

March 25, 2024

Lakeville Conservation Commission
241 Main Street
Lakeville, MA 02347

Re: Stream Determination – Supplemental Information for ANRAD (DEP File #192-0915)
Off Freetown Street Lakeville, MA 02347
Map/Parcel: 34-2-1, 34-2-2, 34-2-11, 34-2-12, 35-1-2A, 35-1-4

Dear Lakeville Conservation Commission

Goddard Consulting, LLC is pleased to submit this Stream Determination as supplemental information for the Abbreviated Notice of Resource Area Delineation (ANRAD)(DEP File #192-0195) submitted on behalf of the applicant, Simonds Hills, LLC, for the properties located at Off Freetown Street Lakeville, MA 02347 (Map/Parcel: 34-2-1, 34-2-2, 34-2-11, 34-2-12, 35-1-2A, 35-1-4). This Stream Determination will be used to answer questions raised by Massachusetts DEP and the Lakeville Conservation Commission regarding the intermittent status of portion of Cedar Swamp River and an unnamed mapped intermittent stream on-site.

Attachments:

StreamStats Report – Cedar Swamp River, accessed on 3/25/2024
StreamStats Report – Unnamed Intermittent Stream, accessed on 3/25/2024

Existing Conditions

The site consists of six parcels totaling approximately 186.6 acres (8,039,420 square feet). The site is bordered by Freetown Street to the west, and Route 140 to the east. The site is primarily wooded, with several large Bordering Vegetated Wetland (BVW) systems (44.1 acres), two intermittent streams. The larger of the two streams is Cedar Swamp River, which is located adjacent to Freetown Street. The unnamed mapped intermittent stream exists in the southeastern portion of the site adjacent to Route 140.

Cedar Swamp River drains from a large Bordering Vegetated Wetland (BVW) adjacent to Freetown Street between properties addressed as 51 Freetown Street and 59 Freetown Street. Water flows northwest into a culvert under Freetown Street and off-site. Based on the most recent USGS map, the portion of Cedar Swamp River on-site is mapped as intermittent. Cedar Swamp River is mapped as perennial +/-1.6 miles downstream of the site.

The unnamed mapped intermittent stream drains from a BVW system adjacent to Route 140 in the Southeastern portion of the site. Water flows southeast into a culver under Route 140, off-site. Based on the most recent USGS map, the portion of the unnamed intermittent stream on-site is mapped as intermittent. This stream is never mapped perennial.

Massachusetts DEP SERO commented the following regarding the stream on-site:

“The most current USGS map (<https://apps.nationalmap.gov/viewer/>) shows a number of intermittent streams located on the subject property. Has the stream status of each of these streams been assessed per 310 CMR 10.58(2)(a)1.b. or c. to determine if they are perennial?”

310 CMR 10.58(2)(a)(1)(b) states: *“A river or stream shown as intermittent or not shown on the current USGS map or more recent map provided by the Department, that has a watershed size greater than or equal to one square mile, is perennial.”* Cedar Swamp River has a drainage area of 0.44 square miles which is less than 1 square mile (reference attached StreamStats – Cedar Swamp River). Additionally, the unnamed intermittent stream has a drainage area of 0.0762 square miles, which is less than 1 square mile (reference attached StreamStats – Unnamed Intermittent Stream).

310 CMR 10.58(2)(a)(1)(c)(i) states *“A stream shown as intermittent or not shown on the current USGS map or more recent map provided by the Department, that has a watershed size less than one square mile, is intermittent unless:*

- i. The stream has a watershed size of at least 1/2 (0.50) square mile **and** has a predicted flow rate greater than or equal to 0.01 cubic feet per second at the 99% flow duration using the USGS Stream Stats method. The issuing authority shall find such streams to be perennial;”*

Cedar Swamp River is mapped as intermittent on the USGS maps. Using the StreamStats method, Cedar Swamp River has a predicted flow rate of 0.011ft³/s at the 99% flow duration, which is greater than 0.01ft³/s. However, Cedar Swamp River has a drainage area 0.44 square miles which is less than a 1/2 (0.50) square mile. According to 310 CMR 10.58(2)(a)(1)(c)(i) a mapped intermittent stream has to have a predicted flow rate at the 99% flow duration of equal to or greater than 0.01 **and** drainage area of at least a 1/2 (0.50) square miles. This confirms Cedar Swamp Rivers intermittent status on-site (reference attached StreamStats – Cedar Swamp River). Using the StreamStats method, the unnamed intermittent stream has a predicted flow rate of 0.0004111ft³/s at the 99%flow duration and a drainage area of 0.0762 square miles. The unnamed intermittent stream does not have predicted flow rate at the 99% flow duration of equal to or greater than 0.01 or drainage area of at least a 1/2 (0.50) square miles confirming its intermittent status (reference attached StreamStats – Unnamed Intermittent Stream).



Conclusion

It is the professional opinion of Goddard Consulting that the streams mapped on-site on the most recent USGS map are intermittent based on the methods provided in 310 CMR 10.58(2)(a)1.b. or c.

Please feel free to contact us if you have any questions.

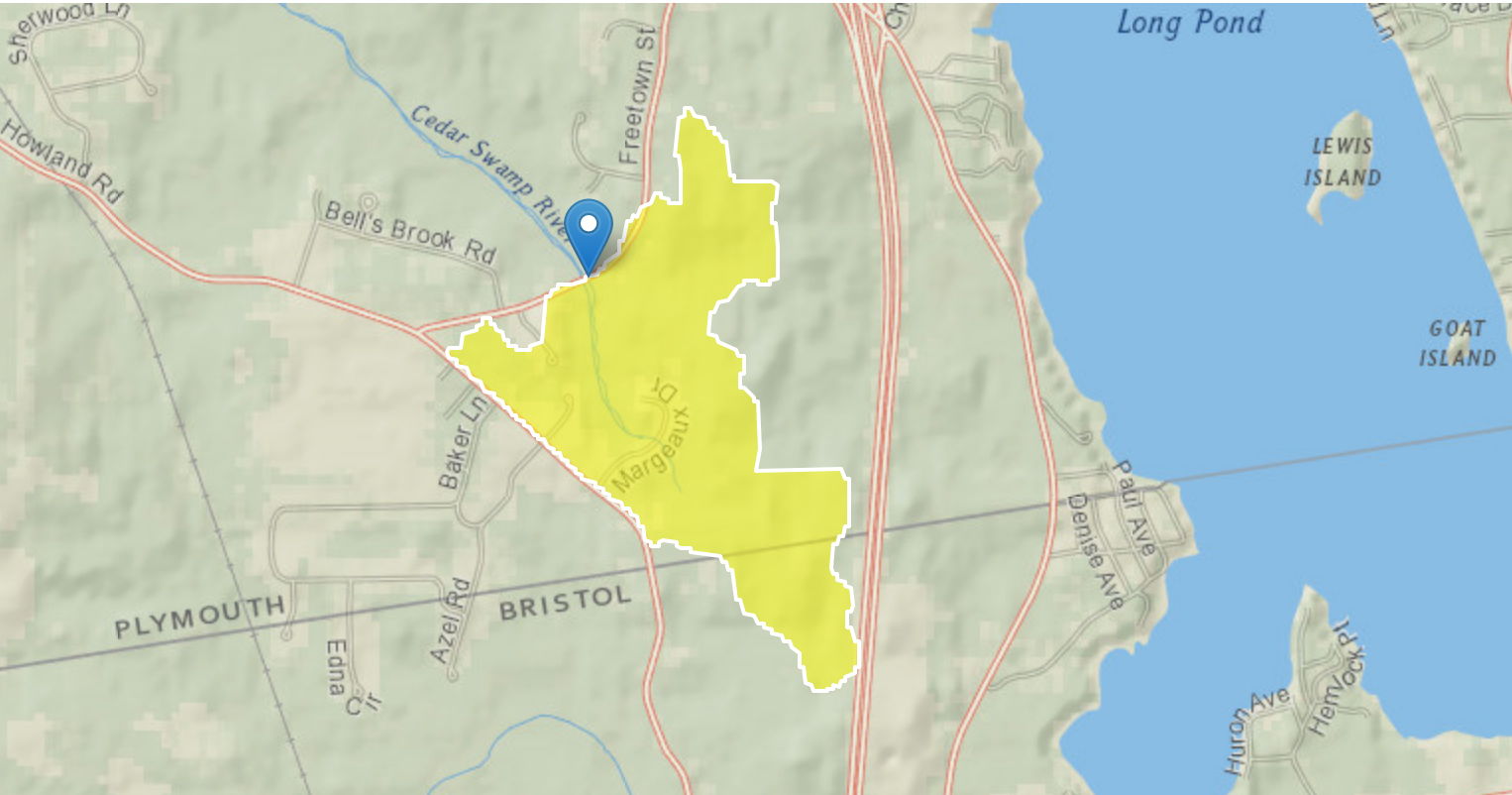
Sincerely,
Goddard Consulting, LLC

Tom Schutz, WPIT, WSA
Wetland Scientist

Cc: MassDEP Southeast Regional Office, Wetlands Division. 20 Riverside Drive, Lakeville, MA 02347
Simonds Hills, LLC, 32 Norfolk Avenue, South Easton, MA 02375

StreamStats Report - Cedar Swamp River

Region ID: MA
Workspace ID: MA20240325154501261000
Clicked Point (Latitude, Longitude): 41.79470, -70.97335
Time: 2024-03-25 11:45:22 -0400



 Collapse All

➤ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM10M	Mean basin slope computed from 10 m DEM	4.877	percent
BSLDEM250	Mean basin slope computed from 1:250K DEM	1.203	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.24	square mile per mile
DRNAREA	Area that drains to a point on a stream	0.44	square miles
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless

➤ Bankfull Statistics

Bankfull Statistics Parameters [Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	4.877	percent	2.2	23.9

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	0.07722	59927.7393

Bankfull Statistics Disclaimers [Bankfull Statewide SIR2013 5155]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Bankfull Statewide SIR2013 5155]

Statistic	Value	Unit
Bankfull Width	10.2	ft
Bankfull Depth	0.713	ft
Bankfull Area	7.15	ft^2
Bankfull Streamflow	14.9	ft^3/s

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	10.8	ft

Statistic	Value	Unit
Bieger_D_channel_depth	0.886	ft
Bieger_D_channel_cross_sectional_area	9.67	ft ²

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	20.1	ft
Bieger_P_channel_depth	1.15	ft
Bieger_P_channel_cross_sectional_area	22.8	ft ²

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	9.28	ft
Bieger_USA_channel_depth	1.01	ft
Bieger_USA_channel_cross_sectional_area	11	ft ²

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bankfull Width	10.2	ft
Bankfull Depth	0.713	ft
Bankfull Area	7.15	ft ²
Bankfull Streamflow	14.9	ft ³ /s
Bieger_D_channel_width	10.8	ft
Bieger_D_channel_depth	0.886	ft
Bieger_D_channel_cross_sectional_area	9.67	ft ²
Bieger_P_channel_width	20.1	ft
Bieger_P_channel_depth	1.15	ft
Bieger_P_channel_cross_sectional_area	22.8	ft ²
Bieger_USA_channel_width	9.28	ft
Bieger_USA_channel_depth	1.01	ft

Statistic	Value	Unit
Bieger_USA_channel_cross_sectional_area	11	ft^2

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M.,2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (<http://pubs.usgs.gov/sir/2013/5155/>)

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p.

([https://digitalcommons.unl.edu/usdaarsfacpub/1515?](https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=)

utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=

➤ Flow-Duration Statistics

Flow-Duration Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	0.24	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	1.203	percent	0.32	24.6

Flow-Duration Statistics Disclaimers [Statewide Low Flow WRIR00 4135]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit
50 Percent Duration	0.413	ft^3/s
60 Percent Duration	0.282	ft^3/s
70 Percent Duration	0.172	ft^3/s
75 Percent Duration	0.132	ft^3/s
80 Percent Duration	0.104	ft^3/s
85 Percent Duration	0.0705	ft^3/s
90 Percent Duration	0.0504	ft^3/s

Statistic	Value	Unit
95 Percent Duration	0.0253	ft^3/s
98 Percent Duration	0.0163	ft^3/s
99 Percent Duration	0.011	ft^3/s
<i>Flow-Duration Statistics Citations</i>		
Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)		

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Application Version: 4.19.4
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats Report - Unnamed Intermittent Strea,

Region ID: MA
Workspace ID: MA20240325153846709000
Clicked Point (Latitude, Longitude): 41.79256, -70.95966
Time: 2024-03-25 11:39:09 -0400



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 Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM10M	Mean basin slope computed from 10 m DEM	6.179	percent
BSLDEM250	Mean basin slope computed from 1:250K DEM	1.198	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.00309	square mile per mile
DRNAREA	Area that drains to a point on a stream	0.0762	square miles
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless

➤ Flow-Duration Statistics

Flow-Duration Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0762	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	0.00309	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	1.198	percent	0.32	24.6

Flow-Duration Statistics Disclaimers [Statewide Low Flow WRIR00 4135]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit
50 Percent Duration	0.0691	ft ³ /s
60 Percent Duration	0.0387	ft ³ /s
70 Percent Duration	0.0172	ft ³ /s
75 Percent Duration	0.0118	ft ³ /s
80 Percent Duration	0.0071	ft ³ /s
85 Percent Duration	0.00435	ft ³ /s
90 Percent Duration	0.00234	ft ³ /s
95 Percent Duration	0.00107	ft ³ /s
98 Percent Duration	0.000656	ft ³ /s
99 Percent Duration	0.000411	ft ³ /s

Flow-Duration Statistics Citations

Ries, K.G., III, 2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p.
(<http://pubs.usgs.gov/wri/wri004135/>)

➤ Bankfull Statistics

Bankfull Statistics Parameters [Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0762	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	6.179	percent	2.2	23.9

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0762	square miles	0.07722	940.1535

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Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0762	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0762	square miles	0.07722	59927.7393

Bankfull Statistics Disclaimers [Bankfull Statewide SIR2013 5155]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Bankfull Statewide SIR2013 5155]

Statistic	Value	Unit
Bankfull Width	5.33	ft
Bankfull Depth	0.444	ft
Bankfull Area	2.32	ft^2
Bankfull Streamflow	4.77	ft^3/s

Bankfull Statistics Disclaimers [Appalachian Highlands D Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	5.22	ft
Bieger_D_channel_depth	0.535	ft
Bieger_D_channel_cross_sectional_area	2.82	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	12.3	ft
Bieger_P_channel_depth	0.781	ft
Bieger_P_channel_cross_sectional_area	9.31	ft^2

Bankfull Statistics Disclaimers [USA Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	5	ft
Bieger_USA_channel_depth	0.697	ft
Bieger_USA_channel_cross_sectional_area	4.26	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bankfull Width	5.33	ft
Bankfull Depth	0.444	ft
Bankfull Area	2.32	ft^2
Bankfull Streamflow	4.77	ft^3/s
Bieger_D_channel_width	5.22	ft
Bieger_D_channel_depth	0.535	ft

Statistic	Value	Unit
Bieger_D_channel_cross_sectional_area	2.82	ft^2
Bieger_P_channel_width	12.3	ft
Bieger_P_channel_depth	0.781	ft
Bieger_P_channel_cross_sectional_area	9.31	ft^2
Bieger_USA_channel_width	5	ft
Bieger_USA_channel_depth	0.697	ft
Bieger_USA_channel_cross_sectional_area	4.26	ft^2

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M.,2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (<http://pubs.usgs.gov/sir/2013/5155/>)

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p.

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Application Version: 4.19.4

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1