Model My Watershed

Solving Everyday Challenges:
Applications in the Real World

Leisczs Bridge Road, Bern Township, July 9, 2024

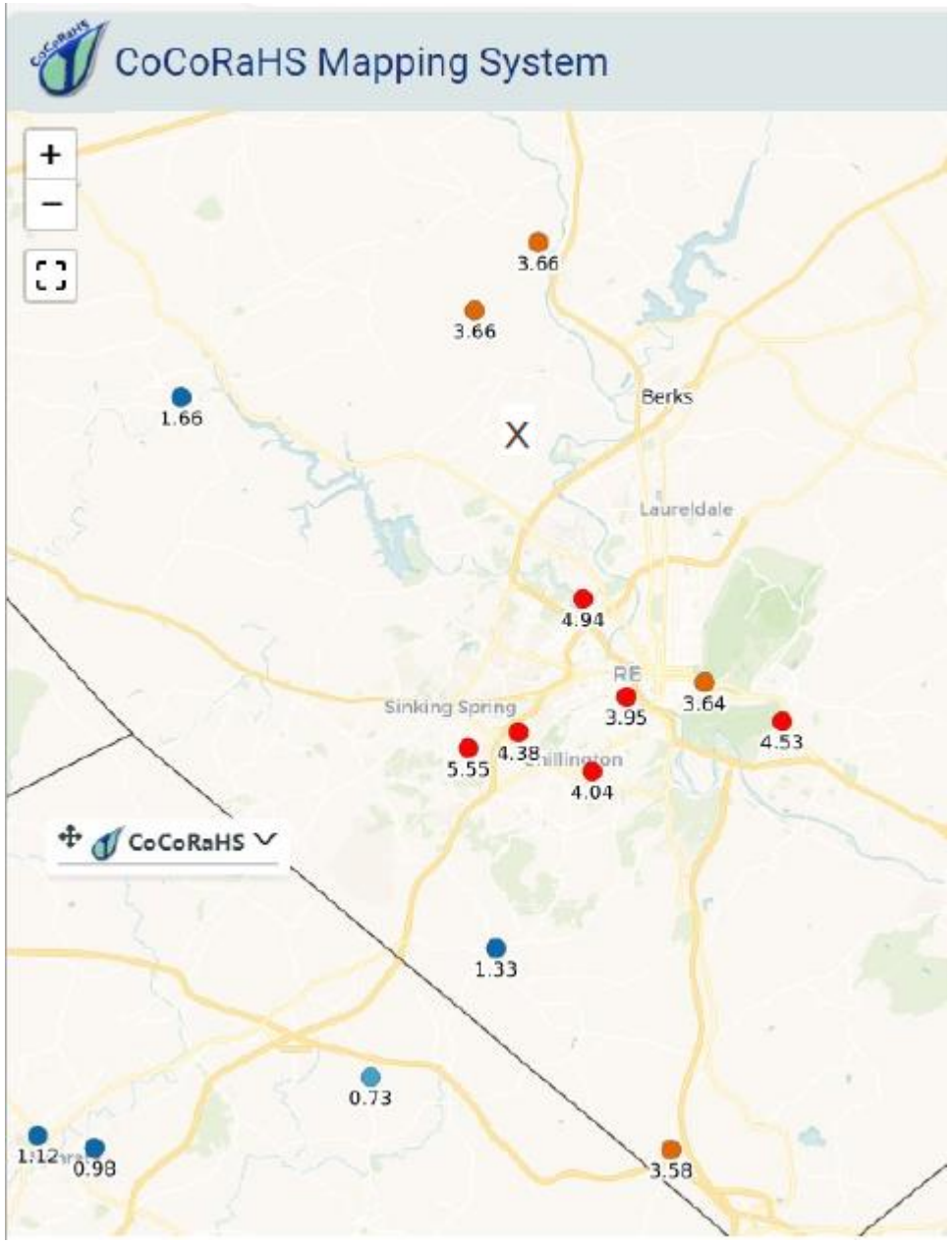
Data selection for site: READING, PA
Database: FAA_HOURLY

Metadata:

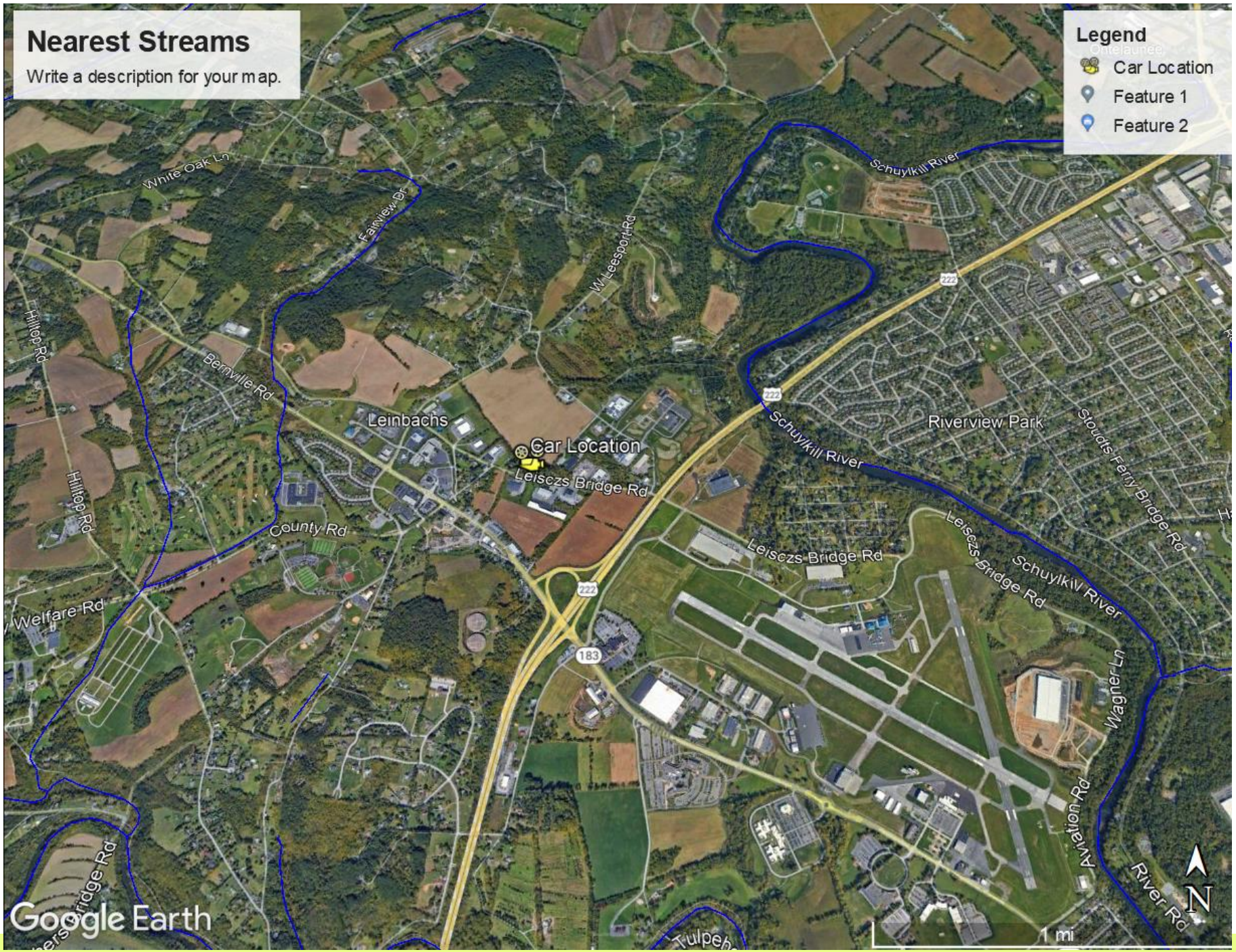
Id: KRDG
Name: READING
County: BERKS
State: PA
Lat: 40.370
Lon: -75.960
Elev (ft): 360.0
Start_date: 1973-01-01
End_date: 2024-01-19

Requested Start Date: 2023-07-09
Requested End Date: 2023-07-09
Records Returned: 24

2023-07-09 13:00:00	
2023-07-09 14:00:00	
2023-07-09 15:00:00	0.19
2023-07-09 16:00:00	0.38
2023-07-09 17:00:00	1.18
2023-07-09 18:00:00	1.61
2023-07-09 19:00:00	1.25
2023-07-09 20:00:00	0.44
2023-07-09 21:00:00	0.28
2023-07-09 22:00:00	0.02




Flood water Location
Write a description for your map.
Legend
Car Location
Feature 1
Feature 2
Malsnee Tile & Stone
Stinson Dr
Kohl Building Products
Miller-Keystone Blood Center
Berkshire Mechanical
Leiscszs Bridge Rd
Ulrich Ln
Car Location
Wind-Lock Corporation
B&G Glass
Miller Transportation Group
Old Airport Rd
Bulk Chemicals
Berks Engineering
Andrew Hess
N
700 ft
Google Earth


Nearest Streams
Write a description for your map.
Legend
Car Location
Feature 1
Feature 2
White Oak Ln
Fairview Dr
W Leesport Rd
Schuylkill River
Hilltop Rd
Bernville Rd
Leinbachs
Car Location
Leisczs Bridge Rd
Riverview Park
Sloudts Ferry Bridge Rd
County Rd
Welfare Rd
183
Wagner Ln
Aviation Rd
River Rd
Google Earth
1 mi
N

Model My Watershed

Select Area

Explore mapped layers, such as streams, land cover, soils, boundaries and observations, using the layer selector in the lower left of the map. See our documentation on layers.

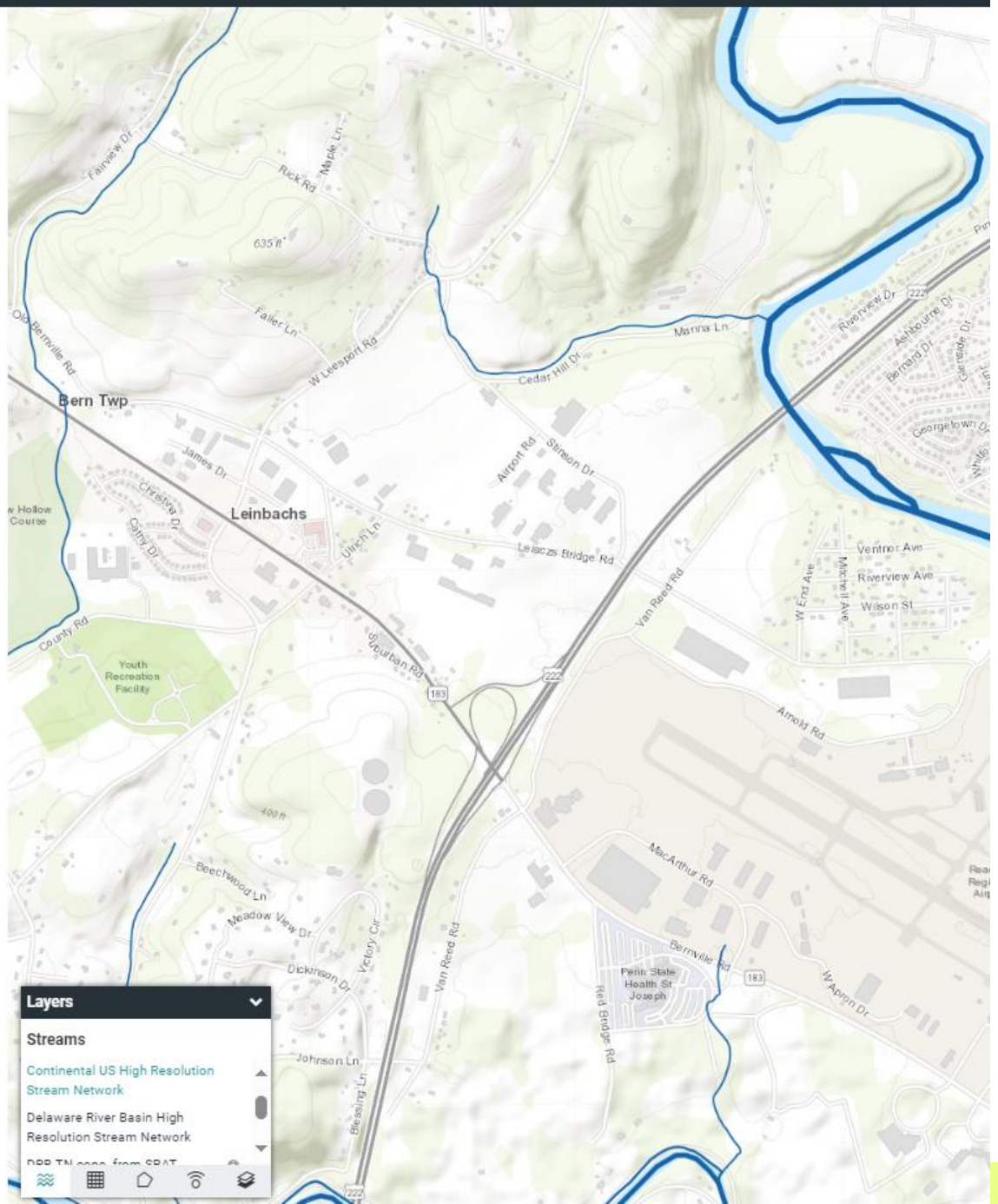
Select an Area of Interest in the continental United States, using the suite of tools below, to analyze the factors that impact water in your area and to begin to model different scenarios of human impacts. Different modeling options for using these tools are described in the technical documentation.

Select boundary
Choose a predefined boundary from several types

Draw area
Free draw an area or place a square kilometer

Delineate watershed
Automatically delineate a watershed from any point

Upload file
Upload a polygon for your area



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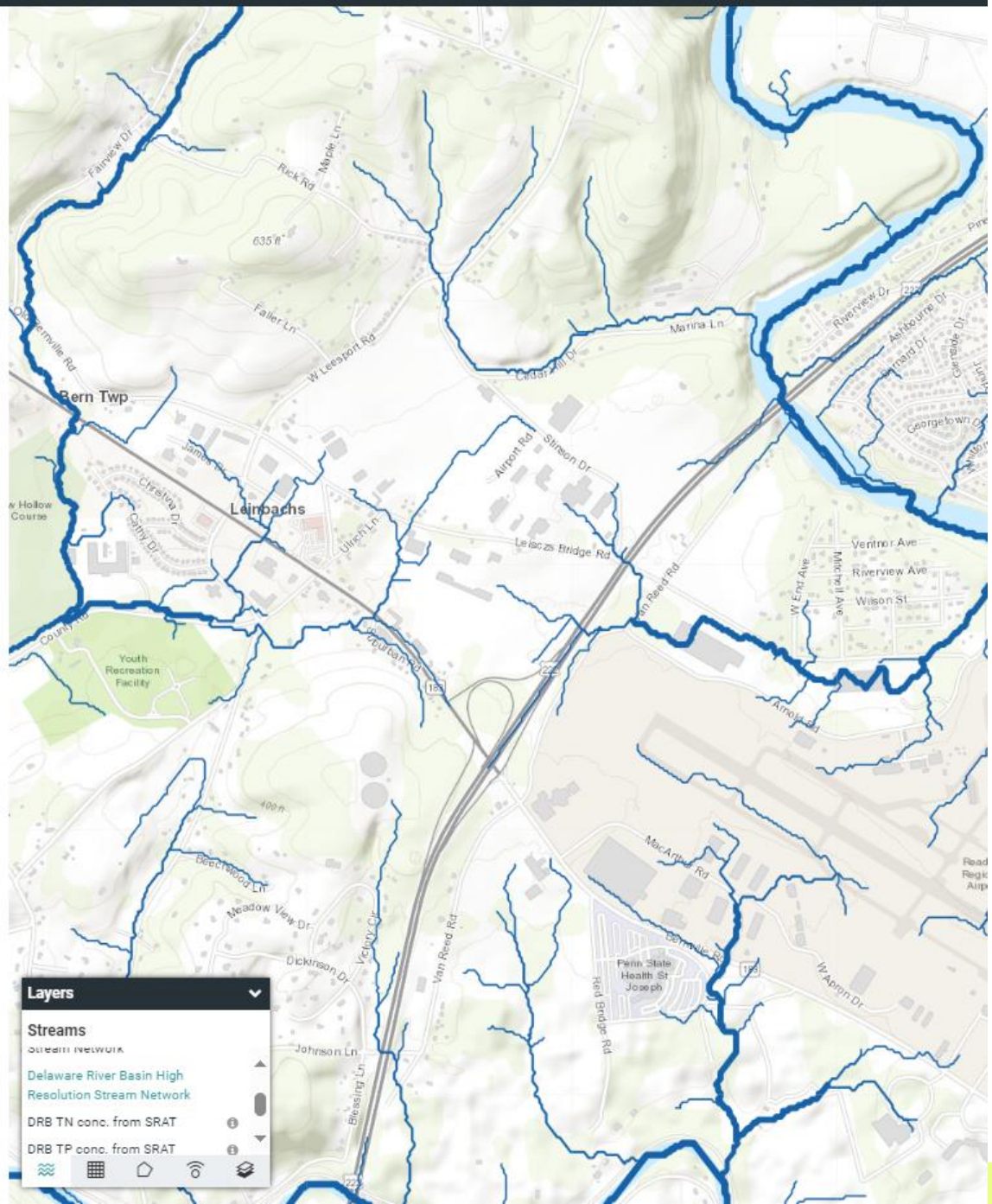


Model My Watershed

Analyze Monitor Model

Delaware High Resolution 7,179,673 ft²

Streams Land Soil Terrain Climate Pt Sources Animals Water Qual

NHD Medium Resolution Streams

NHD Medium Resolution Stream Network Statistics

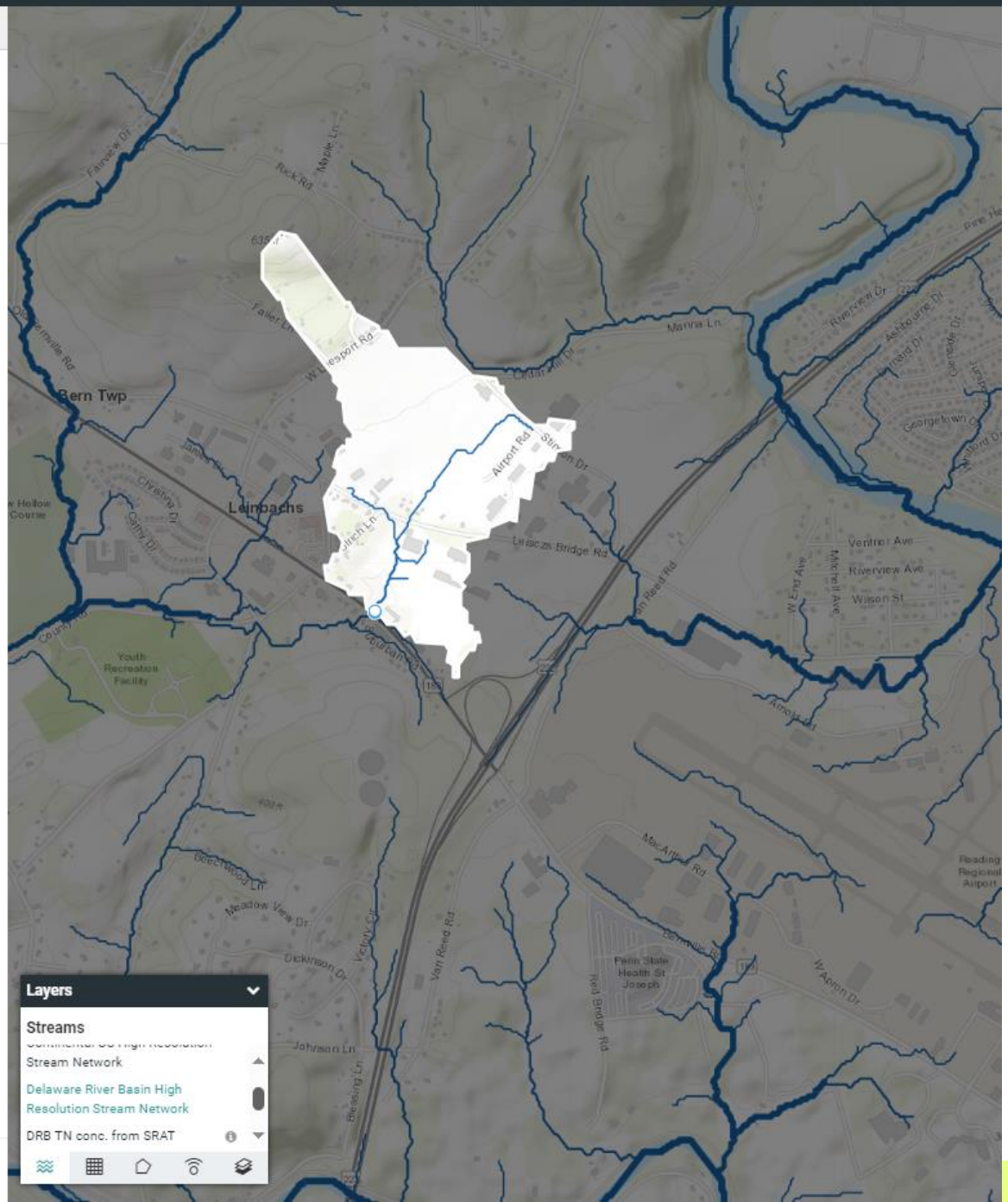
Related Layer: Continental US Medium Resolution Stream Network
Turn on
Source: NHDplusV2

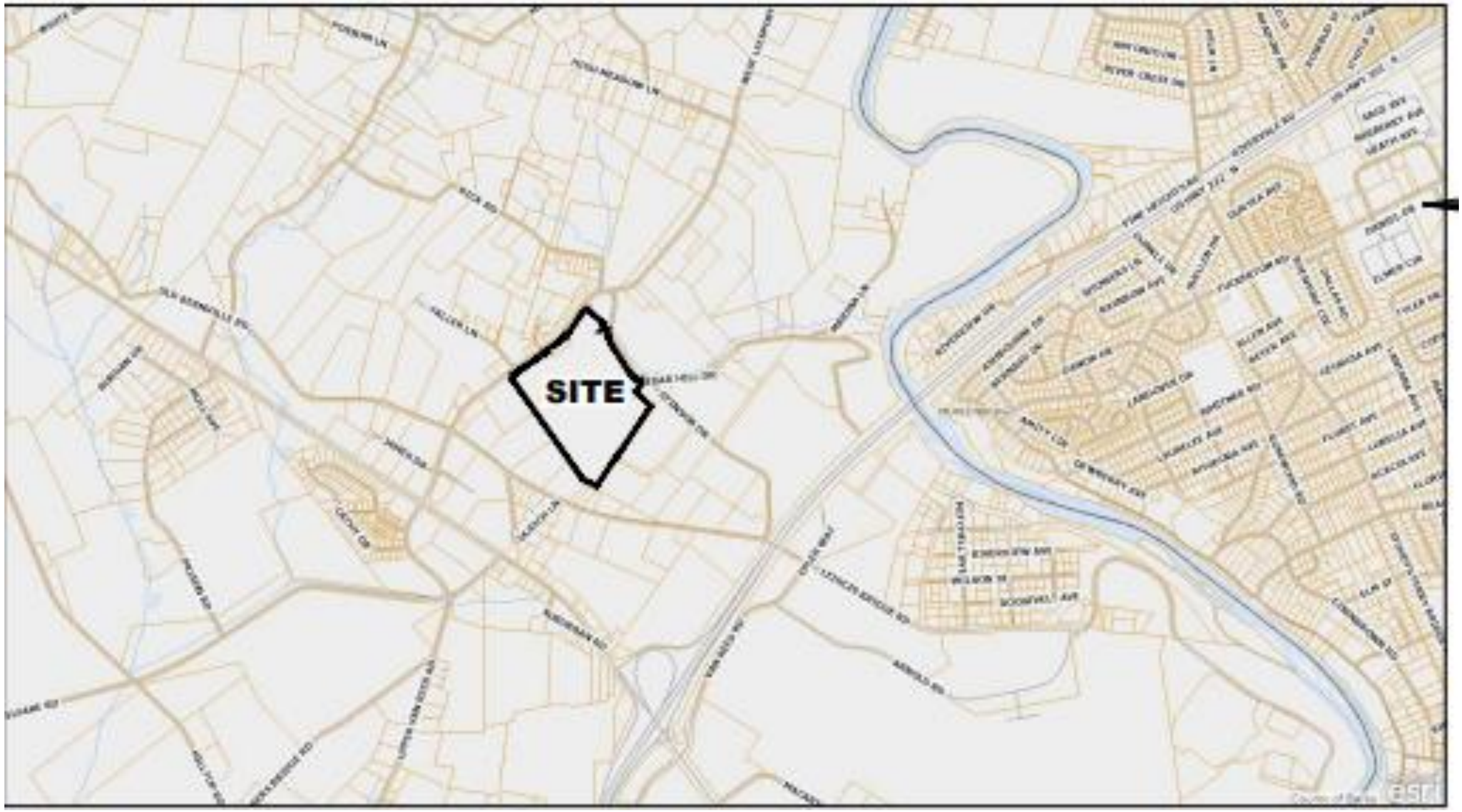
Stream Order	Total Length (mi)	Mean Channel Slope (%)
1st	0.00	No Data
2nd	0.00	No Data
3rd	0.00	No Data
4th	0.00	No Data
5th	0.00	No Data
6th	0.00	No Data
7th	0.00	No Data
8th	0.00	No Data
9th	0.00	No Data
10th	0.00	No Data
Other	0.00	No Data
Combined	**0.00**	**NaN%**

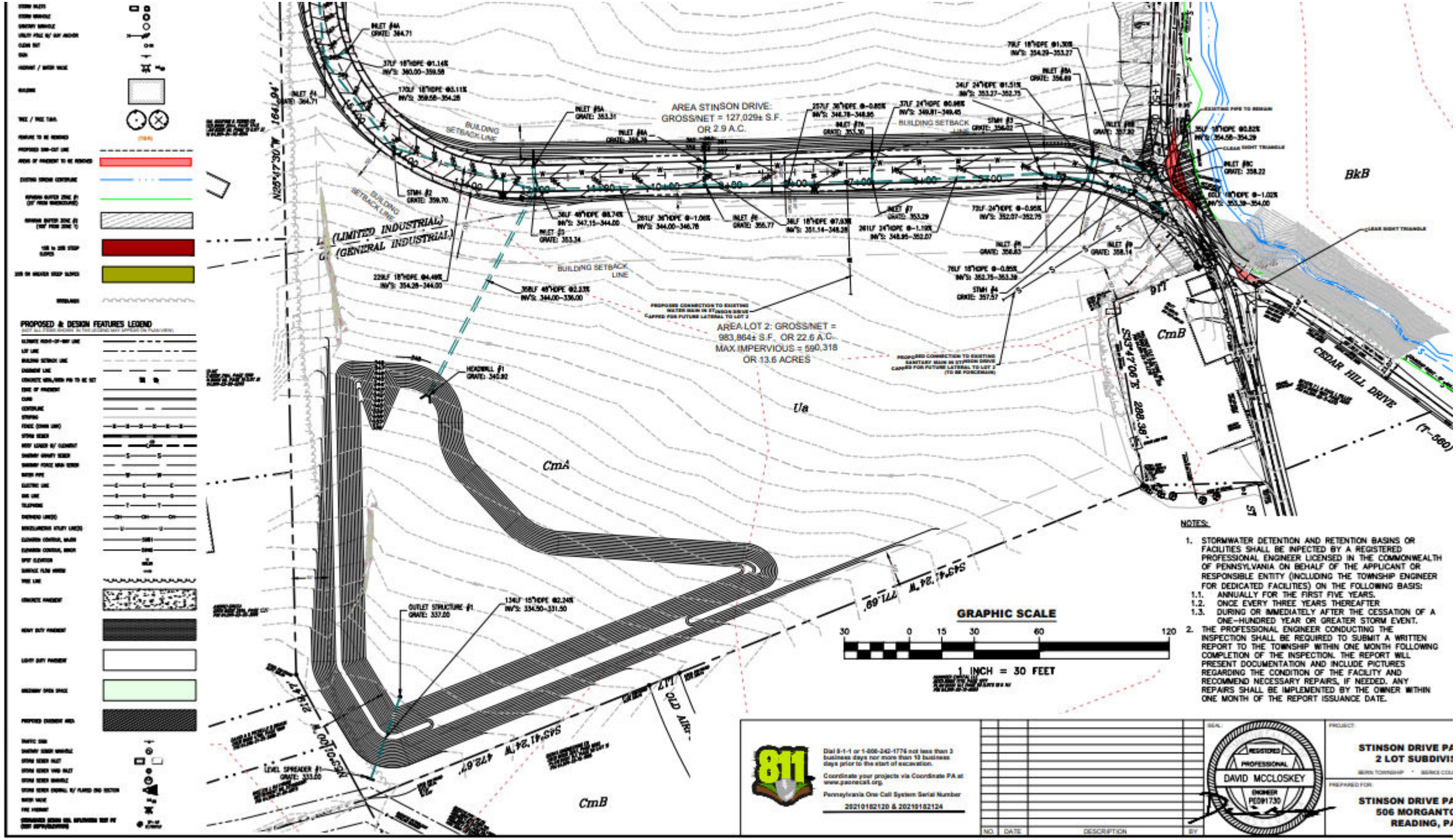
Length in agricultural areas = 0.00 mi
Length in non-agricultural areas = 0.00 mi

Download this data

Change area




SITE


PROPOSED & DESIGN FEATURES LEGEND
AREA STINSON DRIVE:
GROSS/NET = 127,029± S.F.
OR 2.9 A.C.
AREA LOT 2: GROSS/NET =
983,864± S.F. OR 22.6 A.C.
MAX IMPERVIOUS = 590,318
OR 13.6 ACRES
(LIMITED INDUSTRIAL)
(GENERAL INDUSTRIAL)
BUILDING SETBACK LINE
CmA
CmB
UaA
BkB
CEDAR HILL DRIVE
GRAPHIC SCALE
30 0 15 30 60 120
1 INCH = 30 FEET
NOTES:
1. STORMWATER DETENTION AND RETENTION BASINS OR FACILITIES SHALL BE INPECTED BY A REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE COMMONWEALTH OF PENNSYLVANIA ON BEHALF OF THE APPLICANT OR RESPONSIBLE ENTITY (INCLUDING THE TOWNSHIP ENGINEER FOR DEDICATED FACILITIES) ON THE FOLLOWING BASIS:
1.1. ANNUALLY FOR THE FIRST FIVE YEARS.
1.2. ONCE EVERY THREE YEARS THEREAFTER
1.3. DURING OR IMMEDIATELY AFTER THE CESSATION OF A ONE-HUNDRED YEAR OR GREATER STORM EVENT.
2. THE PROFESSIONAL ENGINEER CONDUCTING THE INSPECTION SHALL BE REQUIRED TO SUBMIT A WRITTEN REPORT TO THE TOWNSHIP WITHIN ONE MONTH FOLLOWING COMPLETION OF THE INSPECTION. THE REPORT WILL PRESENT DOCUMENTATION AND INCLUDE PICTURES REGARDING THE CONDITION OF THE FACILITY AND RECOMMEND NECESSARY REPAIRS, IF NEEDED. ANY REPAIRS SHALL BE IMPLEMENTED BY THE OWNER WITHIN ONE MONTH OF THE REPORT ISSUANCE DATE.
811
Dial 8-1-1 or 1-800-242-1776 not less than 3 business days nor more than 10 business days prior to the start of excavation.
Coordinate your projects via Coordinate PA at www.paonecall.org
Pennsylvania One Call System Serial Number
20210182120 & 20210182124
REGISTERED PROFESSIONAL ENGINEER
DAVID MCCLOSKEY
PE091730
STINSON DRIVE PA
2 LOT SUBDIVI
STINSON DRIVE PA
506 MORGANT
READING, PA

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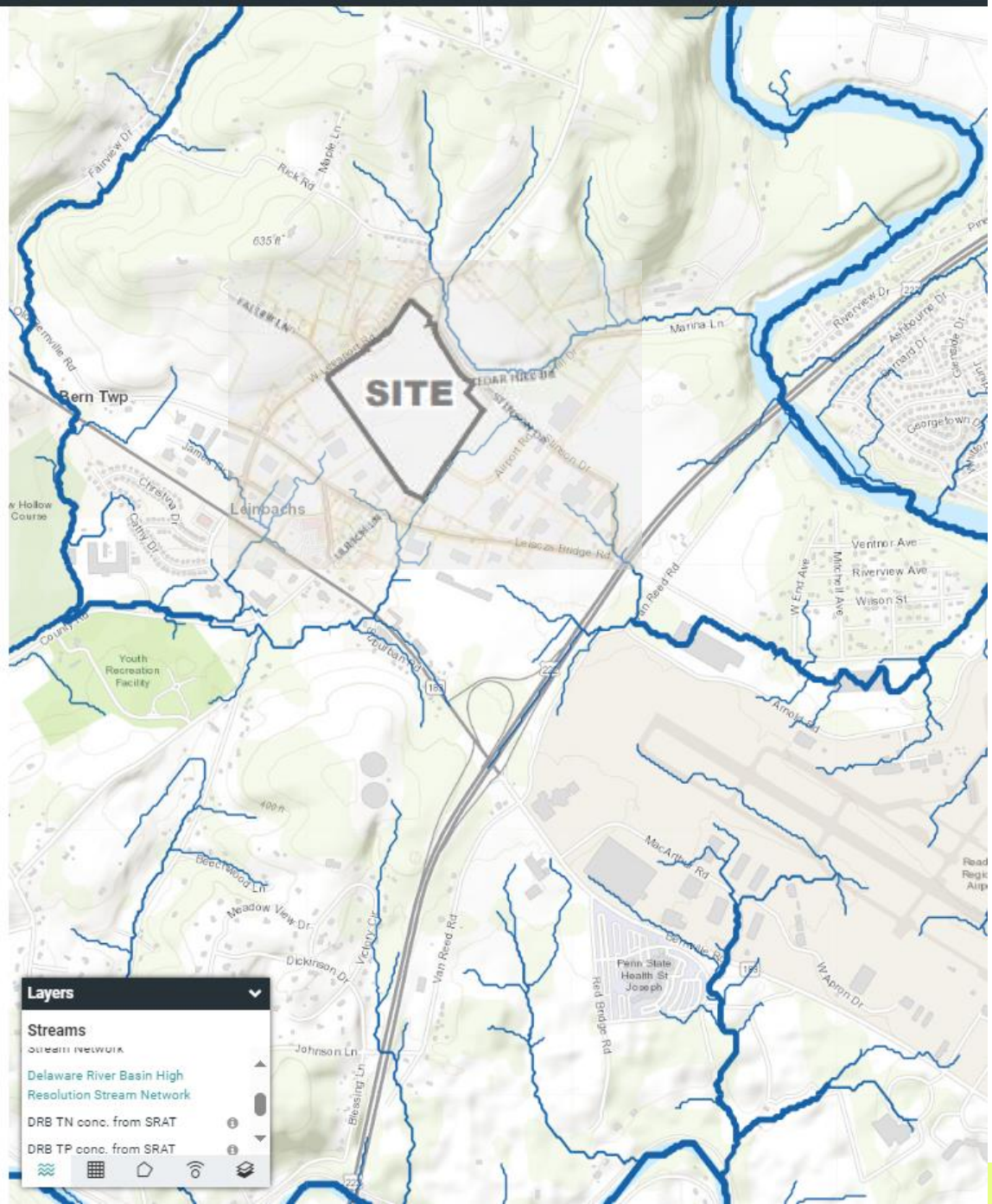


From Bern Township Stormwater Ordinance (2023)

Section 149-17 Water quality requirements

H. If a perennial or intermittent stream passes through the site, the applicant shall create a stream buffer extending a minimum of fifty (50) feet to either side of the top-of-bank of the channel. The buffer area shall be maintained with appropriate native vegetation (Reference to Appendix H of Pennsylvania Handbook of Best Management Practices for Developing Area for plant lists). If the applicable rear or side yard setback is less than fifty (50) feet, the buffer width may be reduced to twenty-five (25) percent of the setback to a minimum of ten (10) feet. If an existing buffer is legally prescribed (i.e. deed, covenant, easement, etc.) and it exceeds the requirements of this Ordinance, the existing buffer shall be maintained. [The Municipality may select a smaller or larger buffer width if desired, but the selected buffer may not be less than ten (10) feet]. This does not include lakes or wetlands.

From Section 404 of the Clean Water Act - Streams under CWA Section 404

Seasonal streams (intermittent) flow during certain times of the year when smaller upstream waters are flowing and when groundwater provides enough water for stream flow. Runoff from rainfall or other precipitation supplements the flow of seasonal stream. During dry periods, seasonal streams may not have flowing surface water. Larger seasonal streams are more common in dry areas.

Rain-dependent streams (ephemeral) flow only after precipitation. Runoff from rainfall is the primary source of water for these streams. Like seasonal streams, they can be found anywhere but are most prevalent in arid areas.

https://www.epa.gov/cwa-404/streams-under-cwa-section-404


BMS1 Little Northkill Creek
BMS3 UT 1 to Northkill Creek
BMS4 UT2 to Northkill
BMS5 Tulpehocken Creek
BMS7 Licking Creek
BMS6 Power Mill Creek
BMS8 UT Near Sheidy Rd
BMS9 UT Near Peacock Rd
Milestone Rd
Brownsville Rd
BMS10 UT Near Milestone Rd
BMS11 Spring Creek
BMS13 UT Near Highland Rd
BMS12 UT East of Brownsville
7402 ft

Date from Model My Watershed for the Entire Tulpehocken Creek Watershed

Model My Watershed

Analyze Monitor Model

Continental US Medium Resolution 220 mi²

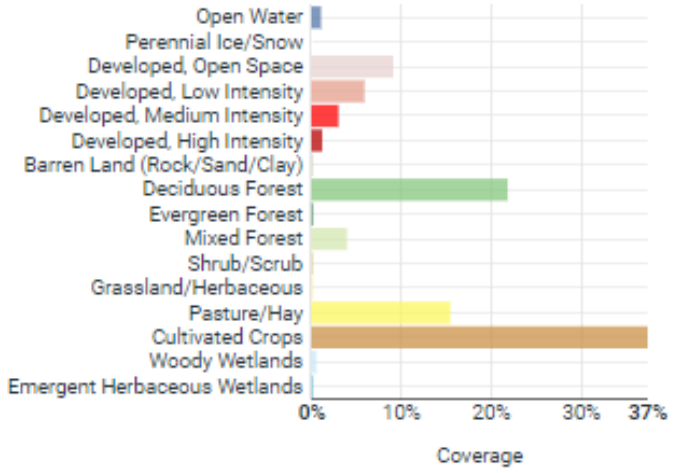
Streams Land Soil Terrain Climate Pt Sources Animals Water Qual

Land Use/Cover 2019 (NLCD19)

Land Use/Cover 2019 (NLCD19)

Related Layer: Land Use/Cover 2019 (NLCD19) ✔ Turn on

Source: National Land Cover Database (NLCD 2019)



Model My Watershed

Analyze Monitor Model

Continental US Medium Resolution 220 mi²

Streams Land Soil Terrain Climate Pt Sources Animals Water Qual

NHD Medium Resolution Streams

NHD Medium Resolution Stream Network Statistics

Related Layer: Continental US Medium Resolution Stream Network ✔ Turn on

Source: NHDplusV2

Stream Order	Total Length (mi)	Mean Channel Slope (%)
1st	135.28	1.78%
2nd	35.60	0.82%
3rd	22.95	0.34%
4th	13.16	0.13%
5th	13.29	0.14%
6th	0.00	No Data
7th	0.00	No Data
8th	0.00	No Data
9th	0.00	No Data
10th	0.00	No Data
Other	14.69	No Data
Combined	**234.96**	**1.93%**

Length in agricultural areas = 72.63 mi

Length in non-agricultural areas = 162.33 mi

Model My Watershed

Untitled Project Details

Current Conditions Export GMS

Hydrology Water Quality

Average annual loads from 30-years of daily fluxes

Related Layer: Weather Stations used in this model. ✔ Turn on

Weather Source: USEPA National Climate Data

Simulated by the GWLF-E (MapShed) model

Sources	Sediment	Total Nitrogen	Total Phosphorus
Total Loads (lb)	133,713,045.8	5,315,837.5	360,364.1
Loading Rates (lb/ac)	959.47	38.14	2.59
Mean Annual Concentration (mg/L)	191.90	7.63	0.52
Mean Low-Flow Concentration (mg/L)	317.70	12.51	1.19

Mean Flow: 11,161,335,819 (ft³/year) and 353.92 (ft³/s)

Model My Watershed

BMS1 Little NorthKill Cr...

Analyze | Monitor | Model | Share | New Pro

Current Conditions | Export GMS | Add changes to this a

Hydrology | Water Quality

Average annual loads from 30-years of daily fluxes

Related Layer: Weather Stations used in this model. ✔ Turn on

Weather Source: USEPA National Climate Data

Simulated by the GWLF-E (MapShed) model

Sources	Sediment	Total Nitrogen	Total Phosphorus
Total Loads (lb)	5,870,520.7	237,152.9	13,922.9
Loading Rates (lb/ac)	417.19	16.85	0.99
Mean Annual Concentration (mg/L)	102.60	4.14	0.24
Mean Low-Flow Concentration (mg/L)	283.36	5.33	0.66

Model My Watershed

BMS2 Northkill Creek

Analyze | Monitor | Model | Share

Current Conditions | Export GMS

Hydrology | Water Quality

Average annual loads from 30-years of daily fluxes

Related Layer: Weather Stations used in this model. ✔ Turn on

Weather Source: USEPA National Climate Data

Simulated by the GWLF-E (MapShed) model

Sources	Sediment	Total Nitrogen	Total Phosphorus
Total Loads (lb)	3,613,638.6	162,996.2	9,767.0
Loading Rates (lb/ac)	328.91	14.84	0.89
Mean Annual Concentration (mg/L)	80.89	3.65	0.22
Mean Low-Flow Concentration (mg/L)	234.51	4.85	0.64

Mean Flow: 715,645,343 (ft³/year) and 22.69 (ft³/s)

Download this data

Model My Watershed

BMS3 UT1 to Northkill ...

Analyze | Monitor | Model | Share | New Proje

Current Conditions | Export GMS | Add changes to this are

Hydrology | Water Quality

Average annual loads from 30-years of daily fluxes

Related Layer: Weather Stations used in this model. ✔ Turn on

Weather Source: USEPA National Climate Data

Simulated by the GWLF-E (MapShed) model

Sources	Sediment	Total Nitrogen	Total Phosphorus
Total Loads (lb)	353,921.0	13,599.4	937.7
Loading Rates (lb/ac)	466.38	17.92	1.24
Mean Annual Concentration (mg/L)	108.01	4.15	0.29
Mean Low-Flow Concentration (mg/L)	322.64	5.35	0.78

Model My Watershed

BMS4 UT2 to NorthKill ...

Analyze | Monitor | Model | Share

Current Conditions | Export GMS

Hydrology | Water Quality

Average annual loads from 30-years of daily fluxes

Related Layer: Weather Stations used in this model. ✔ Turn on

Weather Source: USEPA National Climate Data

Simulated by the GWLF-E (MapShed) model

Sources	Sediment	Total Nitrogen	Total Phosphorus
Total Loads (lb)	252,885.3	9,680.1	727.1
Loading Rates (lb/ac)	430.18	16.47	1.24
Mean Annual Concentration (mg/L)	101.25	3.88	0.29
Mean Low-Flow Concentration (mg/L)	316.78	5.10	0.82

Location	From Stroud MMW Total Nitrogen (mg/L)	TCWA Measured Nitrate-Nitrogen* (mg/L)
BMS1 Little Northkill Creek	4.1	1.0
BMS2 Northkill Creek	3.7	4.0, 2.0, 1.5, 1.0
BMS3 UT1 to Northkill Creek	4.2	No Flow
BMS4 UT2 to Northkill Creek	3.9	No Flow
BMS5 Tulpehocken Creek	12.8	6.5
BMS6 Power Mill Creek	3.6	4.0
BMS7 Licking Creek	3.5	5.0, 6.0
BMS8 UT Near Sheidy Rd	4.1	9.0
BMS9 UT Near Peacock Rd	4.5	5.5, 6.0
BMS10 Near Milestone Rd	5.5	8.0
BMS11 Spring Creek	4.0	7.0
BMS12 UT East of Brownsville	4.4	3.0
BMS13 UT Near Highland Rd	3.1	1.5

*Note: Results of the Nitrate-Nitrogen tests do not include other sources of nitrogen such as ammonia, nitrite, and total organic nitrogen.

Location	From Stroud MMW Total Phosphorus (mg/L)	TCWA Measured Orthophosphate* (mg/L)
BMS1 Little Northkill Creek	0.2	0.1
BMS2 Northkill Creek	0.2	0.04, 0.08, 0.02, 0.05
BMS3 UT1 to Northkill Creek	0.3	No Flow
BMS4 UT2 to Northkill Creek	0.3	No Flow
BMS5 Tulpehocken Creek	0.9	0.3
BMS6 Power Mill Creek	0.3	0.3
BMS7 Licking Creek	0.3	0.3
BMS8 UT Near Sheidy Rd	0.3	0.1
BMS9 UT Near Peacock Rd	0.3	0.12 & 0.00
BMS10 Near Milestone Rd	0.3	0.1
BMS11 Spring Creek	0.3	0.1
BMS12 UT East of Brownsville	0.2	0.0
BMS13 UT Near Highland Rd	0.3	0.2

*Note: Results of the Orthophosphorus tests are only a fraction of the Total Phosphorus.

The relationship between total phosphorus and phosphate (including orthophosphate) concentrations can vary depending on the composition of the sample being analyzed. The concentration of phosphate in a TP measurement is just one component of the total phosphorus, and the proportion of phosphate to total phosphorus will depend on the specific sources of phosphorus in the sample.

Similarly, Total Nitrogen (TN) is the sum of all nitrogen forms or; Total Nitrogen = Ammonia Nitrogen (NH_3) + Organic Nitrogen (Nitrogen in amino acids and proteins) + Nitrite (NO_2) + Nitrate (NO_3). Our test method is only measuring Nitrates as NO_3-N. In a stream with active nitrification processes, nitrates may indeed constitute a substantial portion of the TN. The specific percentage can vary widely and is influenced by many factors.

Model My Watershed concentrations are the Mean Annual concentration (which represents a large range of concentrations) and Mean Low-Flow concentration.

An average of our measurements at low flow (when particulate phosphorus is negligible) over a full year would be most relatable to the Mean Low-Flow concentration in MMW.

In many cases, environmental regulations and water quality assessments focus on monitoring nitrate levels due to their potential impact on ecosystems and human health..

Location	From Stroud Model My Watershed					Conversion		Measured	
	Total Nitrogen lb/yr	Total Phosphorus lb/yr	Avg Total Nitrogen (mg/l)	Avg Total Phosphorus (mg/l)	cfs	Water gpd	Water lb/yr	Nitrate NO3-N (mg/L)	Phosphate PO_4^{3-} (mg/L)
BMS1 Little Northkill Creek	237,152	13,922	4.1	0.24	29.0	18,743,193	57,093,116,756	1.00	0.13
BMS2 Northkill Creek	176,126	10,551	3.7	0.22	24.2	15,640,871	47,643,221,569	4&2&1.5&1	.04&.08&.02&.05
BMS3 UT1 to Northkill Creek	13,599	937	4.2	0.29	1.7	1,072,886	3,268,088,752	No Flow	No Flow
BMS4 UT2 to Northkill Creek	9,680	727	3.9	0.29	1.3	820,823	2,500,284,768	No Flow	No Flow
BMS5 Tulpehocken Creek	3,720,280	264,787	12.8	0.91	147.0	95,008,599	289,403,040,108	6.50	0.25
BMS6 Power Mill Creek	26,722	2,114	3.6	0.28	3.8	2,475,394	7,540,228,868	4.00	0.25
BMS7 Licking Creek	31,166	2,552	3.5	0.28	4.6	2,940,742	8,957,713,146	5.0 & 6.0	0.34
BMS8 UT Near Sheidy Rd	27,281	1,856	4.1	0.28	3.3	2,158,699	6,575,552,068	9.00	0.05
BMS9 UT Near Peacock Rd	43,116	4,028	4.5	0.30	5.2	3,360,848	10,237,386,453	5.5 & 6.0	0.12 & 0.00
BMS10 Near Milestone Rd	28,607	2,734	5.5	0.38	4.5	2,889,037	8,800,214,893	8.00	0.11
BMS11 Spring Creek	326,607	23,316	4.0	0.29	41.4	26,738,134	81,446,284,145	7.00	0.11
BMS12 UT East of Brownsville	9,409	495	4.4	0.23	1.1	704,486	2,145,913,699	3.00	0.04
BMS13 UT Near Highland Rd	4,756	419	3.1	0.28	0.8	497,664	1,515,920,686	1.50	0.20
Total	4,654,501	328,438				173,051,377	527,126,965,911		