Section 305(b) Assessment Methodology

Assessment Methodology refers to what monitoring tools are used and how resulting data and information are interpreted to determine the level of waterbody use support and to arrive at an overall assessment of water quality. In some cases a lack of use support is apparent (e.g., beaches closed to public bathing or acid rain lakes devoid of fish). However, in most cases, the support of waterbody uses is evaluated using established water quality criteria or surrogate indicators of water quality. The assessment methodology presented here outlines various water quality monitoring tools and considers other aspects of the resulting data and information, such as the type of data and information generated (numerical, observational/narrative or anecdotal), the source of the data/information, and the level of confidence in the data/information. The methodology also outlines specific criteria that relates water quality monitoring data and information to the degree of use support. Such criteria are critical to providing a balanced and consistent assessment of the quality of waters throughout New York State.

Types of Assessment Criteria

The methodology outlined here relies on a combination of three categories of assessment criteria:

- Use Restriction Orders,
- Numerical and Narrative Standards and Criteria, and
- Surrogate Water Quality Indicators

Use Restriction Orders are administrative restrictions or closures of waters to specific uses. These orders are issued by regulatory agencies charged with protecting particular aspects of public health and are based on data collected through monitoring activities directed by those agencies. While the restriction orders are based on monitoring data, the raw data itself is not usually re-interpreted by NYSDEC in making the use support decisions; rather the level of restricted use already in place drives the use support determination. Examples of use restriction orders include fish consumption advisories, closed shellfishing areas, seasonal or conditional shellfishing areas, public bathing beach closures, etc.

Numerical (and narrative) Water Quality Standards and Criteria represent parameter-specific thresholds for establishing limits regarding the discharge of substances to the waters of the state such that various water uses are protected. In New York State, such standards are adopted in the state Code of Rules and Regulations while criteria are established through development of formal DEC guidance. For many substances the standard or criterion exists as a numeric value; for other parameters, the standard/criterion is more descriptive (narrative) in nature (e.g., *no increase in turbidity that will cause a substantial visible contrast to natural conditions*). Although the use of standards and criteria (particularly numeric standards/criteria) would seem to be directly applicable to determining use support in ambient waters, an assessment methodology is necessary to address issues such as appropriate sampling methods, location, frequency or sample size, natural or background conditions, mixing zones, and so on.

Surrogate Water Quality Indicators are other measures of water quality conditions that are not established in standards or formal criteria. These are often used when an exact determination of use support is not possible. For example, it is difficult to say exactly when a waterbody moves from supporting to not supporting recreational activities. The use of water quality indicators, such as nutrient levels and Secchi disc measurements, bring added consistency to the evaluation. Biological assessments, sediment toxicity evaluations, Section 319 nonpoint source assessments, source water assessments, dilution calculations and

predictive models all reflect levels of water quality condition and use support without reliance on standards. Even where these indicators are more subjective, indicator-specific criteria help to maintain a degree of consistency and allow for the incorporation of additional information/data sets into water quality assessments.

Waterbody Inventory/Priority Waterbodies List

NYSDEC maintains information regarding waterbody use support, including impaired waters and lesser water quality impacts, through its *Waterbody Inventory/Priority Waterbodies List (WI/PWL)* database. The *Waterbody Inventory* refers to a listing of all waters, identified as specific individual waterbodies or Assessment Units, within the state. The Waterbody Inventory includes both assessed and unassessed waters. The *Priority Waterbodies List* is the subset of waters in the Waterbody Inventory that have documented water quality impairments, minor impacts and/or threats. The WI/PWL assessments provide the foundation for both the compilation of the biennial Section 305(b) Water Quality Report on all waters of the state, and for the development of the state Section 303(d) List, which is comprised of waters that do not meet water quality standards and do not support water uses and require development of a TMDL. More detail regarding the WI/PWL assessment effort can be found at http://www.dec.ny.gov/chemical/23846.html.

As well as providing the basis of the New York State Section 305(b)/303(d) integrated assessment, the water quality assessment information in the WI/PWL is also instrumental in directing other water quality efforts. The methodology outlined here goes beyond Section 305(b)/303(d) integrated reporting and reflects the use of the WI/PWL in supporting these additional needs.

As well as providing the basis of the New York State Section 305(b)/303(d) integrated assessment, the water quality assessment information in the WI/PWL is also instrumental in directing other water quality efforts. It is used to prioritize monitoring, permitting and compliance activities, to provide a comprehensive inventory of water quality conditions suitable for establishing funding priorities, to enlist participation of other agencies and local partners, and to track progress toward improving the state's water resources. The methodology outlined here goes beyond Section 305(b)/303(d) Integrated Reporting and reflects the use of the WI/PWL in supporting these additional needs. The methodology specific to developing the Section 303(d) List of Impaired/TMDL waters is discussed in more detail in the Section 303(d) *Listing Methodology* (Part III, Chapter 3).

To accommodate a thorough evaluation including public participation, the review and updating of the WI/PWL follows a continuing rotating basin schedule in which two or three of the 17 drainage areas in the state are scheduled for reassessment each year. These basin reassessments typically follow the same basin five year rotation schedule employed by the NYSDEC Rotating Integrated Basin Studies (RIBS) monitoring program (http://www.dec.ny.gov/chemical/30951.html). This continuous rotating basin schedule allows for comprehensive solicitation of available data and information, meaningful public participation and review, and more thoughtful dialogue and consideration of water quality assessments. In addition, it is easier to manage than a biennial review of all waters of the state.

To incorporate recent well-documented information, particularly for waters that have not undergone a WI/WPL update during the two-year Integrated Reporting cycle, **NYSDEC will establish September 30 of the year prior to the issuing of a Section 305(b)/303(d) Integrated Report as the cut-off date to receive data and information to be considered for inclusion in the Section 305(b)/303(d) assessment.** Establishing a September 30 "cut-off" date (6 months before the Integrated Report is due) allows both an opportunity for consideration of additional data as well as sufficient time for consideration and comment by all parties on any proposed revisions to existing water quality assessments, and time for a public review component comparable to the WI/PWL process.

Segmentation of Waterbodies

The delineation of waterbodies (Assessment Units) must strike a balance between being too specific (resulting in more segments than can be assessed with finite resources) and too general (resulting in segments that are too large and diverse and difficult to assess accurately). Determining specific boundaries for individual waterbody segments is based on a number of considerations. These factors, which correspond to those outlined in *EPA Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act* (July 21, 2003), include:

Waterbody Type Different waterbody types are not combined into single waterbody segments. That is, lakes (including reservoirs and ponds) are not combined with river reaches to form one segment. Similarly, estuary waters, ocean coastline and Great Lakes shoreline are distinct waterbody types that must be tracked as separate Assessment Units.

Stream Classification A change in the stream class (A, B, C) of a waterbody usually necessitates the division of the waterbody into separate segments, since the two different classes of waters will be assessed for the support of different waterbody uses. However, differences regarding trout support (T, TS waters) do not require designation of a separate segment. In the case of trout/trout spawning and non-trout portions of the same segment, the assessment reflects the support of the appropriate corresponding fish community. Similarly, Class AA, AA-Spcl or A-Spcl may be grouped with Class A waters in one segment, and Class I waters may be combined with Class SC waters which support similar uses. Note however that some small reaches of Class A or B waters might be combined with a Class C waterbody (and vice versa), if these small reaches are unlikely to be assessed separately.

Hydrologic Drainage Waterbodies that cross 8-digit Hydrologic Unit Code (HUC) and 11-digit watershed boundaries are usually broken into separate waterbody segments at the boundaries.

Waterbody Length/Size As a practical matter, waterbodies should not be too large or too small. There should also be some consistency with regard to segment size. Length/size of particular types of waterbody segments are outlined below.

Rivers and Streams - River and stream segments may be limited to main stem waters, or may include tributaries. Typically 5th order streams and above – which are significantly larger than their direct tributaries – are listed as main stem segments and tributary waters are listed as separate segments. Larger tributaries (or portions of tributaries) are considered as separate segments but in most cases include smaller tributary waters. Occasionally, smaller tributary waters to a larger main stem or lake are combined into one segment, where land use, hydrologic boundaries and other commonality indicate this is appropriate. Generally, river segments include between 10 and 25 miles of stream.

Lakes and Reservoirs - Lakes/reservoirs must be greater than 6.4 acres (0.01 square mile) to be included in the Waterbody Inventory. This is consistent with the threshold for inclusion in the New York State Lake Gazetteer. Lakes are generally listed as "entire lake." However, some very large lakes (e.g., Lake Champlain) may be segmented into separate portions. Conversely, some lake chains and/or smaller lakes in more remote watersheds may be joined together as a single segment, if land use and other commonality indicate this is appropriate.

Estuary Waters - Estuary segments are defined by physical features and stream classification with less consideration to consistency of size. Homogeneity of the waters within a segment is a key consideration.

Great Lakes/Ocean Coastline - Segments are delineated to reflect classification, hydrologic unit boundaries, and political boundaries, with an attempt to be consistent in regard to size.

Land Use and Character In addition, all waters within a single waterbody segment should drain areas of generally similar land use and character. If land use and other character changes, a separate segment is considered.

Waterbody segments are **not** defined solely upon the length/size of area impacted by a water quality problem. Estimates of the extent of water quality impacts are often inexact and may change regularly. Therefore, using this information to establish segment boundaries would make the Waterbody Inventory/Priority Waterbodies List considerably more difficult to manage and update, while providing little added benefit. Flexibility in segmenting waterbodies is allowed to provide sufficient protection and evaluation of waterbody uses.

Evaluation of Waterbody Use Support

The WI/PWL assessment of New York State water resources is based on the ability of waters to support a range of specific uses (see box). For the most part these uses align with the designated uses set forth in New York State regulations. However the WI/PWL uses capture more specific aspects within the broader designated uses. The particular uses that a specific waterbody is expected to support are dependent upon the classification of that waterbody. For example, only Class A, A-S, AA, AA-S designated waterbodies are assigned designated best uses of *Drinking Water Supply*. Similarly, *Shellfishing* use is limited to Class SA waters, and *Public Bathing (primary contact)* is limited to Class A, A-S, AA, AA-S, SA, B, SB. (See *New York State Water Quality Classifications*.)

WI/PWL Waterbody Uses

- Drinking Water Supply
- Shellfishing
- Public Bathing (Primary Contact)
- Recreation (Secondary Contact)
- Aquatic Life (Fishing)
- Fish Consumption (Fishing)
- Habitat/Hydrology (Fishing)
- Aesthetics (Primary/Secondary Contact)

The determination of waterbody use support and degree of water quality impact is drawn from a wide range of available data sources and relies on various criteria. These sources and criteria include use restriction orders (drinking water restrictions, bathing beach closures, fish consumption and shellfishing advisories), comparison of data (from NYSDEC ambient monitoring network as well as other agency, local or public/citizen monitoring program) with parameter-specific criteria that reflect water quality standards, the use of surrogate indicators, and qualitative perception and observational information (stream habitat assessments, recreational use or fishery resource surveys, citizen complaints). Given the growing involvement of local agency and citizen volunteers in water quality monitoring, the WI/PWL updating process has expanded to include a significant public participation and outreach component. This effort relies on a network of local Water Quality Coordinating Committees working in conjunction with the NYSDEC staff to capture additional available water quality information. To help ensure consistency in the assessments, basin update efforts begin with a regional WI/PWL workshop with other agency and local partners to introduce the assessment methodology and solicit water quality information.

After all readily available water quality information is collected, judgments and evaluations are made regarding:

- what specific use(s), if any, is/are affected,
- the severity of the impact on the use(s), and
- the level of documentation that corresponds to the use impact/impairment.

The focus of a water quality assessment is based on whether a specific use is restricted. If this is the case, then the severity of use impact (i.e., the degree to which the use is restricted) is evaluated as either *Precluded*, *Impaired*, *Stressed* or *Threatened* (see box). The water use impact and level of severity are also identified as *Known*, *Suspected* or *Possible* (see box) based upon available documentation. The severity of use impacts and the corresponding levels of documentation are dependent upon a number of factors,

including the *magnitude* of the impact, the *frequency* of occurrence or *extent* of affected area, and *confidence* of data.

The *magnitude* of water quality impacts or degrees of use restrictions are reflected in the WI/PWL level of severity; the more significant the impact, the greater the severity. For example, fish consumption advisories may recommend eating no more than one fish per week (*Stressed*), eating no more than one meal per month (*Impaired*), or eating no fish at all (*Precluded*). With regard to water quality monitoring and its evaluation against criteria, in-stream concentrations may be below, near, at, above or well above applicable water quality criteria. Such conditions correspond to varying degrees of impact ranging from *No Known Impact*, *Threatened*, *Stressed*, *Impaired* or *Precluded*.

The *frequency* with which water quality conditions occurs, is also reflected in the WI/PWL level of

WI/PWL Level of Documentation

Known - Water quality monitoring data and/or *studies have been completed and conclude* that the use of the waterbody is restricted to the degree indicated by the listed severity.

Suspected - Reasonably strong evidence, supported by best professional judgment of DEC staff, *suggests* the use of the waterbody is impacted. However, water quality data/studies that establish an impact *have not been completed* or there is *conflicting information*.

Possible - Anecdotal evidence, public perception and/or specific citizen complaints indicate that the use of the waterbody *may be restricted*. However, there is *currently very little, if any, documentation* of an *actual* water quality problem.

WI/PWL Severity of Use Impact

PRECLUDED
Frequent/persistent water quality, or quantity, conditions and/or associated habitat degradation *prevents all aspects* of a specific waterbody use.

IMPAIRED
Occasional water quality, or quantity, conditions and/or habitat characteristics *periodically prevent* specific uses of the waterbody, or;
Waterbody uses are not precluded, but some aspects of the use are *limited or restricted*, or;
Waterbody uses are not precluded, but *frequent/persistent* water quality, or quantity, conditions and/or associated habitat degradation *discourage* the use of the waterbody, or;
Support of the waterbody use *requires additional/advanced* measures or treatment.

STRESSED
Waterbody uses are not significantly limited or restricted (i.e. uses are *Fully Supported*), but *occasional* water quality, or quantity, conditions and/or associated habitat degradation *periodically discourage* specific uses of the waterbody.

THREATENED
Water quality supports waterbody uses and ecosystem exhibits no obvious signs of stress, however *existing or changing land use patterns* may result in restricted use or ecosystem disruption, or;
Data reveals decreases in water quality or presence of toxics below the level of concern, or;
Waterbody uses are not restricted and no water quality problems exists, but the support of a specific and distinctive use make the waterbody more susceptible to water quality threats.

severity. The more frequently a specific condition occurs, the more significant – or severe – the effect on related water resource uses. Similarly, the spatial *extent* of the water quality condition (i.e., the percent of total waterbody affected) is also reflected in the severity. For example, a bay where shellfishing is restricted in one small cove is less severely impacted than if shellfishing were restricted in the entire bay.

Frequency of occurrence and spatial extent also influence the WI/PWL level of documentation. For example, if a specific condition occurs less than 10% of the time (or in less than 10% of the waterbody), the overall water quality impacts for the total waterbody are less certain than if the frequency/extent of the condition is greater than 50%. As general guidelines, if frequency/extent of conditions are less than 10%, the level of documentation for impacts to uses corresponding to that condition is considered *Possible*. If the frequency or extent is between 10 and 25%, the level of documentation should be considered *Suspected*. If greater than 25%, the impact should be considered *Known*.

However, the use of the 10% and 25% thresholds outlined above assumes that the frequency/extent of a condition is well-established. For some measures of impact, this is not very difficult (e.g., fish consumption advisories are in effect 100% of the time, for beaches that are closed 14 days out of a 100 day season the frequency is 14%, for estuary segments where shellfishing is restricted in 40 of 200 acres the extent is 20%). However, for other water quality monitoring the determination of frequency/extent depends upon a number of factors, including the level of data confidence.

Data confidence refers to statistical measures that help determine the degree of certainty that a condition exists. Such statistical confidence depends upon a number of factors (monitoring design, number of samples collected, variability of analysis) and is an important factor in determining the WI/PWL level of documentation. Other considerations, such as quality and age of data, also influence the level of documentation.

Though they are related, it is important not to confuse data confidence with the frequency/extent of a condition. For example a single data point might show exceedence of a standard. While this represents high frequency of a condition (100%), the level of data confidence based on just one sample is usually quite low.

WI/PWL Assessment Categories

Based on the degree of use support, severity of impact/impairment and level of documentation, all waterbodies in the WI/PWL are assigned to one of five possible *Water Quality Assessment Categories*. These categories are outlined below and in Table 1.

> *Impaired Waters* are waterbodies with well documented water quality problems that result in *Precluded*, or *Impaired* uses and, in most cases, a level of documentation of *Known* (occasionally *Suspected*). Waters with *Stressed, Threatened* uses are not included in this category.
>
> *Waters with Minor Impacts* are waterbodies where less severe water quality impacts are apparent, but uses are considered fully supported. These waters correspond to waters listed as having *Stressed* uses and a level of documentation of *Known* or *Suspected*.
>
> *Threatened Waters* are waterbodies for which uses are not restricted and no water quality problems currently exist, but where data suggests declining water quality trends or specific land use or other changes in the surrounding watershed are *Known* to be threatening water quality. Also included in this category are waterbodies where the support of a specific and/or distinctive use make the waterbody more susceptible to *Possible* water quality threats.

Waters with Impacts Needing Verification are waterbodies that are thought to have water quality problems or impact, but for which there is not sufficient or definitive documentation. These segments include waters with *Stressed* uses and a level of documentation of *Possible* and waters with *Threatened* uses and a *Suspected* level of documentation Such waterbodies require additional monitoring to determine whether uses are restricted or threatened.

Waters Having No Known Impacts are waterbodies where monitoring data and information indicate that there are no use restrictions or other water quality impacts, threats or issues.

UnAssessed Waters are waterbodies where there is no available water quality information to assess the support of waterbody uses.

Table 7 Relationships Between WI/PWL Severity/Documentation and Water Quality Assessment Categories

Severity of Problem	Level of Problem Documentation		
	Known	**Suspected**	**Possible**
Precluded	Impaired Water	N/A*	N/A*
Impaired		Impaired Water	N/A*
Stressed	Minor Impacts but Fully Supporting	Minor Impacts but Fully Supporting	Needs Verification (Considered Minor Impacts But Fully Supporting)
Threatened	Threatened, but Fully Supporting	Needs Verification (Considered Threatened)	Threatened (Poss) (But Fully Supporting)
None	No Known Impairment - Fully Supporting Uses		
???	UnAssessed Water		

* For more severe impacts (*Precluded, Impaired*) a greater level of documentation is needed.

The WI/PWL Water Quality Assessment Categories differ somewhat from the national Use Attainment Categories suggested by USEPA in their Integrated Reporting guidance for reporting on water quality. Whereas the Integrated Reporting Use Attainment Categories are more narrowly tailored to focus on questions concerning the attainment of water quality standards and the appropriateness of TMDLs to address water quality impairments, the WI/PWL categories are crafted to better provide support for a myriad of NYSDEC water quality management programs.

Perhaps the most significant difference between the two frameworks involves the WI/PWL's inclusion of *Waters with Minor Impacts* (*Stressed* waters). This category allows the WI/PWL to track waters that fully support uses but with less than ideal water quality. Conditions in these waters are considered stable, have been well documented and additional protection activities are not necessarily needed to maintain use support

into the future.

The tracking of waters with minor impacts – while not readily accommodated in the national Use Attainment Category scheme – supports the NYSDEC water quality management programs and is an integral component of its overall watershed restoration and protection efforts. The emphasis at the federal government level regarding water quality efforts continues to be focused on the restoration of waters that do not support uses (*Precluded*, *Impaired*). However in New York – at both the state and local levels – there is growing interest and support for directing resources to protection efforts as well. Maintaining non-impacted waters and improving waters with lesser impacts is often a more effective use of limited resources for the advancing of water quality goals and progress. The more comprehensive framework of WI/PWL assessment categories better supports efforts to benefit these waters.

The tracking of waters with minor impacts – while not readily accommodated in the national Use Attainment Category scheme – supports the NYSDEC water quality management programs and is an integral component of its overall watershed restoration and protection efforts.

Although the current national Integrated Reporting Use Attainment Categories differ from the WI/PWL Assessment Categories, the two schemes share significant similarities. As a result waters assigned to WI/PWL Assessment Categories translate easily to corresponding USEPA designations. A more detailed discussion of the linkage between the WI/PWL Assessment Categories and the national Integrated Reporting Categories is presented in the Listing Methodology.

Monitored and *Evaluated* Waters

In compiling water quality information for 305(b) Reporting, states are to distinguish between water quality assessments based on monitoring data, and assessments based on other information. The distinctions between *Monitored* and *Evaluated* Waters in New York State are outlined below.

Monitored Waters are those waterbodies for which the use support assessment is based primarily on current (i.e., less than 5 years old) site-specific ambient monitoring data. Such data includes biological monitoring (macroinvertebrate assessment, toxicity testing) and/or chemical/physical monitoring results. Because fixed-station chemical/physical monitoring represents only a "snapshot" in time, such monitoring should be conducted quarterly or more frequently if it is to accurately portray water quality conditions at the site.

Evaluated Waters are those waterbodies for which the use support assessment is based on information other than current site-specific ambient monitoring data. Such assessments may rely on land use data, identification of sources, predictive modeling and/or surveys of water quality and natural resource staff. Also, assessments based on older ambient monitoring data are generally considered to be "evaluated."

Use-Specific Assessment Criteria

Detailed guidelines regarding the relationships between the results of various monitoring and assessment indicators and corresponding levels of support for specific water uses are discussed on the following pages. Assessment criteria tables for specific designated water uses, which are intended to provide guidance to insure consistent evaluation of water quality, are included in these guidelines. The criteria in the tables are intended to define general boundaries between levels of impact (severity) and degrees of confidence (documentation). Individual waterbody assessments are evaluated on a case-by-case basis. These assessments may take into account additional or alternative indicators not captured in the assessment criteria

tables and may require the application of best professional judgment. Multiple water quality indicators that may suggest conflicting levels of impacts also require careful consideration (see also *Independent Applicability and Weight of Evidence*).

In establishing assessment criteria to determine what uses are supported in a waterbody, New York State takes into consideration a number of factors. The starting point for the criteria is often based on established NYS water quality standards and/or guidance values. These standards and guidance values are integral to many water quality activities, including – and perhaps most prominently – the derivation of water quality-based effluent limitations for SPDES discharge permits. The NYS water quality standards and accompanying guidance recognize that the application of standards to the derivation of permit limits and the determination of compliance or noncompliance of discharges with the standards require additional interpretation and instruction, as approved by the department. This additional guidance is necessary to address issues such as appropriate sampling methods, sampling location, flow variability, averaging periods, frequency of sampling or sample size, natural or background conditions, mixing zones, and so on.

Similarly, the application of water quality standards and guidance values to determine use support and levels of impact/impairment also requires some interpretation and additional guidance. The most recent USEPA Integrated Reporting Guidance notes specifically the need for states to address issues of data quality, data quantity and data representativeness in making assessment decisions. The guidance speaks at some length on the issue of data representativeness, and recognizes that the "...spatial and temporal representativeness of data and information should be considered by states as they attempt to characterize conditions..." The guidance continues to note that:

> "...state methodologies should describe, in general terms, the decision logic used to determine the temporal and spatial extent a grab sample can be construed to represent. In order to make credible assessment determinations, states should employ approaches that strike a balance between the extremes of: (1) considering every grab sample to be representative of merely the instant in which, and the drop of water from which, each was taken, or (2) assuming that each such sample is representative of conditions over several years, and covering hundreds of stream miles of hundreds of lake acres."

This New York State Assessment Methodology, and the associated Listing Methodology attempts to strike the balance called for in the USEPA guidance through the use of established water quality standards and guidance values, other criteria and indicators and the application of best professional judgment. However, NYDEC recognizes that achieving this balance is a work in progress and is continuing to work together with USEPA to improve the transparency of decision-making based on different types of data collected from numerous monitoring programs.

Drinking Water Supply Use

Only those waters where *Drinking Water Supply* is designated as the best usage (i.e., Class A, AA, A/AA-Special surface and Class GA groundwaters) are evaluated for support of this use. The evaluation of *Drinking Water Supply* use support is driven largely by water quality information and monitoring data generated by the New York State Department of Health (NYSDOH) or local health departments, which are primarily responsible for the protection of public health in the state.

A comprehensive evaluation of *Drinking Water Supply* use must consider the use on a number of levels. The first of these considerations focuses on administrative closures or restrictions on a *Drinking Water Supply* use. However, while this criterion is most directly related to the use, it is not sensitive to impacts.

Consequently, a secondary level of assessment uses the degree of treatment necessary for a water supply to be used for drinking water. The intent of this assessment criterion is to categorize as *Impaired* any water supply that requires "extra-ordinary" treatment measures. Given national filtration rules and other

considerations, defining "extra-ordinary" is somewhat difficult. The criteria language–"*additional treatment beyond conventional processes (coagulation, sedimentation, filtration, disinfection) is required to remove any impurities that are not naturally present"*-reflects similar language used in the New York State Water Quality Regulations for classification of waters.

Because of the human health implications, threats to and protection of the *Drinking Water Supply* use take on added significance. Therefore, it is also appropriate to evaluate these waters prior to and without consideration of final treatment. This level of assessment evaluates contaminant concentrations relative to standards for the protection of Health (Water Source). In addition, other information regarding nutrient levels, precursors to Trihalomethane (THM) formation and other contaminants that may affect *Drinking Water Supply* use and quality is reflected in measures of natural sensitivity and susceptibility as determined through the NYSDOH Source Water Assessment Program (SWAP).

Table 8 Drinking Water Supply Use Assessment Criteria

Use Assessment Criteria	WI/PWL Use Impact	
	Severity	**Documentation**
Frequent/Persistent Conditions Prevent Use • NYS/local Health Department water supply closures lasting >30 days.	Precluded	Known
Occasional Conditions Prevent Use • NYS/local Health Department water supply closures lasting up to 30 days.	Impaired	Known
Frequent/Persistent Conditions Discourage Use • Impacts do not require closure or advisories but adversely affect the quality of the finished water and/or treatment costs (e.g., taste/odors, color, turbidity, activated charcoal filtration, etc.), or • Monitoring data show exceedence of *Impaired* criteria* for cryptosporidium, coliform, or • Monitoring data show exceedence of *Impaired* parameter-specific criteria* for other substances more than 10% (*suspected*) or 25% (*known*) of time.	Impaired	Known or Suspected
Occasional Conditions Discourage Use • SWAP determination of *very high susceptibility* [1] • Monitoring data show exceedence of *Stressed* criteria* for cryptosporidium, coliform, or • Monitoring data show exceedence of *Stressed* parameter-specific criteria* for other substances more than 10% (*suspected*) or 25% (*known*) of time.	Stressed	Known or Suspected [1]
Conditions Support Use, but Threats Noted • SWAP determination of *high susceptibility* [1] • Monitoring data show exceedence of *Threatened* parameter-specific criteria* more than 10% (*suspected*) or 25% (*known*) of time.	Threatened	Known or Suspected [1]
No Known Impairment or Imminent Threat • No drinking water restrictions, and • No additional treatment required, and • No significant contaminants/threats present.	No Known Impact	Assessment Level *Monitored or Evaluated*

***Parameter-Specific Criteria**	*Impaired*	*Stressed*	*Threatened*	
Cryptosporidium (average)	7.5	3.0	–	oocysts/100 L
Cryptosporidium (individual)	–	7.5	3.0	oocysts/100 L
Coliform, Total (median)[2]	50/2,400	–	–	per 100 ml
Coliform, Fecal (geometric mean)	200	–	–	per 100 ml
Ammonia/Ammonium	20	10	5	mg/l
Nitrate, as N	10	5	2	mg/l
other substances (source water) [3]	Standard	50% of Std.	20% of Std.	
other substances (finished water) [4]	MCL	50% of MCL	20% of MCL.	

[1] Impacts/impairments based on SWAP susceptibility determinations should be listed as *Suspected*.
[2] Refers to Class AA and A respectively.
[3] Refers to substances for which there are NYS water quality standards for protection of *Health (Water Source)*.
[4] Refers to substances for which there are Maximum Contaminant Levels (MCL) for finished drinking water.

The relationship between drinking water supply advisories, monitoring data, SWAP determinations and other information and the level of *Drinking Water Supply* use support is outlined in Table 2.

Shellfishing Use

Support of *Shellfishing* use is assessed for Class SA marine waters only. These assessments reflect the level of certification of the waters for the taking of shellfish as determined by DEC Division of Fish, Wildlife and Marine Resources and based on NYSDEC regulations (6NYCRR, Part 47, *Certification of Shellfish Lands*) and National Shellfish Sanitation Program requirements. Shellfishing waters that are not certified may be closed year-round, seasonally, or conditionally (after rainfalls events of a specific magnitude). Other restrictions on the use include requirements to transplant the shellfish to certified waters for cleansing prior to harvesting for human consumption. More information regarding the NYSDEC Shellfishing program can be found at http://www.dec.ny.gov/outdoor/345.html.

Table 9 Shellfishing Use Assessment Criteria

Use Assessment Criteria	WI/PWL Use Impact	
	Severity	**Documentation**
Frequent/Persistent Conditions Prevent Use • NYSDEC Division of Fish, Wildlife and Marine Resources (DFWMR) has designated more than 25% of the waterbody area as uncertified year-round for shellfishing based on water quality conditions and contaminants, or • DFWMR has designated more than 10% of the area as uncertified year-round AND shellfishing in remaining area is restricted (i.e., only *seasonally* or *conditionally* certified) based on water quality conditions..	Precluded	Known
Occasional Conditions Prevent Use • DFWMR has designated 10 to 25% of the waterbody area as uncertified year-round based on water quality conditions, or • DFWMR has designated more than 25% of the waterbody area as restricted (i.e., only *seasonally* or *conditionally* certified) based on water quality conditions.	Impaired	Known
Occasional Conditions Discourage Use • DFWMR has designated up to 25% of the waterbody area as restricted (i.e., only *seasonally* or *conditionally* certified) based on water quality conditions, or • DFWMR has designated more than 10% of the waterbody area as uncertified based on administrative guidelines (nearby outfall, marina).	Stressed	Known
Conditions Support Use, but Threats Noted • DFWMR has designated < 10% of the waterbody area as uncertified, or • DFWMR has designated the entire waterbody as certified, but significant trib waters are uncertified due to water quality conditions.	Threatened	Known or Suspected
No Known Impairment or Imminent Threat • DFWMR has designated the entire waterbody as certified for the taking of shellfish and all significant trib waters are also certified.	No Known Impact	Assessment Level: *Monitored*

* For large estuary segments where 10-25% of the waterbody area represents a significant closure or restriction, a greater severity of use impact may be assigned to the waterbody.

Shellfishing restrictions may be driven by either water quality or by administrative requirements. Water quality-based closures are the result of actual bacteriological monitoring and subsequent findings that the

waters do not support safe consumption of shellfish. Administrative closures are precautionary; they are not necessarily reflective of water quality conditions but are issued for areas where the *potential* for contamination of shellfish exists. Administrative closures are generally issued for areas in close proximity to WWTP discharges and for waters around marinas. Generally closures based on actual water quality monitoring correspond to *Precluded/Impaired* uses, depending on the type of restriction (year-round, seasonal, conditional) and the percent of waterbody area affected. If the area affected by a water quality-based closure is relatively small, the severity of impact may be listed as *Stressed*. Administrative closures – because they are more precautionary in nature – correspond to *Shellfishing* that is *Stressed* or *Threatened.* The relationship between certification and level of *Shellfishing* use support is reflected in Table 3.

> Generally, closures based on actual water quality monitoring correspond to *Precluded/Impaired* uses. Administrative closures–because they are more precautionary in nature–correspond to a *Shellfishing* use that is *Stressed* or *Threatened.*

Waters that are designated Class SB or SC are not assessed for *Shellfishing* use support, even if they have been evaluated by the National Shellfish Sanitation Program. However, because shellfishing is arguably the most sensitive of the uses assessed, if any Class SB, SC waters are certified for shellfishing they will be assessed as having *No Known Impairment* to other uses (unless additional/other water quality data indicates an impairment). If these waters are uncertified (due to water quality) then *Public Bathing/Recreation* are considered to be *Stressed*. A more severe level of impact to *Public Bathing/Recreation* requires monitoring data corresponding to those uses.

Public Bathing and Recreation Uses

Swimming and other recreational activities are important and popular uses for the waters of the state. The assessment of these activities involves two separate use categories: *Public Bathing* and *Recreation*. While the assessment of both *Public Bathing* and *Recreation* uses rely on similar water quality indicators, these two distinct uses are evaluated separately.

> As a practical matter, not all waters of the state are regularly monitored to assess swimming use support to the degree that designated public bathing areas are. Therefore, general precautions should be taken regarding recreation in these other waters.

Evaluation of *Public Bathing* use is limited to those waters classified by New York State for primary contact recreation (i.e., Class B, SB, A, AA, A/AA-Special and SA). This classification applies to waters specifically designated as suitable for public beaches and bathing areas, which see an increased level of swimming use and are more regularly monitored by public health agencies. State and local/county health departments conduct regular bacteriological sampling programs and perform sanitary surveys at designated public bathing areas. Based on the findings of these surveys, bathing use may be restricted either permanently or periodically. Localized closings may also occur due to contamination by spills, waterfowl, or runoff from wet-weather events. It should be noted although the quality of Class C, D and SC waters are to be suitable for primary and secondary other factors, including natural physical characteristics, may limit their use as public beaches and bathing areas.

Evaluation of the *Public Bathing* use focuses primarily on public health concerns, particularly bacteriological contamination and water clarity. Consequently the Public Bathing Use Assessment Criteria are linked primarily to these parameters as well as beach closures.

The relationship between bathing restrictions, water quality monitoring and other indicators (including the closely-related *Recreation* use assessment) and the level of *Public Bathing* use support is reflected in 4.

Table 10 Public Bathing Use Assessment Criteria

Use Assessment Criteria	WI/PWL Use Impact	
	Severity	**Documentation**
Frequent/Persistent Conditions Prevent Use • NYS/local Health Department has closed the waterbody to swimming for the entire season, based on water quality (bacteriological) monitoring data.	Precluded	Known
Periodic/Occasional Conditions Prevent Use • NYS/local Health Department has issued temporary closures of the waterbody to swimming, based on water quality (bacteriological) monitoring data, or • Sufficient stream flow/water level necessary to support swimming uses are artificially restricted.	Impaired	Known
Frequent/Persistent Conditions Discourage Use • Swimming use requires additional measures (e.g., aquatic weed harvesting/control). • Monitoring data show exceedence of *Impaired* criteria* (bacteriological, clarity) more than 10% (*suspected*) or 25% (*known*) of time.	Impaired	Known or Suspected
Occasional (Other) Conditions Discourage Use • *Recreation* uses are assessed as *Impaired/Precluded*[1], or • Monitoring data show exceedence of *Stressed* criteria* (clarity) more than 10% (*suspected*) or 25% (*known*) of time.	Stressed	Known or Suspected[1]
Conditions Support Use, but Threats Noted • Monitoring data show exceedence of *Threatened* criteria* (clarity, phosphorus) more than 10% (*suspected*) or 25% (*known*) of time.	Threatened	Known or Suspected
No Known Impairment or Imminent Threat • NYS/local Health Department has not restricted swimming, and • Swimming use does not require any additional measures, and • Monitoring data does not exceed criteria* (>10% of time), and • *Recreation* uses are not *Impaired/Precluded*.	No Known Impact	Assessment Level: *Monitored*

*** Monitoring Data Criteria**	*Impaired*	*Stressed*	*Threatened*	
Coliform, Total (geometric mean)	2,400	–	–	per 100 ml
Coliform, Fecal (geometric mean)	200	–	–	per 100 ml
Entericocci (geometric mean)	See below [2]			
Clarity (Secchi Disc)	1.2	1.5	2.0	meters
Total Phosphorus [3,4]	–	–	20	µg/l

[1] *Public Bathing* assessments based on *Recreation* use support should be listed as *suspected*.

[2] For marine waters (excluding tributaries), the enterococci criteria is 35/100 ml. For Great Lakes waters (excluding tributaries), the enterococci criteria is 126/100 ml.

[3] Application of the Total Phosphorus criteria is limited to lakes and ponded waters.

[4] Based on current New York State criteria indicative of elevated nuisance conditions and slight impacts to recreation; other state/national nutrient criteria currently being developed will be incorporated into the Assessment Methodology once adopted.

Table 11 Recreation Use Assessment Criteria

Use Assessment Criteria	WI/PWL Use Impact	
	Severity	Documentation
Frequent/Persistent Conditions Prevent Use • NYS/local Health Department has closed the waterbody to swimming, boating or other recreational use for the entire season, due to water quality concerns.	Precluded	Known
Periodic/Occasional Conditions Prevent Use • NYS/local Health Department has issued temporary closures of the waterbody or portions of the waterbody to swimming, boating or other recreational use due to water quality concerns, or • Sufficient stream flow/water level necessary to support recreational uses are artificially restricted.	Impaired	Known
Frequent/Persistent Conditions Discourage Use • Recreational uses of water require additional measures (e.g., weed harvesting/control), or • *Public Bathing* uses are assessed as *Impaired/Precluded*, or • Monitoring data show exceedence of *Impaired* criteria* more than 10% (*suspected*) or 25% (*known*) of time, or • Observational criteria* indicating restricted recreational uses are noted more than 50% of the time.	Impaired	Known or Suspected [4]
Occasional (Other) Conditions Discourage Use • *Public Bathing* uses are assessed as *Stressed*, or • Monitoring data shows exceedence of *Stressed* criteria* more than 10% (*suspected*) or 25% (*known*) of time, or • Observational criteria** indicating restricted recreational uses are noted more than 25% of the time.	Stressed	Known or Suspected [4]
Conditions Support Use, but Threats Noted • Monitoring data shows exceedence of *Threatened* criteria* more than 10% (*suspected*) or 25% (*known*) of time. • Observational criteria** indicating restricted recreational uses are noted more than 10% of the time.	Threatened	Known or Suspected [4]
No Known Impairment or Imminent Threat • *Public Bathing* uses are not *Stressed*, *Impaired*, *Precluded*, and • Recreation uses not restricted, nor require additional measures, and • Monitoring data does not exceed criteria* (>10% of time), and • Observational criteria** for restricted use not noted (>10% of time).	No Known Impact	Assessment Level: *Monitored*

*** Monitoring Data Criteria**	*Impaired*	*Stressed*	*Threatened*	
Total Phosphorus [1, 2]	–	20	–	µg/l
Chlorophyl a [1]	15	12	8	µg/l
Clarity (Secchi Disc) [1]	1.2	1.5	2.0	meters

**** Observational Data Criteria** [3, 4]
Swimming/recreation slightly (or more) restricted by specifically identified causes (algae, clarity, etc).

[1] Application of the Total Phosphorus criteria is limited to lakes and ponded waters.

[2] State/national nutrient criteria to be developed and incorporated into the Assessment Methodology.

[3] *Observational Criteria* refers to responses on ***CSLAP Field Observation Forms***. Specifically, *Condition of Lake* notes presence of algae, *Suitability for Recreation* notes some impacts/impairment, and *Opinion of Recreational Use* notes weeds and/or clarity problems.

[4] Impacts/impairments based on observational criteria should be listed as *suspected*.

The category of *Recreation* tracks impacts and impairments to a more expansive list of recreational activities,

such as fishing, boating, water skiing, rafting, wading and other primary/secondary contact activities, including swimming. The requirement of all waters to support *Recreation* uses addresses the federal Clean Water Act goal that all waters be *swimmable*.[6] However, while all waters of the state are to be swimmable, as a practical matter not all waters of the state are regularly monitored to assess swimming use support to the same degree that designated public bathing areas are. As a result of differing criteria and the varying levels of monitoring, *Public Bathing* (Class B, SB, A, AA, A/AA-Special and SA) waters are evaluated more rigorously than other *Recreation* use waters.

Whereas the *Public Bathing* use assessment has a greater focus on public health concerns, *Recreation* uses are assessed more broadly. The evaluation of *Recreation* use support places emphasis on excessive weed growth, silty/muddy lake bottoms, color, odors and other conditions that discourage recreational activity. In those cases where certain Class C, D, and SC waters have been assessed for bacteria, these results will be incorporated into the overall assessment of the *Recreation* use for these waters.

Excessive nutrient levels – which may increase turbidity, lower dissolved oxygen, and promote aquatic plant and algal growth – may also discourage the use of lakes, ponds and reservoirs for recreation activities. Recognizing this, NYSDEC derived a total phosphorus criterion of 20 μg/l for the protection of recreational uses in lakes. However the criterion is based on lake user surveys and was developed to be indicative of *elevated nuisance conditions and slight impacts to recreation*. Such impacts are more closely aligned with Stressed/Threatened uses than with Impaired uses. Because of its basis, the criterion is more appropriate in assessing more general *Recreation* use support than *Public Bathing* use. However, since conditions resulting from elevated nutrients and weed/algal growth also may threaten swimming, this indicator is included in the *Public Bathing* use assessment as indicating *Threatened* uses.

The relationship between water quality monitoring and other indicators and the severity and documentation of an impact to *Recreation* use is reflected in Table 5. For various nutrient parameters, Table 5 refers to *"state/national criteria to be developed and incorporated into the Assessment Methodology."* This flexibility of language reflects a need to accommodate the ongoing efforts by NYSDEC (and USEPA) to develop and implement nutrient criteria, including the use of different ecoregion-specific criteria for various regions of the state. Once these criteria are established, the Assessment Methodology will be revised to reflect them. Until then the surrogate indicators outlined in Table 5 will be used to assess recreational use support.

Fish Consumption Use

The assessment of *Fish Consumption* use is based on NYSDOH advisories regarding the catching and eating of sportfish, and contaminant monitoring in fish tissue, other biological tissue and surficial bottom sediments. The advisories reflect federal government standards for chemicals in food that is sold commercially, including fish. The NYSDEC Division of Fish Wildlife and Marine Resources routinely monitors contaminant levels in fish and game. Based on this monitoring data, NYSDOH issues advisories for specific waterbodies and species when contaminant levels in sportfish exceed the federal standards. These advisories are updated and published annually. In addition to the waterbody-specific advisories, a general advisory recommends eating no more than one meal (one-half pound) per week of fish taken from New York State freshwaters and some marine water at the mouth of the Hudson River. These general advisories are to protect against eating large amounts of fish that have not been tested or that may contain unidentified contaminants. Because the general statewide and marine waters advisories are precautionary and not based on any actual contaminant monitoring data, it does not represent any documented impairment of *Fish Consumption* use. Consequently, the general statewide advisories are not reflected in the assessment of *Fish Consumption* use. Current statewide advisories regarding snapping turtles and wild waterfowl are

[6] In order to meet the federal Clean Water Act goal that all waters be "swimmable," water quality of New York State waters Class C, SC (and above) "shall be suitable for primary and secondary contact recreation." However, other factors (such as flow/depth, access, conflicting use) may limit this use. (See NYS Classifications for Surface Waters, Part 701.1 thru 701.14.)

not reflected in the methodology for similar reasons.

Other general advisories recommend limiting the consumption of striped bass, bluefish and eels taken from marine waters due to specific habits or characteristics that make these species more likely to accumulate contaminants (particularly PCBs). Because these marine water advisories (outside of New York Harbor and Western Long Island Sound) are also more precautionary in nature and no more significant than the statewide advisory for freshwaters, they correspond to *Stressed* rather than *Impaired* use.

The relationship between the waterbody-specific fish consumption advisories and the severity and documentation of an impact/impairment to *Fish Consumption* use is reflected in Table 6.

Table 12 Fish Consumption Use Assessment Criteria

Use Assessment Criteria	WI/PWL Use Impact	
	Severity	**Documentation**
Frequent/Persistent Conditions Prevent Use • NYSDOH advisory recommends eating no fish (or none of sub-species) from a specific waterbody.	Precluded	Known
Periodic/Occasional Conditions Prevent Use • NYSDOH advisory recommends limiting consumption of fish (no more than one meal per month) from a specific waterbody.	Impaired	Known
Occasional (Other) Conditions Discourage Use • Monitoring of fish tissue shows contaminant levels that exceed levels of concern, but NYSDOH advisory has not been issued. • NYSDOH general advisory recommends limiting consumption of fish (no more than one meal per week) from certain marine waters. • Monitoring of macroinvertebrate tissue or surficial bottom sediment shows contaminant levels that exceed levels of concern.	Stressed	Known or Suspected
Conditions Support Use, Threats Noted • Monitoring of fish (known) or macroinvertebrate tissue/bottom sediment (suspected) shows contaminant levels present but not exceeding levels of concern.	Threatened	Known or Suspected
No Known Impairment or Imminent Threat • No fish consumption advisory beyond the NYSDOH *General Advisory for Eating Gamefish*, and • Monitoring data revealing no contaminants in fish, macroinvertebrate tissue or surficial bottom sediment above background levels.	No Known Impact	Assessment Level: *Monitored*

Aquatic Life Use Support

A primary focus of the Statewide Waters Monitoring Program (SWMP) involves determining the degree to which waters support aquatic life. There are a number of reasons for this emphasis:

- *Aquatic Life* use support must be maintained in all waters, regardless of classification, and
- *Aquatic Life* use support is one of the most sensitive of national use support categories, and
- *Aquatic Life* use support can be assessed easily and economically using biological sampling techniques.

The evaluation of *Aquatic Life* use support represents a recent change to the WI/PWL. Prior to 1999, the WI/PWL tracked waterbody support of *Fish Propagation* and *Fish Survival* rather than *Aquatic Life* use support. This was a reflection of the distinctions regarding fishing use outlined in New York State standards. However, the change to the broader WI/PWL waterbody use category of *Aquatic Life* use support better

represents the results of the macroinvertebrate sampling used to assess water quality. The change from *Fish Propagation/Survival* to *Aquatic Life* use support also provides greater flexibility in reporting water quality and allows tracking of aquatic impacts that are not sufficiently severe as to be apparent in the fishery. The revised category also corresponds more closely to the USEPA national use support category.

Different types of monitoring data may be used to determine *Aquatic Life* use support use. The SWMP relies on biological sampling. The assemblage most frequently used is macroinvertebrates, however the program has recently incorporated some periphyton and, to a lesser degree, fish community assessments. The relationship between biological (macroinvertebrate) assessment, as described in the *Quality Assurance Work Plan for Biological Stream Monitoring in New York State* (*Bode, et.al., 2002*) and the impact/impairment to *Aquatic Life* use support is shown in Table 7.

Table 13 Aquatic Life Use Support Assessment Criteria

Biological (Macroinvertebrate) Assessment		WI/PWL Use Impact	
		Severity	**Documentation**
Severely Impacted (Very Poor)		Precluded	Known
Moderately Impacted (Poor)		Impaired	Known
*Slightly Impacted** (Good)	Other indications of impact present	Stressed	Suspected or Known
	No other indications of impact	No Known Impact	Assessment Level: *Evaluated*
Non-Impacted (Very Good)		No Known Impact	Assessment Level: *Monitored*

* *Slightly Impacted* represents a broad category ranging from generally good water quality to conditions causing minor impacts, but still providing adequate support of aquatic life.

Independent Applicability and Weight of Evidence

A comprehensive evaluation of *Aquatic Life* use support must consider all available biological, physical/chemical and toxicity monitoring data. Biological assessment of the macroinvertebrate community is a good integrator of these monitoring components. Consequently, when biological macroinvertebrate community assessment data is available and considered definitive, *Aquatic Life* use support is generally determined as outlined in Table 7. For instances in which assessment of the macroinvertebrate community is inconclusive and/or other indicators suggest different levels of use support, aquatic life use support determination is made by further consideration of all available monitoring data and comparison of monitoring data results against the applicable water quality standards and criteria for the protection of aquatic life.

To address the possibility of conflicting results, USEPA developed a policy of *Independent Applicability*. This policy states that where there are conflicting and equally valid data sets no one type of assessment (biological, physical/chemical, toxicity) can be used to override a finding of water quality impact/impairment that is based on another type of assessment. However, while no one assessment type routinely takes precedence over others, the evaluation of conflicting assessments must take into account levels of documentation, quality and overall confidence in the data, other artifacts of monitoring data (e.g., analytic methods, sampling techniques, etc.), how representative the sampling is of conditions in the larger waterbody segment and the relationship of the indicator to the actual use being assessed. These considerations (or *weight of evidence*) may, in fact, lead to favoring one assessment over

others in arriving at an assessment for a specific waterbody. Because biological sampling is a good integrator of water quality conditions and it is a direct measurement of aquatic life use support, it is often the deciding factor in assessment decisions for this use.

Assessment of Naturally Occurring Low Dissolved Oxygen Waters

NYS water quality standards for dissolved oxygen for the protection of aquatic life specify that dissolved oxygen in waters should not be less than the standard "at any time." In some instances this "never less than" condition is qualified to except waters where low dissolved oxygen is the result of natural conditions (Class AA-Special, AA, A, B and C trout spawning waters); for other waters, the natural conditions exception is not explicit. However, whether explicitly stated or not, assessments of use support based on dissolved oxygen should recognize that low dissolved oxygen at lower depths of non-flowing waters (i.e., lakes and impoundments) or in areas of poor aeration, circulation or natural organic loadings are likely to occur.

A review of the assessment methodologies of other northeastern states finds that most recognize and allow for natural conditions of low dissolved oxygen that do not result in designation of the water as not supporting uses.[7] These states allow for the application of "best professional judgment" in determining whether low dissolved oxygen values are naturally occurring, whether they are representative of the waterbody as a whole, and how they should be considered in light of biological sampling results and other available information. In fact, USEPA in earlier *Guidelines for the Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates* (USEPA, 1997) includes low dissolved oxygen (and low pH) caused by poor aeration or natural organic materials among its examples of what might be considered naturally occurring conditions.

Water quality assessment for the determination of *Aquatic Life* use support applies an approach to the evaluation of dissolved oxygen results that recognizes that morphology and other natural conditions may contribute to the occurrence of low dissolved oxygen in some waters. Specifically, data will be evaluated on a case-by-case basis to determine whether impacts result in impairments to aquatic life and/or other uses, and the degree to which natural conditions contribute to the impacts. This evaluation will be made using best professional judgement, with attention to other available physical/chemical indicators and particular emphasis on biological assessments which are a more direct measurement of aquatic life use support. As the triennial water quality standards rule-making effort moves forward, NYSDEC will evaluate the current dissolved oxygen standards for freshwater in light of available research and adopt a criterion that might better reflect the natural occurrence of low dissolved oxygen in deeper waters and its impact on use support. (See also *Impacts Due to Natural Conditions/Conflicting Uses* in the Listing Methodology.) A general relationship between dissolved oxygen data, water chemistry and aquatic biology and assessed impacts to aquatic life use support is shown in Table 8.

Impacts from Low/High pH on *Aquatic life Use Support*

One important chemical indicator for evaluating *Aquatic Life* use support is pH. Specific criteria regarding the use of pH data to determine *Aquatic Life* use support is applied to waterbodies, particularly lakes and ponds, that are

[7] Both Vermont and Pennsylvania allow for seasonal and periodic variations in hypolimnetic dissolved oxygen (perhaps as low as 0 mg/l) if biological sampling reveals a healthy aquatic (marcoinvertebrate, fish) community. Rhode Island also recognizes that D.O. measurements should not exceed the criteria "except as naturally occurs." And New Hampshire states that "exceedances of most water quality criteria due to naturally occurring conditions are not considered violations of water quality standards."

Table 14 Aquatic Life Use Support/D.O. Assessment Criteria

Lake/River Conditions (Dissolved Oxygen, Water Chemistry, Aquatic Biology)	WI/PWL Use Impact	
	Severity	Documentation
Dissolved Oxygen not meeting standards is consistent over depth, season and/or area.	Impaired	Known
Dissolved Oxygen not meeting standards periodically and/or not consistent over depth, season and/or area, and other indicators (water chemistry, aquatic biology) suggest impairment.	Impaired	Known
Dissolved Oxygen not meeting standards periodically and/or not consistent over depth, season and/or area, and no other indicators or use support/impairment are available.	Stressed *	Possible *
Dissolved Oxygen not meeting standards periodically and/or not consistent over depth, season and/or area, and other indicators more representative of conditions suggest no impairment. Possible natural condition	Stressed or No Known Impact	Known Suspected, or Possible
Dissolved Oxygen typically meets standards (> 90%), and other indicators (chemistry, aquatic biology) suggest no impairment.	No Known Impact	Known, or Suspected
Dissolved Oxygen not meeting standards, but limited data (single sampling event or single point not representing whole waterbody)	Stressed *	Possible *
Dissolved Oxygen standards are consistently met.	No Known Impact	Assessment: *Monitored*

* Waters assessed as Stressed/Possible are listed as *Waters Needing Verification of Impact* and reported as *Integrated Reporting Category 3 - Waters with Insufficient Data*.

subject to atmospheric deposition/acid rain. Because of the extent and significance of this issue, extensive chemical sampling efforts to monitor the pH of streams, lakes and ponds in the state have long been in place. The *Aquatic Life* use support/pH criteria takes advantage of the considerable amount of study and available chemical (pH) data. These efforts provide strong evidence that pH levels that fall somewhat outside the 6.5 to 8.5 range specified in NYS water quality standards are still supportive of aquatic life. As is the case with low dissolved oxygen (cited above), other states as well as USEPA have recognized the occurrence of natural conditions that may result in low pH levels.

Water quality assessment for the determination of *Aquatic Life* use support with regard to pH results also relies on best professional judgment. As with dissolved oxygen data, pH data will be evaluated in light of all other available data (including biological assessments) on a case-by-case basis using best professional judgment. (See also *Natural Conditions* in the Listing Methodology.)

The general relationship between pH monitoring data and the assessed impacts to aquatic life is shown in Table 9. Note that waters having pH between 6.0 and the minimum pH water quality standard of 6.5, but where biological sampling suggests that aquatic life is supported, may be listed as *Waters Needing Verification of Impact.* This is consistent with the *weight of evidence* approach (outlined above) and recognizes that because biological samples represent an integrator of all water quality conditions and are also a direct measurement of aquatic life, biological assessments are often given more weight in evaluating *Aquatic Life* use support.

Table 15 Aquatic Life Use Support/pH Assessment Criteria

Lake pH/Fishery Assessment	WI/PWL Use Impact	
	Severity	**Documentation**
pH values less than 5.0 or greater than 10.0	Precluded	Known
pH values between 5.0 and 6.0 or between 9.0 and 10.0	Impaired	Known
pH values between 6.0 and 6.5 or between 8.5 and 9.0, and fish/biological surveys indicate a fishery/aquatic life impact.	Impaired	Known or Suspected
pH values between 6.0 and 6.5 or between 8.5 and 9.0, but fish/biological surveys indicate no fishery/aquatic life impact	Stressed	Known Suspected, or Possible *
pH values greater than 6.5 and less than 8.5	No Known Impact	Assessment: *Evaluated*

* Waters that have pH above 6.0 and below 6.5 and where biological sampling suggests that aquatic life is supported may be listed as *Waters Needing Verification of Impact*.

Note about *Episodic Acidification*

Episodic Acidification refers to short-term decreases in acid neutralizing capacity (ANC) that may occur during high streamflow events (i.e., spring runoff, snowmelt). Although these events are periodic, bioassays and other fish studies show that the impact on the fishery can be significant and longer lasting. The severity of the impact may result in precluded–rather than merely *impaired*–aquatic life, even though episodic acidification occurs over a short time period. This situation represents an exception to the strict application of the Priority Waterbodies List (PWL) definitions for a precluded use (frequent/persistent water quality condition) and an impaired use (occasional water quality conditions).

Site Specific Factors

The USEPA policy also recognizes the difficulty and time involved in resolving conflicting results that might be due to site-specific environmental factors. In these cases, site-specific criteria, use attainability analysis or re-evaluation of a standard may be needed to determine use support. Because these efforts may require additional monitoring, USEPA suggests use of an assessment category of *Monitoring Insufficient to Determine Impairment*. This category corresponds to the WI/PWL category of *Segments Needing Verification of Impact/Impairment*, and allows for the deferring of a use support decision until appropriate evaluation is complete.

Natural Resources Habitat/Hydrologic Uses

In an effort to better incorporate wetlands and other natural resources concerns into the water quality assessments, the water use category of *Natural Resources Habitat/Hydrology* uses was recently added to the list of uses to be assessed. This category recognizes that, in some waterbodies, water quality may be appropriate to support uses, but various other conditions, such as habitat, streamflow, invasive species, and so on, result in degradation of natural resources (i.e., fish and wildlife populations). Additionally, hydrologic conditions can have a negative impact on wetland uses such as flood protection, erosion control, nutrient recycling and surface and groundwater recharge. This category may also be used to capture impacts to various water quantity and flooding/flood plain issues including excessively low flows, increased peak flows, alterations to the frequency, duration and timing of floods and loss of flood storage.

For many impacts to *Natural Resources Habitat/Hydrology* use support, the situation is more clearly defined by the cause or source of the problem, than by the use affected. Such causes/sources include dredging, draining, excavation and/or filling of wetlands, stream channels, lakes/ponds; stream widening; stream downcutting; sediment embedded-

ness; other losses of wetlands; habitat fragmentation; loss of riparian vegetation or upland buffer zones. Generally, *Natural Resources Habitat/Hydrology* use impacts and impairments are more likely attributed to *"pollution"* (i.e., a condition related to the waterbody) rather than a *"pollutant"* (i.e., a substance/contaminant in the waterbody).

While waterbody assessments include impacts to *Natural Resources Habitat/Hydrology*, specific criteria for *Natural Resources Habitat/Hydrology* use support have not yet been developed.

Aesthetics

An evaluation of waterbody support of *Aesthetics* is much more subjective than those for the other assessed uses. Because of this subjectivity and the difficulty in assigning a level of severity of impacts to aesthetics, available choices for the assessment of aesthetics are limited to *No Known Impact* and *Stressed*. Due to the subjectivity and the limitations on the level of severity, there is no specific assessment criteria to determine support of aesthetics. Instead, the assessment of *Aesthetics* use support should reflect available objective information (CSLAP Lake Perception Surveys, preponderance of citizen complaints, etc).

Presumed Assessments

While the great majority of waters in New York State are thought to support a variety of uses, because of limited monitoring resources and the emphasis on monitoring in priority/problem waters documentation of good quality waters has been generally lacking. This shortcoming was addressed in previous 305(b) assessments by assuming that waterbodies were fully supporting uses, unless there was information to the contrary. However, USEPA has determined such "presumed" assessments to be unacceptable. NYSDEC also recognizes the need to increase efforts to document water quality in the great number of waterbodies that do support uses in order to provide a more balanced picture of water quality in the state.

Recent modifications to the NYSDEC Division of Water Statewide Waters Monitoring Program (SWMP) include an expanded biological screening component. This effort uses a fairly simple but effective set of on-site assessment criteria based on the presence/absence of key macroinvertebrate indicator species. Where the assessment criteria are met, the waterbody is assessed as having *No Known Impacts*. Where the criteria are not met, possible water quality problems are evaluated using more intensive sampling methods to collect more complete data.

A similar effort is being developed and implemented to evaluate all currently unassessed lakes in the state. This effort relies on basic water chemistry sampling in conjunction with visual assessments of aesthetics and recreational use support.

These screening efforts, which greatly increase the number of sites assessed in a basin study area, reflect the incorporation of a "census" approach into the SWMP and are key components in the state's goal of providing a comprehensive assessment of its waters.

Pollutants (Causes) and Sources of Water Quality Impacts

In addition to providing assessments of waterbody use support, the WI/PWL assessments also includes information regarding the likely pollutants/causes and sources that are responsible for water use impacts. These pollutant and source identifications are derived from a number of information sources including Impact Source Determinations conducted during biological sampling, water chemistry data collected during Intensive Network Monitoring, or other available monitoring data. In many cases, monitoring focused on the specific pollutants and sources is not available. In the absence of any such data, best professional judgment based on surrounding land use may be used to identify possible causes and sources.

The listing of specific pollutants and sources includes an indication of the degree to which they are thought to contribute to water quality problems. The impact of all listed pollutants and sources are characterized as being

Known, *Suspected*, or *Possible*. Since it is common for multiple pollutants and sources to be indicated as contributing to a water quality impact, each identified pollutant and source is also listed as either a *major* or *minor* contributor to the impact, based on best professional judgment. Note that the designation *major* is assigned to pollutants and sources that significantly contribute to the most severe water quality impacts/impairments affecting the segment; pollutants and sources contributing to lesser impacts are listed as *minor*.

National (USEPA) reporting guidance suggests that state databases specify which uses are affected by which pollutants, and which sources contribute each pollutant. However the New York Statewide Water Monitoring Program does not routinely focus on pollutant identification and source trackdown to a degree that this level of precision is known for most waters. Pollution identification and source trackdown is typically a more resource-intensive effort reserved for special situations. In its national reporting to USEPA, New York State provides data that links sources to pollutants and pollutants to use impacts. But these linkages are usually broadly interpreted and typically reflect that most sources contribute varying degrees of each pollutant and each pollutant has some influence on all impacted uses.

Resolution/Management Information

The WI/PWL database also allows for the tracking of information relating to management and status regarding the resolution of water quality impacts for each waterbody. This information includes:

- Resolvability indicates where a waterbody needs additional study, the development of a strategy, implementation of a strategy, or verification of the effectiveness of an implemented strategy. In some cases a water quality impact may be deemed *Not Resolvable* at this time due to technical and/or economic limitations or if the impact is the result of natural conditions or conflicting uses.
- Status of Verification refers to the specific aspect of the waterbody that needs further study. The verification effort may need to focus on the existence of an impact, the pollutant/cause of a known impact, the source of a known pollutant, or the development of a management strategy to address the problem.
- Lead Agency/Office indicates the specific government agency, office or other group that has primary responsibility for managing/addressing the impact to the waterbody.
- Resolution Potential is used to reflect the degree to which the expenditure of available NYSDEC resources on the waterbody or water quality issue is appropriate. Resolution Potential reflects the level of public interest, the expectation that measurable improvements can be reasonably achieved, and the appropriate role for NYSDEC.
- TMDL Note indicates the status of planned and/or ongoing Total Maximum Daily Load activities, if any.

Such information allows NYSDEC to better prioritize monitoring, restoration and protection activities, target the expenditure of limited resources to those waters where there is greatest public interest and/or the expectation that measurable improvements can be achieved, and track progress toward water quality improvement and problem resolution.

Section 303(d) Listing Methodology

The Clean Water Act, in Section 303(d), requires states to identify and prioritize waterbodies for which technology-based effluent limitations are not stringent enough to attain and maintain applicable state water quality standards. These impaired waters – which require a Total Maximum Daily Load (TMDL) or other restoration strategy – are compiled every two years in the states' Section 303(d) Lists. Presented below is the New York State Section 303(d) *Listing Methodology* – which guides the development of the New York State *Section 303(d) Impaired/TMDL Waters List*. This Listing Methodology builds on the monitoring data/information and assessment decisions that come out of the state Monitoring Strategy and Assessment Methodology for the updating of the NYSDEC Waterbody Inventory and Priority Waterbodies List.

By the time the biennial updating of the New York State Section 303(d) List begins, considerable monitoring activity and the assessment of monitoring data that drives the development of the List has been largely completed. The New York State *Monitoring Strategy* and the *Assessment Methodology* outline the planning, collection, and evaluation of all existing and readily available water quality data and information. Those monitoring and assessment efforts culminate in the periodic updating of the Water Inventory/Priority Waterbodies List (WI/PWL) Basin Reports. The biennial report on the quality of the state's waters, as required in Section 305(b), is the compilation of the most current WI/PWL Basin Reports. The list of waterbodies to be included on the New York State Section 303(d) List is also drawn from the updated WI/PWL assessments. The use of the WI/PWL assessment process as the basis for Section 305(b)/303(d) Integrated Reporting activities results in greater consistency and efficiency across these programs than would be the case if separate water quality assessments – independent of the WI/PWL – were conducted for Integrated Reporting purposes every two years.

This Listing Methodology describes the Integrated Reporting Use Attainment Categories used by USEPA to report nationally on the quality of all waters under Section 305(b). More importantly the methodology also outlines the relationship between the WI/PWL Water Quality Assessment Categories used to characterize waterbodies (detailed in the *Assessment Methodology)* and the national Integrated Reporting Use Attainment Categories. Guidelines for moving from the WI/PWL assessments toward making final Section 303(d) listing decisions, and various other issues that affect those decisions are discussed in this methodology as well.

Availability for Public Comment

When compiled, the New York State *Draft* Section 303(d) List of Impaired/TMDL Waters is presented for Public Notice, and an appropriate period for the receipt of and response to written comments regarding the *Draft* List is announced.[1] However, as noted above, much of the discussion and decisions regarding which waters are impacted and/or impaired – and which are candidates to be included on the Section 303(d) List – takes place during the water quality assessment process. Consequently while written comments during the Section 303(d) List public notice and comment period are welcome, greater participation in the entire Comprehensive Assessment Strategy – including the monitoring and particularly the assessment and WI/PWL update activities which precede the compilation and submission of the Section 303(d) List – is equally (perhaps more) important and highly encouraged.

[1] If the *Assessment Methodology* and/or *Listing Methodology* used to develop the Section 303(d) List have been significantly revised since the previous listing cycle, these documents will also be made available for public comment, as appropriate.

In order to effectively and efficiently manage the monitoring and assessment effort, NYSDEC uses a rotating basin approach that evaluates water quality in two or three of 17 drainage areas in the state each year. This allows for coverage of the entire state over a five year period. However, NYSDEC also recognizes that there may be instances where the updating of specific waterbody assessments outside the rotating basin schedule is appropriate. To address this occasional need, **NYSDEC has establish September 30 prior to the issuing of a Section 305(b)/303(d) Integrated Report as the "cutoff" date for submitting data and information to be considered for inclusion in the Section 305(b)/303(d) assessment.**

Establishing this cut-of date will allow an opportunity to consider new or more recent data for waters that may not be scheduled for re-assessment until after the Section 303(d) List is issued. Additionally, the six months between a September 30 cut off date and the April 1 date the list is due to be submitted allows for consideration and comment by all parties on any revised re-assessment. As noted above, the WI/PWL update process includes a public participation and review component. The September 30 date allows time to provide that same level of public input.

Standards Attainment Categories

In October 2001, USEPA issued integrated monitoring and assessment guidance to the states encouraging the consolidation of methodologies for the assessment of all waters (Section 305(b) reporting) and the identification of impaired waters under Section 303(d). This guidance established five (5) Integrated Reporting Use Attainment Categories (IR categories) which are to be used to characterize the degree of use support and standards attainment for all waters. The IR categories are outlined below.

Waters Attaining All Standards (IR Category 1) describes waters where data and information indicates all standards are met and appropriate uses are supported, and no standards or uses are threatened.

Waters Attaining Some Standards (IR Category 2) describes waters where data and information indicates standards are met and appropriate uses are supported (and none are threatened), but where some standards/uses have not been fully assessed due to insufficient data/information.

Waters with Insufficient Data (IR Category 3) describes waters where insufficient or no data is available to make a determination of standards attainment and use support.

Impaired/Threatened Waters Not Requiring a TMDL (IR Category 4) describes waters where standards are not being met and/or uses are not supported, but where TMDL development is not necessary because:

a) a TMDL has been completed, or
b) other actions required by federal, state and/or local agencies are more appropriate than a TMDL and are expected to result in water quality improvement, or
c) the impairment/threat is attributed to *pollution* (such as flow alteration, hydrologic modification, degraded habitat, exotic, invasive and/or non-native species, or other cause not associated with a contaminant), rather than a specific *pollutant*, that is suitable to address through development of a TMDL.

Impaired/Threatened Waters Requiring a TMDL (IR Category 5) describes waters where standards are not being met and/or uses are not supported, and where TMDL development is an appropriate response to the impairment/threat.

Although the New York State WI/PWL assessment categories differ from the Integrated Reporting categories, the WI/PWL assessment information captures the same waterbody use support information reflected in the IR categories. As a result, the IR categories correlate well with the *severity of water quality*

problem and *level and documentation* used in the WI/PWL assessments. The general relationship between the IR categories and the WI/PWL severity/documentation information are outlined in the table below. A more detailed discussion of the relationship between the IR categories and the WI/PWL assessment information is presented below.

Table 16 WI/PWL Use Support/Severity/Documentation and USEPA 305(b) Integrated Reporting Categories

Severity of Problem	Level of Documentation	USEPA Integrated Reporting Categories
Precluded	Known	Impaired/Threatened Waters [1]
Impaired	Known, Suspected	
Stressed	Known, Suspected	Waters Attaining All or Some Standards [2]
	Possible	Waters with Insufficient Data
Threatened [3]	Known	See Below[4]
	Suspected	Waters with Insufficient Data
	Possible	Waters Attaining All or Some Standards [2]
No Known Impact/Impairment		Waters Attaining All or Some Standards [2]
UnAssessed Waters		Waters with Insufficient Data

1 Determination as to whether a TMDL is required will be made on a case-by-case basis.

2 Determination as to whether all or some standards are attained will be made on a case-by-case basis.

3 In order to support restoration and protection strategies, the WI/PWL uses a broader definition of *Threatened* to track potential threats to waters that do not meet the EPA threshold of data that reveals a declining water quality trend; hence the assignment of the appropriate Use Attainment Category for WI/PWL *Threatened* waters is dependent upon the Level of Documentation.

4 Waters listed in the WI/PWL as having Known Threats to uses will be evaluated on case-by-case basis to determine if the threats meet the EPA threshold for a threatened water and whether the water should be reported as a Category 4 or 5 waters and considered for inclusion on the Section 303(d) List.

Fully Supporting Waters

The Integrated Reporting categories of *Waters Attaining All or Some Standards* (IR Categories 1 and 2) include waters listed in the WI/PWL as having *No Known Impact/Impairment*. In addition WI/PWL waters with uses assessed as *Stressed* (*Known* or *Suspected*) – these are categorized on the WI/PWL as *Waters Having Minor Impacts* – are also assigned to one of these Integrated Reporting categories. Although *Stressed* waters exhibit indications of minor water quality impacts, these waters meet water quality standards and fully support uses. Consequently, *Waters Attaining All or Some Standards* are the most appropriate of the available USEPA IR categories for these waters.

Although *Stressed* waters exhibit indications of minor water quality impacts, these waters meet water quality standards and fully support uses...Consequently *Waters Attaining All or Some Standards* are the most appropriate of the available USEPA categories for these waters.

Determinations as to which of the two *Waters Attaining Standards* categories (i.e., *IR Category 1 - Waters Attaining All Standards* or *IR Category 2 - Waters Attaining Some Standards*) are more appropriate are made on a case-by-case basis. Class C waters (or similar water classes where best uses are aquatic life use support, recreation and fish consumption) with *No Known Impact/Impairment* are often categorized as *Attaining All Standards*. This is because assessments for these waters typically include biological screening, and a favorable biological screening has at least some relationship to these other uses being supported. On the other hand, Class A and B (and similar) waters which support additional uses – namely drinking water supply and public bathing, respectively – require use-specific monitoring information and assessment. Because assessment of these additional uses require more use-specific indicators – indicators that are not a routine component of routine statewide monitoring efforts – it is more likely that some of the wider range of uses for these waters are not evaluated. Consequently, these waters are more likely to fall into the *Attaining Some Standards* category unless additional monitoring information specific to assessing these uses is available.

Waters Not Supporting Uses

The two Integrated Reporting categories that capture *Impaired/Threatened Waters* (IR Categories 4 and 5) correspond to waters listed in the WI/PWL as having *Precluded* and/or *Impaired* uses. These waters are categorized on the WI/PWL as *Impaired Waters*. Determinations as to which of the two *Impaired/Threatened Waters* categories (i.e., *IR Category 4 - Impaired/Threatened Waters Not Requiring a TMDL* or *IR Category 5 - Impaired/Threatened Waters Requiring a TMDL*) are more appropriate are made on a case-by-case basis. Additional discussion regarding this determination is presented later in this methodology.

The two Integrated Reporting Use Attainment Categories that capture *Impaired/Threatened Waters* correspond to waters listed in the WI/PWL as having *Precluded* and/or *Impaired* uses. Determinations as to whether a waterbody requires a TMDL are made on a case-by-case basis.

Waters with Insufficient Data

Waters listed in the WI/PWL as *UnAssessed Waters* or as corresponding to *Waterbody Impacts Needing Verification* (these include *Stressed/Possible* and *Threatened/Suspected* waters) are generally assigned to the IR Category *Waters with Insufficient Data*. The inclusion of an IR Category of *Waters with Insufficient Data* recognizes that assessment of a waterbody as impaired should include the attainment of a minimum threshold of confidence and certainty that such a designation is appropriate for the waterbody. Maintaining that minimum threshold is all the more appropriate when one considers that the threshold for delisting waters once they are listed is quite high and requires significant documentation of water quality improvement. Therefore, it is NYSDEC's philosophy that the Section 303(d) List be reserved for those waterbodies where impairment of uses is clear. Waters where impairments are suggested but not confirmed are more appropriately included as IR Category 3 - *Waters with Insufficient Data* to make a determination. Additional monitoring and verification of conditions in these waterbodies will be conducted in accordance with New York State Monitoring Strategy. Meanwhile, resources for development of TMDL and other restoration strategies can be more effectively directed to those water quality problems where benefits are more certain.

Threatened Waters

The assignment of waters listed in the WI/PWL as *Threatened* to an appropriate USEPA IR category is dependent upon the WI/PWL level of documentation for the threat. This is because the use of the term "threatened" in the WI/PWL is much broader than USEPA's use of the term, encompassing a wider-range of threats.

To satisfy the more stringent USEPA definition of a "threatened" water, available data must indicate a declining trend in water quality that is predictive of the non-attainment of standards in the future–specifically, by the end of the current listing cycle. Only WI/PWL *Threatened* waters with a level of documentation of *Known* potentially meet this threshold. Consequently, only waters listed on the

WI/PWL as ***Known*** to be *Threatened* are considered for assignment to the *Impaired/Threatened Waters* IR categories. Whether these waters are, in fact, designated as *Impaired/Threatened* is dependent upon the rate of water quality decline (i.e., does the water meet the USEPA condition that non-attainment is expected by the end of the current listing cycle?), which will be evaluated on a case-by-case basis.

Waters listed in the WI/PWL as *Threatened*, but with a level of documentation of *Suspected* or *Possible*, reflect intuitive or potential threats, and do not meet the USEPA threshold of "threatened." WI/PWL *Threatened* waters characterized as *Suspected* have some reasonable evidence to suggest declining water quality but results remain inconclusive. Consequently *Threatened* ***Suspected*** waters are typically designated as IR Category 3 - *Waters with Insufficient Data. Threatened* ***Possible*** waters, where anecdotal evidence (with limited documentation) suggests a threat, are assigned to the *Waters Attaining All/Some Standards* IR categories, until additional information allows for better quantification of the threat.

Impaired/Threatened Waters Not Requiring a TMDL

Waters assessed as *Impaired/Threatened Waters* are designated as either requiring a TMDL (IR Category 5) or not requiring a TMDL (IR Category 4). Waters assessed as *Impaired/Threatened Waters* but where TMDL development is not the most appropriate response to the water quality issue are assigned to IR Category 4 and are not included on the Section 303(d) List. (See also *Appendix: Comments on Listing/Delisting Decisions and Delisting Due to Other Required Control Measures*.) These *Impaired/Threatened Waters Not Requiring a TMDL* fall into one of the following three sub-categories.

Impaired/Threatened Waters where a TMDL is Developed and Being Implemented (IR Category 4a)
Once a TMDL has been developed and approved, the waterbody is no longer included on the Section 303(d) List. Progress regarding completion of TMDLs and the delisting of waters where TMDLs are in place will be evaluated with the development of each subsequent 303(d) List.

Impaired/Threatened Waters where Other Controls are More Suitable (IR Category 4b)
This sub-category recognizes that for some water quality impairments and threats, actions other than TMDL development provide a more appropriate and effective response. Assignment of waters to this sub-category is based on the availability and appropriateness of other strategies that are expected to be more effective in addressing impairments/threats than TMDLs. These strategies may include the correction of failing or inadequate treatment facilities, implementation of best management practices (BMPs) to specifically address impairments, zoning restrictions or other local initiatives. Progress and effectiveness of these strategies – relative to the development of a TMDL – will be evaluated during the development of each subsequent 303(d) List.

Waters Impaired by Pollution, Not by Pollutant(s) (IR Category 4c)
Waterbodies assigned to this sub-category are not meeting standards due to *pollution* and/or no specific *pollutant* is contributing to the impairment. Because TMDLs represent a pollutant-specific approach, the development of a TMDL for these waters is NOT required. Specific examples of impairments/threats that fall into this sub-category include, but are not limited to:

- exotic, invasive, non-native species,
- flow alteration or other hydrologic modification, or
- natural conditions or conflicting use.

Section 303(d) Listed Waters

For waters where none of these three conditions apply, the waterbody/pollutant is designated an *Impaired/Threatened Waters Requiring a TMDL* (IR Category 5). ***This list of waters – that do not meet water quality standards in spite of technology-based effluent limits and for which TMDL development or other strategy to attain water quality standards is required – represents the New York State Section 303(d) List.***

Prioritization of Section 303(d) List Waters

The Section 303(d) List of *Impaired/Threatened Waters* requiring a TMDL or other strategy includes an indication of priorities for the development of TMDLs for waters/pollutants. While all waters on the Section 303(d) List need to be addressed, the identification of those specific waterbodies/pollutants that are high priority for TMDL development during the next 2-year reporting cycle reflect the understanding of the water quality problem and sources, the availability of the data necessary to develop a TMDL, the value (i.e., presumed effectiveness) of a TMDL toward addressing the problem, and other factors.

To provide a more general sense of these factors and their impact on priorities and the timing of TMDL development, the waters on the New York State Section 303(d) List are segregated into sub-parts. These sub-parts allow for clarification of widely differing conditions as well as limitations and other circumstances which affect the scheduling and development of TMDLs or other strategies. These sub-parts are outlined below:

Part 1 - *Individual Waterbody Segments with Impairments Requiring TMDL (or other strategy)*

These *Impaired/Threatened Waters* have been identified by the state to have use impairments and to need a segment-specific TMDL or other water quality restoration strategy. TMDLs or other appropriate strategies for these waters and specified pollutants are either currently being developed by NYSDEC, or they are scheduled for future development by NYSDEC.

Part 2 - *Multiple Segment/Categorical Impaired Waterbody Segments*

These are *Impaired/Threatened Waters* that also require a TMDL or other strategy to attain water quality standards. However, because these waters are impaired by similar pollutants/sources it may be more effective to develop a TMDL or other approach to address the cause and/or source of the impairment of these multiple rather than the specific waterbody. Due to the complexity of the problem and number of segments involved, development of multiple segment TMDLs/strategies for these waters may require additional time and involvement of agencies (USEPA, others) outside NYSDEC in order to complete.

These *Multiple Segment/Categorical Impaired Waterbody Segment* groupings include:

- Atmospheric Deposition (Acid Rain) Waters - where much of the pollutant source lies outside of New York State and for which the issue requires a national effort/program. TMDLs for some of these waters have been developed. But the implementation of the TMDL and restoration of these waters will require USEPA leadership at the national level.
- Fish Consumption Waters - which in many cases are the result of either historic/legacy pollutants (PCBs, dioxins, mirex, etc.) in bottom sediments, the continuing discharge of which has effectively been regulated, or; atmospheric deposition pollutants (mercury) that must, like acid rain waters, be addressed nationally.
- Shellfishing Waters - where this specific use is restricted due primarily to urban/stormwater runoff sources. A pilot TMDL has been developed (Oyster Bay) and has been applied to other shellfishing impaired waters. The scheduling of TMDL development for the remaining waterbodies is dependent upon available resources as well as the implementation and evaluation of the impact of new stormwater regulations which are expected to address, at least in part, this water quality issue.

Part 3 - *Waterbodies for which TMDL Development May be Deferred*

These are waters where the scheduling of TMDL development may be deferred, pending verification of the suspected impairment, or verification of the specific pollutant/cause, or evaluation of the effectiveness of other restoration measures already underway. Part 3 of the list is further divided into three components. These are outlined below:

- *Waterbodies Requiring Verification of Impairment*
  For some listed waterbodies, there is some degree of uncertainty as to whether the water quality impacts rise to the level of an impairment. As discussed earlier in this methodology, waters where there such uncertainty exists are typically categorized as *Waters with Insufficient Data* (Category 3). However a number of waters with suspected impairments are included on the current Section 303(d) List. In most cases these are previously listed waterbodies for which more recent information suggests that the waterbody may not be impaired, but where such information is insufficient to meet the requirements for de-listing the waterbody. In keeping with the requirements for de-listing, these waters continue on the Section 303(d) List. However it may be appropriate to defer the development of TMDLs to address these suspected impairments until such impairments can be verified.
- *Waterbodies Requiring Verification of Cause/Pollutant*
  In some cases, water quality impairments may be identified, yet there may be uncertainty as to the specific cause/pollutant regarding that impairment. Before prioritization and scheduling of TMDL development of these waters can be conducted, the cause/pollutant needs to be verified. Waters requiring this verification have been segregated to this part of the list pending such verification.
- *Waterbodies Pending Implementation/Evaluation of Other Restoration Measures*
  For some impaired waters, considerable measures are in place or underway that are expected to address water quality impairments. Where it can be shown that such measures will result in achieving water quality standards and restoration of uses in the waterbody, these waters can be d-listed as Category 4b (*Impaired/Threatened Waters where Other Controls are More Suitable*) waters. However in some case the waters and impairments are sufficiently complex that such a demonstration is not possible. Nonetheless proceeding with development of a TMDL in these instances would provide no additional benefit to the work that is already underway. Consequently, TMDL development for these waters may be deferred until the effect of other activities can be evaluated. (See also *Appendix: Comments on Listing/Delisting Decisions and Delisting Due to Other Required Control Measures*)

Other Listing Issues

In compiling the Section 303(d) List a number of other issues which have an impact on listing decisions should be considered. These issues are discussed below.

Delisting of Waters from Section 303(d) List

The removal of waterbodies from the list (delisting) and movement of waterbodies within the list is governed by specific guidelines. The most common justification for delisting a waterbody from the Section 303(d) List is the completion of a TMDL to address the listed pollutant. Once a TMDL has been developed for a water on the Section 303(d) List, the water is moved from Category 5 to an *Impaired/Threatened Water Not Requiring a TMDL* (Category 4a) and is, by definition, no longer included on the list. Note that these waters continue to be considered to be impaired (pending future assessment that shows standards are met and uses are fully supported), but they are no long appropriate for listing on the Section 303(d) List of Impaired Waters Requiring a TMDL. The delisting of waters for which TMDLs have been developed will occur during the compilation of the next Section 303(d) List after the TMDL has been approved.

Delisting of a previously listed water *prior* to the development of a TMDL can occur only 1) if the water is shown to be meeting all applicable water quality standards, or 2) if, upon re-examination, the original basis for listing the water is determined to be inaccurate. Based on these thresholds, the following presumptions guide delisting of waters for the three types of assessment criteria outlined in the Assessment Methodology.

Use Restriction Orders

For listings based on use restriction orders, waters will be delisted if the restriction is lifted by the issuing authority. This applies to drinking water advisories, public bathing beach closures, fish and shellfish consumption advisories. The lifting of a restriction order represents sufficient evidence that standards that previously were not being met are now being met. As a result, this justification for delisting corresponds to the first of the two thresholds for delisting: that the water is meeting applicable water quality standards.

As long as a use restriction order remains in effect, the waterbody cannot be delisted. Subsequent monitoring data showing water quality improvement and the attainment/maintenance of standards alone is not sufficient to delist; that data will be forwarded to the appropriate agency for consideration regarding the lifting of the use restrictions. If use restriction orders are modified, the degree of use impairment should be re-evaluated in light of the assessment methodology to determine the appropriateness of continued listing. For example, if a seasonal shellfishing restriction for a listed waterbody is lifted due to improved water quality but an administrative closure in the waterbody remains in effect for portion of the waterbody due to proximity of wastewater discharges, the water may be delisted since the assessment methodology indicates that administrative closures alone do not result in listing.

Numerical and Narrative Standards and Criteria

For listings based on the failure of the water to meet water quality standards, delisting requires more recent monitoring data showing that the standards are now being attained and maintained. In most of these delistings, measurable evidence of a sufficient water quality improvement is needed. However, if the applicable water quality standard or criteria is revised to be less stringent, if site-specific criteria are developed for the waterbody, or if other water quality measures are determined to be more appropriate, and existing data meets the new threshold, then waters may be delisted without a documented improvement in water quality.

Surrogate Water Quality Indicators

For listing based on surrogate water quality indicators, requirements for delisting are similar to those for listing based on standards and criteria. Generally, delisting requires monitoring data showing sufficient water quality improvement and that conditions resulting in the original listing (as outlined in the Assessment and Listing Methodologies) are no longer present. However, if more appropriate and/or accurate indicators are developed and implemented, waters may be delisted without documented water quality improvement as reflected in the original surrogate indicators.

The justification for delisting waters based not on water quality improvement, but on changes in water quality standards, criteria and/or indicators corresponds to both of the two thresholds for delisting outlined above. In such cases the waters are, in fact, *meeting all (new) applicable water quality standards*. Additionally, in these cases the *basis of the original listing* (i.e., the standard, criteria or indicator) has, in fact, *been re-evaluated and determined to be inaccurate* (or, at a minimum, less accurate than the revise standard, criteria or indicator).

Other reasons for the delisting of Section 303(d) List waters without documentation of specific water quality improvement include:

Reassessment Based on New Methodology

Waters previously listed based on water quality assessment guidance pre-dating the more recent *Assessment Methodology* should be re-evaluated. If any of these waters do not meet the new thresholds for listing, they will be proposed for delisting. Justification for such delistings from Part 3a of the List will reflect that the waterbody is meeting applicable water quality standards and that the original basis for listing is no longer accurate/appropriate.

Verification of Cause/Pollutant Not Suitable for TMDL Development

As noted previously, some impairments are a result of pollution, rather than a pollutant. Such waters do not require TMDL development. Justification for such delistings from Part 3b of the List where verification of the cause indicates that the impairment is the result of pollution, rather than a pollutant will reflect that the original basis for listing is no longer accurate/appropriate.

Age of Data/Information

Ideally data and information used in the listing decisions would have been collected within the preceding five years (one statewide cycle of the Comprehensive Assessment Strategy rotating basin schedule). However given resource limitations, the size of New York State and the number of waterbodies (nearly 5,000 segments), it is not always possible to assess all waters within one or (in the case of more remote waters) even two five year cycles. Waters with data/information indicating *No Known Impairment* is typically assessed and considered as having no impairment (*Water Attaining All/Some Standards*) for as long as 10 years (2 rotating basin cycles), assuming no subsequently collected data/information contradicts this assessment. Waters assessed as having *No Known Impairment* based on data that is greater than 10 years old may also be considered to continue to have *No Known Impairment* in the WI/PWL if the waterbody segment is more remote and/or it is reasonable to assume – based on best professional judgement – that watershed conditions (land use, development, etc) have not changed significantly. However waters that have not been assessed in ten years should be considered *evaluated* rather than *monitored* (*evaluated* and *monitored* assessments are discussed in the Assessment Methodology). For waters previously assessed as having *No Known Impairment* but where watershed conditions have changed and there is no more recent verification of fully supporting water quality should be listed as *UnAssessed* in the WI/PWL and assigned to the *Waters with Insufficient Data* category.

Once a waterbody is assessed as an *Impaired Segment* and included on the Section 303(d) List, the water must not be removed based solely on passage of time that results in the initial assessment data/information becoming more than 10 years old. Delisting of waters requires subsequent data/information that corresponds to the delisting justifications outlined above. Absent such a delisting justification, waters previously assessed as impaired will continue to be listed.

Impacts Due to Natural Conditions/Conflicting Uses

Waters where impacts result from natural conditions, unrelated to anthropogenic sources (such as rivers that carry high sediment loads that may discourage recreation, low dissolved oxygen at lower depths in lakes, habitat that does not support diverse biological communities, and so on) are evaluated on a case-by-case basis during the WI/PWL assessment. Some of these waters may be listed as impaired. However, in other cases where natural conditions cause impacts or impairment, the waters may be listed as *Impaired/Threatened Waters Not Requiring a TMDL* (due to a cause related to pollution rather than a pollutant). For waters where surrogate indicators suggest an impact or impairment due to natural conditions but where there is no specific water quality standards exceedence, the water may be considered to be supporting appropriate uses and not listed. Even in waters where specific water quality standards are not met 100% of the time or in 100% of the waterbody due to assumed natural conditions, the decision to list the water as impaired or not depends on the frequency of non-compliance with standards and/or the degree to which the sampling data is representative of the larger waterbody. It may be appropriate to consider such waters as fully supporting of uses, fully supporting but stressed, or – in cases where there is uncertainty regarding the presence of a natural condition – the water may be considered to have insufficient data to make a determination.

Similarly, waters where an impact or impairment is due to multiple conflicting uses, both or all of which cannot be reasonably resolved, need to be considered on a case-by-case basis as well. Examples of such conflicting uses include fluctuating flood control reservoir levels that affect aquatic life or the administrative closure of portions of larger waters for shellfishing due to the proximity of recreational boating marinas.

High (Natural) Background Concentrations of Specific Substances

In the past, naturally occurring levels of substances that do not meet water quality standards have been found in some waters of the state. Yet there is little if any measured impact on aquatic life use support and/or other uses that these standards are designed to protect. Because of this discrepancy, evaluation of use support and consideration of these waters for inclusion on the Section 303(d) List should take into account the policy of *Independent Application* and *Weight of Evidence* discussed in the Assessment Methodology. For example, a number of waters were previously listed for iron concentrations above the water quality standard. These substances (as is the case with iron) are given particular attention during the periodic standards review process. (The rule change for the iron standard to a more appropriate value is expected to be approved during the 2008 Water Quality Standards Revision effort.) Evaluation and listing decisions should also reflect the most current thinking regarding what is an appropriate standard for these substances.

For some other substances (lead, phenolic compounds) sampling and analytical procedures have in the past limited the ability to confidently quantify concentrations of the specific fraction defined by the standard (e.g., acid-soluble) or at/near a very low standard. Waters where reported in-stream concentrations (or approximations) relative to standards are not consistent with observed biological effects or other use support information are evaluated for inclusion on the Section 303(d) List on a case-by-case basis.

USEPA's Consolidated Assessment and Listing Methodology (CALM) guidance recognizes the occurrence of conflicting indicators such as those outlined above and proposes approaches to resolve these conflicts. In cases where the conflict may be attributed to artifacts of the data or environmental factors USEPA suggests delaying the classification in order to collect more data, re-evaluate the criteria, investigate site-specific criteria or conduct use attainability analysis. This approach is supported by the Integrated Reporting category of *Waters with Insufficient Data* which tracks these waters until sufficient information is available to determine the attainment status and whether it is to be listed. Because the threshold for de-listing typically requires a demonstration of water quality improvement, it is most appropriate to use this category when there is uncertainty whether current conditions support uses or not.

Waters Needing Verification of Impact/Impairment

In addition to waters with conflicting indicators of use support, impacts based on anecdotal information or insufficient data will be listed in the WI/PWL as *Stressed* (Possible), tracked as *Waters Needing Verification of Impact*, and assigned to the Integrated Reporting Use Attainment Category of *Waters with Insufficient Data*. Because clear evidence of an impairment or non-attainment of standards is lacking, these waters will not be included on the Section 303(d) List. Such waters will be re-evaluated during subsequent rotating basin monitoring and assessment cycles. The reasoning for this approach lies in the difficulty in showing water quality improvement (a requirement for delisting) if there is insufficient baseline information to document an impairment.

Although it has been suggested that *Waters with Insufficient Data* be included on the Section 303(d) List, NYSDEC suggests that the Section 303(d) List should be reserved for waters where there is a clear impairment to uses. The practical effect of not listing *Waters with Insufficient Data* is not significant. Whether the waterbody is listed or not, these waters require additional monitoring to better document water quality conditions before a TMDL can begin to be developed. In accordance with the *Comprehensive Assessment Strategy*, such monitoring will be conducted within 5 years, which, given the likely low priority assigned the water if placed on the list and the resource limitations of the state, equals or improves the time frame for monitoring under a TMDL approach.

Alignment of the Assessment and Monitoring Programs

The proposal for a New York State Comprehensive Assessment Strategy – with a goal of assessing ALL the waters of the state, not just waters with known or suspected impacts – was first presented in the 1998 New York State Section 305(b) Report. The strategy sought to integrate and build on three cornerstones: a rotating drainage basin approach (already in place for the New York State monitoring program), enhanced communication and public involvement in the assessment process, and use of the New York State Priority Waterbodies List (now the Waterbody Inventory and Priority Waterbodies List) to drive the assessment process. The strategy lays out a continuous iterative process that incorporates public and stakeholder input into a thorough updating of water quality information. The strategy also sets out a schedule to complete basin assessments throughout the entire state over a five-year cycle.

The first assessments to reflect the Comprehensive Assessment Strategy (including assessments for waters w/ No Known Impacts) were published in 2001. These assessment addressed the waters of the Lake Champlain, Susquehanna River and Atlantic Ocean/Long Island Sound Basins, and the results of these basin assessment were reported in 2002 Section 305(b) Report. As additional basin assessments were completed, progress toward comprehensive assessment of ALL waters of the state was reported in subsequent Section 305(b) Reports. The increase in the percent of assessed river/stream miles in the state from 7% in 1996, to 18% (2002), 51% (2004) and 62% (2006) reflects this progress.

It was envisioned that comprehensive assessments would be conducted at the conclusion of two-year Rotating Integrated Basin Monitoring Program (RIBS) monitoring cycles, and would result in completed assessments for all 17 drainage basins in the state by 2006. However, while a continuous five-year schedule for updating the basin assessments remains in place, the initial assessments to include the significantly greater number of waters have taken more time to complete than originally planned. However in the most recent two-year 305(b)/303(d) reporting and listing cycle, considerable progress has been made toward completing the comprehensive assessments for the remaining basins and aligning the assessment and the RIBS monitoring efforts.

The 2008 Section 305(b)/303(d) Integrated Report/List reflects comprehensive assessments for six (6) of 17 drainage basins in the state that have been updated since the 2006 report, bringing to ten (10) the total number of basins that have been updated in the five-year cycle between 2002 and 2007. The four remaining basins without comprehensive assessments (Lower Hudson, Ramapo, Housatonic and Saint Lawrence) are scheduled to be completed in the first half of 2008. The three basins with assessments published in 2001 (Lake Champlain, Susquehanna, Atlantic Ocean/Long Island Sound) are also scheduled to be updated in 2008. A revised schedule for Comprehensive Assessment (WI/PWL) Report Updates is presented in the table that follows this discussion. The schedule presents a path for achieving the full alignment of the WI/PWL assessment program with the Division of Water RIBS monitoring program by the next Section 305(b)/303(d) integrated reporting and listing cycle in 2010.

Although the comprehensive assessments for some basins has not been completed, a review of available data for the waters in these basins was undertaken. The focus of this review was to identify clearly impaired waters that, even without the benefit of a comprehensive assessment associated with the WI/PWL update process, are appropriate to include on the 2008 Section 303(d) List. Future comprehensive assessments through the WI/PWL update process may identify additional waters that meet the threshold of impaired waters, and these waters will be included on the next Section 303(d) List. However without the more thorough review and public/stakeholder involvement provided by the comprehensive assessment, it is more appropriate to consider the yet-to-be-assessed waters in these basins to be *Waters with Insufficient Data* to make a determination regarding listing (Integrated Reporting Category 3).

Table 17 Status/Schedule of Comprehensive Assessment (WI/PWL) Report Updates		
Drainage Basin	**Most Recent Update**	**Next Scheduled Update**
Allegheny River Basin	May 2007	2009
Atlantic Ocean/Long Island Sound Basin	April 2002	Summer 2008
Black River Basin	May 2007	2009
Chemung River Basin	May 2007	2009
Delaware River Basin	December 2002	Summer 2008
Genesee River Basin	March 2003	Summer 2008
Housatonic River Basin	June 2000	Winter 2007-08
Lake Champlain Basin	July 2001	Spring 2008
Lake Ontario (Minor Tribs) Basin	August 2007	Fall 2008
Lower Hudson River Basin	June 2000	Winter 2007-08
Mohawk River Basin	April 2003	Fall 2008
Niagara River/Lake Erie Basin	September 2005	Fall 2008
Oswego River/Finger Lakes Basin	December 2007	2009
Ramapo (Hackensack/Passaic) River Basin	June 2000	Winter 2007-08
Saint Lawrence River Basin	May 1999	Spring 2008
Susquehanna River Basin	April 2001	Spring 2008
Upper Hudson River Basin	May 2007	2009

Segmentation of Waterbodies

As discussed in the *Assessment Methodology*, the designation of specific waterbodies in the Waterbody Inventory must strike a balance between being too specific (resulting in more segments than can be assessed with finite resources) and too general (resulting in segments that are too large and diverse and difficult to assess accurately). Determining the specific boundaries for individual waterbody segments is based on a number of considerations, including waterbody type, stream classification, hydrologic drainage, waterbody length/size, and homogeneity of land use and watershed character. Waterbody segments are **not** defined based upon the length/size of area impacted by a water quality problem. Because estimates of the extent of water quality impacts are often inexact and may change regularly, using this information to establish segment boundaries would make the Waterbody Inventory/Priority Waterbodies List considerably more difficult to manage and update, while providing little added benefit. However, some flexibility in the segmenting of

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waterbodies is allowed in order to provide sufficient protection of all waterbody uses.

Generally water quality impairment affecting more than 10% of a waterbody length/area is assigned to the entire waterbody segment in the database. Any limitation regarding the extent of the impairment is noted in the segment narrative. If impairments affect less than 10% of the total waterbody area, the impairment may not be recorded for the entire segment. However, the nature and extent of the impact will also be recorded in the segment narrative. Additionally, if the limited area does not support waterbody uses, the affected area of the segment may be considered for inclusion on the Section 303(d) List.

Transition from the 1998 Section 303(d) List

Recent USEPA guidance regarding integrated water quality monitoring and assessment and the development of New York State's Consolidated Assessment and Listing Methodologies will somewhat alter the process used to compile New York State's Section 303(d) List. The methodologies outlined here rely on recently updated monitoring and assessment strategies for the development of subsequent New York State Section 303(d) Lists. As was discussed previously, these revised strategies have not yet been implemented throughout the state. And while these new strategies are similar, they are not identical to the approaches used to develop the 1998 Section 303(d) List. Consequently, it is possible that waters listed previously may not meet the revised thresholds for listing contained in the new methodology.

However, as stated previously, the delisting of previously listed waters prior to the development of a TMDL can occur only 1) if the water is shown to be meeting all applicable water quality standards, or 2) if, upon re-examination, the original basis for listing the water is determined to be inaccurate. Therefore, any waters on the 1998 New York State list that do not appear to meet conditions for inclusion on subsequent lists will be evaluated on a case-by-case basis. These waters will either be added to the subsequent list (most likely prioritized for TMDL development as *Part 3a - Waters Requiring Evaluation Based on the New Methodology*), or will be submitted for delisting based on the two considerations outlined above.

Other issues regarding the transition from the 1998 Section 303(d) List to subsequent lists are discussed below.

Waterbody Segmentation

Implementation of a more systematic approach to defining the bounds of individual waterbody segments (discussed previously in the Assessment Methodology and Listing Methodology) will result in some inconsistency regarding the number of segments, total area/length affected and the specific waterbody names listed on the 1998 and subsequent Section 303(d) Lists that are not related to changing 303(d)/TMDL status. To address any possible confusion, changes resulting from the new approach to the segmentation of waterbodies are outlined in the final Section 303(d) List.

Acid Rain Segments

The 1998 Section 303(d) List included 388 waterbodies impacted by atmospheric deposition. Because development of a comprehensive monitoring strategy required limiting the WI/PWL database to lakes 6.4 acres or larger, many of these lakes are no longer tracked as individual waterbodies in the database. As a result, the Section 303(d) Lists will not list these smaller lakes individually, but instead will combine them into one listing group: *Smaller Lakes Impaired by Atmospheric Deposition.* Previously listed acid rain lakes greater than 6.4 acres will continue to be evaluated, tracked in the database and, if appropriate, listed individually. Also, to facilitate the transition from the 1998 list, a list of the smaller lakes included in the previous Section 303(d) List but no longer tracked individually will be included as an appendix to subsequent lists.

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Comments on
Listing/Delisting Decisions and
Delisting Due to Other Required Control Measures

The discussion below is taken from the New York State Response to Comments regarding The 2006 NYS Section 303(d) List of Impaired Waters Requiring a TMDL (May 17, 2007). These discussion concern specific listing issues that came up during the development of the 2006 Section 303(d) List and that are also expected to affect the development of future lists.

GENERAL COMMENT on Listing/Delisting Decisions

In responding to the comments received on the 2006 Section 303(d) List, a few broad issues regarding the listing and delisting of waters arose that should be addressed at the outset of this response to the comments. These issues largely concern the intent of the Section 303(d) List. The List is **not** a comprehensive list of waters that meet a threshold of *Impaired*. Rather the List is defined as including only those impaired waters *for which development of a Total Maximum Daily Load (or other restoration strategy) is necessary* to address the impairment and restore the waterbody uses of the water. If a TMDL or other strategy has been developed, or if a TMDL is not appropriate to address the impairment, then inclusion on the List is not appropriate even if the water continues to be impaired.

The most obvious reason for removing a water from the Section 303(d) List (delisting) is because the conditions in that water have improved to the point where the water supports its waterbody uses and no longer meets the threshold of being impaired. A number of those commenting on the proposed List expressed concern that by not listing a specific water, NYSDEC is stating that the water is not impaired. However that is not necessarily true. USEPA regulations and guidance concerning Section 303(d) Listing also recognize specific circumstances when a water that meets the threshold of being impaired should not be included on the Section 303(d) List. These circumstances include:

- Waters where a TMDL has already been developed and approved by USEPA;
- Waters where other required control measures are expected to result in the attainment of applicable water quality standards in a reasonable period of time, and;
- Waters where the impairment is the result of pollution that is not the result of a specific pollutant (substance) and for which a loading (TMDL) cannot reasonably be developed.

In presenting the 2006 Section 303(d) List, New York State is including a supplemental listing of *Impaired/DeListed Waters NOT Included on the 2006 Section 303(d) List*. This listing includes *Other Impaired Waterbody Segments Not Listed Because Development of a TMDL is Not Necessary*. The purpose of this supplement is to provide a more comprehensive inventory of waters in the state that do not fully support waterbody uses and are considered to be impaired, irrespective of whether a TMDL has been completed, some other strategy is more effective than a TMDL, or whether a TMDL is even practical for the specific pollutant of concern. The supplemental listing includes notations indicating the justification for the decision to not include the waterbody/pollutant on the 2006 Section 303(d) List.

Also included in the supplemental listing of *Impaired/DeListed Waters NOT Included on the 2006 Section 303(d) List* is a list of *2006 Delisted Waters (Waters listed in 2004, but that are NOT included in the 2006 Section 303(d) List)*. This listing is included to provide easier tracking of specific waters from the previous (2004) List.

Most of the comments NYSDEC received on the draft Section 303(d) List concerned specific waterbodies/pollutants and the decision whether or not it was appropriate to include them on the List. The listing decisions regarding each of these specific waterbodies/pollutants are outlined in more detail below in the *Response to Comments on Specific 2006 Section 303(d) Listed Waters*. As noted previously, the listing decision for a specific waterbody/pollutant typically hinges on one or more of the following issues:

1. whether water quality impacts meet the threshold of being impaired;
2. whether a TMDL already in place is reasonably expected to address the impairment;
3. whether some other strategy to address the impairment is appropriate/adequate, and/or;
4. whether a TMDL is an appropriate approach to address a particular impairment.

GENERAL COMMENT on Delisting Due to Other Required Control Measures

In the Draft Section 303(d) List, NYSDEC proposed delisting a number of waters due to other significant required control measures that are in place and are expected to address water quality impairments. Two groups of waters in particular were the focus of considerable comment and discussion. One of these was the New York City CSO waters where an Order on Consent between NYSDEC and the New York City Department of Environmental Protection to develop and implement watershed and facility plans to address CSO discharges and bring these waters into compliance with the Clean Water Act. The other group of waters included the reaches of the Upper Hudson River where impairment to fish consumption due to PCB contaminated sediments is being addressed by a Record of Decision calling for the remediation of the river through dredging of the sediments. In both of these instances NYSDEC believes that these other required control measures are the appropriate means to address the water quality impairments, and that restoration of the waters will occur over a period of time that is reasonable, given the magnitude and complexity of the problem. It is also NYSDEC's position that not only would the development of a TMDL provide no additional benefit to the considerable work that currently is underway but would more likely complicate and possibly contradict the measures already in place.

Prior to the public noticing of the Draft List, NYSDEC discussed its proposal to delist these waters with USEPA, which has approval authority for the Final Section 303(d) List. USEPA agreed that the NYSDEC proposal was deserving of consideration and encouraged NYSDEC to submit a Draft List that included the delisting of these waters, so that the approach could be considered fully.

Upon review of the Draft List, USEPA agreed that for these waters the development of a TMDL in addition to the other control measures would be of little if any value. However, USEPA also expressed some concerns about the delisting of some of these waters. Primarily these concerns focused on whether the other required control measures would, in fact, be sufficient to meet existing water quality standards. NYSDEC acknowledges that while these measures will result in water quality improvement, any assurance that water quality standards would be fully met through these alternative strategies is no more and no less than the assurance that a TMDL would result in meeting standards. In fact, because there is no requirement for implementation of control measures specified by a TMDL, the alternative enforceable/required measures currently in place carry with them greater assurance for the implementation of actions that will result in significant water quality improvement than does a TMDL.

In discussions of the proposed List with USEPA, NYSDEC continued to contend that the appropriate approach in these cases is to delist these waters, and then re-evaluate compliance with water quality standards once the control measures have been implemented (in much the same way that conditions would be re-evaluated post-TMDL implementation). NYSDEC also pointed out that if water quality standards are still not being achieved after implementation, the water would be included on subsequent Section 303(d) Lists and a TMDL to resolve the remaining impairment could be developed. This approach would be comparable to the way that a second (phased) TMDL would address a situation where a TMDL did not result in full compliance with standards.

Recognizing legitimate concerns on both sides, USEPA and NYSDEC reached a compromise regarding the listing of these waters on the Section 303(d) List. It was agreed (and is reflected in the Final 2006 Section 303(d) List) that these waters would remain on the List and not be delisted. However with both USEPA and NYSDEC recognizing that the development of a TMDL on top of other control measures would be of little if any value to the restoration of these waters, it was also agreed that these waters would be included on Part 3c of the List and identified as *Waterbodies for which TMDL Development May be Deferred Pending Implementation/Evaluation of Other Restoration Measures.*

While NYSDEC would have preferred USEPA concurrence to delist these waters, we are satisfied that this listing approach recognizes 1) that other strategies can be as effective (or more effective) in restoring impaired waters, 2) that it is reasonable to await the outcome of these strategies to determine water quality compliance and if additional measures need to be taken, 3) that it allows resources to develop TMDLs to be directed to waters where no other measures are being taken, and 4) TMDLs remain an option to address remaining water quality problems in these waters.