

December 22, 2020

C. Webb & Associates, LLC.  
P.O. Box 452  
Norfolk, CT 06058

RE: 155 TOLL GATE ROAD, BERLIN, CT

Dear Mr. Webb:

As requested, we have performed a Preliminary Hydrologic and Hydraulic Analysis of Belcher Brook at the above location. That portion of the brook is mapped by FEMA as being within the floodway with an approximate elevation of 99.0.

We used the latest USGS Streamstats information to establish flows for our modeling along with detailed survey information of the roadway culvert and site mapping.

Our results indicate a somewhat higher elevation than FEMA as the water exits the culvert onto the site. Once it travels a short distance through the site the elevation is the same or less than FEMA. It does not appear to have any downstream impacts.

We believe the discrepancy may be due to the more detailed mapping we have today versus the mapping used in the FEMA study or some of the roughness coefficients used in our model. We will be reviewing those items to refine the model.

Attached is output information from the model and the Streamstats information.

Please contact me if you have any questions or require any additional information at 860-620-3673.

Sincerely,

A handwritten signature in blue ink that reads "Sebastian A. Amenta".

Sebastian A Amenta P.E. #12339  
1166 Woodruff Street  
Southington, CT 06489

HEC-RAS Plan: Without Weir River: TG 1 Reach: Belcher Profile: Stream Stats

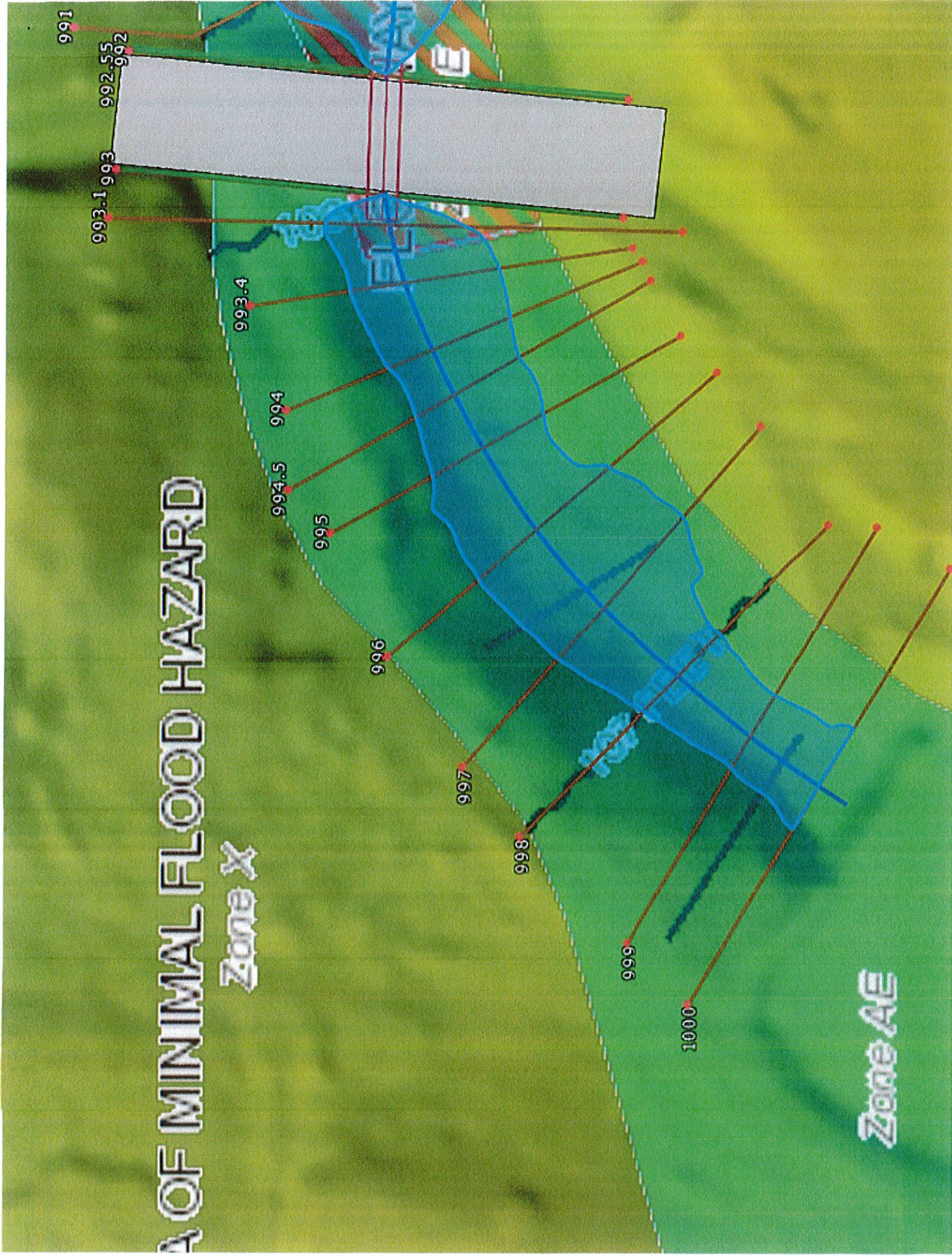
| Reach   | River Sta | Profile      | Q Total<br>(cfs) | Min Ch El<br>(ft) | W.S. Elev<br>(ft) | Crit W.S.<br>(ft) | E.G. Elev<br>(ft) | E.G. Slope<br>(ft/ft) | Vel Chnl<br>(ft/s) | Flow Area<br>(sq ft) | Top Width<br>(ft) | Froude # Chl |
|---------|-----------|--------------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| Belcher | 1000      | Stream Stats | 685.00           | 104.23            | 106.35            | 106.35            | 107.28            | 0.012565              | 7.74               | 88.49                | 48.03             | 1.01         |
| Belcher | 999       | Stream Stats | 685.00           | 101.82            | 105.39            |                   | 106.09            | 0.005444              | 6.71               | 102.08               | 35.51             | 0.70         |
| Belcher | 998       | Stream Stats | 685.00           | 102.02            | 105.24            |                   | 105.86            | 0.005494              | 6.31               | 108.60               | 42.62             | 0.70         |
| Belcher | 997       | Stream Stats | 685.00           | 99.84             | 105.56            |                   | 105.65            | 0.000541              | 2.49               | 275.24               | 77.32             | 0.23         |
| Belcher | 996       | Stream Stats | 685.00           | 99.65             | 105.50            |                   | 105.62            | 0.000694              | 2.79               | 245.31               | 69.15             | 0.26         |
| Belcher | 995       | Stream Stats | 685.00           | 99.61             | 105.45            |                   | 105.59            | 0.000664              | 3.09               | 221.73               | 50.73             | 0.26         |
| Belcher | 994.5     | Stream Stats | 685.00           | 98.49             | 105.45            |                   | 105.57            | 0.000438              | 2.77               | 247.01               | 47.77             | 0.22         |
| Belcher | 994       | Stream Stats | 685.00           | 97.33             | 105.47            |                   | 105.55            | 0.000255              | 2.24               | 305.90               | 54.46             | 0.17         |
| Belcher | 993.4     | Stream Stats | 685.00           | 97.34             | 105.46            |                   | 105.54            | 0.000246              | 2.26               | 303.69               | 51.16             | 0.16         |
| Belcher | 993.1     | Stream Stats | 685.00           | 97.34             | 105.44            |                   | 105.54            | 0.000346              | 2.42               | 282.64               | 56.53             | 0.19         |
| Belcher | 993       | Stream Stats | 685.00           | 97.17             | 104.73            | 101.56            | 105.46            | 0.001483              | 6.86               | 99.86                | 33.53             | 0.44         |
| Belcher | 992.55    | Culvert      |                  |                   |                   |                   |                   |                       |                    |                      |                   |              |
| Belcher | 992       | Stream Stats | 685.00           | 97.28             | 101.66            | 101.68            | 103.87            | 0.009247              | 11.87              | 57.69                | 31.16             | 1.01         |
| Belcher | 991       | Stream Stats | 685.00           | 97.60             | 100.13            |                   | 100.50            | 0.005525              | 4.87               | 140.78               | 83.79             | 0.66         |
| Belcher | 990       | Stream Stats | 685.00           | 97.04             | 99.55             | 99.55             | 100.13            | 0.015100              | 6.12               | 111.87               | 99.64             | 1.02         |
| Belcher | 989.4     | Stream Stats | 685.00           | 96.10             | 98.32             | 98.32             | 98.92             | 0.014710              | 6.20               | 110.47               | 95.08             | 1.01         |
| Belcher | 989       | Stream Stats | 685.00           | 95.94             | 98.26             |                   | 98.43             | 0.002469              | 3.32               | 206.26               | 118.73            | 0.44         |
| Belcher | 988.6     | Stream Stats | 685.00           | 95.93             | 97.70             | 97.70             | 98.22             | 0.015536              | 5.79               | 118.37               | 117.57            | 1.02         |
| Belcher | 988.35    | Stream Stats | 685.00           | 94.64             | 97.73             |                   | 97.93             | 0.003210              | 3.55               | 192.99               | 119.28            | 0.49         |
| Belcher | 988.3     | Stream Stats | 685.00           | 94.68             | 97.60             |                   | 97.90             | 0.005329              | 4.45               | 153.87               | 99.36             | 0.63         |
| Belcher | 988       | Stream Stats | 685.00           | 94.86             | 97.32             |                   | 97.71             | 0.006089              | 4.97               | 137.83               | 105.19            | 0.77         |
| Belcher | 987.6     | Stream Stats | 685.00           | 94.42             | 96.80             | 96.80             | 97.40             | 0.013917              | 6.20               | 110.51               | 91.30             | 0.99         |
| Belcher | 987       | Stream Stats | 685.00           | 93.97             | 96.59             |                   | 96.84             | 0.004457              | 3.98               | 171.96               | 117.78            | 0.58         |
| Belcher | 986.5     | Stream Stats | 685.00           | 93.89             | 96.08             | 96.07             | 96.55             | 0.014679              | 5.54               | 123.64               | 125.93            | 0.99         |
| Belcher | 986       | Stream Stats | 685.00           | 93.63             | 95.57             | 95.55             | 95.96             | 0.014199              | 4.98               | 137.52               | 160.59            | 0.95         |
| Belcher | 985       | Stream Stats | 685.00           | 92.43             | 94.72             |                   | 95.04             | 0.008450              | 4.55               | 150.55               | 136.16            | 0.76         |
| Belcher | 984       | Stream Stats | 685.00           | 92.52             | 94.57             |                   | 94.87             | 0.007777              | 4.38               | 156.27               | 140.53            | 0.73         |
| Belcher | 983       | Stream Stats | 685.00           | 92.43             | 93.86             | 93.86             | 94.27             | 0.016886              | 5.15               | 133.08               | 167.09            | 1.02         |
| Belcher | 982       | Stream Stats | 685.00           | 91.56             | 93.12             | 92.95             | 93.35             | 0.009017              | 3.82               | 179.44               | 221.92            | 0.75         |



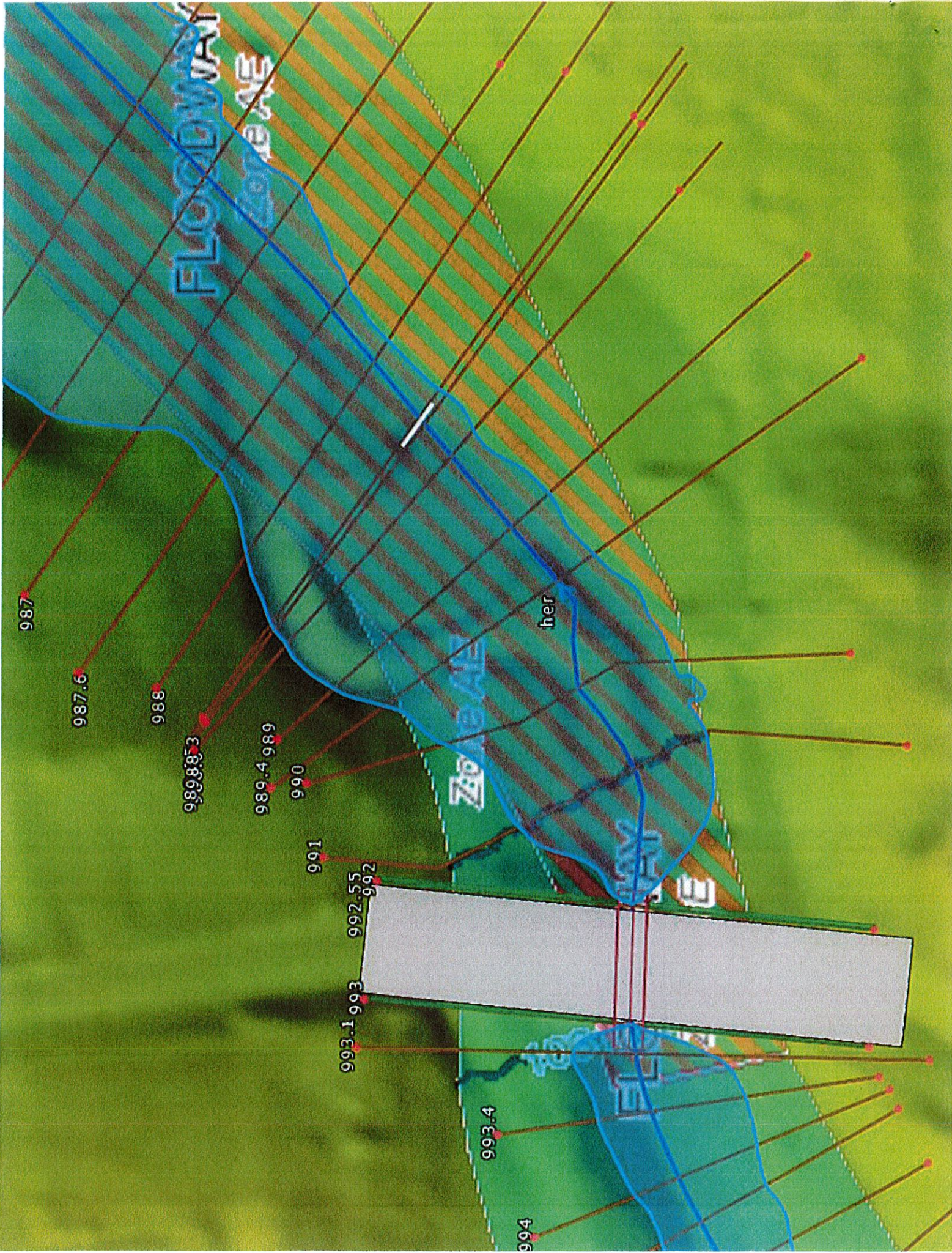
# AREA OF MINIMAL FLOOD HAZARD

Zone X

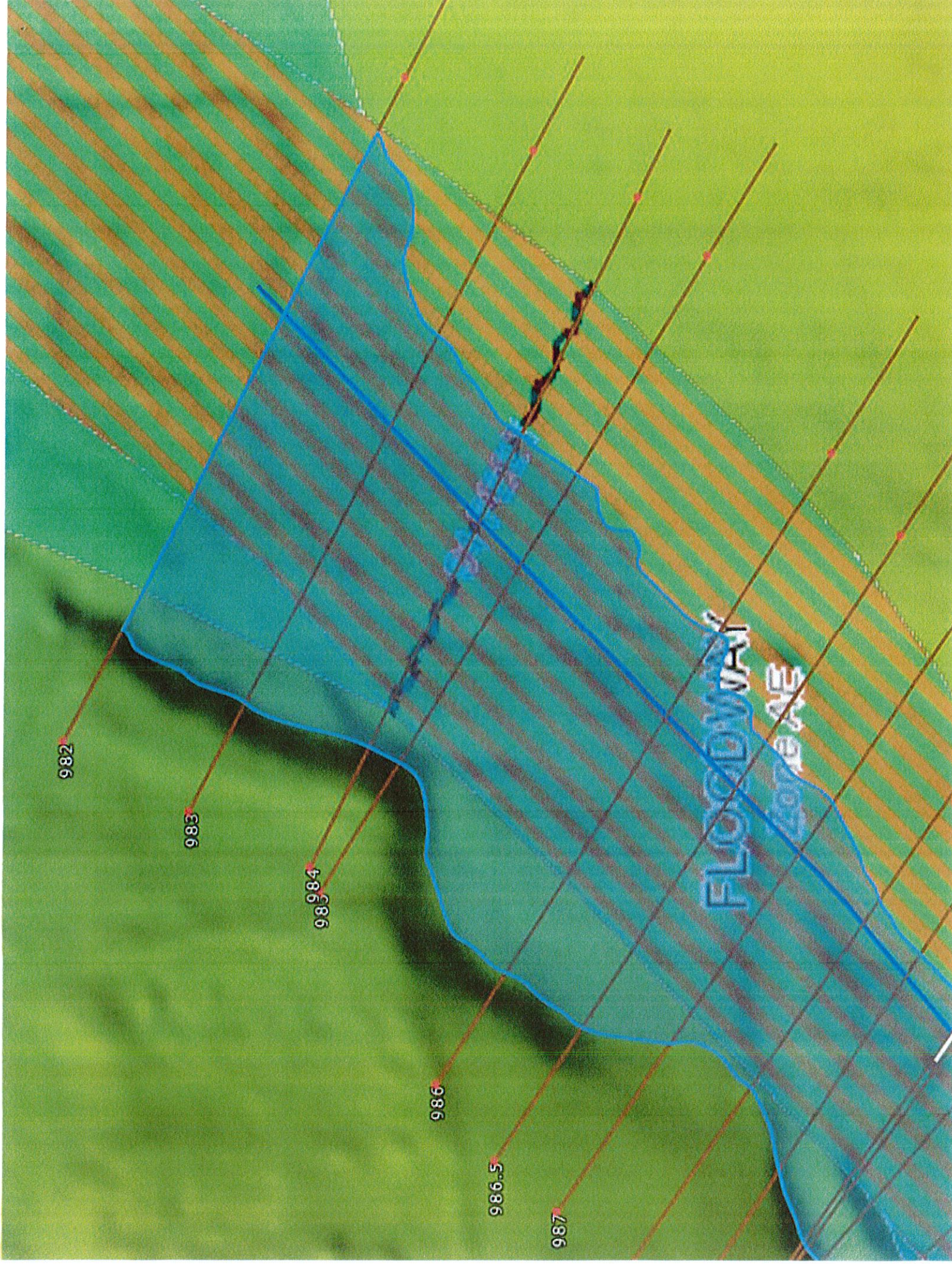
Zone AE













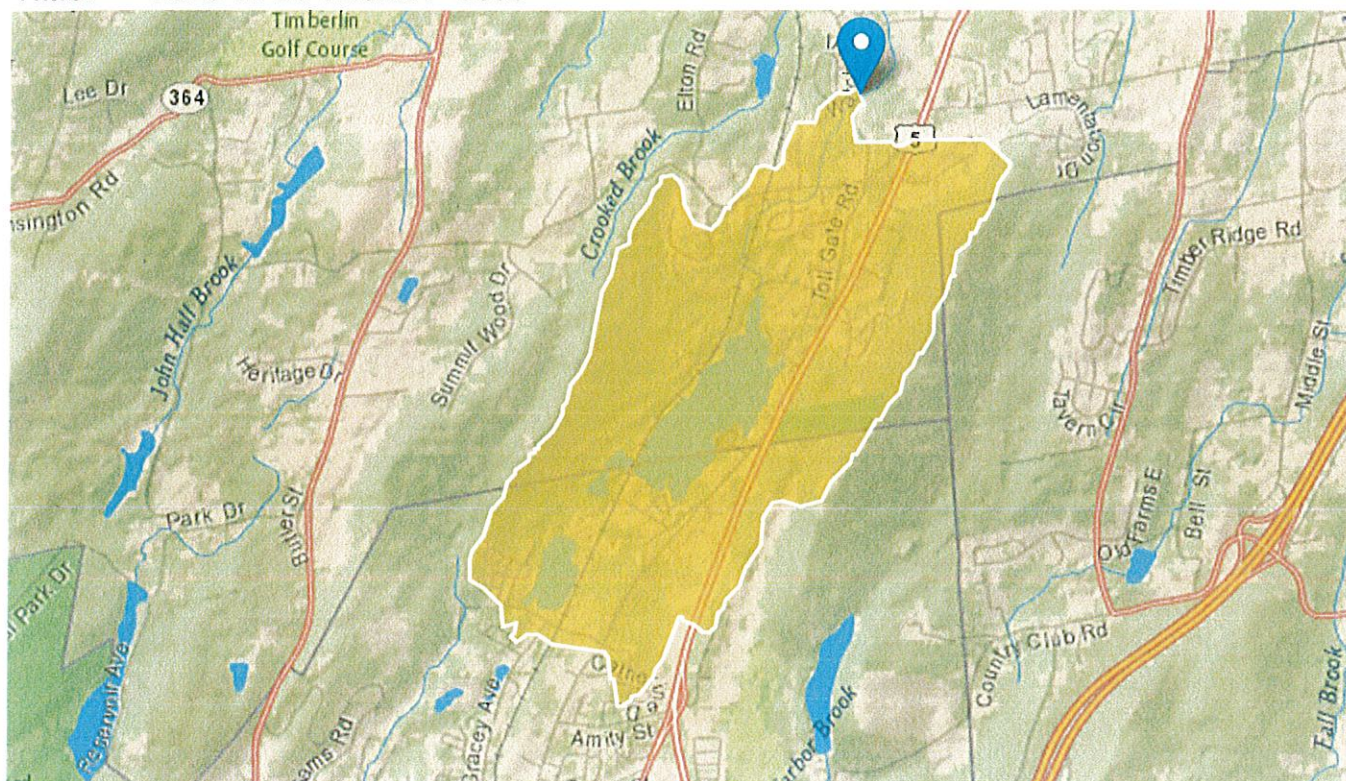
# StreamStats Report

Region ID: CT

Workspace ID: CT20201221003825762000

Clicked Point (Latitude, Longitude): 41.60012, -72.75983

Time: 2020-12-20 19:39:39 -0500



## Basin Characteristics

| Parameter Code | Parameter Description                                                                                              | Value | Unit         |
|----------------|--------------------------------------------------------------------------------------------------------------------|-------|--------------|
| DRNAREA        | Area that drains to a point on a stream                                                                            | 3.2   | square miles |
| I24H2Y         | Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index | 3.688 | inches       |
| ELEV           | Mean Basin Elevation                                                                                               | 205   | feet         |
| I24H10Y        | Maximum 24-hour precipitation that occurs on average once in 10 years                                              | 5.396 | inches       |
| I24H25Y        | Maximum 24-hour precipitation that occurs on average once in 25 years                                              | 6.718 | inches       |

| <b>Parameter Code</b> | <b>Parameter Description</b>                                           | <b>Value</b> | <b>Unit</b> |
|-----------------------|------------------------------------------------------------------------|--------------|-------------|
| I24H50Y               | Maximum 24-hour precipitation that occurs on average once in 50 years  | 7.93         | inches      |
| I24H100Y              | Maximum 24-hour precipitation that occurs on average once in 100 years | 9.364        | inches      |

## Peak-Flow Statistics Parameters[Statewide DA only]

| <b>Parameter Code</b> | <b>Parameter Name</b> | <b>Value</b> | <b>Units</b> | <b>Min Limit</b> | <b>Max Limit</b> |
|-----------------------|-----------------------|--------------|--------------|------------------|------------------|
| DRNAREA               | Drainage Area         | 3.2          | square miles | 1.69             | 715              |

## Peak-Flow Statistics Parameters[Statewide Multiparameter]

| <b>Parameter Code</b> | <b>Parameter Name</b>          | <b>Value</b> | <b>Units</b> | <b>Min Limit</b> | <b>Max Limit</b> |
|-----------------------|--------------------------------|--------------|--------------|------------------|------------------|
| DRNAREA               | Drainage Area                  | 3.2          | square miles | 1.69             | 715              |
| I24H2Y                | 24 Hour 2 Year Precipitation   | 3.688        | inches       | 2.95             | 3.82             |
| ELEV                  | Mean Basin Elevation           | 205          | feet         | 169              | 1310             |
| I24H10Y               | 24 Hour 10 Year Precipitation  | 5.396        | inches       | 4.15             | 5.53             |
| I24H25Y               | 24 Hour 25 Year Precipitation  | 6.718        | inches       | 4.93             | 7                |
| I24H50Y               | 24 Hour 50 Year Precipitation  | 7.93         | inches       | 5.62             | 8.36             |
| I24H100Y              | 24 Hour 100 Year Precipitation | 9.364        | inches       | 6.41             | 9.99             |

## Peak-Flow Statistics Flow Report[Statewide DA only]

PIl: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

| <b>Statistic</b>     | <b>Value</b> | <b>Unit</b> | <b>SE</b> | <b>SEp</b> | <b>Equiv. Yrs.</b> |
|----------------------|--------------|-------------|-----------|------------|--------------------|
| 50_percent_AEP_flood | 163          | ft^3/s      | 35.5      | 35.5       | 2.9                |
| 10_percent_AEP_flood | 364          | ft^3/s      | 36.8      | 36.8       | 6.6                |
| 4_percent_AEP_flood  | 487          | ft^3/s      | 38.2      | 38.2       | 9.2                |
| 2_percent_AEP_flood  | 583          | ft^3/s      | 39.3      | 39.3       | 11                 |
| 1_percent_AEP_flood  | 685          | ft^3/s      | 40.7      | 40.7       | 12.5               |

| Statistic             | Value | Unit               | SE   | SEp  | Equiv. Yrs. |
|-----------------------|-------|--------------------|------|------|-------------|
| 0_2_percent_AEP_flood | 940   | ft <sup>3</sup> /s | 45.2 | 45.2 | 15.1        |

#### Peak-Flow Statistics Flow Report [Statewide Multiparameter]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic             | Value | Unit               | SE   | SEp  | Equiv. Yrs. |
|-----------------------|-------|--------------------|------|------|-------------|
| 50_percent_AEP_flood  | 152   | ft <sup>3</sup> /s | 31.8 | 31.8 | 3.5         |
| 10_percent_AEP_flood  | 331   | ft <sup>3</sup> /s | 32.7 | 32.7 | 8.1         |
| 4_percent_AEP_flood   | 438   | ft <sup>3</sup> /s | 34.4 | 34.4 | 10.9        |
| 2_percent_AEP_flood   | 526   | ft <sup>3</sup> /s | 35.9 | 35.9 | 12.7        |
| 1_percent_AEP_flood   | 615   | ft <sup>3</sup> /s | 37.6 | 37.6 | 14.3        |
| 0_2_percent_AEP_flood | 794   | ft <sup>3</sup> /s | 45   | 45   | 14.9        |

#### Peak-Flow Statistics Citations

**Ahearn, E.A., 2004, Regression Equations for Estimating Flood Flows for the 2-, 10-, 25-, 50-, 100-, and 500-Year Recurrence Intervals in Connecticut: U.S. Geological Survey SRI 2004-5160, 62 p. (<http://water.usgs.gov/pubs/sir/2004/5160/>)**

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Application Version: 4.4.0