APPENDIX J
Hydrology Study

LAND DEVELOPMENT DIVISION
STORM DRAIN & HYDROLOGY UNIT

TO: NorthPoint Development DATE 4/22/24
ATTN: Jack Lac
CC: Chandler Elliott

REVIEW OF HYDROLOGY STUDY AND LID PLAN

PD/MTD. NO.	**N/A**	**DATE OF REPORT**	**04/18/2024**
CUP NO.	**RPPL2022013992**	**PLAN CHECK NO.**	**4**
		PLAN CASE NO.	**ESTU2023000671**

We have reviewed your Hydrology Study and LID Plan.

[X] The Hydrology Study has been approved.

[X] The LID Plan has been approved.

[X] Refer to comments below:

COMMENTS:

1. Work within soft bottom drainage areas (which may include but is not limited to soft bottom basins, channels, watercourses, grade to drain) will require maintenance permits from Fish and Game, Army Corps of Engineers, and RWQCB prior to approval of the storm drain, and the permits must be still active prior to acceptance.

2. No other encroachment or vertical infrastructure more than what is shown on the hydrology study and grading plans is to be constructed within the FEMA Flood Zone and County Floodplain/Floodway without any additional analysis.

REVIEWED BY _____
Alex Mikhailpoor - (626) 458-4921

APPROVED BY: Thong Ngou

RAINFALL DATA

CAPITAL STORM	
RECURRENCE INTERVAL	50-YEAR
RAINFALL DEPTH	2.6 INCHES
SOIL NUMBER	120

50-YEAR STORM

HYDROLOGY ANALYSIS POST			
SUB-AREA	IMP %	AREA	CFS
1A-14A	1	8.9	1.3
TOTAL	-	125	8.4

FLOW AND VOLUME BY STORM		
STORM	PEAK Q	VOLUME
2-YR	2.0	16,988
5-YR	3.5	31,363
10-YR	4.5	43,560
25-YR	5.7	61,855
50-YR	8.4	83,199

LEGEND

DRAINAGE MANAGEMENT AREA BOUNDARY
SUBAREA BOUNDARY
SUBAREA FLOW PATH

FLOOD ZONE BOUNDARY

DIRECTIONAL FLOW ARROW

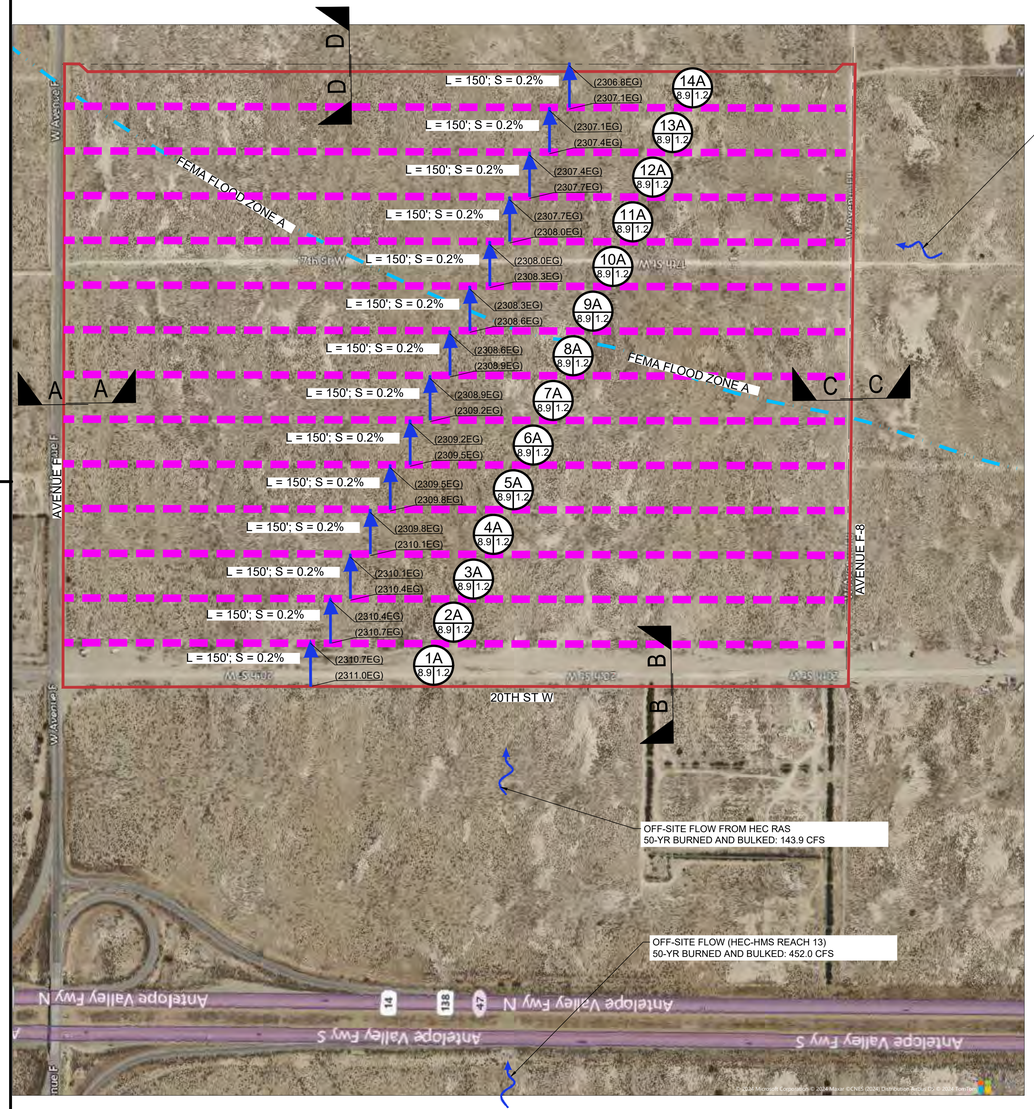
GRAPHIC SCALE

240 0 120 240 480 960

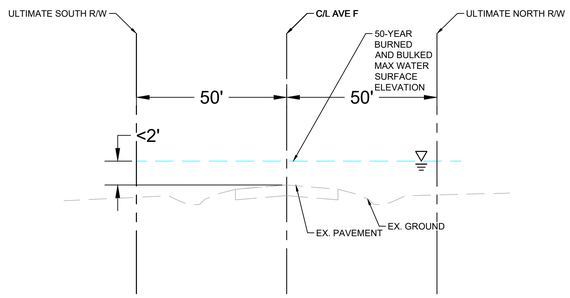
(IN FEET)
1 inch = 240 ft.

SUB AREA / XX
ACRES X.X | CFS* X

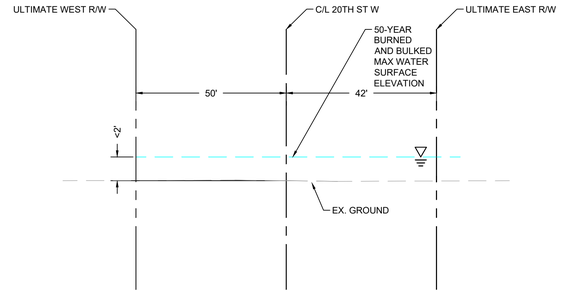
*GENERATED USING HYDROCALC FOR 50-YEAR STORM



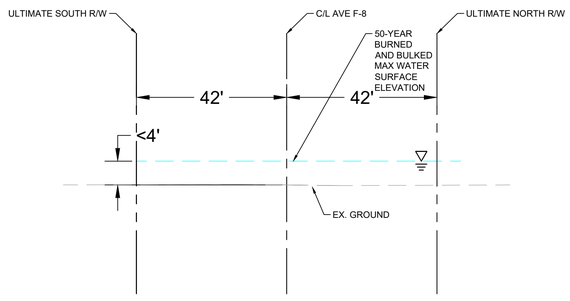
OFF-SITE FLOW FROM HEC RAS
50-YEAR BURNED AND BULKED: 2,843.6 CFS



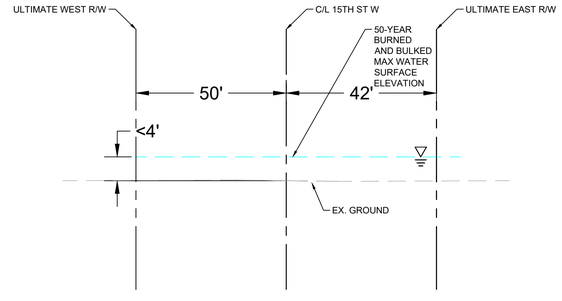
SECTION A-A
5x VERTICAL SCALE



SECTION B-B
5x VERTICAL SCALE



SECTION C-C
5x VERTICAL SCALE



SECTION D-D
5x VERTICAL SCALE

HYDROLOGY STUDY APPROVED

REVIEWED BY: _____ DATE 04/22/24

APPROVED BY: Thong Ngov DATE 4/24/24

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

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(661) 952-7918

DUKE ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
RYAN DUKE
C078739
EXP. 12-30-24
CIVIL
STATE OF CALIFORNIA

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REV#	APPR.	DATE	REVISION DESCRIPTION	APPR.	DATE
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COUNTY OF LOS ANGELES

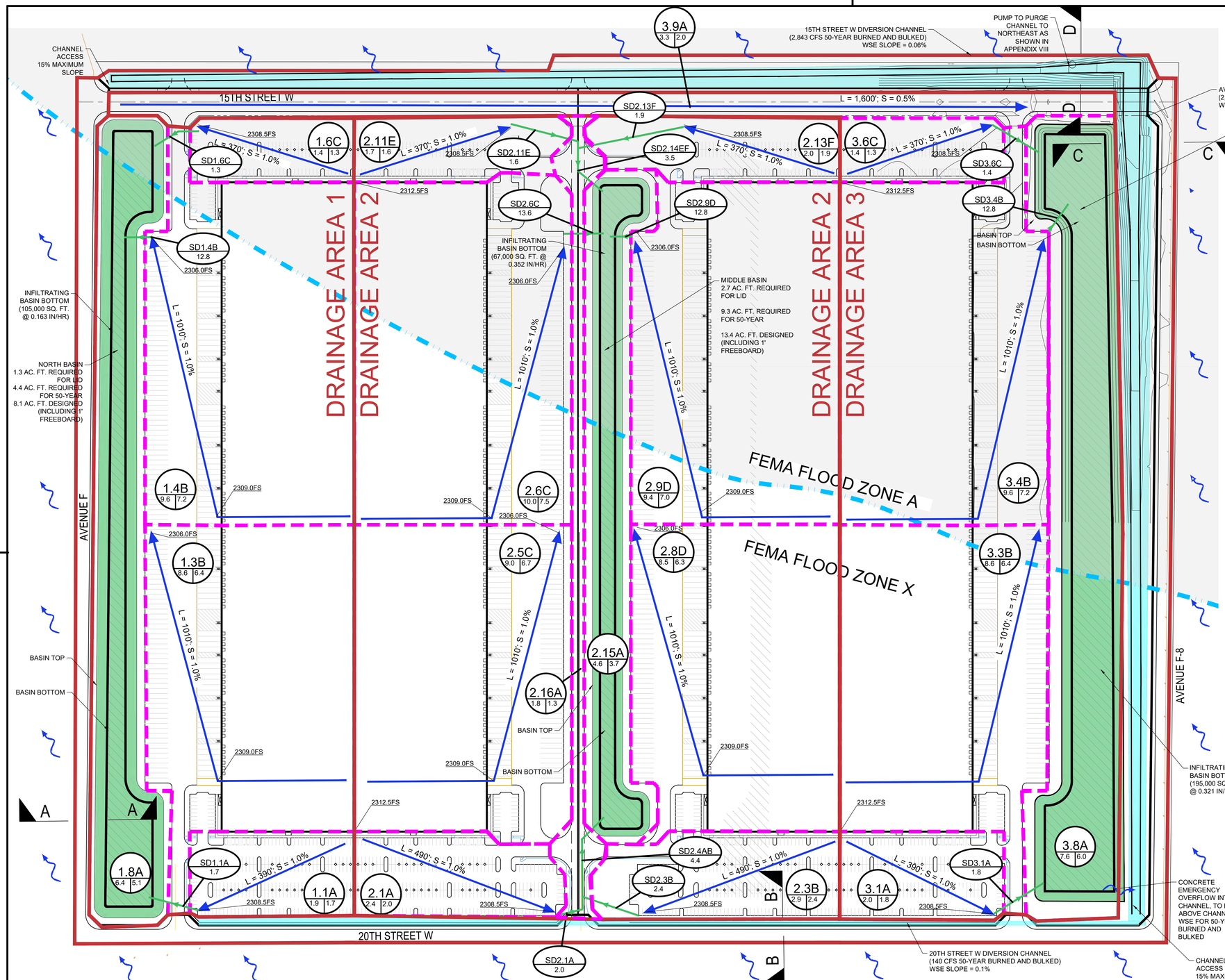
PREDEVELOPED HYDROLOGY

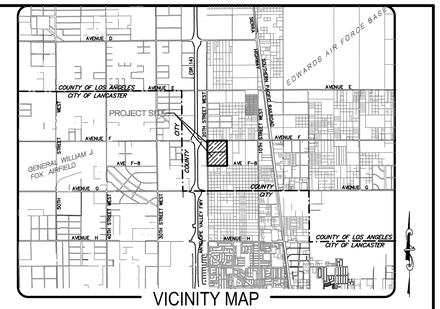
NORTHPOINT AVLC WEST

AVENUE F & 20TH STREET WEST
LANCASTER, CA

ESTU2023000671 - RPPL2022013992

SCALE: PER PLAN
DESIGNED:ZP
DRAWN:ZP
CHECKED: RD
SHEET:
PROJECT NO.:23136
SHEET NO.





VICINITY MAP
NTS

0.75 INCH STORM

HYDROLOGY ANALYSIS POST

SUB-AREA	IMP %	AREA	CFS	VOLUME
1.1A	90	1.9	0.3	4,207
1.3B	100	8.6	1.2	20,899
1.4B	100	9.6	1.4	23,329
1.6C	90	1.4	0.2	3,100
1.8A	10	6.4	0.5	3,110
TOTAL DMA1	-	27.9	-	54,645
2.1A	90	2.4	0.4	5,314
2.3B	90	2.9	0.5	6,421
2.5C	100	9.0	1.3	21,871
2.6C	100	10.0	1.4	24,301
2.8D	100	8.5	1.2	20,656
2.9D	100	9.4	1.3	22,843
2.11E	90	1.7	0.3	3,764
2.13F	90	2.0	0.3	4,428
2.15A	10	4.6	0.4	2,236
2.16A	100	1.8	0.3	4,374
TOTAL DMA2	-	52.3	-	116,208
3.1A	90	2.0	0.3	4,428
3.3B	100	8.6	0.5	20,899
3.4B	100	9.6	1.4	23,329
3.6C	90	1.4	0.2	3,100
3.8A	10	7.6	0.6	3,694
3.9A	100	3.3	0.4	8,019
TOTAL DMA3	-	32.5	-	63,469
TOTAL ALL	-	112.7	-	234,322

50-YEAR STORM

HYDROLOGY ANALYSIS POST

SUB-AREA	IMP %	AREA	CFS	VOLUME
1.1A	90	1.9	1.7	14,608
1.3B	100	8.6	6.4	72,447
1.4B	100	9.6	7.2	80,871
1.6C	90	1.4	1.3	10,765
1.8A	10	6.4	5.1	11,748
TOTAL DMA1	-	27.9	-	190,439
2.1A	90	2.4	2.0	18,448
2.3B	90	2.9	2.4	22,292
2.5C	100	9.0	6.7	75,816
2.6C	100	10.0	7.5	84,240
2.8D	100	8.5	6.3	71,604
2.9D	100	9.4	7.0	79,186
2.11E	90	1.7	1.6	13,071
2.13F	90	2.0	1.9	15,378
2.15A	10	4.6	3.7	8,444
2.16A	100	1.8	1.3	15,163
TOTAL DMA2	-	52.3	-	403,642
3.1A	90	2.0	1.8	15,377
3.3B	100	8.6	6.4	72,447
3.4B	100	9.6	7.2	80,871
3.6C	90	1.4	1.3	10,765
3.8A	10	7.6	6.0	13,950
3.9A	100	3.3	2.0	27,799
TOTAL DMA3	-	32.5	-	221,209
TOTAL ALL	-	112.7	-	815,290

HYDROLOGY STUDY APPROVED

REVIEWED BY: _____ DATE 04/22/24

APPROVED BY: Thong Ngov DATE 4/24/24

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

DRAINAGE AREA — SDX.XX (X.X) — SUB AREA/JUNCT

DRAINAGE AREA — SUB AREA — X.XX

ACRES — X.X — X — CFS*

CFS**

*GENERATED USING HYDROCALC FOR 50-YEAR STORM

**GENERATED USING LAR04 FOR 50-YEAR STORM

NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED

RAINFALL DATA

CAPITAL STORM	
RECURRENCE INTERVAL	50-YEAR
RAINFALL DEPTH	2.6 INCHES
SOIL NUMBER	120

LEGEND

- DRAINAGE MANAGEMENT AREA BOUNDARY
- SUBAREA BOUNDARY
- SUBAREA FLOW PATH
- PRIVATE (ON-SITE) STORM DRAIN
- PRIVATE DETENTION BASIN
- PRIVATE FLOOD DIVERSION CHANNEL
- FLOOD ZONE BOUNDARY
- DIRECTIONAL FLOW ARROW
- INFILTRATION AREA

GRAPHIC SCALE

120 0 60 120 240 480

(IN FEET)
1 inch = 120 ft.

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REV#	APPR.	DATE	REVISION DESCRIPTION	APPR.	DATE
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COUNTY OF LOS ANGELES
POSTDEVELOPED HYDROLOGY
NORTHPOINT AVLC WEST
AVENUE F & 20TH STREET WEST
LANCASTER, CA
ESTU2023000671 - RPPL2022013992

SCALE: PER PLAN
DESIGNED:ZP
DRAWN:ZP
CHECKED: RD
SHEET:
PROJECT NO.:23136
SHEET NO.

County of Los Angeles
Hydrology Study

Northpoint AVLC West
Avenue F and 20th Street West
Lancaster, CA 93534
ESTU2023000671
RPPL2022013992

Prepared For:

Northpoint Development, LLC

6010 W Amelia Earhart Dr
ake City, UT 84116
816) 888-7380

HYDROLOGY STUDY
APPROVED
REVIEWED BY: _____ DATE 04/22/24
APPROVED BY: Thong Ngov DATE 4/24/24
COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER
RYAN DUKE
C079729
Exp 9-30-24
CIVIL
STATE OF CALIFORNIA

Prepared By:

Duke Engineering
759 W Lancaster Blvd
Lancaster, California 93534
Phone: (661) 952-7918

The Registered Professional Engineer Certifies that the Storm Drain Facilities have been designed in accordance with the Los Angeles County Engineering Design Guidelines Policies & Procedures.

Table of Contents

1. Introduction

The purpose of this study is to analyze the drainage conditions of a new project in unincorporated Lancaster, Los Angeles County. The report will be used to design new storm water facilities.

2. Approach

This study uses Los Angeles County methods and software such as the HydroCalc time of concentration calculator. Site survey and new grading plans are used to analyze predeveloped and postdeveloped flows. HEC-RAS is used to analyze predeveloped and postdeveloped flows for hydromodification requirements.

3. Project Location

The project site is located at the southeast corner of Avenue F and 20th Street West in unincorporated Lancaster, Los Angeles County.

4. Project Use

The project site will be developed for two 1 million square feet industrial buildings with associated parking, drive aisles, and truck docking areas.

5. Existing Conditions

The project site and all of its surrounding parcels are currently undeveloped. Avenue F to the north is partially improved and 20th street west to the west is a dirt road. The eastern part of the site currently sits within a FEMA flood zone A, indicating that a 100-year recurrence interval storm is expected to produce depths of 1' or greater in the existing condition. The tributary for this flood zone is the Amargosa Creek, which has as its tributary most of Lancaster, much of Palmdale, and the undeveloped Los Angeles County area to the southwest of the two cities. The Los Angeles County Flood Insurance Study shown in Appendix XXXVII shows the table of flowrates as well as the FEMA panel associated with the project site.

Stormwater generated on-site currently flows to the northeast. During large storm events, off-site flows enter the site along the southern property line and exits along the eastern property line. The flood insurance study in Section G of this report shows that Amargosa Creek has a tributary flow of 13,000 CFS for a 100-yr recurrence interval storm.

5.1 Hydrologic Analysis

While the LA County Flood Insurance Study hydrologic analysis completed in the 1980s is used later in this report for analyzing the FEMA flood zone, there was no hydrologic analysis for the Amargosa Creek that was performed using current LA County Hydrology standards. This section details the method used to calculate the 2-, 5-, 10-, 25-, and 50-year hydrographs that are tributary to the project site.

GIS data was used extensively in this analysis to ensure that calculations are as accurate as possible. Appendix XIV shows the terrain of the Antelope Valley, obtained from the USGS National Geospatial Program. Most of the Antelope Valley has been surveyed at a 3'x3' grid, which was used for this analysis. With this topography map as an input into HEC-HMS, the delineated subareas and reaches were created and are shown in Appendix XV. The characteristics associated

with these subbasins and reaches, determined using the 3'x3' topography, are tabulated in Appendices XVI and XVII respectively.

In order to determine the losses associated with rainfall, the USGS Soils Type Map that covers the tributary area was used and is shown in Appendix XVIII. It was assumed that there were no initial losses associated with this project, and a constant loss map was created using the Army Corps of Engineers' Loss Table shown in appendix XIX. The constant losses for each soils group were taken as the lowest value in the range provided by the Army Corps. Finally, the loss rate map was averaged over each subbasin to create the table shown in Appendix XIX.

The User Specified S-Graph method was used to transform rainfall data into subarea outflow data. The LA County Desert S-Graph, shown in Appendix XX, was used for this method. The program also requires an input for Lag Time; the Snyder Lag Time equation developed for the Los Angeles County area is shown in Appendix XXI, and the full transform table is shown in Appendix XXII. The NLCD land cover map and associated Manning's numbers, which were used in the Lag Time equation, is in Appendix XLIV.

The Muskingum-Cunge routing method was used to temporally route each subbasin's transformed hydrograph to the downstream junctions. The routing method requires inputs for reach length and slope which were determined using the previously mentioned reach characteristics table. In addition to these inputs, the manning's n, and width and side slope of the channel are required. As the reaches determined by HEC-HMS are irregular and change throughout each reach, some values were assumed. In reaches where there is clear evidence of channelized flows (i.e. through improved channels within the city or natural valley channels) manning's n was assumed to be between 0.03 and 0.04, and a channel section take from GIS terrain data was modeled; in reaches where it appears that flows are not well channelized (i.e. over flat desert ground), a manning's n of 0.1 is assumed and a 500' wide channel with 1000:1 side slopes is used. A map showing which reach is assumed to be channelized and which are not is shown in Appendix XXIII, and the summary table for all reaches is shown in Appendix XXIV.

Rainfall data for the entirety of LA County is available, and a map of rainfall depth associated with each storm is shown in Appendix XXV. The rainfall depth is averaged over each subbasin, and combined with the LA County Unit Hyetograph shown in Appendix XXVI to determine the rainfall at each subbasin.

The LA County Hydrology Manual describes the methodology used for calculating the burned hydrograph for a subarea. However, this method uses the LA County soils values compatible with their modified rational method, which is not used for this hydrology analysis. Instead, the highlighted subbasins shown in Appendix XXVII are changed to act as completely impervious by having removed these subbasin's loss rate as shown in Appendix XXVIII. This is a conservative estimate of flow rates produced by each storm as it would produce more outflow than the standard LA County method.

The LA County methodology of calculating bulking flows was used to create the maximum flowrate expected for the 50-year storm. The map of Debris Production Areas is shown in Appendix XXIX, and the calculation of the bulking factor is shown in Appendix XXX. The 50-year burned

hydrograph was multiplied by this bulking factor to determine the 50-year Burned and Bulked hydrograph, which is the largest storm event analyzed in this report.

Summary tables for each storm event are shown in Appendix XXXI. Reach 13 enters the site from west of the Antelope Valley Freeway, and Reach 1, the main Amargosa tributary, enters the site from the south. The locations of these reaches are also shown in Appendix I.

6. Proposed Conditions

The project site is approximately 120 acres. The project will construct two million square feet of building area as well as their associated parking and driveways. The rest of the project area will be utilized as either landscaping or stormwater management areas. The project will create about 89 acres of impervious area, which means that the site will be about 75% impervious. In the calculations, all areas are shown to be either 90% or 100% impervious, except for the subareas containing only drainage basins which are calculated using a 10% impervious ration. All proposed drainage infrastructure will be privately owned and maintained, including the new drainage channel discussed below.

In its post developed condition, the site will be divided into three drainage areas. The first drainage area includes half of the northern building, half of its associated parking, the truck docks to the north, and the northern private detention basin. The second drainage area includes the south half of the northern building, the north half of the southern building, half of their associated parking, the truck docks between the two buildings, and the middle private detention basin. The third and final drainage area includes the south half of the southern building, its associated parking, the truck dock to the south, the southern private detention basin, and Avenue F-8 to the south. These areas are shown in the Postdeveloped Hydrology Map in Appendix II. Each subarea contains its own storm drain and detention system. However, as the LID analysis below necessitates, the three basins will be hydraulically connected for infiltration purposes.

A new private channel, shown Appendix II, will be constructed around the site to protect it from flooding. As the ground is extremely flat, there is no possibility to daylight the channel to existing ground allowing free outfall. Instead, stormwater will cross Avenue F-8 during a large enough storm and fill the channel, at which point the channel will begin to flow to the east, cross under the interior street A, and then flow north. The southern and eastern edges of the private channel will be at or near the existing ground allowing the flows to return to their natural flow path with no additional energy dissipation necessary. The cross sections at the property boundaries show the new private channel dimensions as well as how stormwater will enter and exit while not combining with on-site flows.

As the private channel will not daylight, a pump is required. Channel purge calculations are shown in Appendix XII, which show that the pumps will purge the channel within the required 96 hours. As the channel is within the large Amargosa floodplain, the pump will not be able to purge the channel immediately as the Amargosa will still be ponded above the channel; around 72 hours after the modeled 50-year burned and bulked storm, the Amargosa will have receded beyond the channel, and the pump will purge stormwater over the next 96 hours. The Amargosa creek will still be ponded over this time period, the pumped stormwater will combine with ponded water just outside of the basin after being spread out to reduce the outflow velocity, which will eliminate erosion at the outlet. The pump schematic exhibit in Appendix VIII shows the previous information along with a figure of the Amargosa 4 days after the storm simulation begins. The pump and spreader shown in the exhibit will be within a private easement on the property to the east. This easement must be created prior to the construction of any off-site stormwater control.

7. Analysis

7.1 Rainfall Data

Table 1 below shows the rainfall data for the project obtained from the LA County Isohyet maps included in Appendix XLII.

Table 1: Rainfall Data

Information	Project Specific Values
Storm Frequency	50-Year
Rainfall Amount	2.6 inches
Soil Number	120

7.2 LA County Hydromodification Requirements

As this project will change flows upstream of an unimproved natural drainage system, hydromodification analysis will be required. The intention for this project is to fully retain and infiltrate on-site the largest storm event, 50-year, 24-hour.

The HydroCalc calculations for each subarea shown in the postdeveloped conditions map are shown in Appendix VI. The time of concentrations shown in these results are used in the LAR04 analysis shown in Appendix VII. This analysis gives the peak flow in each subarea on-site as well as the peak flow at each junction on-site which will be used to size underground storm drain.

The HydroCalc volumes for each subarea for the 50-year storm shown on the postdeveloped map are summed to obtain a total volume required to be infiltrated. This volume is the volume used in Appendix IX with the infiltration rates shown in Appendix X to show that the 50-year storm will be fully captured and infiltrated on-site within 96 hours.

7.3 LA County LID Compliance

This project is a designated project as it will add more than 10,000 square feet of impervious area. As such, the project is required to fully infiltrate the SWQDv associated with the project. As the project is industrial in nature, stormwater harvest is not feasible, so basin infiltration is used to meet LID requirements instead. Appendix VII shows the calculation of the 0.75-inch storm. However, since this storm is much smaller than the 50-year 24-hour storm, the previous section shows that the 0.75-inch storm will be infiltrated within the 96-hour drawdown period.

The project will be required to implement source control measures as specified in the LID Manual. These source control measures will include at least the Storm Drain Messages and Signage, Outdoor Trash and Storage and Waste Handling Area, Loading and Unloading Docks Area, and Irrigation Practiced.

In addition to these requirements, on-site basins and infiltration areas shall be monitored and kept free of debris. Maintenance will be necessary in the event that infiltration slows to below the infiltration specified in the infiltration report.

7.4 Upstream/Downstream Depth & Velocity Analysis

HEC-RAS two-dimensional flow analysis is used to analyze the Amargosa Creek in its predeveloped and postdeveloped conditions for the 2- through 50-year flow conditions as well as the 50-year Burned and Bulked storm calculated in HEC-HMS. The depth and velocity maps associated with each storm for the predeveloped condition are shown in Appendices XXXII and XXXIII respectively. The same is shown in Appendices XXXIV and XXXV for the postdeveloped condition. For each of these storms, a section along the project boundary was taken as shown in the maps. A table showing the comparisons between the predeveloped and postdeveloped storms along the project boundary is shown in Appendix XXXVI. In addition to the tabular data, Appendix XLV shows maps that were created that show any change in depth, velocity, and sedimentation from the predeveloped condition to the postdeveloped condition. This table shows that there is no increase in flow depth or velocity upstream of the project site to the south and west. The maps show that flows outside of the project area will be effectively unchanged from the predeveloped state.

7.4.1 Two-Dimensional Model Development

Publicly available high resolution (3'x3') LIDAR topography is available from USGS for land in LA County. This topography was used in both the predeveloped and postdeveloped models completed in HEC-RAS. For the postdeveloped model, the area within the project boundary was replaced with a new surface that reflects the essential parts of the proposed development to be modeled.

The model boundaries are west of the 14 freeway, south of Avenue G, east of Sierra Highway, and North of Avenue F. The area within the boundary is modeled as a two-dimensional net with 100'x100' resolution in most areas to reduce complexity. Important linear such as the Amargosa Creek, roadways, and railroad tracks are made more accurate using a 30'x30' resolution. The channel surrounding the site is at a resolution of 10'x10' as it most needs accurate hydraulic modeling.

There are two inflow boundary conditions in the model. The boundary condition from the south is taken from the HEC-HMS Reach 1 inflow hydrograph with a slope of 0.06%. The boundary condition from the west is taken from the HEC-HMS Reach 13 Hydrograph; this inflow is blocked by the freeway and ponds before it crosses the freeway by way of culverts implemented in the model. Finally, the outflow boundary condition to the northeast is set to outflow at a slope of 0.06%.

The model was built using the diffusion wave equations to find and correct any errors in the model. When the model was completed with no errors, the equation set was switched to the Full Momentum equation and run again; there was virtually no difference between the results of the two equation sets, so the final model uses the diffusion wave equations to reduce computation time.

Finally, NLCD land cover information was used in conjunction with the Army Corps of Engineer's manning's number table to assign manning's values to each cell. In the post developed condition, new impervious areas are assigned a manning's value of 0.013, and the new channels are assigned a manning's value between 0.03 and 0.07.

7.4.2 Channel Hydraulic Analysis

As the HEC-RAS model is a two-dimensional flow model, a section is taken perpendicular to and including the new private channel that analyzes the velocity in the channel when it is at its most full. This section shows that the maximum velocity in the channel is about 6 ft/sec. As the velocity in the channel is greater than 2 ft/sec, it is recommended that the private channel be protected with erosion control measures to prevent erosion.

7.5 FEMA Flood Zone Analysis

The following analysis shows that the current design will be able to meet FEMA's requirements to obtain a CLOMR, as prior to the approval of storm drain plans, an approved FEMA CLOMR must be submitted to the county.

The LA County Flood Insurance Study shown in Appendix XXXVII gives the off-site flows associated with the 100-year storm event as accepted by FEMA. The geometry used for the Amargosa Creek is shown in Appendix XXXVIII. The geometry is a one-dimensional channel that closely matches the FEMA flood zone shown with the Flood Insurance Study. The same channel sections are used for the predeveloped and postdeveloped conditions, except for the terrain which was updated for the postdeveloped conditions to match the new design. The predeveloped depth map, profile table, and sections tables are shown in Appendix XXXIX. The same exhibits are shown in Appendix XL for the postdeveloped condition. These exhibits show that there is effectively no increase to water surface elevation or velocity from the predeveloped to postdeveloped condition anywhere in the channel model. Therefore, the project will not impact the Amargosa floodplain.

7.5.1 One-Dimensional Model Development

Predeveloped and postdeveloped terrain and manning's values for the one-dimensional model are the same as those used for the two-dimensional model discussed in section 7.4.1. Cross sections were drawn perpendicular to the direction of flow, and elevation data and manning's values were assigned from GIS data. The upstream boundary condition is assigned a flowrate of 13,000 CFS per the LA County Flood Insurance Study shown in appendix XXXVII, and the model was set to analyze only the subcritical flow regime, as it produces the highest water surface elevation.

7.6 Sediment Transport Analysis

The HEC-RAS two-dimensional hydraulic model was implemented using the gradations of soil specified in the soils report created for this project. It was assumed that there is equilibrium at the flow boundaries in order to calculate if the project will cause an increase in sediment downstream. Also, unlike the models discussed previously in the report, the sedimentation modeling exclusively implements the Shallow Water Equations (SWE)v instead of using the diffusion method. Other modeling choices are discussed below.

7.6.1 Sediment Transport Equations

The Wu et al. sediment transport equations were used for this project. In *HEC-RAS 2d: Sediment Transport Theory,"* published in 2024 by USACE, it is stated that Wu is one of the three most popular equations used for 2D modeling, it is based on extensive lab and

field measurements, and is the most recent of the three most popular transport equations to be developed. It was also developed for nonuniform sediment, which applies to this project. Wu also developed the "Active Layer" sorting method, which is used in all HEC-RAS two-dimensional sediment modeling.

7.6.2 Fall Velocity Equations

The Soulsby fall velocity method is used for this project. In the same report mentioned in the previous section, it is recommended to "use Soulsby except for specific conditions." Also, the HEC-RAS 2D Sediment User Manual states that "the results are not very sensitive to the [Fall Velocity] formula."

7.6.3 Results

The results, shown in Appendix XLIII, indicate that the project will not cause an increase in bed change upstream or downstream of the project for either the 50-year Burned and Bulked or 2-year clear flow scenarios. Specifically, the appendix shows that for a storm with a 2-year recurrence interval, the project will not cause any measurable change in sedimentation at all. For a storm with a 50-year recurrence interval, any measurable changes will occur within the new channel to the east of this site; both degradation and aggregation will occur here, but the total of these will be equal on average meaning the property owner can remedy changes in bed elevation by redistributing the soil across the channel bed after a storm event.

As the 50-year burned and bulked and the 2-year clear flow storm models both do not show that the project will cause any sedimentation issues, it can be interpolated that the project will not cause sedimentation issues for storms that lie between these two in magnitude. Any scour of the channel itself will be combatted with erosion control measures, and sedimentation shall be monitored so that the private channel is cleared of any debris after a storm event.

8. Conclusion

In conclusion, the site has been assessed and stormwater runoff has been quantified to sufficiently size the proposed storm drain improvements.

Using the information discussed in this current report, it is our opinion that this study sufficiently analyses storm drain devices to safely collect and convey storm water run-off.

Sincerely,

Ryan Duke P.E.

RCE 79729

Principle Engineer

Appendix I: Predeveloped Conditions Map

RAINFALL DATA

CAPITAL STORM	
RECURRENCE INTERVAL	50-YEAR
RAINFALL DEPTH	2.6 INCHES
SOIL NUMBER	120

50-YEAR STORM

HYDROLOGY ANALYSIS POST			
SUB-AREA	IMP %	AREA	CFS
1A-14A	1	8.9	1.3
TOTAL	-	125	8.4

FLOW AND VOLUME BY STORM		
STORM	PEAK Q	VOLUME
2-YR	2.0	16,988
5-YR	3.5	31,363
10-YR	4.5	43,560
25-YR	5.7	61,855
50-YR	8.4	83,199

LEGEND

DRAINAGE MANAGEMENT AREA BOUNDARY
SUBAREA BOUNDARY
SUBAREA FLOW PATH

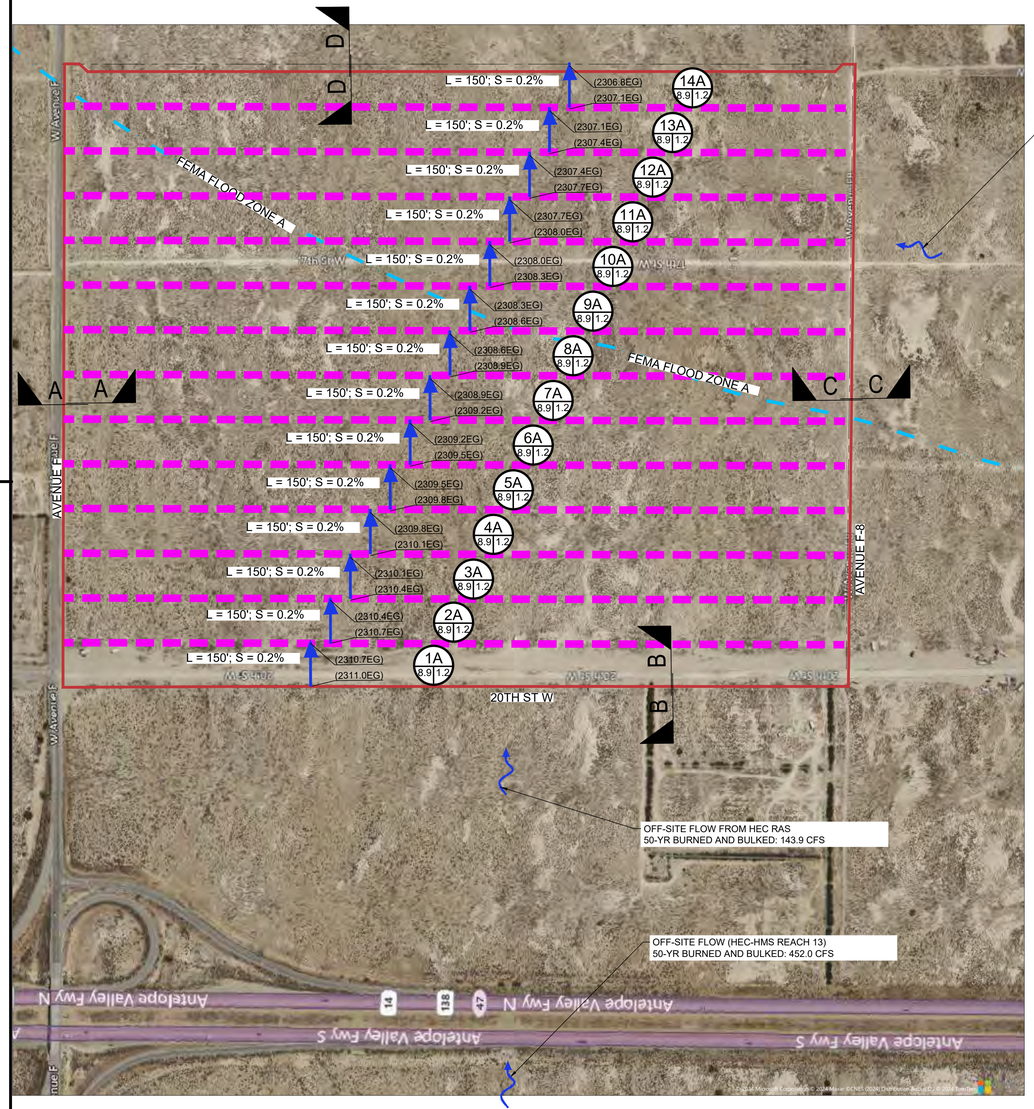
FLOOD ZONE BOUNDARY

DIRECTIONAL FLOW ARROW

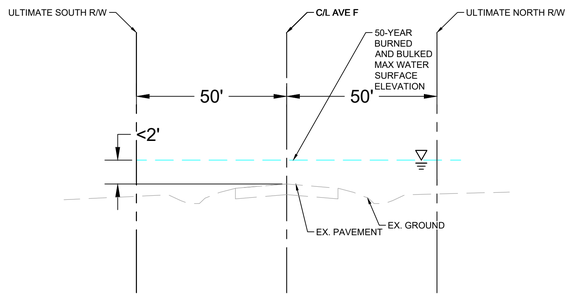
GRAPHIC SCALE
240 0 120 240 480 960
(IN FEET)
1 inch = 240 ft.

SUB AREA / XX
ACRES X.X | CFS* X

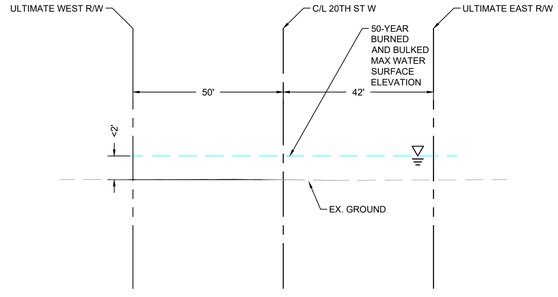
*GENERATED USING HYDROCALC FOR 50-YEAR STORM



OFF-SITE FLOW FROM HEC RAS
50-YEAR BURNED AND BULKED: 2,843.6 CFS



SECTION A-A
5x VERTICAL SCALE



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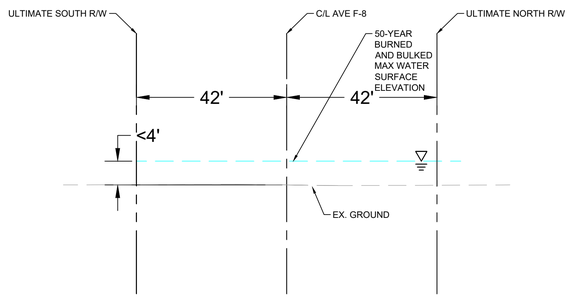
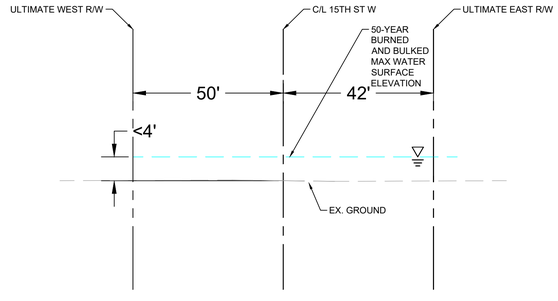


SECTION C-C
5x VERTICAL SCALE



SECTION D-D
5x VERTICAL SCALE

UNDERGROUND SERVICE ALERT
CALL BEFORE YOU DIG
Call: TOLL FREE 811
TWO WORKING DAYS BEFORE YOU DIG

PREPARED FOR:
NORTHPOINT DEVELOPMENT, LLC

ENGINEER OF RECORD
44732 YUCCA AVENUE
LANCASTER, CA 93534
(661) 952-7918

DUKE ENGINEERING

REGISTERED PROFESSIONAL ENGINEER RYAN DUKE C078739 EXP 6-30-24 CIVIL STATE OF CALIFORNIA

REV#	RECORD RCE APPR.	RECORD RCE DATE	REVISION DESCRIPTION	CITY APPR.	CITY DATE
△					
△					
△					
△					
△					

REVISION BLOCK

COUNTY OF LOS ANGELES
PREDEVELOPED HYDROLOGY
NORTHPOINT AVLC WEST
AVENUE F & 20TH STREET WEST
LANCASTER, CA
ESTU2023000671 - RPPL2022013992

SCALE: PER PLAN
DESIGNED:ZP
DRAWN:ZP
CHECKED: RD
SHEET:
PROJECT NO.:23136
SHEET NO.

Appendix II: Predeveloped Hydrocalc

Peak Flow Hydrologic Analysis

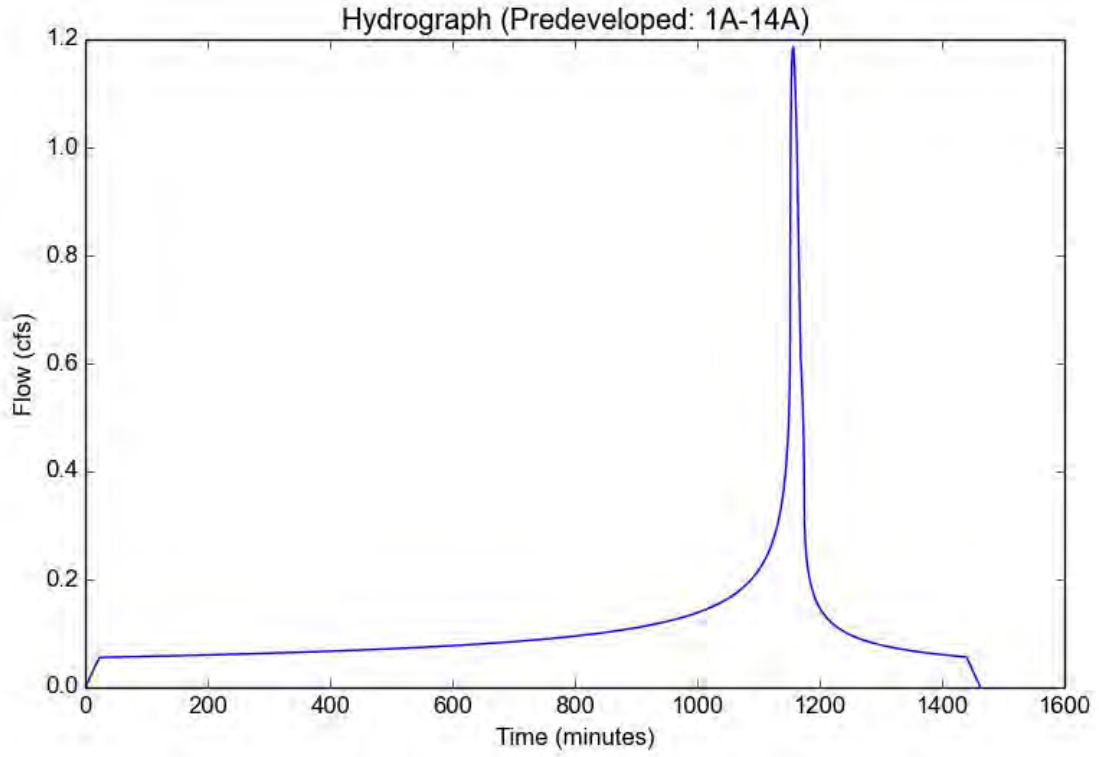
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/12242023/On-Site/Predevelop
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Predeveloped
Subarea ID	1A-14A
Area (ac)	8.9
Flow Path Length (ft)	150.0
Flow Path Slope (vft/hft)	0.002
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.01
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.7571
Undeveloped Runoff Coefficient (Cu)	0.1687
Developed Runoff Coefficient (Cd)	0.176
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	1.1859
Burned Peak Flow Rate (cfs)	1.1859
24-Hr Clear Runoff Volume (ac-ft)	0.2138
24-Hr Clear Runoff Volume (cu-ft)	9311.463



Appendix III: Predeveloped LAR04

ESTU2023000671
RPPL2022013992

```
 Program Package Serial Number:  2240
02/22/24   FILE: 23136    INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units     PAGE     1
                                    LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                      PROG F0601M

          Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR =  2  SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat
                                                                                                                STORM DAY 4
                    SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV     CONV     CONV    CONV   CONTROL SOIL       TC  RAIN  PCT
          LOCATION  AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)   Z    Q(CFS) NAME       ZONE  IMPV
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          3136   4A    8.9       .28      35.6      .98   2      150.   .00200   500.00  5.00       0.  120  23   A13   .01
          3136   5A    8.9       .28      44.5     1.17   2      150.   .00200   500.00  5.00       0.  120  23   A13   .01
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          3136   7A    8.9       .28      62.3     1.46   2      150.   .00200   500.00  5.00       0.  120  23   A13   .01
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          3136  12A    8.9       .28     106.8     1.90   2      150.   .00200   500.00  5.00       0.  120  23   A13   .01
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          Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR =  5  SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat
                                                                                                                STORM DAY 4
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          LOCATION  AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)   Z    Q(CFS) NAME       ZONE  IMPV
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                                                                                                                STORM DAY 4
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          LOCATION  AREA(Ac)  Q(CFS)    AREA(Ac)  Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)   Z    Q(CFS) NAME       ZONE  IMPV
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          3136   4A    8.9       .72      35.6     2.37   2      150.   .00200   500.00  5.00       0.  120  23   A13   .01
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LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM RAIN ZONE	DAY 4 PCT IMPV
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3136	8A	8.9	.72	71.2	4.00	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
3136	9A	8.9	.72	80.1	4.32	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
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3136	12A	8.9	.72	106.8	5.19	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
3136	13A	8.9	.72	115.7	5.45	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
3136	14A	8.9	.72	124.6	5.70	0	0.	.00000	.00	.00	0.	120	23	A13	.01

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM RAIN ZONE	DAY 4 PCT IMPV
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3136	3A	8.9	1.33	26.7	3.34	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
3136	4A	8.9	1.33	35.6	4.09	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
3136	5A	8.9	1.33	44.5	4.71	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
3136	6A	8.9	1.33	53.4	5.24	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
3136	7A	8.9	1.33	62.3	5.74	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
3136	8A	8.9	1.33	71.2	6.21	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
3136	9A	8.9	1.33	80.1	6.63	2	150.	.00200	500.00	5.00	0.	120	23	A13	.01
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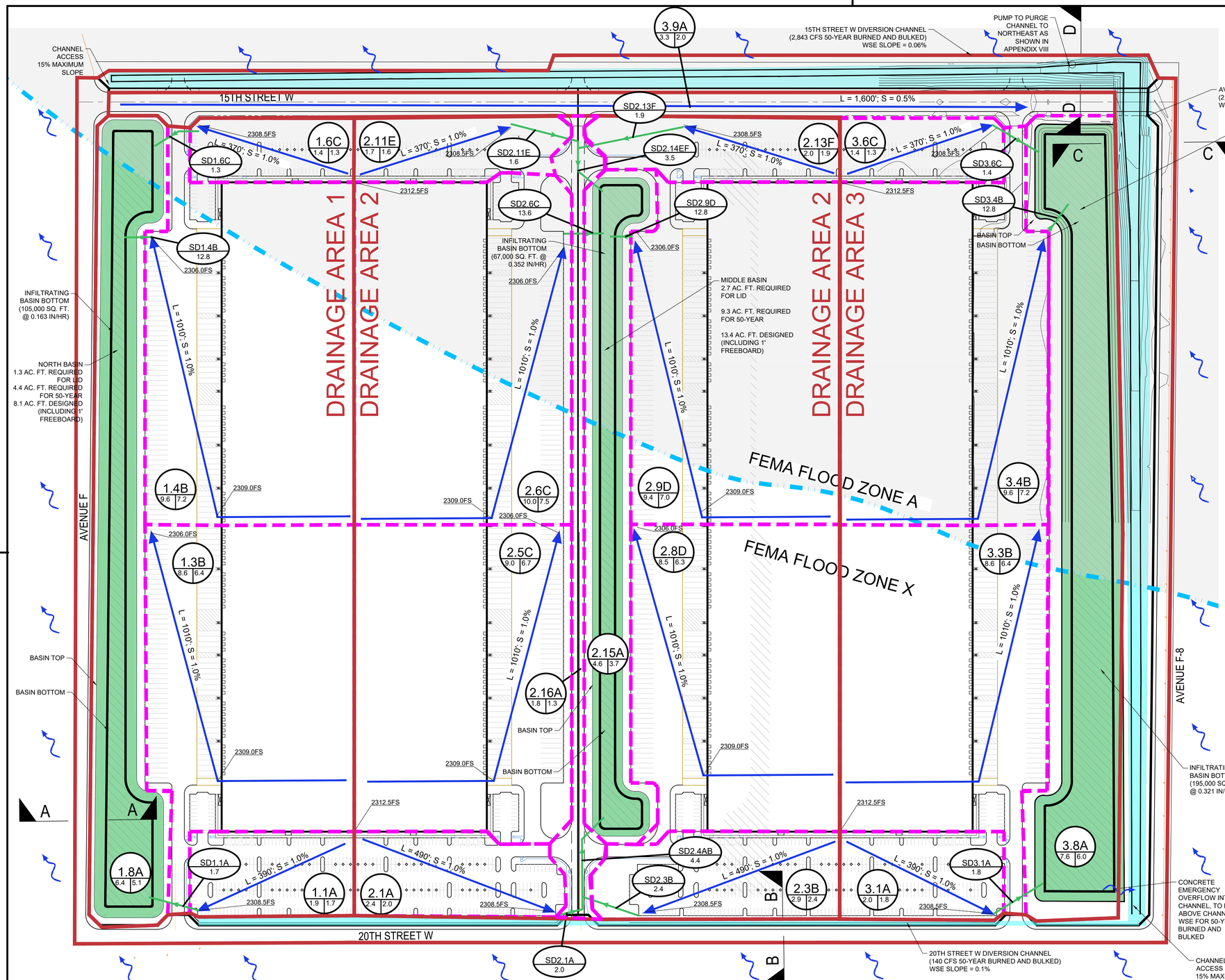
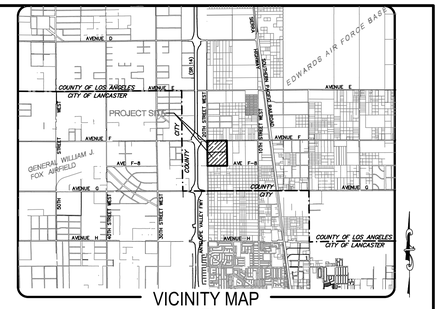
ESTU2023000671
RPPL2022013992

Appendix V: Postdeveloped Conditions Map





VICINITY MAP
NTS

0.75 INCH STORM

HYDROLOGY ANALYSIS POST

SUB-AREA	IMP %	AREA	CFS	VOLUME
1.1A	90	1.9	0.3	4,207
1.3B	100	8.6	1.2	20,899
1.4B	100	9.6	1.4	23,329
1.6C	90	1.4	0.2	3,100
1.8A	10	6.4	0.5	3,110
TOTAL DMA1	-	27.9	-	54,645
2.1A	90	2.4	0.4	5,314
2.3B	90	2.9	0.5	6,421
2.5C	100	9.0	1.3	21,871
2.6C	100	10.0	1.4	24,301
2.8D	100	8.5	1.2	20,656
2.9D	100	9.4	1.3	22,843
2.11E	90	1.7	0.3	3,764
2.13F	90	2.0	0.3	4,428
2.15A	10	4.6	0.4	2,236
2.16A	100	1.8	0.3	4,374
TOTAL DMA2	-	52.3	-	116,208
3.1A	90	2.0	0.3	4,428
3.3B	100	8.6	0.5	20,899
3.4B	100	9.6	1.4	23,329
3.6C	90	1.4	0.2	3,100
3.8A	10	7.6	0.6	3,694
3.9A	100	3.3	0.4	8,019
TOTAL DMA3	-	32.5	-	63,469
TOTAL ALL	-	112.7	-	234,322

50-YEAR STORM

HYDROLOGY ANALYSIS POST

SUB-AREA	IMP %	AREA	CFS	VOLUME
1.1A	90	1.9	1.7	14,608
1.3B	100	8.6	6.4	72,447
1.4B	100	9.6	7.2	80,871
1.6C	90	1.4	1.3	10,765
1.8A	10	6.4	5.1	11,748
TOTAL DMA1	-	27.9	-	190,439
2.1A	90	2.4	2.0	18,448
2.3B	90	2.9	2.4	22,292
2.5C	100	9.0	6.7	75,816
2.6C	100	10.0	7.5	84,240
2.8D	100	8.5	6.3	71,604
2.9D	100	9.4	7.0	79,186
2.11E	90	1.7	1.6	13,071
2.13F	90	2.0	1.9	15,378
2.15A	10	4.6	3.7	8,444
2.16A	100	1.8	1.3	15,163
TOTAL DMA2	-	52.3	-	403,642
3.1A	90	2.0	1.8	15,377
3.3B	100	8.6	6.4	72,447
3.4B	100	9.6	7.2	80,871
3.6C	90	1.4	1.3	10,765
3.8A	10	7.6	6.0	13,950
3.9A	100	3.3	2.0	27,799
TOTAL DMA3	-	32.5	-	221,209
TOTAL ALL	-	112.7	-	815,290

DRAINAGE AREA
SDX.XX
X.X
SUB AREA/JUNCT
CFS**

**GENERATED USING LAR04 FOR 50-YEAR STORM

DRAINAGE AREA SUB AREA
X.XX
ACRES X.X X CFS*

*GENERATED USING HYDROCALC FOR 50-YEAR STORM

NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED

RAINFALL DATA

CAPITAL STORM	
RECURRENCE INTERVAL	50-YEAR
RAINFALL DEPTH	2.6 INCHES
SOIL NUMBER	120

LEGEND

- DRAINAGE MANAGEMENT AREA BOUNDARY
- SUBAREA BOUNDARY
- SUBAREA FLOW PATH
- PRIVATE (ON-SITE) STORM DRAIN
- PRIVATE DETENTION BASIN
- PRIVATE FLOOD DIVERSION CHANNEL
- FLOOD ZONE BOUNDARY
- DIRECTIONAL FLOW ARROW
- INFILTRATION AREA
- CONCRETE EMERGENCY OVERFLOW INTO CHANNEL, TO BE 1' ABOVE CHANNEL WSE FOR 50-YEAR BURNED AND BULKED
- CHANNEL ACCESS 15% MAXIMUM SLOPE

GRAPHIC SCALE
120 0 60 120 240 480
(IN FEET)
1 inch = 120 ft.

UNDERGROUND SERVICE ALERT
CALL BEFORE YOU DIG
Call: TOLL FREE 811
TWO WORKING DAYS BEFORE YOU DIG

PREPARED FOR:
NORTHPOINT DEVELOPMENT, LLC

ENGINEER OF RECORD
44732 YUCCA AVENUE
LANCASTER, CA 93534
(661) 952-7918

DUKE ENGINEERING

REGISTERED PROFESSIONAL ENGINEER RYAN DUKE C070729 EXP 6-30-24 CIVIL STATE OF CALIFORNIA

RECORD RCE			REVISION BLOCK	CITY	
REV#	APPR.	DATE	REVISION DESCRIPTION	APPR.	DATE
△					
△					
△					
△					
△					

COUNTY OF LOS ANGELES
POSTDEVELOPED HYDROLOGY
NORTHPOINT AVLC WEST
AVENUE F & 20TH STREET WEST
LANCASTER, CA
ESTU2023000671 - RPPL2022013992

SCALE: PER PLAN
DESIGNED:ZP
DRAWN:ZP
CHECKED: RD
SHEET:
PROJECT NO.:23136
SHEET NO.

Appendix VI: Postdeveloped Hydrocalc

ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

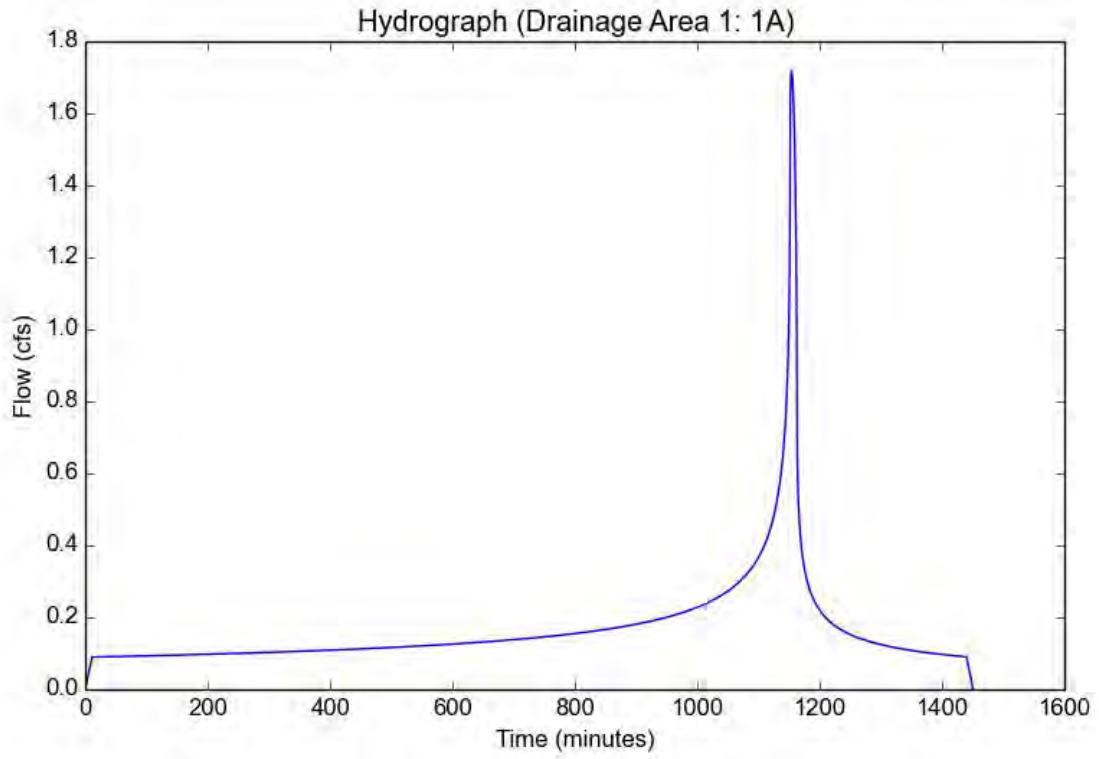
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	1A
Area (ac)	1.9
Flow Path Length (ft)	390.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	1.0709
Undeveloped Runoff Coefficient (Cu)	0.3437
Developed Runoff Coefficient (Cd)	0.8444
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	1.718
Burned Peak Flow Rate (cfs)	1.718
24-Hr Clear Runoff Volume (ac-ft)	0.3354
24-Hr Clear Runoff Volume (cu-ft)	14608.0005



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

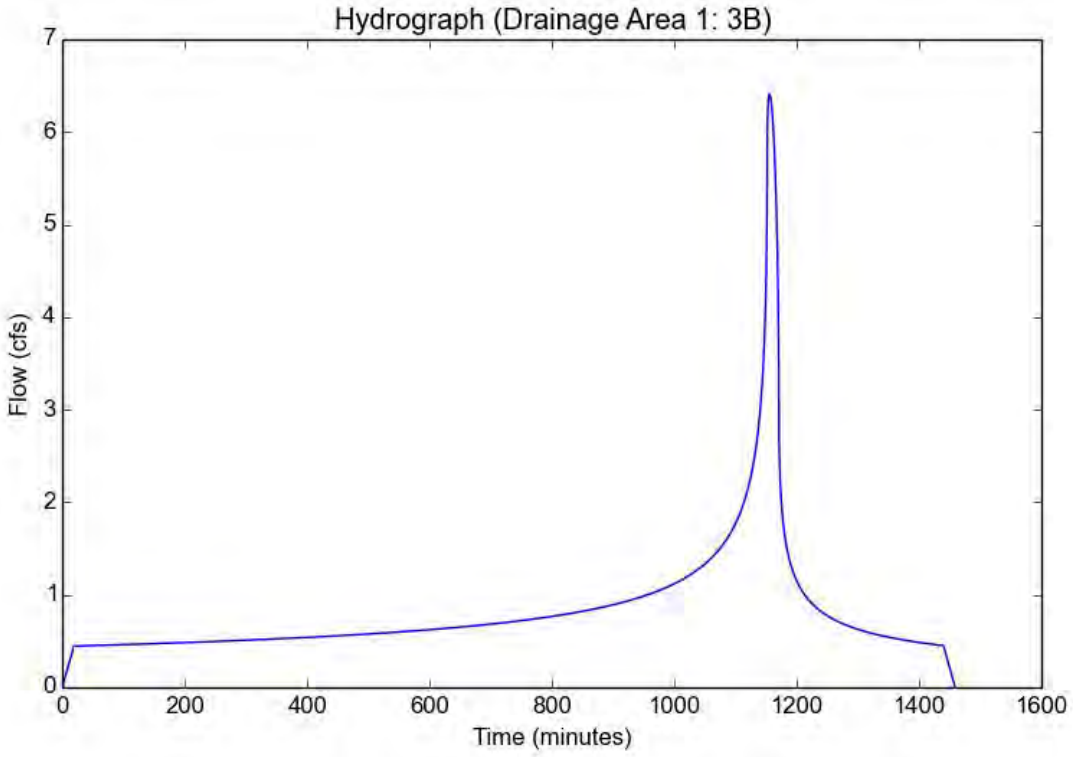
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	3B
Area (ac)	8.6
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.8283
Undeveloped Runoff Coefficient (Cu)	0.2143
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	6.4109
Burned Peak Flow Rate (cfs)	6.4109
24-Hr Clear Runoff Volume (ac-ft)	1.6631
24-Hr Clear Runoff Volume (cu-ft)	72446.7312



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

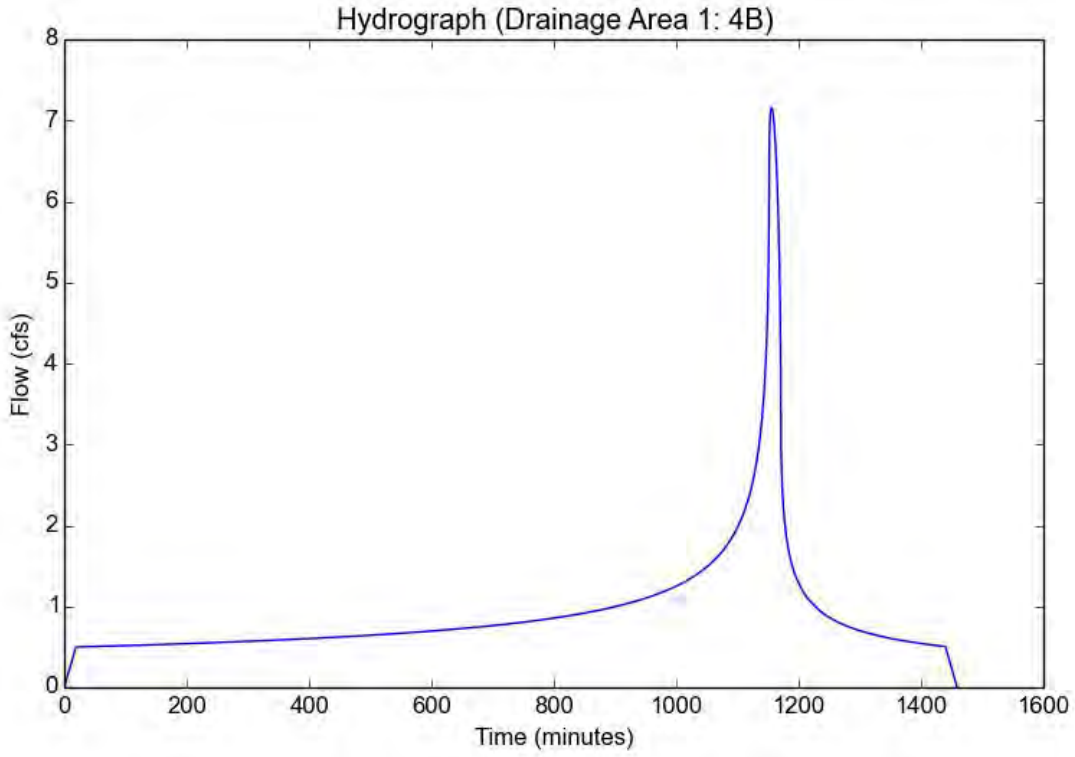
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	4B
Area (ac)	9.6
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.8283
Undeveloped Runoff Coefficient (Cu)	0.2143
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	7.1564
Burned Peak Flow Rate (cfs)	7.1564
24-Hr Clear Runoff Volume (ac-ft)	1.8565
24-Hr Clear Runoff Volume (cu-ft)	80870.7698



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

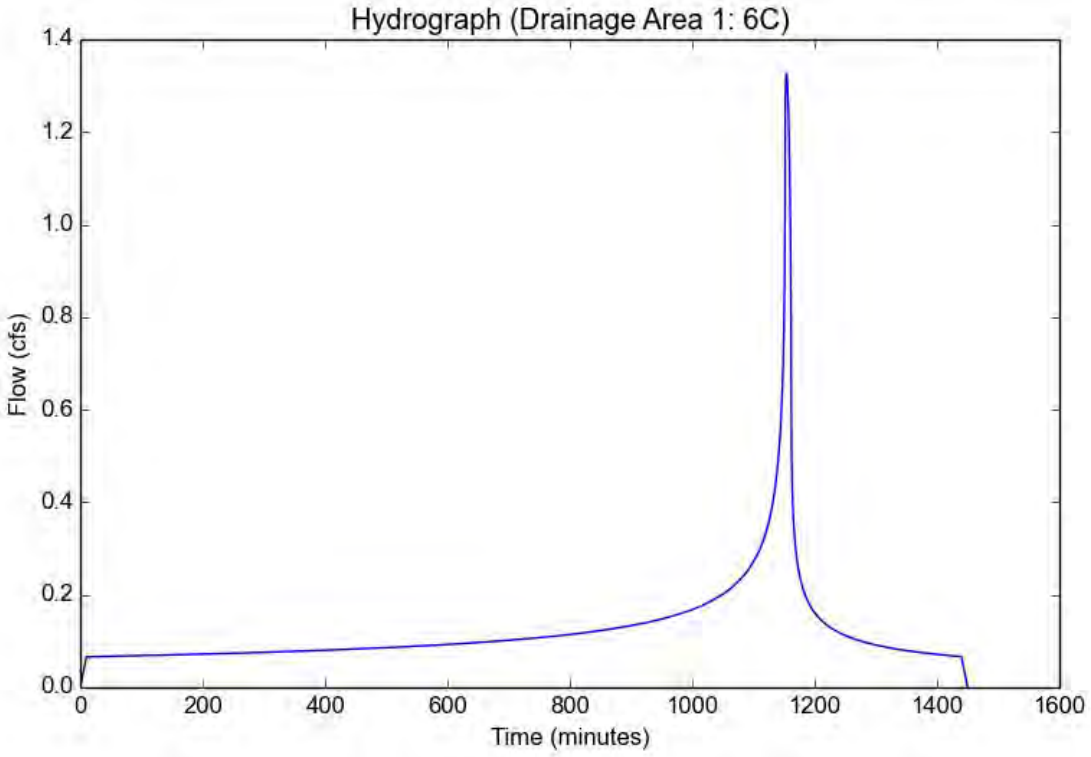
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	6C
Area (ac)	1.4
Flow Path Length (ft)	370.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	1.1199
Undeveloped Runoff Coefficient (Cu)	0.3572
Developed Runoff Coefficient (Cd)	0.8457
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	1.326
Burned Peak Flow Rate (cfs)	1.326
24-Hr Clear Runoff Volume (ac-ft)	0.2471
24-Hr Clear Runoff Volume (cu-ft)	10764.6333



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

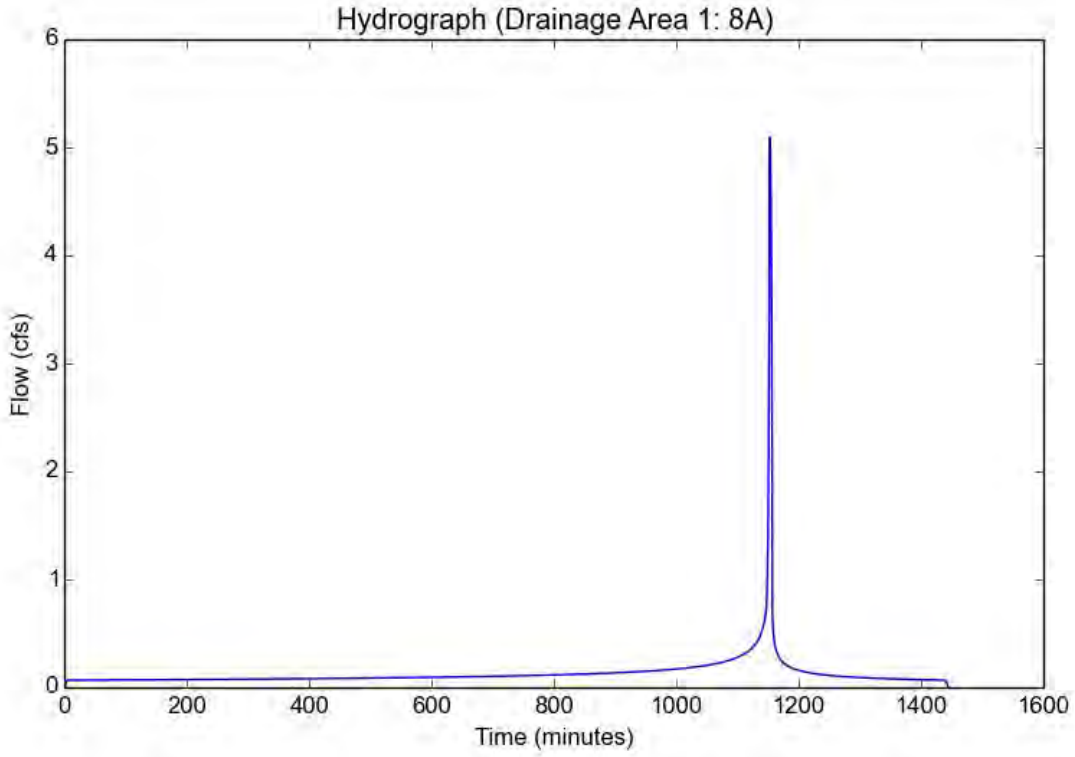
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	8A
Area (ac)	6.4
Flow Path Length (ft)	5.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.1
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	1.5512
Undeveloped Runoff Coefficient (Cu)	0.4699
Developed Runoff Coefficient (Cd)	0.5129
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.092
Burned Peak Flow Rate (cfs)	5.092
24-Hr Clear Runoff Volume (ac-ft)	0.2697
24-Hr Clear Runoff Volume (cu-ft)	11747.9288



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50-YEAR

Peak Flow Hydrologic Analysis

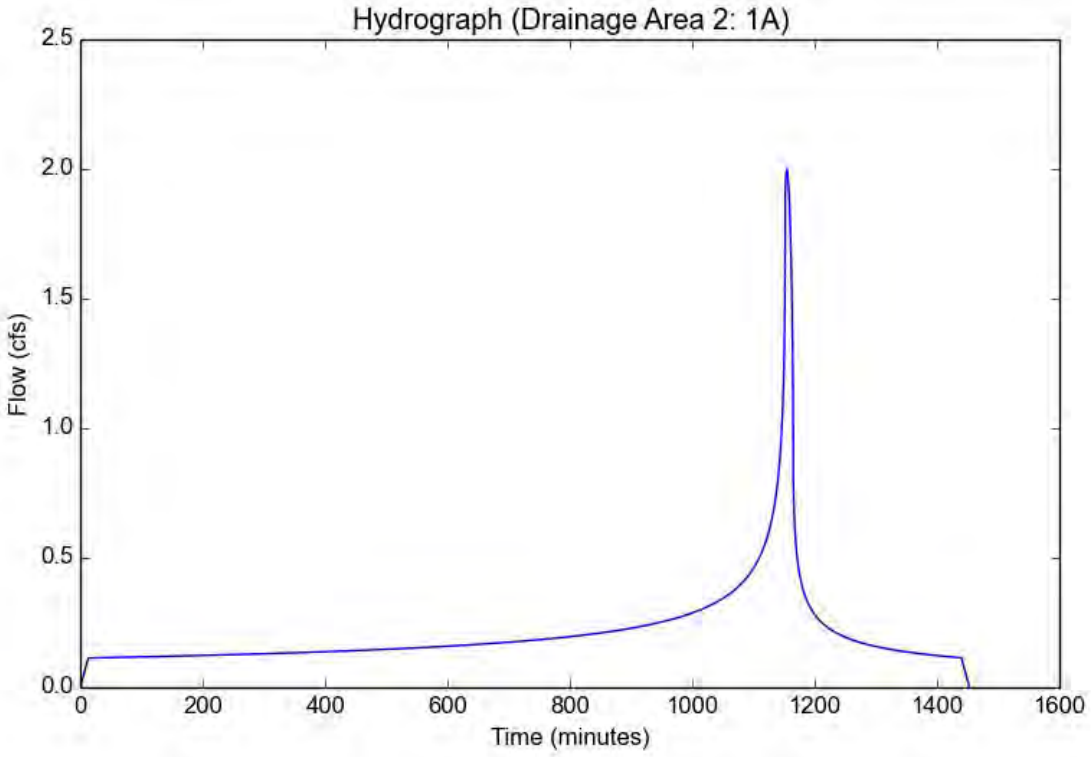
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	1A
Area (ac)	2.4
Flow Path Length (ft)	490.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.99
Undeveloped Runoff Coefficient (Cu)	0.3179
Developed Runoff Coefficient (Cd)	0.8418
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	2.0001
Burned Peak Flow Rate (cfs)	2.0001
24-Hr Clear Runoff Volume (ac-ft)	0.4235
24-Hr Clear Runoff Volume (cu-ft)	18448.4188



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RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

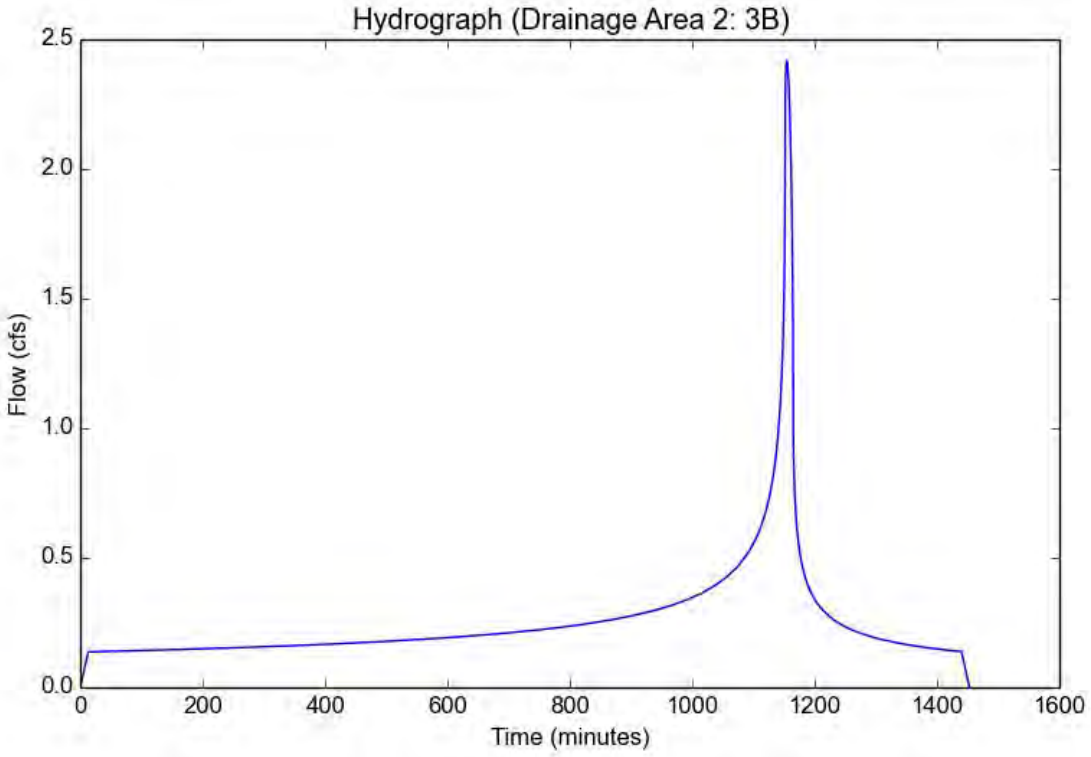
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	3B
Area (ac)	2.9
Flow Path Length (ft)	490.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.99
Undeveloped Runoff Coefficient (Cu)	0.3179
Developed Runoff Coefficient (Cd)	0.8418
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	2.4168
Burned Peak Flow Rate (cfs)	2.4168
24-Hr Clear Runoff Volume (ac-ft)	0.5118
24-Hr Clear Runoff Volume (cu-ft)	22291.8394



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50-YEAR

Peak Flow Hydrologic Analysis

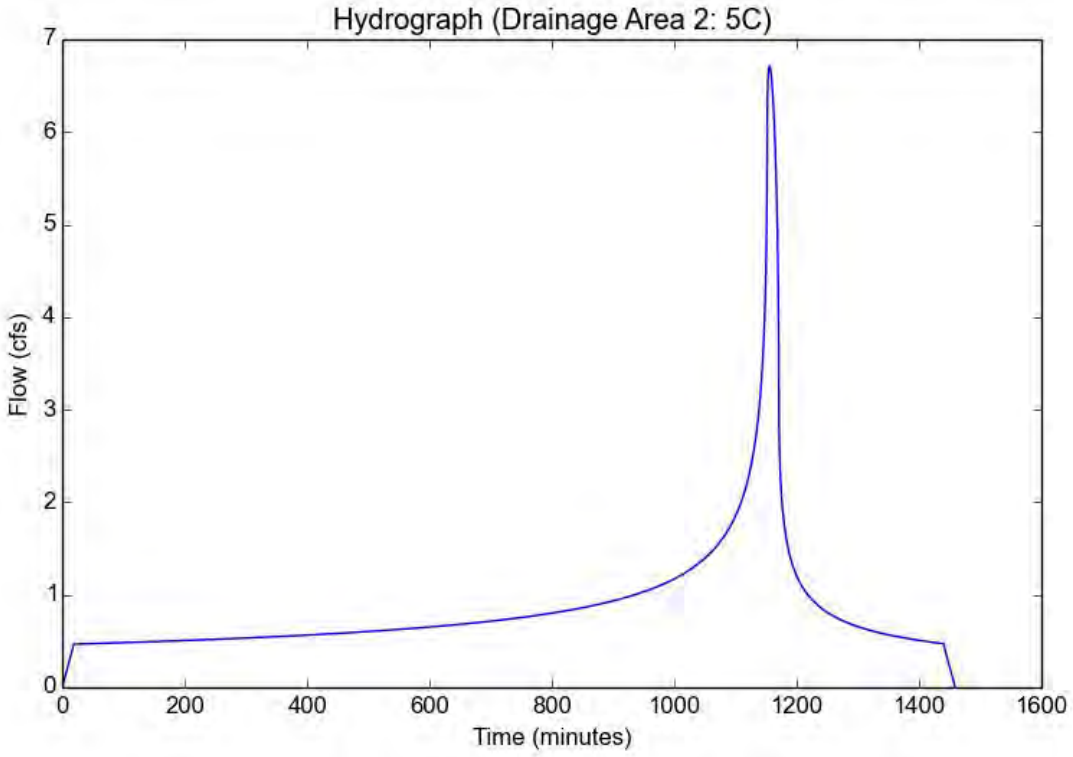
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	5C
Area (ac)	9.0
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.8283
Undeveloped Runoff Coefficient (Cu)	0.2143
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	6.7091
Burned Peak Flow Rate (cfs)	6.7091
24-Hr Clear Runoff Volume (ac-ft)	1.7405
24-Hr Clear Runoff Volume (cu-ft)	75816.3467



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50-YEAR

Peak Flow Hydrologic Analysis

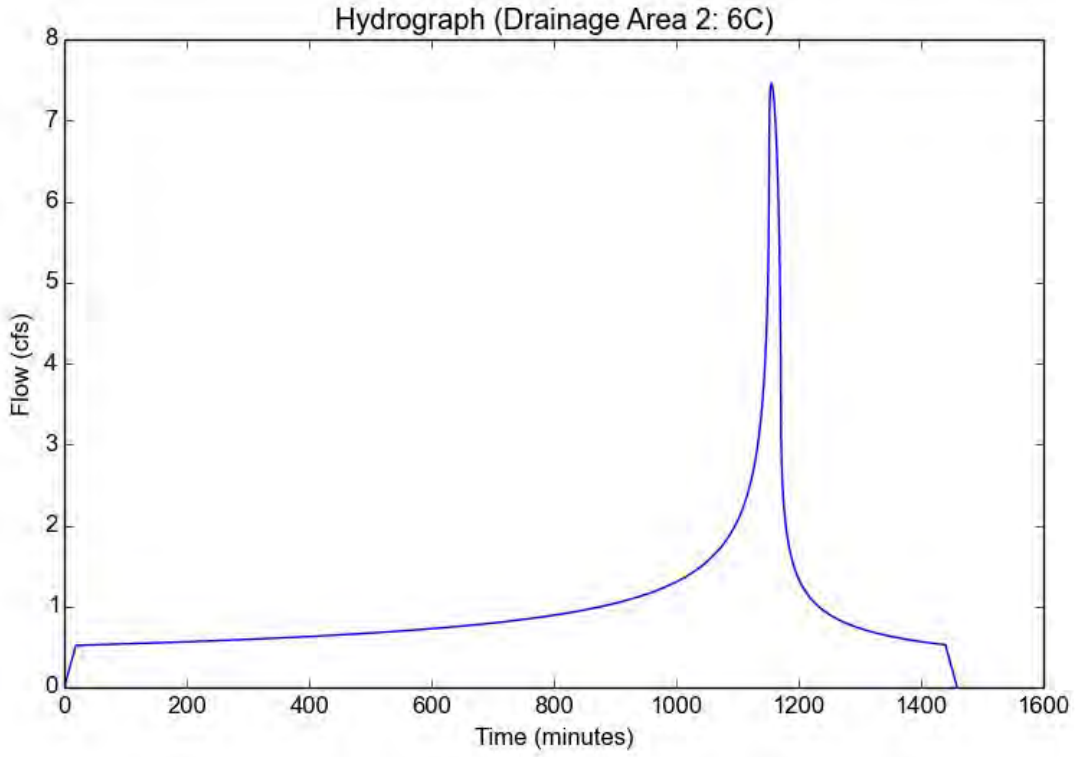
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	6C
Area (ac)	10.0
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.8283
Undeveloped Runoff Coefficient (Cu)	0.2143
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	7.4545
Burned Peak Flow Rate (cfs)	7.4545
24-Hr Clear Runoff Volume (ac-ft)	1.9339
24-Hr Clear Runoff Volume (cu-ft)	84240.3852



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

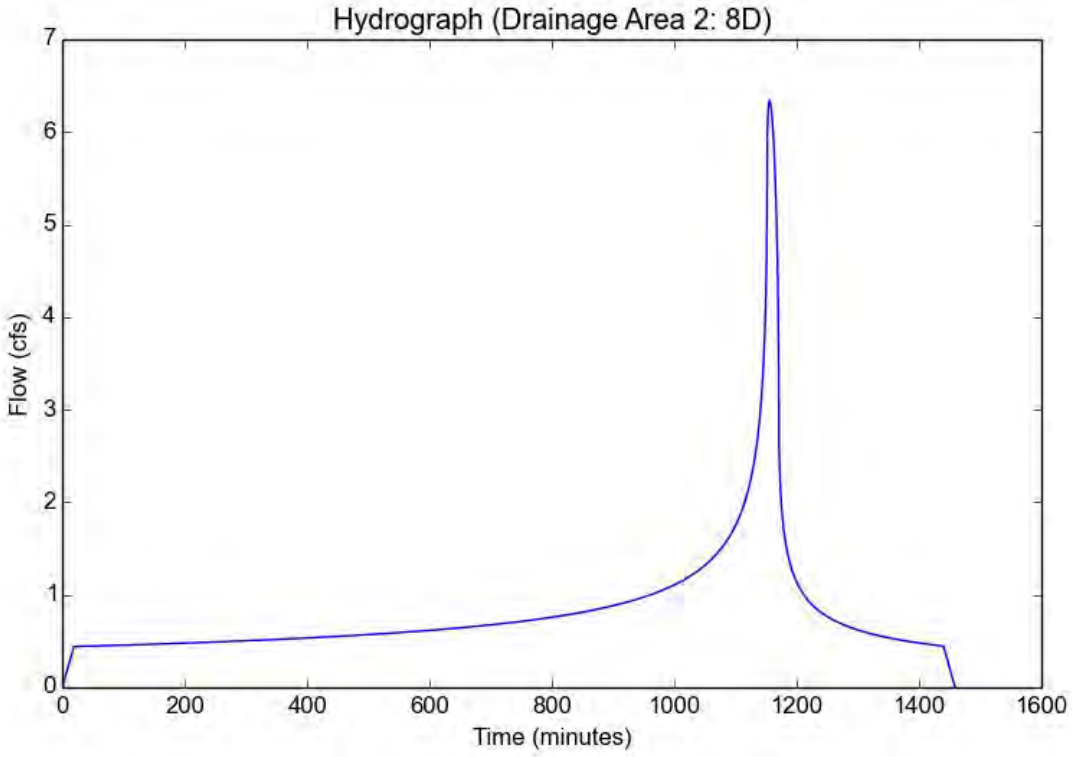
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	8D
Area (ac)	8.5
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.8283
Undeveloped Runoff Coefficient (Cu)	0.2143
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	6.3364
Burned Peak Flow Rate (cfs)	6.3364
24-Hr Clear Runoff Volume (ac-ft)	1.6438
24-Hr Clear Runoff Volume (cu-ft)	71604.3274



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

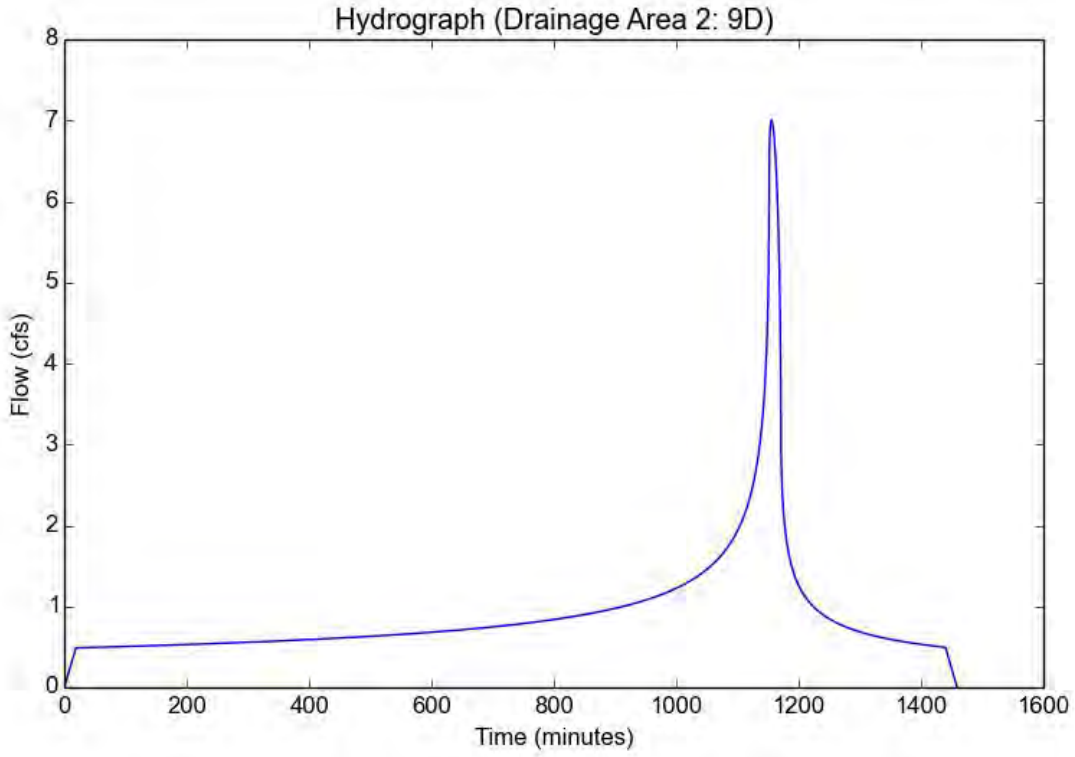
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	9D
Area (ac)	9.4
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.8283
Undeveloped Runoff Coefficient (Cu)	0.2143
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	7.0073
Burned Peak Flow Rate (cfs)	7.0073
24-Hr Clear Runoff Volume (ac-ft)	1.8179
24-Hr Clear Runoff Volume (cu-ft)	79185.9621



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

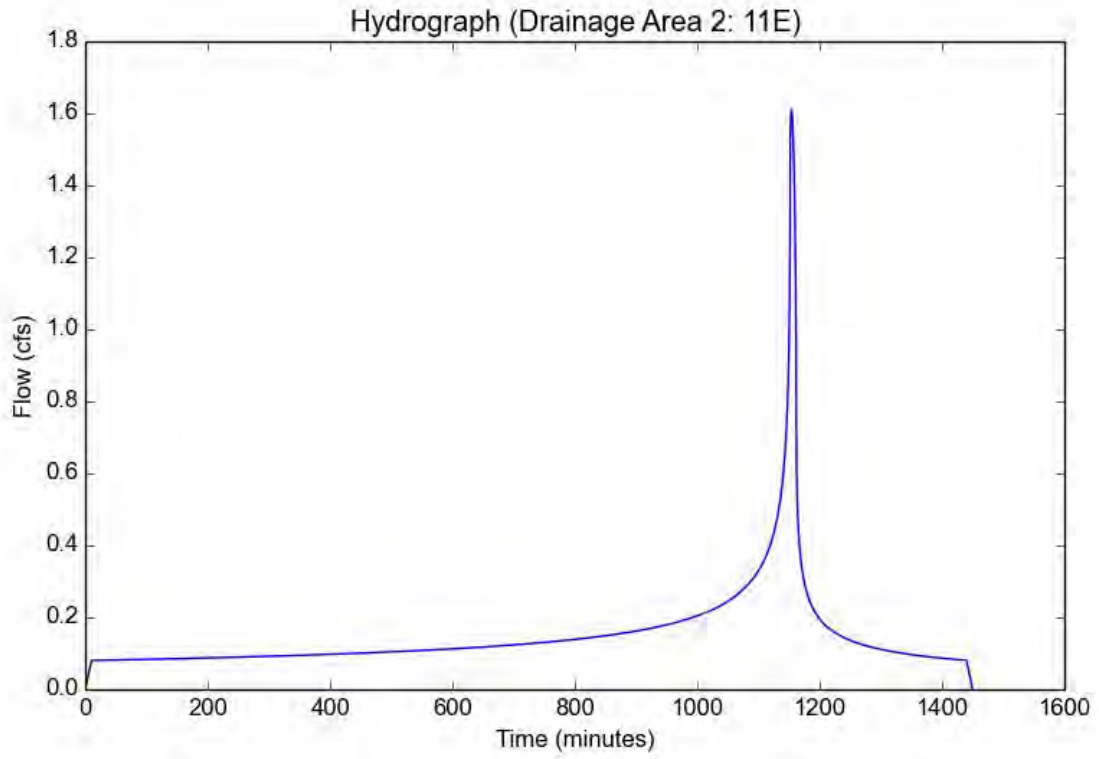
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	11E
Area (ac)	1.7
Flow Path Length (ft)	370.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	1.1199
Undeveloped Runoff Coefficient (Cu)	0.3572
Developed Runoff Coefficient (Cd)	0.8457
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	1.6102
Burned Peak Flow Rate (cfs)	1.6102
24-Hr Clear Runoff Volume (ac-ft)	0.3001
24-Hr Clear Runoff Volume (cu-ft)	13071.3404



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

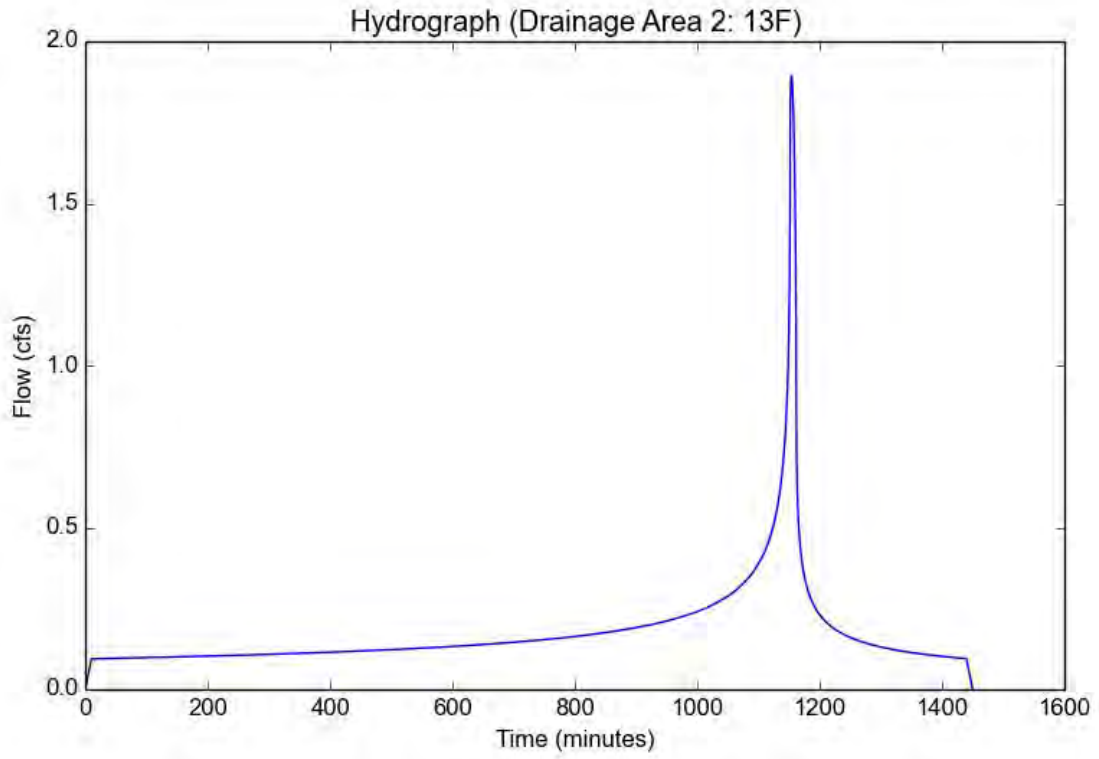
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	13F
Area (ac)	2.0
Flow Path Length (ft)	370.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	1.1199
Undeveloped Runoff Coefficient (Cu)	0.3572
Developed Runoff Coefficient (Cd)	0.8457
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	1.8943
Burned Peak Flow Rate (cfs)	1.8943
24-Hr Clear Runoff Volume (ac-ft)	0.353
24-Hr Clear Runoff Volume (cu-ft)	15378.0476



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

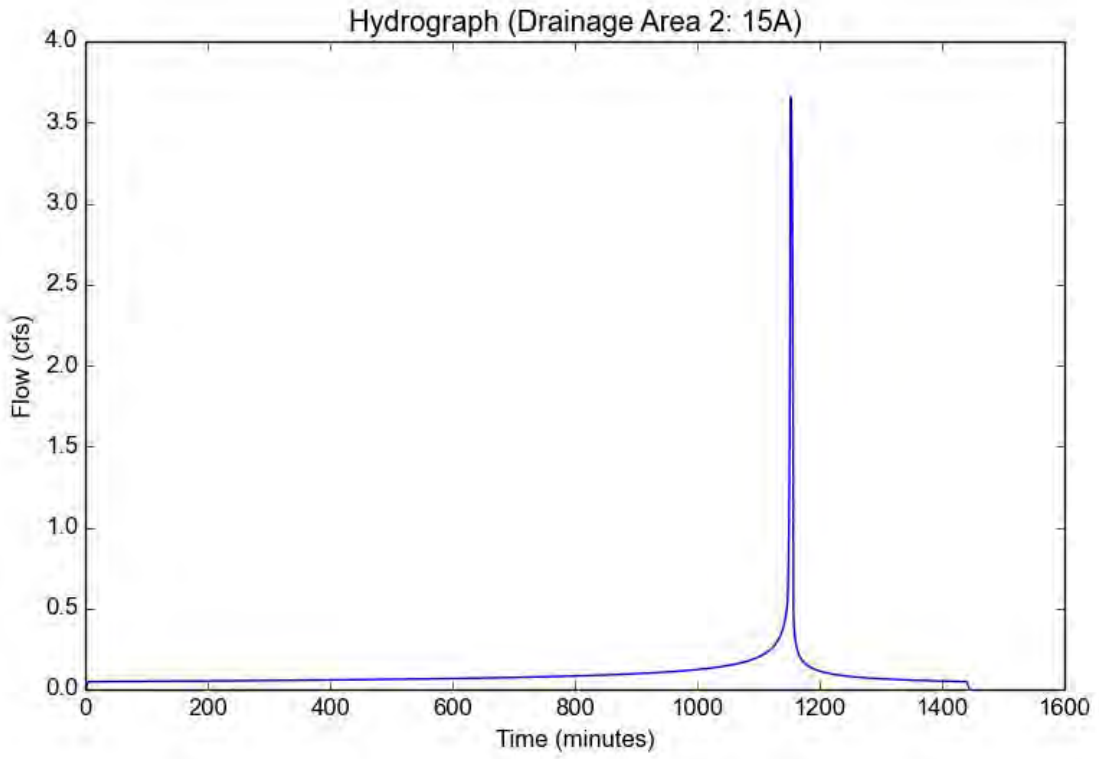
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	15A
Area (ac)	4.6
Flow Path Length (ft)	5.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.1
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	1.5512
Undeveloped Runoff Coefficient (Cu)	0.4699
Developed Runoff Coefficient (Cd)	0.5129
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.6599
Burned Peak Flow Rate (cfs)	3.6599
24-Hr Clear Runoff Volume (ac-ft)	0.1938
24-Hr Clear Runoff Volume (cu-ft)	8443.8238



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

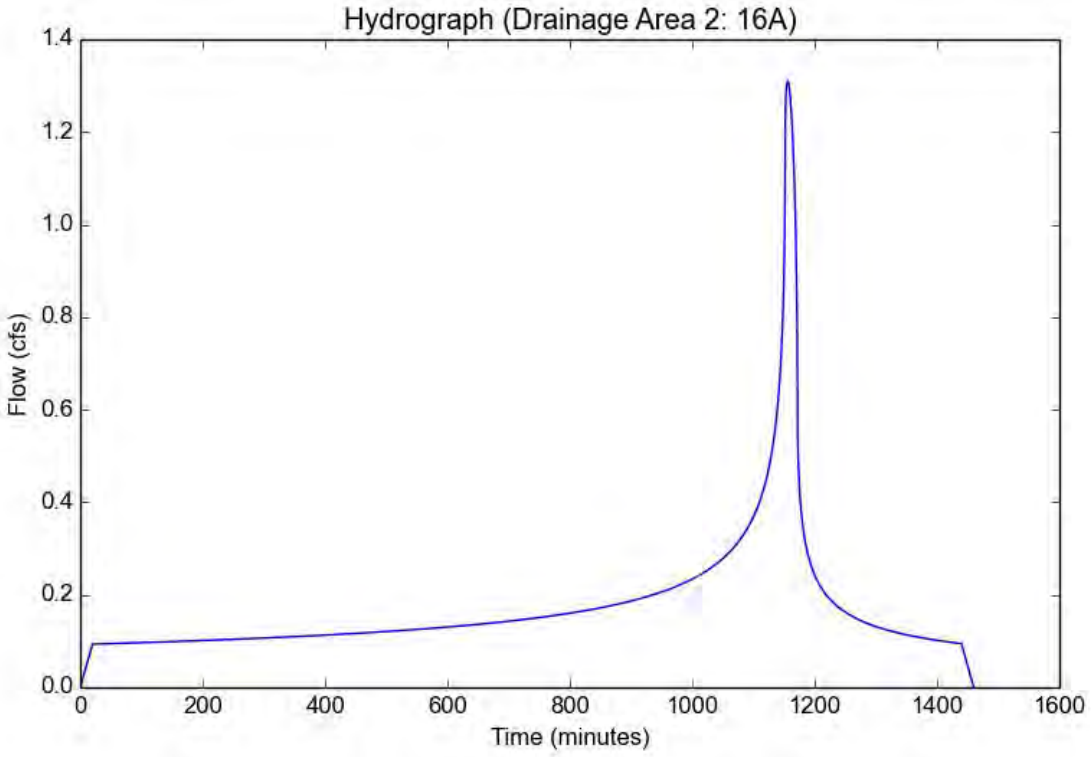
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	16A
Area (ac)	1.8
Flow Path Length (ft)	930.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.8086
Undeveloped Runoff Coefficient (Cu)	0.2016
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	1.3099
Burned Peak Flow Rate (cfs)	1.3099
24-Hr Clear Runoff Volume (ac-ft)	0.3481
24-Hr Clear Runoff Volume (cu-ft)	15163.2769



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

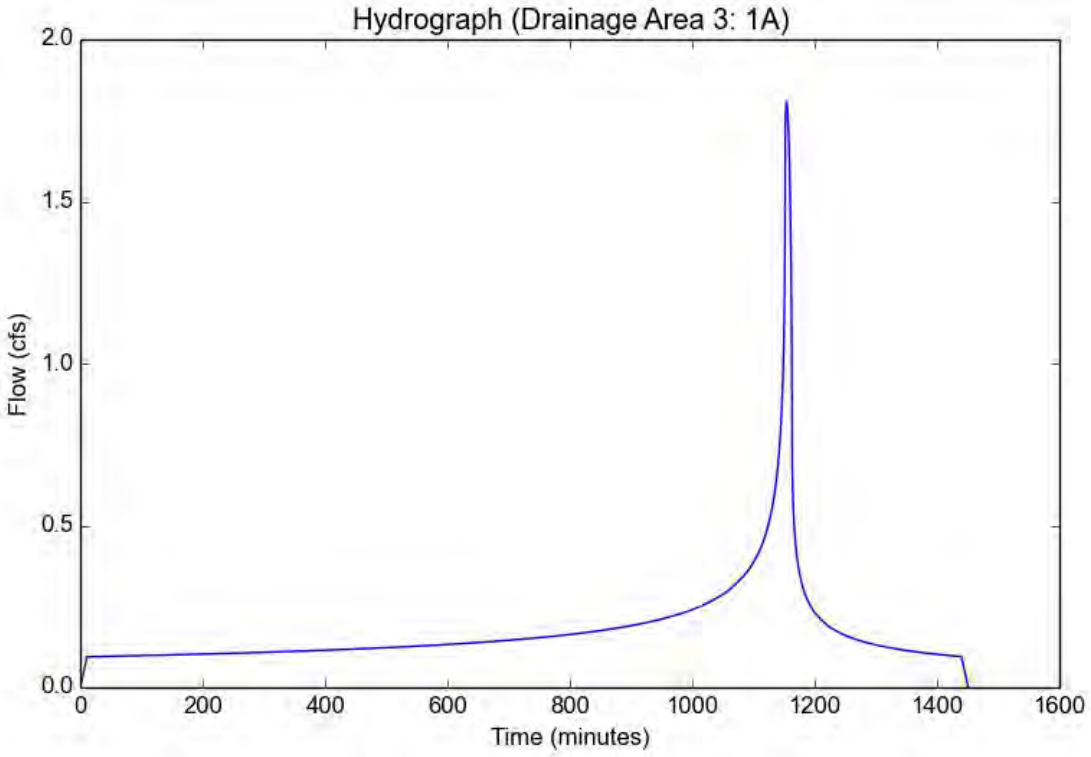
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	1A
Area (ac)	2.0
Flow Path Length (ft)	390.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	1.0709
Undeveloped Runoff Coefficient (Cu)	0.3437
Developed Runoff Coefficient (Cd)	0.8444
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	1.8084
Burned Peak Flow Rate (cfs)	1.8084
24-Hr Clear Runoff Volume (ac-ft)	0.353
24-Hr Clear Runoff Volume (cu-ft)	15376.8427



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

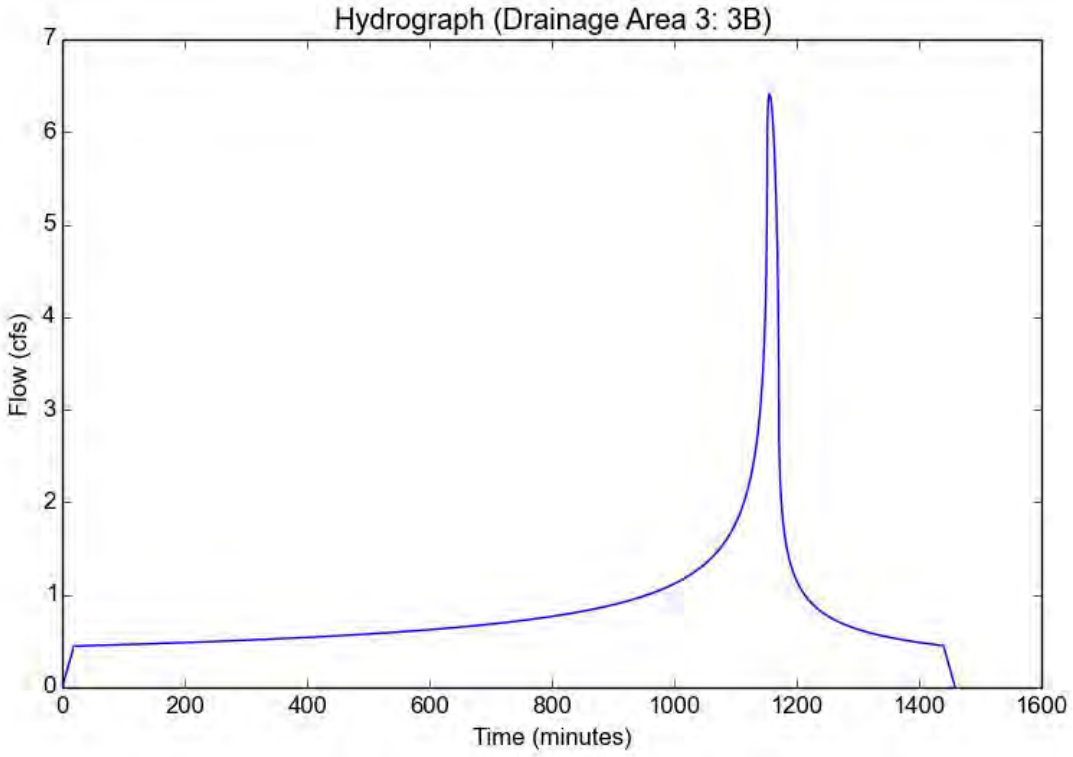
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	3B
Area (ac)	8.6
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.8283
Undeveloped Runoff Coefficient (Cu)	0.2143
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	6.4109
Burned Peak Flow Rate (cfs)	6.4109
24-Hr Clear Runoff Volume (ac-ft)	1.6631
24-Hr Clear Runoff Volume (cu-ft)	72446.7312



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

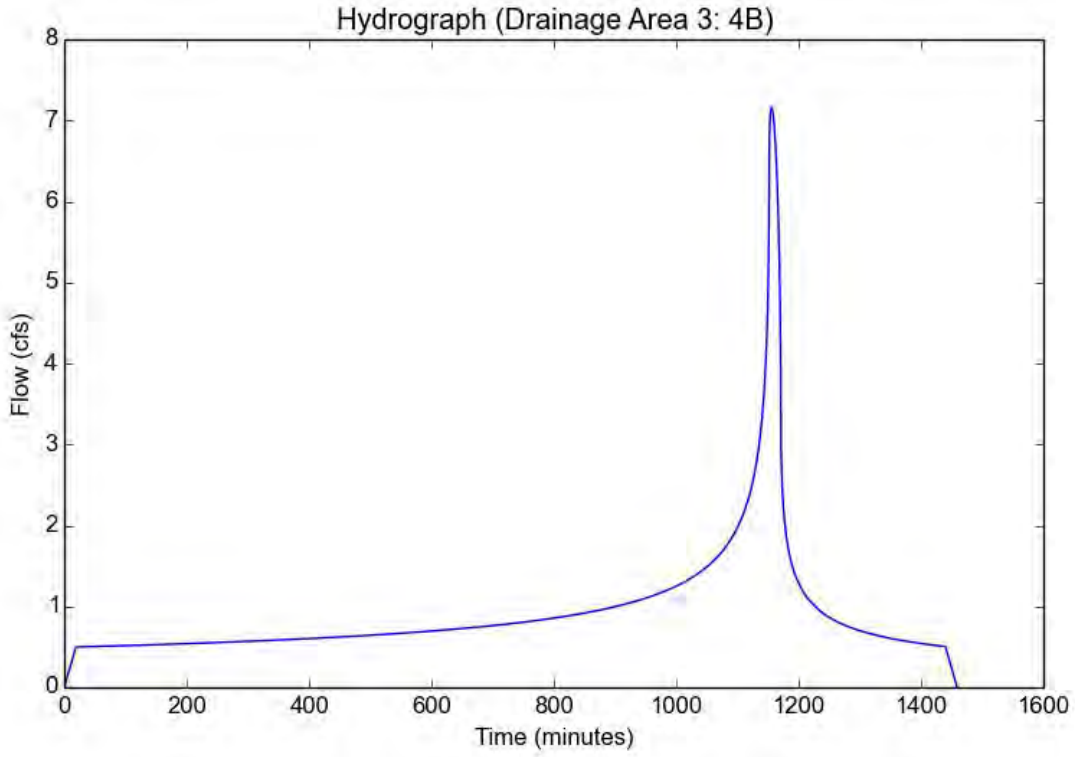
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	4B
Area (ac)	9.6
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.8283
Undeveloped Runoff Coefficient (Cu)	0.2143
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	7.1564
Burned Peak Flow Rate (cfs)	7.1564
24-Hr Clear Runoff Volume (ac-ft)	1.8565
24-Hr Clear Runoff Volume (cu-ft)	80870.7698



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

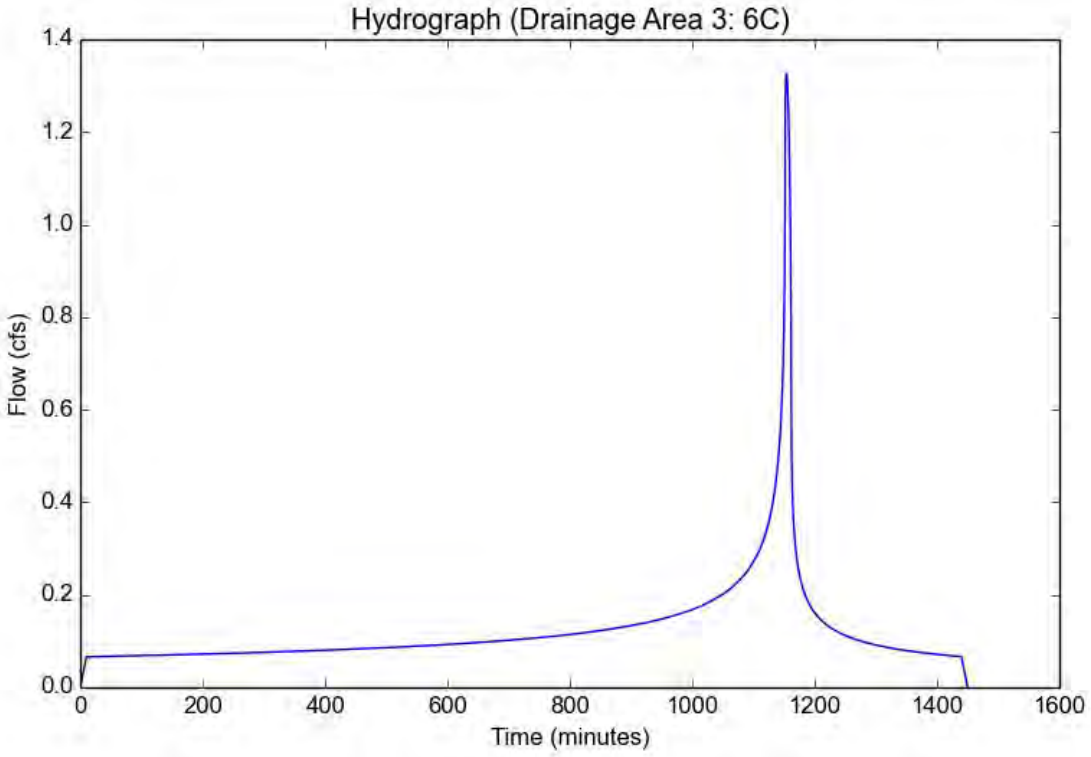
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	6C
Area (ac)	1.4
Flow Path Length (ft)	370.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	1.1199
Undeveloped Runoff Coefficient (Cu)	0.3572
Developed Runoff Coefficient (Cd)	0.8457
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	1.326
Burned Peak Flow Rate (cfs)	1.326
24-Hr Clear Runoff Volume (ac-ft)	0.2471
24-Hr Clear Runoff Volume (cu-ft)	10764.6333



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

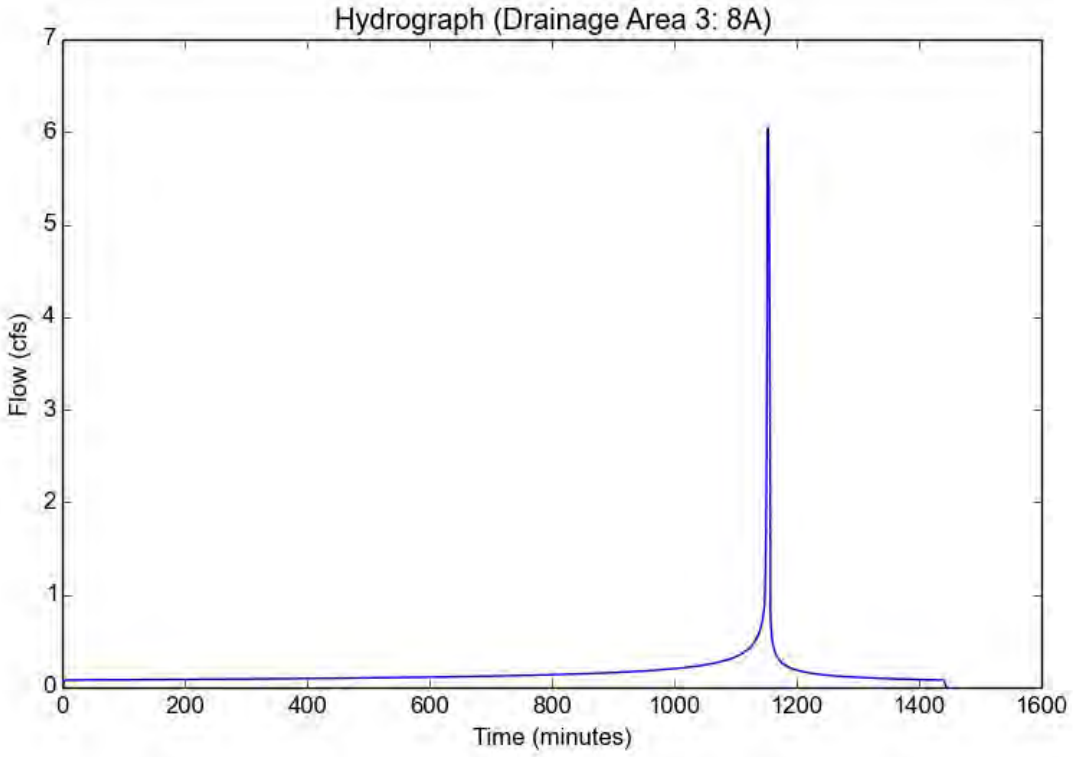
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	8A
Area (ac)	7.6
Flow Path Length (ft)	5.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	2.6
Percent Impervious	0.1
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	1.5512
Undeveloped Runoff Coefficient (Cu)	0.4699
Developed Runoff Coefficient (Cd)	0.5129
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.0468
Burned Peak Flow Rate (cfs)	6.0468
24-Hr Clear Runoff Volume (ac-ft)	0.3203
24-Hr Clear Runoff Volume (cu-ft)	13950.6655



ESTU2023000671
RPPL2022013992

50-YEAR

Peak Flow Hydrologic Analysis

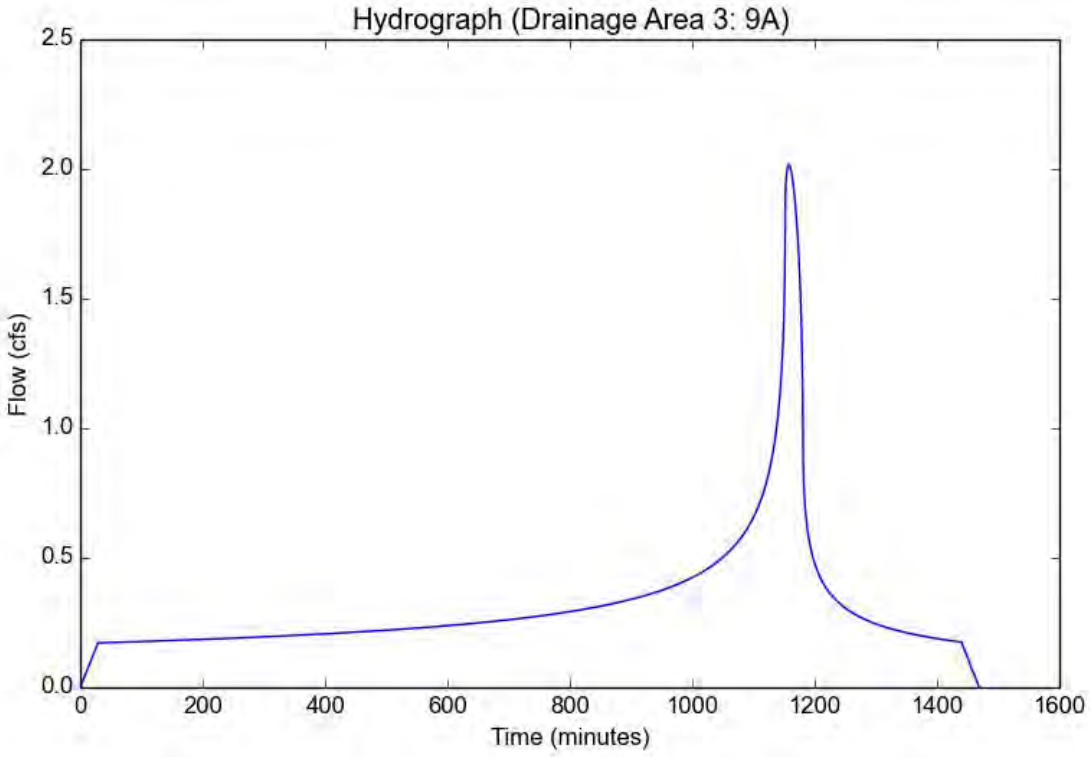
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	9A
Area (ac)	3.3
Flow Path Length (ft)	1600.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	2.6
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	2.6
Peak Intensity (in/hr)	0.679
Undeveloped Runoff Coefficient (Cu)	0.1186
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	29.0
Clear Peak Flow Rate (cfs)	2.0166
Burned Peak Flow Rate (cfs)	2.0166
24-Hr Clear Runoff Volume (ac-ft)	0.6382
24-Hr Clear Runoff Volume (cu-ft)	27799.4981



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

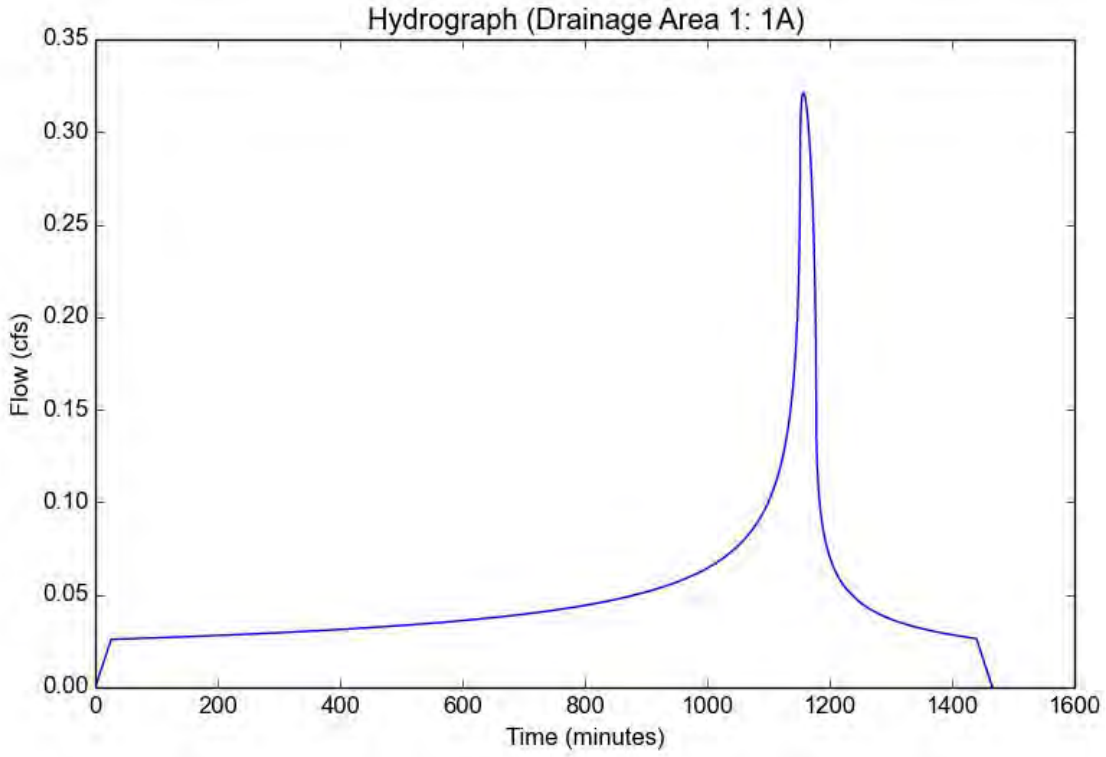
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	1A
Area (ac)	1.9
Flow Path Length (ft)	390.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2062
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	0.3212
Burned Peak Flow Rate (cfs)	0.3212
24-Hr Clear Runoff Volume (ac-ft)	0.0966
24-Hr Clear Runoff Volume (cu-ft)	4206.6362



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

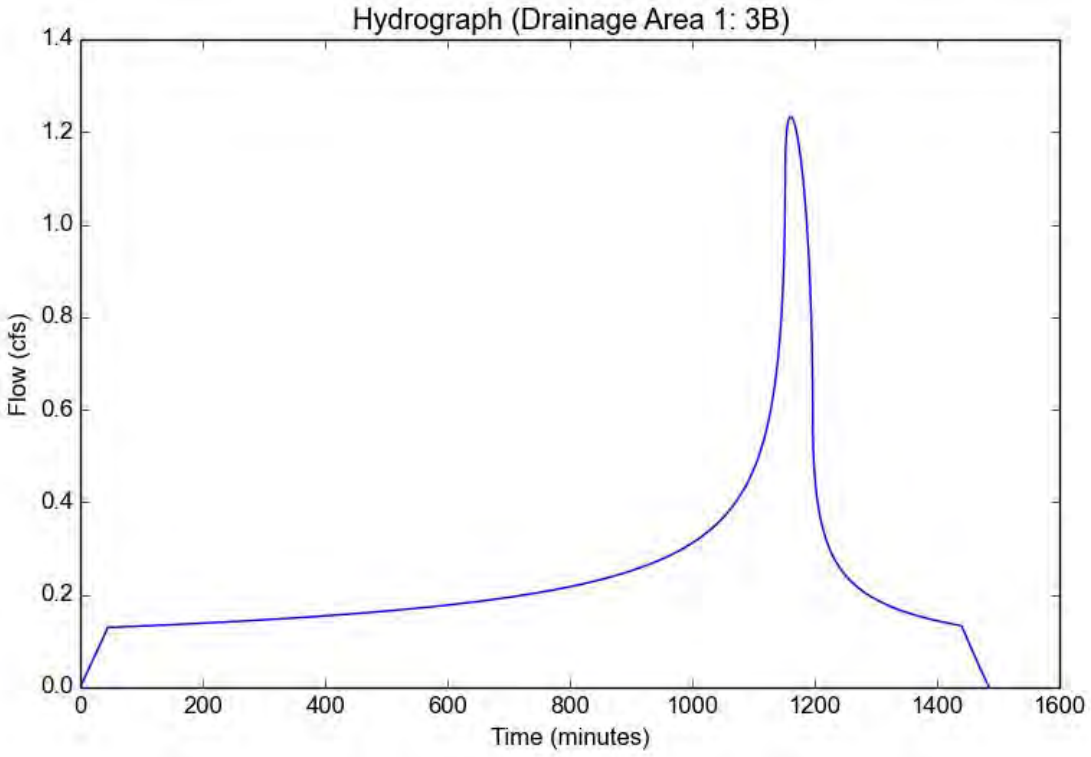
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	3B
Area (ac)	8.6
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1593
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	45.0
Clear Peak Flow Rate (cfs)	1.2331
Burned Peak Flow Rate (cfs)	1.2331
24-Hr Clear Runoff Volume (ac-ft)	0.4798
24-Hr Clear Runoff Volume (cu-ft)	20898.5452



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

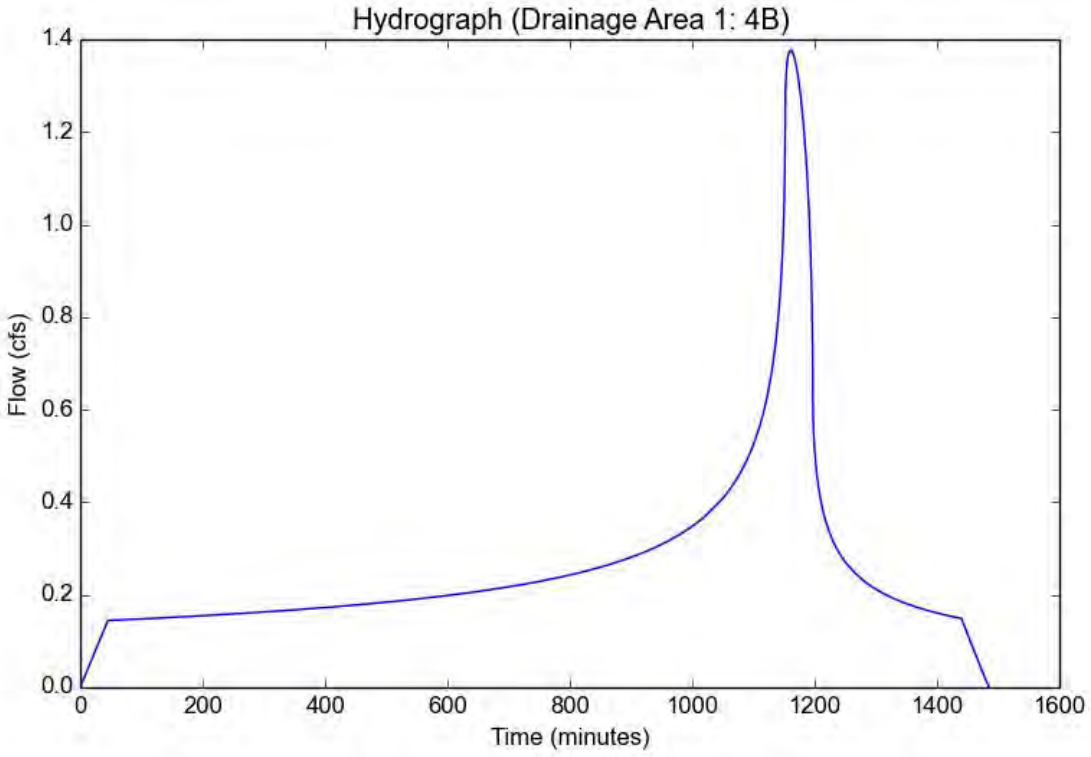
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	4B
Area (ac)	9.6
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1593
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	45.0
Clear Peak Flow Rate (cfs)	1.3765
Burned Peak Flow Rate (cfs)	1.3765
24-Hr Clear Runoff Volume (ac-ft)	0.5356
24-Hr Clear Runoff Volume (cu-ft)	23328.6086



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

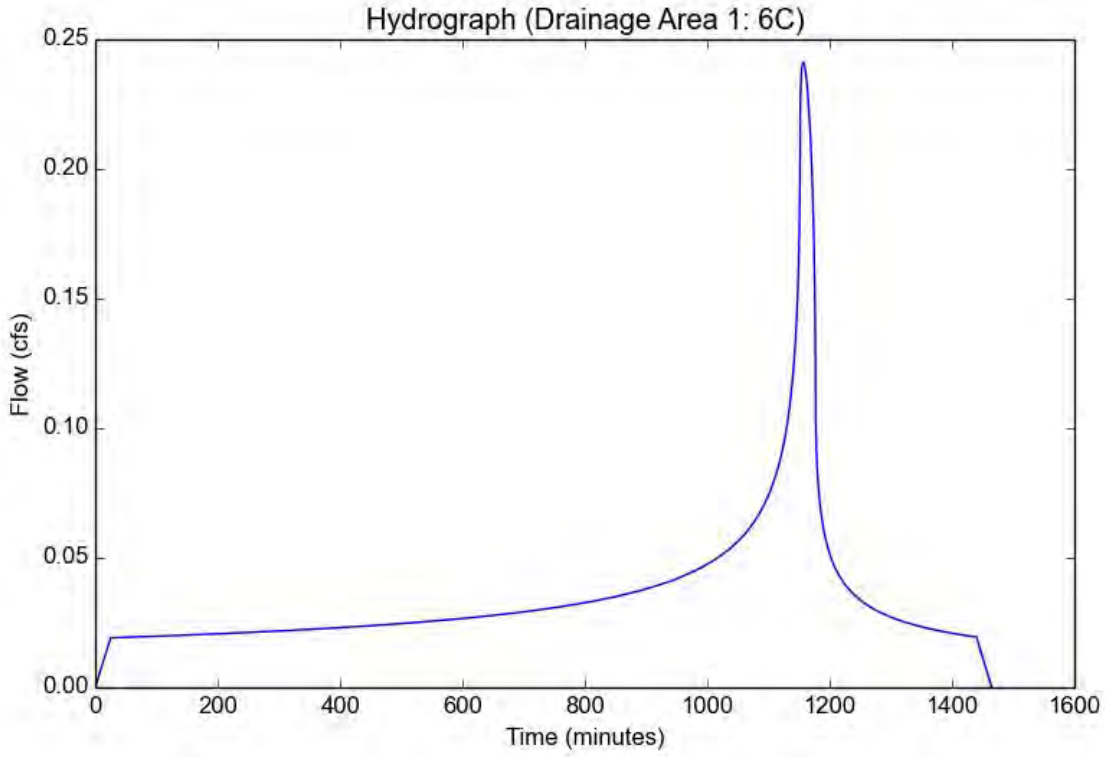
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	6C
Area (ac)	1.4
Flow Path Length (ft)	370.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.21
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	25.0
Clear Peak Flow Rate (cfs)	0.2411
Burned Peak Flow Rate (cfs)	0.2411
24-Hr Clear Runoff Volume (ac-ft)	0.0712
24-Hr Clear Runoff Volume (cu-ft)	3099.6246



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

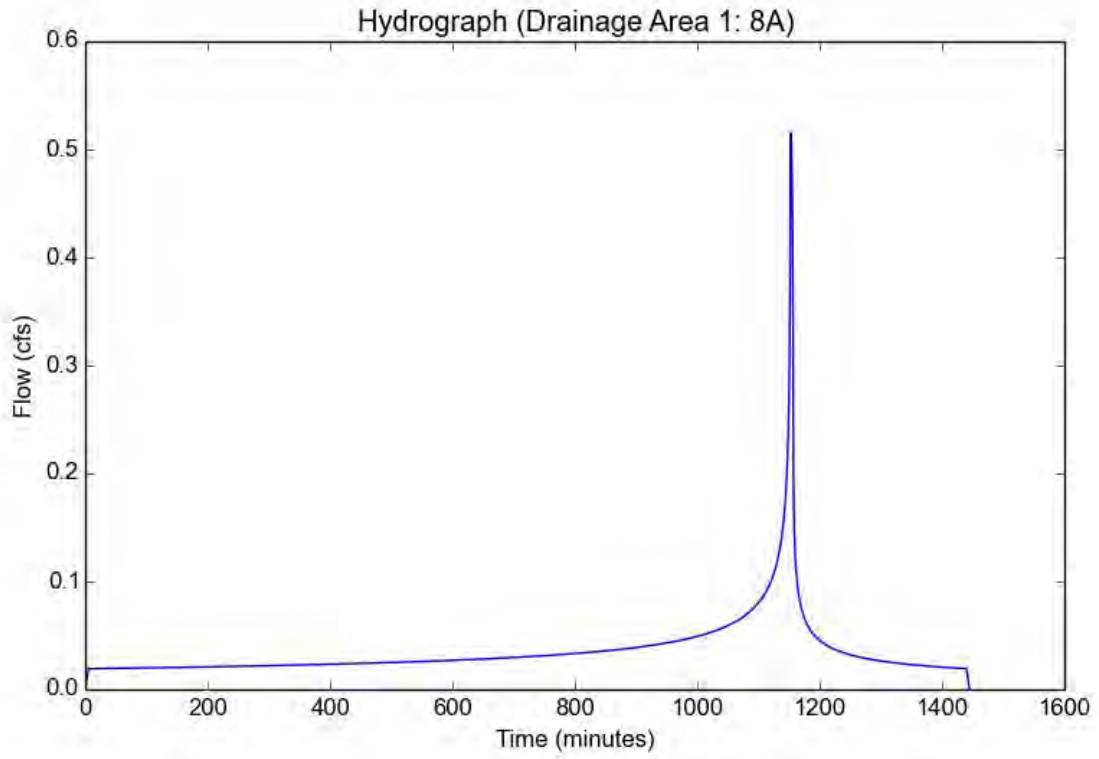
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 1
Subarea ID	8A
Area (ac)	6.4
Flow Path Length (ft)	5.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.1
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.4475
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.5155
Burned Peak Flow Rate (cfs)	0.5155
24-Hr Clear Runoff Volume (ac-ft)	0.0714
24-Hr Clear Runoff Volume (cu-ft)	3110.401



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

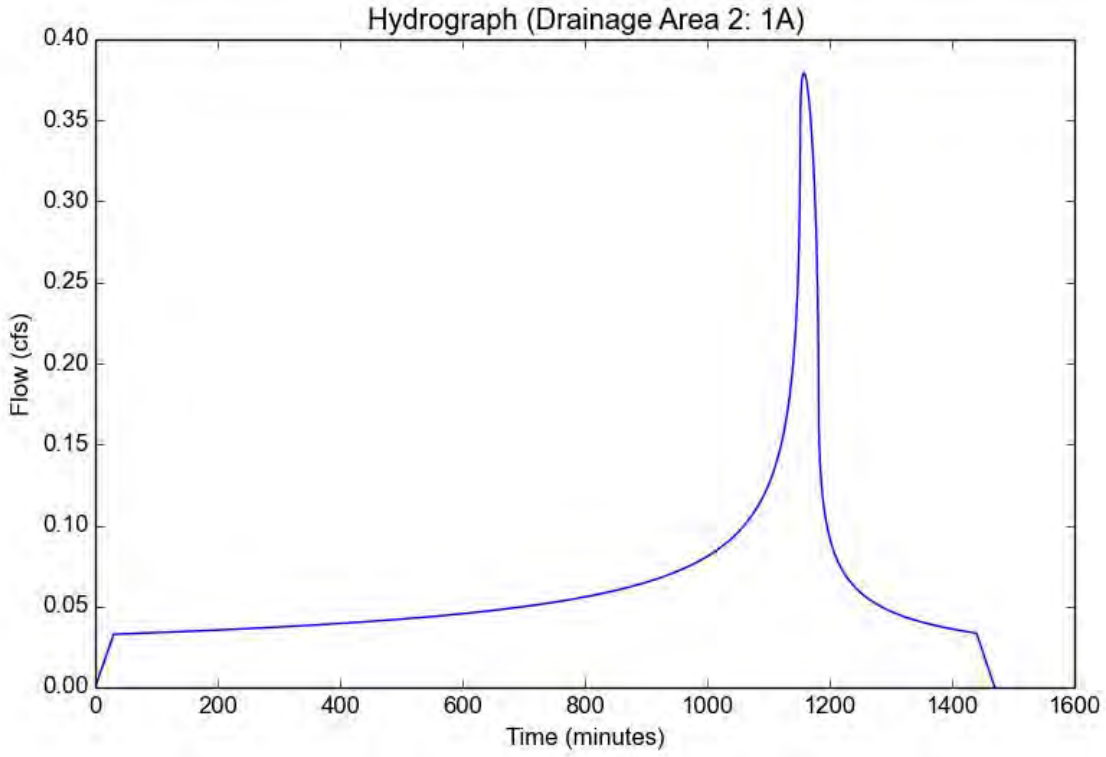
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	1A
Area (ac)	2.4
Flow Path Length (ft)	490.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1928
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.3794
Burned Peak Flow Rate (cfs)	0.3794
24-Hr Clear Runoff Volume (ac-ft)	0.122
24-Hr Clear Runoff Volume (cu-ft)	5313.661



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

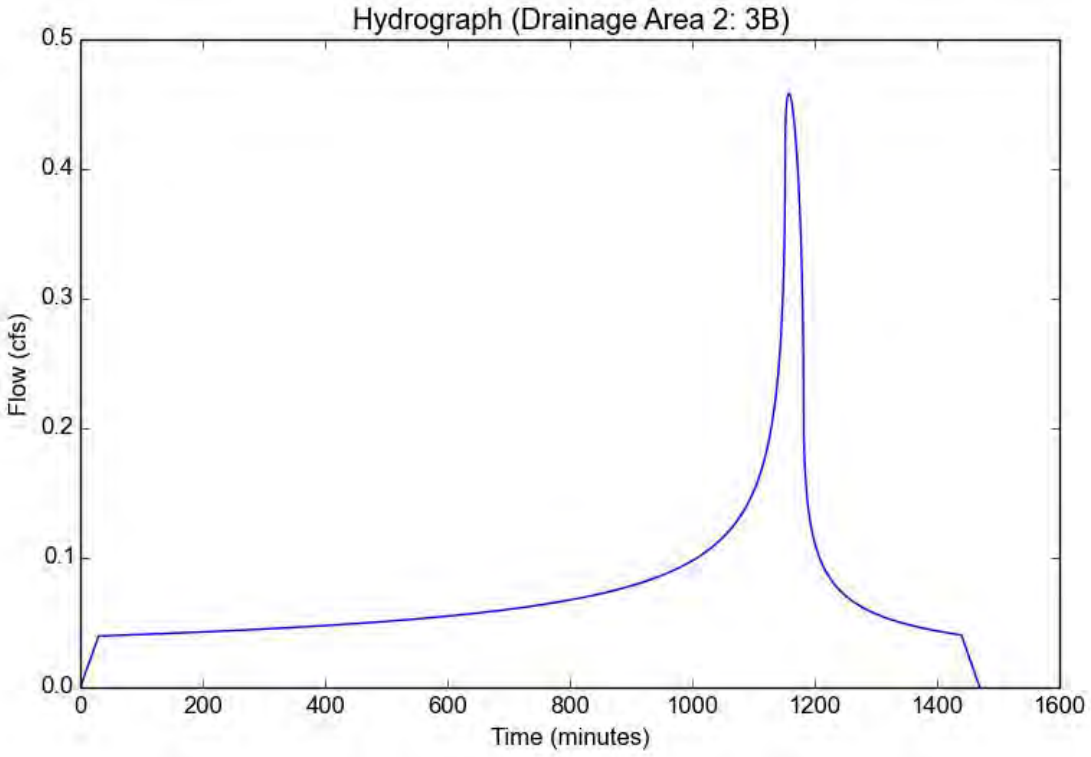
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	3B
Area (ac)	2.9
Flow Path Length (ft)	490.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1928
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.4584
Burned Peak Flow Rate (cfs)	0.4584
24-Hr Clear Runoff Volume (ac-ft)	0.1474
24-Hr Clear Runoff Volume (cu-ft)	6420.6737



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

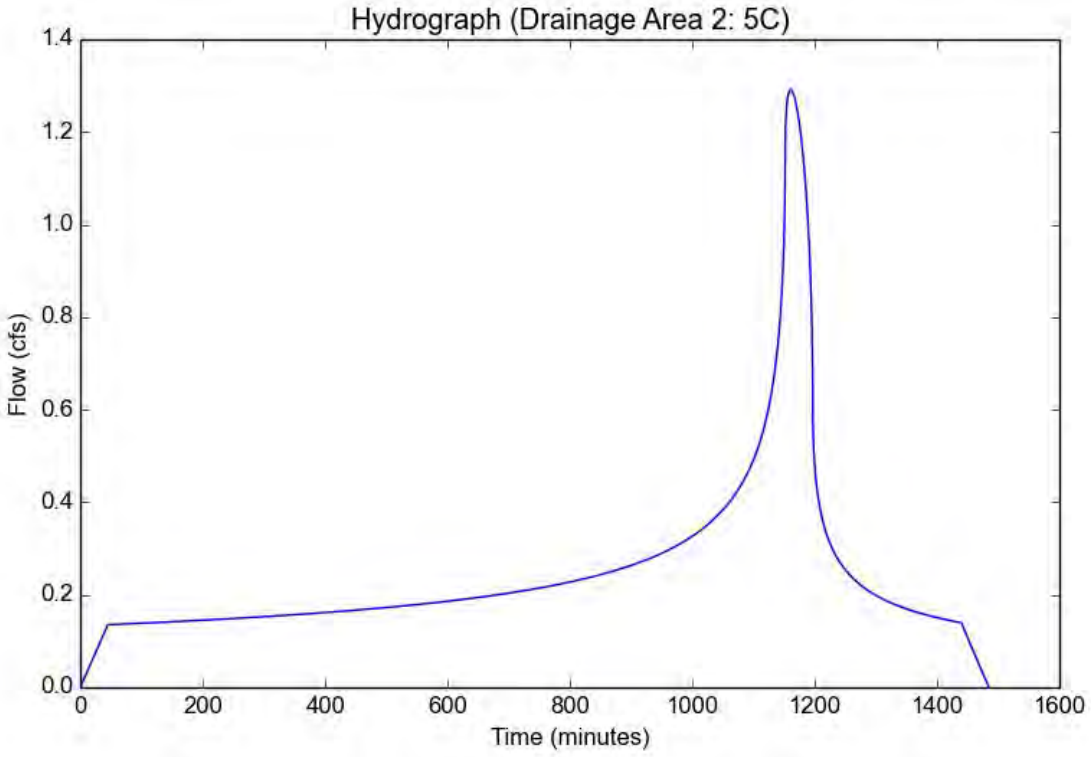
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	5C
Area (ac)	9.0
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1593
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	45.0
Clear Peak Flow Rate (cfs)	1.2905
Burned Peak Flow Rate (cfs)	1.2905
24-Hr Clear Runoff Volume (ac-ft)	0.5021
24-Hr Clear Runoff Volume (cu-ft)	21870.5706



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

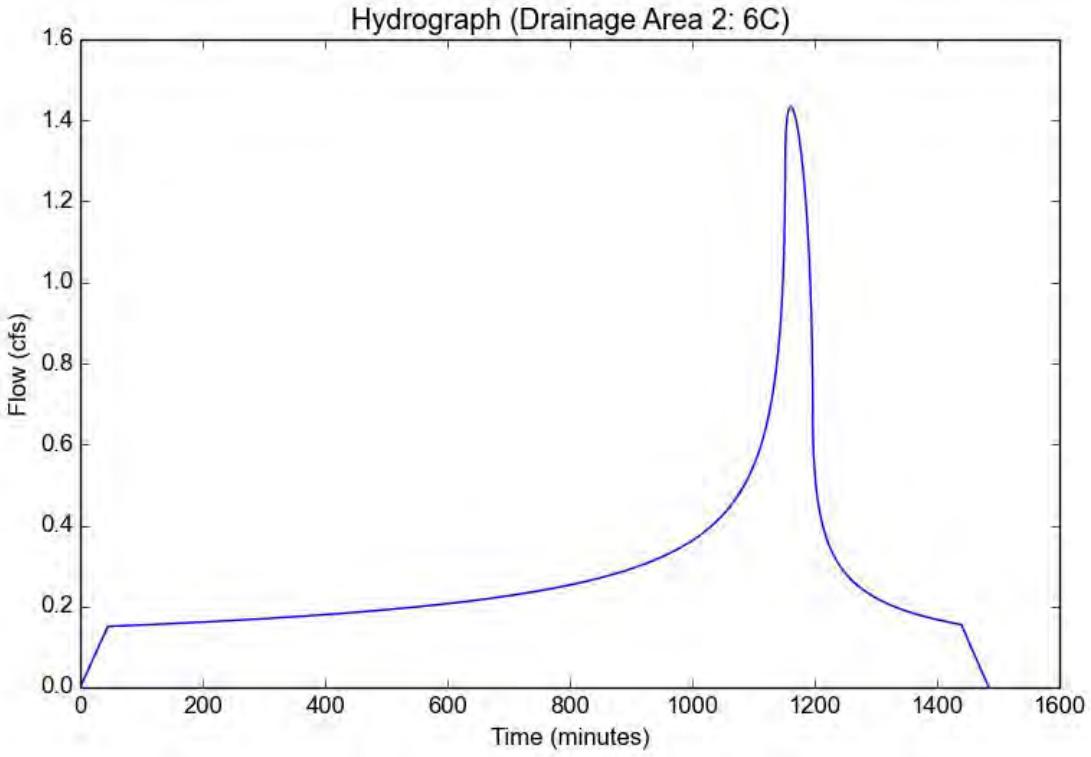
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	6C
Area (ac)	10.0
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1593
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	45.0
Clear Peak Flow Rate (cfs)	1.4339
Burned Peak Flow Rate (cfs)	1.4339
24-Hr Clear Runoff Volume (ac-ft)	0.5579
24-Hr Clear Runoff Volume (cu-ft)	24300.634



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

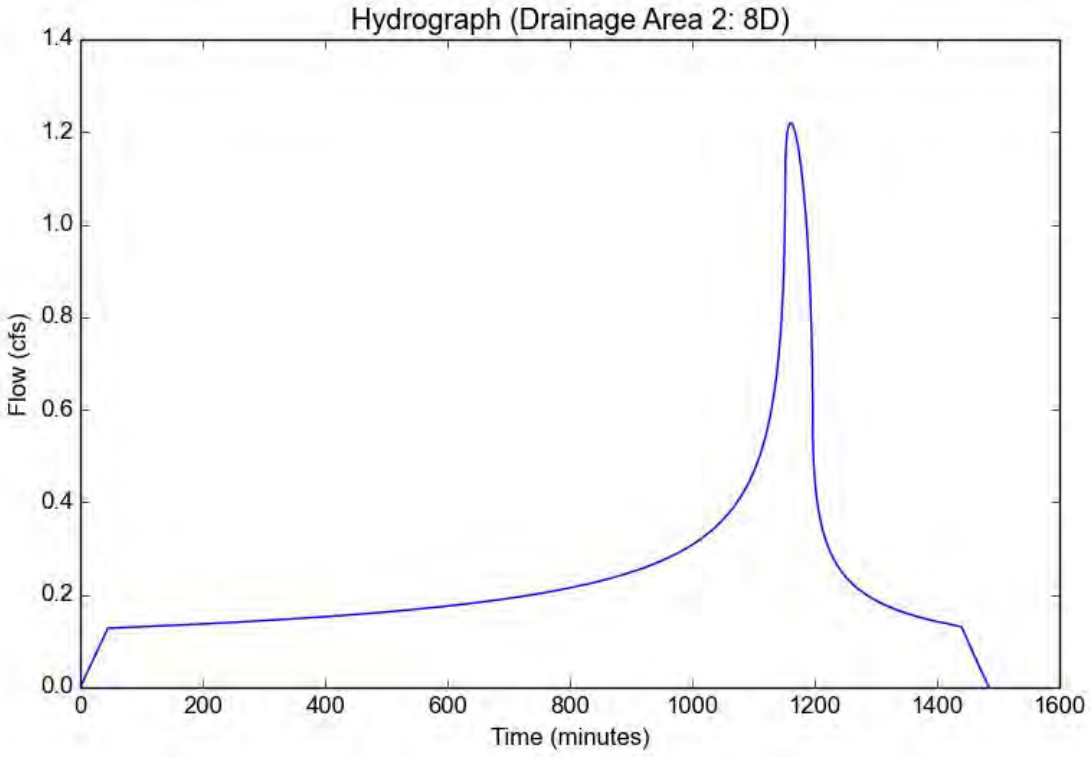
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	8D
Area (ac)	8.5
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1593
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	45.0
Clear Peak Flow Rate (cfs)	1.2188
Burned Peak Flow Rate (cfs)	1.2188
24-Hr Clear Runoff Volume (ac-ft)	0.4742
24-Hr Clear Runoff Volume (cu-ft)	20655.5389



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

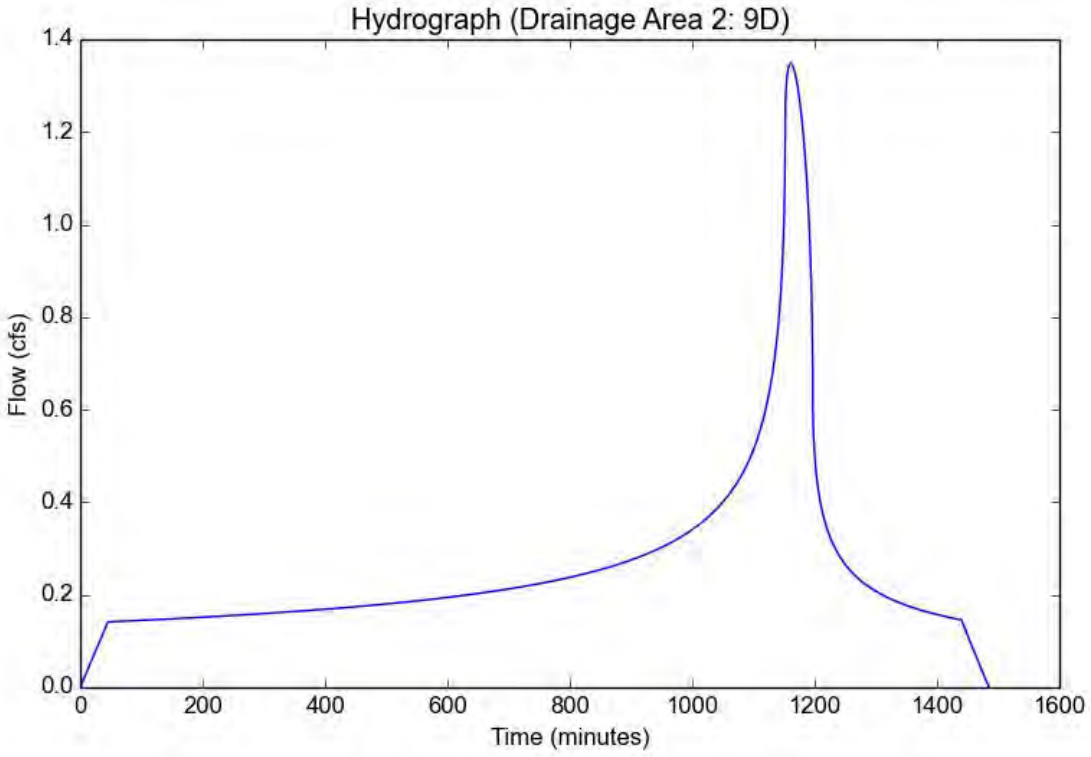
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	9D
Area (ac)	9.4
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1593
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	45.0
Clear Peak Flow Rate (cfs)	1.3478
Burned Peak Flow Rate (cfs)	1.3478
24-Hr Clear Runoff Volume (ac-ft)	0.5244
24-Hr Clear Runoff Volume (cu-ft)	22842.5959



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

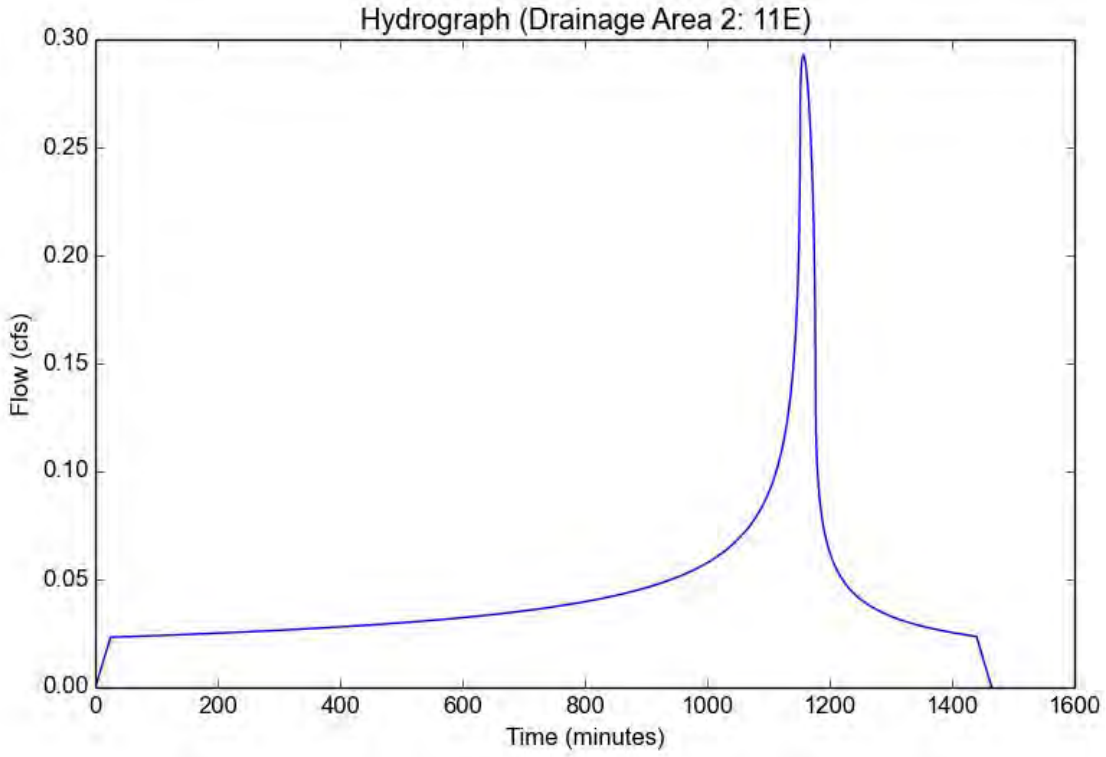
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	11E
Area (ac)	1.7
Flow Path Length (ft)	370.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.21
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	25.0
Clear Peak Flow Rate (cfs)	0.2928
Burned Peak Flow Rate (cfs)	0.2928
24-Hr Clear Runoff Volume (ac-ft)	0.0864
24-Hr Clear Runoff Volume (cu-ft)	3763.8299



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

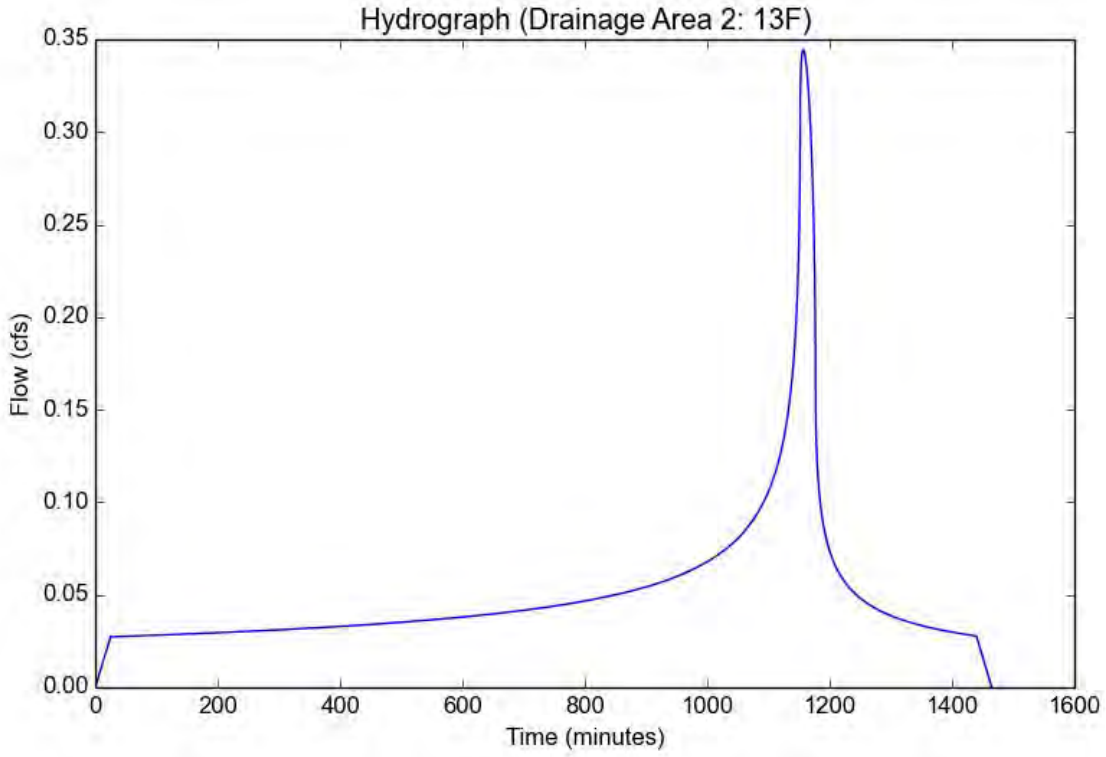
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	13F
Area (ac)	2.0
Flow Path Length (ft)	370.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.21
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	25.0
Clear Peak Flow Rate (cfs)	0.3444
Burned Peak Flow Rate (cfs)	0.3444
24-Hr Clear Runoff Volume (ac-ft)	0.1017
24-Hr Clear Runoff Volume (cu-ft)	4428.0352



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

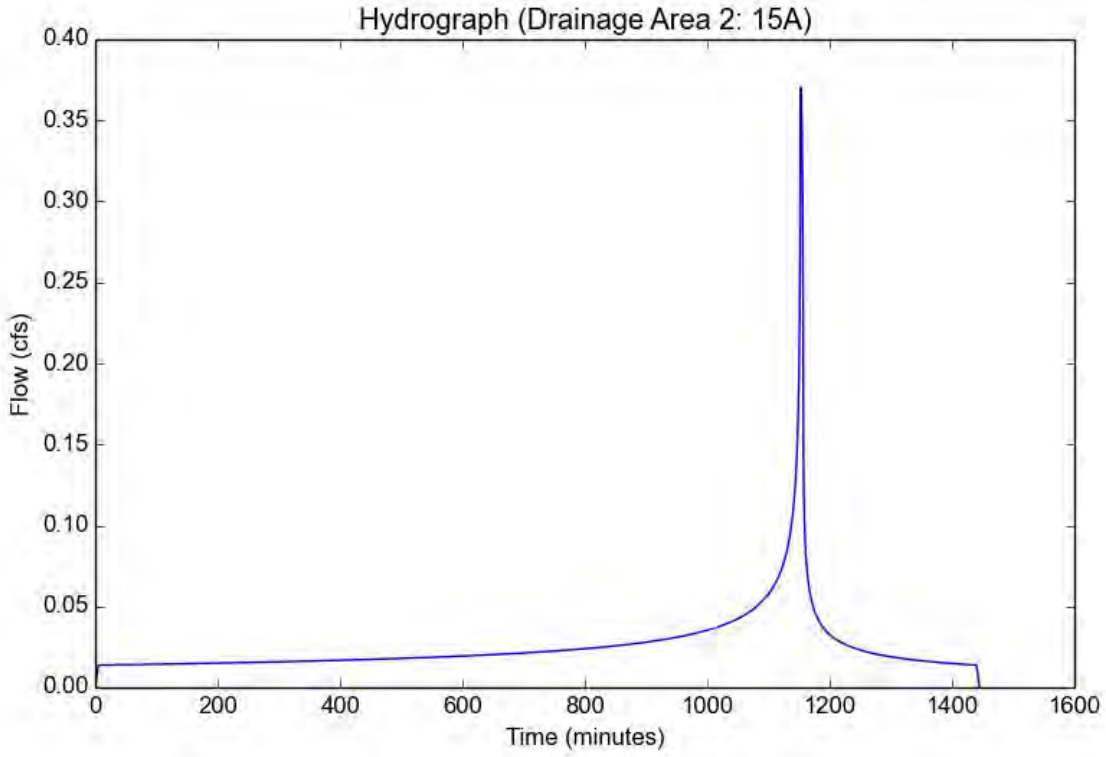
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	15A
Area (ac)	4.6
Flow Path Length (ft)	5.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.1
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.4475
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3705
Burned Peak Flow Rate (cfs)	0.3705
24-Hr Clear Runoff Volume (ac-ft)	0.0513
24-Hr Clear Runoff Volume (cu-ft)	2235.6007



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

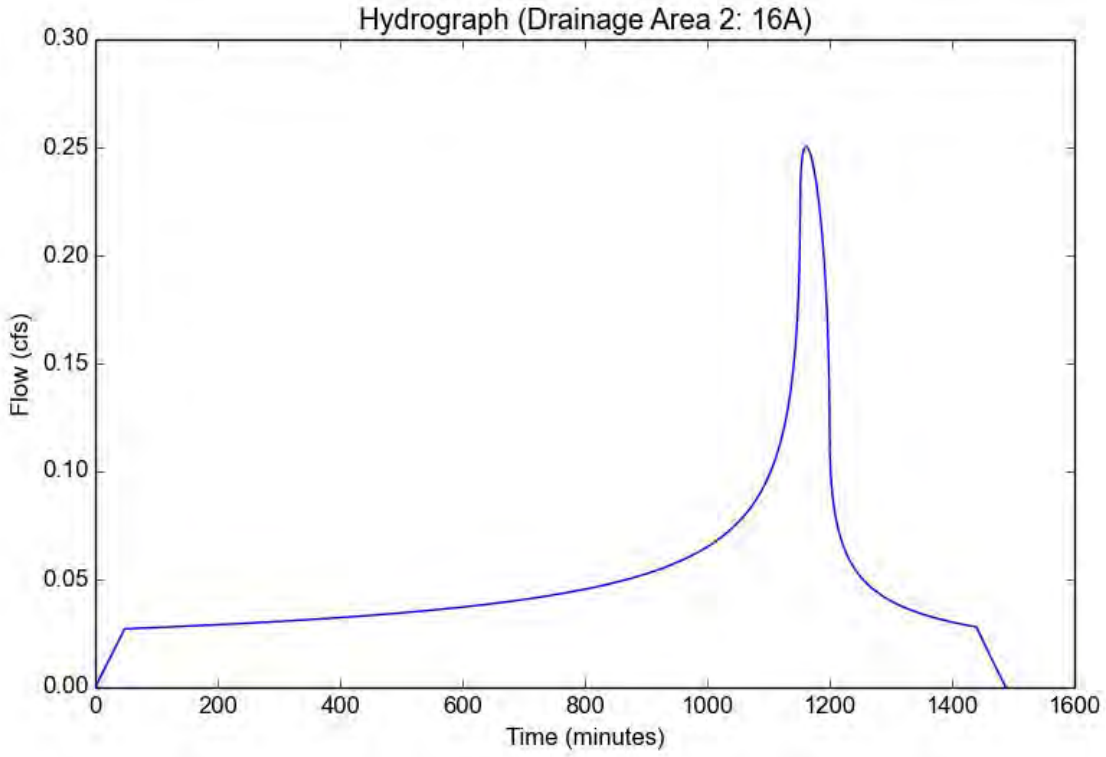
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 2
Subarea ID	16A
Area (ac)	1.8
Flow Path Length (ft)	930.0
Flow Path Slope (vft/hft)	0.005
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1546
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	48.0
Clear Peak Flow Rate (cfs)	0.2504
Burned Peak Flow Rate (cfs)	0.2504
24-Hr Clear Runoff Volume (ac-ft)	0.1004
24-Hr Clear Runoff Volume (cu-ft)	4374.1301



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

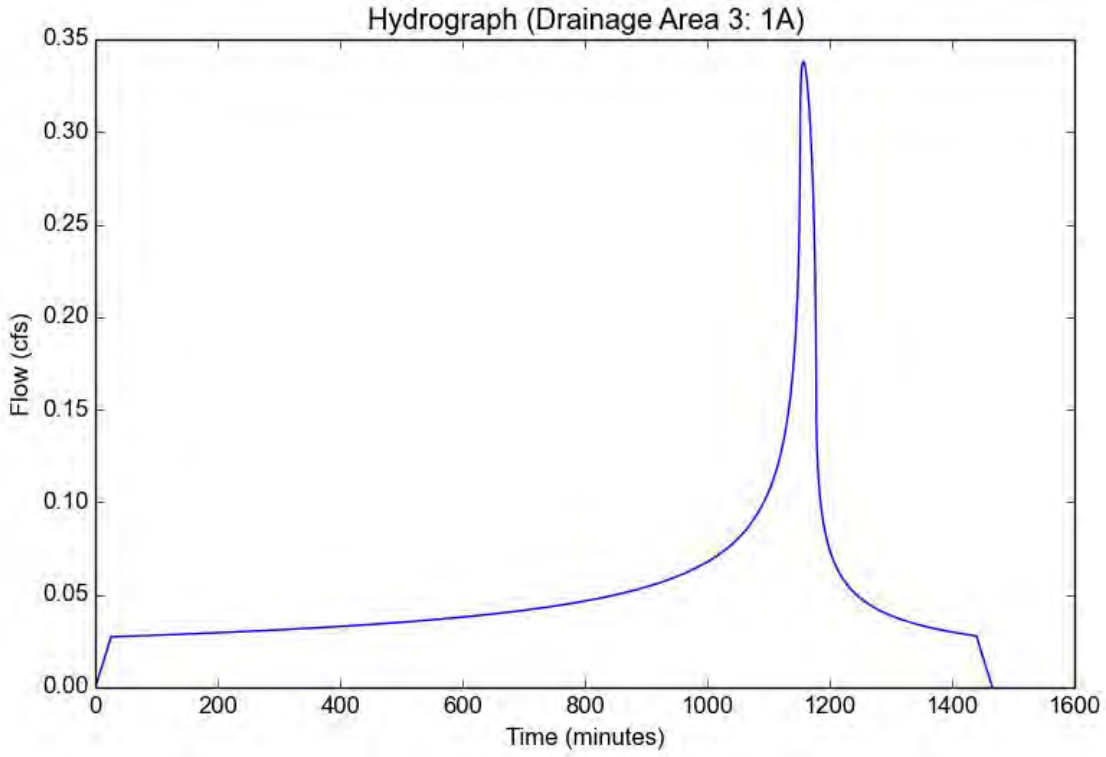
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	1A
Area (ac)	2.0
Flow Path Length (ft)	390.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2062
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	0.3381
Burned Peak Flow Rate (cfs)	0.3381
24-Hr Clear Runoff Volume (ac-ft)	0.1017
24-Hr Clear Runoff Volume (cu-ft)	4428.0381



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

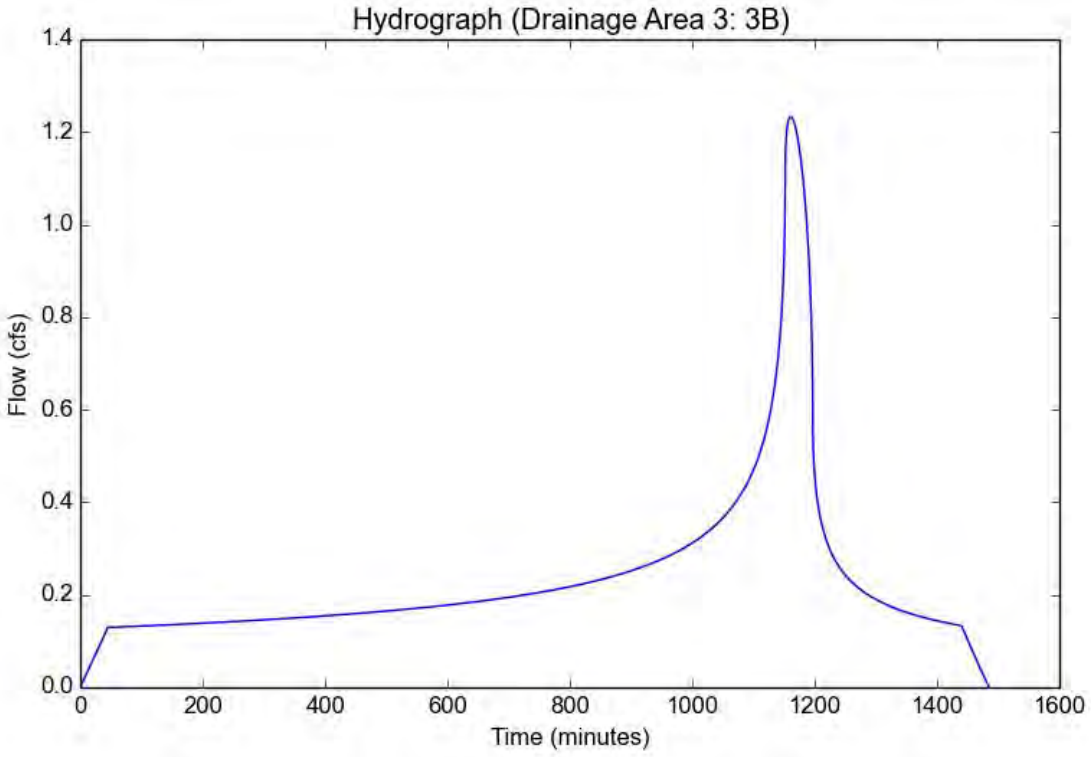
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	3B
Area (ac)	8.6
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1593
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	45.0
Clear Peak Flow Rate (cfs)	1.2331
Burned Peak Flow Rate (cfs)	1.2331
24-Hr Clear Runoff Volume (ac-ft)	0.4798
24-Hr Clear Runoff Volume (cu-ft)	20898.5452



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

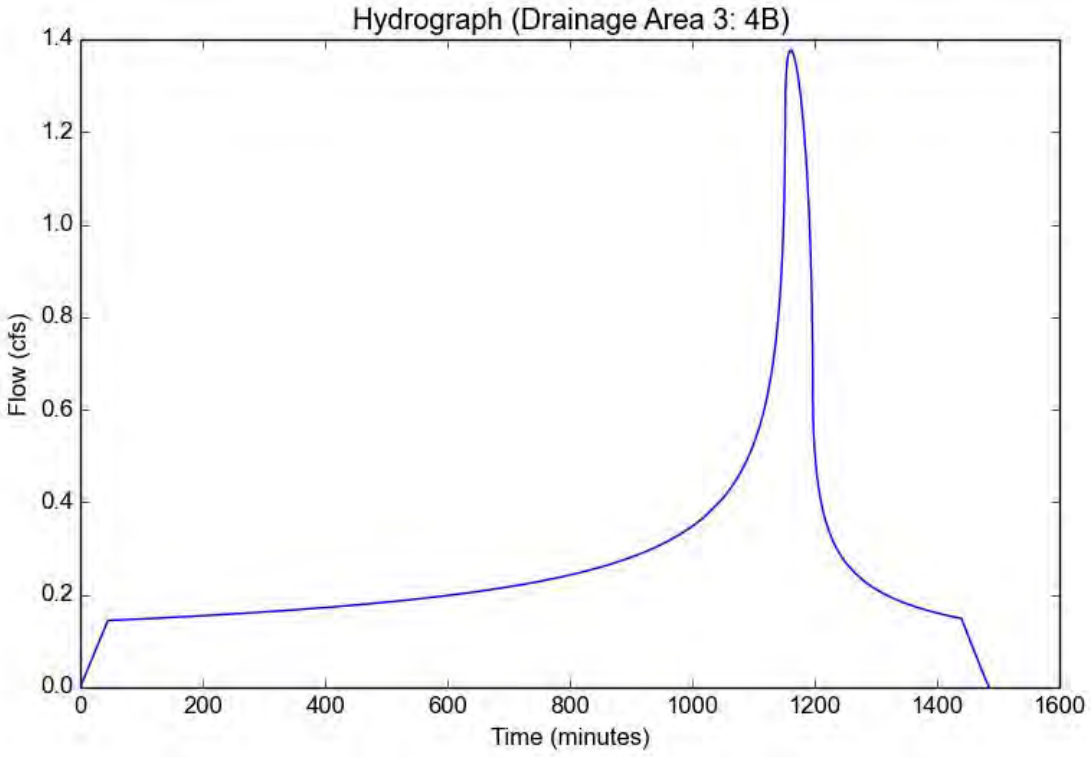
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	4B
Area (ac)	9.6
Flow Path Length (ft)	1010.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1593
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	45.0
Clear Peak Flow Rate (cfs)	1.3765
Burned Peak Flow Rate (cfs)	1.3765
24-Hr Clear Runoff Volume (ac-ft)	0.5356
24-Hr Clear Runoff Volume (cu-ft)	23328.6086



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

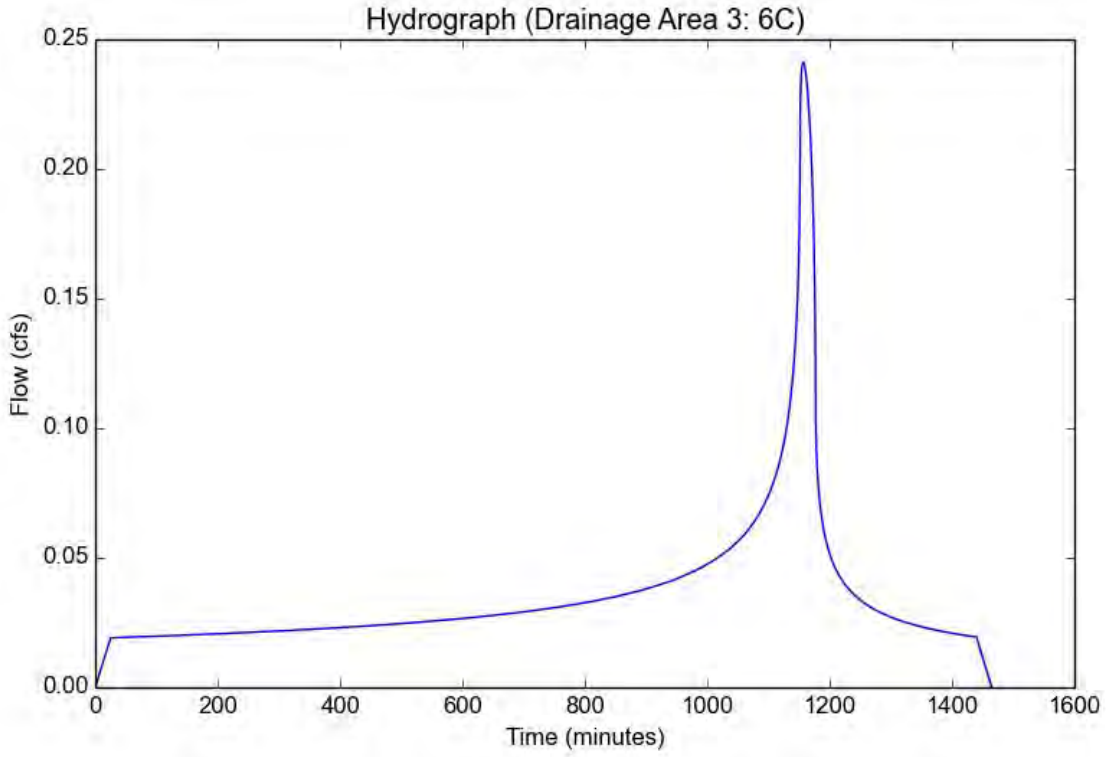
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	6C
Area (ac)	1.4
Flow Path Length (ft)	370.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.9
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.21
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	25.0
Clear Peak Flow Rate (cfs)	0.2411
Burned Peak Flow Rate (cfs)	0.2411
24-Hr Clear Runoff Volume (ac-ft)	0.0712
24-Hr Clear Runoff Volume (cu-ft)	3099.6246



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

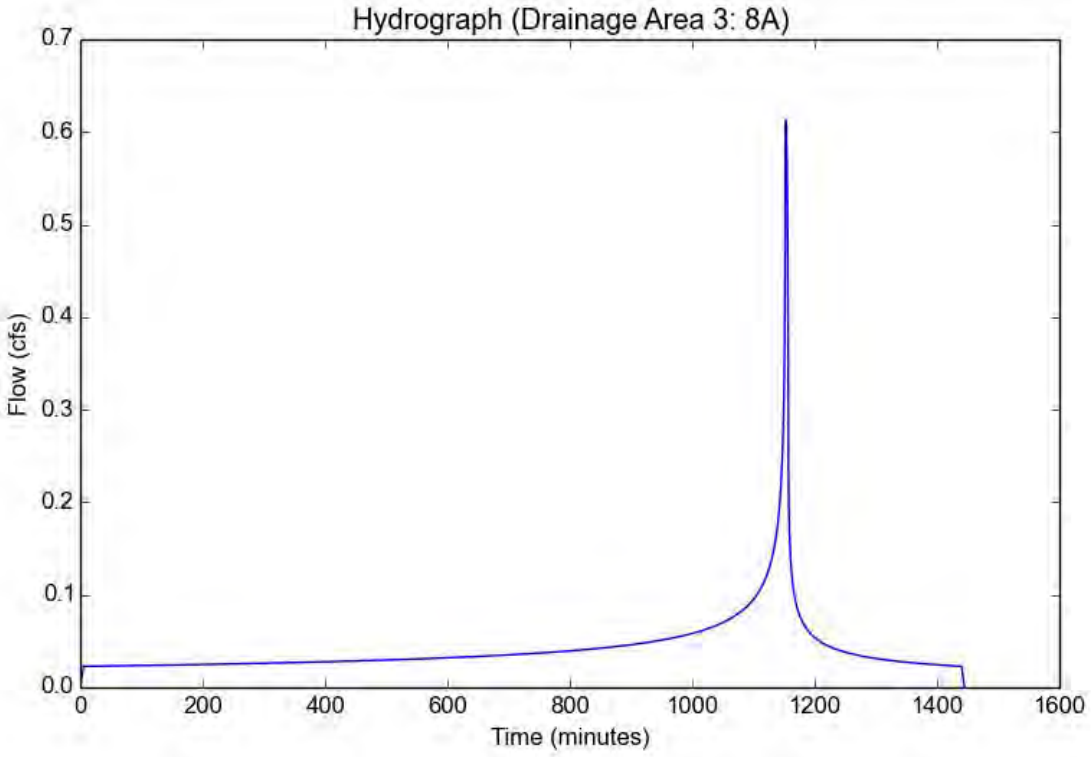
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	8A
Area (ac)	7.6
Flow Path Length (ft)	5.0
Flow Path Slope (vft/hft)	0.01
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.1
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.4475
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.6121
Burned Peak Flow Rate (cfs)	0.6121
24-Hr Clear Runoff Volume (ac-ft)	0.0848
24-Hr Clear Runoff Volume (cu-ft)	3693.6012



ESTU2023000671
RPPL2022013992

0.75-INCH

Peak Flow Hydrologic Analysis

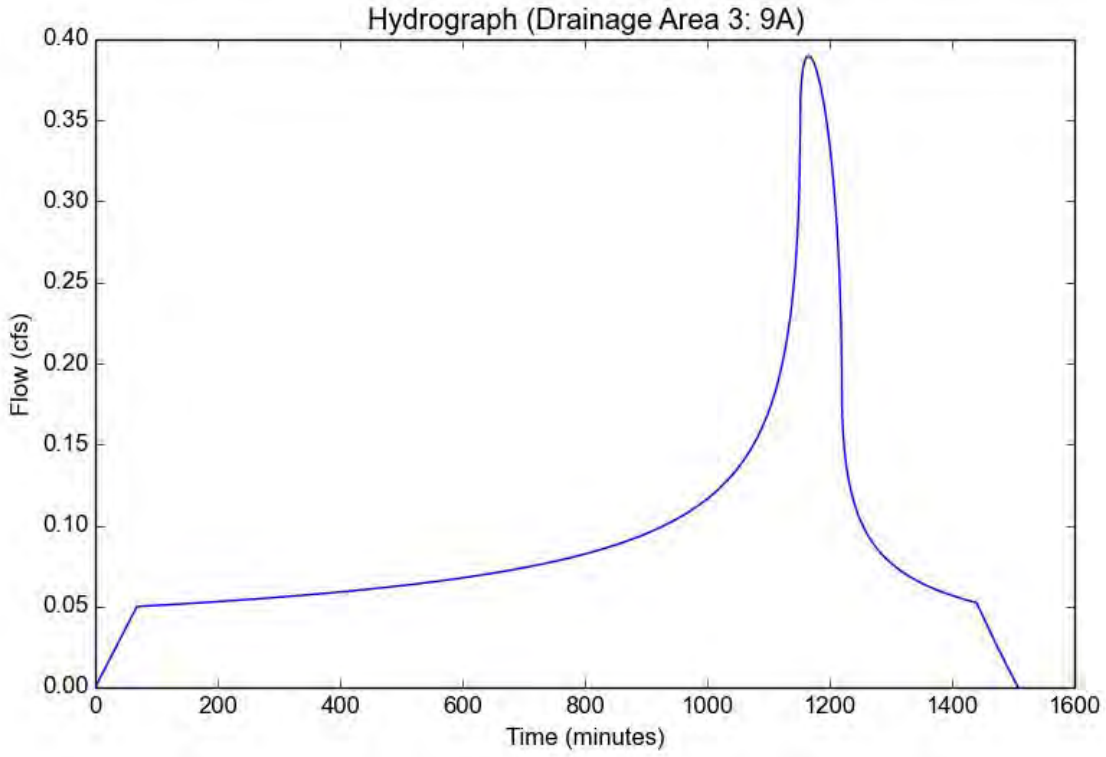
File location: C:/Users/Zac/DukeEng Dropbox/Job Files/23136 AVLC West/3 - Civil/9 - Studies/1 - Hydrology Study/figures/02272024/On-Site/Hydrocalc/
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Drainage Area 3
Subarea ID	9A
Area (ac)	3.3
Flow Path Length (ft)	1600.0
Flow Path Slope (vft/hft)	0.005
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	1.0
Soil Type	120
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1312
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	68.0
Clear Peak Flow Rate (cfs)	0.3897
Burned Peak Flow Rate (cfs)	0.3897
24-Hr Clear Runoff Volume (ac-ft)	0.1841
24-Hr Clear Runoff Volume (cu-ft)	8019.485



Appendix VII: Postdeveloped LAR04

ESTU2023000671
RPPL2022013992

Drainage Area 1

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	1.9	1.71	1.9	1.71	4	120.	.01000	2.00	.00	0.	120	11	A13	.90
3136	2A	.0	.00	1.9	1.71	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	6.40	8.6	6.40	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	7.15	18.2	12.78	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	12.77	20.1	14.21	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	6C	1.4	1.32	1.4	1.32	4	120.	.01000	2.00	.00	0.	120	10	A13	.90
3136	7AC	1.4	1.32	21.5	15.37	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8A	6.4	5.10	27.9	18.42	0	0.	.00000	.00	.00	0.	120	5	A13	.10

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	1.9	1.49	1.9	1.49	4	120.	.01000	2.00	.00	0.	120	11	A13	.90
3136	2A	.0	.00	1.9	1.49	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	5.62	8.6	5.62	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	6.28	18.2	11.18	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	11.18	20.1	12.43	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	6C	1.4	1.15	1.4	1.15	4	120.	.01000	2.00	.00	0.	120	10	A13	.90
3136	7AC	1.4	1.15	21.5	13.42	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8A	6.4	4.17	27.9	15.80	0	0.	.00000	.00	.00	0.	120	5	A13	.10

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 10 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	1.9	1.20	1.9	1.20	4	120.	.01000	2.00	.00	0.	120	11	A13	.90
3136	2A	.0	.00	1.9	1.20	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	4.57	8.6	4.57	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	5.10	18.2	9.04	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	9.04	20.1	10.03	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	6C	1.4	.93	1.4	.93	4	120.	.01000	2.00	.00	0.	120	10	A13	.90
3136	7AC	1.4	.92	21.5	10.82	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8A	6.4	2.95	27.9	12.31	0	0.	.00000	.00	.00	0.	120	5	A13	.10

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 5 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	1.9	.97	1.9	.97	4	120.	.01000	2.00	.00	0.	120	11	A13	.90
3136	2A	.0	.00	1.9	.97	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	3.74	8.6	3.74	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	4.17	18.2	7.35	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	7.35	20.1	8.14	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	6C	1.4	.75	1.4	.75	4	120.	.01000	2.00	.00	0.	120	10	A13	.90
3136	7AC	1.4	.74	21.5	8.77	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8A	6.4	1.98	27.9	9.58	0	0.	.00000	.00	.00	0.	120	5	A13	.10

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 2 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	1.9	.64	1.9	.64	4	120.	.01000	2.00	.00	0.	120	11	A13	.90
3136	2A	.0	.00	1.9	.64	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	2.48	8.6	2.48	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	2.77	18.2	4.81	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	4.81	20.1	5.31	0	0.	.00000	.00	.00	0.	120	0	A13	.00

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM RAIN ZONE	DAY 4 PCT IMPV
3136	1A	1.9	.48	1.9	.48	4	120.	.01000	2.00	.00	0.	120	11	A 3	.90
3136	2A	.0	.00	1.9	.48	0	0.	.00000	.00	.00	0.	120	99	A 3	.00
3136	3B	8.6	1.86	8.6	1.86	3	600.	.00500	.00	.01	0.	120	19	A 3	1.00
3136	4B	9.6	2.07	18.2	3.56	4	50.	.04000	3.00	.00	0.	120	19	A 3	1.00
3136	5AB	18.2	3.56	20.1	3.90	0	0.	.00000	.00	.00	0.	120	0	A 3	.00
3136	6C	1.4	.37	1.4	.37	4	120.	.01000	2.00	.00	0.	120	10	A 3	.90
3136	7AC	1.4	.37	21.5	4.21	0	0.	.00000	.00	.00	0.	120	0	A 3	.00
3136	8A	6.4	.51	27.9	4.37	0	0.	.00000	.00	.00	0.	120	5	A 3	.10

ESTU2023000671
RPPL2022013992

Drainage Area 1

ESTU2023000671
RPPL2022013992

Drainage Area 2

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 0.75-INCH SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.4	.56	2.4	.56	4	80.	.01000	2.00	.00	0.	120	13	A 3	.90
3136	2A	.0	.00	2.4	.56	0	0.	.00000	.00	.00	0.	120	99	A 3	.00
3136	3B	2.9	.68	2.9	.68	4	50.	.01000	2.00	.00	0.	120	13	A 3	.90
3136	4AB	2.9	.68	5.3	1.23	4	200.	.01000	2.00	.00	0.	120	0	A 3	.00
3136	5C	9.0	1.94	9.0	1.94	3	500.	.00500	.00	1.00	0.	120	19	A 3	1.00
3136	6C	10.0	2.16	19.0	3.80	4	20.	.05000	3.00	.00	0.	120	19	A 3	1.00
3136	7AC	19.0	3.80	24.3	4.94	0	0.	.00000	.00	.00	0.	120	0	A 3	.00
3136	8D	8.5	1.84	8.5	1.84	3	500.	.00500	.00	1.00	0.	120	19	A 3	1.00
3136	9D	9.4	2.03	17.9	3.58	4	20.	.05000	3.00	.00	0.	120	19	A 3	1.00
3136	10AD	17.9	3.58	42.2	8.48	0	0.	.00000	.00	.00	0.	120	0	A 3	.00
3136	11E	1.7	.45	1.7	.45	4	80.	.01000	2.00	.00	0.	120	10	A 3	.90
3136	12E	.0	.00	1.7	.45	0	0.	.00000	.00	.00	0.	120	99	A 3	.00
3136	13F	2.0	.53	2.0	.53	4	50.	.01000	2.00	.00	0.	120	10	A 3	.90
3136	14EF	2.0	.53	3.7	.97	4	200.	.01000	2.00	.00	0.	120	0	A 3	.00
3136	15A	4.6	.37	46.8	8.56	0	0.	.00000	.00	.00	0.	120	5	A 3	.10
3136	16A	1.8	.38	48.6	8.93	0	0.	.00000	.00	.00	0.	120	20	A 3	1.00
3136	17A	.0	.00	48.6	8.93	0	0.	.00000	.00	.00	0.	120	99	A 3	.00

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 2 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.4	.75	2.4	.75	4	80.	.01000	2.00	.00	0.	120	13	A13	.90
3136	2A	.0	.00	2.4	.75	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	2.9	.90	2.9	.90	4	50.	.01000	2.00	.00	0.	120	13	A13	.90
3136	4AB	2.9	.90	5.3	1.65	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
3136	5C	9.0	2.59	9.0	2.59	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00
3136	6C	10.0	2.88	19.0	5.13	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
3136	7AC	19.0	5.13	24.3	6.69	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8D	8.5	2.45	8.5	2.45	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00
3136	9D	9.4	2.71	17.9	4.83	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
3136	10AD	17.9	4.83	42.2	11.49	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	11E	1.7	.60	1.7	.60	4	80.	.01000	2.00	.00	0.	120	10	A13	.90
3136	12E	.0	.00	1.7	.60	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	13F	2.0	.71	2.0	.71	4	50.	.01000	2.00	.00	0.	120	10	A13	.90
3136	14EF	2.0	.71	3.7	1.30	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
3136	15A	4.6	.50	46.8	11.62	0	0.	.00000	.00	.00	0.	120	5	A13	.10
3136	16A	1.8	.51	48.6	12.11	0	0.	.00000	.00	.00	0.	120	20	A13	1.00
3136	17A	.0	.00	48.6	12.11	0	0.	.00000	.00	.00	0.	120	99	A13	.00

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 5 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.4	1.13	2.4	1.13	4	80.	.01000	2.00	.00	0.	120	13	A13	.90
3136	2A	.0	.00	2.4	1.13	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	2.9	1.37	2.9	1.37	4	50.	.01000	2.00	.00	0.	120	13	A13	.90
3136	4AB	2.9	1.37	5.3	2.49	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
3136	5C	9.0	3.91	9.0	3.91	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00
3136	6C	10.0	4.35	19.0	7.83	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
3136	7AC	19.0	7.82	24.3	10.19	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8D	8.5	3.70	8.5	3.70	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00
3136	9D	9.4	4.09	17.9	7.37	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
3136	10AD	17.9	7.36	42.2	17.54	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	11E	1.7	.91	1.7	.91	4	80.	.01000	2.00	.00	0.	120	10	A13	.90

3136	12E	.0	.00	1.7	.90	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	13F	2.0	1.07	2.0	1.07	4	50.	.01000	2.00	.00	0.	120	10	A13	.90
3136	14EF	2.0	1.07	3.7	1.97	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
3136	15A	4.6	1.42	46.8	17.73	0	0.	.00000	.00	.00	0.	120	5	A13	.10
3136	16A	1.8	.77	48.6	18.47	0	0.	.00000	.00	.00	0.	120	20	A13	1.00
3136	17A	.0	.00	48.6	18.47	0	0.	.00000	.00	.00	0.	120	99	A13	.00

ESTU2023000671
RPPL2022013992

Drainage Area 2

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 10 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.4	1.39	2.4	1.39	4	80.	.01000	2.00	.00	0.	120	13	A13	.90
3136	2A	.0	.00	2.4	1.39	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	2.9	1.68	2.9	1.68	4	50.	.01000	2.00	.00	0.	120	13	A13	.90
3136	4AB	2.9	1.68	5.3	3.07	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
3136	5C	9.0	4.79	9.0	4.79	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00
3136	6C	10.0	5.32	19.0	9.61	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
3136	7AC	19.0	9.61	24.3	12.52	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8D	8.5	4.52	8.5	4.52	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00
3136	9D	9.4	5.00	17.9	9.04	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
3136	10AD	17.9	9.04	42.2	21.54	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	11E	1.7	1.13	1.7	1.13	4	80.	.01000	2.00	.00	0.	120	10	A13	.90
3136	12E	.0	.00	1.7	1.12	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	13F	2.0	1.33	2.0	1.33	4	50.	.01000	2.00	.00	0.	120	10	A13	.90
3136	14EF	2.0	1.32	3.7	2.44	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
3136	15A	4.6	2.12	46.8	21.77	0	0.	.00000	.00	.00	0.	120	5	A13	.10
3136	16A	1.8	.94	48.6	22.69	0	0.	.00000	.00	.00	0.	120	20	A13	1.00
3136	17A	.0	.00	48.6	22.69	0	0.	.00000	.00	.00	0.	120	99	A13	.00

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.4	1.73	2.4	1.73	4	80.	.01000	2.00	.00	0.	120	13	A13	.90
3136	2A	.0	.00	2.4	1.73	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	2.9	2.09	2.9	2.09	4	50.	.01000	2.00	.00	0.	120	13	A13	.90
3136	4AB	2.9	2.09	5.3	3.82	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
3136	5C	9.0	5.88	9.0	5.88	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00
3136	6C	10.0	6.54	19.0	11.87	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
3136	7AC	19.0	11.87	24.3	15.52	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8D	8.5	5.56	8.5	5.56	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00
3136	9D	9.4	6.15	17.9	11.17	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
3136	10AD	17.9	11.17	42.2	26.64	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	11E	1.7	1.40	1.7	1.40	4	80.	.01000	2.00	.00	0.	120	10	A13	.90
3136	12E	.0	.00	1.7	1.39	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	13F	2.0	1.65	2.0	1.65	4	50.	.01000	2.00	.00	0.	120	10	A13	.90
3136	14EF	2.0	1.65	3.7	3.04	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
3136	15A	4.6	3.00	46.8	26.95	0	0.	.00000	.00	.00	0.	120	5	A13	.10
3136	16A	1.8	1.15	48.6	28.09	0	0.	.00000	.00	.00	0.	120	20	A13	1.00
3136	17A	.0	.00	48.6	28.09	0	0.	.00000	.00	.00	0.	120	99	A13	.00

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.4	1.99	2.4	1.99	4	80.	.01000	2.00	.00	0.	120	13	A13	.90
3136	2A	.0	.00	2.4	1.98	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	2.9	2.40	2.9	2.40	4	50.	.01000	2.00	.00	0.	120	13	A13	.90
3136	4AB	2.9	2.40	5.3	4.38	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
3136	5C	9.0	6.70	9.0	6.70	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00

139	3136	6C	10.0	7.45	19.0	13.56	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
140	3136	7AC	19.0	13.56	24.3	17.75	0	0.	.00000	.00	.00	0.	120	0	A13	.00
141	3136	8D	8.5	6.33	8.5	6.33	3	500.	.00500	.00	1.00	0.	120	19	A13	1.00
142	3136	9D	9.4	7.00	17.9	12.76	4	20.	.05000	3.00	.00	0.	120	19	A13	1.00
143	3136	10AD	17.9	12.76	42.2	30.46	0	0.	.00000	.00	.00	0.	120	0	A13	.00
144	3136	11E	1.7	1.61	1.7	1.61	4	80.	.01000	2.00	.00	0.	120	10	A13	.90
145	3136	12E	.0	.00	1.7	1.60	0	0.	.00000	.00	.00	0.	120	99	A13	.00
146	3136	13F	2.0	1.89	2.0	1.89	4	50.	.01000	2.00	.00	0.	120	10	A13	.90
147	3136	14EF	2.0	1.89	3.7	3.49	4	200.	.01000	2.00	.00	0.	120	0	A13	.00
148	3136	15A	4.6	3.66	46.8	30.82	0	0.	.00000	.00	.00	0.	120	5	A13	.10
149	3136	16A	1.8	1.31	48.6	32.11	0	0.	.00000	.00	.00	0.	120	20	A13	1.00
150	3136	17A	.0	.00	48.6	32.11	0	0.	.00000	.00	.00	0.	120	99	A13	.00
151																

Drainage Area 2

ESTU2023000671
RPPL2022013992

ESTU2023000671
RPPL2022013992

Drainage Area 3

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 0.75-INCH SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.0	.51	2.0	.51	4	120.	.01000	2.00	.00	0.	120	11	A 3	.90
3136	2A	.0	.00	2.0	.50	0	0.	.00000	.00	.00	0.	120	99	A 3	.00
3136	3B	8.6	1.86	8.6	1.86	3	600.	.00500	.00	.01	0.	120	19	A 3	1.00
3136	4B	9.6	2.07	18.2	3.56	4	50.	.04000	3.00	.00	0.	120	19	A 3	1.00
3136	5AB	18.2	3.56	20.2	3.92	0	0.	.00000	.00	.00	0.	120	0	A 3	.00
3136	6C	1.4	.37	1.4	.37	4	120.	.01000	2.00	.00	0.	120	10	A 3	.90
3136	7AC	1.4	.37	21.6	4.23	0	0.	.00000	.00	.00	0.	120	0	A 3	.00
3136	8A	12.2	.98	33.8	4.74	0	0.	.00000	.00	.00	0.	120	5	A 3	.10
3136	9A	3.3	.58	37.1	5.31	0	0.	.00000	.00	.00	0.	120	29	A 3	1.00

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 2 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.0	.68	2.0	.68	4	120.	.01000	2.00	.00	0.	120	11	A13	.90
3136	2A	.0	.00	2.0	.67	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	2.48	8.6	2.48	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	2.77	18.2	4.81	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	4.81	20.2	5.34	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	6C	1.4	.50	1.4	.50	4	120.	.01000	2.00	.00	0.	120	10	A13	.90
3136	7AC	1.4	.49	21.6	5.76	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8A	12.2	1.32	33.8	6.40	0	0.	.00000	.00	.00	0.	120	5	A13	.10
3136	9A	3.3	.78	37.1	7.16	0	0.	.00000	.00	.00	0.	120	29	A13	1.00

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 5 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.0	1.02	2.0	1.02	4	120.	.01000	2.00	.00	0.	120	11	A13	.90
3136	2A	.0	.00	2.0	1.02	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	3.74	8.6	3.74	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	4.17	18.2	7.35	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	7.35	20.2	8.19	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	6C	1.4	.75	1.4	.75	4	120.	.01000	2.00	.00	0.	120	10	A13	.90
3136	7AC	1.4	.74	21.6	8.82	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8A	12.2	3.77	33.8	11.42	0	0.	.00000	.00	.00	0.	120	5	A13	.10
3136	9A	3.3	1.18	37.1	12.55	0	0.	.00000	.00	.00	0.	120	29	A13	1.00

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 10 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.0	1.26	2.0	1.26	4	120.	.01000	2.00	.00	0.	120	11	A13	.90
3136	2A	.0	.00	2.0	1.26	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	4.57	8.6	4.57	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	5.10	18.2	9.04	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	9.04	20.2	10.08	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	6C	1.4	.93	1.4	.93	4	120.	.01000	2.00	.00	0.	120	10	A13	.90
3136	7AC	1.4	.92	21.6	10.87	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8A	12.2	5.62	33.8	15.04	0	0.	.00000	.00	.00	0.	120	5	A13	.10
3136	9A	3.3	1.44	37.1	16.42	0	0.	.00000	.00	.00	0.	120	29	A13	1.00

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
3136	1A	2.0	1.57	2.0	1.57	4	120.	.01000	2.00	.00	0.	120	11	A13	.90

3136	2A	.0	.00	2.0	1.57	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	5.62	8.6	5.62	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	6.28	18.2	11.18	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	11.18	20.2	12.49	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	6C	1.4	1.15	1.4	1.15	4	120.	.01000	2.00	.00	0.	120	10	A13	.90
3136	7AC	1.4	1.15	21.6	13.49	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8A	12.2	7.95	33.8	19.65	0	0.	.00000	.00	.00	0.	120	5	A13	.10
3136	9A	3.3	1.77	37.1	21.35	0	0.	.00000	.00	.00	0.	120	29	A13	1.00

Drainage Area 3

ESTU2023000671
RPPL2022013992

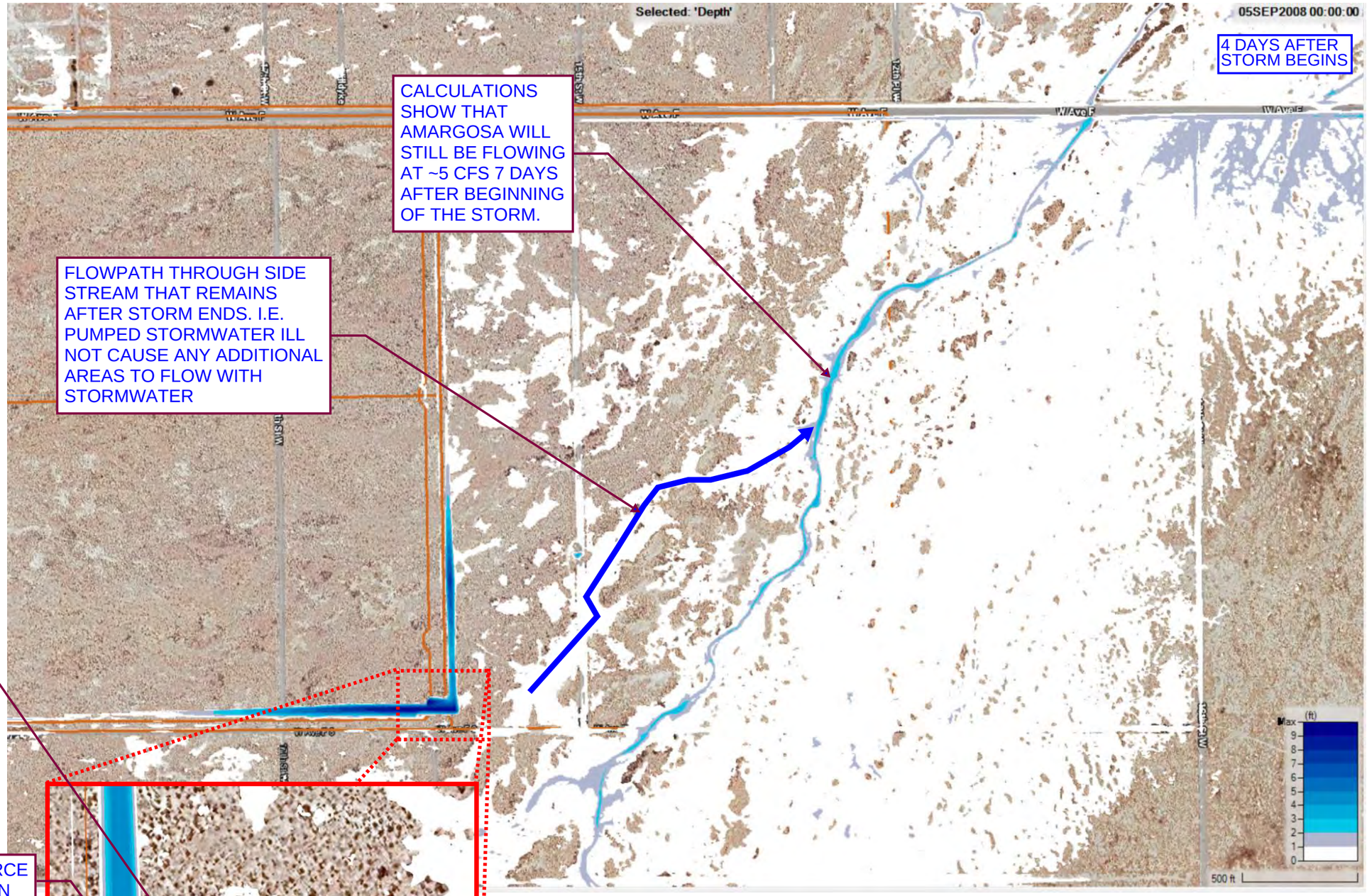
Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\LAR04 - 2240\lasoilx.dat

STORM DAY 4

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
3136	1A	2.0	1.80	2.0	1.80	4	120.	.01000	2.00	.00	0.	120	11	A13	.90
3136	2A	.0	.00	2.0	1.80	0	0.	.00000	.00	.00	0.	120	99	A13	.00
3136	3B	8.6	6.40	8.6	6.40	3	600.	.00500	.00	.01	0.	120	19	A13	1.00
3136	4B	9.6	7.15	18.2	12.78	4	50.	.04000	3.00	.00	0.	120	19	A13	1.00
3136	5AB	18.2	12.77	20.2	14.29	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	6C	1.4	1.32	1.4	1.32	4	120.	.01000	2.00	.00	0.	120	10	A13	.90
3136	7AC	1.4	1.32	21.6	15.45	0	0.	.00000	.00	.00	0.	120	0	A13	.00
3136	8A	12.2	9.71	33.8	23.12	0	0.	.00000	.00	.00	0.	120	5	A13	.10
3136	9A	3.3	2.02	37.1	25.06	0	0.	.00000	.00	.00	0.	120	29	A13	1.00

Appendix VIII: Pump Exhibit

ESTU2023000671
RPPL2022013992



NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED

Appendix IX: On-Site Basin Infiltration Area Calculation

ESTU2023000671
RPPL2022013992

Basin	Infiltration Rate [in/hr]	Basin Bottom Area [Sq. Ft.]	Infiltration Rate [cfs]	Additional Area [Sq. Ft.]	Infiltration Rate [cfs]	Tributary Volume [Ac.-Ft.]
North	0.163	105000	0.396	0	0.00	4.13
Center	0.352	67000	0.546	0	0.00	8.08
South	0.321	195000	1.449	0	0.00	4.41

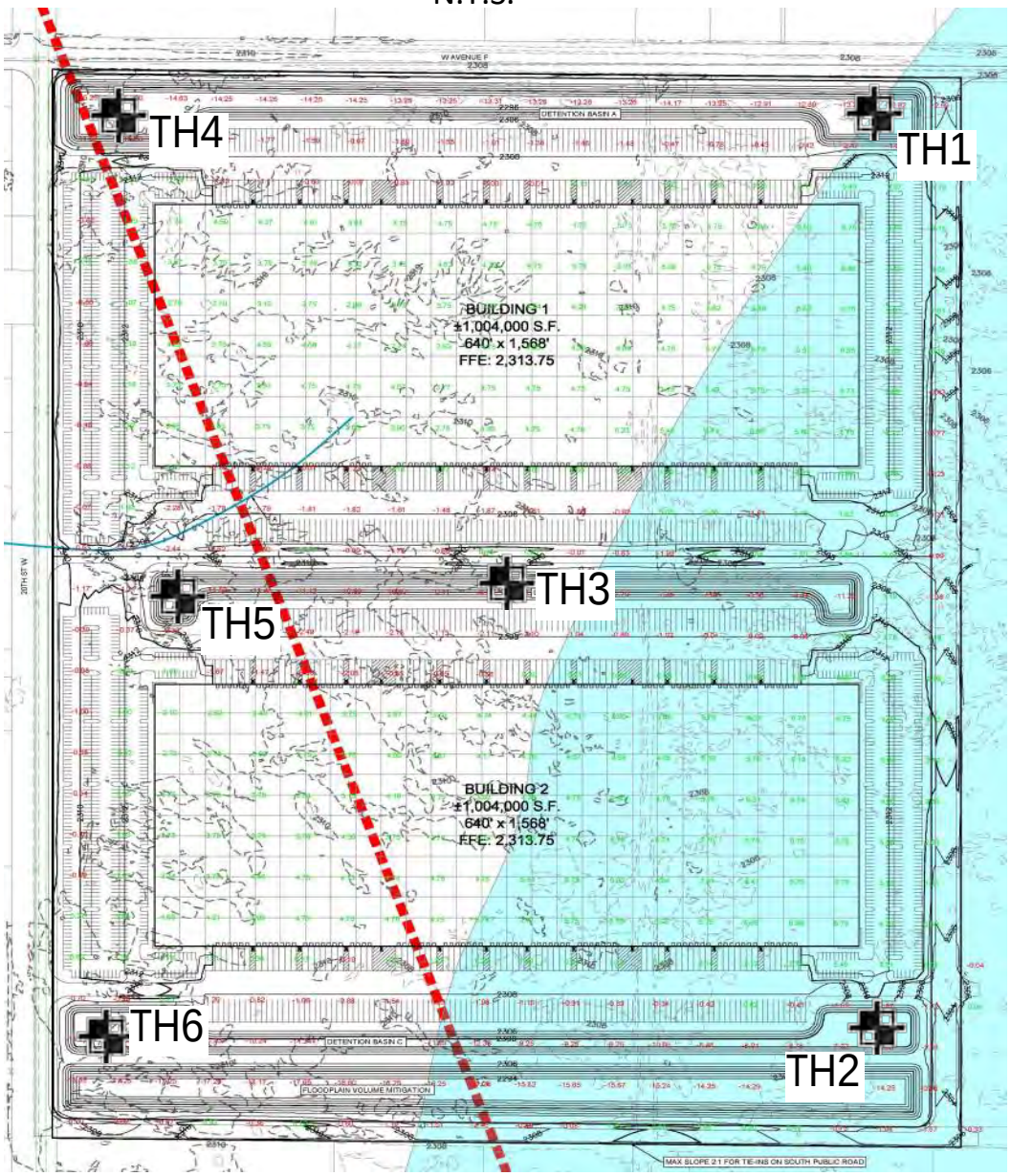
Total Infiltration Rate [cfs]:	2.39
Total Volume Tributary to Basins [Cu. Ft.]:	815,290
Drawdown Time [hours]	**94.7**

Appendix X: Infiltration Exhibit

ESTU2023000671
RPPL2022013992

Test Hole Location Map

N.T.S.



TH1 = Denotes Approximate Test Hole Location

Test Hole	Basin	Invert Depth Tested (ft.)
1	A, east end	12
2	C, east end	6
3	B, center	10
4	A, west end	12
5	B, west end	10
6	C, west end	6

Test Hole No.	**1**	**2**	**3**	**4**	**5**	**6**
Presoak	Pass	Fail	Pass	Fail	Fail	Pass
Infiltration Rate	0.163	Fail	0.352	Fail	Fail	0.321

Appendix XI: GMED Infiltration Letter

ESTU2023000671
RPPL2022013992

Dist. Office -
PCA L000671LID / A402
EPIC LA ESTU2023000677
Telephone: (626) 458-4925

County of Los Angeles Department of Public Works
Geotechnical and Materials Engineering Division
GEOLOGIC AND GEOTECHNICAL ENGINEERING REVIEW SHEET
900 S. Fremont Avenue, Alhambra, CA 91803

Tract / Parcel Map		**Lot(s)**		**Parent Tract**	
Site Address	(Vacant) 20th Street West at Avenue F	**Location**	Lancaster	**APN**	3118-015-001
Geologist	---	**Developer/Owner**	NorthPoint Development		
Soils Engineer	---	**Engineer/Arch.**	JT Engineering, Inc / studioNorth Architecture		

Review of:

C.U.P. No.: CUP RPPL2022013992 For: LID Review for CUP, Proposed Industrial Warehousing & Distribution Buildings
Submittal Received by GMED: **11/27/2023**

Geologic Report(s) Dated: --
Soils Engineering Report(s) Dated: **08/07/2023**
Geotechnical Report(s) Dated: --
References: -

Remarks:

GMED has no comments at this time.

NOTE(S) TO THE PLAN CHECKER/BUILDING AND SAFETY DISTRICT ENGINEER:

A. A DESIGN INFILTRATION RATE OF 0.163 IN/HR WITH A TESTED INVERT DEPTH AT 14 FEET BGS MAY BE APPLIED TO THE PROPOSED NORTH DETENTION BASIN.
B. A DESIGN INFILTRATION RATE OF 0.352 IN/HR WITH A TESTED INVERT DEPTH AT 11 FEET BGS MAY BE APPLIED TO THE PROPOSED CENTER DETENTION BASIN.
C. A DESIGN INFILTRATION RATE OF 0.321 IN/HR WITH A TESTED INVERT DEPTH AT 18 FEET BGS MAY BE APPLIED TO THE PROPOSED SOUTH DETENTION BASIN.

Prepared by

REGISTERED PROFESSIONAL ENGINEER
JOSE JULIAN URQUIZO
No. 85500
STATE OF CALIFORNIA
CIVIL

-
-

Jose J. Urquizo
Geotechnical Section

Date 12/15/2023

Please complete a Customer Service Survey at http://dpw.lacounty.gov/go/gmedsurvey

NOTICE: Public safety, relative to geotechnical subsurface exploration, shall be provided in accordance with current codes for excavations, inclusive of the Los Angeles County Code, Chapter 11.48, and the State of California, Title 8, Construction Safety Orders.

Appendix XII: Channel Purge Calculations

2,000 Linear Feet of Channel Section G-G and D-D

Trapezoid Dimensions

$$B_1 = 15'$$

$$B_2 = 39'$$

$$H = 6'$$

$$Area = 162\ sq.ft.$$

$$Volume = 324{,}000\ Cu.Ft.$$

2,450 Linear Feet of Channel Section E-E and F-F

Trapezoid Dimensions

$$B_1 = 40'$$

$$B_2 = 80'$$

$$H = 10'$$

$$Area = 600\ sq.ft.$$

$$Volume = 1{,}470{,}000\ Cu.Ft.$$

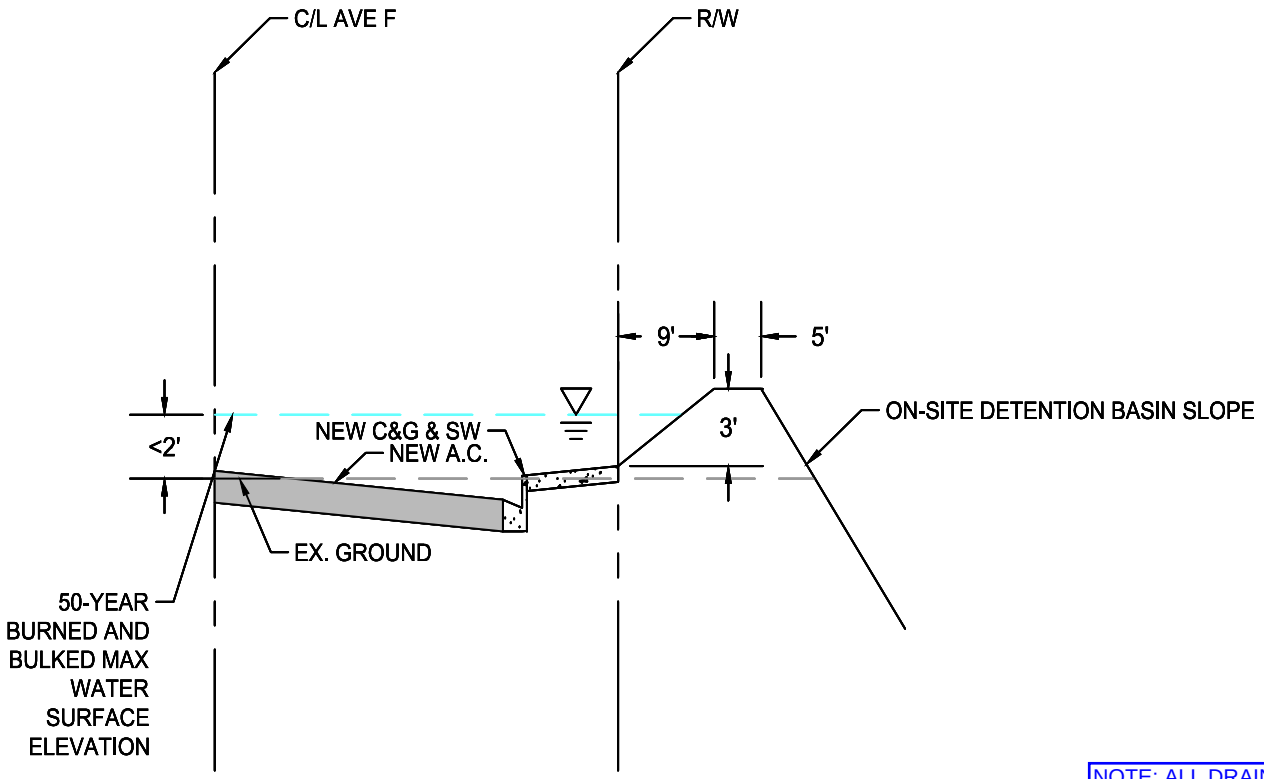
$$Total\ Volume\ to\ Purge = 1{,}794{,}000\ Cu.Ft.$$

$$Drawdown\ Time = 96\ hours$$

$$Required\ Pump\ Rate\ for\ Offsite\ Channel = 5.2\ CFS$$

Appendix XIII: Boundary Cross Sections

ESTU2023000671
RPPL2022013992

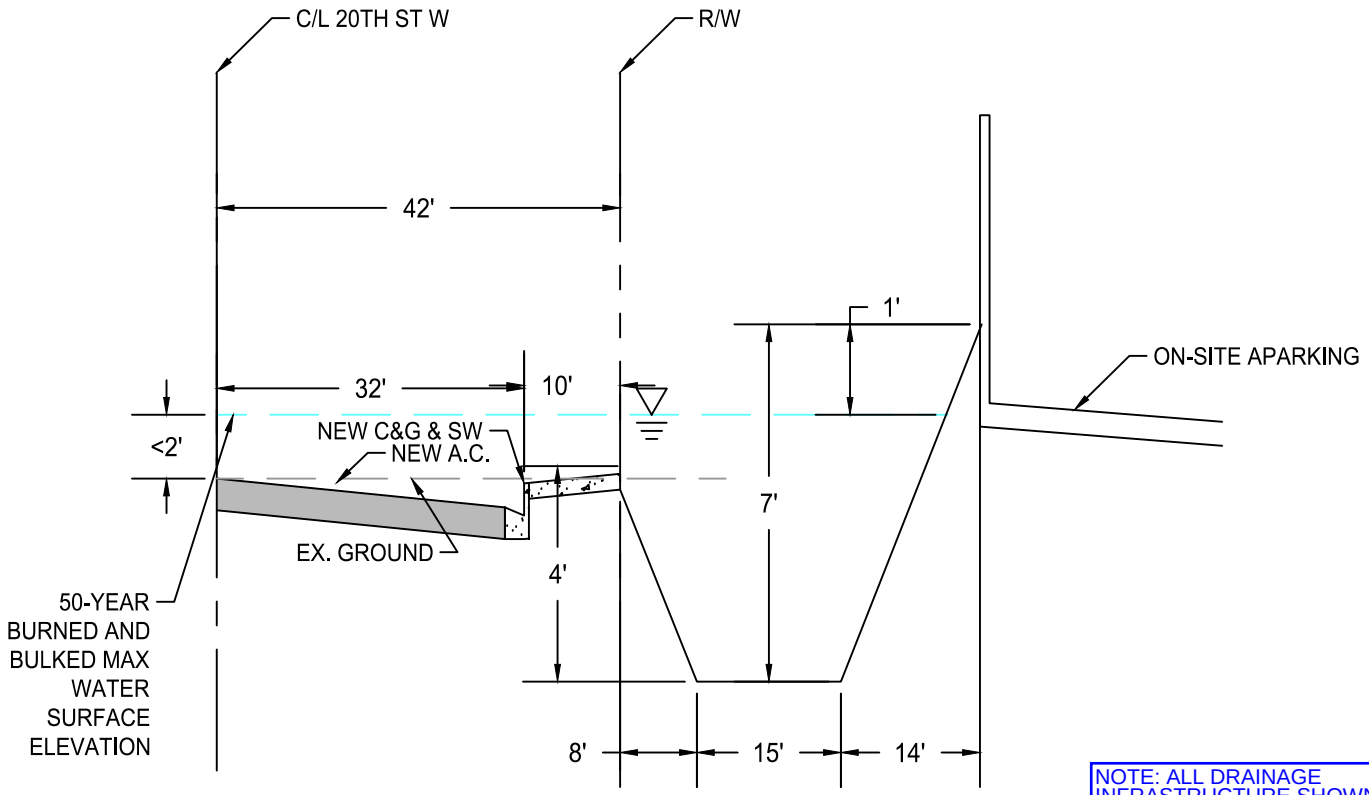


NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED

SECTION A-A

5x VERTICAL SCALE

ESTU2023000671
RPPL2022013992

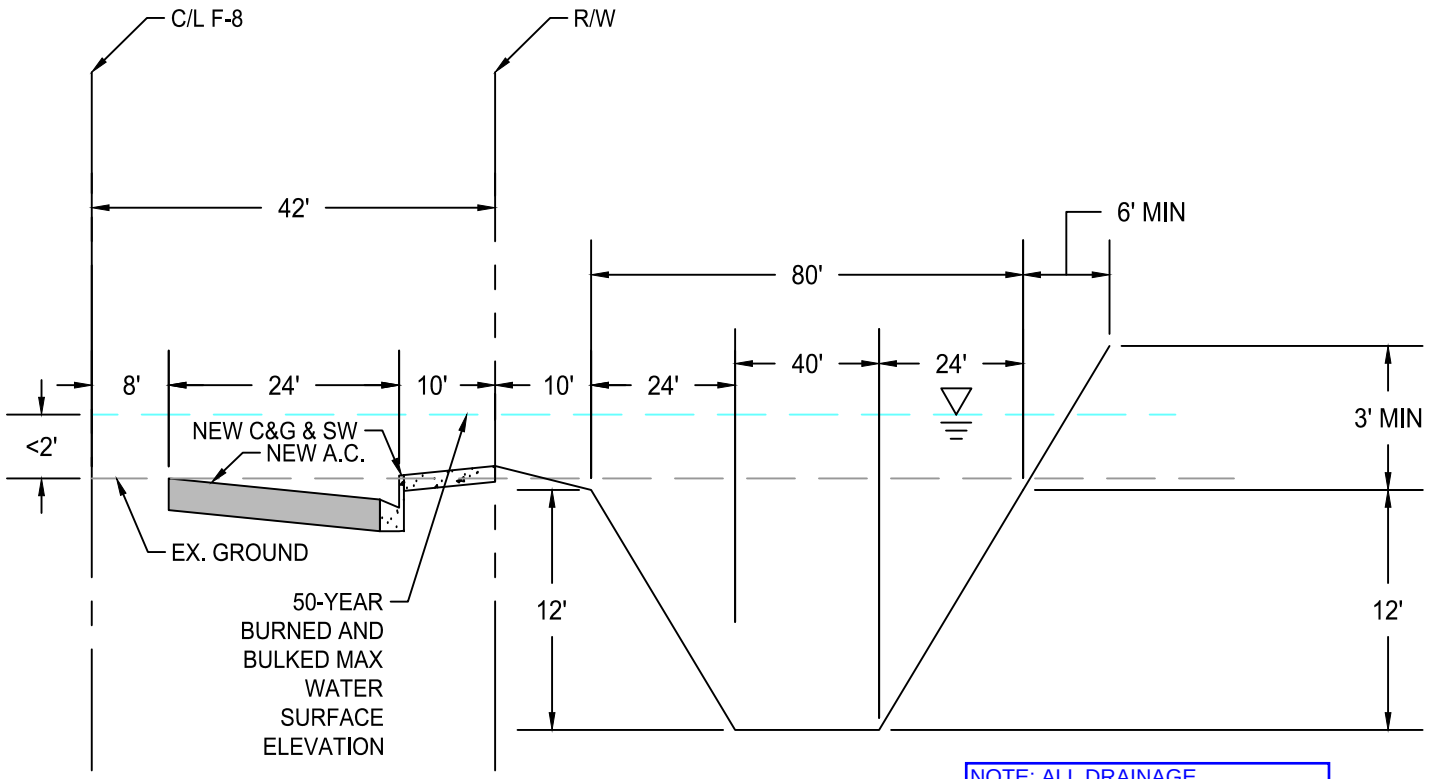


NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED

SECTION B-B

5x VERTICAL SCALE

ESTU2023000671
RPPL2022013992

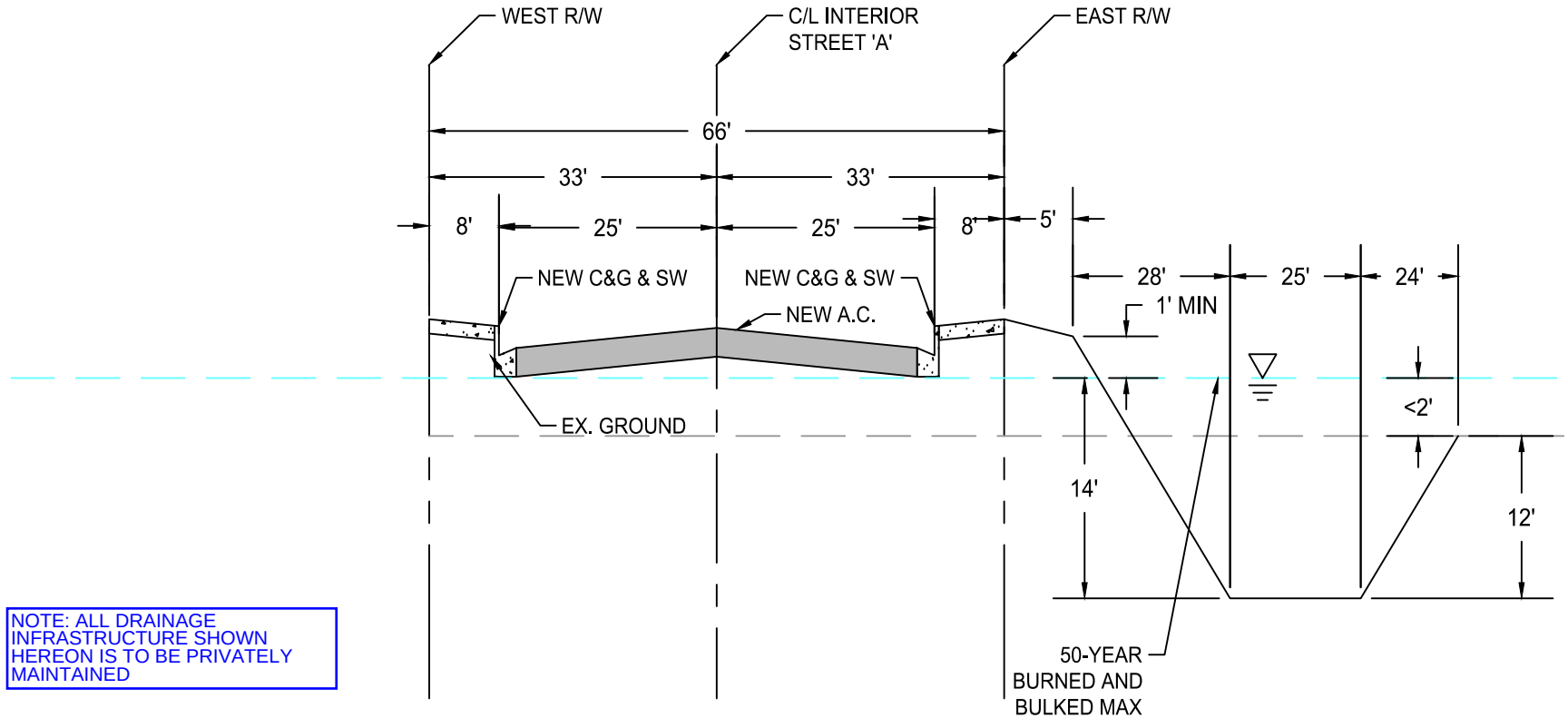


NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED

SECTION C-C

5x VERTICAL SCALE

ESTU2023000671
RPPL2022013992



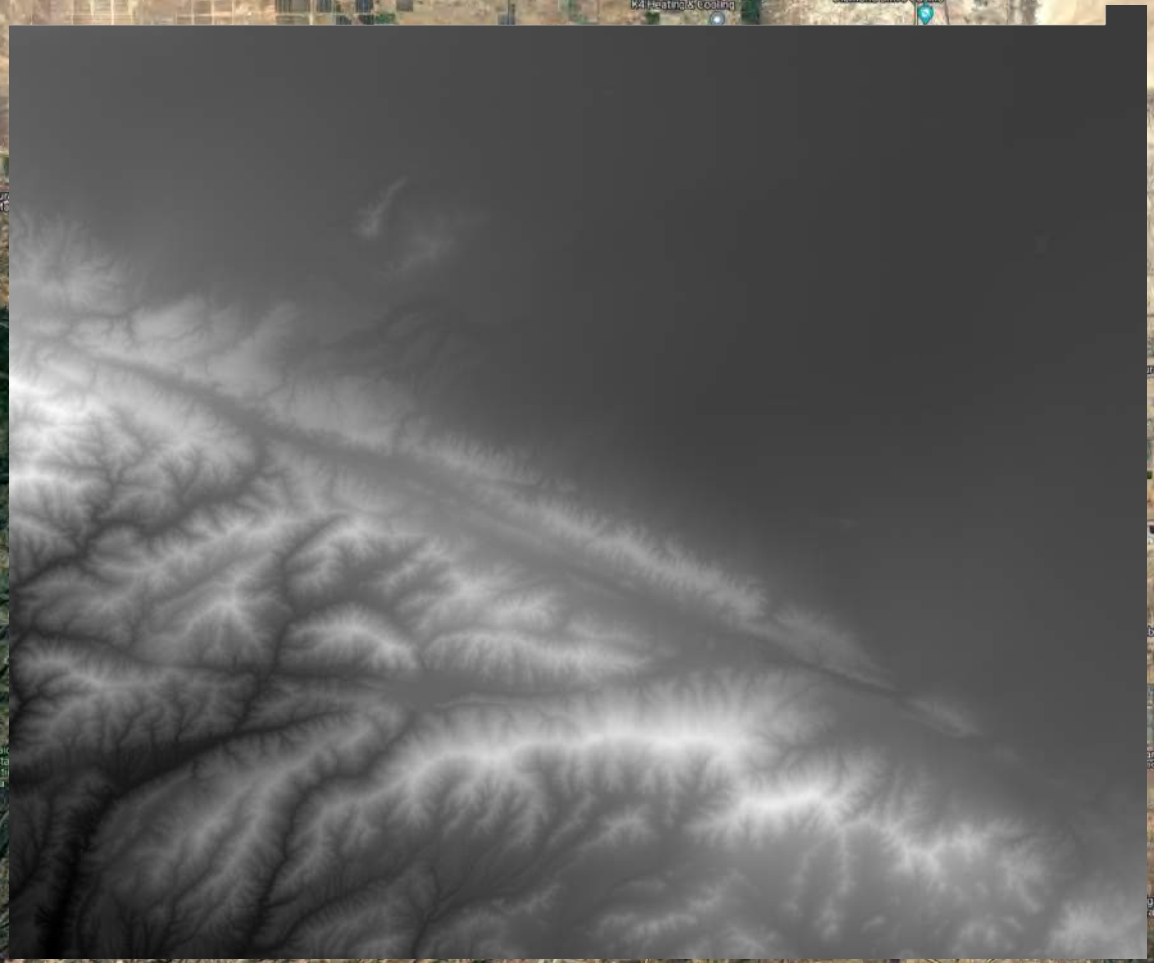
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED

SECTION D-D

5x VERTICAL SCALE

Appendix XIV: Antelope Valley Terrain Map

ESTU2023000671
RPPL2022013992



Legend

full AV Terrain 3x3.MergedInputs

Band 1 (Gray)

5,516.46875

1,293.125

Google Hybrid

0 5 10 mi

Appendix XV: Amargosa Tributary Map

ESTU2023000671
RPPL2022013992

Reaches
Project Limits — entities
Subbasins
Google Hybrid

0 10,000 20,000 ft

Appendix XVI: Subbasin Characteristics Table

ESTU2023000671
RPPL2022013992

Subbasin	Longest Flowpath Length (MI)	Longest Flowpath Slope (FT/FT)	Centroidal Flowpath Length (MI)	Centroidal Flowpath Slope (FT/FT)	10-85 Flowpath Length (MI)	10-85 Flowpath Slope (FT/FT)	Basin Slope (FT/FT)	Basin Relief (FT)	Relief Ratio	Elongation Ratio	Drainage Density (MI/MI^2)
Subbasin-10	8.445	0.034	4.381	0.006	6.334	0.013	0.118	1596.199	0.036	0.469	0.306
Subbasin-11	5.432	0.054	2.983	0.020	4.074	0.034	0.150	1621.088	0.057	0.471	0.101
Subbasin-15	5.549	0.052	3.059	0.015	4.162	0.038	0.131	1650.194	0.056	0.436	0.147
Subbasin-25	1.406	0.003	0.790	0.002	1.055	0.003	0.008	22.207	0.003	0.489	2.235
Subbasin-16	6.248	0.044	4.348	0.011	4.686	0.023	0.117	1519.168	0.046	0.411	0.227
Subbasin-28	2.329	0.006	1.016	0.003	1.747	0.005	0.007	67.924	0.006	0.332	1.148
Subbasin-5	8.387	0.034	4.250	0.014	6.290	0.027	0.176	1499.227	0.034	0.424	0.429
Subbasin-4	5.377	0.048	2.574	0.015	4.033	0.040	0.186	1350.412	0.048	0.440	0.061
Subbasin-8	7.804	0.029	4.015	0.007	5.853	0.016	0.087	1442.014	0.035	0.333	0.504
Subbasin-26	8.937	0.029	4.610	0.006	6.703	0.016	0.081	1397.946	0.030	0.290	1.008
Subbasin-32	4.836	0.004	2.779	0.003	3.627	0.004	0.010	111.983	0.004	0.278	2.920
Subbasin-29	1.680	0.004	1.028	0.003	1.260	0.003	0.020	37.662	0.004	0.404	0.592
Subbasin-6	6.497	0.004	3.329	0.002	4.873	0.004	0.008	133.095	0.004	0.322	0.351
Subbasin-34	5.923	0.003	3.223	0.002	4.442	0.003	0.009	89.340	0.003	0.316	0.592
Subbasin-14	7.473	0.034	4.112	0.005	5.605	0.017	0.081	1358.215	0.034	0.320	0.391
Subbasin-35	0.877	0.004	0.338	0.005	0.658	0.002	0.011	17.716	0.004	0.511	2.204
Subbasin-19	12.822	0.011	6.961	0.005	9.616	0.007	0.089	1403.871	0.021	0.314	0.737
Subbasin-36	3.906	0.003	2.031	0.002	2.930	0.002	0.010	52.913	0.003	0.439	0.899
Subbasin-13	9.449	0.008	5.364	0.007	7.087	0.009	0.020	462.068	0.009	0.308	0.329
Subbasin-9	8.740	0.008	3.623	0.005	6.555	0.009	0.020	386.047	0.008	0.331	0.121
Subbasin-37	4.162	0.002	1.769	0.001	3.122	0.002	0.009	44.209	0.002	0.404	0.767
Subbasin-23	1.434	0.002	0.713	0.000	1.075	0.001	0.013	12.095	0.002	0.483	2.678
Subbasin-18	6.206	0.033	2.814	0.011	4.655	0.013	0.273	1397.049	0.043	0.502	0.350
Subbasin-20	4.186	0.057	2.150	0.030	3.140	0.038	0.329	1455.245	0.066	0.492	0.143
Subbasin-21	4.421	0.082	2.109	0.020	3.315	0.065	0.309	2145.007	0.092	0.566	0.327
Subbasin-24	3.999	0.063	1.220	0.014	2.999	0.045	0.242	1349.217	0.064	0.536	0.644
Subbasin-22	6.060	0.071	2.816	0.028	4.545	0.049	0.334	2442.392	0.076	0.586	0.319
Subbasin-27	7.898	0.056	3.776	0.008	5.924	0.034	0.253	2327.953	0.056	0.445	0.604
Subbasin-33	12.413	0.014	7.022	0.008	9.310	0.009	0.076	903.888	0.014	0.211	1.901
Subbasin-17	6.751	0.010	3.616	0.009	5.063	0.011	0.024	355.010	0.010	0.345	0.228
Subbasin-7	5.987	0.007	2.924	0.005	4.490	0.007	0.017	219.531	0.007	0.362	0.040
Subbasin-39	1.830	0.005	0.821	0.003	1.372	0.005	0.036	59.770	0.006	0.359	4.482
Subbasin-40	2.596	0.002	1.207	0.001	1.947	0.002	0.020	52.650	0.004	0.345	2.159
Subbasin-38	0.673	0.001	0.247	0.001	0.505	0.000	0.008	4.256	0.001	0.440	3.896
Subbasin-41	7.706	0.002	2.833	0.002	5.780	0.002	0.011	100.271	0.002	0.284	0.231
Subbasin-12	12.000	0.005	6.233	0.003	9.000	0.005	0.017	332.075	0.005	0.293	0.561
Subbasin-3	8.310	0.004	4.424	0.002	6.232	0.003	0.016	155.176	0.004	0.299	0.302
Subbasin-42	1.159	0.002	0.534	0.000	0.869	0.002	0.021	32.052	0.005	0.552	2.839
Subbasin-30	0.260	0.001	0.121	0.001	0.195	0.000	0.004	2.234	0.002	0.430	4.519
Subbasin-44	13.529	0.009	7.313	0.003	10.147	0.005	0.021	741.167	0.010	0.308	0.894
Subbasin-31	4.805	0.002	2.180	0.002	3.604	0.001	0.010	43.926	0.002	0.374	1.166
Subbasin-43	2.076	0.001	0.912	0.001	1.557	0.001	0.011	34.468	0.003	0.448	1.571

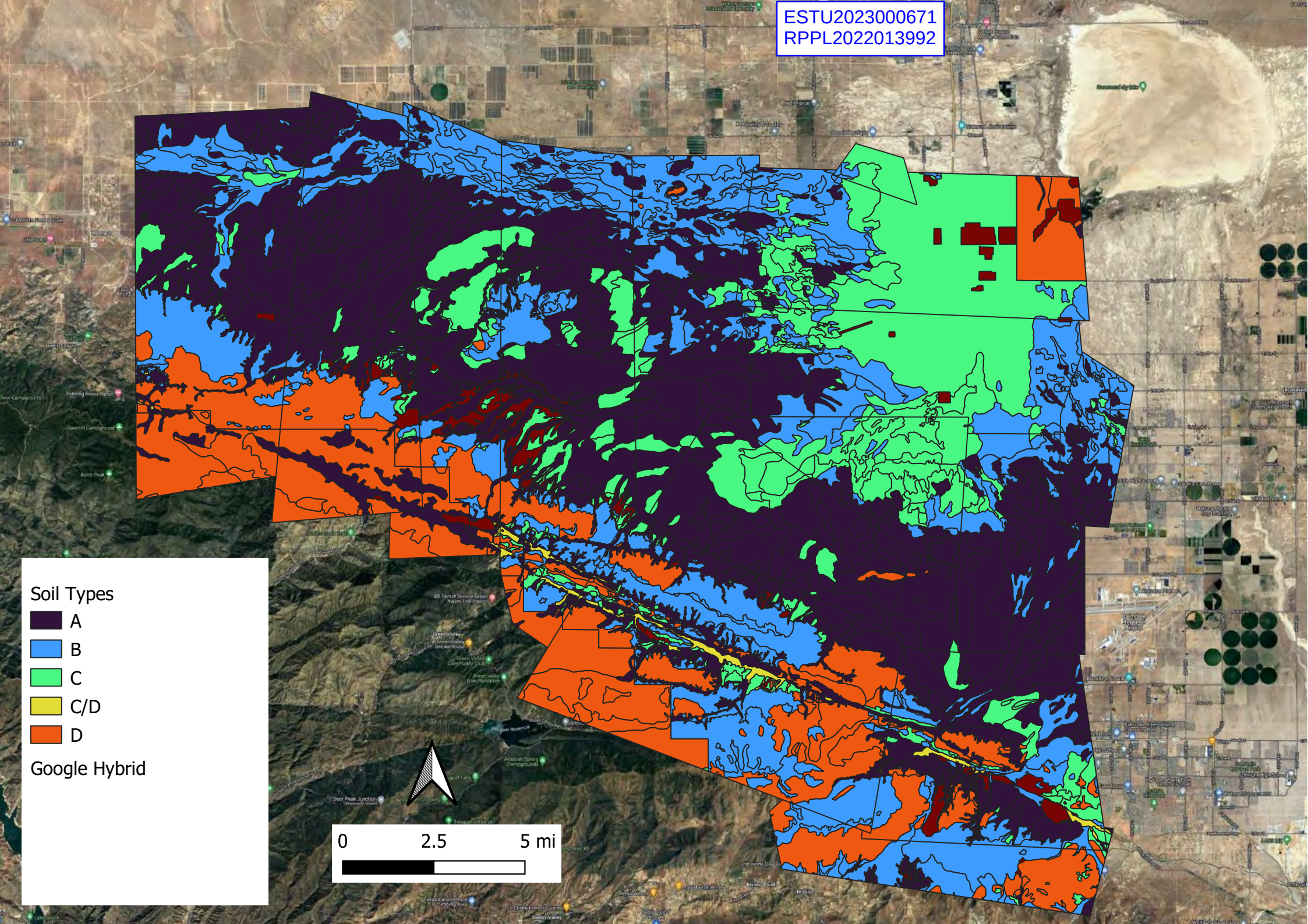
Appendix XVII: Reach Characteristics Table

ESTU2023000671
RPPL2022013992

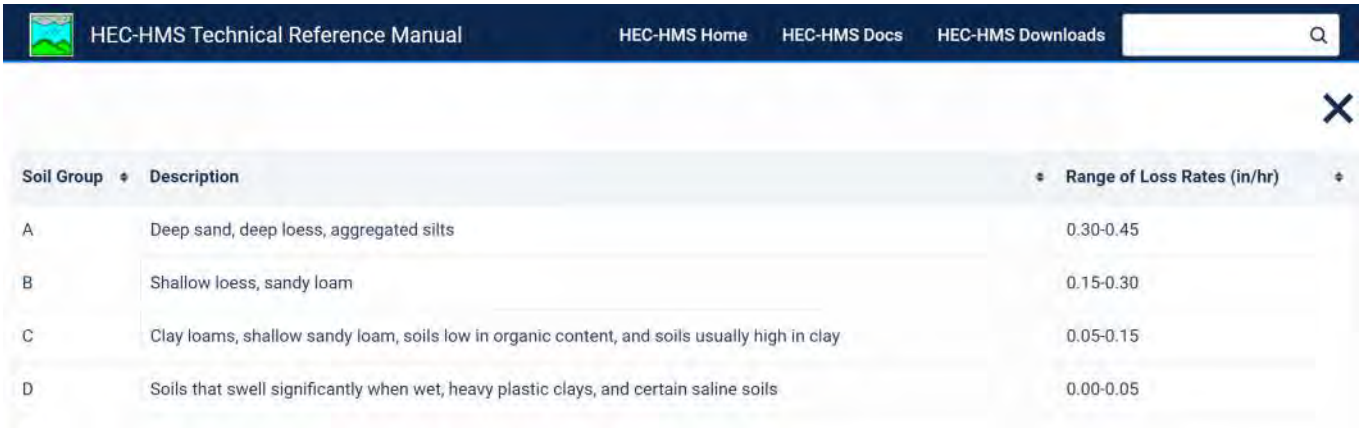
Reach	Length (MI)	Slope (FT/FT)	Relief (FT)	Sinuosity
Reach-19	0.837	0.002	7.034	1.227
Reach-16	0.542	0.001	2.596	1.214
Reach-15	0.221	0.004	4.348	1.109
Reach-18	5.318	0.006	155.531	1.317
Reach-12	4.140	0.003	74.815	1.298
Reach-10	1.632	0.001	9.945	1.352
Reach-9	0.355	0.004	7.193	1.069
Reach-8	2.083	0.001	13.026	1.682
Reach-7	1.710	0.001	10.226	1.302
Reach-21	1.017	0.001	7.581	1.239
Reach-6	0.275	0.001	1.104	1.053
Reach-20	2.331	0.008	94.278	1.282
Reach-17	5.876	0.009	271.615	1.171
Reach-11	10.262	0.008	417.570	1.476
Reach-5	1.524	0.004	34.203	1.165
Reach-4	1.363	0.001	8.677	1.236
Reach-3	0.872	0.002	10.060	1.329
Reach-2	0.918	0.001	5.140	1.161
Reach-14	0.051	0.002	0.665	1.062
Reach-1	1.059	0.001	2.871	1.182
Reach-13	2.967	0.001	17.372	1.649

Appendix XVIII: USGS Soils Type Map

ESTU2023000671
RPPL2022013992

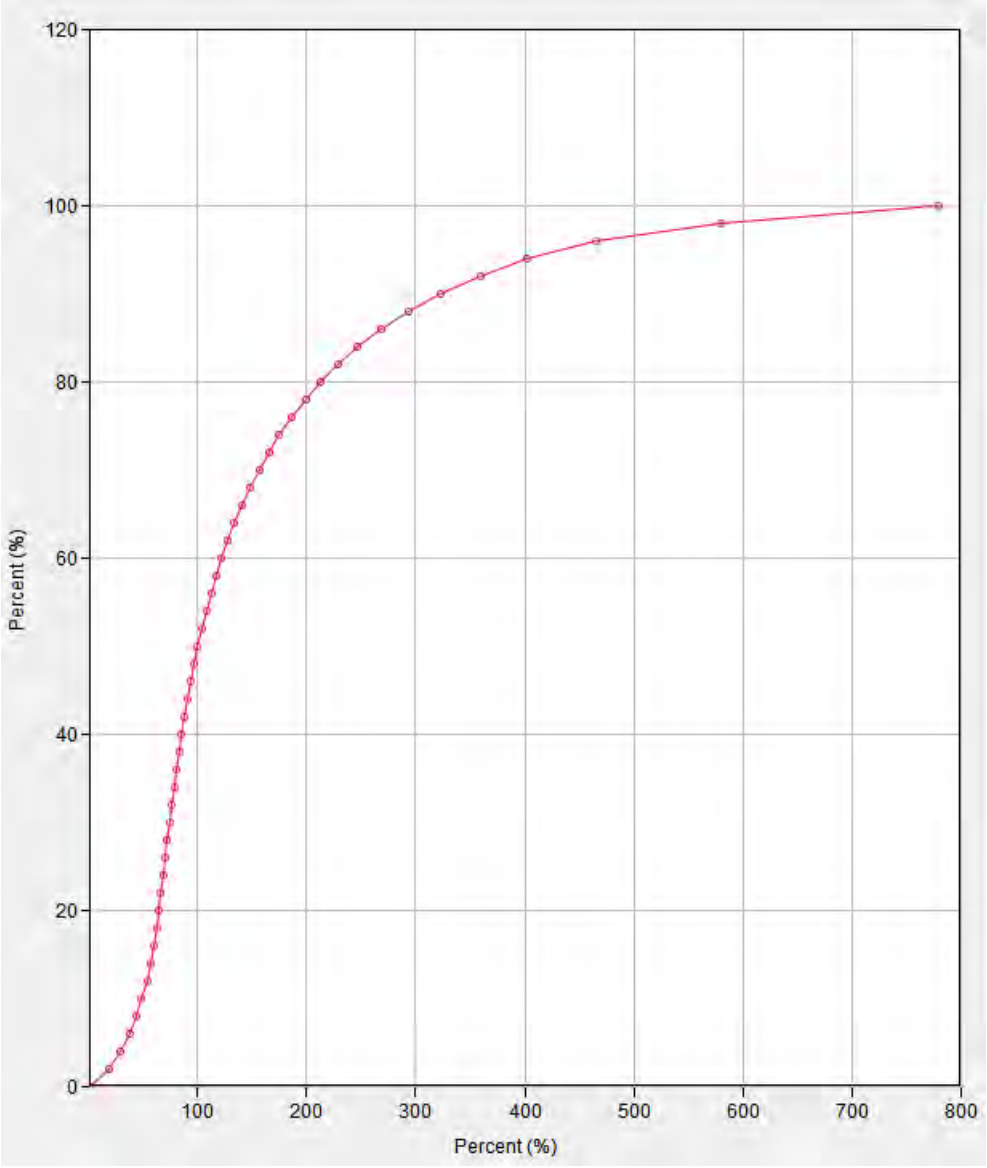


Appendix XIX: Army Corps of Engineers Soils Loss Table



Soil Group	Description	Range of Loss Rates (in/hr)
A	Deep sand, deep loess, aggregated silts	0.30-0.45
B	Shallow loess, sandy loam	0.15-0.30
C	Clay loams, shallow sandy loam, soils low in organic content, and soils usually high in clay	0.05-0.15
D	Soils that swell significantly when wet, heavy plastic clays, and certain saline soils	0.00-0.05

Appendix XX: Desert S-Graph


120
100
80
60
40
20
0
Percent (%)
100
200
300
400
500
600
700
800
Percent (%)

Appendix XXI: Lag Time Equation

ESTU2023000671
RPPL2022013992

Snyder Lag Time Estimation

$$t_p = 24\bar{n}\left(\frac{LL_c}{\sqrt{S}}\right)^{0.38}$$

Where:

t_p = Lag Time [hrs]

$\bar{n}$ = Average Roughness of Subbasin [−]

L = Longest Flowpath Length [mi]

L_c = Centroidal Flowpath Length [mi]

S = Slope of Longest Flowpath $[\frac{\text{ft}}{\text{mi}}]$

Appendix XXII: HEC-HMS Transform Table (Lag Time)

ESTU2023000671
RPPL2022013992

Subbasin	n_bar	L [mi]	L_c [mi]	S [ft/mi]	Lag Time (hr)
Subbasin-10	0.105	8.44	4.38	180	3.7065
Subbasin-11	0.0942	5.43	2.98	288	2.22312
Subbasin-15	0.0929	5.55	3.06	272	2.25747
Subbasin-25	0.0618	1.41	0.79	15.7	0.91464
Subbasin-16	0.119	6.25	4.35	231	3.5581
Subbasin-28	0.0621	2.33	1.02	29.2	1.08675
Subbasin-5	0.122	8.39	4.25	178	4.2578
Subbasin-4	0.14	5.38	2.57	251	3.192
Subbasin-8	0.0909	7.8	4.02	152	3.10878
Subbasin-26	0.0916	8.94	4.61	153	3.47164
Subbasin-32	0.0649	4.84	2.78	23.2	2.30395
Subbasin-29	0.112	1.68	1.03	22.5	1.8256
Subbasin-6	0.0599	6.5	3.33	20.4	2.60565
Subbasin-34	0.0883	5.92	3.22	15	3.8852
Subbasin-14	0.107	7.47	4.11	182	3.5096
Subbasin-35	0.121	0.877	0.338	20.2	1.03455
Subbasin-19	0.114	12.8	6.96	56.5	7.011
Subbasin-36	0.124	3.91	2.03	13.5	3.9928
Subbasin-13	0.119	9.45	5.36	44.5	6.1761
Subbasin-9	0.125	8.74	3.62	44	5.4375
Subbasin-37	0.142	4.16	1.77	10.6	4.6434
Subbasin-23	0.134	1.43	0.713	8.56	2.1574
Subbasin-18	0.142	6.21	2.81	172	3.8056
Subbasin-20	0.143	4.19	2.15	304	2.6741
Subbasin-21	0.15	4.42	2.11	432	2.655
Subbasin-24	0.127	4	1.22	331	1.8542
Subbasin-22	0.101	6.06	2.82	375	2.3129
Subbasin-27	0.109	7.9	3.78	293	3.2264
Subbasin-33	0.14	12.4	7.02	72.1	8.134
Subbasin-17	0.123	6.75	3.62	52.6	4.6863
Subbasin-7	0.137	5.99	2.92	36.4	4.932
Subbasin-39	0.142	1.83	0.821	27.2	2.13
Subbasin-40	0.139	2.6	1.21	12.4	3.1831
Subbasin-38	0.129	0.673	0.247	3.73	1.21905
Subbasin-41	0.124	7.71	2.83	13	5.9024
Subbasin-12	0.141	12	6.23	27.6	9.2778
Subbasin-3	0.143	8.31	4.42	18.5	7.7506
Subbasin-42	0.137	1.16	0.534	9.93	1.7673
Subbasin-30	0.152	0.26	0.121	6.59	0.68704
Subbasin-44	0.0824	13.5	7.31	49.1	5.40544
Subbasin-31	0.139	4.81	2.18	9.14	5.3515
Subbasin-43	0.146	2.08	0.912	6.73	3.1098

Appendix XXIII: Routing Map

ESTU2023000671
RPPL2022013992

REACHES CONSIDERED CHANNELIZED IN GREEN, TYP.

Reaches
Project Limits — entities
Subbasins
Google Hybrid

0 10,000 20,000 ft

Appendix XXIV: Routing Table

ESTU2023000671
RPPL2022013992

Reach	Length (FT)	Slope (FT/FT)	Manning's n	Index Celerity (FT/S)	Shape	Diameter (FT)	Width (FT)	Side Slope (xH:1V)	Left Manning's n	Right Manning's n	Cross Section
Reach-19	4417.776	0.00159	0.1		Trapezoid		500	1000			
Reach-16	2864.1888	0.00091	0.1		Trapezoid		500	1000			
Reach-15	1165.6656	0.00373	0.1		Trapezoid		500	1000			
Reach-18	28081.4688	0.00554	0.1		Trapezoid		500	1000			
Reach-12	21856.6128	0.00342	0.1		Trapezoid		500	1000			
Reach-10	8614.848	0.00115	0.1		Trapezoid		500	1000			
Reach-9	1874.2416	0.00384	0.1		Trapezoid		500	1000			
Reach-8	10996.1808	0.00118	0.1		Trapezoid		500	1000			
Reach-7	9030.4896	0.00113	0.1		Trapezoid		500	1000			
Reach-21	5369.8656	0.00141	0.1		Trapezoid		500	1000			
Reach-6	1452.1056	0.00076	0.03		Eight Point				0.03	0.03	Reach 6
Reach-20	12305.3568	0.00766	0.04		Eight Point				0.04	0.04	Reach 20
Reach-17	31023.4848	0.00876	0.04		Eight Point				0.04	0.04	Reach 17
Reach-11	54180.984	0.00771	0.04		Eight Point				0.04	0.04	Reach 11
Reach-5	8047.0368	0.00425	0.03		Eight Point				0.03	0.03	Reach 5
Reach-4	7195.584	0.00121	0.03		Eight Point				0.03	0.03	Reach 5
Reach-3	4604.16	0.00219	0.03		Eight Point				0.03	0.03	Reach 3
Reach-2	4845.5616	0.00106	0.1		Trapezoid		500	1000			
Reach-14	270.7056	0.00245	0.1		Trapezoid		500	1000			
Reach-1	5590.5696	0.00051	0.1		Trapezoid		500	1000			
Reach-13	15666.024	0.00111	0.1		Trapezoid		500	1000			

Appendix XXV: LA County Rainfall Maps

ESTU2023000671
RPPL2022013992

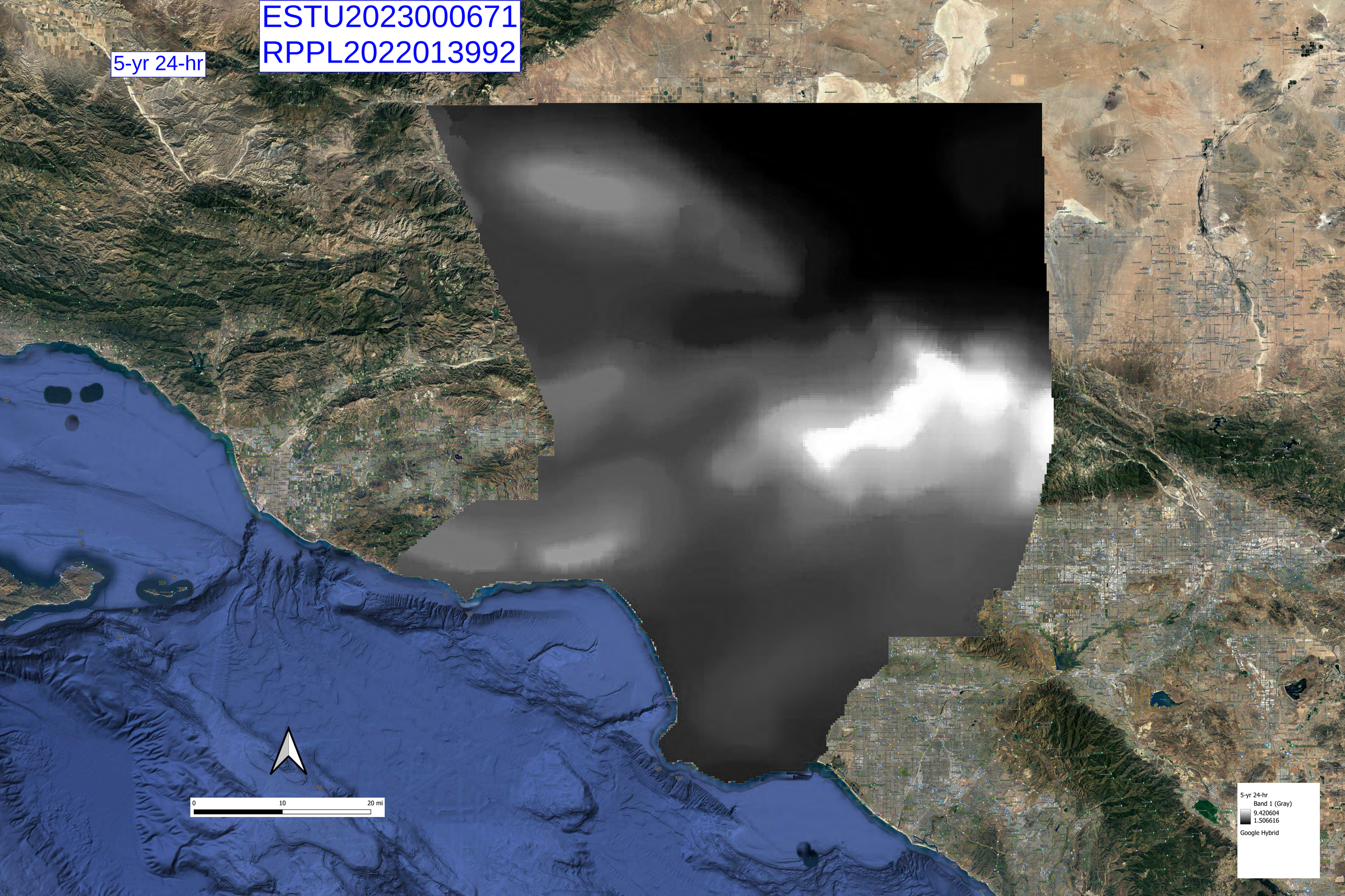
2-yr 24-hr

0 10 20 mi

2-yr 24-hr
Band 1 (Gray)
6.247
0.999068
Google Hybrid

ESTU2023000671
RPPL2022013992

5-yr 24-hr



ESTU2023000671
RPPL2022013992

10-yr 24-hr

0 10 20 mi

10-yr 24-hr
Band 1 (Gray)
11.52521
1.8432
Google Hybrid

ESTU2023000671
RPPL2022013992

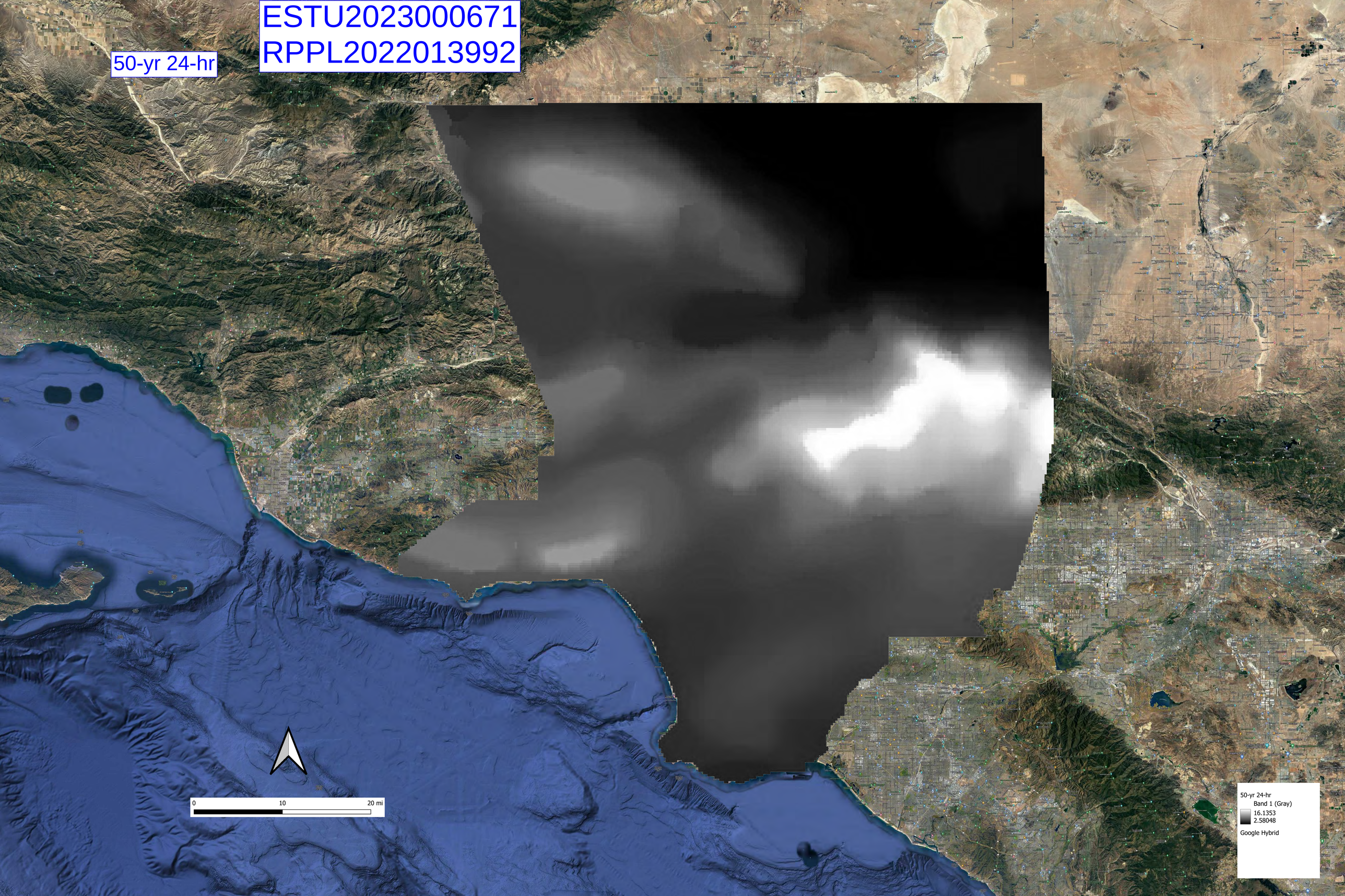
25-yr 24-hr

0 10 20 mi

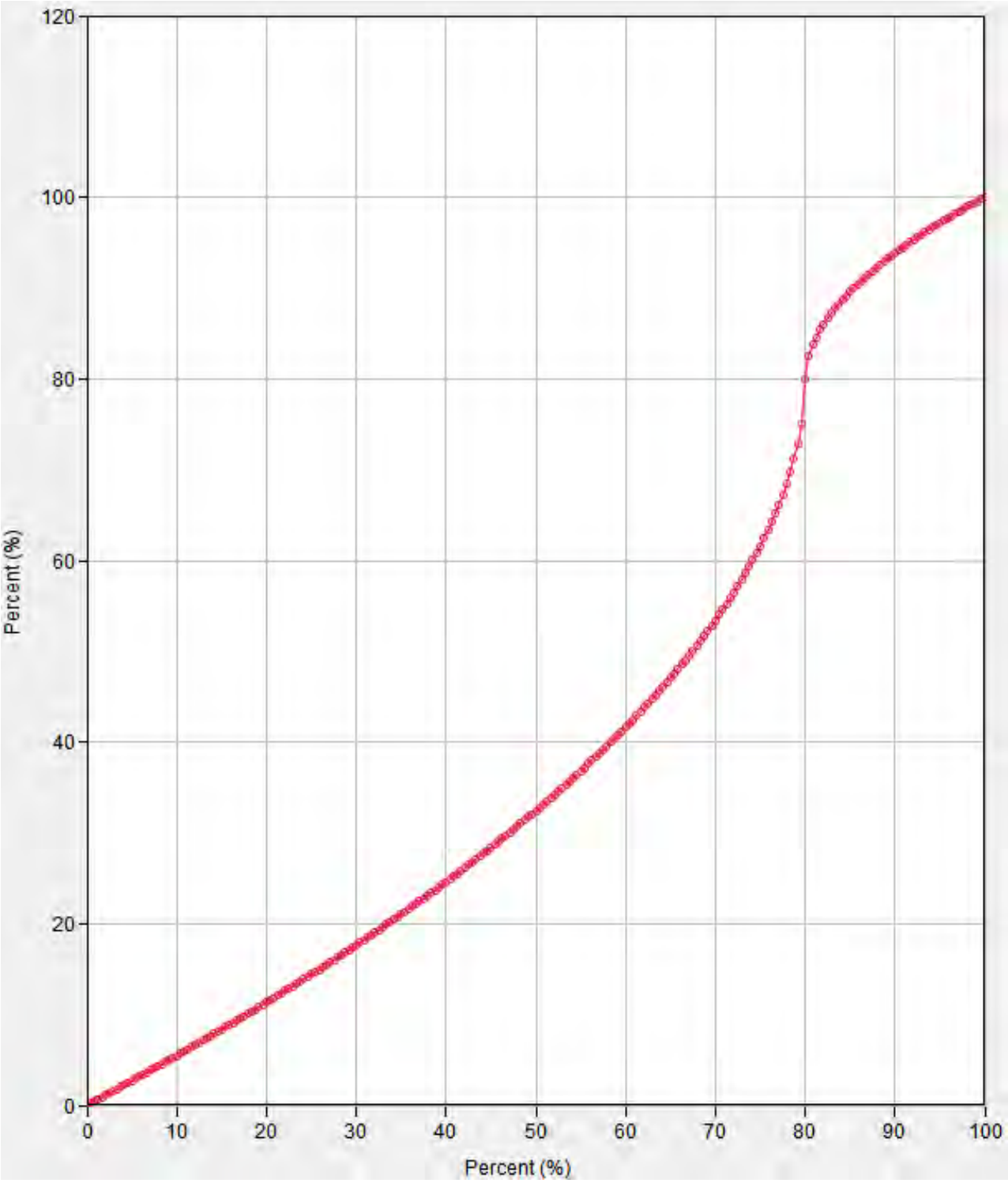
25-yr 24-hr
Band 1 (Gray)
14.16431
2.265266
Google Hybrid

ESTU2023000671
RPPL2022013992

50-yr 24-hr



Appendix XXVI: LA County Unit Hyetograph


120
100
80
60
40
20
0
Percent (%)
0
10
20
30
40
50
60
70
80
90
100
Percent (%)

Appendix XXVII: Burned Subbasin Map

ESTU2023000671
RPPL2022013992

Reaches
Project Limits — entities
Subbasins
Google Hybrid

Subbasins assumed to have 0 constant loss (fully burned)

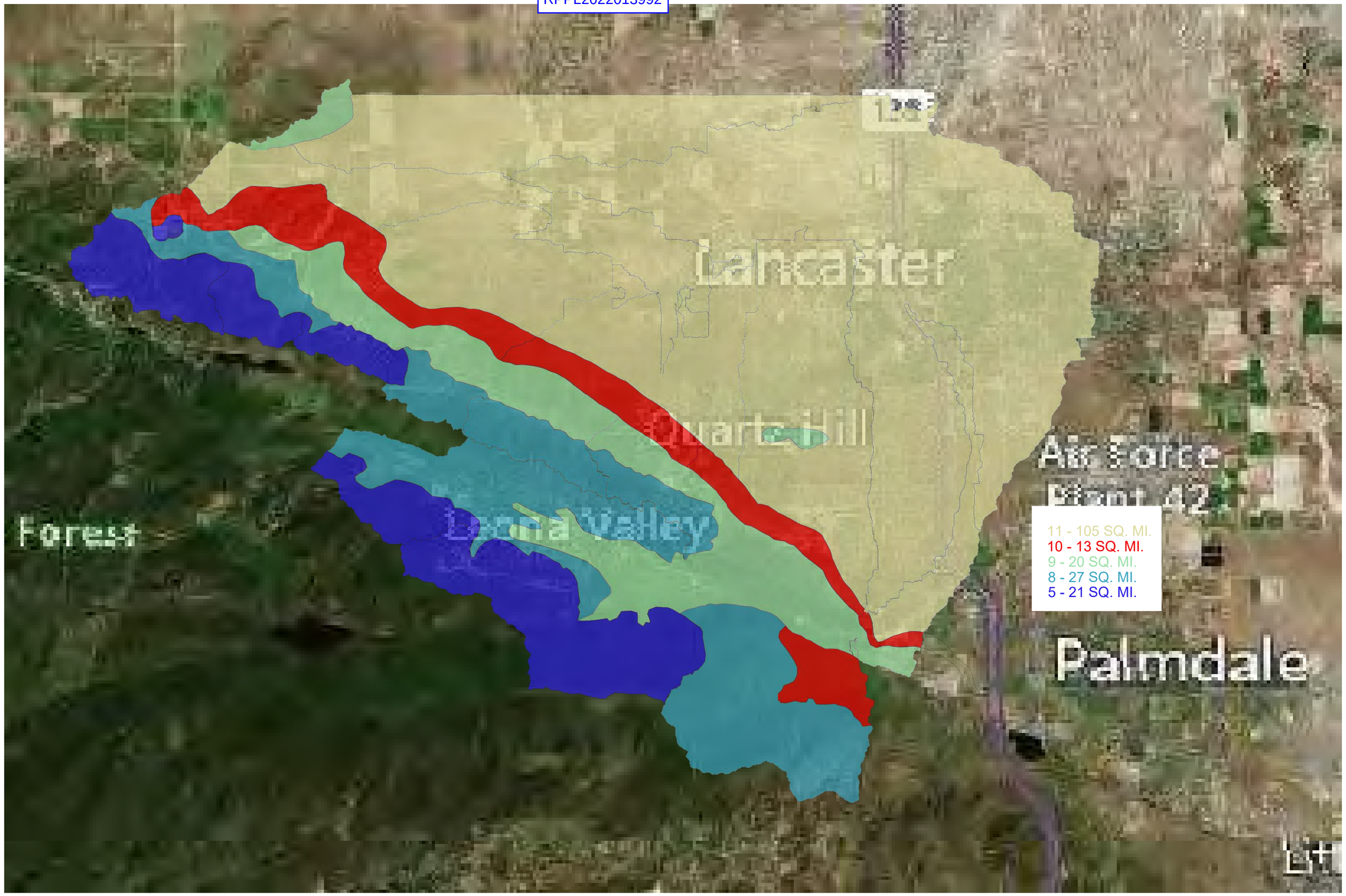
0 10,000 20,000 ft

Appendix XXVIII: Burned Subbasin Characteristics Table

Subbasin	Initial Loss (IN)	Constant Rate (IN/HR)	Impervious (%)
Subbasin-10	0	0.195	1.13
Subbasin-11	0	0.198	1.2
Subbasin-15	0	0.212	1.01
Subbasin-25	0	0.05	0.283
Subbasin-16	0	0.253	16.4
Subbasin-28	0	0.127	0.223
Subbasin-5	0	0.139	0.137
Subbasin-4	0	0.121	0.0594
Subbasin-8	0	0.195	0.363
Subbasin-26	0	0.199	0.548
Subbasin-32	0	0.215	1.2
Subbasin-29	0	0.239	30.3
Subbasin-6	0	0.251	4.04
Subbasin-34	0	0.191	6.89
Subbasin-14	0	0.215	20.4
Subbasin-35	0	0.0805	25.1
Subbasin-19	0	0.216	24.1
Subbasin-36	0	0.173	0.72
Subbasin-13	0	0.208	28.4
Subbasin-9	0	0.197	24.1
Subbasin-37	0	0.113	4.38
Subbasin-23	0	0.05	14.7
Subbasin-18	0	0	0.189
Subbasin-20	0	0	0.461
Subbasin-21	0	0	0.207
Subbasin-24	0	0	1.8
Subbasin-22	0	0	1.56
Subbasin-27	0	0	1.29
Subbasin-33	0	0.221	30.4
Subbasin-17	0	0.271	21.3
Subbasin-7	0	0.217	42.5
Subbasin-39	0	0.0733	46.6
Subbasin-40	0	0.0432	36.5
Subbasin-38	0	0.0452	7.58
Subbasin-41	0	0.126	14.2
Subbasin-12	0	0.214	35.7
Subbasin-3	0	0.172	26.2
Subbasin-42	0	0.05	9.85
Subbasin-30	0	0.05	0.258
Subbasin-44	0	0.201	1.03
Subbasin-31	0	0.0498	4.69
Subbasin-43	0	0.05	2.18

Appendix XXIX: LA County DPA Map

ESTU2023000671
RPPL2022013992

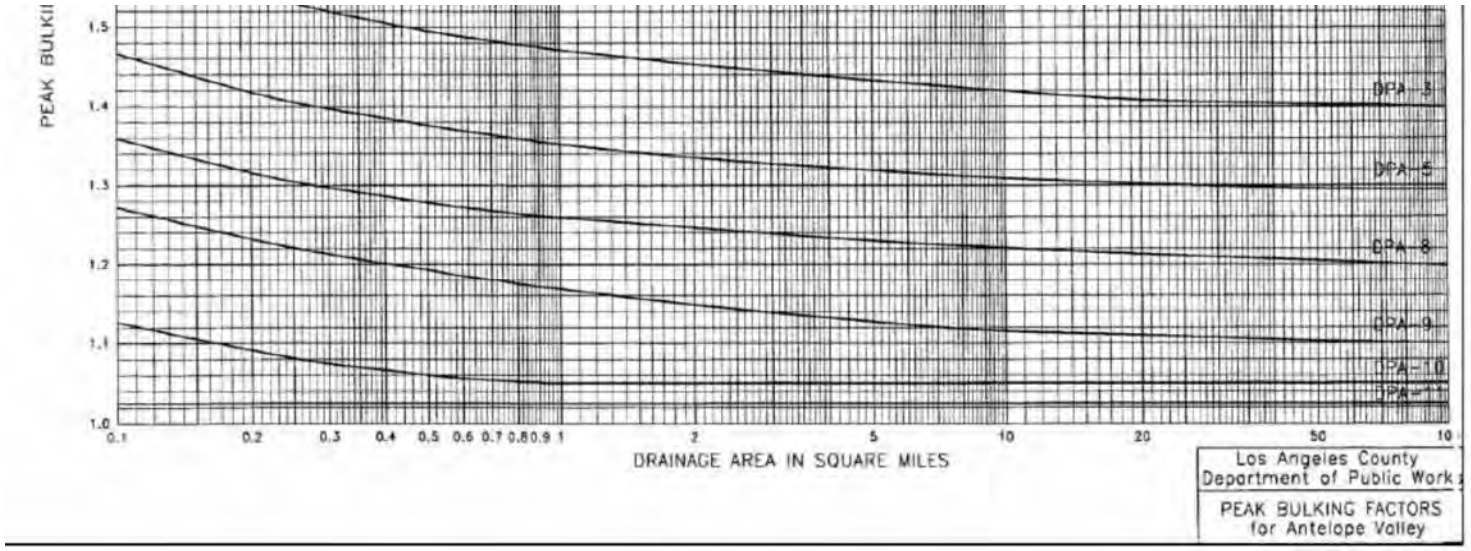


Appendix XXX: Bulked Flow Calculation

ESTU2023000671
RPPL2022013992

DPA	AREA [SQ. MI.]	PK BLK FACTOR	BULKING
5	21	1.3	0.14677419
8	27	1.2	0.17419355
9	20	1.1	0.11827957
10	13	1.05	0.0733871
11	105	1.02	0.57580645
		TOTAL BULKING:	**1.08844086**

= BLK FACTOR*AREA/TOTAL AREA



Appendix XXXI: HEC-HMS Summary Outputs

ESTU2023000671
RPPL2022013992

2-YEAR 24-HOUR CLEAR					
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak		Volume (ACRE-FT)
Subbasin-10	12.3	432.7	1-Jan-01	21:53	145.1
Subbasin-11	5.1	271.5	1-Jan-01	20:54	57.3
Reach-19	17.4	476.1	1-Jan-01	23:09	199.2
Subbasin-15	4.6	184.3	1-Jan-01	21:00	38.5
Subbasin-25	0.4	41.3	1-Jan-01	20:14	6.9
Reach-16	22.4	409.8	2-Jan-01	00:04	241.2
Subbasin-16	5.2	184.4	1-Jan-01	21:24	112.8
Subbasin-28	0.5	29.4	1-Jan-01	20:29	3.2
Reach-15	28.1	457.4	2-Jan-01	00:17	357.1
Subbasin-5	9.9	636.3	1-Jan-01	21:31	255.2
Subbasin-4	4.4	384.9	1-Jan-01	20:53	128.8
Reach-18	14.3	872.1	2-Jan-01	01:35	383.4
Subbasin-8	5.3	204.9	1-Jan-01	21:40	55.4
Subbasin-26	5.3	152.1	1-Jan-01	21:59	45.9
Reach-12	24.9	819.7	2-Jan-01	05:35	482
Subbasin-32	1.4	26	1-Jan-01	21:21	5.8
Subbasin-29	0.4	17.4	1-Jan-01	20:19	8.9
Reach-10	54.7	708.8	2-Jan-01	08:19	847.6
Subbasin-6	3.4	43	1-Jan-01	22:14	15.7
Subbasin-34	2.7	41.1	1-Jan-01	21:55	21.6
Reach-9	60.9	707.6	2-Jan-01	08:39	884.8
Subbasin-14	4.5	147.3	1-Jan-01	21:50	95.8
Subbasin-35	0.2	12.6	1-Jan-01	19:47	3.4
Reach-8	65.6	622.5	2-Jan-01	11:55	978.5
Subbasin-19	12.8	294.2	1-Jan-01	22:47	318.2
Subbasin-36	2.3	20	1-Jan-01	21:10	7.2
Reach-7	80.6	593.6	2-Jan-01	14:35	1299.5
Subbasin-13	6.7	139.3	1-Jan-01	22:05	147.2
Subbasin-9	6.6	135.6	1-Jan-01	21:50	127.2
Reach-21	13.2	247.2	1-Jan-01	22:26	273.8
Subbasin-37	2.2	28.5	1-Jan-01	21:14	14.4
Subbasin-23	0.4	18.4	1-Jan-01	20:29	6.5
Reach-6	96.5	603.6	2-Jan-01	14:41	1594
Subbasin-18	7.6	635.8	1-Jan-01	21:06	257.7
Subbasin-20	3.3	440.1	1-Jan-01	20:31	189.5
Reach-20	11	969.3	1-Jan-01	21:21	447.2
Subbasin-21	4.9	476.3	1-Jan-01	20:37	137.2
Subbasin-24	3.6	400	1-Jan-01	20:26	84.9
Reach-17	19.5	1489	1-Jan-01	21:24	669.3
Subbasin-22	9.9	1060.2	1-Jan-01	20:50	299.6
Subbasin-27	9.7	875.9	1-Jan-01	21:34	344.3
Reach-11	39.1	2131.4	1-Jan-01	22:25	1313
Subbasin-33	5.4	122.3	1-Jan-01	22:33	153
Subbasin-17	4.3	78.5	1-Jan-01	21:24	70
Reach-5	48.8	2302.6	1-Jan-01	23:23	1535.9
Subbasin-7	3.7	91	1-Jan-01	21:24	92.3
Subbasin-39	0.3	18.4	1-Jan-01	20:17	10
Reach-4	52.8	2341.5	1-Jan-01	23:41	1637.7
Subbasin-40	0.6	28.7	1-Jan-01	20:51	17.6
Subbasin-38	0.1	4.8	1-Jan-01	19:54	1
Reach-3	149.9	2623.2	1-Jan-01	23:49	3250.4
Subbasin-41	3.8	49.3	1-Jan-01	21:55	41.4
Reach-2	153.7	2487.2	2-Jan-01	00:54	3283.8
Subbasin-12	9.7	146.8	1-Jan-01	22:50	210.2
Subbasin-3	4.9	64.5	1-Jan-01	22:24	78.2
Reach-14	14.6	208.2	1-Jan-01	22:55	288.4
Subbasin-42	0.3	16.9	1-Jan-01	20:29	4.7
Subbasin-30	0	0.9	1-Jan-01	19:31	0.1
Reach-1	168.6	2283.7	2-Jan-01	02:41	3550.7
Subbasin-44	13.6	104.8	1-Jan-01	23:12	52.3
Reach-13	13.6	55.6	2-Jan-01	01:14	49.7
Subbasin-31	2.5	56.1	1-Jan-01	21:23	31.3
Subbasin-43	0.7	22.2	1-Jan-01	20:41	7.5
Sink-1	185.4	2297.2	2-Jan-01	02:40	3639.2

ESTU2023000671
RPPL2022013992

5-YEAR 24-HOUR CLEAR					
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (ACRE-FT)	Volume (ACRE-FT)
Subbasin-10	12.3	945.3	1-Jan-01	21:52	334
Subbasin-11	5.1	571.3	1-Jan-01	20:54	131.4
Reach-19	17.4	1094.8	1-Jan-01	22:50	460.1
Subbasin-15	4.6	402.3	1-Jan-01	20:59	88.5
Subbasin-25	0.4	68.4	1-Jan-01	20:14	16.5
Reach-16	22.4	1006.8	1-Jan-01	23:29	559.8
Subbasin-16	5.2	354.2	1-Jan-01	21:24	194
Subbasin-28	0.5	58	1-Jan-01	20:29	7.6
Reach-15	28.1	1117.4	1-Jan-01	23:31	761.3
Subbasin-5	9.9	1264.9	1-Jan-01	21:30	609.9
Subbasin-4	4.4	724.4	1-Jan-01	20:53	308.4
Reach-18	14.3	1754.2	2-Jan-01	00:55	917.1
Subbasin-8	5.3	446.9	1-Jan-01	21:40	130.8
Subbasin-26	5.3	340	1-Jan-01	22:00	107.5
Reach-12	24.9	1674	2-Jan-01	04:10	1150.6
Subbasin-32	1.4	60.3	1-Jan-01	21:20	13
Subbasin-29	0.4	30.9	1-Jan-01	20:19	14.2
Reach-10	54.7	1557.3	2-Jan-01	06:15	1929.5
Subbasin-6	3.4	101.1	1-Jan-01	21:48	31.4
Subbasin-34	2.7	86.8	1-Jan-01	21:55	40.7
Reach-9	60.9	1556.4	2-Jan-01	06:31	2001.5
Subbasin-14	4.5	274.7	1-Jan-01	21:50	160.8
Subbasin-35	0.2	21.8	1-Jan-01	19:47	5.9
Reach-8	65.6	1420.8	2-Jan-01	09:05	2158.4
Subbasin-19	12.8	522.2	1-Jan-01	22:50	525.9
Subbasin-36	2.3	47.4	1-Jan-01	21:09	16.6
Reach-7	80.6	1377.9	2-Jan-01	11:10	2693.9
Subbasin-13	6.7	239.1	1-Jan-01	22:05	236.9
Subbasin-9	6.6	240.6	1-Jan-01	21:50	208.1
Reach-21	13.2	427.5	1-Jan-01	22:23	443.9
Subbasin-37	2.2	62.1	1-Jan-01	21:14	29.7
Subbasin-23	0.4	32.4	1-Jan-01	20:29	12.8
Reach-6	96.5	1402.2	2-Jan-01	11:14	3180.2
Subbasin-18	7.6	1189.8	1-Jan-01	21:06	615.9
Subbasin-20	3.3	738.3	1-Jan-01	20:31	425
Reach-20	11	1767.8	1-Jan-01	21:18	1040.8
Subbasin-21	4.9	886.1	1-Jan-01	20:37	327.5
Subbasin-24	3.6	746.7	1-Jan-01	20:26	195.6
Reach-17	19.5	2877.9	1-Jan-01	21:16	1563.9
Subbasin-22	9.9	1909.1	1-Jan-01	20:50	700.2
Subbasin-27	9.7	1570	1-Jan-01	21:34	810.9
Reach-11	39.1	4566.3	1-Jan-01	22:05	3074.7
Subbasin-33	5.4	207.9	1-Jan-01	22:34	246.6
Subbasin-17	4.3	140.8	1-Jan-01	21:24	114.1
Reach-5	48.8	4833.8	1-Jan-01	22:58	3435.3
Subbasin-7	3.7	148.4	1-Jan-01	21:24	143.7
Subbasin-39	0.3	30.7	1-Jan-01	20:17	16.3
Reach-4	52.8	4927.8	1-Jan-01	23:15	3594.6
Subbasin-40	0.6	48.2	1-Jan-01	20:51	31
Subbasin-38	0.1	8.2	1-Jan-01	19:54	2.2
Reach-3	149.9	5354.3	1-Jan-01	23:21	6808.7
Subbasin-41	3.8	95.9	1-Jan-01	21:56	73.2
Reach-2	153.7	5215.8	2-Jan-01	00:15	6870.7
Subbasin-12	9.7	239.2	1-Jan-01	22:51	330.5
Subbasin-3	4.9	110.5	1-Jan-01	22:24	126.4
Reach-14	14.6	343.6	1-Jan-01	22:54	456.9
Subbasin-42	0.3	29.8	1-Jan-01	20:29	9.7
Subbasin-30	0	1.5	1-Jan-01	19:31	0.2
Reach-1	168.6	4754.2	2-Jan-01	01:38	7295.5
Subbasin-44	13.6	245.7	1-Jan-01	23:13	118.1
Reach-13	13.6	128.4	2-Jan-01	00:54	110.8
Subbasin-31	2.5	110	1-Jan-01	21:23	69.3
Subbasin-43	0.7	42	1-Jan-01	20:41	17.2
Sink-1	185.4	4785.9	2-Jan-01	01:36	7492.8

ESTU2023000671
RPPL2022013992

10-YEAR 24-HOUR CLEAR					
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (ACRE-FT)	Volume (ACRE-FT)
Subbasin-10	12.3	1348.4	1-Jan-01	21:52	505.6
Subbasin-11	5.1	798	1-Jan-01	20:54	198.6
Reach-19	17.4	1607.7	1-Jan-01	22:42	698.7
Subbasin-15	4.6	572.3	1-Jan-01	20:59	133.7
Subbasin-25	0.4	86.3	1-Jan-01	20:14	25.1
Reach-16	22.4	1543.1	1-Jan-01	23:13	851.3
Subbasin-16	5.2	489.5	1-Jan-01	21:24	257.7
Subbasin-28	0.5	78.5	1-Jan-01	20:28	11.6
Reach-15	28.1	1711.8	1-Jan-01	23:19	1120.5
Subbasin-5	9.9	1717.8	1-Jan-01	21:30	935.8
Subbasin-4	4.4	959.2	1-Jan-01	20:53	473.5
Reach-18	14.3	2393.5	2-Jan-01	00:40	1407.8
Subbasin-8	5.3	635	1-Jan-01	21:40	199.9
Subbasin-26	5.3	491.3	1-Jan-01	21:59	163.7
Reach-12	24.9	2320.2	2-Jan-01	03:37	1764.2
Subbasin-32	1.4	88.9	1-Jan-01	21:21	19.5
Subbasin-29	0.4	41.2	1-Jan-01	20:19	18
Reach-10	54.7	2197.1	2-Jan-01	05:24	2909.2
Subbasin-6	3.4	148.4	1-Jan-01	21:48	44
Subbasin-34	2.7	125	1-Jan-01	21:55	56.6
Reach-9	60.9	2197.9	2-Jan-01	05:38	3009.5
Subbasin-14	4.5	374.9	1-Jan-01	21:50	210.5
Subbasin-35	0.2	27.9	1-Jan-01	19:47	7.9
Reach-8	65.6	2033.1	2-Jan-01	07:53	3214.7
Subbasin-19	12.8	702.5	1-Jan-01	22:51	682.5
Subbasin-36	2.3	71.4	1-Jan-01	21:09	25
Reach-7	80.6	1993.7	2-Jan-01	09:42	3913.7
Subbasin-13	6.7	316.4	1-Jan-01	22:05	302.2
Subbasin-9	6.6	323.5	1-Jan-01	21:50	268.2
Reach-21	13.2	568.1	1-Jan-01	22:21	569
Subbasin-37	2.2	89.7	1-Jan-01	21:14	43.1
Subbasin-23	0.4	41.9	1-Jan-01	20:29	18.3
Reach-6	96.5	2032	2-Jan-01	09:45	4544
Subbasin-18	7.6	1571.3	1-Jan-01	21:06	944.8
Subbasin-20	3.3	936.2	1-Jan-01	20:31	585.2
Reach-20	11	2311.5	1-Jan-01	21:17	1530
Subbasin-21	4.9	1167.3	1-Jan-01	20:37	502.3
Subbasin-24	3.6	985.9	1-Jan-01	20:26	296.3
Reach-17	19.5	3843.5	1-Jan-01	21:13	2329.1
Subbasin-22	9.9	2482.9	1-Jan-01	20:50	1065.8
Subbasin-27	9.7	2037.8	1-Jan-01	21:34	1219.1
Reach-11	39.1	6485.2	1-Jan-01	22:00	4598
Subbasin-33	5.4	273.5	1-Jan-01	22:34	314.9
Subbasin-17	4.3	188.3	1-Jan-01	21:24	145.8
Reach-5	48.8	6801.5	1-Jan-01	22:48	5058.7
Subbasin-7	3.7	189.7	1-Jan-01	21:24	179.1
Subbasin-39	0.3	39.2	1-Jan-01	20:17	20.9
Reach-4	52.8	6766.9	1-Jan-01	23:04	5257.7
Subbasin-40	0.6	61.4	1-Jan-01	20:51	41.7
Subbasin-38	0.1	10.4	1-Jan-01	19:54	3.3
Reach-3	149.9	7374	1-Jan-01	23:10	9848.4
Subbasin-41	3.8	133.6	1-Jan-01	21:56	98.5
Reach-2	153.7	7155.4	2-Jan-01	00:01	9933.3
Subbasin-12	9.7	306	1-Jan-01	22:52	414.6
Subbasin-3	4.9	145.9	1-Jan-01	22:25	161.6
Reach-14	14.6	443.3	1-Jan-01	22:54	576.1
Subbasin-42	0.3	38.5	1-Jan-01	20:29	14.1
Subbasin-30	0	1.9	1-Jan-01	19:31	0.4
Reach-1	168.6	6550.2	2-Jan-01	01:16	10473.5
Subbasin-44	13.6	372.3	1-Jan-01	23:16	177.3
Reach-13	13.6	197.7	2-Jan-01	00:44	166.1
Subbasin-31	2.5	149.1	1-Jan-01	21:23	103.4
Subbasin-43	0.7	55.8	1-Jan-01	20:41	26.1
Sink-1	185.4	6599.8	2-Jan-01	01:14	10769

ESTU2023000671
RPPL2022013992

25-YEAR 24-HOUR CLEAR					
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (ACRE-FT)	Volume (ACRE-FT)
Subbasin-10	12.3	1897.7	1-Jan-01	21:52	1.18
Subbasin-11	5.1	1100.3	1-Jan-01	20:54	1.11
Reach-19	17.4	2324.9	1-Jan-01	22:35	1.15
Subbasin-15	4.6	803.5	1-Jan-01	20:59	0.83
Subbasin-25	0.4	108.8	1-Jan-01	20:14	1.83
Reach-16	22.4	2320.8	1-Jan-01	22:58	1.09
Subbasin-16	5.2	678	1-Jan-01	21:24	1.26
Subbasin-28	0.5	104.8	1-Jan-01	20:28	0.72
Reach-15	28.1	2581.6	1-Jan-01	22:55	1.12
Subbasin-5	9.9	2301.8	1-Jan-01	21:30	2.74
Subbasin-4	4.4	1256.1	1-Jan-01	20:53	3.11
Reach-18	14.3	3213.6	2-Jan-01	00:27	2.85
Subbasin-8	5.3	889.9	1-Jan-01	21:40	1.09
Subbasin-26	5.3	699.9	1-Jan-01	21:59	0.9
Reach-12	24.9	3186.5	2-Jan-01	03:09	2.06
Subbasin-32	1.4	130.1	1-Jan-01	21:20	0.39
Subbasin-29	0.4	55	1-Jan-01	20:19	1.2
Reach-10	54.7	3120.6	2-Jan-01	04:38	1.52
Subbasin-6	3.4	219	1-Jan-01	21:48	0.34
Subbasin-34	2.7	180.2	1-Jan-01	21:55	0.55
Reach-9	60.9	3123.8	2-Jan-01	04:51	1.41
Subbasin-14	4.5	513.8	1-Jan-01	21:50	1.17
Subbasin-35	0.2	35.8	1-Jan-01	19:47	1.28
Reach-8	65.6	2918.2	2-Jan-01	06:49	1.39
Subbasin-19	12.8	954.8	1-Jan-01	22:50	1.32
Subbasin-36	2.3	106.8	1-Jan-01	21:09	0.31
Reach-7	80.6	2886.5	2-Jan-01	08:23	1.34
Subbasin-13	6.7	424.1	1-Jan-01	22:05	1.1
Subbasin-9	6.6	439.2	1-Jan-01	21:50	1
Reach-21	13.2	767.2	1-Jan-01	22:19	1.05
Subbasin-37	2.2	128.6	1-Jan-01	21:14	0.54
Subbasin-23	0.4	53.9	1-Jan-01	20:29	1.32
Reach-6	96.5	2947.5	2-Jan-01	08:24	1.29
Subbasin-18	7.6	2052.3	1-Jan-01	21:06	3.46
Subbasin-20	3.3	1184.3	1-Jan-01	20:31	4.42
Reach-20	11	2985.8	1-Jan-01	21:16	3.75
Subbasin-21	4.9	1522.4	1-Jan-01	20:37	2.96
Subbasin-24	3.6	1288.3	1-Jan-01	20:26	2.36
Reach-17	19.5	5057.3	1-Jan-01	21:11	3.29
Subbasin-22	9.9	3204.3	1-Jan-01	20:50	3.04
Subbasin-27	9.7	2624.6	1-Jan-01	21:34	3.35
Reach-11	39.1	8933.4	1-Jan-01	21:55	3.24
Subbasin-33	5.4	364.9	1-Jan-01	22:34	1.42
Subbasin-17	4.3	257.1	1-Jan-01	21:24	0.84
Reach-5	48.8	9394.6	1-Jan-01	22:40	2.83
Subbasin-7	3.7	246	1-Jan-01	21:24	1.15
Subbasin-39	0.3	50	1-Jan-01	20:17	1.5
Reach-4	52.8	9555.1	1-Jan-01	22:55	2.7
Subbasin-40	0.6	77.9	1-Jan-01	20:51	1.68
Subbasin-38	0.1	13.3	1-Jan-01	19:54	1.32
Reach-3	149.9	10353.5	1-Jan-01	23:01	1.79
Subbasin-41	3.8	187.3	1-Jan-01	21:55	0.68
Reach-2	153.7	10045.2	1-Jan-01	23:48	1.76
Subbasin-12	9.7	397.3	1-Jan-01	22:54	1.01
Subbasin-3	4.9	195.8	1-Jan-01	22:25	0.81
Reach-14	14.6	580.4	1-Jan-01	22:54	0.95
Subbasin-42	0.3	49.5	1-Jan-01	20:29	1.21
Subbasin-30	0	2.5	1-Jan-01	19:31	1.09
Reach-1	168.6	9157.2	2-Jan-01	00:58	1.68
Subbasin-44	13.6	562	1-Jan-01	23:22	0.37
Reach-13	13.6	311	2-Jan-01	00:35	0.35
Subbasin-31	2.5	199.6	1-Jan-01	21:23	1.15
Subbasin-43	0.7	73.4	1-Jan-01	20:41	1.1
Sink-1	185.4	9232.5	2-Jan-01	00:55	1.57

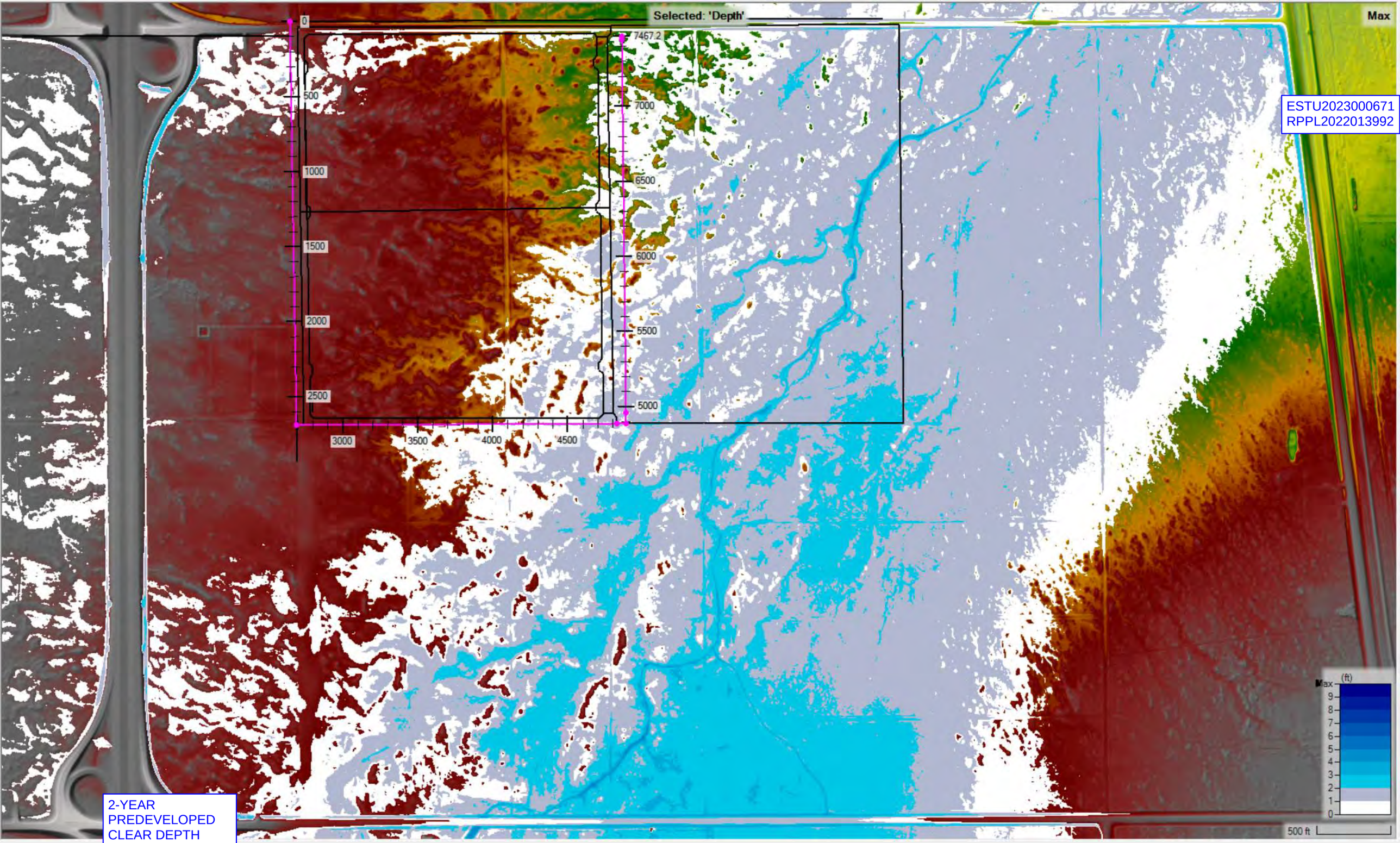
ESTU2023000671
RPPL2022013992

50-YEAR 24-HOUR CLEAR					
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (ACRE-FT)	Volume (ACRE-FT)
Subbasin-10	12.3	2329.7	1-Jan-01	21:52	1015.8
Subbasin-11	5.1	1334	1-Jan-01	20:54	398.2
Reach-19	17.4	2896.1	1-Jan-01	22:32	1408.9
Subbasin-15	4.6	985	1-Jan-01	20:59	268.2
Subbasin-25	0.4	125.6	1-Jan-01	20:14	44.6
Reach-16	22.4	2950.5	1-Jan-01	22:51	1712.2
Subbasin-16	5.2	828.6	1-Jan-01	21:24	425.1
Subbasin-28	0.5	124.7	1-Jan-01	20:28	23.6
Reach-15	28.1	3306.6	1-Jan-01	22:34	2160.7
Subbasin-5	9.9	2741.9	1-Jan-01	21:30	1894.2
Subbasin-4	4.4	1478	1-Jan-01	20:53	923
Reach-18	14.3	3830.6	2-Jan-01	00:19	2815.4
Subbasin-8	5.3	1089.5	1-Jan-01	21:40	406.5
Subbasin-26	5.3	865.4	1-Jan-01	21:59	331.5
Reach-12	24.9	3850.4	2-Jan-01	02:52	3547.9
Subbasin-32	1.4	163.5	1-Jan-01	21:20	38.6
Subbasin-29	0.4	65.9	1-Jan-01	20:19	27.2
Reach-10	54.7	3875.3	2-Jan-01	04:12	5754.4
Subbasin-6	3.4	278	1-Jan-01	21:48	79.9
Subbasin-34	2.7	225.9	1-Jan-01	21:55	100.7
Reach-9	60.9	3881.4	2-Jan-01	04:24	5934.6
Subbasin-14	4.5	624.5	1-Jan-01	21:50	338.3
Subbasin-35	0.2	41.6	1-Jan-01	19:47	13.3
Reach-8	65.6	3656.4	2-Jan-01	06:11	6266
Subbasin-19	12.8	1160.7	1-Jan-01	22:50	1079.2
Subbasin-36	2.3	136.7	1-Jan-01	21:09	50.2
Reach-7	80.6	3804.9	2-Jan-01	07:34	7382.8
Subbasin-13	6.7	511.3	1-Jan-01	22:05	462.7
Subbasin-9	6.6	533.7	1-Jan-01	21:50	418.9
Reach-21	13.2	931.1	1-Jan-01	22:18	879.3
Subbasin-37	2.2	159.8	1-Jan-01	21:14	81.9
Subbasin-23	0.4	62.8	1-Jan-01	20:29	33
Reach-6	96.5	3974.4	2-Jan-01	07:34	8376.8
Subbasin-18	7.6	2411.5	1-Jan-01	21:06	1751.6
Subbasin-20	3.3	1369.6	1-Jan-01	20:31	936.3
Reach-20	11	3498.4	1-Jan-01	21:16	2687.6
Subbasin-21	4.9	1788	1-Jan-01	20:37	989.1
Subbasin-24	3.6	1514.7	1-Jan-01	20:26	595.7
Reach-17	19.5	5841	1-Jan-01	21:09	4272.8
Subbasin-22	9.9	3743	1-Jan-01	20:50	2014.5
Subbasin-27	9.7	3062.9	1-Jan-01	21:34	2127.8
Reach-11	39.1	10665.9	1-Jan-01	21:52	8407.6
Subbasin-33	5.4	438.7	1-Jan-01	22:34	483.2
Subbasin-17	4.3	313.4	1-Jan-01	21:24	224.7
Reach-5	48.8	11222.6	1-Jan-01	22:35	9115.2
Subbasin-7	3.7	290.7	1-Jan-01	21:24	261.6
Subbasin-39	0.3	58.1	1-Jan-01	20:17	32.2
Reach-4	52.8	11440.5	1-Jan-01	22:49	9410.6
Subbasin-40	0.6	90.3	1-Jan-01	20:51	67.2
Subbasin-38	0.1	15.4	1-Jan-01	19:54	6
Reach-3	149.9	12431.7	1-Jan-01	22:56	17861.3
Subbasin-41	3.8	231	1-Jan-01	21:55	166.7
Reach-2	153.7	11932.7	1-Jan-01	23:41	18006.3
Subbasin-12	9.7	470.8	1-Jan-01	22:55	613.5
Subbasin-3	4.9	236.5	1-Jan-01	22:25	248.2
Reach-14	14.6	691.4	1-Jan-01	22:53	861.7
Subbasin-42	0.3	57.7	1-Jan-01	20:29	26.3
Subbasin-30	0	2.8	1-Jan-01	19:31	0.7
Reach-1	168.6	11074	2-Jan-01	00:48	18820.7
Subbasin-44	13.6	723.2	1-Jan-01	23:22	352.4
Reach-13	13.6	415.3	2-Jan-01	00:30	330.9
Subbasin-31	2.5	237.6	1-Jan-01	21:23	199.7
Subbasin-43	0.7	86.6	1-Jan-01	20:41	51.4
Sink-1	185.4	11170.7	2-Jan-01	00:46	19402.7

ESTU2023000671
RPPL2022013992

50-YEAR 24-HOUR BURNED					
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (ACRE-FT)	Volume (ACRE-FT)
Subbasin-10	12.3	2329.7	1-Jan-01	21:52	1015.8
Subbasin-11	5.1	1334	1-Jan-01	20:54	398.2
Reach-19	17.4	2896.1	1-Jan-01	22:32	1408.9
Subbasin-15	4.6	985	1-Jan-01	20:59	268.2
Subbasin-25	0.4	125.6	1-Jan-01	20:14	44.6
Reach-16	22.4	2950.5	1-Jan-01	22:51	1712.2
Subbasin-16	5.2	828.6	1-Jan-01	21:24	425.1
Subbasin-28	0.5	124.7	1-Jan-01	20:28	23.6
Reach-15	28.1	3306.6	1-Jan-01	22:34	2160.7
Subbasin-5	9.9	2741.9	1-Jan-01	21:30	1894.2
Subbasin-4	4.4	1478	1-Jan-01	20:53	923
Reach-18	14.3	3830.6	2-Jan-01	00:19	2815.4
Subbasin-8	5.3	1089.5	1-Jan-01	21:40	406.5
Subbasin-26	5.3	865.4	1-Jan-01	21:59	331.5
Reach-12	24.9	3850.4	2-Jan-01	02:52	3547.9
Subbasin-32	1.4	163.5	1-Jan-01	21:20	38.6
Subbasin-29	0.4	65.9	1-Jan-01	20:19	27.2
Reach-10	54.7	3875.3	2-Jan-01	04:12	5754.4
Subbasin-6	3.4	278	1-Jan-01	21:48	79.9
Subbasin-34	2.7	225.9	1-Jan-01	21:55	100.7
Reach-9	60.9	3881.4	2-Jan-01	04:24	5934.6
Subbasin-14	4.5	624.5	1-Jan-01	21:50	338.3
Subbasin-35	0.2	41.6	1-Jan-01	19:47	13.3
Reach-8	65.6	3656.4	2-Jan-01	06:11	6266
Subbasin-19	12.8	1160.7	1-Jan-01	22:50	1079.2
Subbasin-36	2.3	136.7	1-Jan-01	21:09	50.2
Reach-7	80.6	3804.9	2-Jan-01	07:34	7382.8
Subbasin-13	6.7	511.3	1-Jan-01	22:05	462.7
Subbasin-9	6.6	533.7	1-Jan-01	21:50	418.9
Reach-21	13.2	931.1	1-Jan-01	22:18	879.3
Subbasin-37	2.2	159.8	1-Jan-01	21:14	81.9
Subbasin-23	0.4	62.8	1-Jan-01	20:29	33
Reach-6	96.5	3974.4	2-Jan-01	07:34	8376.8
Subbasin-18	7.6	2940.5	1-Jan-01	21:06	2823.8
Subbasin-20	3.3	1517	1-Jan-01	20:31	1228.7
Reach-20	11	4177	1-Jan-01	21:15	4052.4
Subbasin-21	4.9	2174.1	1-Jan-01	20:37	1755
Subbasin-24	3.6	1853.3	1-Jan-01	20:26	1267
Reach-17	19.5	7264.4	1-Jan-01	21:07	7074.4
Subbasin-22	9.9	4410.5	1-Jan-01	20:50	3338.3
Subbasin-27	9.7	3587.8	1-Jan-01	21:34	3180.4
Reach-11	39.1	13324.7	1-Jan-01	21:49	13580.3
Subbasin-33	5.4	438.7	1-Jan-01	22:34	483.2
Subbasin-17	4.3	313.4	1-Jan-01	21:24	224.7
Reach-5	48.8	13874.4	1-Jan-01	22:30	14287.9
Subbasin-7	3.7	290.7	1-Jan-01	21:24	261.6
Subbasin-39	0.3	58.1	1-Jan-01	20:17	32.2
Reach-4	52.8	14100.4	1-Jan-01	22:43	14581.2
Subbasin-40	0.6	90.3	1-Jan-01	20:51	67.2
Subbasin-38	0.1	15.4	1-Jan-01	19:54	6
Reach-3	149.9	15064.9	1-Jan-01	22:49	23031.1
Subbasin-41	3.8	231	1-Jan-01	21:55	166.7
Reach-2	153.7	14673.4	1-Jan-01	23:33	23164
Subbasin-12	9.7	470.8	1-Jan-01	22:55	613.5
Subbasin-3	4.9	236.5	1-Jan-01	22:25	248.2
Reach-14	14.6	691.4	1-Jan-01	22:53	861.7
Subbasin-42	0.3	57.7	1-Jan-01	20:29	26.3
Subbasin-30	0	2.8	1-Jan-01	19:31	0.7
Reach-1	168.6	13716.6	2-Jan-01	00:36	23943.1
Subbasin-44	13.6	723.2	1-Jan-01	23:22	352.4
Reach-13	13.6	415.3	2-Jan-01	00:30	330.9
Subbasin-31	2.5	237.6	1-Jan-01	21:23	199.7
Subbasin-43	0.7	86.6	1-Jan-01	20:41	51.4
Sink-1	185.4	13821.2	2-Jan-01	00:35	24525.1

Appendix XXXII: Predeveloped Depth Maps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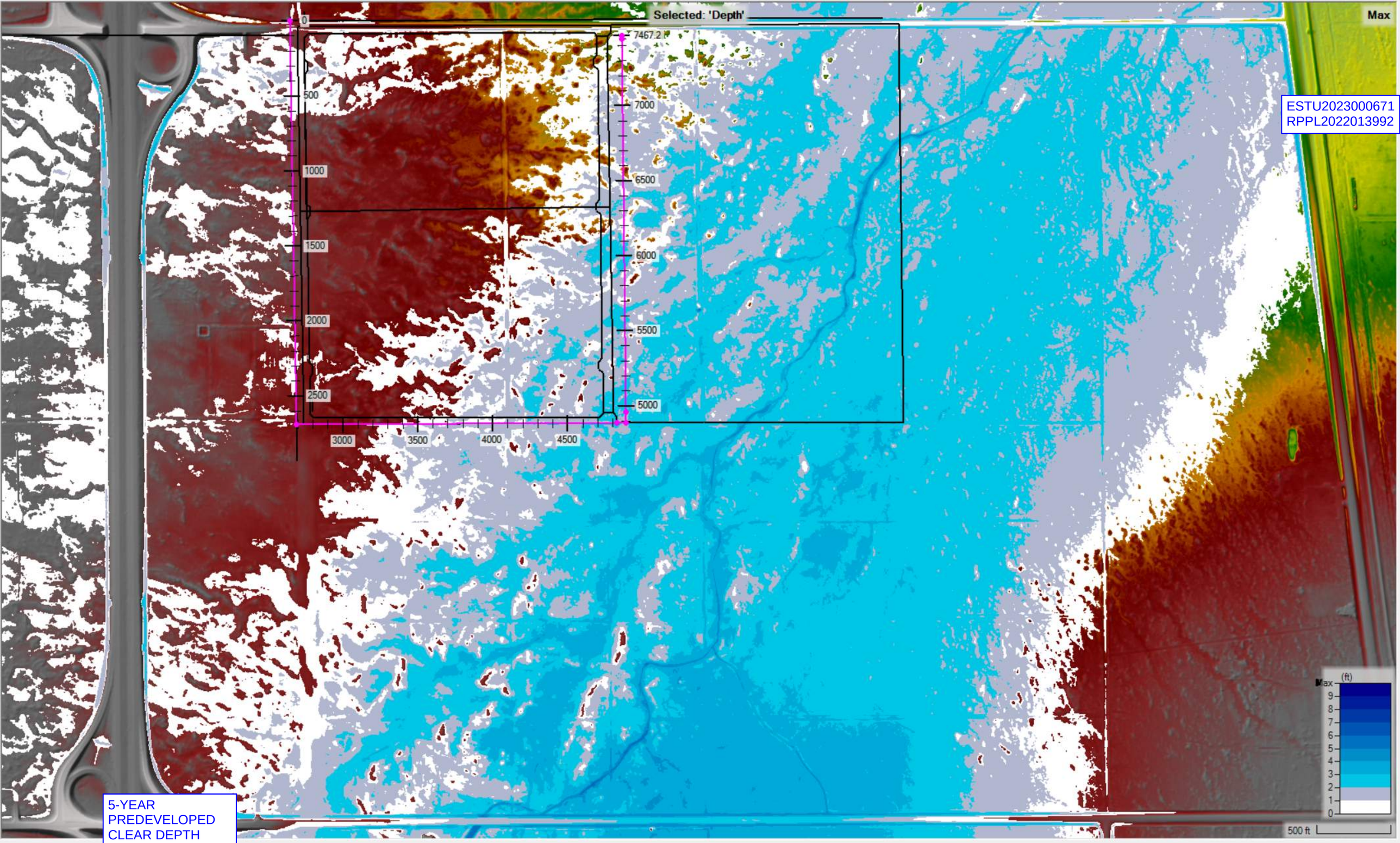
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
2-YEAR
PREDEVELOPED
CLEAR DEPTH
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft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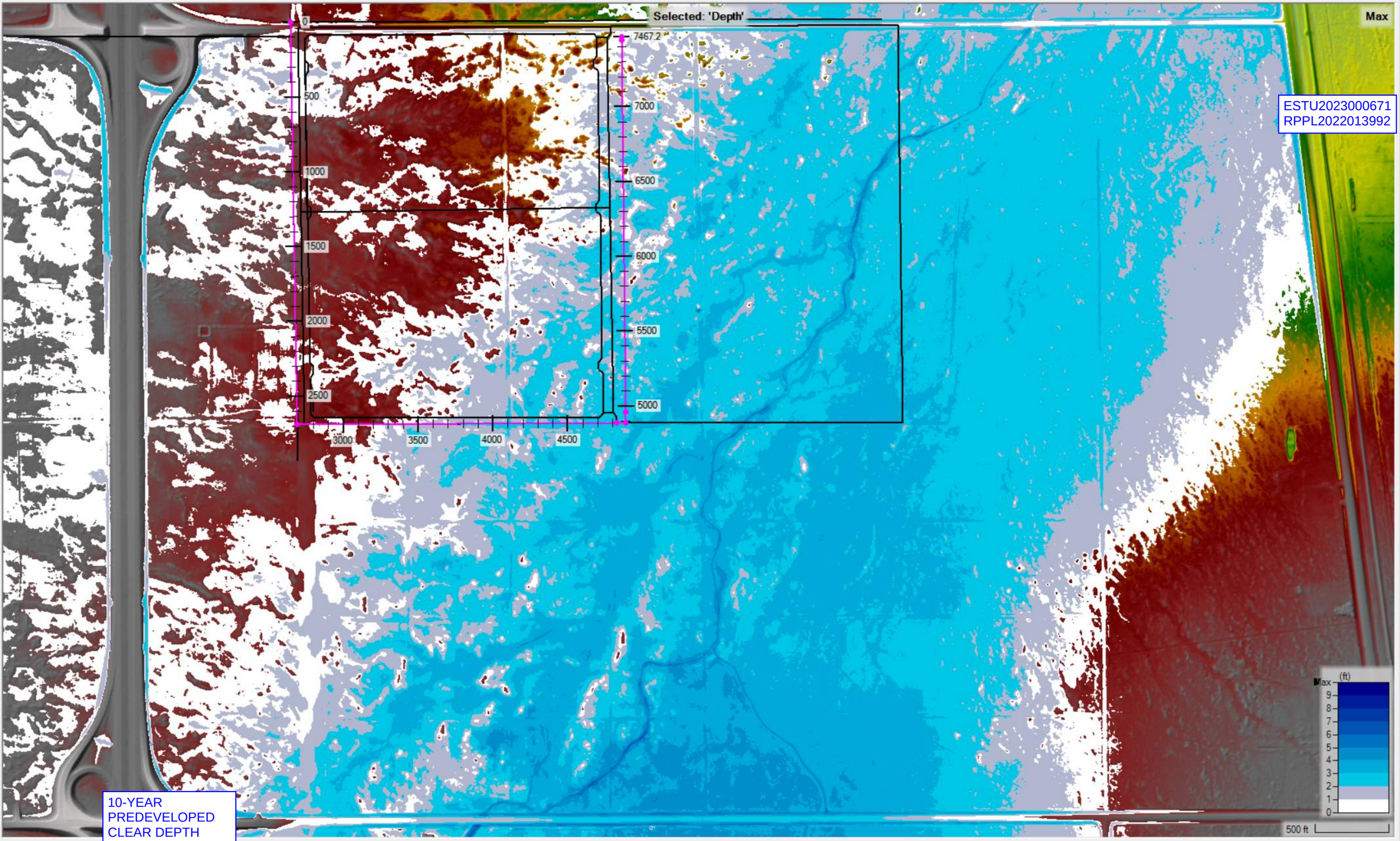
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
5-YEAR
PREDEVELOPED
CLEAR DEPTH
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft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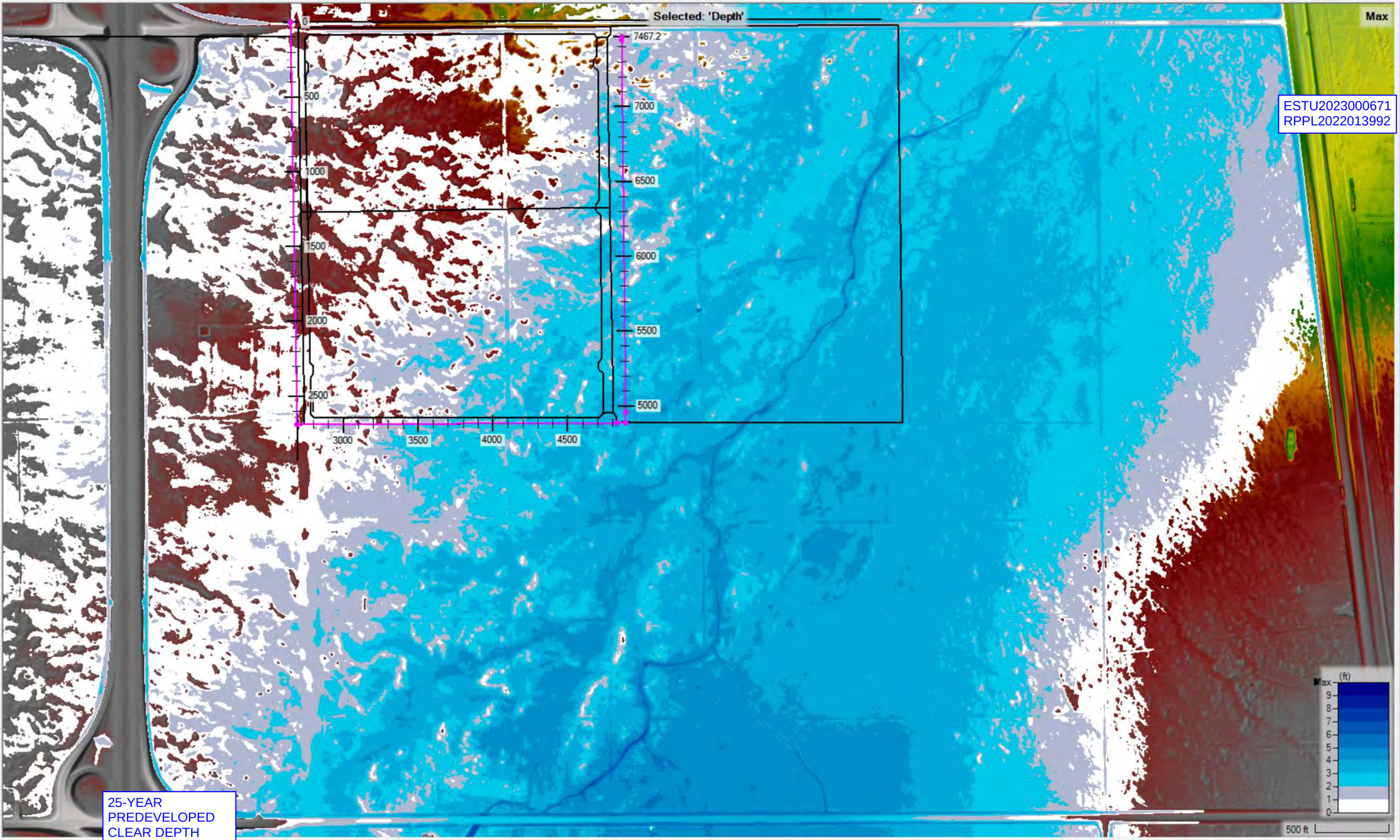
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
10-YEAR
PREDEVELOPED
CLEAR DEPTH
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft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Max
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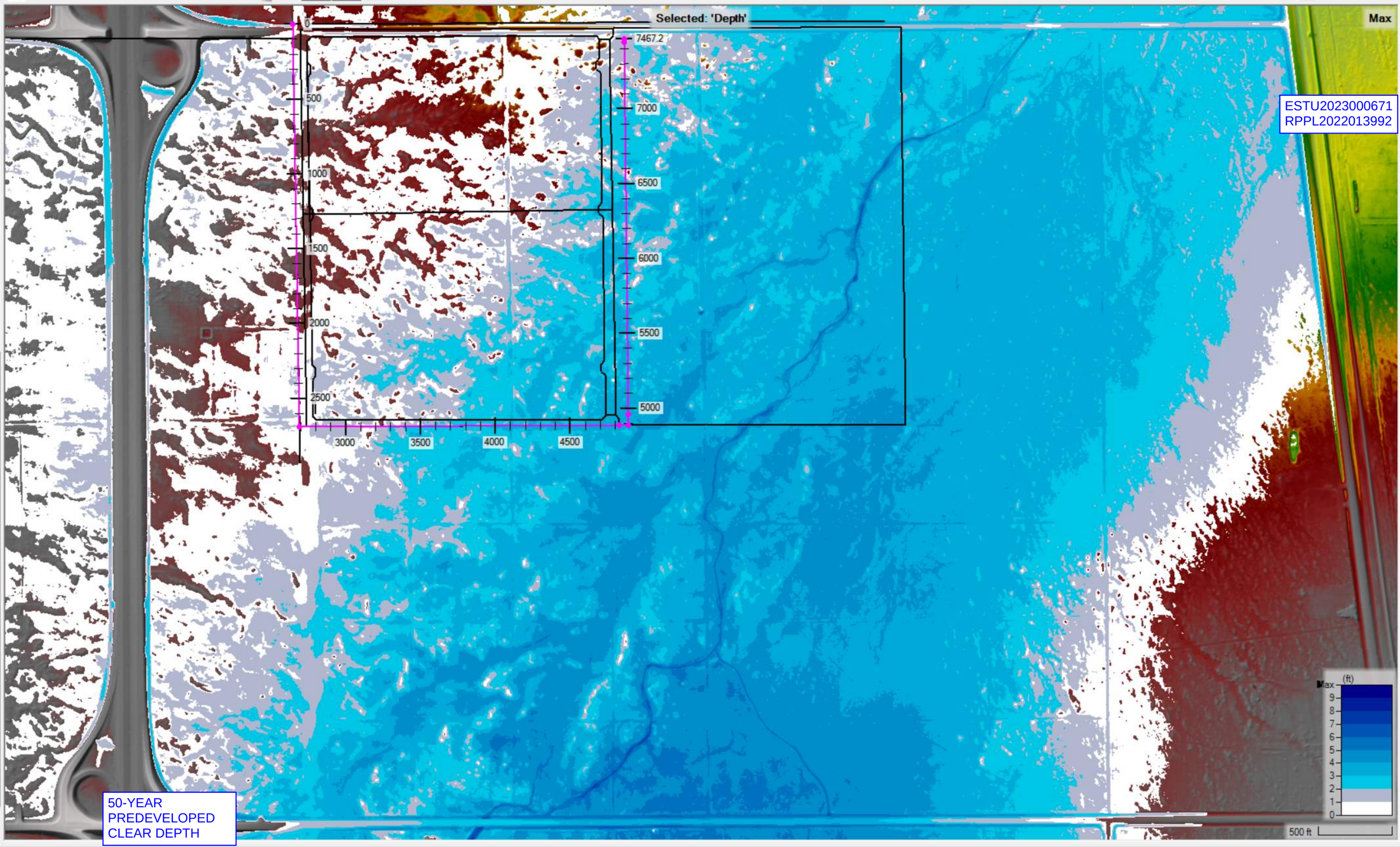
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
25-YEAR
PREDEVELOPED
CLEAR DEPTH
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft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Max
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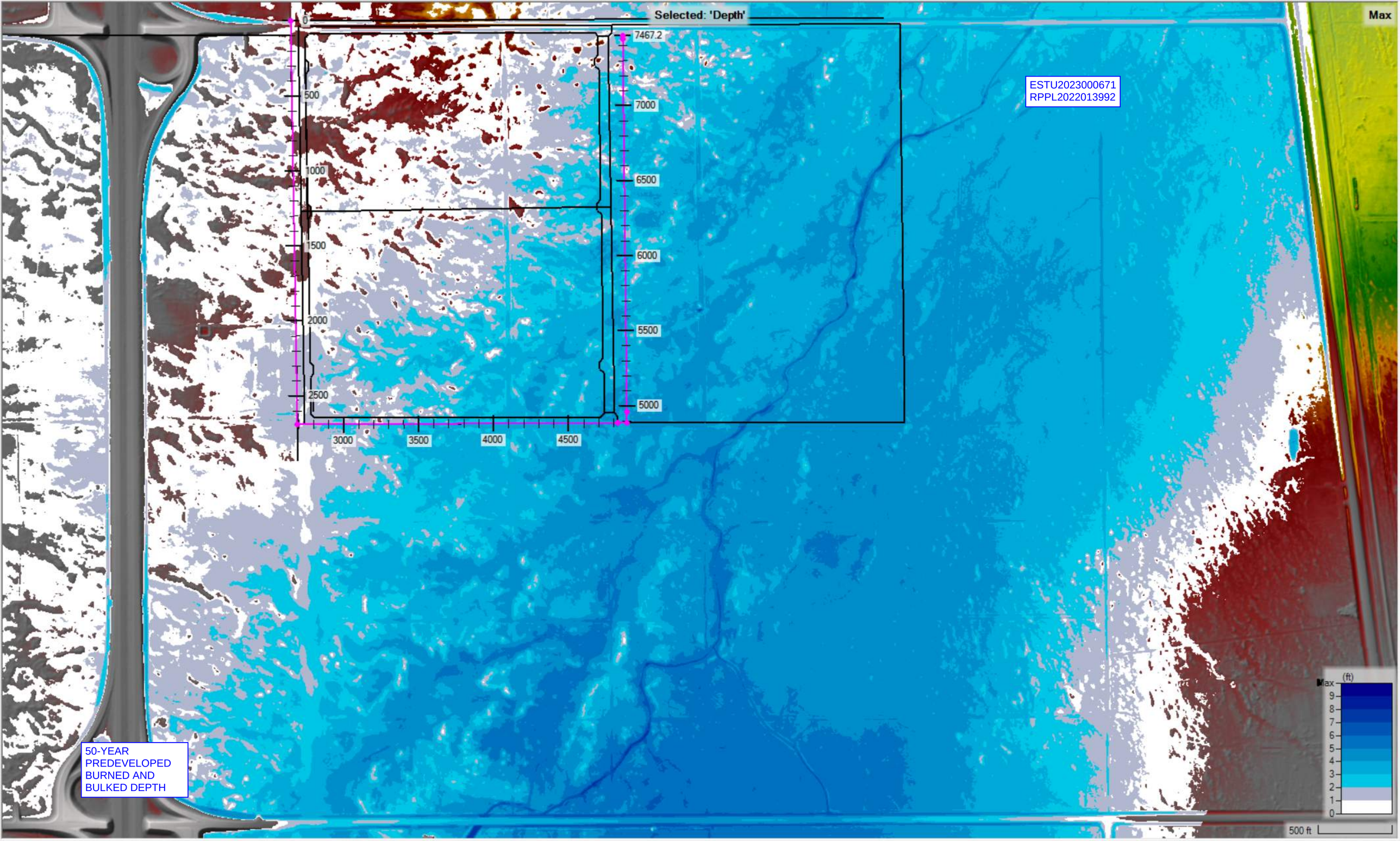
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
50-YEAR
PREDEVELOPED
CLEAR DEPTH
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft


Selected: 'Depth'
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1000
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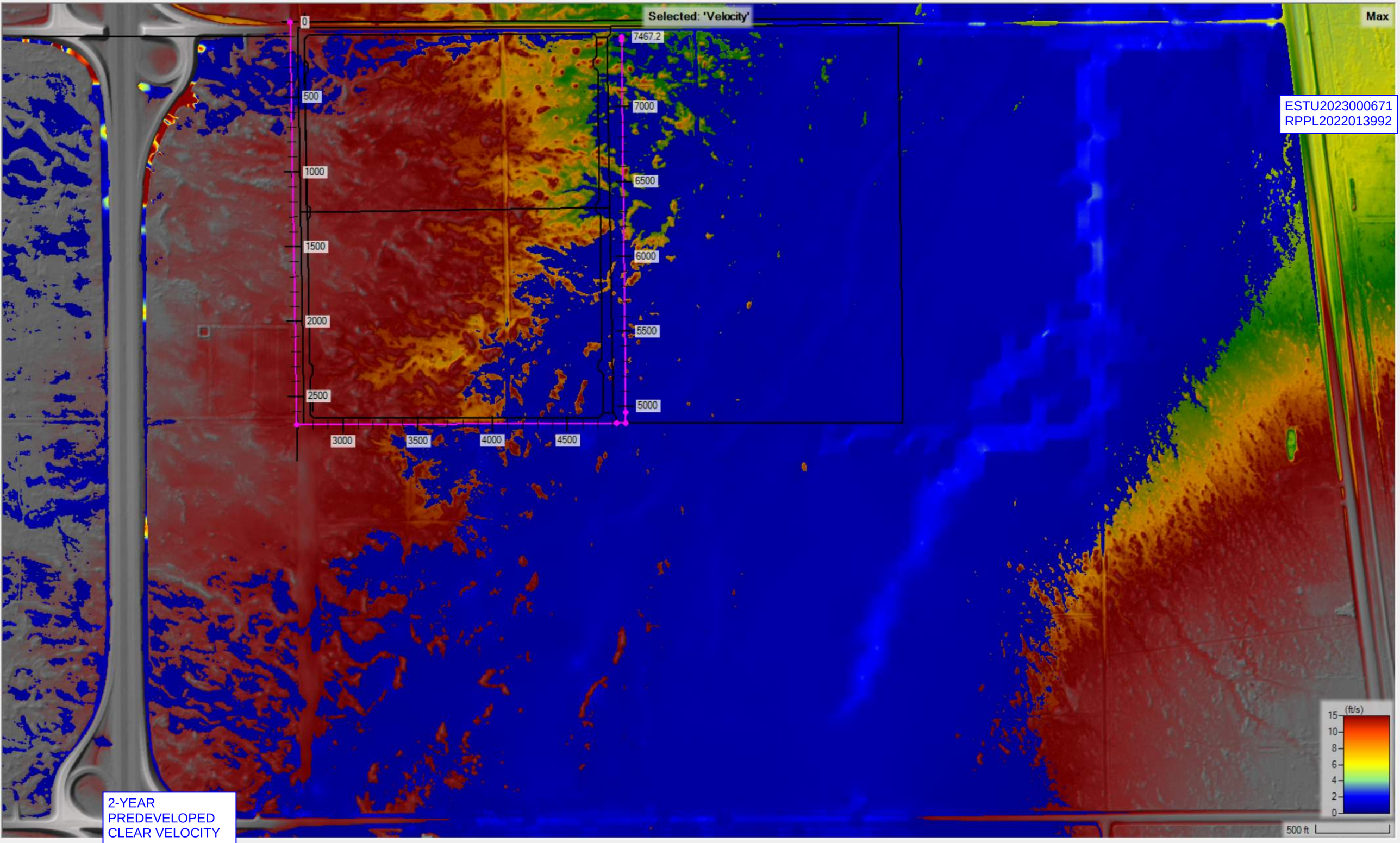
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7467.2
ESTU2023000671
RPPL2022013992
50-YEAR
PREDEVELOPED
BURNED AND
BULKED DEPTH
Max
(ft)
9
8
7
6
5
4
3
2
1
0
500 ft

Appendix XXXIII: Predeveloped Velocity Maps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Max
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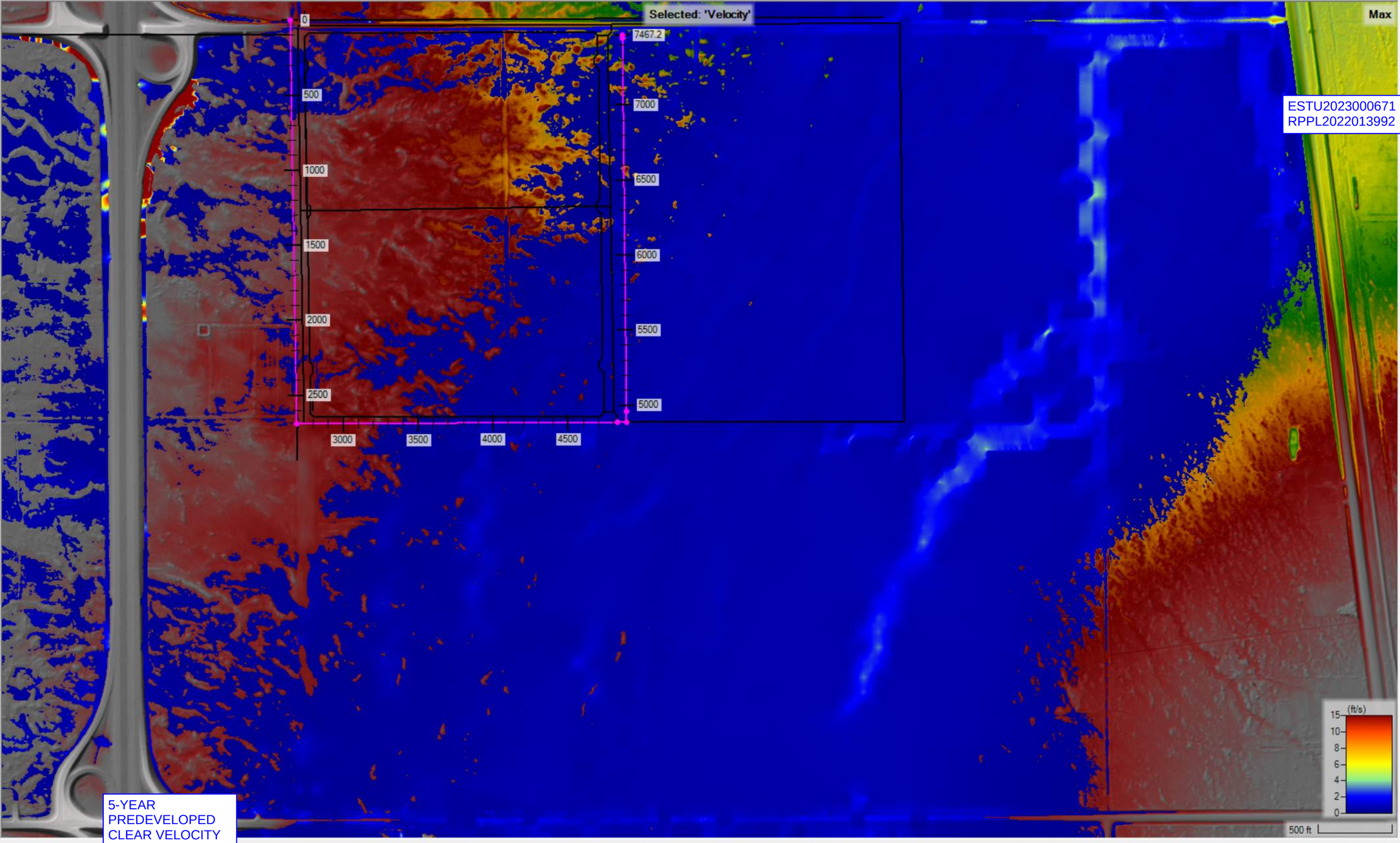
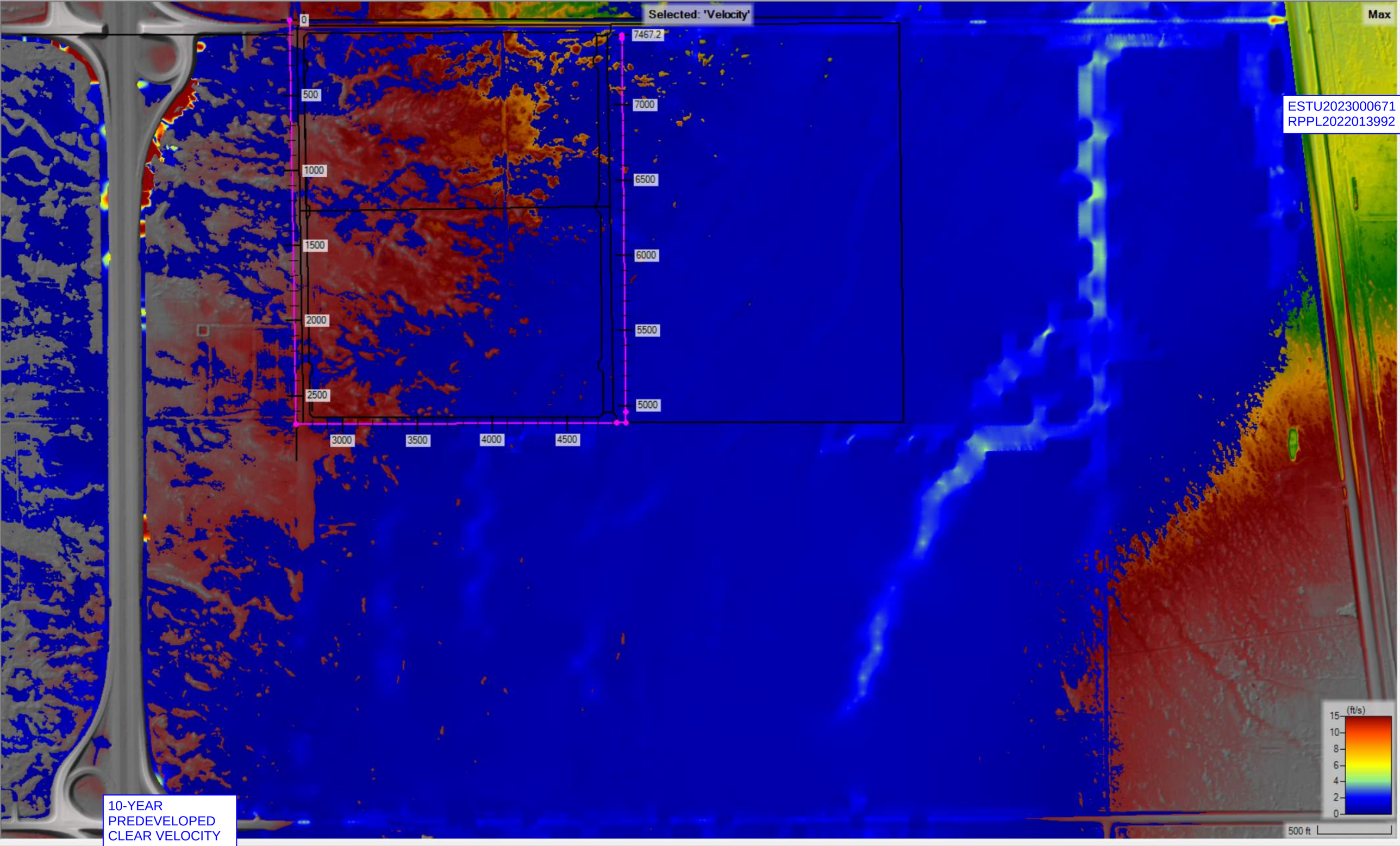
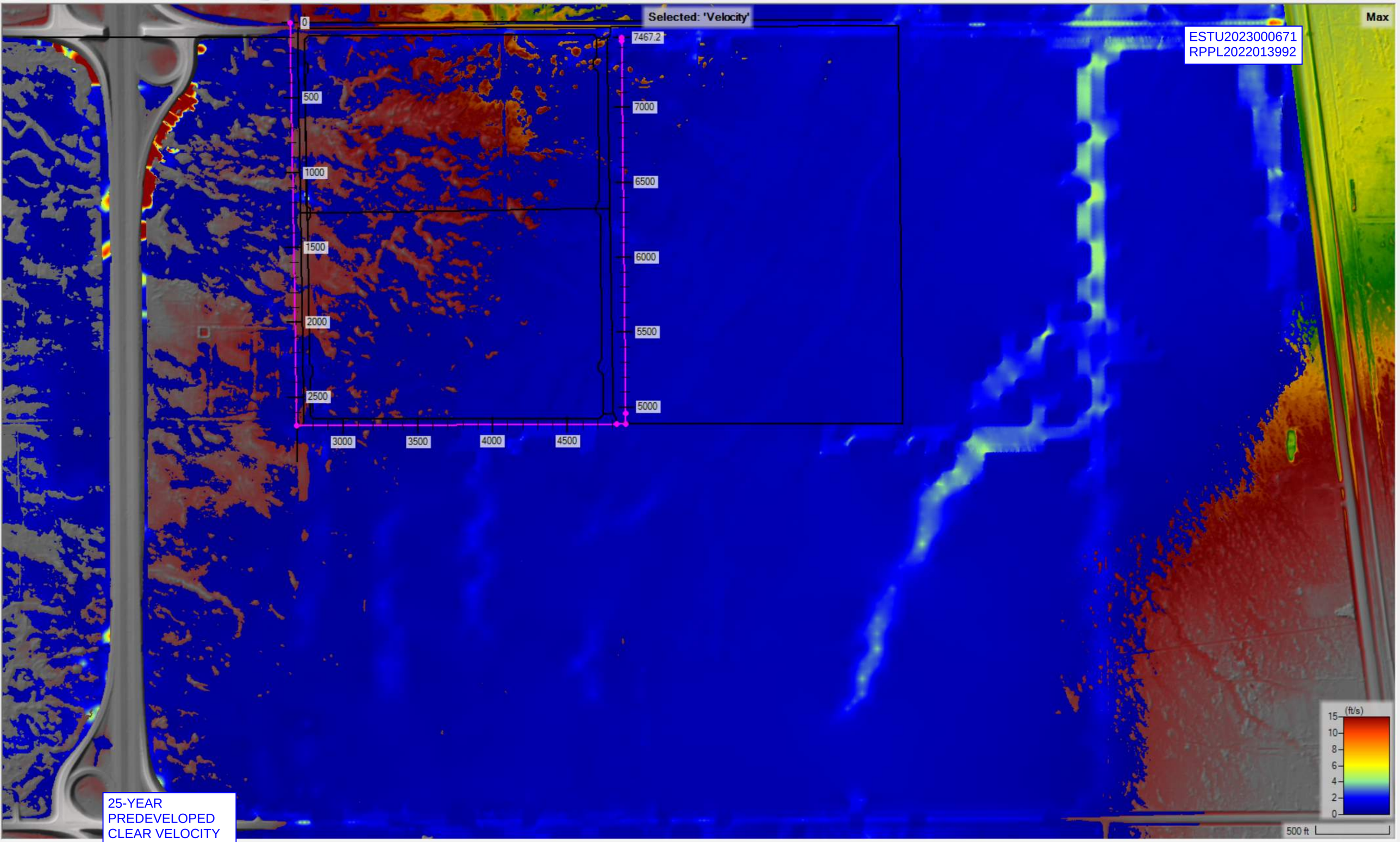
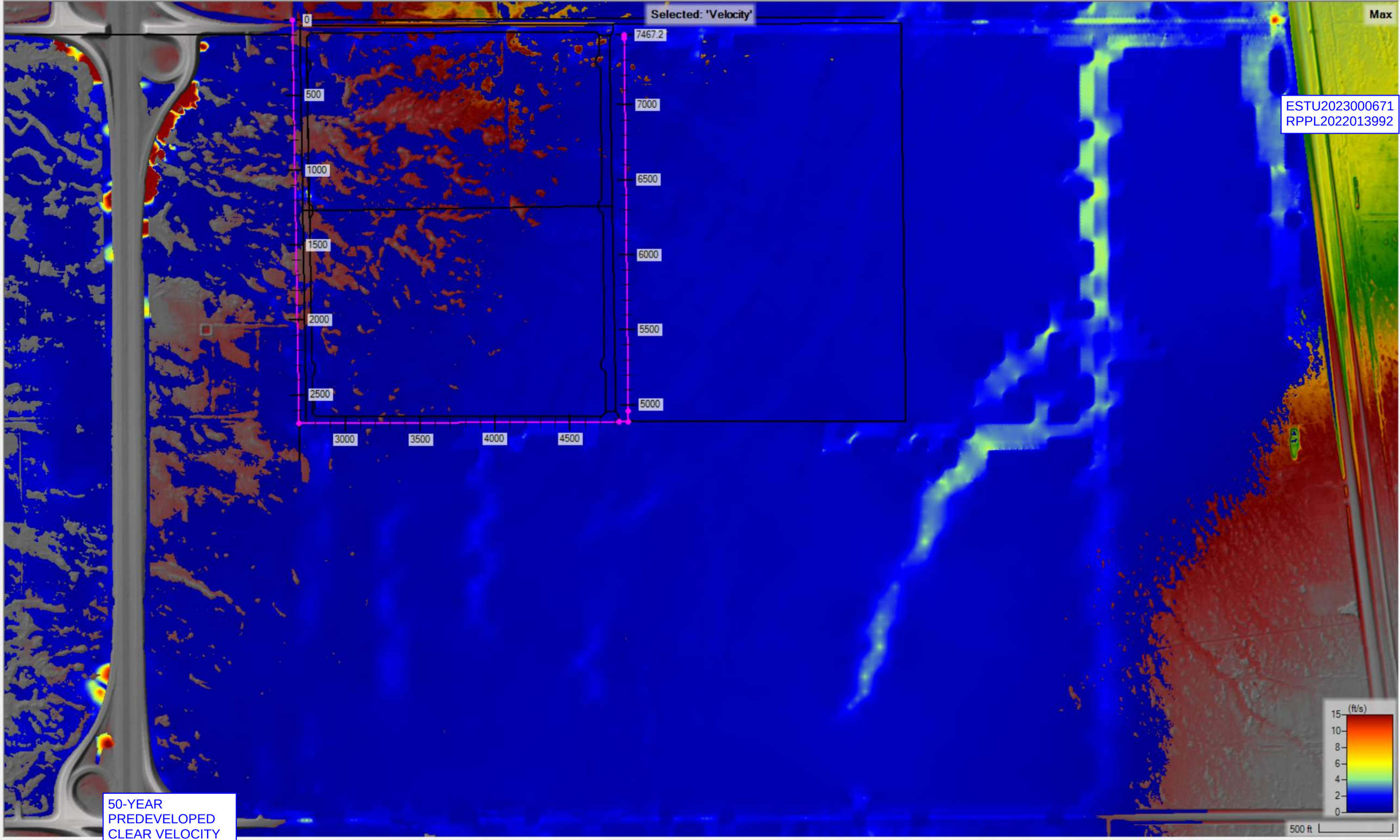
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
(ft/s)
15
10
8
6
4
2
0
500 ft
2-YEAR
PREDEVELOPED
CLEAR VELOCITY

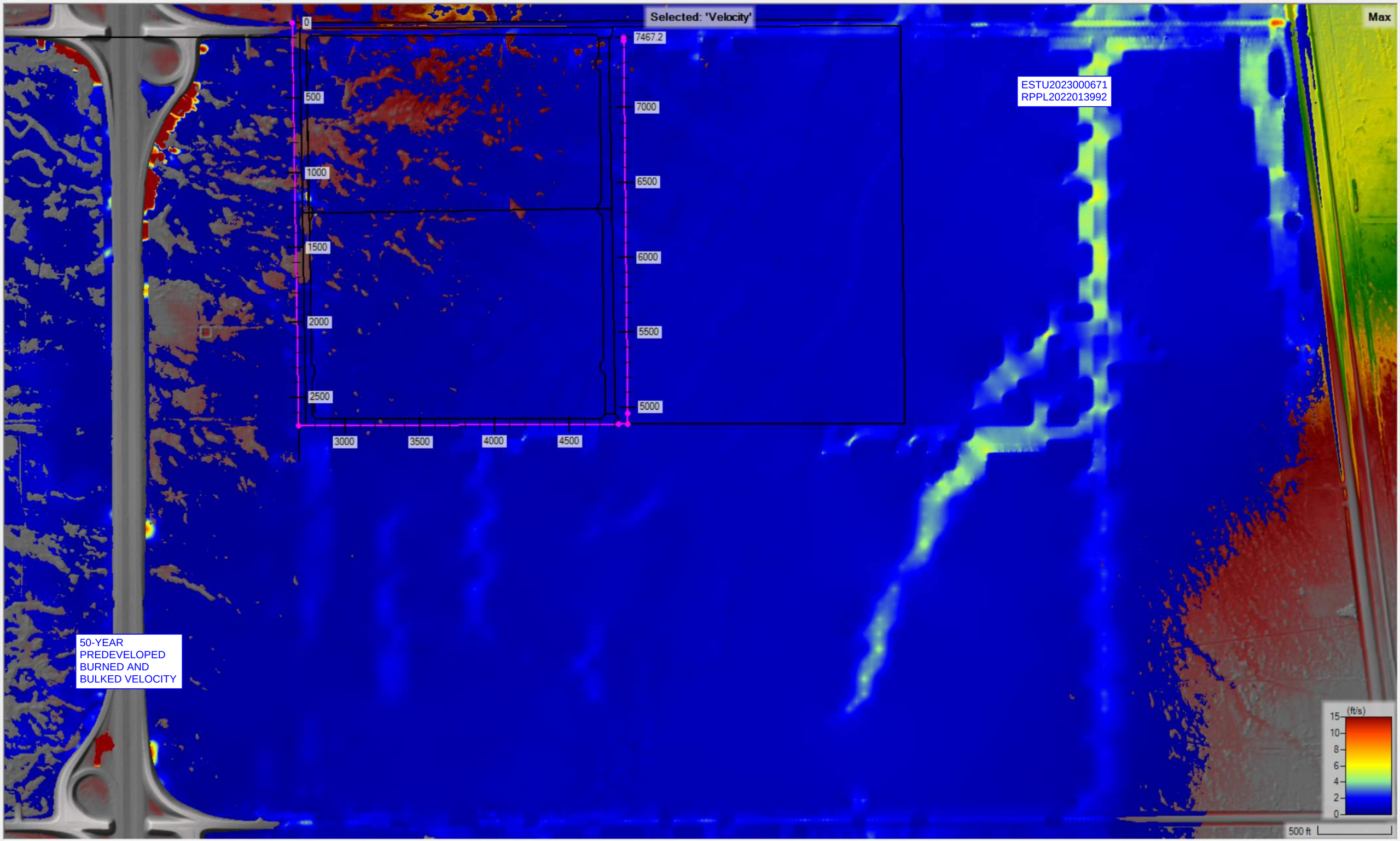

Selected: 'Velocity'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
(ft/s)
15
10
8
6
4
2
0
500 ft
5-YEAR
PREDEVELOPED
CLEAR VELOCITY



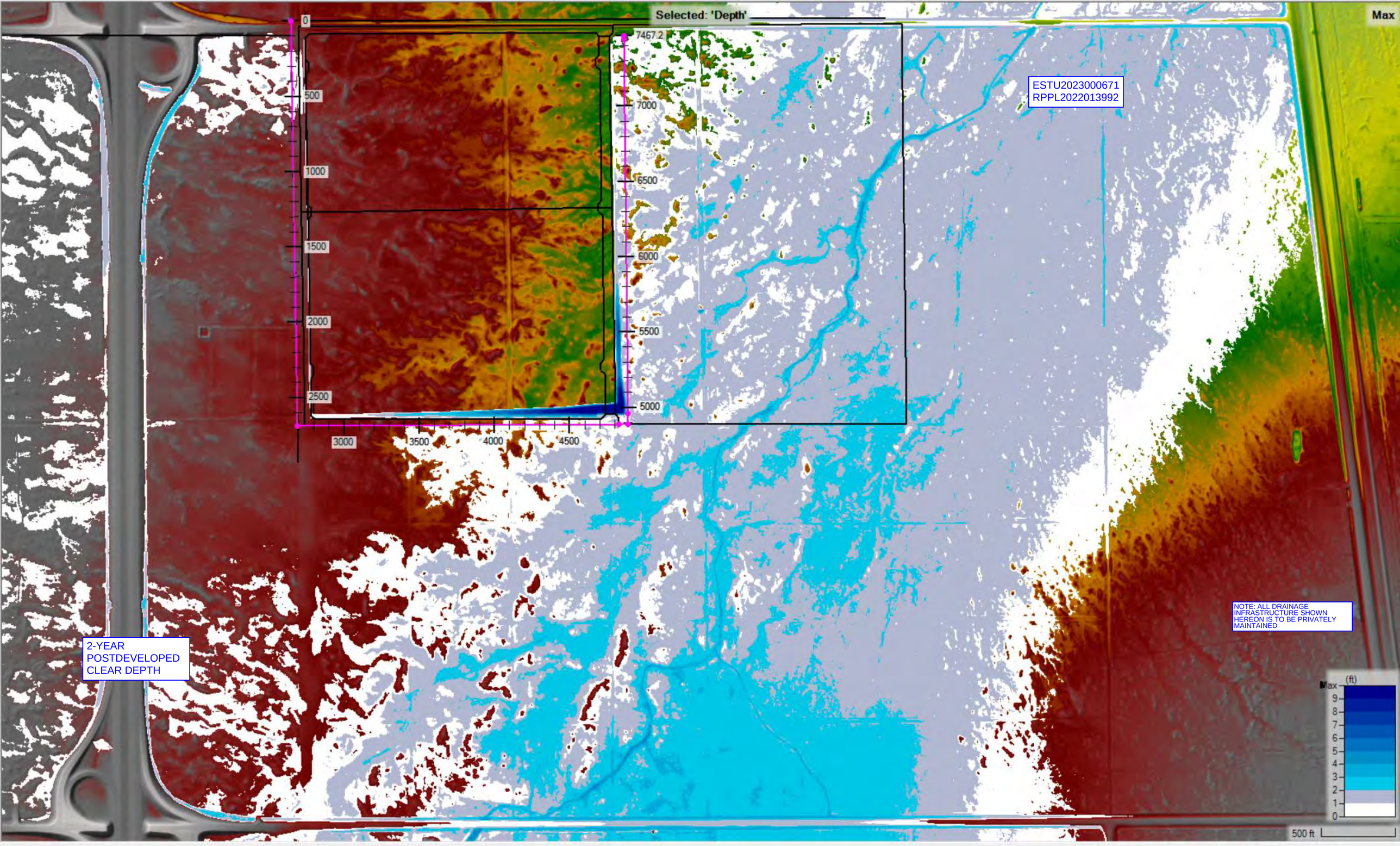
10-YEAR
PREDEVELOPED
CLEAR VELOCITY

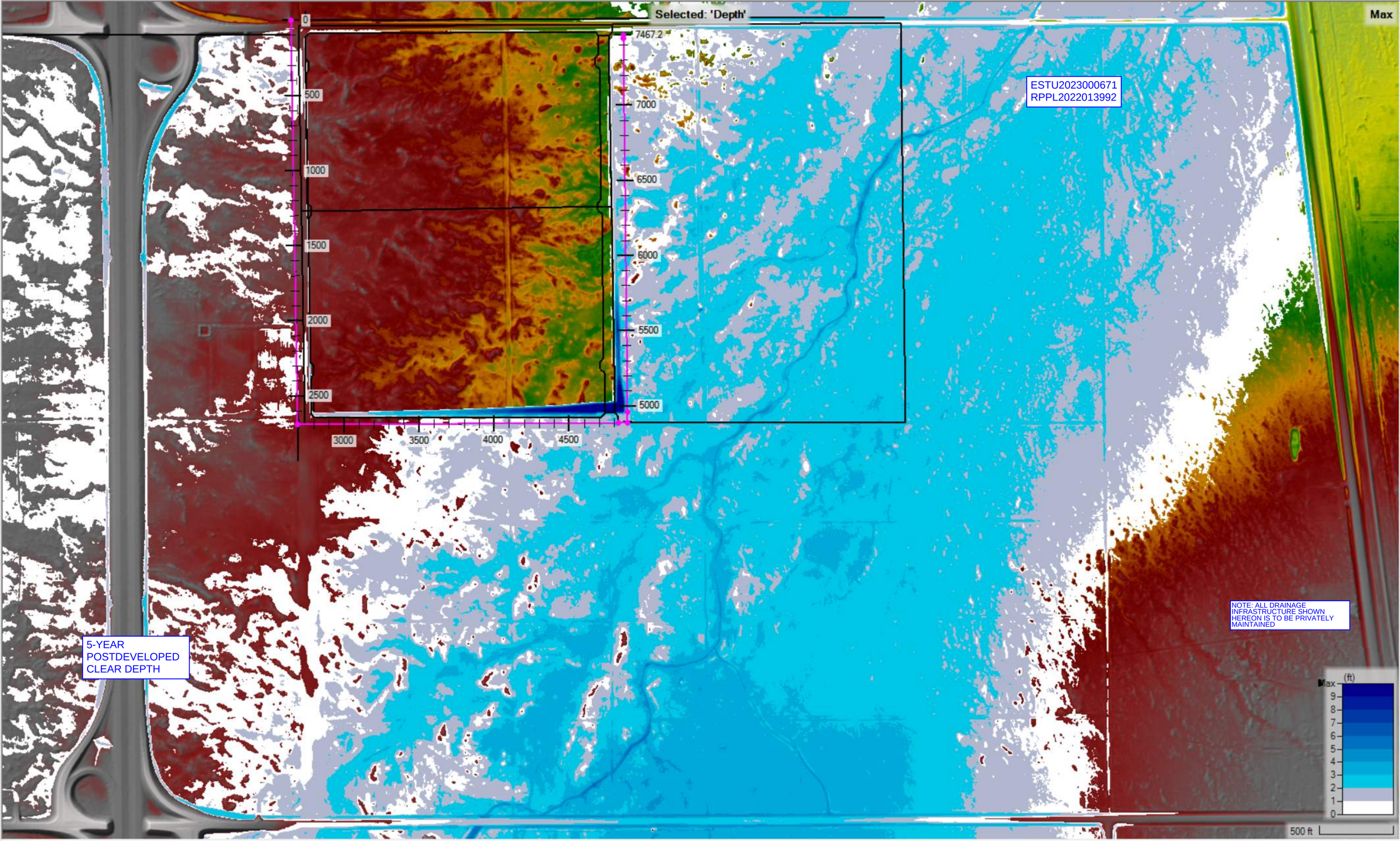

Selected: 'Velocity'
Max
ESTU2023000671
RPPL2022013992
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
6500
6000
5500
7467.2
7000
(ft/s)
15
10
8
6
4
2
0
500 ft
25-YEAR
PREDEVELOPED
CLEAR VELOCITY

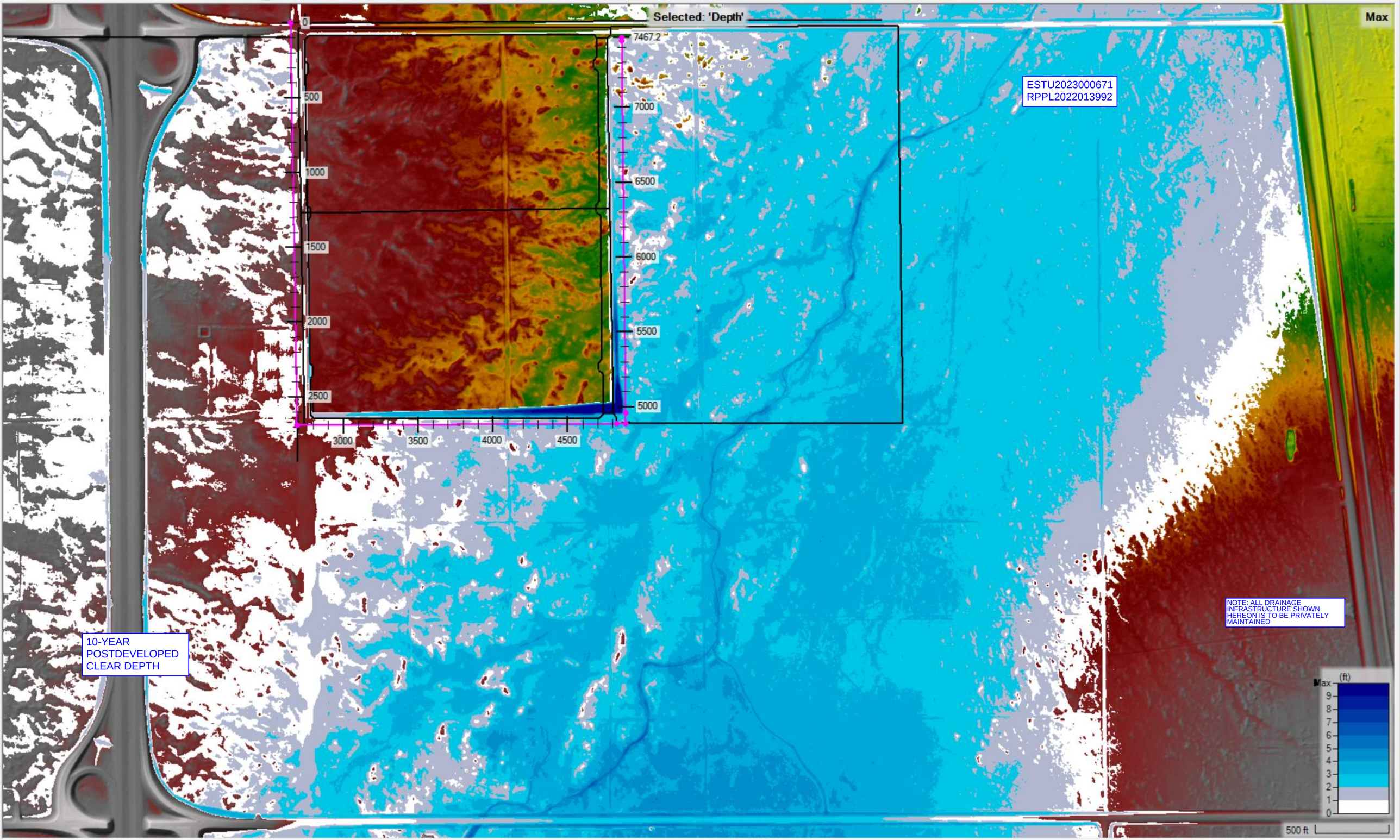

Selected: 'Velocity'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
50-YEAR
PREDEVELOPED
CLEAR VELOCITY
(ft/s)
15
10
8
6
4
2
0
500 ft

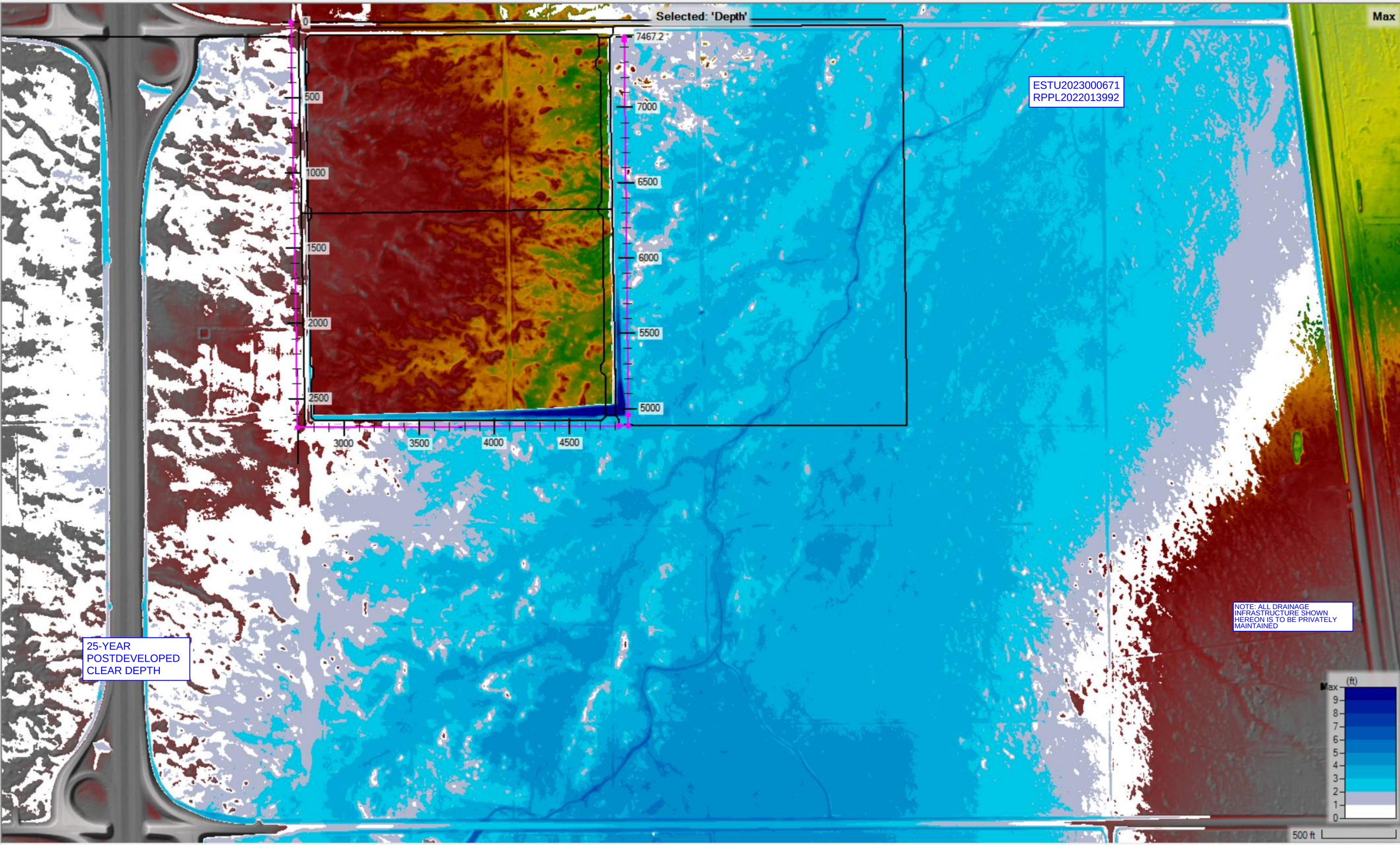

Selected: 'Velocity'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
6000
6500
7000
7467.2
ESTU2023000671
RPPL2022013992
50-YEAR
PREDEVELOPED
BURNED AND
BULKED VELOCITY
(ft/s)
15
10
8
6
4
2
0
500 ft

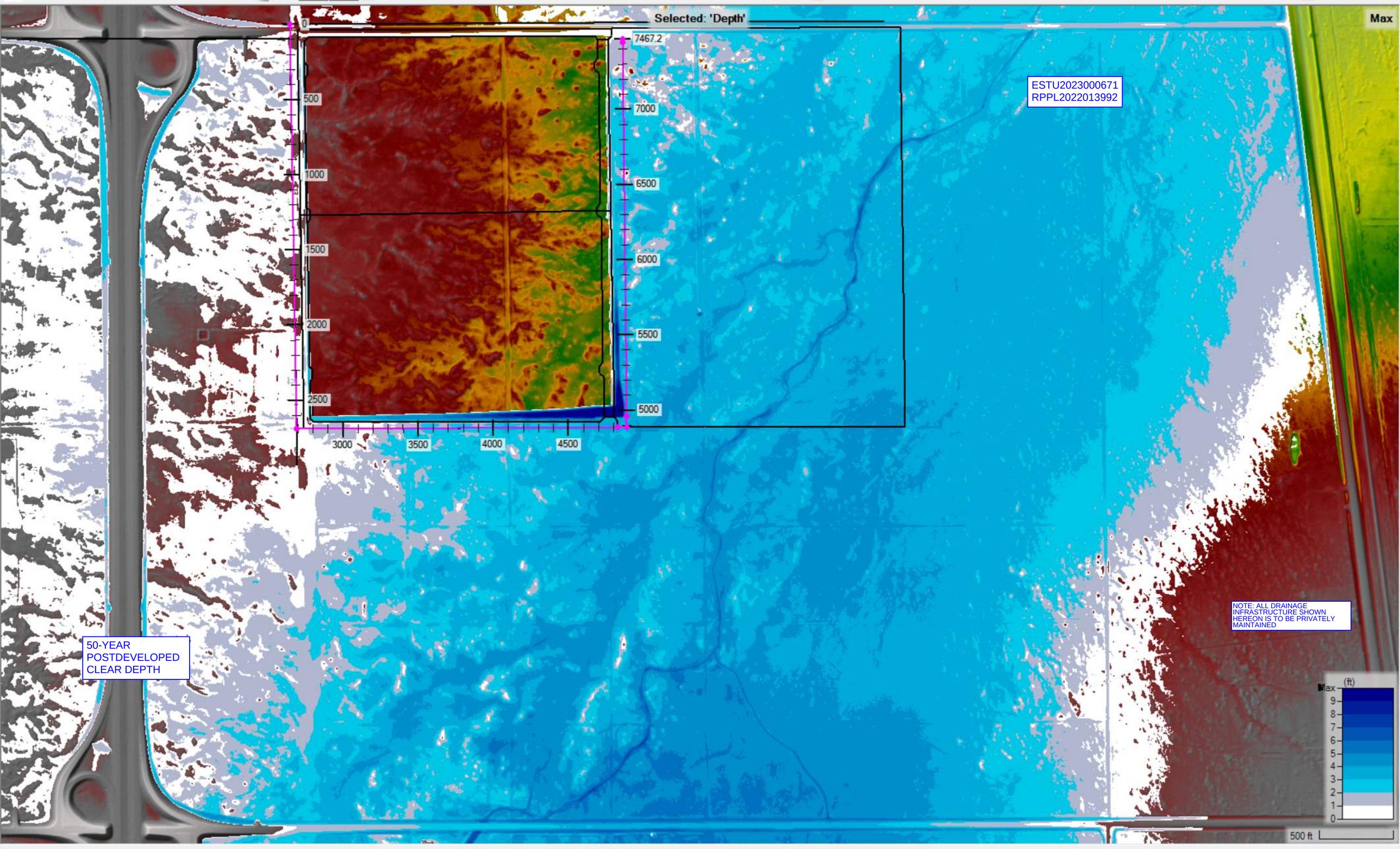
Appendix XXXIV: Postdeveloped Depth Maps

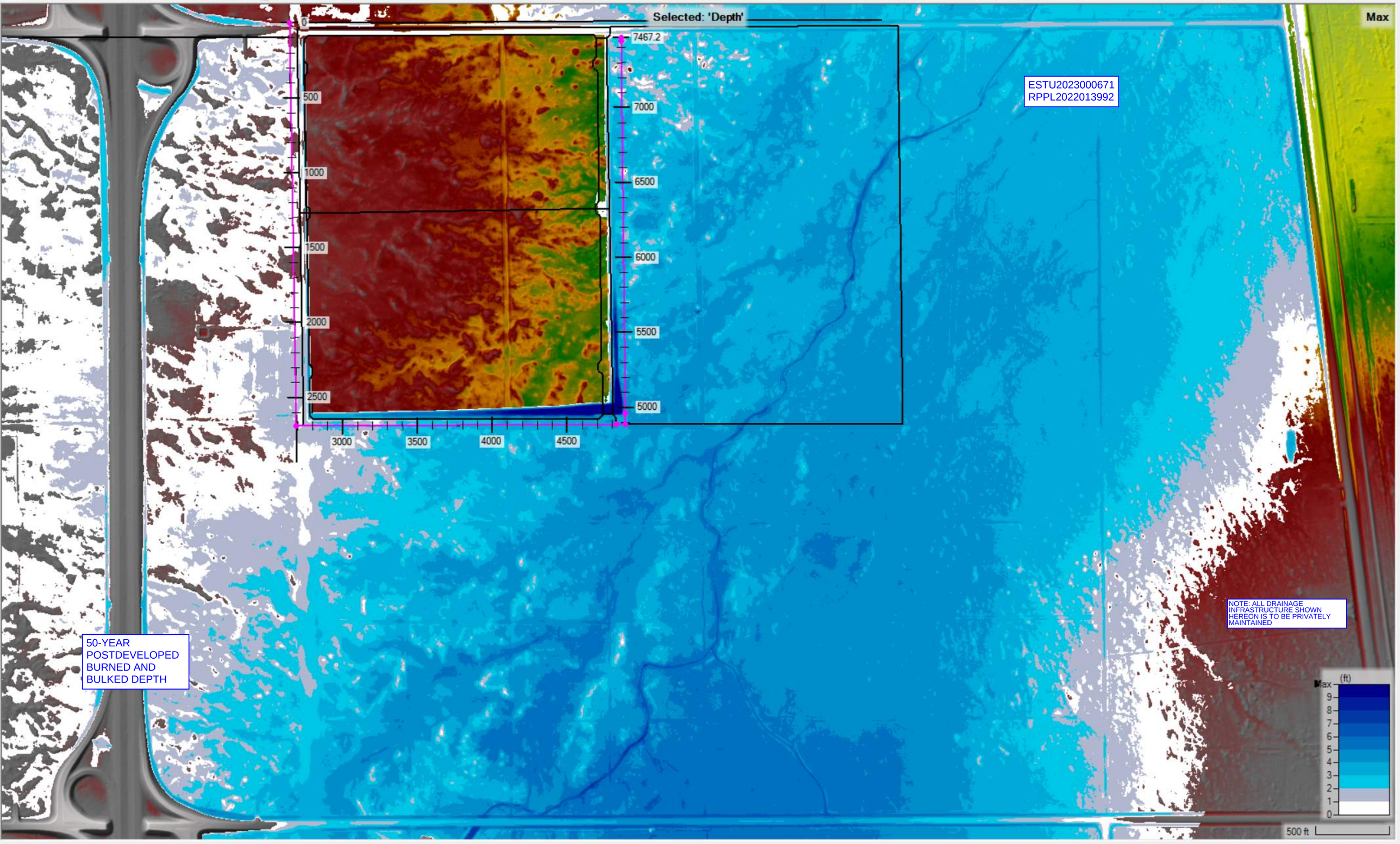

Selected: 'Depth'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
2-YEAR
POSTDEVELOPED
CLEAR DEPTH
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
Max
(ft)
9
8
7
6
5
4
3
2
1
0
500 ft


Selected: 'Depth'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
5-YEAR
POSTDEVELOPED
CLEAR DEPTH
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft

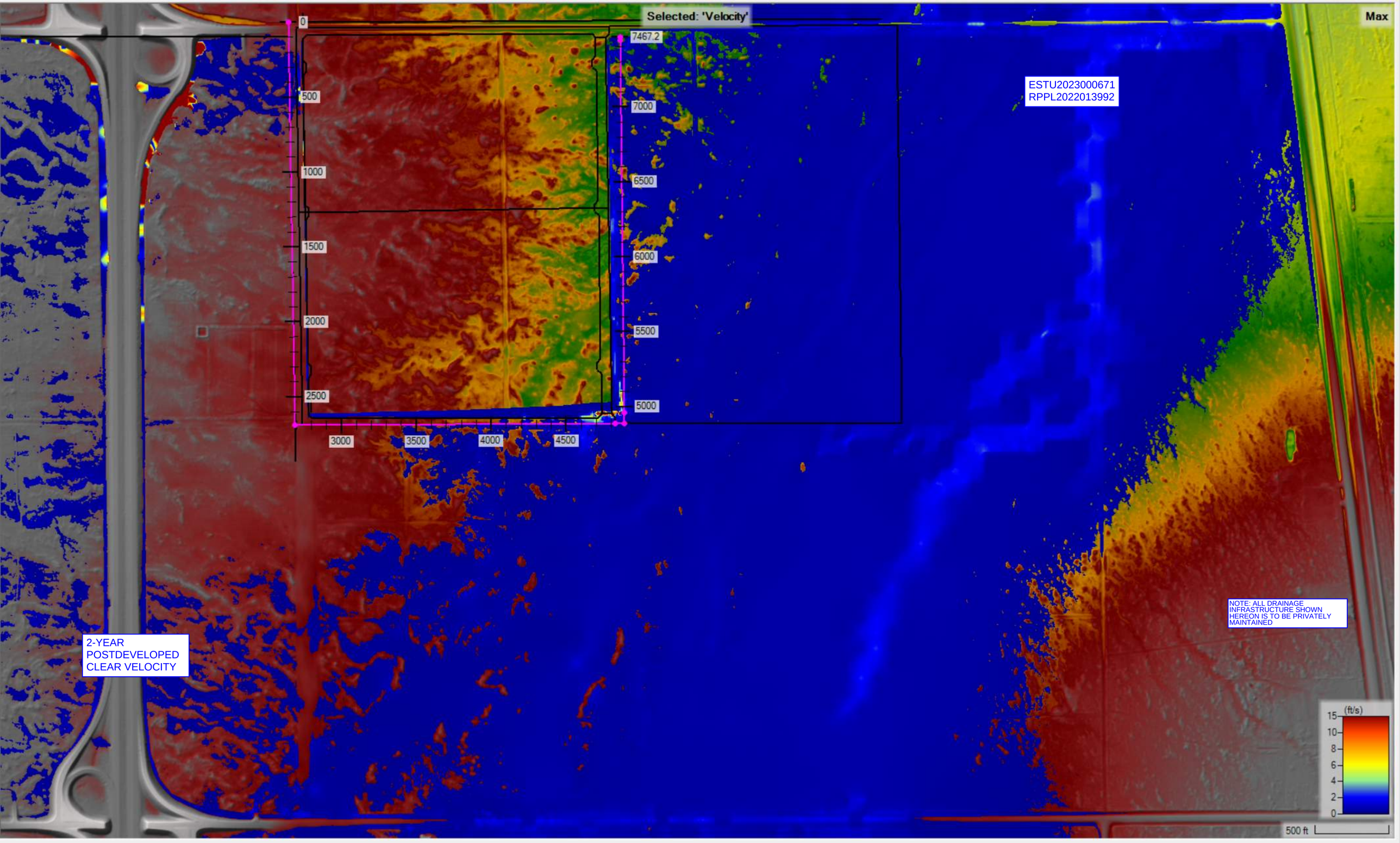

Selected: 'Depth'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
10-YEAR
POSTDEVELOPED
CLEAR DEPTH
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft

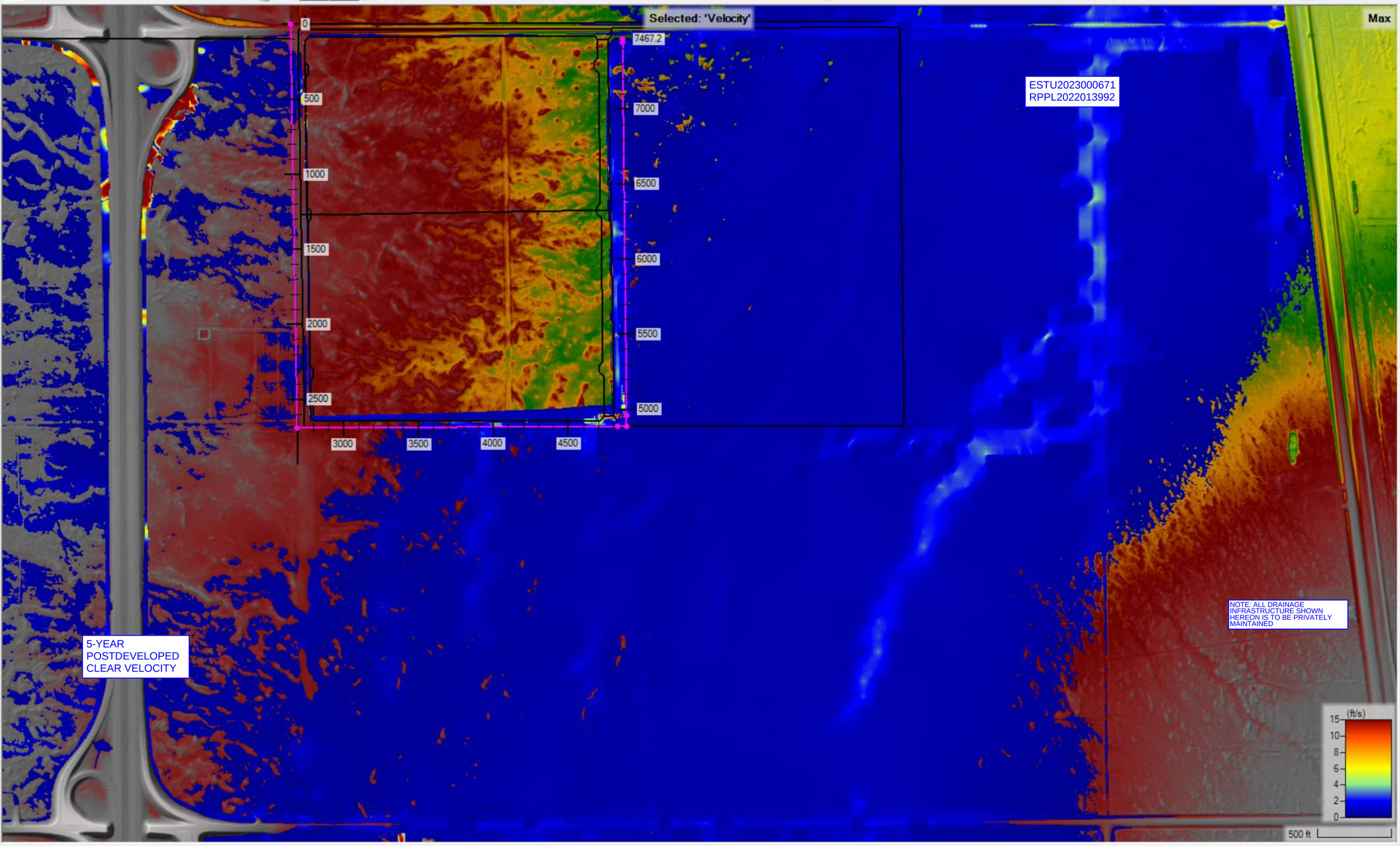

Selected: 'Depth'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
25-YEAR
POSTDEVELOPED
CLEAR DEPTH
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft

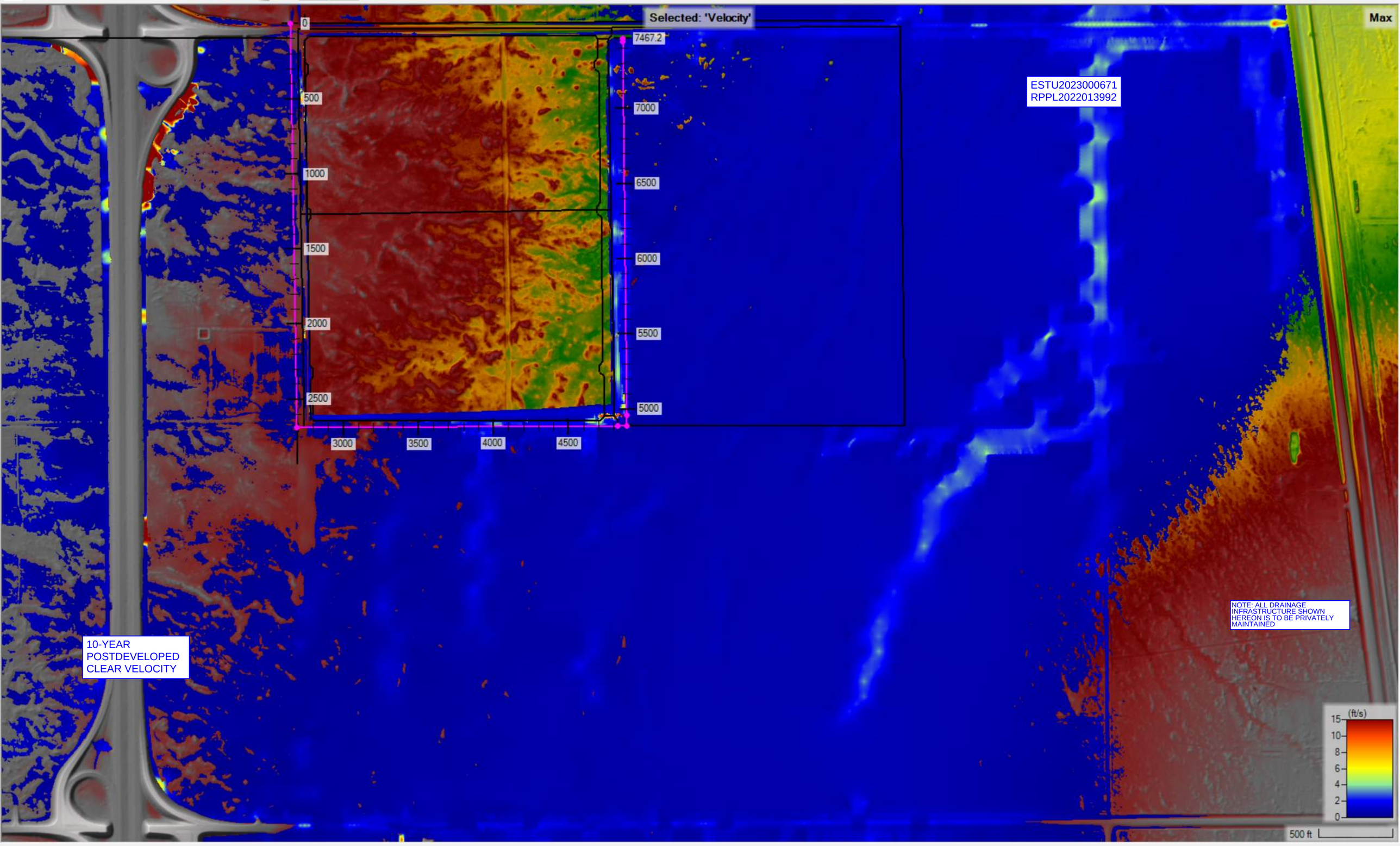

Selected: 'Depth'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
50-YEAR
POSTDEVELOPED
CLEAR DEPTH
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft

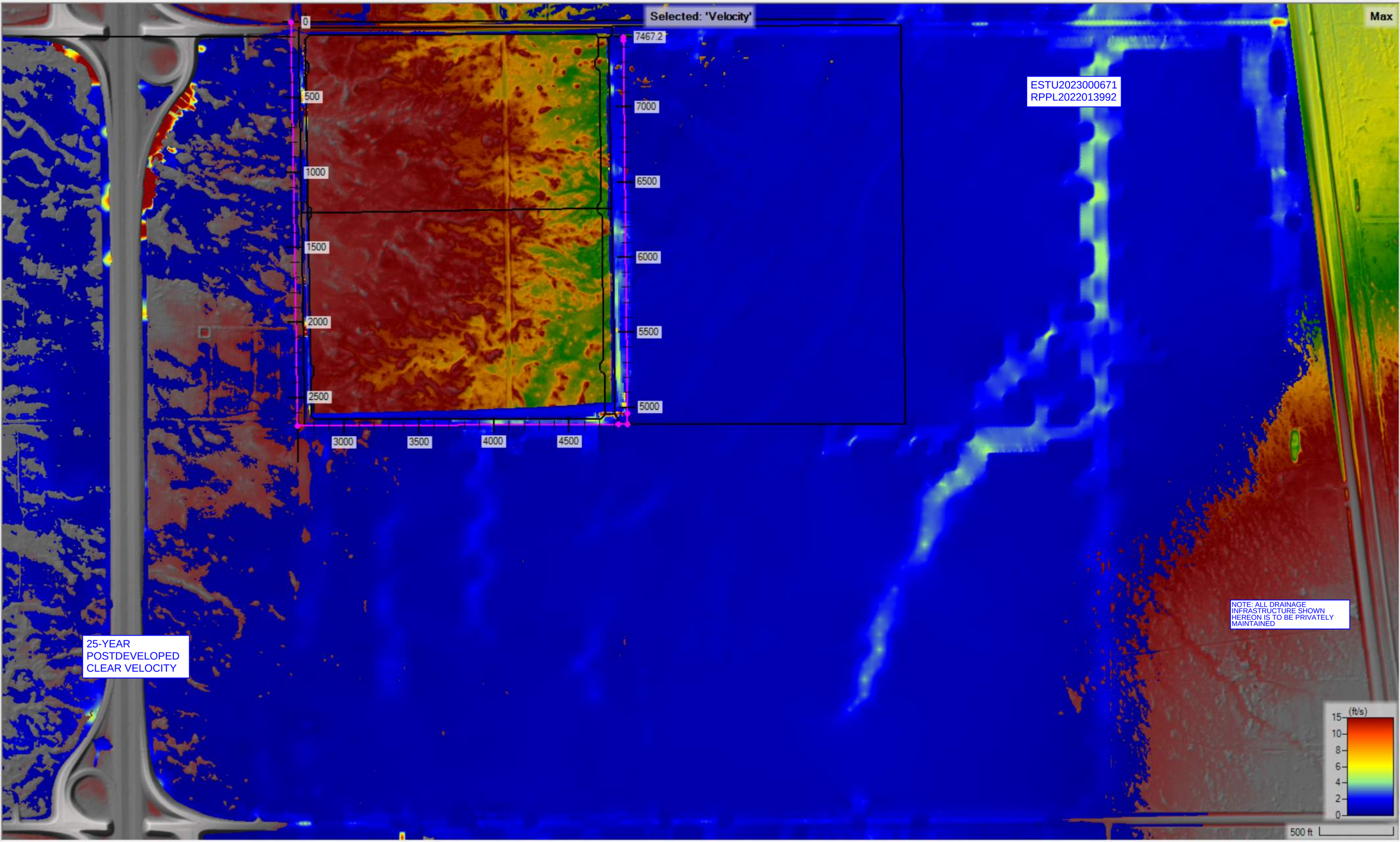

Selected: 'Depth'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7467.2
ESTU2023000671
RPPL2022013992
50-YEAR
POSTDEVELOPED
BURNED AND
BULKED DEPTH
NOTE: ALL DRAINAGE
INFRASTRUCTURE SHOWN
HEREON IS TO BE PRIVATELY
MAINTAINED
(ft)
Max
9
8
7
6
5
4
3
2
1
0
500 ft

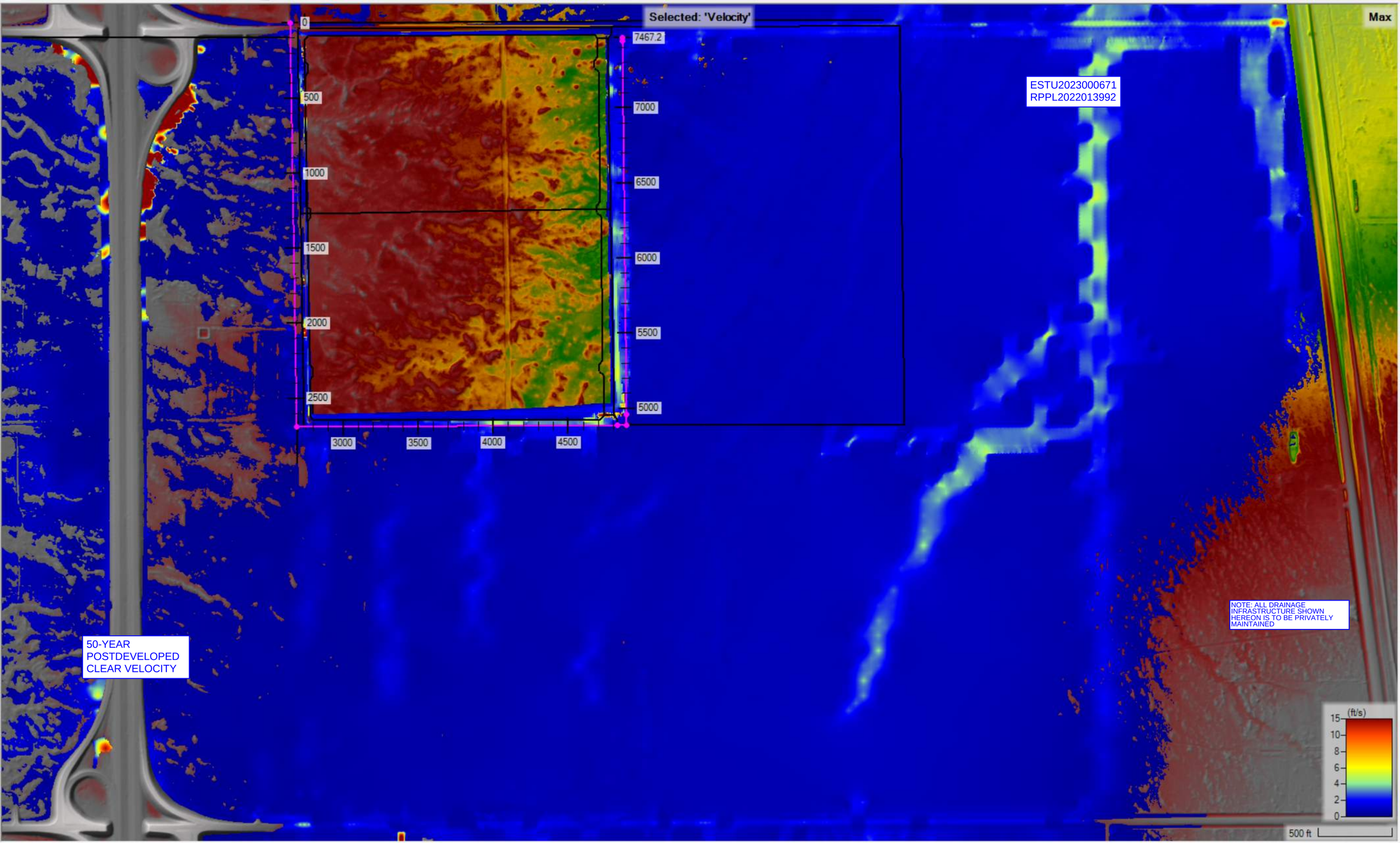
Appendix XXXV: Postdeveloped Velocity Maps

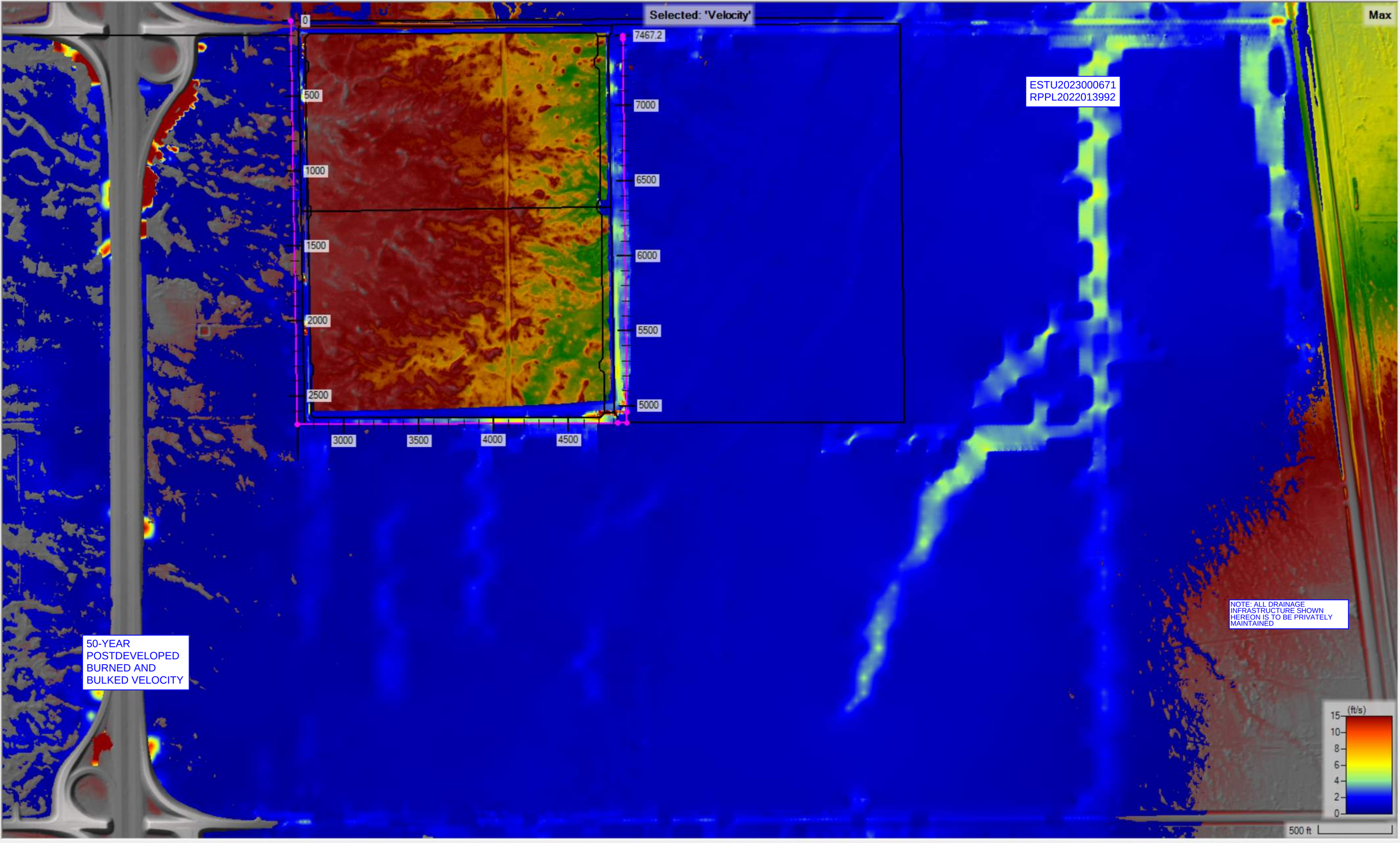

Selected: 'Velocity'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
2-YEAR
POSTDEVELOPED
CLEAR VELOCITY
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
(ft/s)
15
10
8
6
4
2
0
500 ft


Selected: 'Velocity'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
5-YEAR
POSTDEVELOPED
CLEAR VELOCITY
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
(ft/s)
15
10
8
6
4
2
0
500 ft


Selected: 'Velocity'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
10-YEAR
POSTDEVELOPED
CLEAR VELOCITY
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
(ft/s)
15
10
8
6
4
2
0
500 ft


Selected: 'Velocity'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7467.2
ESTU2023000671
RPPL2022013992
25-YEAR
POSTDEVELOPED
CLEAR VELOCITY
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
(ft/s)
15
10
8
6
4
2
0
500 ft


Selected: 'Velocity'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
50-YEAR
POSTDEVELOPED
CLEAR VELOCITY
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
(ft/s)
15
10
8
6
4
2
0
500 ft


Selected: 'Velocity'
Max
0
500
1000
1500
2000
2500
3000
3500
4000
4500
7467.2
7000
6500
6000
5500
5000
ESTU2023000671
RPPL2022013992
50-YEAR
POSTDEVELOPED
BURNED AND
BULKED VELOCITY
NOTE: ALL DRAINAGE
INFRASTRUCTURE SHOWN
HEREON IS TO BE PRIVATELY
MAINTAINED
(ft/s)
15
10
8
6
4
2
0
500 ft

Appendix XXXVI: Postdeveloped Comparison Tables

ESTU2023000671
RPPL2022013992

Station (ft)	2yr 24hr Pre Velocity '02SEP2008 23:00:00' (feet/sec)	2yr 24hr Post No Sed Velocity '02SEP2008 23:00:00' (feet/sec)
0	0.0	0.0
200.042	0.0	0.0
400.57	0.0	0.0
599.67	0.1	0.1
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.0	0.0
1400.34	0.0	0.0
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.0	0.0
2400.894	0.0	0.0
2599.266	0.0	0.0
2800.634	0.0	0.0
3000.653	0.0	0.0
3200.228	0.0	0.0
3200.671	0.0	0.0
3200.77	0.0	0.0
3400.543	0.0	0.0
3600.316	0.0	0.0
3800.09	0.0	0.0
4000.746	0.0	0.0
4200.714	0.0	0.0
4400.242	0.0	0.0
4600.802	0.0	0.0
4800.672	0.1	0.2
5000.023	0.0	0.0
5200.246	0.0	0.0
5400.009	0.0	0.0
5600.691	0.0	0.0
5800.161	0.0	0.0
6000.045	0.0	0.0
6200.762	0.0	0.0
6401.583	0.0	0.0
6600.082	0.0	0.0
6800.18	0.0	0.0
7001.965	0.0	0.0
7200.119	0.0	0.0
7401.131	0.0	0.0

ESTU2023000671
RPPL2022013992

Station (ft)	2yr 24hr Pre Depth 'Max' (feet)	2yr 24hr Post No Sed Depth 'Max' (feet)
0	0.0	0.0
200.042	0.1	0.1
400.57	0.3	0.0
599.67	0.1	0.1
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.0	0.0
1400.34	0.0	0.0
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.0	0.0
2400.894	0.0	0.0
2599.266	0.0	0.0
2800.634	0.0	0.0
3000.653	0.0	0.0
3200.228	0.0	0.0
3200.671	0.0	0.0
3200.77	0.0	0.0
3400.543	0.1	0.0
3600.316	0.4	0.3
3800.09	0.5	0.4
4000.746	0.5	0.3
4200.714	0.5	0.1
4400.242	1.2	0.9
4600.802	1.2	0.8
4800.672	1.4	1.1
5000.023	1.9	1.7
5200.246	0.0	1.1
5400.009	1.1	1.1
5600.691	1.4	1.5
5800.161	0.0	0.1
6000.045	0.5	0.7
6200.762	0.0	0.0
6401.583	0.0	0.0
6600.082	0.0	0.0
6800.18	0.5	0.8
7001.965	0.0	0.9
7200.119	0.3	0.5
7401.131	0.0	0.0

ESTU2023000671
RPPL2022013992

Station (ft)	5yr 24hr Post Velocity '02SEP2008 23:00:00' (feet/sec)	5yr 24hr Pre Velocity '02SEP2008 23:00:00' (feet/sec)
0	0.0	0.0
200.042	0.1	0.1
400.57	0.1	0.0
599.67	0.1	0.1
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.0	0.0
1400.34	0.0	0.0
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.0	0.0
2400.894	0.0	0.0
2599.266	0.0	0.0
2800.634	0.0	0.0
3000.653	0.0	0.0
3200.228	0.0	0.0
3200.671	0.0	0.0
3200.77	0.0	0.0
3400.543	0.0	0.0
3600.316	0.0	0.0
3800.09	0.0	0.0
4000.746	0.0	0.0
4200.714	0.0	0.0
4400.242	0.2	0.1
4600.802	0.2	0.9
4800.672	0.2	0.2
5000.023	0.1	0.1
5200.246	0.0	0.1
5400.009	0.1	0.1
5600.691	0.1	0.2
5800.161	0.0	0.0
6000.045	0.0	0.6
6200.762	0.0	0.0
6401.583	0.0	0.0
6600.082	0.0	0.0
6800.18	0.0	0.0
7001.965	0.0	0.0
7200.119	0.0	0.0
7401.131	0.4	0.0

ESTU2023000671
RPPL2022013992

Station (ft)	5yr 24hr Post Depth 'Max' (feet)	5yr 24hr Pre Depth 'Max' (feet)
0	0.0	0.0
200.042	0.3	0.2
400.57	0.5	0.0
599.67	0.2	0.2
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.0	0.0
1400.34	0.2	0.1
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.0	0.0
2400.894	0.0	0.1
2599.266	0.0	0.0
2800.634	0.0	0.0
3000.653	0.0	0.0
3200.228	0.0	0.0
3200.671	0.0	0.0
3200.77	0.0	0.0
3400.543	1.0	0.7
3600.316	1.4	0.9
3800.09	1.5	1.1
4000.746	1.5	1.1
4200.714	1.3	1.0
4400.242	2.1	1.8
4600.802	2.0	1.7
4800.672	2.2	2.0
5000.023	2.7	2.6
5200.246	0.0	2.0
5400.009	1.9	1.9
5600.691	2.2	2.3
5800.161	0.8	0.8
6000.045	1.4	1.3
6200.762	0.6	0.6
6401.583	0.4	0.6
6600.082	0.0	0.0
6800.18	1.4	1.6
7001.965	0.0	1.6
7200.119	1.1	1.1
7401.131	0.2	0.5

ESTU2023000671
RPPL2022013992

Station (ft)	010yr 24hr Post Depth 'Max' (feet)	10yr 24hr Pre Depth 'Max' (feet)
0	0.0	0.0
200.042	0.3	0.4
400.57	0.0	0.7
599.67	0.3	0.3
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.2	0.2
1400.34	0.5	0.4
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.2	0.1
2400.894	0.3	0.1
2599.266	0.2	0.0
2800.634	0.3	0.1
3000.653	0.6	0.4
3200.228	0.1	0.4
3200.671	0.1	0.4
3200.77	0.1	0.4
3400.543	1.2	1.5
3600.316	1.5	1.9
3800.09	1.6	2.0
4000.746	1.6	2.0
4200.714	1.6	1.8
4400.242	2.3	2.6
4600.802	2.3	2.5
4800.672	2.5	2.7
5000.023	3.1	3.2
5200.246	2.5	0.0
5400.009	2.4	2.3
5600.691	2.7	2.6
5800.161	1.2	1.2
6000.045	1.7	1.8
6200.762	1.0	1.0
6401.583	1.0	0.9
6600.082	0.3	0.0
6800.18	1.9	1.8
7001.965	2.0	0.0
7200.119	1.5	1.4
7401.131	0.9	0.6

ESTU2023000671
RPPL2022013992

Station (ft)	10yr 24hr Pre Velocity '02SEP2008 23:00:00' (feet/sec)	10-yr 24-hr Post No Sed Velocity '02SEP2008 23:00:00' (feet/sec)
0	0.0	0.0
200.042	0.1	0.1
400.57	0.1	0.0
599.67	0.1	0.1
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.0	0.0
1400.34	0.0	0.0
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.3	0.1
2400.894	0.0	0.0
2599.266	0.0	0.0
2800.634	0.0	0.1
3000.653	0.0	0.0
3200.228	0.0	0.1
3200.671	0.0	0.1
3200.77	0.0	0.1
3400.543	0.0	0.0
3600.316	0.0	0.1
3800.09	0.0	0.0
4000.746	0.2	0.2
4200.714	0.0	0.0
4400.242	0.1	0.3
4600.802	0.3	1.3
4800.672	0.3	0.3
5000.023	0.2	0.1
5200.246	0.0	0.3
5400.009	0.2	0.3
5600.691	0.2	0.3
5800.161	0.0	0.0
6000.045	0.0	0.8
6200.762	0.0	0.0
6401.583	0.0	0.0
6600.082	0.0	0.0
6800.18	0.0	0.1
7001.965	0.0	0.0
7200.119	0.0	0.0
7401.131	0.4	0.0

ESTU2023000671
RPPL2022013992

Station (ft)	25yr 24hr Post Depth 'Max' (feet)	25yr 24hr Pre Depth 'Max' (feet)
0	0.0	0.0
200.042	0.4	0.5
400.57	0.0	0.8
599.67	0.4	0.5
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.2	0.2
1400.34	0.5	0.6
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.4	0.4
2400.894	0.4	0.4
2599.266	0.3	0.5
2800.634	0.7	1.0
3000.653	1.0	1.3
3200.228	0.7	1.0
3200.671	0.8	1.0
3200.77	0.8	1.0
3400.543	1.8	2.1
3600.316	2.2	2.4
3800.09	2.3	2.6
4000.746	2.3	2.5
4200.714	2.2	2.4
4400.242	3.0	3.2
4600.802	2.9	3.1
4800.672	3.1	3.3
5000.023	3.7	3.7
5200.246	3.1	0.0
5400.009	2.9	2.9
5600.691	3.2	3.2
5800.161	1.7	1.7
6000.045	2.1	2.2
6200.762	1.5	1.5
6401.583	1.5	1.4
6600.082	0.8	0.0
6800.18	2.4	2.2
7001.965	2.4	0.0
7200.119	1.8	1.8
7401.131	1.3	1.1

ESTU2023000671
RPPL2022013992

Station (ft)	25yr 24hr Pre Velocity '02SEP2008 23:00:00' (feet/sec)	25yr 24hr Post No Sed Velocity '02SEP2008 23:00:00' (feet/sec)
0	0.0	0.0
200.042	0.1	0.1
400.57	0.1	0.0
599.67	0.1	0.1
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.1	0.0
1400.34	0.0	0.0
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.4	0.1
2400.894	0.0	0.0
2599.266	0.0	0.0
2800.634	0.0	0.1
3000.653	0.0	0.0
3200.228	0.1	0.2
3200.671	0.1	0.2
3200.77	0.1	0.2
3400.543	0.0	0.0
3600.316	0.0	0.0
3800.09	0.1	0.1
4000.746	0.3	1.4
4200.714	0.2	0.4
4400.242	0.2	0.5
4600.802	0.4	1.2
4800.672	0.3	0.4
5000.023	0.3	0.2
5200.246	0.0	0.6
5400.009	0.3	0.6
5600.691	0.2	0.6
5800.161	0.1	0.4
6000.045	0.0	1.1
6200.762	0.4	1.4
6401.583	0.0	0.3
6600.082	0.0	0.0
6800.18	0.0	0.1
7001.965	0.0	0.0
7200.119	0.0	0.0
7401.131	0.4	0.5

ESTU2023000671
RPPL2022013992

Station (ft)	050yr 24hr post Depth 'Max' (feet)	050yr 24hr pre Depth 'Max' (feet)
0	0.0	0.0
200.042	0.6	0.6
400.57	0.0	0.8
599.67	0.5	0.5
800.056	0.0	0.0
999.161	0.1	0.0
1199.542	0.3	0.3
1400.34	0.6	0.6
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.7	0.8
2400.894	0.7	0.9
2599.266	0.7	0.8
2800.634	1.1	1.3
3000.653	1.5	1.6
3200.228	1.2	1.3
3200.671	1.2	1.3
3200.77	1.2	1.3
3400.543	2.2	2.4
3600.316	2.6	2.8
3800.09	2.7	2.9
4000.746	2.6	2.9
4200.714	2.6	2.7
4400.242	3.3	3.5
4600.802	3.2	3.4
4800.672	3.5	3.6
5000.023	4.1	4.1
5200.246	3.4	0.0
5400.009	3.2	3.2
5600.691	3.5	3.4
5800.161	2.0	2.0
6000.045	2.4	2.5
6200.762	1.8	1.8
6401.583	1.7	1.7
6600.082	1.0	0.0
6800.18	2.6	2.5
7001.965	2.6	0.0
7200.119	2.0	2.0
7401.131	1.5	1.3

ESTU2023000671
RPPL2022013992

Station (ft)	050yr 24hr pre Velocity '02SEP2008 23:00:00' (feet/sec)	050yr 24hr Post No Sed Velocity '02SEP2008 23:00:00' (feet/sec)
0	0.0	0.0
200.042	0.1	0.1
400.57	0.1	0.0
599.67	0.1	0.1
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.0	0.1
1400.34	0.1	0.0
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.4	0.1
2400.894	0.0	0.0
2599.266	0.0	0.0
2800.634	0.0	0.1
3000.653	0.0	0.0
3200.228	0.1	0.3
3200.671	0.1	0.3
3200.77	0.1	0.3
3400.543	0.0	0.0
3600.316	0.0	0.2
3800.09	0.2	0.9
4000.746	0.5	1.6
4200.714	0.3	0.4
4400.242	0.4	0.5
4600.802	0.5	1.2
4800.672	0.4	0.4
5000.023	0.3	0.3
5200.246	0.0	0.9
5400.009	0.3	0.8
5600.691	0.3	0.8
5800.161	0.2	0.8
6000.045	0.1	1.4
6200.762	0.6	1.8
6401.583	0.1	0.6
6600.082	0.0	0.0
6800.18	0.1	0.1
7001.965	0.0	0.0
7200.119	0.1	0.1
7401.131	0.4	0.5

ESTU2023000671
RPPL2022013992

Station (ft)	050yr 24hr Post BB Depth 'Max' (feet)	50yr 24hr Pre BB Depth 'Max' (feet)
0	0.0	0.0
200.042	0.6	0.6
400.57	0.0	0.9
599.67	0.6	0.6
800.056	0.0	0.0
999.161	0.2	0.0
1199.542	0.3	0.3
1400.34	0.6	0.6
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.5	0.4
2200.102	1.5	1.4
2400.894	1.5	1.5
2599.266	1.4	1.5
2800.634	1.9	1.9
3000.653	2.2	2.2
3200.228	1.9	1.9
3200.671	1.9	1.9
3200.77	1.9	1.9
3400.543	2.9	3.0
3600.316	3.3	3.3
3800.09	3.3	3.5
4000.746	3.3	3.4
4200.714	3.2	3.3
4400.242	4.0	4.0
4600.802	3.9	4.0
4800.672	4.1	4.1
5000.023	4.7	4.6
5200.246	4.0	0.0
5400.009	3.8	3.7
5600.691	4.1	4.0
5800.161	2.5	2.5
6000.045	2.9	3.0
6200.762	2.3	2.3
6401.583	2.2	2.2
6600.082	1.5	0.0
6800.18	3.1	3.0
7001.965	3.0	0.0
7200.119	2.4	2.4
7401.131	1.8	1.8

ESTU2023000671
RPPL2022013992

Station (ft)	50yr 24hr Pre BB Velocity '02SEP2008 23:00:00' (feet/sec)	No Sed 050yr 24hr Post BB Velocity '02SEP2008 23:00:00' (feet/sec)
0	0.0	0.0
200.042	0.1	0.1
400.57	0.2	0.0
599.67	0.1	0.1
800.056	0.0	0.0
999.161	0.0	0.0
1199.542	0.1	0.1
1400.34	0.0	0.0
1600.679	0.0	0.0
1800.295	0.0	0.0
2000.418	0.0	0.0
2200.102	0.5	0.2
2400.894	0.0	0.0
2599.266	0.0	0.0
2800.634	0.0	0.1
3000.653	0.0	0.0
3200.228	0.1	0.3
3200.671	0.1	0.3
3200.77	0.1	0.3
3400.543	0.0	0.0
3600.316	0.1	0.3
3800.09	0.2	1.1
4000.746	0.5	1.7
4200.714	0.3	0.4
4400.242	0.5	0.6
4600.802	0.6	1.2
4800.672	0.4	0.4
5000.023	0.4	0.3
5200.246	0.0	1.0
5400.009	0.4	0.9
5600.691	0.3	0.9
5800.161	0.2	0.9
6000.045	0.1	1.5
6200.762	0.6	1.9
6401.583	0.1	0.7
6600.082	0.0	0.0
6800.18	0.1	0.1
7001.965	0.0	0.1
7200.119	0.1	0.1
7401.131	0.4	0.5

Appendix XXXVII: LA County Flood Insurance Study

ESTU2023000671
RPPL2022013992

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later and from National Geospatial Intelligence Agency imagery produced at a scale of 1:4,000 from photography dated 2003 or later.

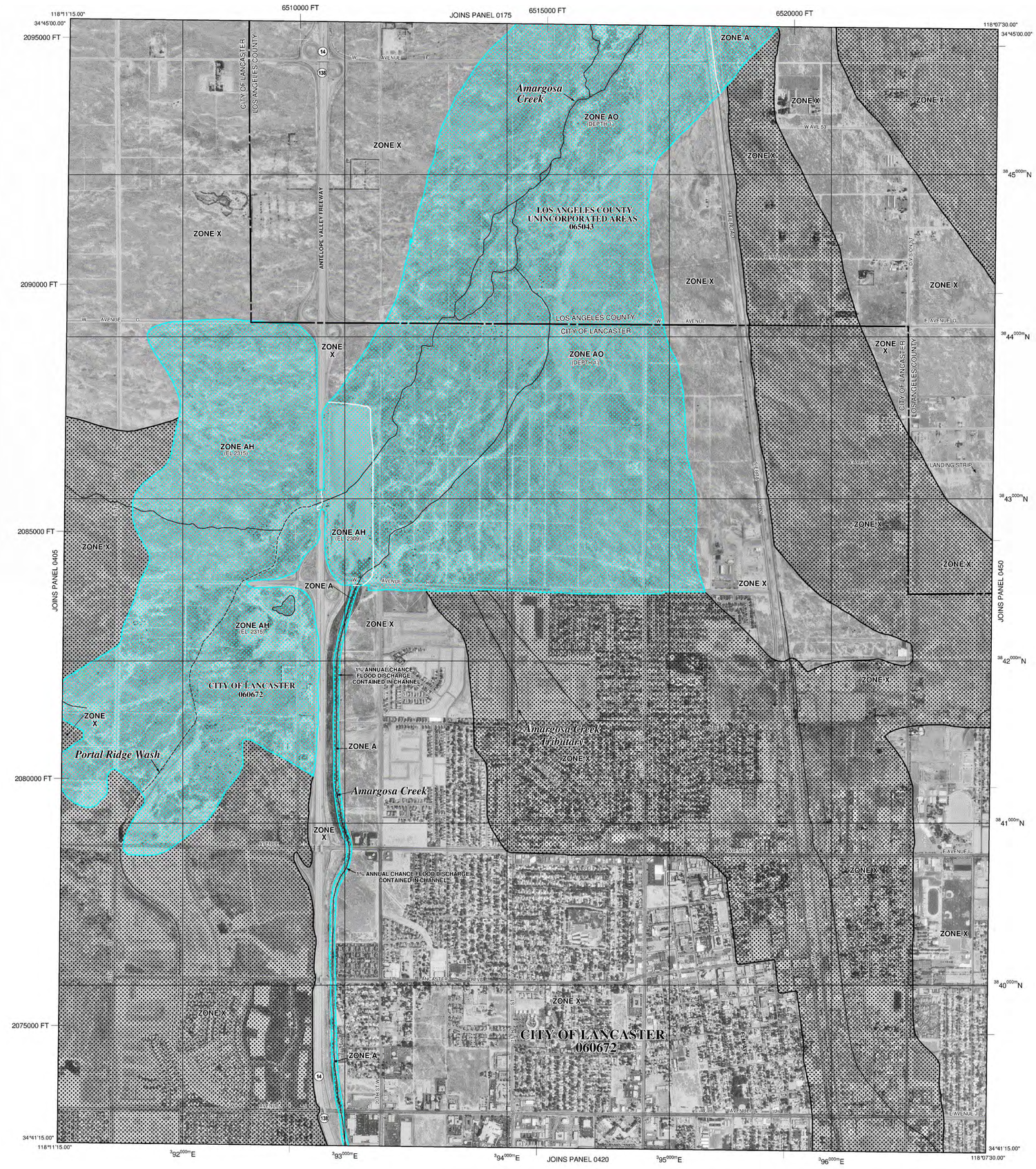
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP**(1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A — Cross section line
23 — 23 — Transect line
97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN — 1000-meter Universal Transverse Mercator grid values, zone 11
6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, V zone (FIPSZONE 0405), Lambert Conformal Conic
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 26, 2008
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0410F

FIRM
FLOOD INSURANCE RATE MAP
LOS ANGELES COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 410 OF 2350
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LOS ANGELES COUNTY	065043	0410	F
LANCASTER, CITY OF	060672	0410	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06037C0410F

EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency

Table 10: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Acton Canyon	At confluence with Santa Clara River	20.9	900	*	2,750	4,080	*	9,050
Acton Canyon	Upstream of confluence with Escondido Canyon Creek	7.5	370	*	1,130	1,670	*	3,700
Agua Dulce Canyon Creek	At confluence with Santa Clara River	29.5	670	*	2,030	3,010	*	6,680
Agua Dulce Canyon Creek	At Sierra Highway	15.6	390	*	1,190	1,770	*	3,930
Agua Dulce Canyon Creek	At Agua Dulce Canyon Road	*	650	*	1,970	2,920	*	6,480
Aliso Canyon Creek	Approximately 0.9 miles upstream of Aliso Canyon Road	*	930	*	2,840	4,210	*	9,340
Aliso Canyon Creek	At Aliso Canyon Road	*	940	*	2,880	4,270	*	9,470
Aliso Canyon Creek	At confluence with Santa Clara River	*	1,030	*	3,160	4,680	*	10,380
Amargosa Creek	East of Antelope Valley Freeway north of Avenue H	206	3,000	*	9,000	13,000	*	30,000
Amargosa Creek	West of Antelope Valley Freeway north of Avenue H	147	2,000	*	5,600	8,400	*	18,000
Amargosa Creek	Approximately midway between 20th Street West and 10th Street West	32.7	1,800	*	3,300	5,000	*	10,100

Appendix XXXVIII: HEC-RAS One-Dimensional Flow Geometry


Selected: 'Postdeveloped 1D'
ESTU2023000671
RPPL2022013992
AMARGOSA CREEK
CROSS SECTIONS
PROJECT SITE
Antelope Valley Fwy
20th St W
17th St W
12th St W
10th St W
Sierra Hwy
5th St W
3rd St W
4th St W
W Ave E 10
W Ave E 8
W Ave E 12
W Ave F
W Ave F 4
W Ave F 8
W Ave F 12
W Ave G
1444
2295
3332
4042
5221
6187
6981
7830
Acreage Plaza
Temporarily closed
Hughes Saloon
Temporarily closed
Amargosa Reach 1
Lancaster Trailer Park
Tn Truss
Space Spots X - Scrace
1000 ft

Appendix XXXIX: Hec Ras Predeveloped Depth Map and Tables (100-year FEMA)

Selected: 'Depth'

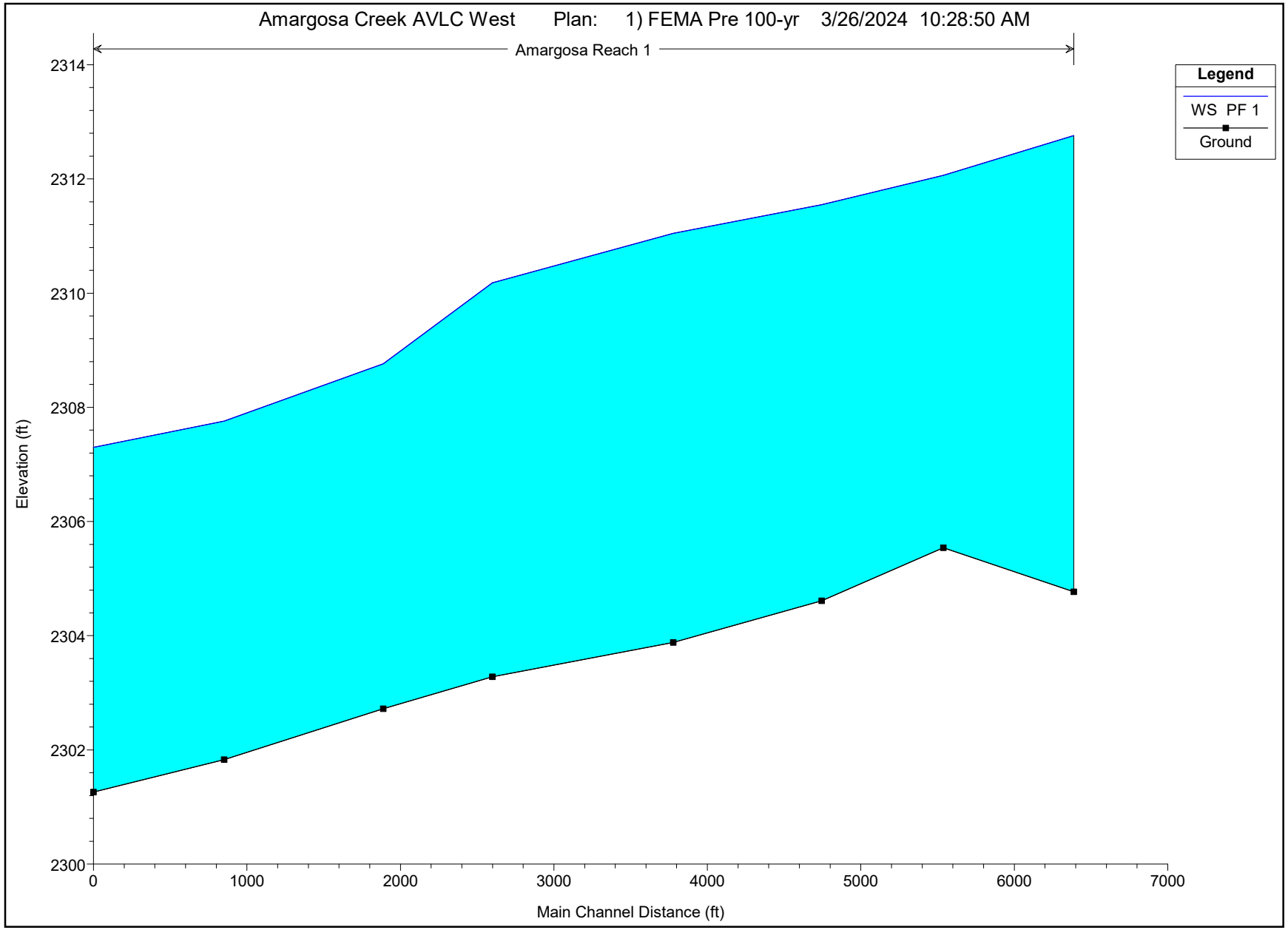
PF 1

W Ave F

ESTU2023000671
RPPL2022013992

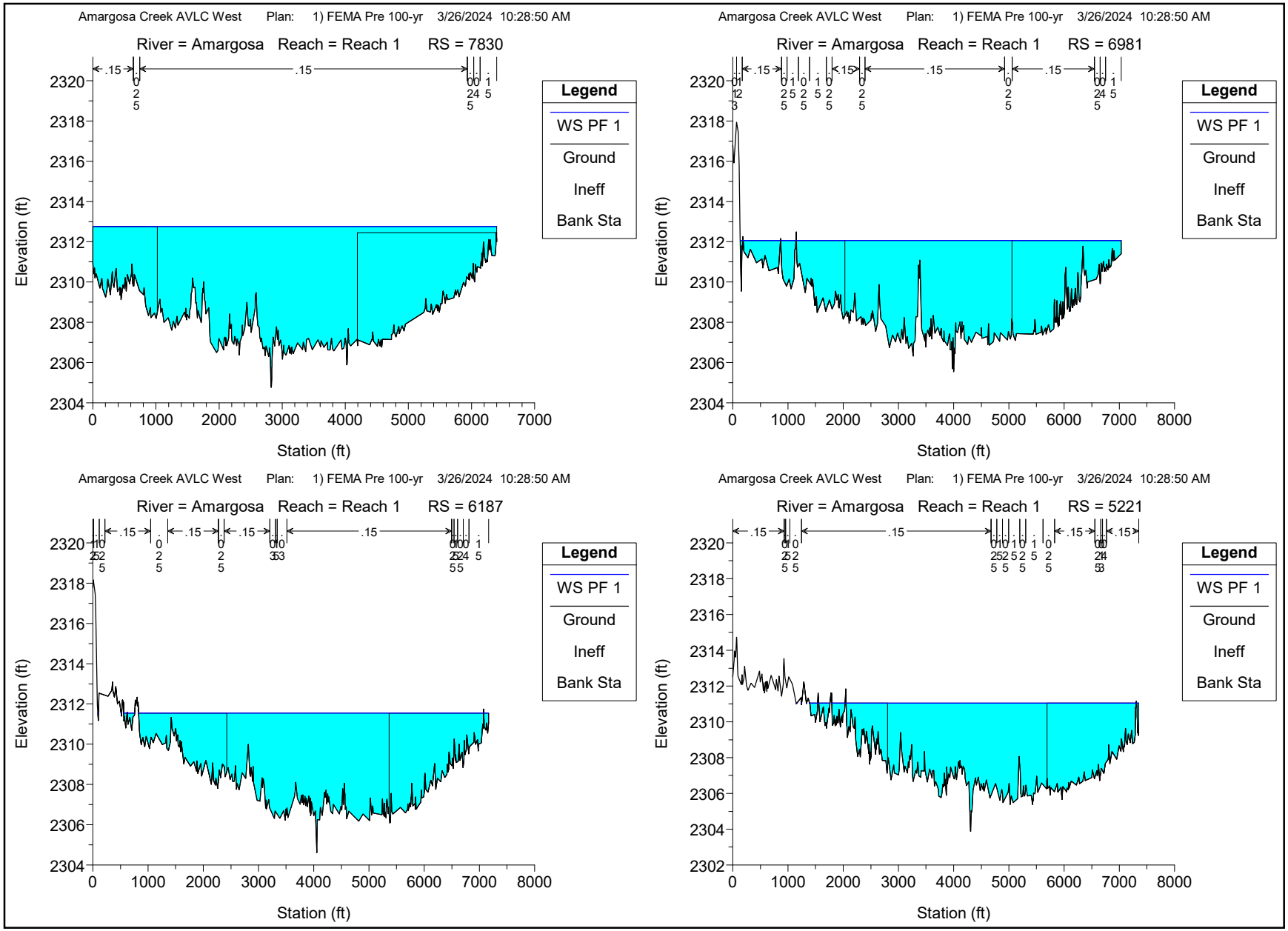
(ft)
Max
9
8
7
6
5
4
3
2
1
0

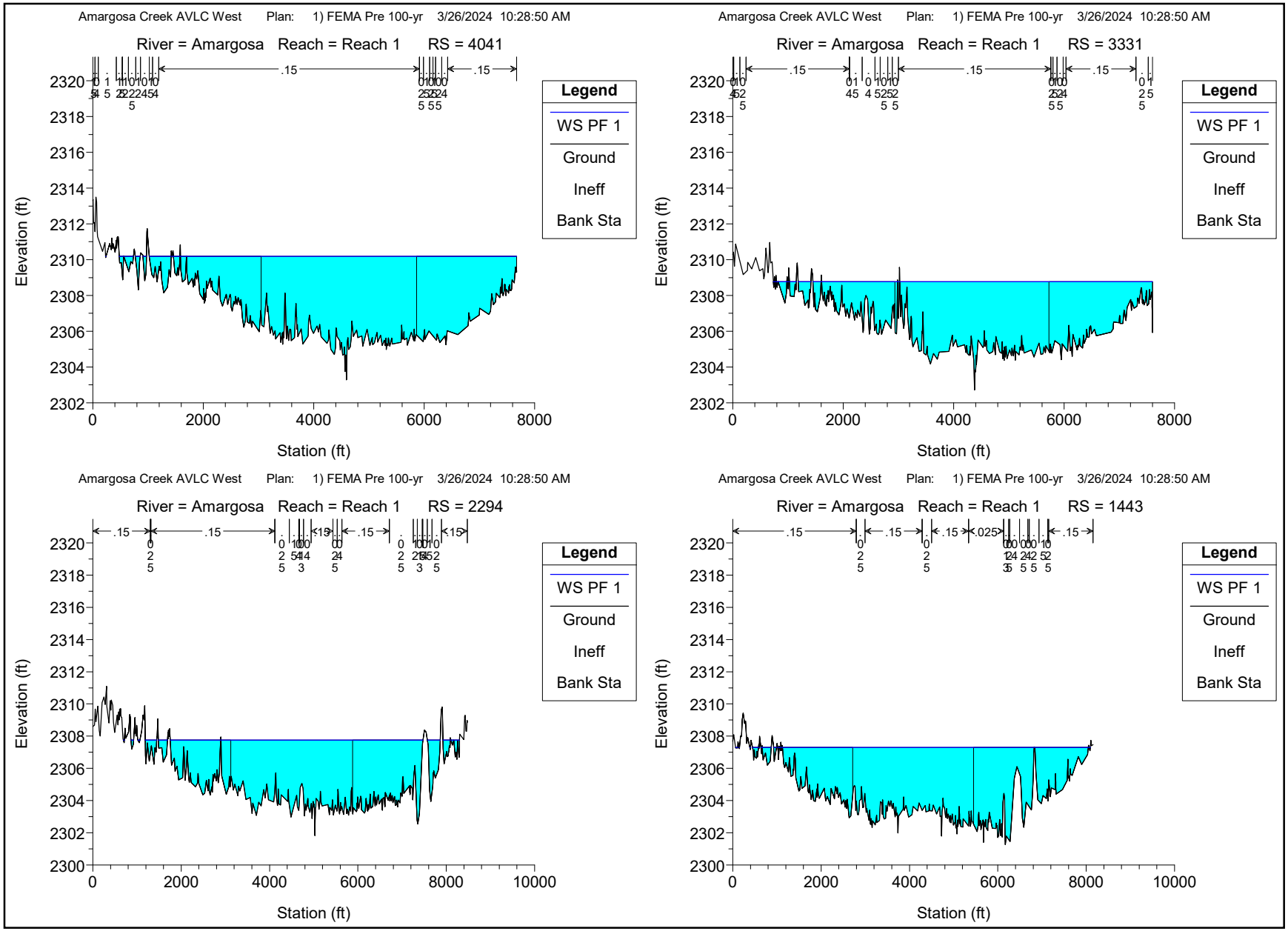
500 ft


Amargosa Creek AVLC West Plan: 1) FEMA Pre 100-yr 3/26/2024 10:28:50 AM
Amargosa Reach 1
Legend
WS PF 1
Ground
Elevation (ft)
2314
2312
2310
2308
2306
2304
2302
2300
0
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)

HEC-RAS Plan: FEMA Pre 100-yr River: Amargosa Reach: Reach 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	7830	PF 1	13000.00	2304.77	2312.76		2312.77	0.001019	0.74	17680.73	6400.00	0.07
Reach 1	6981	PF 1	13000.00	2305.54	2312.06		2312.08	0.000664	0.96	13580.94	6877.47	0.08
Reach 1	6187	PF 1	13000.00	2304.61	2311.55		2311.57	0.000624	0.99	13128.65	6553.92	0.08
Reach 1	5221	PF 1	13000.00	2303.88	2311.05		2311.06	0.000441	1.02	12749.66	5898.77	0.09
Reach 1	4041	PF 1	13000.00	2303.28	2310.18		2310.20	0.001469	1.03	12609.91	7025.39	0.09
Reach 1	3331	PF 1	13000.00	2302.72	2308.76		2308.79	0.002817	1.30	10002.23	6711.40	0.12
Reach 1	2294	PF 1	13000.00	2301.83	2307.76		2307.78	0.000486	1.24	10505.30	6958.83	0.11
Reach 1	1443	PF 1	13000.00	2301.26	2307.30	2304.10	2307.32	0.000601	1.17	11107.85	7526.60	0.10


Amargosa Creek AVLC West Plan: 1) FEMA Pre 100-yr 3/26/2024 10:28:50 AM
River = Amargosa Reach = Reach 1 RS = 7830
Legend
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Amargosa Creek AVLC West Plan: 1) FEMA Pre 100-yr 3/26/2024 10:28:50 AM
River = Amargosa Reach = Reach 1 RS = 6981
Legend
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Amargosa Creek AVLC West Plan: 1) FEMA Pre 100-yr 3/26/2024 10:28:50 AM
River = Amargosa Reach = Reach 1 RS = 6187
Legend
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Amargosa Creek AVLC West Plan: 1) FEMA Pre 100-yr 3/26/2024 10:28:50 AM
River = Amargosa Reach = Reach 1 RS = 5221
Legend
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Amargosa Creek AVLC West Plan: 1) FEMA Pre 100-yr 3/26/2024 10:28:50 AM
River = Amargosa Reach = Reach 1 RS = 4041
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Amargosa Creek AVLC West Plan: 1) FEMA Pre 100-yr 3/26/2024 10:28:50 AM
River = Amargosa Reach = Reach 1 RS = 3331
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Amargosa Creek AVLC West Plan: 1) FEMA Pre 100-yr 3/26/2024 10:28:50 AM
River = Amargosa Reach = Reach 1 RS = 2294
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Amargosa Creek AVLC West Plan: 1) FEMA Pre 100-yr 3/26/2024 10:28:50 AM
River = Amargosa Reach = Reach 1 RS = 1443
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

Plan: FEMA Pre 100-yr Amargosa Reach 1 RS: 7830 Profile: PF 1

E.G. Elev (ft)	2312.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.150	
W.S. Elev (ft)	2312.76	Reach Len. (ft)	848.90	848.90	848.90
Crit W.S. (ft)		Flow Area (sq ft)		17680.73	
E.G. Slope (ft/ft)	0.001019	Area (sq ft)		29109.59	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6400.00	Top Width (ft)		6400.00	
Vel Total (ft/s)	0.74	Avg. Vel. (ft/s)		0.74	
Max Chl Dpth (ft)	7.99	Hydr. Depth (ft)		3.29	
Conv. Total (cfs)	407285.6	Conv. (cfs)		407285.6	
Length Wtd. (ft)	848.90	Wetted Per. (ft)		5382.83	
Min Ch El (ft)	2304.77	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.15	
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)		3222.43	
C & E Loss (ft)	0.00	Cum SA (acres)		981.13	

Plan: FEMA Pre 100-yr Amargosa Reach 1 RS: 6981 Profile: PF 1

E.G. Elev (ft)	2312.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.109	
W.S. Elev (ft)	2312.06	Reach Len. (ft)	794.20	794.20	794.20
Crit W.S. (ft)		Flow Area (sq ft)		13580.94	
E.G. Slope (ft/ft)	0.000664	Area (sq ft)		23214.14	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6877.47	Top Width (ft)		6877.47	
Vel Total (ft/s)	0.96	Avg. Vel. (ft/s)		0.96	
Max Chl Dpth (ft)	6.52	Hydr. Depth (ft)		4.49	
Conv. Total (cfs)	504651.8	Conv. (cfs)		504651.8	
Length Wtd. (ft)	794.20	Wetted Per. (ft)		3029.01	
Min Ch El (ft)	2305.54	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.18	
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)		2712.58	
C & E Loss (ft)	0.00	Cum SA (acres)		851.76	

Plan: FEMA Pre 100-yr Amargosa Reach 1 RS: 6187 Profile: PF 1

E.G. Elev (ft)	2311.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.103	
W.S. Elev (ft)	2311.55	Reach Len. (ft)	966.40	966.40	966.40
Crit W.S. (ft)		Flow Area (sq ft)		13128.65	
E.G. Slope (ft/ft)	0.000624	Area (sq ft)		22157.13	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6553.92	Top Width (ft)		6553.92	
Vel Total (ft/s)	0.99	Avg. Vel. (ft/s)		0.99	
Max Chl Dpth (ft)	6.94	Hydr. Depth (ft)		4.46	
Conv. Total (cfs)	520381.3	Conv. (cfs)		520381.3	
Length Wtd. (ft)	966.40	Wetted Per. (ft)		2945.04	
Min Ch El (ft)	2304.61	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.17	
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)		2298.97	
C & E Loss (ft)	0.00	Cum SA (acres)		729.31	

Plan: FEMA Pre 100-yr Amargosa Reach 1 RS: 5221 Profile: PF 1

E.G. Elev (ft)	2311.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.083	
W.S. Elev (ft)	2311.05	Reach Len. (ft)	1179.30	1179.30	1179.30
Crit W.S. (ft)		Flow Area (sq ft)		12749.66	
E.G. Slope (ft/ft)	0.000441	Area (sq ft)		20917.75	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	5898.77	Top Width (ft)		5898.77	
Vel Total (ft/s)	1.02	Avg. Vel. (ft/s)		1.02	
Max Chl Dpth (ft)	7.17	Hydr. Depth (ft)		4.42	
Conv. Total (cfs)	619392.4	Conv. (cfs)		619392.4	
Length Wtd. (ft)	1179.30	Wetted Per. (ft)		2888.52	
Min Ch El (ft)	2303.88	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.12	
Frctn Loss (ft)	0.87	Cum Volume (acre-ft)		1821.15	
C & E Loss (ft)	0.00	Cum SA (acres)		591.18	

Plan: FEMA Pre 100-yr Amargosa Reach 1 RS: 4041 Profile: PF 1

E.G. Elev (ft)	2310.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.150	
W.S. Elev (ft)	2310.18	Reach Len. (ft)	710.30	710.30	710.30
Crit W.S. (ft)		Flow Area (sq ft)		12609.91	
E.G. Slope (ft/ft)	0.001469	Area (sq ft)		23119.65	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	7025.39	Top Width (ft)		7025.39	
Vel Total (ft/s)	1.03	Avg. Vel. (ft/s)		1.03	
Max Chl Dpth (ft)	6.90	Hydr. Depth (ft)		4.48	
Conv. Total (cfs)	339231.0	Conv. (cfs)		339231.0	
Length Wtd. (ft)	710.30	Wetted Per. (ft)		2817.69	
Min Ch El (ft)	2303.28	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)		1225.04	
C & E Loss (ft)	0.00	Cum SA (acres)		416.23	

Plan: FEMA Pre 100-yr Amargosa Reach 1 RS: 3331 Profile: PF 1

E.G. Elev (ft)	2308.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.143	
W.S. Elev (ft)	2308.76	Reach Len. (ft)	1036.80	1036.80	1036.80
Crit W.S. (ft)		Flow Area (sq ft)		10002.23	
E.G. Slope (ft/ft)	0.002817	Area (sq ft)		17648.22	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6711.40	Top Width (ft)		6711.40	
Vel Total (ft/s)	1.30	Avg. Vel. (ft/s)		1.30	
Max Chl Dpth (ft)	6.04	Hydr. Depth (ft)		3.60	
Conv. Total (cfs)	244913.2	Conv. (cfs)		244913.2	
Length Wtd. (ft)	1036.80	Wetted Per. (ft)		2782.40	
Min Ch El (ft)	2302.72	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		0.82	
Frctn Loss (ft)	1.01	Cum Volume (acre-ft)		892.65	
C & E Loss (ft)	0.00	Cum SA (acres)		304.23	

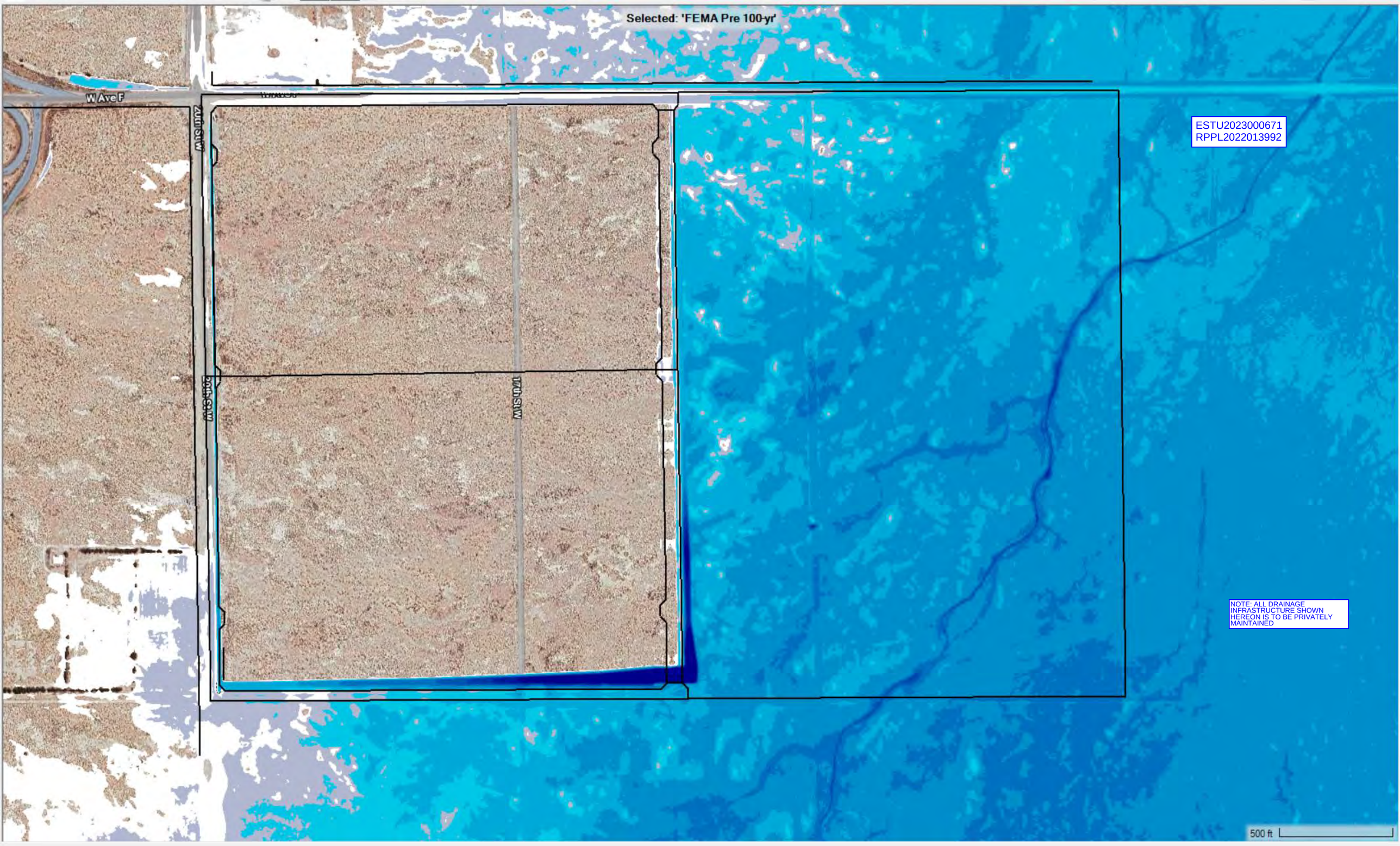
Plan: FEMA Pre 100-yr Amargosa Reach 1 RS: 2294 Profile: PF 1

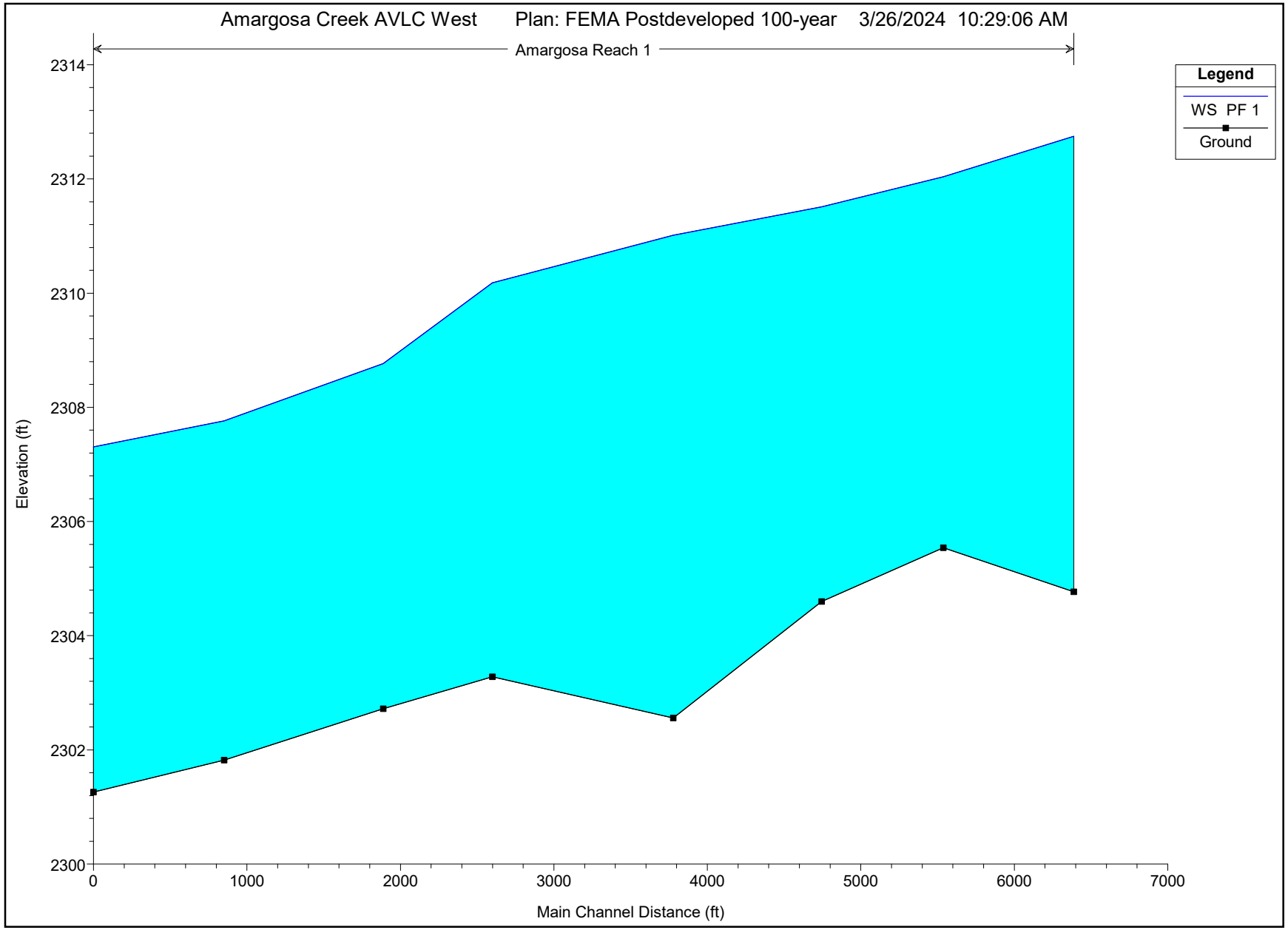
E.G. Elev (ft)	2307.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.065	
W.S. Elev (ft)	2307.76	Reach Len. (ft)	851.30	851.30	851.30
Crit W.S. (ft)		Flow Area (sq ft)		10505.30	
E.G. Slope (ft/ft)	0.000486	Area (sq ft)		20808.13	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6958.83	Top Width (ft)		6958.83	
Vel Total (ft/s)	1.24	Avg. Vel. (ft/s)		1.24	
Max Chl Dpth (ft)	5.93	Hydr. Depth (ft)		3.81	
Conv. Total (cfs)	589687.3	Conv. (cfs)		589687.3	
Length Wtd. (ft)	851.30	Wetted Per. (ft)		2759.86	
Min Ch El (ft)	2301.83	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)		434.99	
C & E Loss (ft)	0.00	Cum SA (acres)		141.55	

Plan: FEMA Pre 100-yr Amargosa Reach 1 RS: 1443 Profile: PF 1

E.G. Elev (ft)	2307.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.079	
W.S. Elev (ft)	2307.30	Reach Len. (ft)			
Crit W.S. (ft)	2304.10	Flow Area (sq ft)		11107.85	
E.G. Slope (ft/ft)	0.000601	Area (sq ft)		23707.79	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	7526.60	Top Width (ft)		7526.60	
Vel Total (ft/s)	1.17	Avg. Vel. (ft/s)		1.17	
Max Chl Dpth (ft)	6.04	Hydr. Depth (ft)		4.06	
Conv. Total (cfs)	530332.7	Conv. (cfs)		530332.7	
Length Wtd. (ft)		Wetted Per. (ft)		2739.68	
Min Ch El (ft)	2301.26	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.18	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

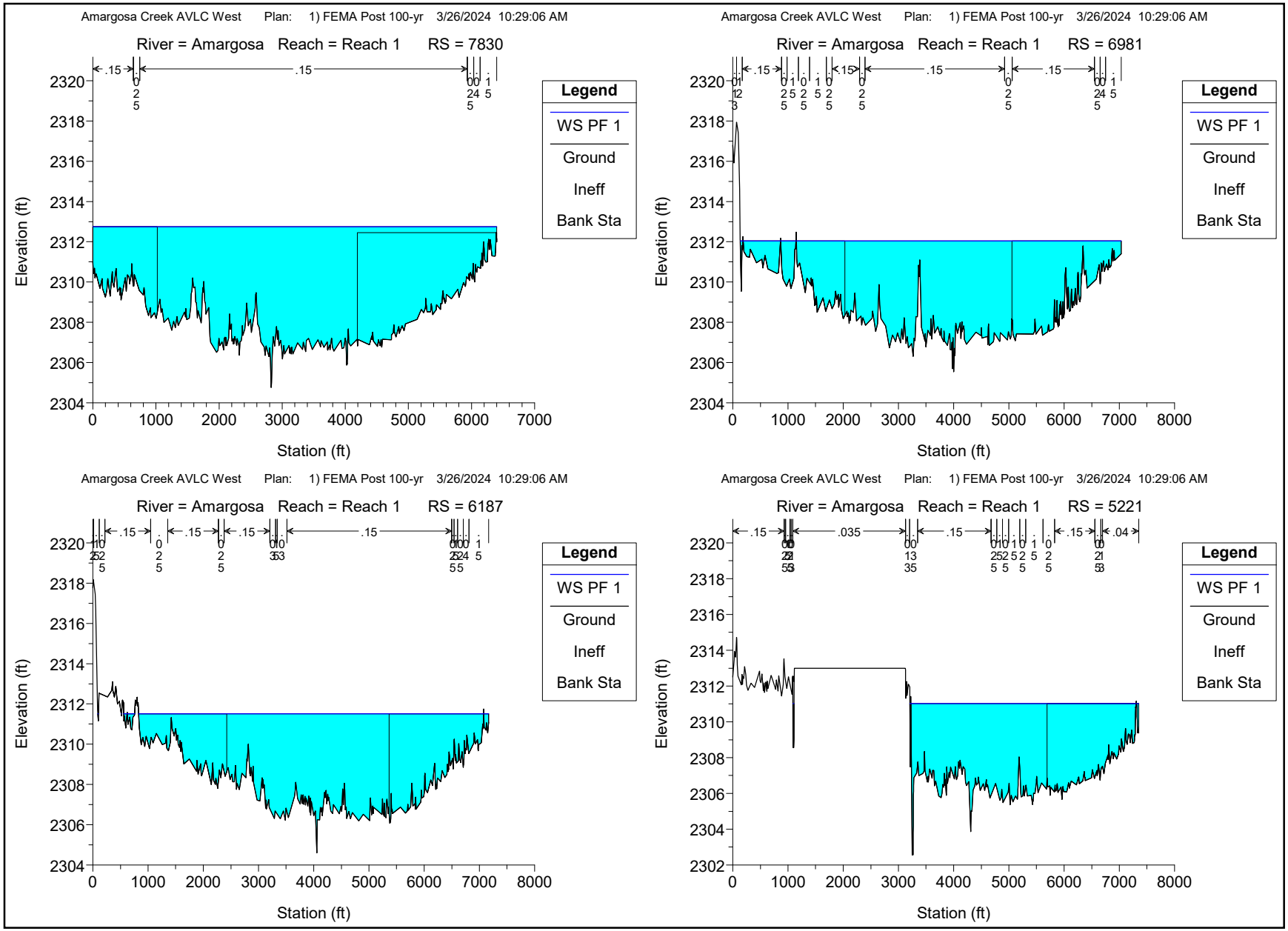
Appendix XL: HEC-RAS Postdeveloped Depth Map and Tables (100-year FEMA)

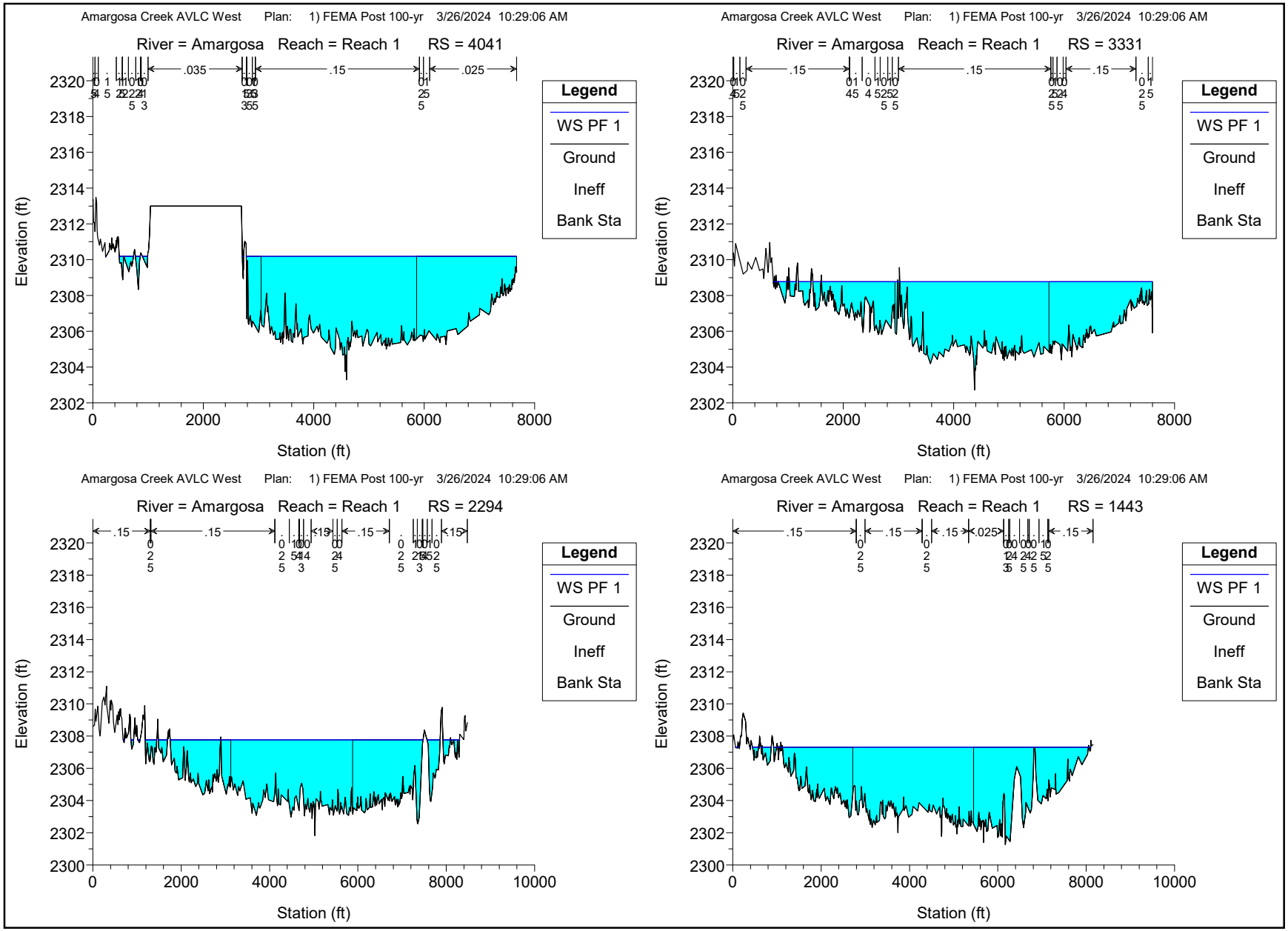

Selected: 'FEMA Pre 100-yr'
W Ave F
20th St W
20th St W
17th St W
ESTU2023000671
RPPL2022013992
NOTE: ALL DRAINAGE INFRASTRUCTURE SHOWN HEREON IS TO BE PRIVATELY MAINTAINED
500 ft


Amargosa Creek AVLC West
Plan: FEMA Postdeveloped 100-year
3/26/2024 10:29:06 AM
Amargosa Reach 1
Legend
WS PF 1
Ground
Elevation (ft)
2314
2312
2310
2308
2306
2304
2302
2300
0
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)

HEC-RAS Plan: FEMA Post 100-yr River: Amargosa Reach: Reach 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	7830	PF 1	13000.00	2304.77	2312.75		2312.76	0.001033	0.74	17604.16	6400.00	0.07
Reach 1	6981	PF 1	13000.00	2305.54	2312.04		2312.05	0.000677	0.96	13506.20	6875.22	0.08
Reach 1	6187	PF 1	13000.00	2304.60	2311.51		2311.53	0.000643	1.00	12996.61	6549.85	0.08
Reach 1	5221	PF 1	13000.00	2302.56	2311.01		2311.03	0.000416	1.14	11371.09	4150.01	0.09
Reach 1	4041	PF 1	13000.00	2303.28	2310.18		2310.20	0.001466	1.03	12615.43	5368.75	0.09
Reach 1	3331	PF 1	13000.00	2302.72	2308.77		2308.79	0.002820	1.30	9997.68	6701.74	0.12
Reach 1	2294	PF 1	13000.00	2301.82	2307.76		2307.79	0.000484	1.24	10524.01	6976.69	0.11
Reach 1	1443	PF 1	13000.00	2301.26	2307.31	2304.10	2307.33	0.000601	1.17	11114.38	7548.41	0.10


Amargosa Creek AVLC West Plan: 1) FEMA Post 100-yr 3/26/2024 10:29:06 AM
River = Amargosa Reach = Reach 1 RS = 7830
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Amargosa Creek AVLC West Plan: 1) FEMA Post 100-yr 3/26/2024 10:29:06 AM
River = Amargosa Reach = Reach 1 RS = 6981
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Amargosa Creek AVLC West Plan: 1) FEMA Post 100-yr 3/26/2024 10:29:06 AM
River = Amargosa Reach = Reach 1 RS = 6187
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Amargosa Creek AVLC West Plan: 1) FEMA Post 100-yr 3/26/2024 10:29:06 AM
River = Amargosa Reach = Reach 1 RS = 5221
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta


Amargosa Creek AVLC West Plan: 1) FEMA Post 100-yr 3/26/2024 10:29:06 AM
River = Amargosa Reach = Reach 1 RS = 4041
.035
.15
.025
Legend
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Amargosa Creek AVLC West Plan: 1) FEMA Post 100-yr 3/26/2024 10:29:06 AM
River = Amargosa Reach = Reach 1 RS = 3331
.15
.15
.15
.15
Legend
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Amargosa Creek AVLC West Plan: 1) FEMA Post 100-yr 3/26/2024 10:29:06 AM
River = Amargosa Reach = Reach 1 RS = 2294
.15
.15
.15
.15
.15
Legend
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Amargosa Creek AVLC West Plan: 1) FEMA Post 100-yr 3/26/2024 10:29:06 AM
River = Amargosa Reach = Reach 1 RS = 1443
.15
.15
.15
.025
.15
Legend
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

Plan: FEMA Post 100-yr Amargosa Reach 1 RS: 7830 Profile: PF 1

E.G. Elev (ft)	2312.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.150	
W.S. Elev (ft)	2312.75	Reach Len. (ft)	848.90	848.90	848.90
Crit W.S. (ft)		Flow Area (sq ft)		17604.16	
E.G. Slope (ft/ft)	0.001033	Area (sq ft)		29016.02	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6400.00	Top Width (ft)		6400.00	
Vel Total (ft/s)	0.74	Avg. Vel. (ft/s)		0.74	
Max Chl Dpth (ft)	7.98	Hydr. Depth (ft)		3.27	
Conv. Total (cfs)	404443.8	Conv. (cfs)		404443.8	
Length Wtd. (ft)	848.90	Wetted Per. (ft)		5382.80	
Min Ch El (ft)	2304.77	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		0.16	
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)		3062.70	
C & E Loss (ft)	0.00	Cum SA (acres)		902.41	

Plan: FEMA Post 100-yr Amargosa Reach 1 RS: 6981 Profile: PF 1

E.G. Elev (ft)	2312.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.		0.109	
W.S. Elev (ft)	2312.04	Reach Len. (ft)	794.20	794.20	794.20
Crit W.S. (ft)		Flow Area (sq ft)		13506.20	
E.G. Slope (ft/ft)	0.000677	Area (sq ft)		23082.87	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6875.22	Top Width (ft)		6875.22	
Vel Total (ft/s)	0.96	Avg. Vel. (ft/s)		0.96	
Max Chl Dpth (ft)	6.50	Hydr. Depth (ft)		4.46	
Conv. Total (cfs)	499800.7	Conv. (cfs)		499800.7	
Length Wtd. (ft)	794.20	Wetted Per. (ft)		3028.87	
Min Ch El (ft)	2305.54	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.18	
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)		2555.05	
C & E Loss (ft)	0.00	Cum SA (acres)		773.06	

Plan: FEMA Post 100-yr Amargosa Reach 1 RS: 6187 Profile: PF 1

E.G. Elev (ft)	2311.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.102	
W.S. Elev (ft)	2311.51	Reach Len. (ft)	966.40	966.40	966.40
Crit W.S. (ft)		Flow Area (sq ft)		12996.61	
E.G. Slope (ft/ft)	0.000643	Area (sq ft)		21917.20	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6549.85	Top Width (ft)		6549.85	
Vel Total (ft/s)	1.00	Avg. Vel. (ft/s)		1.00	
Max Chl Dpth (ft)	6.91	Hydr. Depth (ft)		4.42	
Conv. Total (cfs)	512632.4	Conv. (cfs)		512632.4	
Length Wtd. (ft)	966.40	Wetted Per. (ft)		2945.06	
Min Ch El (ft)	2304.60	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.18	
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)		2144.82	
C & E Loss (ft)	0.00	Cum SA (acres)		650.67	

Plan: FEMA Post 100-yr Amargosa Reach 1 RS: 5221 Profile: PF 1

E.G. Elev (ft)	2311.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.073	
W.S. Elev (ft)	2311.01	Reach Len. (ft)	1179.30	1179.30	1179.30
Crit W.S. (ft)		Flow Area (sq ft)		11371.09	
E.G. Slope (ft/ft)	0.000416	Area (sq ft)		17424.97	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	4150.01	Top Width (ft)		4150.01	
Vel Total (ft/s)	1.14	Avg. Vel. (ft/s)		1.14	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		4.58	
Conv. Total (cfs)	637237.9	Conv. (cfs)		637237.9	
Length Wtd. (ft)	1179.30	Wetted Per. (ft)		2487.30	
Min Ch El (ft)	2302.56	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)		1708.41	
C & E Loss (ft)	0.00	Cum SA (acres)		531.98	

Plan: FEMA Post 100-yr Amargosa Reach 1 RS: 4041 Profile: PF 1

E.G. Elev (ft)	2310.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.150	
W.S. Elev (ft)	2310.18	Reach Len. (ft)	710.30	710.30	710.30
Crit W.S. (ft)		Flow Area (sq ft)		12615.43	
E.G. Slope (ft/ft)	0.001466	Area (sq ft)		20071.58	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	5368.75	Top Width (ft)		5368.75	
Vel Total (ft/s)	1.03	Avg. Vel. (ft/s)		1.03	
Max Chl Dpth (ft)	6.90	Hydr. Depth (ft)		4.48	
Conv. Total (cfs)	339477.3	Conv. (cfs)		339477.3	
Length Wtd. (ft)	710.30	Wetted Per. (ft)		2817.70	
Min Ch El (ft)	2303.28	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)		1200.84	
C & E Loss (ft)	0.00	Cum SA (acres)		403.13	

Plan: FEMA Post 100-yr Amargosa Reach 1 RS: 3331 Profile: PF 1

E.G. Elev (ft)	2308.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.143	
W.S. Elev (ft)	2308.77	Reach Len. (ft)	1036.80	1036.80	1036.80
Crit W.S. (ft)		Flow Area (sq ft)		9997.68	
E.G. Slope (ft/ft)	0.002820	Area (sq ft)		17617.14	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6701.74	Top Width (ft)		6701.74	
Vel Total (ft/s)	1.30	Avg. Vel. (ft/s)		1.30	
Max Chl Dpth (ft)	6.04	Hydr. Depth (ft)		3.60	
Conv. Total (cfs)	244795.5	Conv. (cfs)		244795.5	
Length Wtd. (ft)	1036.80	Wetted Per. (ft)		2781.77	
Min Ch El (ft)	2302.72	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		0.82	
Frctn Loss (ft)	1.00	Cum Volume (acre-ft)		893.56	
C & E Loss (ft)	0.00	Cum SA (acres)		304.72	

Plan: FEMA Post 100-yr Amargosa Reach 1 RS: 2294 Profile: PF 1

E.G. Elev (ft)	2307.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.065	
W.S. Elev (ft)	2307.76	Reach Len. (ft)	851.30	851.30	851.30
Crit W.S. (ft)		Flow Area (sq ft)		10524.01	
E.G. Slope (ft/ft)	0.000484	Area (sq ft)		20855.84	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	6976.69	Top Width (ft)		6976.69	
Vel Total (ft/s)	1.24	Avg. Vel. (ft/s)		1.24	
Max Chl Dpth (ft)	5.94	Hydr. Depth (ft)		3.82	
Conv. Total (cfs)	591069.0	Conv. (cfs)		591069.0	
Length Wtd. (ft)	851.30	Wetted Per. (ft)		2759.89	
Min Ch El (ft)	2301.82	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)		435.70	
C & E Loss (ft)	0.00	Cum SA (acres)		141.93	

Plan: FEMA Post 100-yr Amargosa Reach 1 RS: 1443 Profile: PF 1

E.G. Elev (ft)	2307.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.		0.079	
W.S. Elev (ft)	2307.31	Reach Len. (ft)			
Crit W.S. (ft)	2304.10	Flow Area (sq ft)		11114.38	
E.G. Slope (ft/ft)	0.000601	Area (sq ft)		23732.16	
Q Total (cfs)	13000.00	Flow (cfs)		13000.00	
Top Width (ft)	7548.41	Top Width (ft)		7548.41	
Vel Total (ft/s)	1.17	Avg. Vel. (ft/s)		1.17	
Max Chl Dpth (ft)	6.05	Hydr. Depth (ft)		4.06	
Conv. Total (cfs)	530340.1	Conv. (cfs)		530340.1	
Length Wtd. (ft)		Wetted Per. (ft)		2739.67	
Min Ch El (ft)	2301.26	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.18	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

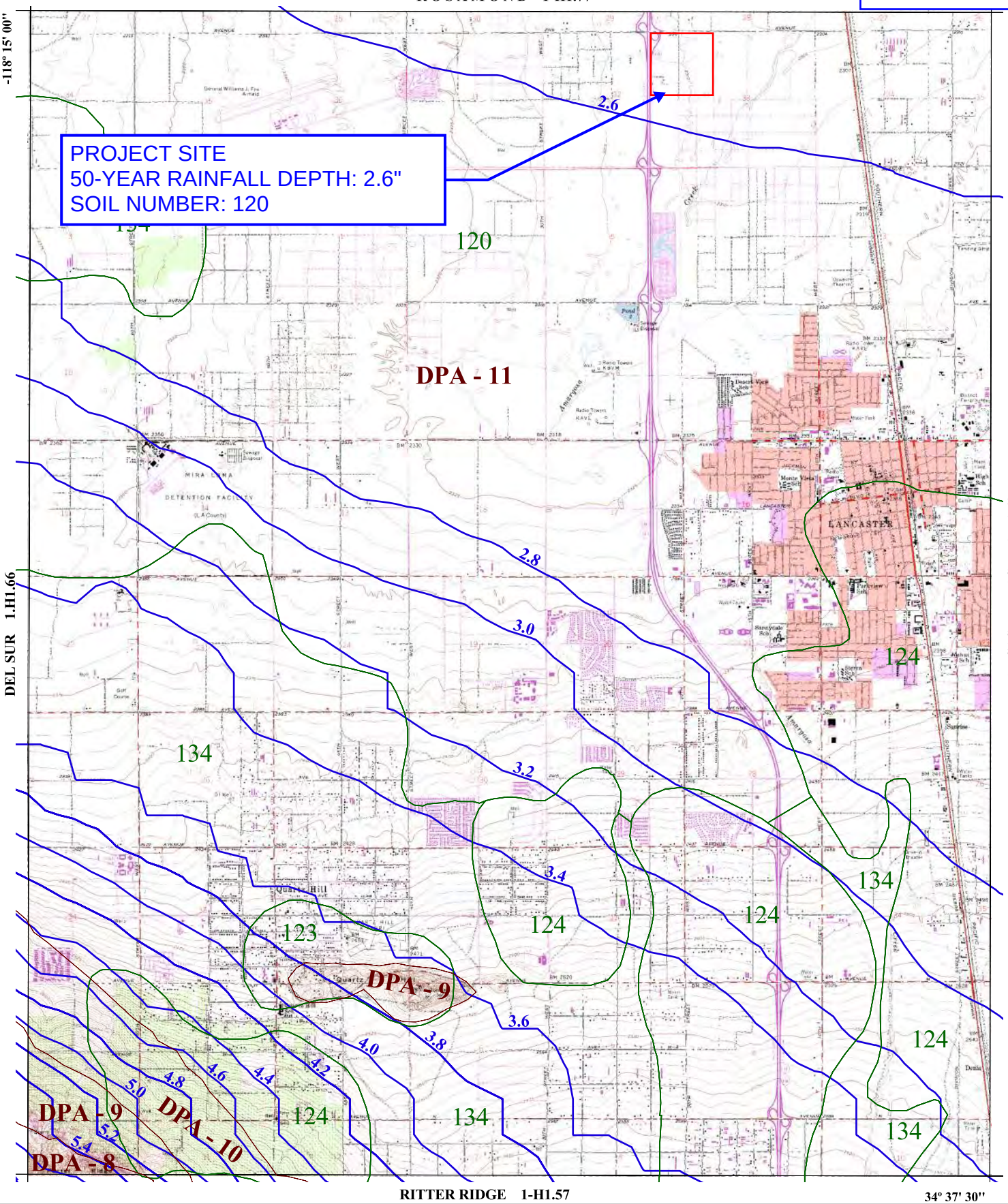
Appendix XLI: FEMA Profile Comparison Table

HEC-RAS River: Amargosa Reach: Reach 1 Profile: PF 1

Reach	River Sta	Plan	Q Total	W.S. Elev	Vel Chnl	Froude # Chl
			(cfs)	(ft)	(ft/s)	
Reach 1	7830	FEMA Pre 100-yr	13000	2312.8	0.74	0.07
Reach 1	7830	FEMA Post 100-yr	13000	2312.7	0.74	0.07
Reach 1	6981	FEMA Pre 100-yr	13000	2312.1	0.96	0.08
Reach 1	6981	FEMA Post 100-yr	13000	2312.0	0.96	0.08
Reach 1	6187	FEMA Pre 100-yr	13000	2311.6	0.99	0.08
Reach 1	6187	FEMA Post 100-yr	13000	2311.5	1.00	0.08
Reach 1	5221	FEMA Pre 100-yr	13000	2311.0	1.02	0.09
Reach 1	5221	FEMA Post 100-yr	13000	2311.0	1.14	0.09
Reach 1	4041	FEMA Pre 100-yr	13000	2310.2	1.03	0.09
Reach 1	4041	FEMA Post 100-yr	13000	2310.2	1.03	0.09
Reach 1	3331	FEMA Pre 100-yr	13000	2308.8	1.30	0.12
Reach 1	3331	FEMA Post 100-yr	13000	2308.8	1.30	0.12
Reach 1	2294	FEMA Pre 100-yr	13000	2307.8	1.24	0.11
Reach 1	2294	FEMA Post 100-yr	13000	2307.8	1.24	0.11
Reach 1	1443	FEMA Pre 100-yr	13000	2307.3	1.17	0.10
Reach 1	1443	FEMA Post 100-yr	13000	2307.3	1.17	0.10

Appendix XLII: Isohyet Map

ESTU2023000671
RPPL2022013992



N
W E
S

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

LANCASTER WEST
50-YEAR 24-HOUR ISOHYET

1-H1.67

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

Appendix XLIII: Burned and Bulked Bed Change Comparison Maps

50-YEAR BURNED AND BULKED BED CHANGE COMPARISON

Selected: 'Bed Change Comparison 50yrBB'

05SEP2008 00:00:00

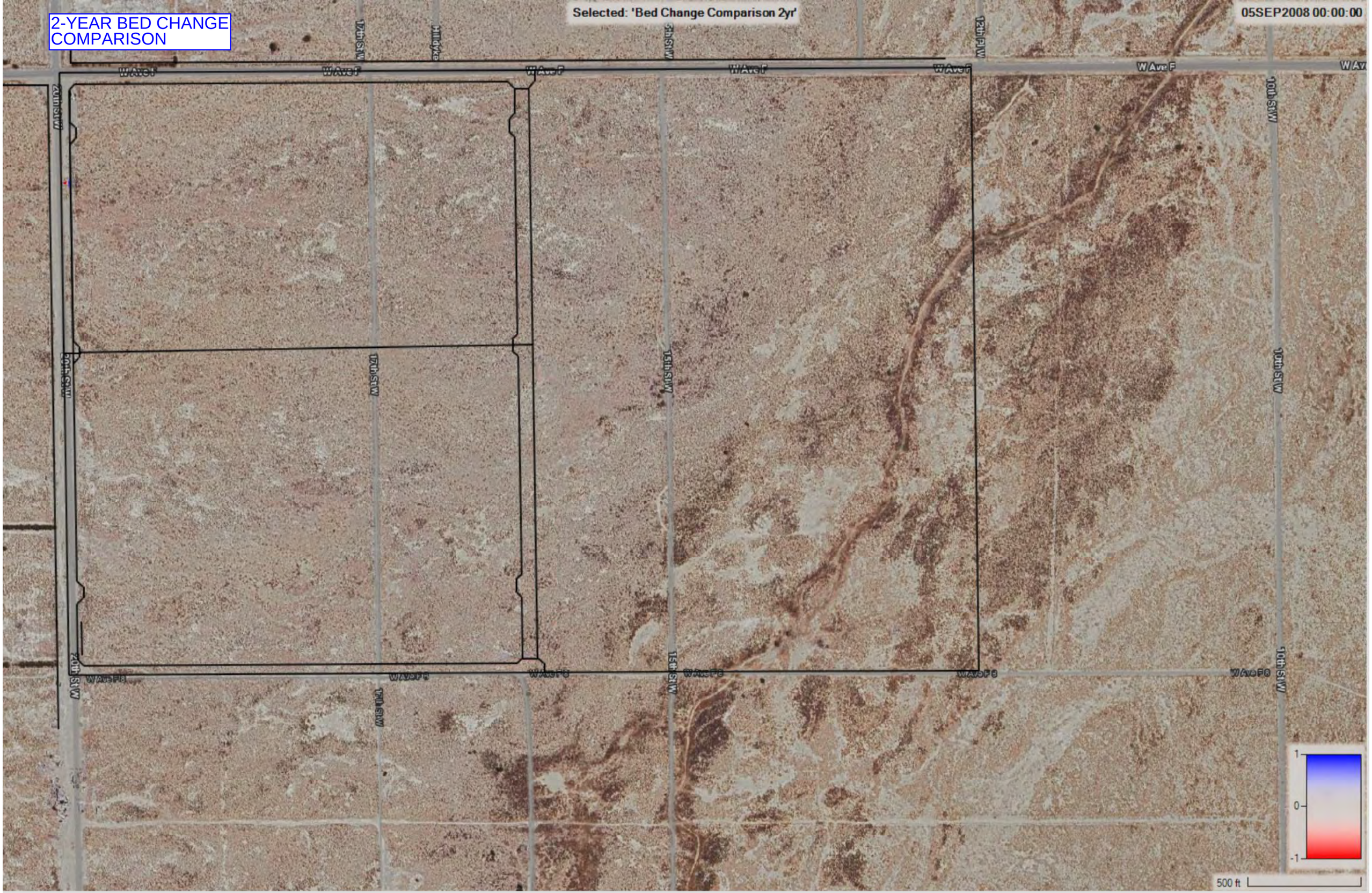
ESTU2023000671
RPPL2022013992

17th St W
Hildyke
5th St W
12th Pl W
W Ave F
20th St W
15th St W
10th St W
1
0
-1
500 ft

2-YEAR BED CHANGE COMPARISON

Selected: 'Bed Change Comparison 2yr'

05SEP2008 00:00:00



Appendix XLIV: Land Cover Map

ESTU2023000671
RPPL2022013992