

STREAM FLOW CLASSIFICATIONS & STATEMENT OF REASONS Housatonic, Hudson and Southwest Coastal River Basins

INTRODUCTION

On June 20, 2018, the Commissioner of the Connecticut Department of Energy & Environmental Protection (the “Commissioner”) published a notice of proposed stream flow classifications for the Housatonic, Hudson & Southwest Coastal River Basins (see Appendix I). Notice was provided in accordance with the Regulations of Connecticut State Agencies (RCSA) Section 26-141b-5 in newspapers in the basins, including the Bristol Press, New Haven Register, Connecticut Post, Greenwich Times, Waterbury Republican-American, News-Times, The Hour, The Advocate and Torrington Register Citizen. The notice was also mailed and emailed to the required parties listed in RCSA Section 26-141b-5 and to other interested parties (see Appendix II), and published on the Department’s website. Mapping of the proposed classifications was made available in several formats, including an interactive on-line map available on the Department website at www.ct.gov/streamflow. The interactive map allowed an individual to view the factors considered in the classification of each stream segment. Two public information sessions were held, as detailed in the public notice.

Public comments and information for the Commissioner’s consideration on the proposed classifications were solicited through the public notice. In accordance with the regulations, comments were solicited pertaining, but not limited to: (i) the factors for consideration in the regulations; (ii) the impact of the proposed classification on any prior investment made to develop a permitted or registered diversion and the alternatives, if any, to the diversion including cost factors and feasibility of such alternatives; (iii) the relationship of an existing or proposed diversion to economic development or jobs; and (iv) the practicality of, and potential for, achieving ecological benefit from restoring stream flow to the specific river or stream system. Comments were accepted by email and hard copy, and a total of seven comment letters were received. The list of individuals and organizations who submitted comment letters on the proposed regulations is included as Appendix III.

This report summarizes the principal reasons in support of the classifications, the principal considerations raised in opposition to the classifications and the reasons for rejecting or modifying specific proposed classifications.

ADMINISTRATIVE REQUIREMENTS

RCSA Sec. 26-141b-5 requires a minimum 90 day public notice period for public comment on proposed classifications. The Commissioner, in consultation with the Commissioner of Public Health and with technical assistance from the Office of Policy and Management, Department of

Economic and Community Development, and the Department of Agriculture: (1) considered such comments and adopted classifications for the river or stream segment thereof as identified in the public notice; and (2) prepared a document summarizing the principal reasons in support of the classifications, the principal considerations raised in opposition to the classifications and the reasons for rejecting or modifying a proposed classification. Notice of the adopted classifications shall be published in the Connecticut Law Journal upon issuance of this report.

BACKGROUND

The Connecticut Stream Flow Standards and Regulations, RCSA Sections 26-141b-1 to 26-141b-8, inclusive, became effective December 12, 2011. The regulations apply to all rivers and streams in the state. They establish stream flow standards that preserve and protect aquatic life, fish, and wildlife dependent on flow; promote public recreation; are based to the maximum extent practicable on natural variations of flow while meeting societal needs; and are based on the best available science.

The regulations require two separate but related activities: First, they require that all rivers and streams be classified into stream flow classes. Each stream flow class represents a balancing of human use and ecological conditions appropriate to the respective class. The regulations establish the public process for classifying streams and identify the human use and ecological considerations for determining the classification appropriate to specific waters. Second, they require owners or operators of dams that control stream flow to comply with release rules that apply to a stream once it has been classified. The releases are required to begin no later than ten years from classification to allow current users time to adjust their operations to comply with the new regulations without unduly disrupting the supply of water available for human use.

In accordance with the RCSA Sec. 26-141b-5, the Commissioner, after consultation with the Commissioner of Public Health, prepared mapping of proposed classifications indicative of the degree of human alteration of natural stream flow and the extent to which the ecological system is supported for the streams in the Connecticut River Basin. The proposed stream flow classification of a stream or river segment was based on ecological conditions and human use characteristics. These included factors such as location, size and use of dams; existing registered or permitted withdrawals; existing and potential use of the water for public water supply; land use and land cover within the watershed; habitat indicators and other conditions. The complete list of factors and considerations in the regulations can be found in Appendix IV.

The Commissioner utilized the best available data sources related to the factors and the state's Geographic Information System (GIS) for the analyses and to propose the initial stream flow classifications. The methodology for establishing the proposed classifications is attached as Appendix V. This methodology was developed in conjunction with the Science & Technical Work Group formed during development of the regulations and was well received by water professionals in demonstrations and presentations. The methodology has continued to evolve as additional basins were classified.

The Department shared and solicited comment on the proposed initial classifications from the Connecticut Department of Public Health (DPH) in April, 2018. DPH provided comment and

information on potential future public water supplies, which was then incorporated into the proposed classifications to the extent possible prior to issuance of the public notice. The Department also solicited information on future potential sources with significant investment from each of the large water companies in the basin in July, 2017. These water companies included Aquarion Water Company, Bethel Water Department, Connecticut Water Company, Heritage Village Water Company, Norwalk First Taxing District, Sharon Water & Sewer Commission, South Central Connecticut Regional Water Authority, South Norwalk Electric & Water, Torrington Water Company, Waterbury Water Department and Watertown Fire District.

The Department recognizes that while it used the best available data for the proposed initial classifications, additional data could be available at the local level. The public notice and comment period allowed the public to provide additional or more accurate segment-specific data so that the proposed classifications could be modified as appropriate in accordance with the factors for consideration.

CONSIDERATION OF PUBLIC COMMENT

Comment letters were received from seven entities (see Appendix III). The full comment letters, as submitted, can be obtained online at www.ct.gov/deep/streamflow. In general, the comments were focused on providing additional data on specific stream segments for consideration in the classification of that segment. All the segment-specific data provided were evaluated and factored into the proposed classification for that segment where appropriate. Specific responses on individual segments are provided in Appendix VI. More general comments are discussed below. These comments are paraphrased for brevity; however, every effort has been made to preserve the original intent of the comment. Comments focused on similar issues and common themes are grouped together. The comment letter numbers from Appendix III are listed in parentheses at the end of each comment to identify the commenter.

PRINCIPAL REASONS IN SUPPORT

Comment letter 2 commended the Department for the work done to establish the draft classifications and the “tremendous effort on the part of DEEP” to incorporate and manage the extensive data for the process. Letters 4 and 5 were generally supportive of the proposed classifications, and Letter 6 found the preliminary classification to be accurate with respect to most of their interests.

PRINCIPAL CONCERNS OR CONSIDERATIONS RAISED IN OPPOSITION

As mentioned above, commenters provided new or revised data for consideration on numerous specific stream segments, which are detailed in Appendix VI (Letters #1 – 7). The additional data were incorporated into the classifications where appropriate, resulting in changes to the classifications where noted in the Appendix. The more general concerns are discussed below.

1. Comment: Several letters noted registered diversions for public water supply which are not significant dams, but are structures (including weirs) that divert part or all of the flow of small watercourses to another watercourse or water supply reservoir. These were not captured by

DEEP's classification process. (Letters 1, 3, 4, 6, and 7).

Response: Because of the significant degree of alteration and use for public water supply, the stream segment(s) downstream of these structures were modified to Class 3. Individual segments so modified are listed in Appendix VI.

2. Comment: Concern was expressed that small public water supply wells are not accounted for as diversions in the classification methodology, resulting in improper classification of those segments (Letter #6).

Response: These are wells that are below the threshold for obtaining a diversion permit (pumping less than 50,000 gallons per day). The premise for not requiring a diversion permit for such wells is that the pumping rate is low enough that it has minimal impact on the stream and other environmental resources in the vicinity. Since such pumping is presumed not to affect stream flow, there is no need to add these in as a consideration for stream flow. However, where there is a high concentration of such wells, or where the estimated source area for an individual well intersects the stream, it was added into the classification considerations. Please see the responses on specific segments in Appendix VI.

3. Comment: It was noted that the Department used only the presence or absence of wild trout populations in factor (8) of the classification methodology ("Available data related to the distribution and abundance of plant and animal species, such as wild trout, which are dependent upon stream and riparian habitat") and we might want to consider other free-flowing obligate species. (Letter #5)

Response: We agree that the regulations allow consideration of other species, but we don't have state-wide data available for other species. Where segment-specific information is provided during the comment period, the Department has and will continue to take it into consideration. Please see the responses on specific segments in Appendix VI.

4. Comment: It was noted that a number of stream segments tributary to the main-stem Housatonic are under consideration for a federal Wild & Scenic designation and recommended that it be factored into their classification (Letter #5).

Response: Although that factor has not been added to the identified segments at this time, once the Wild & Scenic Designation is approved, the Department can consider the new information under RSCA Sec. 26-141b-5a(12) through a petition to change classification under RSCA Sec. 26-141b-5(d).

FINALIZATION OF CLASSIFICATIONS

This Statement of Reasons document was submitted in draft form to the Commissioners of Public Health, Agriculture and Economic & Community Development and to the Secretary of the Office of Policy & Management for review and comment. None of the Agencies requested edits nor provided additional data for consideration in the classification process. No changes were therefore made to the draft, and the report was finalized. The final stream flow classification maps will be made available on the Department web site at www.ct.gov/deep/streamflow. With the finalization of stream flow classifications for the Housatonic, Hudson and Southwest Coastal River Basins, classifications for all streams across the state are now complete.

CONCLUSIONS

The Commissioner, after consultation with the Commissioner of Public Health and consideration of the factors listed in RCSA Sec. 26-141b-5, prepared a map of proposed classification indicative of the degree of human alteration of natural stream flow for the Housatonic, Hudson and Southwest Coastal River Basins. The proposed classifications were public noticed as required and an interactive map of the proposed classifications was made available online. Submitted public comments were subsequently considered, and a number of classifications were modified as a result of the information provided. The final mapping will be made available through the Department web site at www.ct.gov/deep/streamflow and notification of the availability of the adopted classifications will be published in the Connecticut Law Journal. Regulated dam owners will be required to begin making releases in accordance with RCSA Sec. 26-141b-6 ten years after notice of the final classifications is published in the Connecticut Law Journal.

3/13/19

Date



Katherine S. Dykes
Commissioner

APPENDIX I

PUBLIC NOTICE OF PROPOSED STREAM FLOW CLASSIFICATIONS HOUSATONIC, HUDSON & SOUTHWEST COASTAL RIVER BASINS

In accordance with the Connecticut Regulations of Connecticut State Agencies Section 26-141b-5, the Commissioner of the Connecticut Department of Energy and Environmental Protection hereby gives notice that the Department, through consideration of the factors required by the regulations, has prepared maps of proposed Stream Flow Classifications for the Housatonic, Hudson and Southwest Coastal River Basins.

The maps are available on-line at www.ct.gov/deep/streamflow. Such maps include river and stream segments in the following towns: Ansonia, Beacon Falls, Bethany, Bethel, Bethlehem, Bridgeport, Bridgewater, Brookfield, Canaan, Cornwall, Danbury, Darien, Derby, Easton, Fairfield, Goshen, Greenwich, Harwinton, Kent, Litchfield, Middlebury, Milford, Monroe, Morris, Naugatuck, New Canaan, New Fairfield, New Milford, Newtown, Norfolk, North Canaan, Norwalk, Orange, Oxford, Plymouth, Prospect, Redding, Ridgefield, Roxbury, Salisbury, Seymour, Sharon, Shelton, Sherman, Southbury, Stamford, Stratford, Thomaston, Torrington, Trumbull, Warren, Washington, Waterbury, Watertown, Weston, Westport, Wilton, Winchester, Wolcott and Woodbury.

Public information sessions will be held, as follows:

Western Connecticut Council of Governments
1 Riverside Road
Sandy Hook, CT
Tuesday, July 24, 2018

2 sessions: 2:00 – 4:00 pm and 6:00 – 8:00 pm

A short presentation on how the Stream Flow Classification maps were developed will be given and Department staff will be on hand to answer questions at these information sessions.

The proposed Stream Flow Classification of a stream or river segment is based on ecological conditions and human use characteristics, and determines flow management goals and applicable flow standards for that segment. Proposed Stream Flow Classifications were developed using known information on factors indicative of the degree of human alteration of natural stream flow, environmental flow needs and existing and future needs for public water supply.

The public may submit additional information or comments for the Commissioner's consideration on the proposed classification of a specific river or stream system pertaining to, but not limited to: (i) the factors for consideration in the regulations; (ii) the impact of the proposed classification on any prior investment made to develop a permitted or registered diversion and the alternatives, if any, to the diversion including cost factors and feasibility of such alternatives; (iii) the relationship of an existing or proposed diversion to economic development or jobs; and (iv) the practicality of, and potential for, achieving ecological benefit from restoring streamflow to the specific river or stream system. Written comments may be submitted by email to

deep.streamflowclass@ct.gov, or may be mailed to Corinne Fitting, Department of Energy & Environmental Protection, Bureau of Water Protection and Land Reuse, 79 Elm Street, Hartford, Connecticut, 06106-5127. The Department is accepting additional information or written comments on the proposed Stream Flow Classifications until *Friday, September 21, 2018*.

Additional information on the Stream Flow Standards and Classifications is available on the Department's website at: www.ct.gov/deep/streamflow . Anyone requiring more information may contact the Department by email at deep.streamflowclass@ct.gov or by phone at 860-424-3020.

The Connecticut Department of Energy and Environmental Protection is an Affirmative Action and Equal Opportunity Employer that is committed to complying with the Americans with Disabilities Act. To request an accommodation contact us at 860-418-5910 or email deep.accommodations@ct.gov.

(Robert E. Kaliszewski)

Robert E. Kaliszewski
Deputy Commissioner
Environmental Quality Branch

(June 12, 2018)

Date

APPENDIX II

**Mailing List for Public Notice of Proposed Stream Flow Classifications
Connecticut River Basin
Mailed or Emailed June 20, 2018**

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JOE WOLINSKI		KENT SCHOOL CORP	PO BOX 2006	MACEDONIA RD	KENT CT 06757	
ART MORIN		SHOREHAVEN GOLF CLUB INC	14 CANFIELD AVE	NORWALK CT 06855		
ALBERT N HENRICKSEN		UNITED ILLUMINATING CO	80 TEMPLE ST	New Haven CT 06511		
WILLIAM E. BASSETT		W. E. BASSETT COMPANY	259 ROOSEVELT DR	DERBY CT 06418		
Matthew Knickerbocker		Bethel Water Department	CJH Municipal Center	1 School Street	Bethel CT 06801	
David Radka		Connecticut Water Company	93 West Main Street	Clinton CT 06413		
David Day		Danbury Water Dept	155 Deer Hill Ave	Danbury CT 06810		
Frederick Hurley, Jr		Fairfield Hills Water	4 Turkey Hill Rd	NEWTOWN CT 06470		
Raymond Adamaitis		Heritage Village Water Co	450 Heritage Rd	Southbury CT 06488		

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Stephen Szalewicz		Sharon Water & Sewer Commission	PO Box 385	Sharon CT 06069		
John Hudak		SCCRWA	90 Sargent Dr	New Haven CT 06511		
Susan Suhanovsky		Torrington Water Co	277 Norfolk Rd	PO Box 867	TORRINGTON CT 06790	
Christopher Bogucki		Waterbury Water Department	21 East Aurora St	Waterbury CT 06708		
Michael Tanuis	Superintendent	Watertown Fire District	24 Deforest St	Watertown CT 06795		
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APPENDIX III

List of Individuals Who Submitted Comment Letters

Letter ¹	Submitted by
1	Brian Carey, Conservation Director, Town of Fairfield, 725 Old Post Road, Fairfield, CT 06824
2	Len DeJong, Executive Director, Pomperaug River Watershed Coalition, 39 Sherman Hill Rd, Suite C-103, Woodbury, CT 06798
3	John Hudak, Environmental Planning Manager, South Central Connecticut Regional Water Authority, 90 Sargent Dr., New Haven, CT 06511-4020
4	Thomas J. Steinke, 1673 Melville Ave, Fairfield, CT 06825
5	Michael S. Jastremski, Watershed Conservation Director, Housatonic Valley Association, 150 Kent Rd, P.O. Box 28, Cornwall Bridge, CT 06754
6	Daniel R. Lawrence, P.E., Director, Engineering & Planning, Aquarion Water Company, 600 Lindley St, Bridgeport, CT 06606-5044
7	David L. Radka, Director of Water Resources and Planning, Connecticut Water Company, 93 West Main Street, Clinton, CT 06413-1600

¹ The full text of the letters can be found at www.ct.gov/deep/streamflow.
Stream Flow Classification Statement of Reasons – Final
Housatonic, Hudson and Southwest Coastal River Basins

APPENDIX IV

List of Factors for Consideration in Classification Excerpt from the Stream Flow Standards and Regulations

RCSA Sec. 26-141b-5. Adoption of river or stream system classifications.

(a) The commissioner, after consultation with the Commissioner of Public Health, shall prepare a map of proposed classifications indicative of the degree of human alteration of natural stream flow after consideration of the following factors:

(1) A river or stream segment that is immediately downstream of an existing dam that impounds a public water supply source registered or permitted in accordance with section 22a-365 to 22a-378a of the Connecticut General Statutes, or that intersects a Level A aquifer protection area as approved by the Commissioner pursuant to section 22a-354d of the Connecticut General Statutes shall not be classified as Class 1 or 2;

(2) A river or stream segment that is immediately downstream of an existing dam that impounds a water supply source registered or permitted in accordance with section 22a-365 to 22a-378a of the Connecticut General Statutes, other than a public water supply, shall not be classified as Class 1 or 2;

(3) Size and location of permitted and registered diversions within the watershed, to the extent that these diversions, if operated to the maximum extent allowed in accordance with the provisions of the permit or registration, may affect the physical characteristics of flow, volume or velocity of water in the stream channel or may alter the daily, seasonal or inter-annual flow characteristics of the river or stream system;

(4) Size and location of dams, reservoirs and other impoundments within the watershed, to the extent that these dams, reservoirs and other impoundments may affect the physical characteristics of flow, volume or velocity of water in the stream channel or may alter the daily, seasonal or inter-annual flow characteristics of the river or stream system;

(5) Size and location of return flows of water within the watershed, to the extent that these return flows may affect the physical characteristics of flow, volume or velocity of water in the stream channel or may alter the daily, seasonal or inter-annual flow characteristics of the river or stream system;

(6) Existing land cover in the upstream watershed, to the extent that human development and associated impervious land cover may affect the physical characteristics of flow, volume or velocity of water in the stream channel or may alter the daily, seasonal or inter-annual flow characteristics of the river or stream system;

(7) Planned land use in the upstream watershed, as contained in an applicable local or state plan, including the state plan of conservation and development, to the extent that future human development and associated impervious land cover may affect the physical characteristics of flow, volume or velocity of water in the stream channel or may alter the daily, seasonal or inter-

annual flow characteristics of the river or stream system;

(8) Available data related to the distribution and abundance of plant and animal species, such as wild trout, which are dependent upon stream and riparian habitat;

(9) Available data related to the presence of anadromous fish runs or where anadromous fish are actively being restored or are targeted for restoration;

(10) Existence of trout management areas and other recreational resources;

(11) The location of stream gages operated and maintained by the U.S. Geological Survey that have been identified by the commissioner in consultation with the U.S. Geological Survey as hydrologic index reference gages;

(12) Wild or scenic water designation by the state or federal government, or waters predominately within state forests, wildlife management areas, natural heritage areas or other large contiguous areas protected for conservation purposes, including protection for public water supply purposes;

(13) River or stream systems or segments that are identified as a potential source of water supply in an approved coordinated water system plan prepared in accordance with section 25-33h of the Connecticut General Statutes or a water supply plan in effect as of the date of such mapping, to the extent that these potential water supply sources, if developed, may affect the physical characteristics of flow, volume or velocity of water in the stream channel or may alter the daily, seasonal or inter-annual flow characteristics of the river or stream system;

(14) River or stream systems or segments that are identified as a potential source of water supply in an approved coordinated water system plan prepared in accordance with section 25-33h of the Connecticut General Statutes or a water supply plan in effect as of the date of such mapping and where there has been a significant investment toward development of such potential source, including but not limited to capital expenditures, scientific or engineering studies or land acquisition cost, shall not be classified as Class 1 or 2;

(15) River or stream systems or segments that are identified by the Commissioner of Public Health pursuant to Section 59 of Public Act 11-242;

(16) Practicality of, and potential for, restoring stream flow patterns to achieve consistency with the Stream Flow Standards and Regulations due to the extent of prior channel modification or the impact of development and impervious cover in the watershed as of the date of such mapping;

(17) Publicly available data regarding the impact of stream classification on a community water supply's margin of safety; and

(18) Any other factor indicative of the degree of human alteration of natural stream flow.

APPENDIX V

METHODOLOGY FOR DEFINING PRELIMINARY STREAM FLOW CLASSIFICATIONS PURSUANT TO SECTIONS 26-141B-1 TO 26-141B-8 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES

Revised: 2 May 2016

INTRODUCTION

The State of Connecticut Stream Flow Standards and Regulations (*Sections 26-141b-1 to 26-141b-8 of the Regulations of Connecticut State Agencies*) require that the Department of Energy and Environmental Protection (CT DEEP) in consultation with the Department of Public Health (DPH) prepare a State-wide map of proposed classifications indicative of the degree of human alteration of natural stream flow. The regulations define four stream flow class standards (See Table 1). The regulations include consideration of 18 factors when adopting river or stream system classifications (*Sections 26-141b-5 Adoption of river or stream system classifications*).

The process described below represents the data and methodology used to evaluate those 18 factors to assign stream segments a proposed stream flow class for public comment. The numbers in parentheses below reflect the stream flow classification factor listed under Sec. 26-141b-5(a). Sec. 26-141b-2 defines a stream segment as a discrete, contiguous reach of river or stream channel for which a uniform classification has been adopted. For the purposes of proposing classifications, stream segments were derived from the National Hydrography Dataset (NHD) developed at a 1:24,000 scale (1 inch = 2000ft) by USGS for the State of Connecticut using Wrap Hydro tools (<http://www.crrw.utexas.edu/gis/gishydro03/WRAPhydro/WRAPhydro.htm>), an extension for ArcGIS. There are approximately 36,000 stream segments in the State. The average length of the stream segments is approximately 0.3 miles long.

Stream flow Class	Stream Condition	Narrative Standard
1	Free Flowing Stream	Maintain stream flow and water levels to support and maintain habitat conditions supportive of an aquatic, biological community characteristic typically of free-flowing stream systems
2	Minimally Altered	Maintain stream flow and water levels to support and maintain habitat conditions supportive of an aquatic, biological community characteristic minimally altered from that of typically of free-flowing stream systems
3	Moderately Altered	Maintain stream flow and water levels to support and maintain habitat conditions supportive of an aquatic, biological community characteristic moderately altered from that of typically of free-flowing stream systems
4	Altered	Exhibit substantially altered stream flow conditions caused by human activities to provide for societal needs

Table 1: Narrative Standard for Each Stream flow Class

This process will provide all stream segments throughout the state with a class of 1, 2, or 3 designation. CTDEEP is not initially proposing any Class 4 designations; as such designation requires specific information on societal needs, economic costs and environmental impacts that will be considered on a case by case basis.

The process described below entails three steps. The first is to target streams identified in the regulations that shall not be classified as Class 1 or 2. These streams are classified as a Class 3 in this process. Steps 2 and 3 are then used to assign proposed classifications to the remaining streams. The second step involves assigning the remaining streams a classification value based on an index that characterizes current stream flow conditions. The third involves modifying (increasing or decreasing) a stream flow classification based on the additional factors for consideration which describe unique ecological attributes or goals for a particular stream segment.

STEP 1: CLASS 3 FACTORS

Description: *Any streams meeting the criteria for the factors described below are assigned a Class 3 designation.*

(1) A river or stream immediately downstream of an existing dam that impounds a public water supply source or intersects a Level A aquifer protection area.

A public water supply source is a water body listed as reservoir in the State of Connecticut DPH database. Immediately downstream of a dam is defined as the stream segments below the reservoir where the annual Q99 flow is less than two times the annual Q99 flow going into the reservoir. The annual Q99 flow is a very low flow where the naturally occurring daily stream flow that is predicted to equal or exceeded on 99 percent of the days in a year. The annual Q99 stream flow is estimated using methods developed by the United States Geological Survey (USGS) (Ahern 2010).

Level A Aquifer Protection Areas for a public water supply well are delineated in accordance with Connecticut General Statutes (CGS) Section 22a-354c or 22a-354z. If the Level A area intersects a portion of a stream segment, the full segment is designation Class 3.

(2) A river or stream immediately downstream of an existing dam.

Dams are defined as consumptive diversions identified as an impoundment in the CT DEEP diversion spatial dataset. Immediately downstream of an existing dam is defined in the same way as in factor (1), see above.

(14) River or stream identified as potential source of water supply with significant investment.

Water supply Plans prepared in accordance with CGS Section 25-32d and 25-33h, as well as the DPH "High Quality Source" list compiled under CGS 25-33q, were reviewed in detail for

potential future sources of public water supply. In order to consider a potential source, a specific location had to be available to associate the potential source with a specific stream segment. Locations for the proposed sources were identified in the referenced planning documents and mapped in ArcGIS for consideration in the classification system. Information on significant investment was also solicited from the DPH and the water companies within the basin of consideration because the Water Supply Plans do not typically contain documentation of investment in the future sources.

To determine which of the proposed sources had a “significant investment”, CT DEEP used any available information on diversion permitting status, capital expenditures, scientific or engineering studies and land acquisition by the water system. In addition to the sources identified by such information, the timeframe within which the proposed source was needed was considered, and even if there was no information on permitting status, etc., it was assumed that sources proposed within the five-year planning period likely had “significant investment”, as use was imminent. Proposed sources with “significant investment” were then given a Class 3 designation under section 26-141b-5(a)(14). The only exception to this were proposed sources that were small (< 0.05 mgd) bedrock wells. These are below the threshold for a diversion permit and are considered unlikely to have a significant impact on stream flow. The proposed sources for which the planning period is further out than five years or for which no information on investment status was available are given consideration in the classification system under the “Other Factors” discussed below in Step 3 of the process.

STEP 2: HYDROLOGIC STRESSOR INDEX (HSI) FACTORS

Description: *For all remaining unassigned stream segments (i.e. those not assigned to stream flow class 3 in step 1), a class is assigned based on an index that combines the four factors below. Each factor is given a metric value of 1, 2 or 3. Metric values are assigned based on the potential degree of alteration to natural stream flow conditions. A ‘1’ indicates little or no stress to natural stream flow conditions, a ‘2’ indicates minimally altered stream flow conditions and a ‘3’ indicate high stress and alteration from natural stream flow conditions. The values for each of the four metrics are added together to obtain a Hydrologic Stressor Index (HSI) value. The HSI values ranges from 4 to 12. Analogous to the metrics, lower HSI values indicate that in-stream and surrounding drainage area conditions do not stress or alter natural stream flow, whereas higher index values indicate that conditions significantly stress and alter stream flow. HSI values are partitioned into three groups corresponding to a preliminary stream class. An HSI value of 4 - 5 represents Class 1 or ‘natural conditions’, values of 6 - 8 represent Class 2 or ‘near natural conditions’, and values of 9 - 12 represent Class 3 of ‘altered conditions.’ A description of how each metric was defined and calculated is provided below.*

(3) Size and location of permitted and registered diversions within the watershed.

Registered diversions listed in CT DEEP diversion spatial data layer as ‘consumptive’ and permitted diversion listed as ‘consumptive’ and ‘active’ were included in the analysis. Calculated the maximum withdrawal amount and divided by the annual Q99 to calculate the percent of Q99 flows withdrawn.

Metric Value	Maximum Withdrawal / Q99	
1	0	(4) Size and location of dams, reservoirs and other impoundments within the watershed.
2	0 – 100%	
3	>100%	

Large dams using a combined spatial dataset that included information from CT DEEP database and National Inventory of Dams. Large dams were defined as those that were greater or equal to 15 ft in height or having a storage capacity greater than or equal to 15 acre-feet. The number of large dams was divided by the total number of upstream stream miles.

Metric Value	# of Dams / Stream Mile
1	0
2	> 0 – 0.1
3	> 0.1

(5) Size and location of return flows of water within the watershed.

Only municipal NPDES discharges were included in the analysis. Calculated the design flow of the sewage treatment plant divided by annual Q99 to calculate the percent return flow greater than Q99 flows.

Metric Value	Return Flow / Annual Q99
1	0
2	0 – 75%
3	>75%

(6) Existing development and impervious cover in the upstream watershed.

2006 Impervious Cover dataset from the National Land Cover Dataset. Calculated the percent impervious cover in the upstream watershed.

Metric Value	Percent IC
1	0 – 2%
2	2 – 5%
3	> 5 %

STEP 3: ADDITIONAL FACTORS

Description: *Applies to streams that were not classified as a Class 3 in step 1. Includes additional factors in the regulation that can modify (increase the stream flow class (i.e. 1 to 2) or decrease the stream flow class (i.e. 2 to 1)) the classification value calculated using the HSI. The other factors primarily represent a present or future goal for a stream segment or a unique ecological attribute. Each factor is defined as an increaser or decreaser. The total number of increasers and decreasers were added for each stream segment. If there were more increasers than decreasers present in a stream segment than the stream class was increased up by one class (i.e. 2 to 3). If there were more decreasers present in a stream segment than the stream class was decreased by one class (i.e. 2 to 1). Note that the regulations did not provide for any weighting of the factors, so all were given equal weight.*

(7) Planned land use in the upstream watershed for future development. (↑ Increaser)

Stream segment that intersects a growth area defined in the Connecticut Plan of Conservation and Development.

(8) Available data on species that are dependent upon stream and riparian habitat. (↓ Decreaser)

These were defined as stream segments that where high densities of wild brook trout (> 73 wild brook trout/ hectare) have been sampled.

(9) Available data related to the presence or restoration of anadromous fish runs. (↓ Decreaser)

Stream segments that have been identified by CT DEEP where anadromous fish runs occur or are being actively restored or targeted for restoration.

(10) Existence of trout management areas. (↓ Decreaser)

Stream segments that have been identified by CT DEEP as trout management areas.

(11) The location of stream gages operated by USGS that have been identified as an index station. (↓ Decreaser)

Stream segments within the watershed upstream of USGS gages identified as an index station in Ahern 2007.

(12) Areas designated as protected for conservation purposes. (↓ Decreaser)

Stream segments that intersect with the most recent CT DEEP protected open space mapping (POSM) spatial dataset or State conservation area identified in the CT DEEP property spatial dataset.

(13) River or stream segments identified as a potential source of water supply; and **(15)** River or stream segments identified by the DPH pursuant to Section 59 of Public Act 11-242. (↑ Increaser)

Stream segments containing a potential source identified in a Water Supply Plan or on the “High Quality Source” list by the CT DPH in accordance with CGS 25-33q, and planned for development beyond the five-year planning period. (Sources proposed for development within the five-year planning period were considered a Class 3 under Step 1 above).

(16) Practicality and / or potential for restoring stream flow patterns to achieve consistency with the Stream Flow Standards and Regulations due to the extent of prior channel modification or the impact of development and impervious cover in the watershed as of the date of such mapping. (↓ Decreaser or ↑ Increaser)

Factor number 16 will be evaluated by the Department when adopting classifications on a case by case basis.

(17) Publically available data regarding the impact of stream classification on a community’s water supply’s margin of safety. (↑ Increaser)

Factor number 17 will be evaluated by the Department when adopting classifications on a case by case basis. However, numerous off-ramps to reduce releases when margin of safety is impacted were provided in the regulations to assist water companies, so this has little impact on the stream flow classifications.

(18) Any other factor indicative of the degree of human alteration of natural stream flow. (↓ Decreaser or ↑ Increaser)

Factor number 18 will be evaluated by the Department when adopting classifications on a case by case basis.

LITERATURE CITED

Ahearn, E.A., 2007, Flow durations, low-flow frequencies, and monthly median flows for selected streams in Connecticut through 2005: U.S. Geological Survey Scientific Investigations Report 2007–5270, 33 p.

**APPENDIX VI
TABLE OF SEGMENT-SPECIFIC COMMENTS OR DATA AND RESPONSE**

Segment	Stream	Town	Comment	Response	#
102002094	East Branch Cricker Brook	Easton	Aquarion Water Company currently operates a registered water diversion in this area that separates the Morehouse Brook (Class 1) and the East Branch of Cricker Brook (Class 1). The Morehouse Brook is diverted out of its channel into the East Branch of the Cricker Brook and into the Hemlock Reservoir. There is a section of stream in between those two segments that is not labeled or classified. The map should be amended to show this area as Class 3 stream segment.	Diversion is from Morehouse Brook (see below). No change to East Branch Cricker Brook.	1
103004415; 10311685	Unnamed	Bethlehem	We question the impervious cover metric value because the upstream watershed is mostly agriculture and residential.	There is a housing development in the upper watershed driving the IC metric.	2
103011801	Unnamed	Bethlehem	We question the impervious cover metric value because the upstream watershed is mostly agriculture, residential, and undeveloped land.	There is a housing development in the upper watershed driving the IC metric.	2
103013934	South Brook	Woodbury	The public water supply dam has been declassified.	Removed public water supply dam. Segment intersects aquifer protection area. No classification change.	2
103013963	South Brook	Woodbury	The public water supply dam has been declassified.	Removed public water supply dam, resulting in change to Class 2.	2
103014723; 103015005; 103015050	Transylvania Brook	Southbury	The Training School waste water treatment plant no longer exists.	Eliminated return flow, resulting in change to Class 2.	2
103014760; 103014784	Bullet Hill Brook	Southbury	Do not appear to be dams in this vicinity.	Changed Dam Metric to 1. No change in class. HSI value 2 due to high IC.	2
103014937; 103015056; 103015120	Pomperaug River	Southbury	Do not appear to be dams in this vicinity.	Dams other than IBM dam in the upstream watershed. No change to metric.	2
103014954	South Branch of Bullet Hill Brook	Southbury	Do not appear to be dams in this vicinity.	Changed Dam Metric to 1. No change in class. HSI value 2 due to high IC.	2

Segment	Stream	Town	Comment	Response	#
103015123	Pomperaug River	Southbury	We question the impervious cover, return flow, and dam metric values. Regarding the impervious cover metric, the upstream watershed is mostly an Audubon center. With regard to the return flow metric, the Training School waste water treatment plant no longer exists. Therefore, this metric value should be a 1. Regarding the dam metric, we question (1) whether the southern IBM dam meets the requirements of a "large" dam and (2) the existence of the northern IBM dam. We do not see a dam when we drive by this location and in aerial maps, the structure appears to be DOT stream engineering related to roadways	This segment is on the main stem of the Pomperaug. Heritage Village sewage treatment plant is upstream placing return flow as a '2' metric. IC is just above threshold (2.5%) placing it as a '2' metric. Dams other than the IBM dam are in the upstream watershed placing the dam metrics as '2'. No change to metrics.	2
103015152; 103015173; 103015251; 103015254	Pomperaug River	Southbury	We question (1) whether the southern IBM dam meets the requirements of a "large" dam; (2) the existence of the northern IBM dam because we do not see a dam when we drive by this location and in aerial maps, the structure appears to be DOT stream engineering related to roadways; and, (3) consequently, the dam metric value.	Dams other than the IBM dam in the upstream watershed. No change to metric.	2
103015182; 103015217; 103015232	Unnamed	Southbury	We question whether the IBM dam upstream from this segment meets the requirements of a "large" dam an, consequently, the dam metric value.	Changed Dam Metric to 1. No change in class. HSI value 2 due to high IC.	2
103015272; 103015293; 103015799	Pomperaug River	Southbury	We question the impervious cover, return flow, and dam metric values. Regarding the impervious cover metric, the upstream watershed is mostly an Audubon center. With regard to the return flow metric, the Training School waste water treatment plant no longer exists. Therefore, this metric value should be a 1. Regarding the dam metric, we question (1) whether the southern IBM dam meets the requirements of a "large" dam and (2) the existence of the northern IBM dam. We do not see a dam when we drive by this location and in aerial maps, the structure appears to be DOT stream engineering related to roadways	Segments on main stem of Pomperaug River. Heritage Village sewage treatment plant is upstream placing return flow as a '2' metric. IC is just above threshold (2.5%) placing it as a '2' metric. Dams other than the IBM dam are in the upstream watershed placing the dam metrics as '2'. No change to metrics.	2
103016318	Hopp Brook	Bethany	Segment downstream of Hopp Brook Diversion to Peat Swamp Reservoir. Recommended Classification: Automatic 3 or 4	Public water supply diversion to reservoir, changed classification to Class 3.	3
103017053	Unnamed	Seymour	Segment downstream of Wildcat Mountain Diversion to Peat Swamp Reservoir. Recommended Classification: Automatic 3 or 4	Public water supply diversion to reservoir, already a 3, no change in classification.	3
103017260	Black Brook	Woodbridge	Portion of segment downstream of Black Brook Diversion to Peat Swamp Reservoir. Recommended Classification: Automatic 3 or 4	Public water supply diversion to reservoir, changed classification to Class 3.	3

Segment	Stream	Town	Comment	Response	#
103017423	Beaver Brook	Seymour	57 foot segment between two proposed Automatic 3 segments; merge for consistency. Recommended Classification: Automatic 3 or 4	Mistakenly misclassified. Downstream of public water supply reservoir, changed to Class 3.	3
103017572	Unnamed	Seymour	Portions of segment downstream of Burzinski #3 and Turning Dam diversions to Peat Swamp Reservoir. Recommended Classification: Automatic 3 or 4	Public water supply diversion to reservoir, changed classification to Class 3.	3
103017595	Unnamed	Seymour	Portions of segment downstream of Burzinski #1 West and Burzinski #2 diversions to Peat Swamp Reservoir. Recommended Classification: Automatic 3 or 4	Public water supply diversion to reservoir, changed classification to Class 3.	3
103017729	Unnamed	Seymour	Portion downstream of Burzinski #1 East diversion to Peat Swamp Reservoir. Recommended Classification: Automatic 3 or 4	Public water supply diversion to reservoir, changed classification to Class 3.	3
102001995; 102002063	Morehouse Brook	Fairfield	Segment downstream of Aquarion's Morehouse Brook diversion; Dedicated Fairfield conservation wetland open space properties are immediately downstream	Public water supply diversion to reservoir, changed classification to Class 3.	4
103016244	Pootatuck River	Newtown	Housatonic Valley Association working on a project to restore eroding streambanks along this river for Wood Turtles.	Update Factor (8) - species dependent upon stream and riparian habitat, resulting in change to Class 1.	5
103006154; 103006190; 103008554; 103008378; 103009441; 103009443; 103009662; 103001157; 103001171; 103001117; 103001131; 103001138; 103001179; 103001181; 103001201; 103001203; 103003810; 103003829; 103003856; 103003919; 103003977; 103003981; 103004020; 103004227; 103003775; 103003457; 103004070; 103005779; 103001039; 103001209; 103003442; 103004174; 103003430; 103003795; 103003773; 103003889; 103003908; 103004043; 103004044; 103004127; 103005827; 103006792; 103007182; 103008102; 103007135	Tribs to Housatonic River		Segments about eased or protected properties as detailed in the Litchfield Hills Greenprint Collaborative database.	Added consideration into factor (7) - conservation land. This, combined with the additional factor for restoration of stream flow patterns, factor (16) for some segments below, resulted in 12 segments moving from Class 3 to Class 2 and 139 segments moving from Class 2 to Class 1. This did not affect segments designated for public water supply.	5

Segment	Stream	Town	Comment	Response	#
103004077; 103004227; 103001117; 103003939; 103001056; 103003919	Salmon Kill		HVA and partners conducting active restoration for Eastern Brook Trout over past four years.	Added consideration for restoration of stream flow patterns, factor (16) in. This, combined in some cases with the additional factor (7)-conservation land above, resulted in 12 segments moving from Class 3 to Class 2 and 139 segments moving from Class 2 to Class 1. This did not affect segments designated for public water supply.	5
103004947; 103005029; 103005030; 103004959; 103005036; 103005779; 103005753; 103005916; 103004149; 103005149; 103004681; 103004691; 103004695; 103004969; 103005034; 103005084; 103005107; 103005137; 103005139; 103005174; 103005557; 103005827; 103005889; 103006013; 103006076; 103006192; 103006220; 103006245 103006252; 103006308	Ten Mile River		HVA and partners are conducting watershed-scale planning to identify and implement restoration projects in this watershed, where healthy populations of Eastern Brook Trout and other free-flowing obligate species can be protected and restored. Given the significant amount of resources committed to their protection and restoration, we ask that the Department consider awarding decrease to these segments.	Added consideration for restoration of stream flow patterns, factor (16) in. This, combined in some cases with additional factor (7)-conservation land above, resulted in 12 segments moving from Class 3 to Class 2 and 139 segments moving from Class 2 to Class 1. This did not affect segments designated for public water supply.	5

Segment	Stream	Town	Comment	Response	#
103009806; 103009920; 103009734; 103009676; 103009683; 103009688; 103009701; 103009834; 103009835; 103010064; 103005911; 103004478; 103005331; 103005336; 103005515; 103005821; 103005851; 103005947; 103005956; 103006033; 103006041; 103006047; 103006053; 103006061; 103006082; 103006085; 103006127; 103006612; 103009208; 103009457; 103006151; 103006154; 103006156; 103006654; 103006190; 103006202; 103007768; 103008128; 103008136; 103008554; 103006654; 103006190; 103006202; 103007768; 103008128; 103008136; 103008554; 103006700; 103006892; 103006904; 103006910; 103006920; 103006951; 103006963; 103009186; 103009195; 103007030; 103007077; 103007182; 103008102; 103009200; 103009201; 103007135; 103008217; 103008913; 103007531; 103008151; 103008243; 103008349; 103008389; 103008696; 103008737; 103008753; 103010208; 103009723; 103009214; 103009223; 103009441; 103009443; 103009602; 103009649; 103009661; 103009662; 103009673; 103010063; 103010092; 103010037	Shepaug River		HVA and partners are conducting watershed-scale planning to identify and implement restoration projects in this watershed, where healthy populations of Eastern Brook Trout and other free-flowing obligate species can be protected and restored. Given the significant amount of resources committed to their protection and restoration, we ask that the Department consider awarding decreaser to these segments.	Added consideration for restoration of stream flow patterns, factor (16) in. This, combined in some cases with the additional factor (7)-conservation land above, resulted in 12 segments moving from Class 3 to Class 2 and 139 segments moving from Class 2 to Class 1. This did not affect segments designated for public water supply.	5
103001171; 103004070; 103001032; 103001091; 103001095; 103001100; 103001109; 103001131; 103001132; 103001138; 103001179; 103001181; 103001184; 103001185; 103001201; 103001203; 103003895; 103003898; 103003899; 103004043; 103004044; 103004127	Hollenbeck River		HVA and partners are conducting watershed-scale planning to identify and implement restoration projects in this watershed, where healthy populations of Eastern Brook Trout and other free-flowing obligate species can be protected and restored. Given the significant amount of resources committed to their protection and restoration, we ask that the Department consider awarding decreaser to these segments.	Added consideration for restoration of stream flow patterns, factor (16) in. This, combined in some cases with the additional factor (7)-conservation land above, resulted in 12 segments moving from Class 3 to Class 2 and 139 segments moving from Class 2 to Class 1. This did not affect segments designated for public water supply.	5
102000514	Converse Pond Brook	Greenwich	The Converse Brook Diversion diverts water from this segment through a 6-foot diameter aqueduct to Horseneck Brook upstream of Putnam Reservoir in Greenwich. Request that the final classification be Class 3.	Public water supply diversion, changed to Class 3	6

Segment	Stream	Town	Comment	Response	#
102000976	Unnamed	Stamford	The North Poorhouse Brook Diversion diverts water from North Poorhouse brook through a 24-inch pipeline and ultimately into the North Stamford Reservoir. Request that the final classification be Class 3.	Public water supply diversion, changed to Class 3	6
102002063	Morehouse Brook	Easton	Aquarion's Morehouse Brook Diversion consists of a one - two foot high structure that diverts flow from Morehouse Brook into a canal which carries the water to the East Branch of Cricker Brook and then into the Hemlocks Reservoir. Request that the final classification be Class 3.	Public water supply diversion, changed to Class 3	6
102002952	Bennetts Farm Brook	Ridgefield	Segment is approximately 900 feet north of Aquarion's Ridgefield Knolls Wellfield. Pump testing performed during the permit process indicated that the well withdrawals do not impact flow in Bennett's Farm Brook (Segment 102002952). However, the permitted capacity of the wellfield is 0.095 MGD, and StreamStats estimates the Q99 of the segment in the vicinity of the wellfield to be approximately 0.001 MGD. Request that the final classification be Class 3.	Since aquifer testing demonstrates this well field doesn't impact stream flow, then there is no reason to consider it in the stream flow classification. No change to classification.	6
103005982	Unnamed	Cornwall	Segment is adjacent to Aquarion's Coltsfoot Wellfield in Cornwall which consists of two overburden wells for public water supply. Request final classification be Class 3.	The estimated source area for this well field intersects the stream segment, so factor (15) was added in, resulting in classification change to Class 2.	6
103009189	Cobble Brook	Kent	Segment adjacent to Aquarion's Kent Well No. 3. Request final classification be Class 3.	The estimated source area for this well field intersects the stream segment, so factor (15) was added in, resulting in classification change to Class 3.	6
103013705	Still River	New Milford	Segment adjacent to Aquarion's Indian Ridge Wellfield. Request final classification be Class 3.	The estimated source area for this well field intersects the stream segment, so factor (15) was added in, resulting in classification change to Class 3.	6
103015766	Great Plain Brook	Danbury	Segment adjacent to Aquarion's Indian Springs Well. Request final classification be Class 3.	The estimated source area for this well field intersects the stream segment, so factor (15) was added in, resulting in classification change to Class 3.	6
103017739	Hurds Brook	Monroe	Aquarion's Boys Halfway Diversion diverts what was a portion of the Boys Halfway River into Means Brook, and ultimately to the Mean's Brook Reservoir. Request final classification be Class 3.	Added public water supply diversion, resulting in change to Class 3	6
103010183	Unnamed	Plymouth	The CWC no longer owns the Plymouth Reservoir, and it is no longer utilized for public water supply. This stream segment should not be classified as an automatic Class 3.	Removed public water supply reservoir, resulting in change to Class 2.	7

Segment	Stream	Town	Comment	Response	#
103014054	Shattuck Brook	Naugatuck	Existing registered diversion which is a direct stream withdrawal for public water supply. A lessor classification warranted.	Added public water supply diversion, resulting in change to Class 3	7
103015264	Beacon Hill Brook	Bethany	Existing registered diversion which is a direct stream withdrawal for public water supply. A lessor classification warranted.	Added public water supply diversion, resulting in change to Class 3	7

