			18.3	70

DAS

Schramsberg
Watershed B, split, rev2, pre-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
B-1	0.79	12.12	1.22	12.12	1.58	12.12	2.06	12.12	2.43	12.12	2.80	12.12
B-2	2.97	12.13	4.39	12.13	5.55	12.13	7.11	12.13	8.28	12.13	9.45	12.13
REACHES												
Reach B	3.76	12.13	5.60	12.13	7.11	12.12	9.16	12.13	10.70	12.12	12.23	12.12
Down	3.76	12.14	5.60	12.13	7.11	12.13	9.16	12.13	10.70	12.13	12.23	12.13
OUTLET	3.76		5.60		7.11		9.16		10.70		12.23	

Schramsberg
Watershed B, split, rev2, pre-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed B, split, rev2, pre-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B-1							
SHEET	100	0.2500	0.240				0.074
SHALLOW	375	0.2000	0.050				0.014
SHALLOW	135	0.2100	0.050				0.005
					Time of Concentration		0.1
B-2							
SHEET	100	0.1500	0.240				0.091
SHALLOW	510	0.2060	0.050				0.019
SHALLOW	113	0.2920	0.050				0.004
CHANNEL	423	0.1700	0.050	10.00	10.00	11.750	0.010
					Time of Concentration		0.124

Schramsberg
Watershed B, split, rev2, pre-project
Napa County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach B	348	0.04	0.201	4	3 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach B	0.0	0.000	0	4	0.201
	0.5	24.196	2.8	7	
	1.0	89.979	7	10	
	2.0	376.426	20	16	
	5.0	3042.830	95	34	
	10.0	16681.918	340	64	
	20.0	97690.617	1280	124	

DAS

Schramsberg
Watershed B, split, rev2, pre-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B-1	Woods	(good)	C	2.9	70
	Total Area / Weighted Curve Number			2.9	70
B-2	Open space; grass cover 50% to 75%	(fair)	C	.9	79
	Woods	(fair)	C	8.3	73
	Total Area / Weighted Curve Number			9.2	74

DAS

Schramsberg
Watershed B, split, rev2, pre-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B-1	Woods	(good)	C	2.9	70
	Total Area / Weighted Curve Number			2.9	70
B-2	Annual grass	(fair)	C	.9	79
	Woods	(fair)	C	8.3	73
	Total Area / Weighted Curve Number			9.2	74

DAS

Schramsberg
Watershed B, split, rev2, post-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
B-1	0.87	12.12	1.31	12.12	1.68	12.11	2.17	12.12	2.55	12.12	2.92	12.12
B-2	2.97	12.13	4.39	12.13	5.55	12.13	7.11	12.13	8.28	12.13	9.45	12.13
REACHES												
Reach B	3.84	12.12	5.69	12.13	7.22	12.13	9.27	12.12	10.82	12.12	12.35	12.12
Down	3.84	12.14	5.69	12.13	7.22	12.13	9.27	12.14	10.81	12.13	12.35	12.13
OUTLET	3.84		5.69		7.22		9.27		10.81		12.35	

Schramsberg
Watershed B, split, rev2, post-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed B, split, rev2, post-project
Napa County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach B	348	0.04	0.201	4	3 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach B	0.0	0.000	0	4	0.201
	0.5	24.196	2.8	7	
	1.0	89.979	7	10	
	2.0	376.426	20	16	
	5.0	3042.830	95	34	
	10.0	16681.918	340	64	
	20.0	97690.617	1280	124	

DAS

Schramsberg
Watershed B, split, rev2, post-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B-1							
SHEET	100	0.2500	0.240				0.074
SHALLOW	375	0.2000	0.050				0.014
SHALLOW	135	0.2100	0.050				0.005
					Time of Concentration		0.1
B-2							
SHEET	100	0.1500	0.240				0.091
SHALLOW	510	0.2060	0.050				0.019
SHALLOW	113	0.2920	0.050				0.004
CHANNEL	423	0.1700	0.050	10.00	10.00	11.750	0.010
					Time of Concentration		.124

DAS

Schramsberg
Watershed B, split, rev2, post-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B-1	User defined urban (Click button or		C	1	75
	Woods	(good)	C	1.9	70
	Total Area / Weighted Curve Number			2.9	72
B-2	Open space; grass cover 50% to 75%	(fair)	C	.9	79
	User defined urban (Click button or		C	4.1	75
	Woods	(fair)	C	4.2	73
	Total Area / Weighted Curve Number			9.2	74

DAS

Schramsberg
Watershed B, split, rev2, post-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B-1	User defined urban (Click button or		C	1	75
	Woods	(good)	C	1.9	70
	Total Area / Weighted Curve Number			2.9	72
B-2	Annual grass	(fair)	C	.9	79
	Vineyard (annual grass)		C	4.1	75
	Woods	(fair)	C	4.2	73
	Total Area / Weighted Curve Number			9.2	74

DAS Schramsberg
Watershed B, split, rev2, post-project, Tc inc 2
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
B-1	0.80	12.17	1.21	12.17	1.55	12.17	2.01	12.17	2.36	12.16	2.70	12.16
B-2	2.97	12.13	4.39	12.13	5.55	12.13	7.11	12.13	8.28	12.13	9.45	12.13
REACHES												
Reach B	3.76	12.13	5.57	12.13	7.06	12.13	9.07	12.13	10.58	12.13	12.09	12.13
Down	3.76	12.14	5.57	12.14	7.06	12.14	9.07	12.14	10.58	12.14	12.09	12.14
OUTLET	3.76		5.57		7.06		9.07		10.58		12.09	

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach B	348	0.04	0.201	4	3 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach B	0.0	0.000	0	4	0.201
	0.5	24.196	2.8	7	
	1.0	89.979	7	10	
	2.0	376.426	20	16	
	5.0	3042.830	95	34	
	10.0	16681.918	340	64	
	20.0	97690.617	1280	124	

Schramsberg
Watershed B, split, rev2, post-project, Tc inc 2
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B-1							
SHEET	100	0.2500	0.240				0.074
SHALLOW	375	0.2000	0.050				0.014
SHALLOW	135	0.2100	0.050				0.005
CHANNEL	360					1.000	0.100
					Time of Concentration		.193
B-2							
SHEET	100	0.1500	0.240				0.091
SHALLOW	510	0.2060	0.050				0.019
SHALLOW	113	0.2920	0.050				0.004
CHANNEL	423	0.1700	0.050	10.00	10.00	11.750	0.010
					Time of Concentration		.124

DAS

Schramsberg
Watershed B, split, rev2, post-project, Tc inc 2
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B-1							
SHEET	100	0.2500	0.240				0.074
SHALLOW	375	0.2000	0.050				0.014
SHALLOW	135	0.2100	0.050				0.005
CHANNEL	360	MANUAL ENTRY				1.000	0.100
					Time of Concentration		.193
B-2							
SHEET	100	0.1500	0.240				0.091
SHALLOW	510	0.2060	0.050				0.019
SHALLOW	113	0.2920	0.050				0.004
CHANNEL	423	0.1700	0.050	10.00	10.00	11.750	0.010
					Time of Concentration		.124

Schramsberg
Watershed B, split, rev2, post-project, Tc inc 2
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B-1	User defined urban (Click button or		C	1	75
	Woods	(good)	C	1.9	70
	Total Area / Weighted Curve Number			2.9	72
B-2	Open space; grass cover 50% to 75%	(fair)	C	.9	79
	User defined urban (Click button or		C	4.1	75
	Woods	(fair)	C	4.2	73
	Total Area / Weighted Curve Number			9.2	74

DAS

Schramsberg
Watershed B, split, rev2, post-project, Tc inc 2
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B-1	Vineyard (Annual grass)	(good)	C	1	75
	Woods	(good)	C	1.9	70
	Total Area / Weighted Curve Number			2.9	72
B-2	Vineyard (Annual grass)	(fair)	C	.9	79
	Vineyard (Annual grass)	(good)	C	4.1	75
	Woods	(fair)	C	4.2	73
	Total Area / Weighted Curve Number			9.2	74

DAS

Schramsberg
Watershed B, split, rev2, post-project, Tc inc 100
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
B-1	0.84	12.14	1.26	12.15	1.61	12.14	2.09	12.14	2.44	12.14	2.80	12.14
B-2	2.97	12.13	4.39	12.13	5.55	12.13	7.11	12.13	8.28	12.13	9.45	12.13
REACHES												
Reach B	3.80	12.13	5.64	12.13	7.15	12.13	9.18	12.13	10.71	12.13	12.23	12.13
Down	3.80	12.13	5.64	12.14	7.15	12.14	9.18	12.14	10.71	12.14	12.23	12.13
OUTLET	3.80		5.64		7.15		9.18		10.71		12.23	

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach B	348	0.04	0.201	4	3 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach B	0.0	0.000	0	4	0.201
	0.5	24.196	2.8	7	
	1.0	89.979	7	10	
	2.0	376.426	20	16	
	5.0	3042.830	95	34	
	10.0	16681.918	340	64	
	20.0	97690.617	1280	124	

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B-1							
SHEET	100	0.2500	0.240				0.074
SHALLOW	375	0.2000	0.050				0.014
SHALLOW	135	0.2100	0.050				0.005
CHANNEL	200					1.000	0.056
					Time of Concentration		.149
B-2							
SHEET	100	0.1500	0.240				0.091
SHALLOW	510	0.2060	0.050				0.019
SHALLOW	113	0.2920	0.050				0.004
CHANNEL	423	0.1700	0.050	10.00	10.00	11.750	0.010
					Time of Concentration		.124

Schramsberg
Watershed B, split, rev2, post-project, Tc inc 100
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B-1							
SHEET	100	0.2500	0.240				0.074
SHALLOW	375	0.2000	0.050				0.014
SHALLOW	135	0.2100	0.050				0.005
CHANNEL	200	MANUAL ENTRY				1.000	0.056
					Time of Concentration		.149
B-2							
SHEET	100	0.1500	0.240				0.091
SHALLOW	510	0.2060	0.050				0.019
SHALLOW	113	0.2920	0.050				0.004
CHANNEL	423	0.1700	0.050	10.00	10.00	11.750	0.010
					Time of Concentration		.124

Schramsberg
Watershed B, split, rev2, post-project, Tc inc 100
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B-1	Vineyard (Annual grass) (good)	C	1	75
	Woods (good)	C	1.9	70
	Total Area / Weighted Curve Number		2.9	72
B-2	Vineyard (Annual grass) (fair)	C	.9	79
	Vineyard (Annual grass) (good)	C	4.1	75
	Woods (fair)	C	4.2	73
	Total Area / Weighted Curve Number		9.2	74

Schramsberg
Watershed B, split, rev2, post-project, Tc inc 100
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B-1	User defined urban (Click button or		C	1	75
	Woods	(good)	C	1.9	70
	Total Area / Weighted Curve Number			2.9	72
B-2	Open space; grass cover 50% to 75%	(fair)	C	.9	79
	User defined urban (Click button or		C	4.1	75
	Woods	(fair)	C	4.2	73
	Total Area / Weighted Curve Number			9.2	74

DAS

Schramsberg
Sub-Watershed B-1-A
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)
SUBAREAS						
Main	0.31 12.12	0.45 12.12	0.56 12.12	0.72 12.12	0.83 12.12	0.95 12.12
REACHES						
OUTLET	0.31	0.45	0.56	0.72	0.83	0.95

Schramsberg
Sub-Watershed B-1-A
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

DAS

Schramsberg
Sub-Watershed B-1-A
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	User defined urban (Click button or	C	.82	75
	Woods (good)	C	.07	70
	Total Area / Weighted Curve Number		.89	75

DAS

Schramsberg
Sub-Watershed B-1-A
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Vineyard (Annual grass)	(good)	C	.82	75
	Woods	(good)	C	.07	70
	Total Area / Weighted Curve Number			.89	75

Schramsberg
Sub-Watershed B-1-A
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.2500	0.240				0.074
SHALLOW	375	0.2000	0.050				0.014
					Time of Concentration		0.1

DAS

Schramsberg
Watershed C, split, pre-project, rev
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
C-1	3.16	12.13	4.53	12.13	5.64	12.13	7.13	12.13	8.23	12.13	9.34	12.12
C-2	3.28	12.14	4.94	12.14	6.31	12.14	8.17	12.15	9.58	12.14	10.99	12.14
REACHES												
Reach 1	3.16	12.13	4.53	12.13	5.64	12.13	7.13	12.13	8.23	12.13	9.34	12.12
Down	3.16	12.14	4.53	12.13	5.64	12.13	7.12	12.13	8.23	12.14	9.33	12.13
Reach 2	6.43	12.14	9.46	12.14	11.94	12.13	15.28	12.14	17.80	12.14	20.30	12.14
Down	6.42	12.16	9.45	12.16	11.94	12.16	15.28	12.16	17.79	12.15	20.29	12.16
Reach 3	6.42	12.16	9.45	12.16	11.94	12.16	15.28	12.16	17.79	12.15	20.29	12.16
Down	6.42	12.17	9.45	12.16	11.94	12.17	15.28	12.16	17.79	12.16	20.29	12.16
OUTLET	6.42		9.45		11.94		15.28		17.79		20.29	

Schramsberg
Watershed C, split, pre-project, rev
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed C, split, pre-project, rev
Napa County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach 1	390	0.05	0.344	3	1 :1
Reach 2	262	0.229	0.227	4	.75 :1
Reach 3	298	0.03	0.068	5	.5 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach 1	0.0	0.000	0	3	0.344
	0.5	16.462	1.8	4	
	1.0	54.249	4	5	
	2.0	191.906	10	7	
	5.0	1226.643	40	13	
	10.0	5857.104	130	23	
	20.0	31326.588	460	43	
Reach 2	0.0	0.000	0	4	0.227
	0.5	3.773	2.2	4.8	
	1.0	11.915	4.8	5.5	
	2.0	38.877	11	7	
	5.0	211.670	38.8	11.5	
	10.0	890.760	115	19	
	20.0	4314.261	380	34	
Reach 3	0.0	0.000	0	5	0.068
	0.5	19.288	2.6	5.5	
	1.0	59.168	5.5	6	
	2.0	181.477	12	7	
	5.0	848.293	37.5	10	
	10.0	3064.790	100	15	
	20.0	12842.772	300	25	

Schramsberg
Watershed C, split, pre-project, rev
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
C-1							
SHEET	100	0.0920	0.170				0.084
SHALLOW	640	0.1170	0.050				0.032
CHANNEL	309	0.2910	0.050	5.00	5.00	17.167	0.005
					Time of Concentration		.121
C-2							
SHEET	100	0.0320	0.170				0.128
SHALLOW	259	0.2880	0.050				0.008
SHALLOW	573	0.3940	0.050				0.016
					Time of Concentration		.152

Schramsberg
Watershed C, split, pre-project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-1	Open space; grass cover 50% to 75%	(fair)	C	6.1	79
	Woods	(fair)	C	1	73
	Woods	(good)	C	1.5	70
	Total Area / Weighted Curve Number			8.6	77
C-2	Open space; grass cover 50% to 75%	(fair)	C	1.1	79
	Woods	(fair)	C	3.1	73
	Woods	(good)	C	7.2	70
	Total Area / Weighted Curve Number			11.4	72

Schramsberg
Watershed C, split, pre-project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-1	Annual grass	(fair)	C	6.1	79
	Woods	(fair)	C	1	73
	Woods	(good)	C	1.5	70
	Total Area / Weighted Curve Number			8.6	77
C-2	Annual grass	(fair)	C	1.1	79
	Woods	(fair)	C	3.1	73
	Woods	(good)	C	7.2	70
	Total Area / Weighted Curve Number			11.4	72

DAS

Schramsberg
Watershed C, split, post-project, rev
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
	(hr)	(hr)	(hr)	(hr)	(hr)	(hr)
SUBAREAS						
C-1	3.16	4.53	5.64	7.13	8.23	9.34
	12.13	12.13	12.13	12.13	12.13	12.12
C-2	3.28	4.95	6.33	8.20	9.61	11.01
	12.14	12.15	12.14	12.14	12.14	12.14
REACHES						
Reach 1	3.16	4.53	5.64	7.13	8.23	9.34
	12.13	12.13	12.13	12.13	12.13	12.12
Down	3.16	4.53	5.64	7.12	8.23	9.33
	12.14	12.13	12.13	12.13	12.14	12.13
Reach 2	6.44	9.47	11.96	15.31	17.83	20.33
	12.14	12.13	12.13	12.14	12.14	12.14
Down	6.43	9.47	11.96	15.30	17.82	20.32
	12.16	12.16	12.16	12.16	12.15	12.16
Reach 3	6.43	9.47	11.96	15.30	17.82	20.32
	12.16	12.16	12.16	12.16	12.15	12.16
Down	6.43	9.47	11.96	15.30	17.82	20.32
	12.17	12.16	12.17	12.16	12.16	12.16
OUTLET	6.43	9.47	11.96	15.30	17.82	20.32

Schramsberg
Watershed C, split, post-project, rev
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed C, split, post-project, rev
Napa County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach 1	390	0.05	0.344	3	1 :1
Reach 2	262	0.229	0.227	4	.75 :1
Reach 3	298	0.03	0.068	5	.5 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach 1	0.0	0.000	0	3	0.344
	0.5	16.462	1.8	4	
	1.0	54.249	4	5	
	2.0	191.906	10	7	
	5.0	1226.643	40	13	
	10.0	5857.104	130	23	
	20.0	31326.588	460	43	
Reach 2	0.0	0.000	0	4	0.227
	0.5	3.773	2.2	4.8	
	1.0	11.915	4.8	5.5	
	2.0	38.877	11	7	
	5.0	211.670	38.8	11.5	
	10.0	890.760	115	19	
	20.0	4314.261	380	34	
Reach 3	0.0	0.000	0	5	0.068
	0.5	19.288	2.6	5.5	
	1.0	59.168	5.5	6	
	2.0	181.477	12	7	
	5.0	848.293	37.5	10	
	10.0	3064.790	100	15	
	20.0	12842.772	300	25	

Schramsberg
Watershed C, split, post-project, rev
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
C-1							
SHEET	100	0.0920	0.170				0.084
SHALLOW	640	0.1170	0.050				0.032
CHANNEL	309	0.2910	0.050	5.00	5.00	17.167	0.005
					Time of Concentration		.121
C-2							
SHEET	100	0.0320	0.170				0.128
SHALLOW	125	0.2580	0.050				0.004
SHALLOW	564	0.4000	0.050				0.015
CHANNEL	147					26.872	0.002
					Time of Concentration		.149

Schramsberg
Watershed C, split, post-project, rev
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
C-1							
SHEET	100	0.0920	0.170				0.084
SHALLOW	640	0.1170	0.050				0.032
CHANNEL	309	0.2910	0.050	5.00	5.00	17.167	0.005
					Time of Concentration		.121
C-2							
SHEET	100	0.0320	0.170				0.128
SHALLOW	125	0.2580	0.050				0.004
SHALLOW	564	0.4000	0.050				0.015
CHANNEL	147	PIPE FLOW:	SEE OUTSIDE CALCS			26.872	0.002
					Time of Concentration		.149

Schramsberg
Watershed C, split, post-project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-1	Open space; grass cover 50% to 75%	(fair)	C	6.1	79
	Woods	(fair)	C	1	73
	Woods	(good)	C	1.5	70
	Total Area / Weighted Curve Number			8.6	77
C-2	Open space; grass cover 50% to 75%	(fair)	C	1.1	79
	User defined urban (Click button or		C	2.1	75
	Woods	(fair)	C	1	73
	Woods	(good)	C	7.2	70
	Total Area / Weighted Curve Number			11.4	72

DAS

Schramsberg
Watershed C, split, post-project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-1	Annual grass	(fair)	C	6.1	79
	Woods	(fair)	C	1	73
	Woods	(good)	C	1.5	70
	Total Area / Weighted Curve Number			8.6	77
C-2	Annual grass	(fair)	C	1.1	79
	Vineyard (annual grass)	(good)	C	2.1	75
	Woods	(fair)	C	1	73
	Woods	(good)	C	7.2	70
	Total Area / Weighted Curve Number			11.4	72

DAS

Schramsberg
Watershed C, split, post, rev, Tc inc 2
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
C-1	3.16	12.13	4.53	12.13	5.64	12.13	7.13	12.13	8.23	12.13	9.34	12.12
C-2	3.27	12.15	4.93	12.14	6.31	12.15	8.17	12.15	9.57	12.14	10.97	12.14
REACHES												
Reach 1	3.16	12.13	4.53	12.13	5.64	12.13	7.13	12.13	8.23	12.13	9.34	12.12
Down	3.16	12.14	4.53	12.13	5.64	12.13	7.12	12.13	8.23	12.14	9.33	12.13
Reach 2	6.42	12.14	9.45	12.14	11.94	12.13	15.27	12.14	17.79	12.14	20.29	12.14
Down	6.42	12.16	9.45	12.16	11.93	12.16	15.27	12.16	17.78	12.15	20.28	12.16
Reach 3	6.42	12.16	9.45	12.16	11.93	12.16	15.27	12.16	17.78	12.15	20.28	12.16
Down	6.42	12.17	9.45	12.16	11.93	12.17	15.27	12.16	17.78	12.16	20.28	12.16
OUTLET	6.42		9.45		11.93		15.27		17.78		20.28	

Watershed C, split, post, rev, Tc inc 2
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach 1	390	0.05	0.344	3	1 :1
Reach 2	262	0.229	0.227	4	.75 :1
Reach 3	298	0.03	0.068	5	.5 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach 1	0.0	0.000	0	3	0.344
	0.5	16.462	1.8	4	
	1.0	54.249	4	5	
	2.0	191.906	10	7	
	5.0	1226.643	40	13	
	10.0	5857.104	130	23	
	20.0	31326.588	460	43	
Reach 2	0.0	0.000	0	4	0.227
	0.5	3.773	2.2	4.8	
	1.0	11.915	4.8	5.5	
	2.0	38.877	11	7	
	5.0	211.670	38.8	11.5	
	10.0	890.760	115	19	
	20.0	4314.261	380	34	
Reach 3	0.0	0.000	0	5	0.068
	0.5	19.288	2.6	5.5	
	1.0	59.168	5.5	6	
	2.0	181.477	12	7	
	5.0	848.293	37.5	10	
	10.0	3064.790	100	15	
	20.0	12842.772	300	25	

Schramsberg
Watershed C, split, post, rev, Tc inc 2
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-1	Open space; grass cover 50% to 75%	(fair)	C	6.1	79
	Woods	(fair)	C	1	73
	Woods	(good)	C	1.5	70
	Total Area / Weighted Curve Number			8.6	77
C-2	Open space; grass cover 50% to 75%	(fair)	C	1.1	79
	User defined urban (Click button or		C	2.1	75
	Woods	(fair)	C	1	73
	Woods	(good)	C	7.2	70
	Total Area / Weighted Curve Number			11.4	72

DAS

Schramsberg
Watershed C, split, post, rev, Tc inc 2
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-1	Vineyard (Annual grass)	(fair)	C	6.1	79
	Woods	(fair)	C	1	73
	Woods	(good)	C	1.5	70
	Total Area / Weighted Curve Number			8.6	77
C-2	Vineyard (Annual grass)	(fair)	C	1.1	79
	Vineyard (Annual grass)	(good)	C	2.1	75
	Woods	(fair)	C	1	73
	Woods	(good)	C	7.2	70
	Total Area / Weighted Curve Number			11.4	72

DAS

Schramsberg
Watershed C, split, post, rev, Tc inc 2
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
C-1							
SHEET	100	0.0920	0.170				0.084
SHALLOW	640	0.1170	0.050				0.032
CHANNEL	309	0.2910	0.050	5.00	5.00	17.167	0.005
					Time of Concentration		.121
C-2							
SHEET	100	0.0320	0.170				0.128
SHALLOW	125	0.2580	0.050				0.004
SHALLOW	564	0.4000	0.050				0.015
CHANNEL	147					26.872	0.002
CHANNEL	80					5.000	0.004
					Time of Concentration		.153

Schramsberg
Watershed C, split, post, rev, Tc inc 2
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
C-1							
SHEET	100	0.0920	0.170				0.084
SHALLOW	640	0.1170	0.050				0.032
CHANNEL	309	0.2910	0.050	5.00	5.00	17.167	0.005
					Time of Concentration		.121
C-2							
SHEET	100	0.0320	0.170				0.128
SHALLOW	125	0.2580	0.050				0.004
SHALLOW	564	0.4000	0.050				0.015
CHANNEL	147	PIPE FLOW: SEE OUTSIDE CALCS				26.872	0.002
CHANNEL	80	MANUAL ENTRY				5.000	0.004
					Time of Concentration		.153

DAS

Schramsberg
Watershed C, split, post, rev, Tc inc 100
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
C-1	3.16	4.53	5.64	7.13	8.23	9.34
	12.13	12.13	12.13	12.13	12.13	12.12
C-2	3.28	4.94	6.31	8.17	9.58	10.99
	12.14	12.14	12.14	12.15	12.14	12.14
REACHES						
Reach 1	3.16	4.53	5.64	7.13	8.23	9.34
	12.13	12.13	12.13	12.13	12.13	12.12
Down	3.16	4.53	5.64	7.12	8.23	9.33
	12.14	12.13	12.13	12.13	12.14	12.13
Reach 2	6.43	9.46	11.94	15.28	17.80	20.30
	12.14	12.14	12.13	12.14	12.14	12.14
Down	6.42	9.45	11.94	15.28	17.79	20.29
	12.16	12.16	12.16	12.16	12.15	12.16
Reach 3	6.42	9.45	11.94	15.28	17.79	20.29
	12.16	12.16	12.16	12.16	12.15	12.16
Down	6.42	9.45	11.94	15.28	17.79	20.29
	12.17	12.16	12.17	12.16	12.16	12.16
OUTLET	6.42	9.45	11.94	15.28	17.79	20.29

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach 1	390	0.05	0.344	3	1 :1
Reach 2	262	0.229	0.227	4	.75 :1
Reach 3	298	0.03	0.068	5	.5 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach 1	0.0	0.000	0	3	0.344
	0.5	16.462	1.8	4	
	1.0	54.249	4	5	
	2.0	191.906	10	7	
	5.0	1226.643	40	13	
	10.0	5857.104	130	23	
	20.0	31326.588	460	43	
Reach 2	0.0	0.000	0	4	0.227
	0.5	3.773	2.2	4.8	
	1.0	11.915	4.8	5.5	
	2.0	38.877	11	7	
	5.0	211.670	38.8	11.5	
	10.0	890.760	115	19	
	20.0	4314.261	380	34	
Reach 3	0.0	0.000	0	5	0.068
	0.5	19.288	2.6	5.5	
	1.0	59.168	5.5	6	
	2.0	181.477	12	7	
	5.0	848.293	37.5	10	
	10.0	3064.790	100	15	
	20.0	12842.772	300	25	

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Schramsberg
Watershed C, split, post, rev, Tc inc 100
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
C-1							
SHEET	100	0.0920	0.170				0.084
SHALLOW	640	0.1170	0.050				0.032
CHANNEL	309	0.2910	0.050	5.00	5.00	17.167	0.005
					Time of Concentration		.121
C-2							
SHEET	100	0.0320	0.170				0.128
SHALLOW	125	0.2580	0.050				0.004
SHALLOW	564	0.4000	0.050				0.015
CHANNEL	147					26.872	0.002
CHANNEL	250					25.000	0.003
					Time of Concentration		.152

DAS

Schramsberg
Watershed C, split, post, rev, Tc inc 100
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
C-1							
SHEET	100	0.0920	0.170				0.084
SHALLOW	640	0.1170	0.050				0.032
CHANNEL	309	0.2910	0.050	5.00	5.00	17.167	0.005
					Time of Concentration		.121
C-2							
SHEET	100	0.0320	0.170				0.128
SHALLOW	125	0.2580	0.050				0.004
SHALLOW	564	0.4000	0.050				0.015
CHANNEL	147	PIPE FLOW: SEE OUTSIDE CALCS				26.872	0.002
CHANNEL	250	MANUAL ENTRY				25.000	0.003
					Time of Concentration		.152

Schramsberg
Watershed C, split, post, rev, Tc inc 100
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-1	Open space; grass cover 50% to 75%	(fair)	C	6.1	79
	Woods	(fair)	C	1	73
	Woods	(good)	C	1.5	70
	Total Area / Weighted Curve Number			8.6	77
C-2	Open space; grass cover 50% to 75%	(fair)	C	1.1	79
	User defined urban (Click button or		C	2.1	75
	Woods	(fair)	C	1	73
	Woods	(good)	C	7.2	70
	Total Area / Weighted Curve Number			11.4	72

DAS

Schramsberg
Watershed C, split, post, rev, Tc inc 100
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-1	Vineyard (Annual grass)	(fair)	C	6.1	79
	Woods	(fair)	C	1	73
	Woods	(good)	C	1.5	70
	Total Area / Weighted Curve Number			8.6	77
C-2	Vineyard (Annual grass)	(fair)	C	1.1	79
	Vineyard (Annual grass)	(good)	C	2.1	75
	Woods	(fair)	C	1	73
	Woods	(good)	C	7.2	70
	Total Area / Weighted Curve Number			11.4	72

DAS

Schramsberg
Sub-Watershed C-2-A, post
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
C-2-A	0.68	12.14	0.99	12.13	1.23	12.13	1.56	12.13	1.81	12.13	2.06	12.14
REACHES												
OUTLET	0.68		0.99		1.23		1.56		1.81		2.06	

Schramsberg
Sub-Watershed C-2-A, post
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

DAS

Schramsberg
Sub-Watershed C-2-A, post
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-2-A	Open space; grass cover 50% to 75%	(fair)	C	.35	79
	User defined urban (Click button or		C	1.46	75
	Woods	(fair)	C	.14	73
	Total Area / Weighted Curve Number			1.95	76

DAS

Schramsberg
Sub-Watershed C-2-A, post
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
C-2-A	Vineyard (Annual grass)	(fair)	C	.35	79
	Vineyard (Annual grass)	(good)	C	1.46	75
	Woods	(fair)	C	.14	73
	Total Area / Weighted Curve Number			1.95	76

DAS

Schramsberg
Sub-Watershed C-2-A, post
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
C-2-A							
SHEET	100	0.0320	0.170				0.128
SHALLOW	125	0.2580	0.050				0.004
CHANNEL	147					26.872	0.002
					Time of Concentration		.134

DAS

Schramsberg
Sub-Watershed C-2-A, post
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
C-2-A							
SHEET	100	0.0320	0.170				0.128
SHALLOW	125	0.2580	0.050				0.004
CHANNEL	147	PIPE FLOW: SEE OUTSIDE CALCS				26.872	0.002
					Time of Concentration		.134

DAS

Schramsberg
Watershed D, pre-project, rev
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
Main	4.48	12.19	6.84	12.18	8.80	12.18	11.47	12.18	13.49	12.19	15.50	12.18
REACHES												
Reach 4	4.48	12.19	6.84	12.18	8.80	12.18	11.47	12.18	13.49	12.19	15.50	12.18
Down	4.48	12.21	6.84	12.21	8.79	12.21	11.46	12.21	13.47	12.20	15.49	12.21
OUTLET	4.48		6.84		8.79		11.46		13.47		15.49	

Schramsberg
Watershed D, pre-project, rev
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed D, pre-project, rev
Napa County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach 4	793	0.055	0.202	3	4 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach 4	0.0	0.000	0	3	0.202
	0.5	15.105	2.5	7	
	1.0	61.967	7	11	
	2.0	289.596	22	19	
	5.0	2640.442	115	43	
	10.0	15331.930	430	83	
	20.0	92847.393	1660	163	

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Watershed D, pre-project, rev
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0100	0.170				0.204
SHALLOW	330	0.1930	0.050				0.013
CHANNEL	852	0.1900	0.045	8.00	8.00	14.792	0.016
					Time of Concentration		.233

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Schramsberg
Watershed D, pre-project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	.3	79
	Residential districts (1/4 acre)		B	.9	75
	Meadow -cont. grass (non grazed)		C	1.6	71
	Woods	(fair)	C	3.6	73
	Woods	(good)	C	11.1	70
	Total Area / Weighted Curve Number			17.5	71

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Schramsberg
Watershed D, pre-project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Annual grass	(fair)	C	.3	79
	Broadleaf Chaparral	(fair)	C	.9	75
	Broadleaf Chaparral	(good)	C	1.6	71
	Woods	(fair)	C	3.6	73
	Woods	(good)	C	11.1	70
	Total Area / Weighted Curve Number			17.5	71

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Schramsberg
Watershed D, post-project, rev
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
Main	4.47	12.19	6.83	12.19	8.78	12.18	11.44	12.18	13.46	12.19	15.47	12.18
REACHES												
Reach 4	4.47	12.19	6.83	12.19	8.78	12.18	11.44	12.18	13.46	12.19	15.47	12.18
Down	4.47	12.22	6.83	12.22	8.78	12.21	11.44	12.21	13.45	12.22	15.45	12.21
OUTLET	4.47		6.83		8.78		11.44		13.45		15.45	

Schramsberg
Watershed D, post-project, rev
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed D, post-project, rev
Napa County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach 4	793	0.055	0.202	3	4 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach 4	0.0	0.000	0	3	0.202
	0.5	15.105	2.5	7	
	1.0	61.967	7	11	
	2.0	289.596	22	19	
	5.0	2640.442	115	43	
	10.0	15331.930	430	83	
	20.0	92847.393	1660	163	

Schramsberg
Watershed D, post-project, rev
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0100	0.170				0.204
SHALLOW	163	0.1640	0.050				0.007
SHALLOW	82	0.0440	0.050				0.007
CHANNEL	166					21.701	0.002
CHANNEL	852	0.1900	0.045	8.00	8.00	14.792	0.016
					Time of Concentration		.236

DAS

Schramsberg
Watershed D, post-project, rev
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0100	0.170				0.204
SHALLOW	163	0.1640	0.050				0.007
SHALLOW	82	0.0440	0.050	(IN DIVERSION)			0.007
CHANNEL	166	PIPE FLOW:		SEE OUTSIDE CALCS		21.701	0.002
CHANNEL	852	0.1900	0.045	8.00	8.00	14.792	0.016
					Time of Concentration		.236

Schramsberg
Watershed D, post-project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	.3	79
	Residential districts (1/4 acre)		B	.9	75
	User defined urban (Click button or		C	2.2	75
	Meadow -cont. grass (non grazed)		C	1.6	71
	Woods	(fair)	C	1.4	73
	Woods	(good)	C	11.1	70
	Total Area / Weighted Curve Number			17.5	71

DAS

Schramsberg
Watershed D, post-project, rev
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Annual grass	(fair)	C	.3	79
	Broadleaf Chaparral	(fair)	B	.9	75
	Vineyard (annual grass)	(good)	C	2.2	75
	Broadleaf Chaparral	(good)	C	1.6	71
	Woods	(fair)	C	1.4	73
	Woods	(good)	C	11.1	70
	Total Area / Weighted Curve Number			17.5	71

DAS

Schramsberg
Watershed E, pre-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
Main	0.09	12.13	0.14	12.13	0.18	12.13	0.23	12.13	0.27	12.13	0.31	12.14
REACHES												
OUTLET	0.09		0.14		0.18		0.23		0.27		0.31	

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Schramsberg
Watershed E, pre-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed E, pre-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0260	0.150				0.126
SHALLOW	141	0.0990	0.050				0.008
					Time of Concentration		.134

DAS

Schramsberg
Watershed E, pre-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	.02	79
	Woods	(fair)	C	.29	73
	Total Area / Weighted Curve Number			.31	73

DAS

Schramsberg
Watershed E, pre-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Vineyard (annual grass) (fair)	C	.02	79
	Woods (fair)	C	.29	73
	Total Area / Weighted Curve Number		.31	73

DAS

Schramsberg
Watershed E, post-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
Main	0.10	12.14	0.15	12.13	0.19	12.13	0.24	12.13	0.28	12.13	0.32	12.14
REACHES												
OUTLET	0.10		0.15		0.19		0.24		0.28		0.32	

Schramsberg
Watershed E, post-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed E, post-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0260	0.150				0.126
SHALLOW	141	0.0990	0.050				0.008
					Time of Concentration		.134

DAS

Schramsberg
Watershed E, post-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	.01	79
	User defined urban (Click button or		C	.29	75
	Woods	(fair)	C	.01	73
	Total Area / Weighted Curve Number			.31	75

DAS

Schramsberg
Watershed E, post-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Vineyard (annual grass)	(fair)	C	.01	79
	Vineyard (annual grass)	(good)	C	.29	75
	Woods	(fair)	C	.01	73
	Total Area / Weighted Curve Number			.31	75

DAS

Schramsberg
Watershed E, post-project, Tc inc 2
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
Main	0.09	12.19	0.14	12.19	0.17	12.19	0.22	12.20	0.26	12.18	0.29	12.19
REACHES												
OUTLET	0.09		0.14		0.17		0.22		0.26		0.29	

Schramsberg
Watershed E, post-project, Tc inc 2
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

DAS

Schramsberg
Watershed E, post-project, Tc inc 2
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0260	0.150				0.126
SHALLOW	141	0.0990	0.050				0.008
CHANNEL	300					0.750	0.111
					Time of Concentration		.245

DAS

Schramsberg
Watershed E, post-project, Tc inc 2
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0260	0.150				0.126
SHALLOW	141	0.0990	0.050				0.008
CHANNEL	300	MANUAL ENTRY				0.750	0.111
					Time of Concentration		.245

DAS

Schramsberg
Watershed E, post-project, Tc inc 2
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	.01	79
	User defined urban (Click button or		C	.29	75
	Woods	(fair)	C	.01	73
	Total Area / Weighted Curve Number			.31	75

DAS

Schramsberg
Watershed E, post-project, Tc inc 2
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Vineyard (Annual grass)	(fair)	C	.01	79
	Vineyard (Annual grass)	(good)	C	.29	75
	Woods	(fair)	C	.01	73
	Total Area / Weighted Curve Number			.31	75

DAS

Schramsberg
Watershed E, post, Tc inc 100
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
Main	0.10	12.14	0.15	12.14	0.19	12.14	0.24	12.14	0.28	12.14	0.31	12.14
REACHES												
OUTLET	0.10		0.15		0.19		0.24		0.28		0.31	

DAS

Schramsberg
Watershed E, post, Tc inc 100
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed E, post, Tc inc 100
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	.01	79
	User defined urban (Click button or		C	.29	75
	Woods	(fair)	C	.01	73
	Total Area / Weighted Curve Number			.31	75

DAS

Schramsberg
Watershed E, post, Tc inc 100
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Vineyard (Annual grass)	(fair)	C	.01	79
	Vineyard (Annual grass)	(good)	C	.29	75
	Woods	(fair)	C	.01	73
	Total Area / Weighted Curve Number			.31	75

Schramsberg
Watershed E, post, Tc inc 100
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0260	0.150				0.126
SHALLOW	141	0.0990	0.050				0.008
CHANNEL	200					4.000	0.014
					Time of Concentration		.148

DAS

Schramsberg
Watershed E, post, Tc inc 100
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0260	0.150				0.126
SHALLOW	141	0.0990	0.050				0.008
CHANNEL	200	MANUAL ENTRY				4.000	0.014
					Time of Concentration		.148

Schramsberg
Watershed F, pre-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
Main	2.55	12.12	3.72	12.12	4.68	12.12	5.97	12.12	6.93	12.12	7.89	12.12
REACHES												
OUTLET	2.55		3.72		4.68		5.97		6.93		7.89	

Schramsberg
Watershed F, pre-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed F, pre-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.1730	0.170				0.065
SHALLOW	398	0.2010	0.050				0.015
CHANNEL	408	0.1280	0.035	6.00	8.00	12.593	0.009
					Time of Concentration		0.1

DAS

Schramsberg
Watershed F, pre-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	1	79
	Open space; grass cover 50% to 75%	(fair)	D	.1	84
	Legume/Rot. Meadow Straight row	(good)	C	.1	81
	Legume/Rot. Meadow Contoured	(poor)	B	.1	75
	Woods	(fair)	C	.1	73
	Woods	(fair)	D	2.3	79
	Woods	(good)	C	2.8	70
	Woods	(good)	D	.9	77
	Total Area / Weighted Curve Number			7.4	75

Schramsberg
Watershed F, pre-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Vineyard (annual grass)	(fair)	C	1	79
	Vineyard (annual grass)	(fair)	D	.1	84
	Broad-leaf Chaparral	(fair)	D	.1	81
	Broad-leaf Chaparral	(fair)	C	.1	75
	Woods	(fair)	C	.1	73
	Woods	(fair)	D	2.3	79
	Woods	(good)	C	2.8	70
	Woods	(good)	D	.9	77
	Total Area / Weighted Curve Number			7.4	75

DAS

Schramsberg
Watershed F, post-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
Main	2.55	12.12	3.72	12.12	4.68	12.12	5.97	12.12	6.93	12.12	7.89	12.12
REACHES												
OUTLET	2.55		3.72		4.68		5.97		6.93		7.89	

DAS

Schramsberg
Watershed F, post-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed F, post-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.1730	0.170				0.065
SHALLOW	398	0.2010	0.050				0.015
CHANNEL	408	0.1280	0.035	6.00	8.00	12.593	0.009
					Time of Concentration		0.1

DAS

Schramsberg
Watershed F, post-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	.8	79
	Open space; grass cover 50% to 75%	(fair)	D	.03	84
	User defined urban (Click button or		C	.3	75
	User defined urban (Click button or		D	.8	81
	Legume/Rot. Meadow Straight row	(good)	C	.05	81
	Woods	(fair)	C	.1	73
	Woods	(fair)	D	1.7	79
	Woods	(good)	C	2.76	70
	Woods	(good)	D	.86	77
	Total Area / Weighted Curve Number			7.4	75
				===	==

DAS

Schramsberg
Watershed F, post-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Vineyard (annual grass) (fair)	C	.8	79
	Vineyard (annual grass) (fair)	D	.03	84
	Vineyard (annual grass) (good)	C	.3	75
	Vineyard (annual grass) (good)	D	.8	81
	Broad-leaf Chaparral (fair)	D	.05	81
	Woods (fair)	C	.1	73
	Woods (fair)	D	1.7	79
	Woods (good)	C	2.76	70
	Woods (good)	D	.86	77
	Total Area / Weighted Curve Number		7.4	75
			===	==

DAS

Schramsberg
Watershed G, pre-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)
SUBAREAS						
Main	1.58 12.15	2.28 12.16	2.86 12.15	3.63 12.15	4.21 12.16	4.78 12.15
REACHES						
OUTLET	1.58	2.28	2.86	3.63	4.21	4.78

DAS

Schramsberg
Watershed G, pre-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

DAS

Schramsberg
Watershed G, pre-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0280	0.170				0.135
SHALLOW	390	0.1300	0.050				0.019
SHALLOW	390	0.0840	0.050				0.023
						Time of Concentration	.177

DAS

Schramsberg
Watershed G, pre-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	.4	79
	Legume/Rot. Meadow Straight row	(good)	C	.4	81
	Legume/Rot. Meadow Contoured	(poor)	B	3.4	75
	Woods	(good)	C	.2	70
	Woods	(good)	D	.3	77
	Total Area / Weighted Curve Number			4.7	76

DAS

Schramsberg
Watershed G, pre-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Vineyard (annual grass)	(fair)	C	.4	79
	Broad-leaf Chaparral	(fair)	D	.4	81
	Broad-leaf Chaparral	(fair)	C	3.4	75
	Woods	(good)	C	.2	70
	Woods	(good)	D	.3	77
	Total Area / Weighted Curve Number			4.7	76

DAS

Schramsberg
Watershed G, post-project
Napa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	5-Yr (cfs)	(hr)	10-Yr (cfs)	(hr)	25-Yr (cfs)	(hr)	50-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS												
Main	1.58	12.15	2.28	12.16	2.86	12.15	3.63	12.15	4.21	12.16	4.78	12.15
REACHES												
OUTLET	1.58		2.28		2.86		3.63		4.21		4.78	

Schramsberg
Watershed G, post-project
Napa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
4.37	5.46	6.32	7.45	8.29	9.12	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type CA-1
Dimensionless Unit Hydrograph: <standard>

Schramsberg
Watershed G, post-project
Napa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Main							
SHEET	100	0.0280	0.170				0.135
SHALLOW	390	0.1300	0.050				0.019
SHALLOW	390	0.0840	0.050				0.023
						Time of Concentration	.177

DAS

Schramsberg
Watershed G, post-project
Napa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Open space; grass cover 50% to 75%	(fair)	C	.25	79
	User defined urban (Click button or		C	.5	75
	User defined urban (Click button or		D	.1	81
	Legume/Rot. Meadow Straight row	(good)	C	.25	81
	Legume/Rot. Meadow Contoured	(poor)	B	3.1	75
	Woods	(good)	C	.2	70
	Woods	(good)	D	.3	77
	Total Area / Weighted Curve Number			4.7	76

DAS

Schramsberg
Watershed G, post-project
Napa County, California

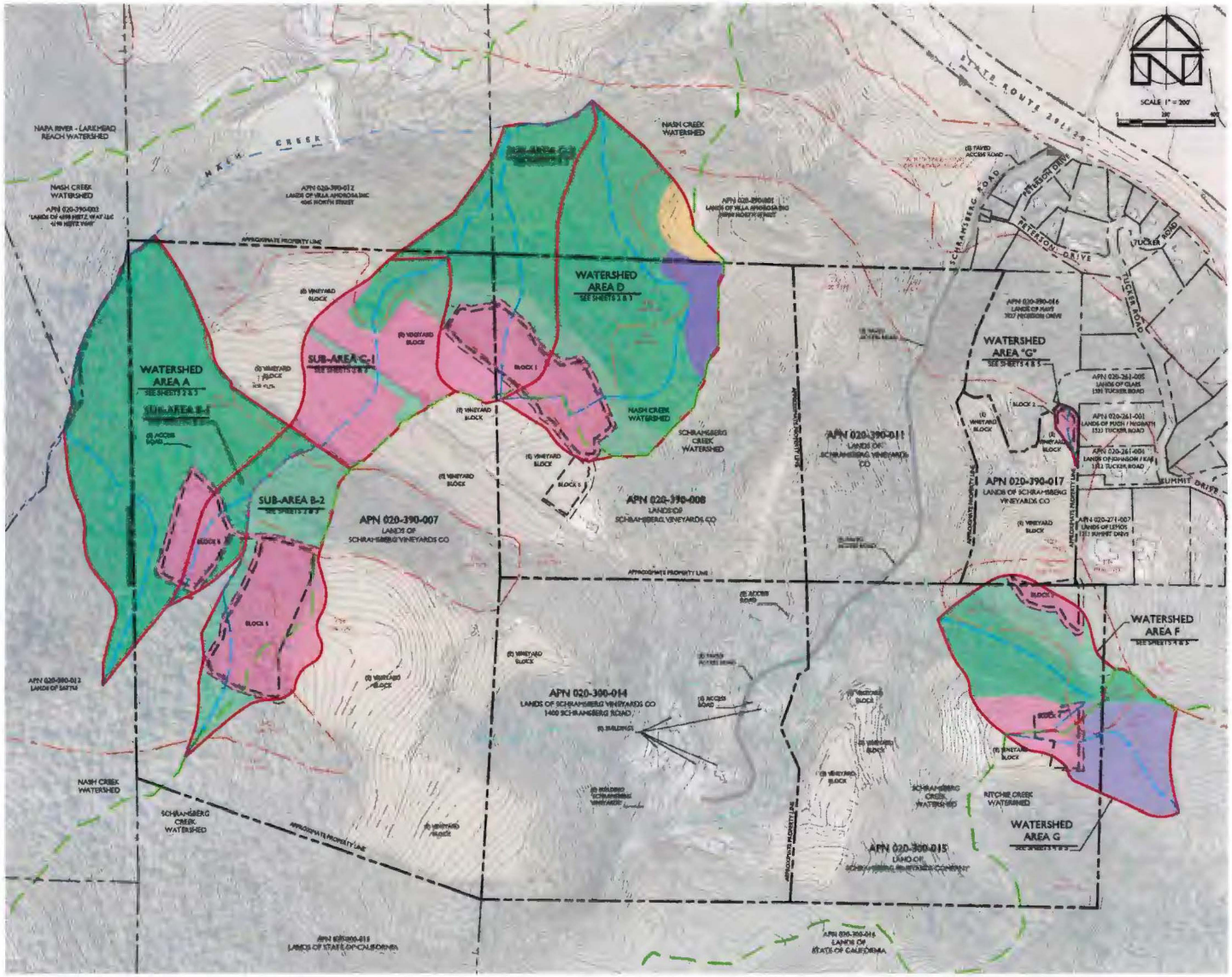
Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Main	Vineyard (annual grass)	(fair)	C	.25	79
	Vineyard (annual grass)	(good)	C	.5	75
	Vineyard (annual grass)	(good)	D	.1	81
	Broad-leaf Chaparral	(fair)	D	.25	81
	Broad-leaf Chaparral	(fair)	C	3.1	75
	Woods	(good)	C	.2	70
	Woods	(good)	D	.3	77
	Total Area / Weighted Curve Number			4.7	76

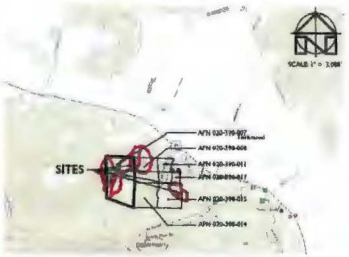
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SCHRAMSBERG VINEYARDS CO

WATERSHED EXHIBITS



WATERSHED EXHIBIT KEY MAP



LOCATION MAP
SCALE 1" = 3,000'

SHEET INDEX:

1 WATERSHED EXHIBIT KEY MAP
2 WATERSHED AREAS A, B, C & D - EXISTING CONDITIONS
3 WATERSHED AREAS A, B, C & D - PROPOSED CONDITIONS
4 WATERSHED AREAS E, F & G - EXISTING CONDITIONS
5 WATERSHED AREAS E, F & G - PROPOSED CONDITIONS

NOTES:

1. FADED BACKGROUND REPRESENTS EXISTING TOPOGRAPHIC FEATURES. TOPOGRAPHIC INFORMATION WAS TAKEN FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATABASE. APPLIED CIVIL ENGINEERING INCORPORATED ASSUMES NO LIABILITY REGARDING THE ACCURACY OR COMPLETENESS OF THE TOPOGRAPHIC INFORMATION.
2. AERIAL PHOTOGRAPHS WERE OBTAINED FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM (GIS) DATABASE, TAKEN APRIL TO JUNE 2018 AND MAY NOT REPRESENT CURRENT CONDITIONS.
3. CONTOUR INTERVAL: FIVE (5) FEET, HIGHLIGHTED EVERY TWENTY FIVE (25) FEET.
4. VERTICAL DATUM: NAVD 88
5. THE PROPERTY LINES SHOWN ON THESE PLANS DO NOT REPRESENT A BOUNDARY SURVEY. THEY ARE APPROXIMATE AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

LEGEND:

- APPROXIMATE PROPERTY LINE
- SOIL TYPE BOUNDARY
- COUNTY DEFINED WATERSHED BOUNDARY
- BLUELINE STREAM
- EPHEMERAL STREAM
- EXISTING VINEYARD BLOCK
- PROPOSED VINEYARD AVENUE
- PROPOSED VINEYARD BLOCK
- WATERSHED AREA
- SUBWATERSHED AREA
- TIME OF CONCENTRATION FLOW PATH

SOIL TYPE LEGEND:

TYPE	HSG	DESCRIPTION
138	C	FORWARD GRAVELLY LOAM, 2 TO 9 PERCENT SLOPES
139	C	FORWARD GRAVELLY LOAM, 9 TO 30 PERCENT SLOPES
140	C	FORWARD GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES
154	D	KIDD LOAM, 30 TO 75 PERCENT SLOPES

SOIL TYPE BOUNDARIES SHOWN ON THIS MAP ARE BASED ON THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATA AND SHOULD BE CONSIDERED APPROXIMATE.

APPLIED
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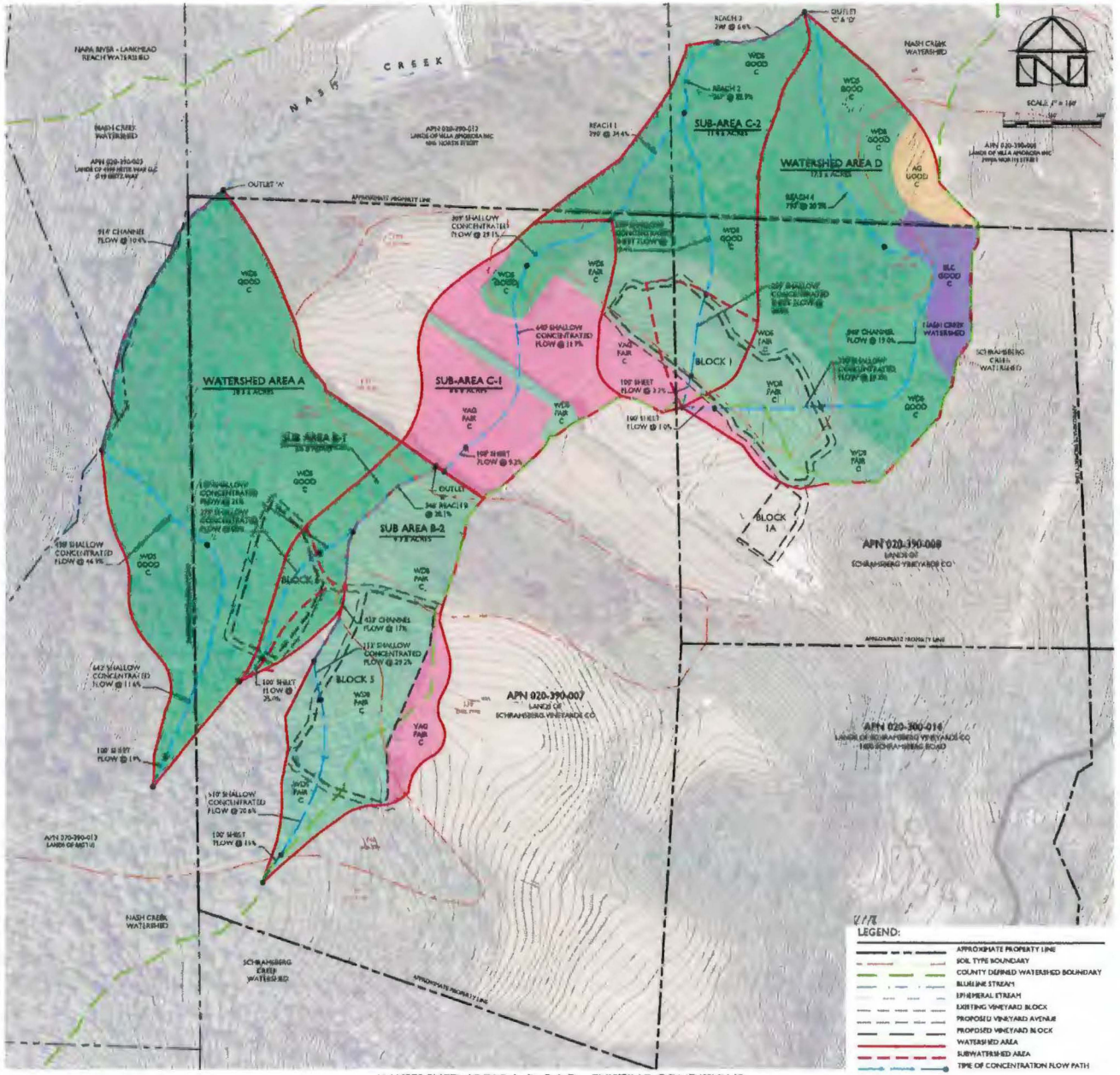
SCHRAMSBERG VINEYARDS CO
WATERSHED EXHIBITS
WATERSHED EXHIBIT KEY MAP

PREPARED UNDER THE DIRECTION OF



DRAWN BY: PreserCAD LLC
CHECKED BY: MRM
DATE: OCTOBER 27, 2023
REVISIONS: BY:
10/27/2023 MRM
PERMIT SUBMITTAL

JOB NUMBER: 16-152
FILE: 16-152EXH-WTRSHD.DWG
ORIGINAL SIZE: 24" X 36"
SHEET NUMBER: 1 OF 5



WATERSHED AREAS A, B, C & D - EXISTING CONDITIONS

SCALE: 1" = 100'

WATERSHED AREA "A" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-GOOD-C	WOODS	GOOD	C	70	18.3 ± AC	1.2 ± AC	17.1 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	1.2 ± AC
				TOTALS	18.3 ± AC	1.2 ± AC	18.3 ± AC

SUB-AREA "B-1" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-GOOD-C	WOODS	GOOD	C	70	24.1 AC	1.3 AC	22.8 AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	1.3 AC
				TOTALS	24.1 AC	1.3 AC	24.1 AC

SUB-WATERSHED AREA "B-1-A" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	77	0.81 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	0.08 ± AC
			TOTALS		0.89 ± AC

SUB-AREA "B-2" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	77	8.8 ± AC	4.8 ± AC	4.8 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	1.3 ± AC	0	1.3 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	4.8 ± AC
				TOTALS	9.3 ± AC	4.8 ± AC	9.3 ± AC

SUB-AREA "C-1" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	77	7.8 ± AC	0	7.8 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	3.3 ± AC	0	7.3 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	6.3 ± AC	0	6.3 ± AC
				TOTALS	8.6 ± AC	0	8.6 ± AC

SUB-AREA "C-2" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	77	3.1 ± AC	2.2 ± AC	1.0 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	7.2 ± AC	0	7.2 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	1.1 ± AC	0	1.1 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	2.1 ± AC
				TOTALS	11.4 ± AC	2.1 ± AC	11.4 ± AC

SUB-WATERSHED AREA "C-2-A" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	77	0.34 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	0.55 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	1.41 ± AC
				TOTAL	1.95 ± AC

WATERSHED "D" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
AG-GOOD-C	ANNUAL GRASS	GOOD	C	75	0.9 ± AC	0	0.9 ± AC
BCH-GOOD-C	BROADLEAF CHAPARRAL	GOOD	C	71	1.6 ± AC	0	1.6 ± AC
WDS-FAIR-C	WOODS	FAIR	C	77	2.0 ± AC	2.1 ± AC	1.6 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	13.1 ± AC	0	13.1 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	0.3 ± AC	0	0.3 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	2.1 ± AC
				TOTALS	17.1 ± AC	2.1 ± AC	19.1 ± AC

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WATERSHED EXHIBITS

WATERSHED AREAS A, B, C & D - EXISTING CONDITIONS

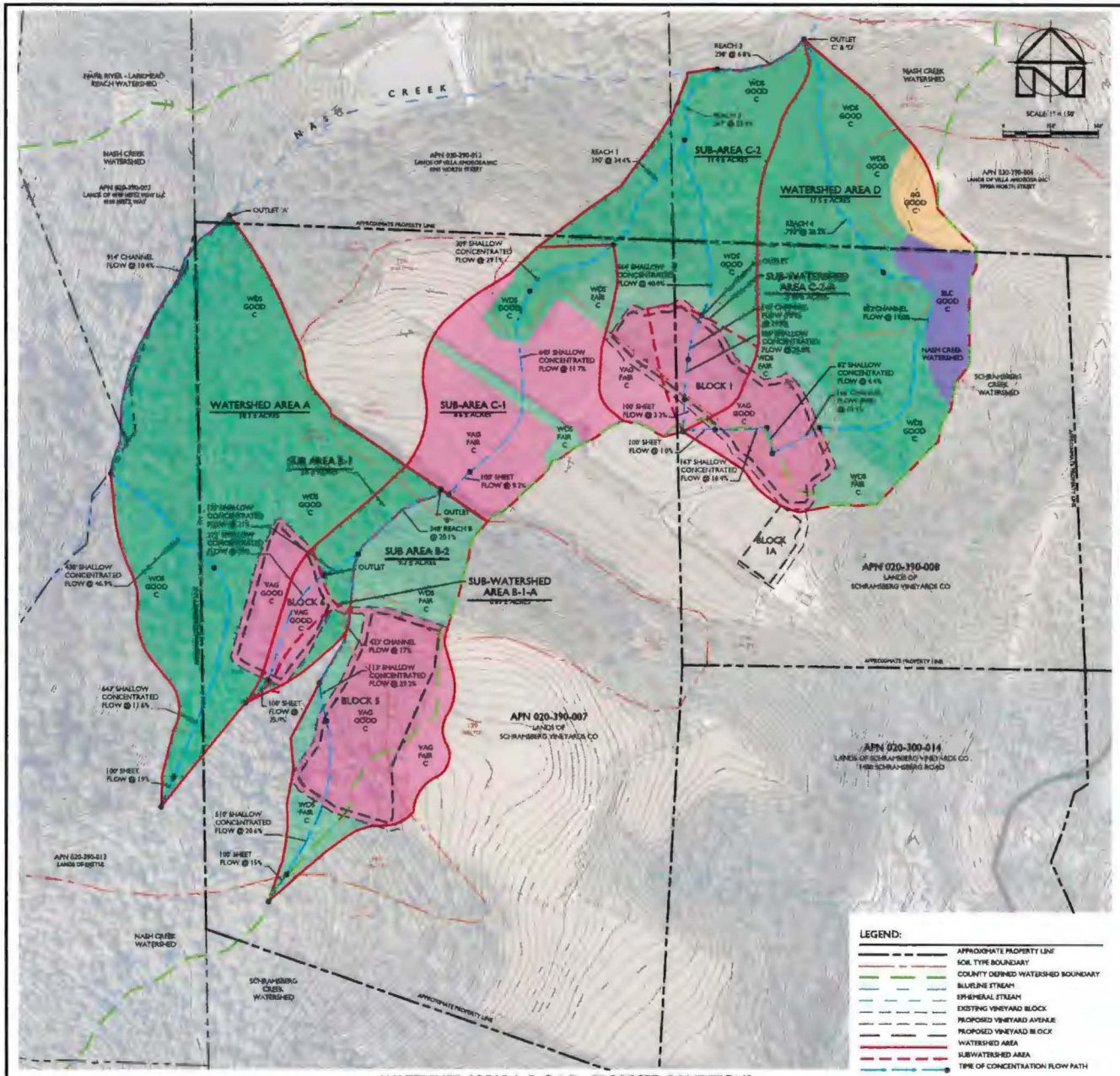
PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER
MICHAEL R. MCCORMICK
No. 65211
CIVIL
STATE OF CALIFORNIA

DRAWN BY: PowerCAD LLC
CHECKED BY: MRM
DATE: OCTOBER 17, 2011
REVISIONS: BY:
10/27/2011 MRM
PERMIT SUBMITTAL

JOB NUMBER: 10-152
FILE: 10-152EXG-WTRSHD.DWG
ORIGINAL SIZE: 24" X 36"
SHEET NUMBER: 2 OF 5

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WATERSHED AREAS A, B, C & D - PROPOSED CONDITIONS

SCALE: 1" = 150'

WATERSHED AREA "A" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	GOOD	C	70	18.3 ± AC	1.1 ± AC	17.1 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	1.2 ± AC
				TOTALS	18.3 ± AC	1.2 ± AC	18.3 ± AC

SUB-AREA "B-1" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	GOOD	C	70	2.4 ± AC	1.1 ± AC	1.3 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	1.1 ± AC
				TOTALS	2.4 ± AC	1.1 ± AC	2.4 ± AC

SUB-WATERSHED AREA "B-1-A" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	73	0.97 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	0.82 ± AC
				TOTALS	0.96 ± AC

SUB-AREA "B-2" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	73	8.8 ± AC	4.8 ± AC	4.8 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	1.3 ± AC	0	1.3 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	4.8 ± AC
				TOTALS	9.2 ± AC	4.8 ± AC	9.2 ± AC

SUB-AREA "C-1" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	73	1.8 ± AC	0	1.8 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	1.5 ± AC	0	1.5 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	6.1 ± AC	0	6.1 ± AC
				TOTALS	8.6 ± AC	0	8.6 ± AC

SUB-AREA "C-2" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	73	2.1 ± AC	2.1 ± AC	1.9 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	7.3 ± AC	0	7.3 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	1.1 ± AC	0	1.1 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	2.2 ± AC
				TOTALS	11.4 ± AC	2.1 ± AC	11.4 ± AC

SUB-WATERSHED AREA "C-2-A" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	73	0.56 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	0.35 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	1.48 ± AC
				TOTALS	1.91 ± AC

WATERSHED "D" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
AG-GOOD-C	ANNUAL GRASS	GOOD	C	75	0.9 ± AC	0	0.9 ± AC
BLC-GOOD-C	BROADBASE CHANNEL	GOOD	C	71	1.6 ± AC	0	1.6 ± AC
WDS-FAIR-C	WOODS	FAIR	C	73	5.6 ± AC	2.2 ± AC	1.9 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	11.1 ± AC	0	11.1 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	0.2 ± AC	0	0.2 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	2.2 ± AC
				TOTALS	17.5 ± AC	2.2 ± AC	17.5 ± AC

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WATERSHED EXHIBITS

WATERSHED AREAS A, B, C & D - PROPOSED CONDITIONS

PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER — MICHAEL R. MAHONEY — No. 79855 — CIVIL — STATE OF CALIFORNIA

DRAWN BY: PowerCAD LLC

CHECKED BY: MRM

DATE: OCTOBER 27, 2022

REVISIONS: DATE / BY / TYPE

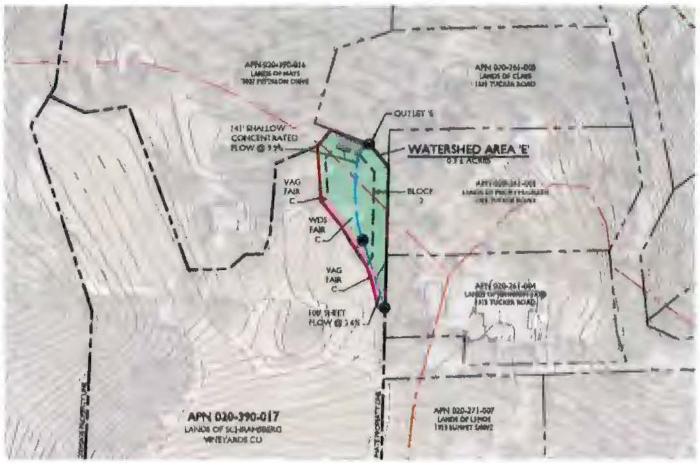
10/27/2022 TMS PERMIT SUBMITTAL

JOB NUMBER: 16-352

FILE: 16-352EXH-WTRSHD.DWG

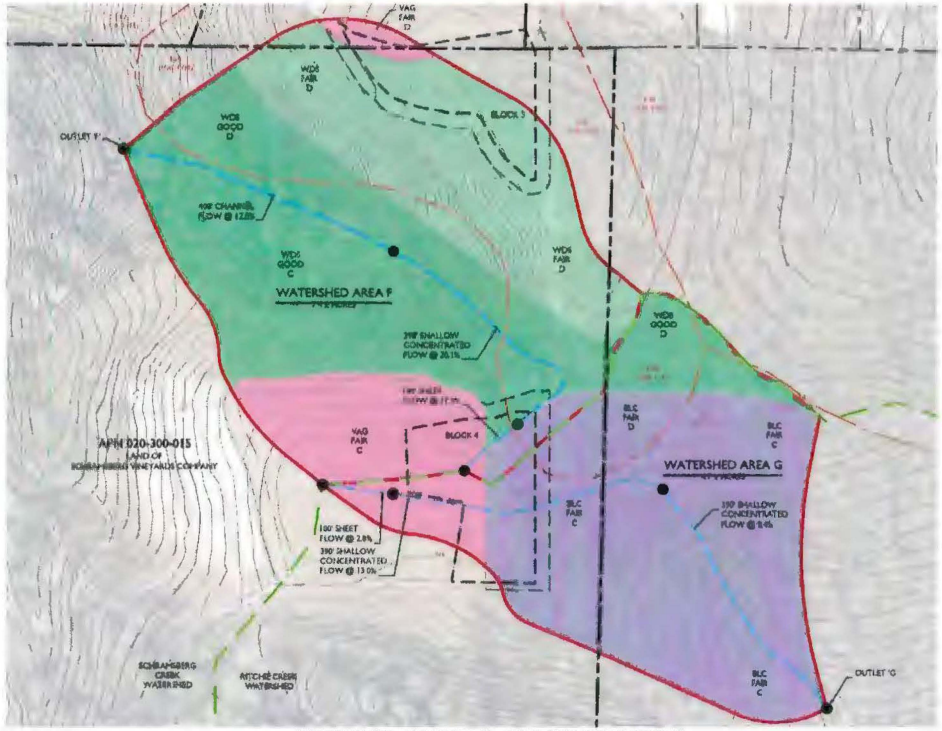
ORIGINAL SIZE: 24" X 36"

SHEET NUMBER: 3 OF 5



WATERSHED AREA E - EXISTING CONDITIONS

SCALE: 1" = 80'



WATERSHED AREAS F & G - EXISTING CONDITIONS

SCALE: 1" = 80'

WATERSHED AREA "E" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	73	0.19 ± AC	0.19 ± AC	0.00 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	0.90 ± AC	0.90 ± AC	0.00 ± AC
VAG-GOOD-D	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.29 ± AC
				TOTALS	0.91 ± AC	0.79 ± AC	0.91 ± AC

WATERSHED AREA "F" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	75	0.1 ± AC	0.1 ± AC	0
BLC-FAIR-D	BROADLEAF CHAPARRAL	FAIR	D	83	0.1 ± AC	0.06 ± AC	0.04 ± AC
WDS-FAIR-C	WOODS	FAIR	C	73	0.1 ± AC	0	0.1 ± AC
WDS-FAIR-D	WOODS	FAIR	D	79	2.3 ± AC	0.6 ± AC	1.7 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	2.9 ± AC	0.04 ± AC	2.9 ± AC
WDS-GOOD-D	WOODS	GOOD	D	77	0.9 ± AC	0.04 ± AC	0.86 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	1.8 ± AC	0.1 ± AC	0.8 ± AC
VAG-FAIR-D	VINEYARD - ANNUAL GRASS (PRE)	FAIR	D	84	0.1 ± AC	0.07 ± AC	0.03 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.3 ± AC
VAG-GOOD-D	VINEYARD - ANNUAL GRASS (POST)	GOOD	D	81	-	-	0.01 ± AC
				TOTALS	7.4 ± AC	1.1 ± AC	7.4 ± AC

WATERSHED AREA "G" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	75	3.4 ± AC	0.3 ± AC	3.1 ± AC
BLC-FAIR-D	BROADLEAF CHAPARRAL	FAIR	D	83	0.9 ± AC	0.35 ± AC	0.55 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	0.2 ± AC	0	0.2 ± AC
WDS-GOOD-D	WOODS	GOOD	D	77	0.3 ± AC	0	0.3 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	0.4 ± AC	0.15 ± AC	0.25 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.11 ± AC
VAG-GOOD-D	VINEYARD - ANNUAL GRASS (POST)	GOOD	D	81	-	-	0.1 ± AC
				TOTALS	4.7 ± AC	0.5 ± AC	4.7 ± AC

LEGEND:

- APPROXIMATE PROPERTY LINE
- SOIL TYPE BOUNDARY
- COUNTY DEFINED WATERSHED BOUNDARY
- BLUELINE STREAM
- EPHEMERAL STREAM
- EXISTING VINEYARD BLOCK
- PROPOSED VINEYARD AVENUE
- PROPOSED VINEYARD BLOCK
- WATERSHED AREA
- SUBWATERSHED AREA
- TIME OF CONCENTRATION FLOW PATH

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WATERSHED EXHIBITS

WATERSHED AREAS E, F & G - EXISTING CONDITIONS

PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER — MICHAEL R. MOLLETTE — No. 19917 — CIVIL — STATE OF CALIFORNIA

PRELIMINARY NOT FOR CONSTRUCTION

DRAWN BY: PowerCAD LLC

CHECKED BY: MRM

DATE: OCTOBER 27, 2023

REVISIONS: BY:

10/27/2023 TTG
PERMIT SUBMITTAL

JOB NUMBER: 16-152

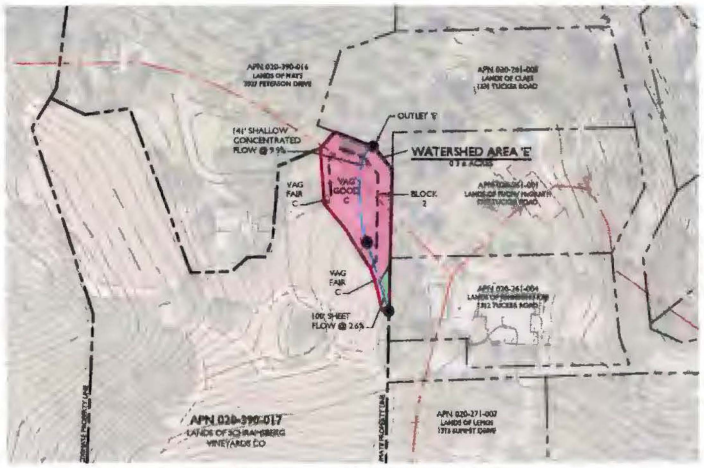
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ORIGINAL SIZE: 24" X 36"

SHEET NUMBER: 4 OF 5

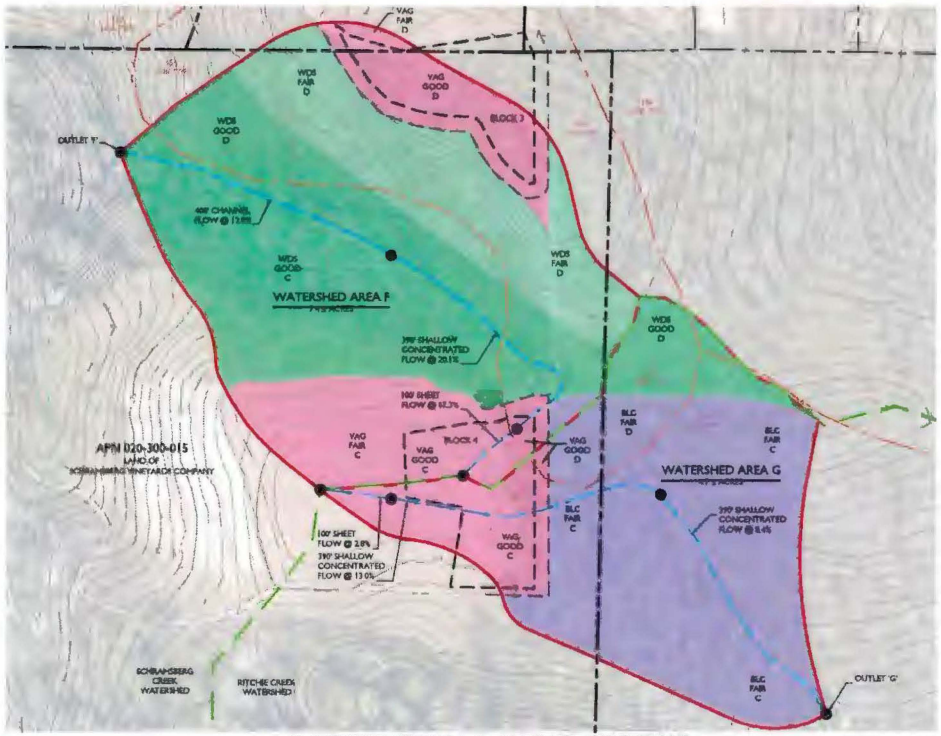
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WATERSHED AREA E - PROPOSED CONDITIONS

SCALE: 1" = 80'



WATERSHED AREAS F & G - PROPOSED CONDITIONS

SCALE: 1" = 80'

WATERSHED AREA "E" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
WDS-FAIR-C	WOODS	FAIR	C	73	0.29 ± AC	0.20 ± AC	0.09 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	0.02 ± AC	0.01 ± AC	0.01 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.29 ± AC
				TOTALS	0.31 ± AC	0.29 ± AC	0.31 ± AC

WATERSHED AREA "F" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	73	0.1 ± AC	0.1 ± AC	0
BLC-FAIR-D	BROADLEAF CHAPARRAL	FAIR	D	80	0.1 ± AC	0.005 ± AC	0.095 ± AC
WDS-FAIR-C	WOODS	FAIR	C	73	0.1 ± AC	0	0.1 ± AC
WDS-FAIR-D	WOODS	FAIR	D	79	2.3 ± AC	0.6 ± AC	1.7 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	3.8 ± AC	0.94 ± AC	2.766 AC
WDS-GOOD-D	WOODS	GOOD	D	77	0.9 ± AC	0.84 ± AC	0.06 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	1.0 ± AC	0.3 ± AC	0.8 ± AC
VAG-FAIR-D	VINEYARD - ANNUAL GRASS (PRE)	FAIR	D	84	0.1 ± AC	0.07 ± AC	0.03 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.3 ± AC
VAG-GOOD-D	VINEYARD - ANNUAL GRASS (POST)	GOOD	D	81	-	-	0.86 AC
				TOTALS	7.9 ± AC	1.1 ± AC	7.9 ± AC

WATERSHED AREA "G" SUMMARY

PLAN SYMBOL	LAND USE DESCRIPTION	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP	CURVE NUMBER (CN)	PRE-PROJECT (ACRES)	REMOVED (ACRES)	POST-PROJECT
BLC-FAIR-C	BROADLEAF CHAPARRAL	FAIR	C	73	3.4 ± AC	0.2 ± AC	3.1 ± AC
BLC-FAIR-D	BROADLEAF CHAPARRAL	FAIR	D	80	0.4 ± AC	0.15 ± AC	0.25 ± AC
WDS-GOOD-C	WOODS	GOOD	C	70	0.2 ± AC	0	0.2 ± AC
WDS-GOOD-D	WOODS	GOOD	D	77	0.3 ± AC	0	0.3 ± AC
VAG-FAIR-C	VINEYARD - ANNUAL GRASS (PRE)	FAIR	C	79	0.4 ± AC	0.15 ± AC	0.25 ± AC
VAG-GOOD-C	VINEYARD - ANNUAL GRASS (POST)	GOOD	C	75	-	-	0.52 AC
VAG-GOOD-D	VINEYARD - ANNUAL GRASS (POST)	GOOD	D	81	-	-	0.1 ± AC
				TOTALS	4.7 ± AC	0.6 ± AC	4.7 ± AC

LEGEND:

- APPROXIMATE PROPERTY LINE
- SOIL TYPE BOUNDARY
- COUNTY DEFINED WATERSHED BOUNDARY
- BLUELINE STREAM
- EPHEMERAL STREAM
- EXISTING VINEYARD BLOCK
- PROPOSED VINEYARD AVENUE
- PROPOSED VINEYARD BLOCK
- WATERSHED AREA
- SUBWATERSHED AREA
- TIME OF CONCENTRATION FLOW PATH

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WATERSHED EXHIBITS

WATERSHED AREAS E, F & G - PROPOSED CONDITIONS

PREPARED UNDER THE DIRECTION OF:

DRAWN BY: PowerCAD LLC

CHECKED BY: MRM

DATE: OCTOBER 27, 2022

REVISIONS:	BY:
10/27/2022 PERMIT SUBMITTAL	TMS

JOB NUMBER: 16-152

FILE: 16-152DG1-WTRSHD.DWG

ORIGINAL SIZE: 24" X 36"

SHEET NUMBER: 5 OF 5