August 26, 2010

Lower Esopus Watershed Partnership (LEWP)
including the Towns of Hurley, Marbletown, Olive, Saugerties, and Ulster,
the Village of Saugerties, and the City of Kingston

Executive Summary

The attached letter from the Lower Esopus Watershed Partnership (LEWP) to Willie Janeway, Regional Director, NYS Department of Environmental Conservation (DEC), Region 3, concerns the NYC Department of Environmental Protection's (DEP's) releases of water from the Ashokan Reservoir to the lower Esopus. LEWP has a direct interest in releases to the lower Esopus (please see LEWP Mission Statement at end of this Executive Summary) and greatly appreciates DEC's invitation to collectively provide input regarding releases from the Askokan Reservoir, while acknowledging the challenges inherent in multi-objective watershed management.

Background.
The DEP has conducted and will be continuing to conduct releases from the Ashokan Reservoir to the lower Esopus for multiple purposes:

- Turbidity Reduction Strategy: To reduce turbidity entering the Catskill water supply aqueduct, DEP has and will be releasing turbid water from the Ashokan Reservoir's West Basin into the lower Esopus.
- Flood mitigation/ prevention: DEP has also conducted, and presumably will continue to conduct, pre-storm clear-water releases to allow for stormwater storage capacity in the reservoir, an activity that is greatly appreciated by downstream communities.

Until recently, the DEP had rarely released water to the lower Esopus from the Ashokan Reservoir. And, unlike the other reservoirs in the NYC Water Supply System, at this time DEP does not have a formal strategy and schedule for clear water releases from the Ashokan Reservoir.

Comments and Recommendations.
LEWP has collectively crafted a set of comments and recommendations, essentially proposing that there is a need for data collection and analysis to support a long-term, science-based release strategy for the Ashokan Reservoir that optimizes multiple objectives and promotes eco-system-based watershed management. However, LEWP in no way wants to detract from the positive benefits received by downstream communities as a result of DEP's pre-storm clear-water releases.

Of particular concern to LEWP is the unknown long-term impact of unprecedented releases of highly turbid water of conceivably unnaturally long duration. LEWP suggests that DEC help ensure that DEP monitor the lower Esopus and, with stakeholder input, devise a release strategy that will not create problems downstream.

LEWP is also concerned about water quality issues associated with chronic low flows, particularly in the flat valley area along State Route 209, where the slope of the stream bed is minimal. Establishing a program which provides for a year-round base release to the lower Esopus during non-drought times, with seasonal releases conducted according to reservoir

fullness and other conditions, will help to ameliorate problems associated with unnaturally low flows (natural flows being the stream before the reservoir truncated the watershed).

LEWP acknowledged and summarized some of the major lower Esopus stakeholders and how they are affected by decisions made about the stream. LEWP presented a simple estimate of what kind of flow volumes would be experienced naturally, in the absence of the reservoir, and used this as a reference point to make an initial recommendation for a possible base-flow release volume during non-drought years. LEWP also emphasized the importance of minimizing or offsetting the impact of highly turbid releases, both through the monitoring and control of turbidity concentration and duration, and through the release of clear water. LEWP also stressed the need to characterize and monitor the stream channel to better understand and describe strategies for corridor enhancement, flood control and mitigation of negative impacts.

The recommendations are divided into short-term and long-term recommendations:

- In the short-term, LEWP recommends that DEC ensures that DEP:
  1. Establish a multi-disciplinary stakeholder advisory group;
  2. Take immediate action to mitigate the potential negative downstream effects of turbid releases;
  3. Provide more information to the public in advance of releases; and
  4. Establish a minimum base-flow release during non-drought low-flow months.

- In the long term, LEWP recommends that DEC ensures that DEP:
  1. Characterize existing conditions;
  2. Conduct long-term water quality, sediment and water quantity monitoring;
  3. Establish a comprehensive release strategy to meet multiple objectives;
  4. Refine a procedure to offset negative downstream impacts of highly turbid releases; and
  5. Develop an adaptive and collaborative strategy for assessing success and incorporating modifications that includes target ecological outcomes.

Conclusion

In summary, LEWP respectfully requested that DEC impose conditions on DEP's SPDES permit for Turbidity Reduction in the Ashokan Reservoir. These conditions would require the DEP, at minimum, to: limit the duration of turbid releases and / or offset negative impacts by incorporating clear-water releases in addition to turbid releases; seek to optimize flood storage capacity as part of a release strategy; implement a minimum seasonal base flow release; provide real-time data on releases to the public; conduct water quality monitoring and flow measurement (with the addition of a USGS gage); and develop a long-term release strategy that incorporates an understanding of natural flow patterns, seasonal variability, and downstream water needs.

LEWP Mission Statement: Foster appreciation and stewardship of the Lower Esopus Watershed through a variety of partnerships to: enhance water quality and stream function; promote floodplain management; support ecosystem health and diversity; and encourage compatible agricultural, cultural, economic, municipal, and recreational activities.

Lower Esopus Watershed Partnership (LEWP)
including the Towns of Hurley, Marbletown, Olive, Saugerties, and Ulster,
the Village of Saugerties, and the City of Kingston

July 28, 2010

Willie Janeway, Regional Director
NYS Department of Environmental (DEC), Region 3
21 South Putts Corners Road
New Paltz, New York 12561

Re: NYC Department of Environmental Protection's (DEP) State Pollution Discharge Elimination System (SPDES) permit relating to Ashokan Releases to the Lower Esopus Creek, SPDES Permit Number 0264652

Dear Mr. Janeway,

On behalf of the Lower Esopus Watershed Partnership (LEWP), and the greater lower Esopus community, thank you for responding to our concerns regarding releases from the Ashokan Reservoir to the lower Esopus as part of the New York City Department of Environmental Protection's (DEP) Turbidity Reduction Strategy. We understand DEP has a SPDES permit to discharge aluminum sulfate (alum) into the Catskill Aqueduct to control turbidity entering Kensico Reservoir, and that one condition of that permit requires DEP to implement structural mechanisms to reduce turbidity entering the aqueduct. These mechanisms include releases of turbid water from the Ashokan Reservoir's West Basin into the lower Esopus. Members of LEWP have a direct interest in releases that impact the lower Esopus watershed.

We appreciate DEC's invitation to provide input regarding conditions for DEP's SPDES permit and have collectively crafted the following comments and recommendations. While our intent is to be as technically specific as possible, we recognize that the issue of releases from the Ashokan Reservoir is more complex than, for example, releases from other reservoirs in the NYC Water Supply System. In consideration of the need for further data collection and analysis to support a long-term, science-based release strategy, we are presenting both near-term and long-term recommendations.

I. REVIEW of OBJECTIVES

These recommendations acknowledge the challenge of establishing guidelines for releases to meet multiple objectives. DEP's primary focus is on protecting the water quality of NYC's water supply, but the DEP also has a responsibility to minimize and mitigate the negative impacts of their activities on downstream communities. Multi-objective reservoir management is increasingly becoming the norm across the country.

LEWP also recognizes that while long-term releases of highly turbid water pose potential problems, releases in general also have the potential for multiple benefits. For example, DEP has recently acknowledged their ability to mitigate downstream flooding by conducting pre-storm

clear-water releases to allow for stormwater storage capacity in the reservoir. Not only did this provide some measure of flood control, these releases marked the first time of which LEWP is aware, that an objective other than water supply management guided DEP operations. Additional base-flow in the lower Esopus due to planned releases could result in measurable improvements in overall stream health.

Thus, in addition to the operational object of DEP to reduce turbidity in the water supply, a more comprehensive set of objectives to guide the permitting of reservoir releases should include, to the extent possible:

1. Protection and improvement of downstream water quality and ecological integrity;
2. Protection and improvement of existing community, agricultural, economic and public health uses; and
3. Mitigation of downstream flood hazards through adequate reservoir storage capacity in advance of flood season and large storm events.

II. FINDINGS and POINTS of DISCUSSION

Ashokan Releases Compared to Other Reservoirs

The circumstances framing releases from the Ashokan are unlike and more complex than those pertaining to some other NYC reservoirs. DEP's Catskill Turbidity Reduction strategy adds management objectives and operational considerations that do not exist for reservoirs that conduct only clear-water releases. Creating flood storage capacity within the reservoir at certain times adds another layer of operational management. Finally, establishing a release strategy that can also provide an ecological benefit to the lower Esopus - a system that has not received water from the upper Esopus aside from Reservoir spillover – is a challenge in itself. Meeting multiple operational objectives will require a thorough consideration of timing, volume, duration and water quality of releases.

Estimating Non-Reservoir Flows

Typically, a first step in drafting release recommendations is to understand the natural flow regime prior to reservoir construction. This analysis of hydrologic alteration is best accomplished with gage data from a pre-reservoir period; unfortunately, these data do not exist for the lower Esopus. The dam on the Ashokan was built about the same time as the USGS gage at Mt. Marion was established.

In the absence of pre-reservoir data, a non-reservoir flow regime for the lower Esopus can only be estimated. To accomplish this, we used data from a USGS gage located above the reservoir at Coldbrook (see Attachment A). The estimate includes a consideration of the differences in Average Monthly Discharge in the upper Esopus basin versus the lower Esopus basin based on the runoff layer in USGA SreamStats. It also subtracts out the flow from the Schoharie diversion in the upper Esopus in an attempt to produce a more natural flow estimation of the upper Esopus. The graph shows that, at the Mt. Marion Gage, the estimated flow to the lower Esopus without the Ashokan Reservoir is between 150 and 240 percent greater than the actual observed flow.

This analysis points to the significant level of hydrologic modification experienced by the lower Esopus due to the construction and present operation of the Ashokan Reservoir. Average Monthly Discharge is only the simplest of measures of hydrologic alteration. The magnitude and timing of various seasonal flows and their consequent ecological linkages have also been significantly impacted, as have those flows responsible for maintenance of channel morphology, such as dimension, pattern, and riffle-to-pool ratios.

Regulatory Framework

It is important to note that there are existing NYS regulations which potentially apply to releases from the Ashokan Reservoir. First, the City of New York is currently releasing water into the lower Esopus that is visibly turbid and violates DEC's own standards for turbidity. The NYS DEC standards for all water classes state that there shall be "no increase that will cause a substantial visible contrast to natural conditions".

Second, New York State Conservation Law, Chapter X. Division of Water, Part 670-672 regulates downstream releases from reservoirs. The Ashokan Reservoir received statutory exemption from this legislation as it was asserted that no such release works exist. However, release works do exist at the Ashokan Reservoir and are operational. Thus, a comprehensive release strategy should be developed for the Ashokan Reservoir and the lower Esopus as is required by regulation. Also, this portion of the regulation should be revised to reflect the releases that are already occurring from the Ashokan Reservoir.

Third, State regulations require continuous monitoring of rivers and streams affected by reservoir releases (Subpart 672-1.4 Monitoring) in order to determine whether there are any adverse environmental impacts. This section also confers responsibility to the agency for conducting technical studies to resolve any issues associated with reservoir releases or diversions.

Data for Most Impacted (Middle) Segment of Creek

A particularly significant deficit in water quantity data is the lack of gage or flow data for the portion of the lower Esopus located upstream of the confluence of its two major tributaries, the Sawkill and the Plattekill. This middle segment of the lower Esopus (see map, Attachment B) is the portion flowing from the Reservoir to the Lake Katrine area, and is the portion of the creek that has been most affected (or altered) by the change in hydrology due to the construction of the Ashokan Reservoir. The Reservoir disconnected approximately 225 square miles of drainage area from this section of the creek, removing large natural tributary inputs (like those found downstream) and exacerbating the impacts of seasonal high flows in a channel shaped by a truncated watershed.

Sediment and Water Quality Data

Besides water quantity, data about water quality is also critical for informed recommendations. The primary goal of releases from the reservoir is to alleviate high turbidity conditions thus preserving drinking water quality. As such, some releases from the Ashokan Reservoir may be of unusually turbid water. In fact, high levels of observed turbidity of unusually long duration have already been noted along the lower Esopus when the release channel was in operation. Currently, LEWP is not aware of any existing long term sediment/turbidity data for the lower Esopus which would describe pre-existing conditions. Accurate sediment loading data requires

information about both water quantity and water quality. This information is important because the transport of suspended sediment through the lower Esopus could potentially further negatively impact aquatic ecosystems.

Optimization of Releases for Habitat and Ecology

The duration, magnitude, temperature and seasonal timing of releases can be planned in a way to mimic- to the extent possible- natural stream flows. Establishing a natural flow regime has the potential to significantly improve the physical and aquatic habitat of the stream. This could not only improve the stream ecology but the ability of people to enjoy the benefits of a healthy stream ecosystem through better water quality and improved recreational opportunities. Computer modeling applications are available to help design a release schedule which could be used to produce a natural or ecological flow regime on the lower Esopus. This could potentially help to mitigate the severe ecological damage caused by hydrologic modification on the lower Esopus.

Major Lower Esopus Stakeholders and Issues

Development. Certain residential and commercial operations along the creek are particularly sensitive to flood events. A particularly vulnerable area is the City of Kingston Shopping Plaza and nearby apartment buildings. DEP has recently acknowledged their ability to release water in anticipation of precipitation events when the Reservoir is at high capacity and successfully did so this past year. A release strategy must not only avoid exacerbating flood events but could also be designed to enhance or allow for some reservoir freeboard in advance of flood events to provide some flood-water storage capacity.

Agriculture. Farmers along the lower Esopus absolutely depend on creek water to irrigate their crops. Any water used for irrigation must be of a high quality and cannot be sediment laden. This is required for farmers to adhere to the Good Agricultural Practices (GAP) standards. Turbid water can negatively impact the ability of farmers to irrigate, to meet GAP standards and to sell their products to GAP-participating markets, resulting in a major economic burden. Also, the stage of the lower Esopus affects farmers' field access and operations, thus adding operational constraints to their agricultural activities. The ability to relate observed increases in stage to release volumes is needed to allow farmers plan appropriately in their operations.

The Ashokan Center. This environmental and outdoor education center serves over 5,000 school children and 3,000 adults per year. It is located immediately downstream of where the Ashokan Reservoir discharges release water to the lower Esopus. Five of the Ashokan Center's buildings are slated to be relocated in the coming years to higher ground because of the DEP's need to increase flexibility in conducting releases for water quality purposes. Currently, however, these buildings are situated directly alongside the historic Esopus channel. Prior to 2006, this section of the lower Esopus had seen no significant flow since the completion of the Ashokan dam in 1911, with at least one noted exception: in the 1990's, while students were in residence and study at Ashokan, release of water by DEP occurred during programming, which required evacuation of children from the pond, while DEP was notified of the emergency by Ashokan Center staff. Release channel operations impact the ability of the Ashokan Center to use the field campus site. The Ashokan Center has contacted NYC DEP to work with them to determine what release

levels can occur without negatively impacting programming on the site, and to help Ashokan Center in its program planning with schools.

Recreation. Public access sites along the lower Esopus are highly valued community resources, and as such, should be protected and enhanced. Low flows and deteriorating water quality during summer months interfere with traditional recreational activities along the creek including swimming, boating, and fishing. Sluggish flows and elevated water temperatures have already impacted recreational uses of the stream corridor. The addition of high concentrations of suspended solids that are partially deposited along swimming beaches and in already sediment-laden pools will further compromise recreational opportunities.

Wastewater Assimilation. The Town of Ulster Wastewater Treatment Facility (WWTF) is located along the banks of the lower Esopus, just north of the NYS Route 209 at Neighborhood Road. Wastewater assimilation by the lower Esopus of WWTF discharges is hampered in the summer months when flows are low, and may force the Town to treat wastewater by tertiary process to maintain SPDES compliance and/or preclude the expansion of the plant or force plant relocation in order to serve the Town's growing population and economic base.

III. RECOMMENDATIONS

LEWP's recommendations address both water quality and water quantity concerns associated with NYC's turbidity reduction program, and are divided into activities that can be readily implemented and those that require more study and more time. LEWP also recognizes that this is an opportunity to establish minimum regular and dry-weather release requirements, as have already been established for NYC's other reservoirs under NYS DEC Regulations Chapter X. Part 670-672. In the absence of comprehensive flow data, our initial recommendations for minimum releases are based primarily on our estimates of non-reservoir flows.

IIIA. SHORT-TERM RECOMMENDATIONS

1. Establish an advisory council including representatives from LEWP and other community and technical partners to ensure a collaborative approach to water release management
2. Take immediate action to mitigate the volume and duration of turbid water that is released
3. Establish limits on duration and timing of turbid water releases
4. Establish procedure to offset negative downstream impacts of highly turbid releases e.g. conduct clear-water releases also.
5. Establish procedure for maximizing the integration of turbidity reduction releases with floodwater-storage capacity needs
6. Allow free and ready access to data on releases. This should include real-time release data available online with flow, temp, turbidity, conductivity (and other relevant water quality parameters).
7. Require minimum releases during summer low-flow months. Based on our estimates of non-reservoir flows, LEWP suggests implementing a continuous minimum base flow release of 100 cubic feet per second (cfs) or about 65 million gallons per day (MGD) for non-drought years (see justification below) and a minimum of 50 cfs (~ 32 MGD) during winter months.

Obviously, more in-depth study will be required to assess the feasibility of this preliminary release recommendation.

JUSTIFICATION

Devising a comprehensive plan to minimize and mitigate immediate and long-term negative impacts of turbid releases, and enhance opportunities for improving ecosystem health, should involve multiple stakeholders. LEWP's outreach to a variety of stakeholders has revealed that there are two issues which are of immediate concern regarding releases, or lack thereof, to the lower Esopus; duration and concentration of turbid release water; and problems associated with very low flows during the summer months.

Duration and Concentration of Turbid Release Water (Water Quality)

Turbid waters from the reservoir are being released over a longer period of time than typically occurs naturally. This is partly related to the constraints on the amount of water that can physically be discharged to the release channel: long periods of release are being used to offset the limitations imposed by this volumetric constraint.

Periodic turbidity is a naturally-occurring characteristic of the Esopus watershed. However, prolonged exposure to turbid water can negatively impact stream habitat, certain species of fish and aquatic macroinvertebrates. This was a major topic of negotiation surrounding releases to the upper Esopus from the Schoharie Reservoir via the Shandaken tunnel. Within the last several months, when DEP was using the release channel, water along the lower Esopus was visibly more turbid than it has been in recent memory, and continued so for extended periods after.

Seasonal guidelines/ requirements are needed to limit the quality, i.e. Total Suspended Solids (TSS) and temperature, and the duration of turbid releases, particularly during the sensitive periods of low flows.

Low Flow Releases (Water Quantity)

As a water-starved system, low summer water levels along the lower Esopus stress the ecology and impede economic and social uses of the river. The Lower Esopus Creek is listed on DEC's 303d Priority Waterbodies List. This document notes that historically non-existent water releases from the Ashokan Reservoir, in combination with a low gradient resulting in slow-moving and ponding waters, contribute to stressed water quality conditions in the creek. This finding is also echoed in the 2008 River Reconnaissance Report (RRR) of the lower Esopus stream corridor, by the consulting engineering firm of Milone and MacBroom, Inc. Summer releases would be extremely beneficial to the system.

Attachment A shows the Average Monthly Discharges from 1970 to 2008 at the Mt. Marion gage and the Cold Brook gage. It also shows an estimate of non-reservoir flows at the Mt. Marion gage (see Section II, Estimating Non-Reservoir Flows, above). From this graph, it can be seen that during July, August and September, actual flows at Mt. Marion range from about 100 cfs to about 200 cfs; (~ 65 MGD to ~130 MGD). Estimated non-reservoir flows at Mt Marion are between ~250 cfs to ~480 cfs (~130 MGD to ~310 MGD) for the same three months.

LEWP therefore recommends instituting a release strategy that provides for a minimum release of 100 cfs (65 MGD) during the driest months of July, August and September which will result in a streamflow of 200 cfs to 300 cfs (~130 MGD to ~195 MGD) and a more modest release of 50 cfs (32.5 MGD) during the rest of the year which would result in a streamflow of 150 cfs to 250 cfs (~ 97 MGD to ~ 162 MGD). A release of 100 cfs during the summer in non-drought situations would be extremely beneficial to the aquatic system and add recreational benefit without significantly increasing DEP's drought risk. These releases should be part of the permit and subject to reevaluation with future studies and stakeholder input through the advisory council.

A more sophisticated release strategy can be developed for the long term. For example, the release schedule for the NYC Delaware System water supply is based both on season and on reservoir fullness (see Attachment C). In the long term, LEWP recommends that a strategy be adopted for releases from the Ashokan Reservoir that is both sophisticated and sensitive to the downstream ecology. Minimum releases for different times of the year and different reservoir stages can be developed using existing and additional data (see IIB Monitoring and Measurement Needs below).

Public Safety and Awareness

LEWP is also concerned that information about the releases is not readily available to the public. Parameter test results must be made available for public review as soon as it becomes available. Public education is essential to ensure widespread awareness of the impact of changing stream flows, velocity and visibility.

IIIB. LONG-TERM RECOMMENDATIONS

1. Conduct water quality, sediment and water quantity long-term monitoring
2. Characterize existing conditions
3. Establish a comprehensive release strategy to meet multiple objectives
4. Refine a procedure to offset negative downstream impacts of highly turbid releases
5. Develop an adaptive and collaborative strategy for assessing success and incorporating modifications that includes target ecological outcomes

JUSTIFICATION

There has been no water management of the lower Esopus over the last hundred years and little data collection or systematic study. Without baseline data for the lower Esopus, it is not possible to evaluate the impact of timing, duration, quantity or quality of turbid releases, or to make scientifically based recommendations. It is imperative that we understand the connection between water quantity, water quality, habitat, channel morphology and human needs and uses of the lower Esopus. Data from long-term studies will inform the development, and measure the success of, a flow regime that includes specific ecological outcomes.

A long-term, science-based plan and strategy for optimizing the benefits of planned releases can be developed based on monitoring data and flow measurements that can be collected reasonably easily. It is essential that there be additional data collection to inform future permits, regulatory

compliance and decision making. With the benefit of additional monitoring data, a comprehensive release schedule can be developed that addresses multiple needs.

A release strategy that can be optimized to satisfy multiple objectives needs to be flexible and responsive to changing conditions. LEWP recommends that a periodic review schedule be built into DEP's SPDES permit conditions.

MONITORING and MEASUREMENT NEEDS
LEWP strongly recommends the following as conditions of the issuing of the SPDES permit.

1. **Install a full USGS gage on the middle segment of the lower Esopus and upgrade the existing gage at Chandler Drive.**

   Requirements: Install a complete USGS gage (stage recording, discharge rating curve, TSS-calibrated turbidity monitoring, real-time on-line data) with total suspended sediment auto-sampling capacity along the middle segment of the lower Esopus. The gage could possibly be located in the Lomontville area. Upgrade the existing gage at Chandler Drive to include real-time stage reporting.

   Purpose: Provide water quantity and water quality data for the middle section of the lower Esopus. The location of the gage in Lomontville would also provide information on stage that would be valuable to the residents of the Towns of Marbletown, Hurley, and Ulster who experience flooding. Further improvements to the gage at Chandler Drive will provide an additional, reliable data source on the creek stage. Additionally, this information will further inform sediment modeling for the entire lower Esopus.

2. **Turbidity Monitoring**

   Requirements: Conduct continuous Nephelometric turbidity monitoring at selected sites during reservoir release events. Conduct baseline Nephelometric turbidity monitoring at selected sites throughout the year.

   Purpose: Provide ongoing water quality data to assist in assessing and minimizing impacts of prolonged releases of highly turbid waters through the establishment of acceptable turbidity concentrations and duration.

3. **Sediment Data Collection**

   Requirements: Collect depth-integrated grab samples at selected locations downstream from the reservoir to Lake Katrine (the portion of the lower Esopus before major tributaries of the Sawkill and the Plattekill) during normal flows, Reservoir releases and storm events. Data on channel morphology should be collected through the Kingston area. Consider the study of the Sawkill watershed (a major tributary of the lower Esopus) as a reference for sediment loading.

   Purpose: This study component is necessary to characterize sediment loading of the lower Esopus. These data would be used in conjunction with the sediment data collected at the USGS gage to characterize sediment input and transport along the lower Esopus.

4. **Biological Monitoring**

   Requirements: Identify and monitor appropriate ecological integrity indicator species, based on Tiered Aquatic Life Use standards.

   Purpose: Evaluate the impact of different potential release strategies on aquatic and riparian ecosystems.

5. **Integrative Study and Analysis**

   Requirements: Compare total suspended sediment (TSS) loading with areas above the reservoir or other reference sites (such as the Sawkill or the Plattekill), to evaluate the need for clean water flows to wash out the residue from more turbid releases. Define targets for channel forming flows, and suggest a statistically relevant time schedule for various flows. Incorporate results of biomonitoring to define best potential uses and target flows. Make recommendations to alternate clean water releases with turbid water releases in order to minimize impact on habitat, fisheries and aquatic invertebrates.

   Purpose: This study would synthesize the gage data, sediment data with additional data to provide recommendations on the best timing, duration, and the water quality requirements of the releases. The recommendations would be tied to the actual ecosystem needs and social uses of the lower Esopus.

IV. CONCLUSION

LEWP is committed to a process which will optimize releases to the lower Esopus for both ecological and social needs. We feel we have been successful in engaging a broad stakeholder group on this issue and are committed to continuing this work. However there is a great need for science and technical support to make informed recommendations and we believe it is warranted for the NYC DEP to fund further study of the lower Esopus. In the meantime, it is counter-productive to allow DEP to conduct large-scale releases of low-quality water to the lower Esopus without establishing provisions to protect downstream water quality, and the function and uses of the creek below the reservoir, and counter to the social justice goals of the Department.

We therefore respectfully request that DEC impose conditions on DEP's SPDES permit for Turbidity Reduction in the Ashokan Reservoir. These conditions would require the DEP, at minimum, to: limit the duration of turbid releases and / or offset negative impacts by incorporating clear-water releases in addition to turbid releases; seek to optimize flood storage capacity as part of a release strategy; implement a minimum seasonal base flow release; provide real-time data on releases to the public; conduct water quality monitoring and flow measurement (with the addition of a USGS gage); and develop a long-term release strategy that incorporates an understanding of natural flow patterns, seasonal variability, and downstream water needs. Thank you for your consideration of this request. We look forward to working collaboratively with you on this very important project.

Very Truly Yours,

The Municipalities of the Lower Esopus Watershed Partnership (LEWP): City of Kingston; Village of Saugerties; Towns of Saugerties, Ulster, Hurley, Marbletown and Olive

LEWP Municipal Representative	**Date**
Hurley Town Supervisor Gary S. Bellows	8/2/10
Kingston City Mayor James M. Sottile	8/2/10
Marbletown Town Supervisor Brooke Pickering-Cole	8/4/10
Olive Town Supervisor Berndt Leifeld	7-27-10
Saugerties Town Supervisor Greg L. Helsmoortel	8-3-10
Saugerties Village Mayor William E. Murphy	8/30/10
Ulster Town Supervisor James E. Quigley 3rd	7.30.10

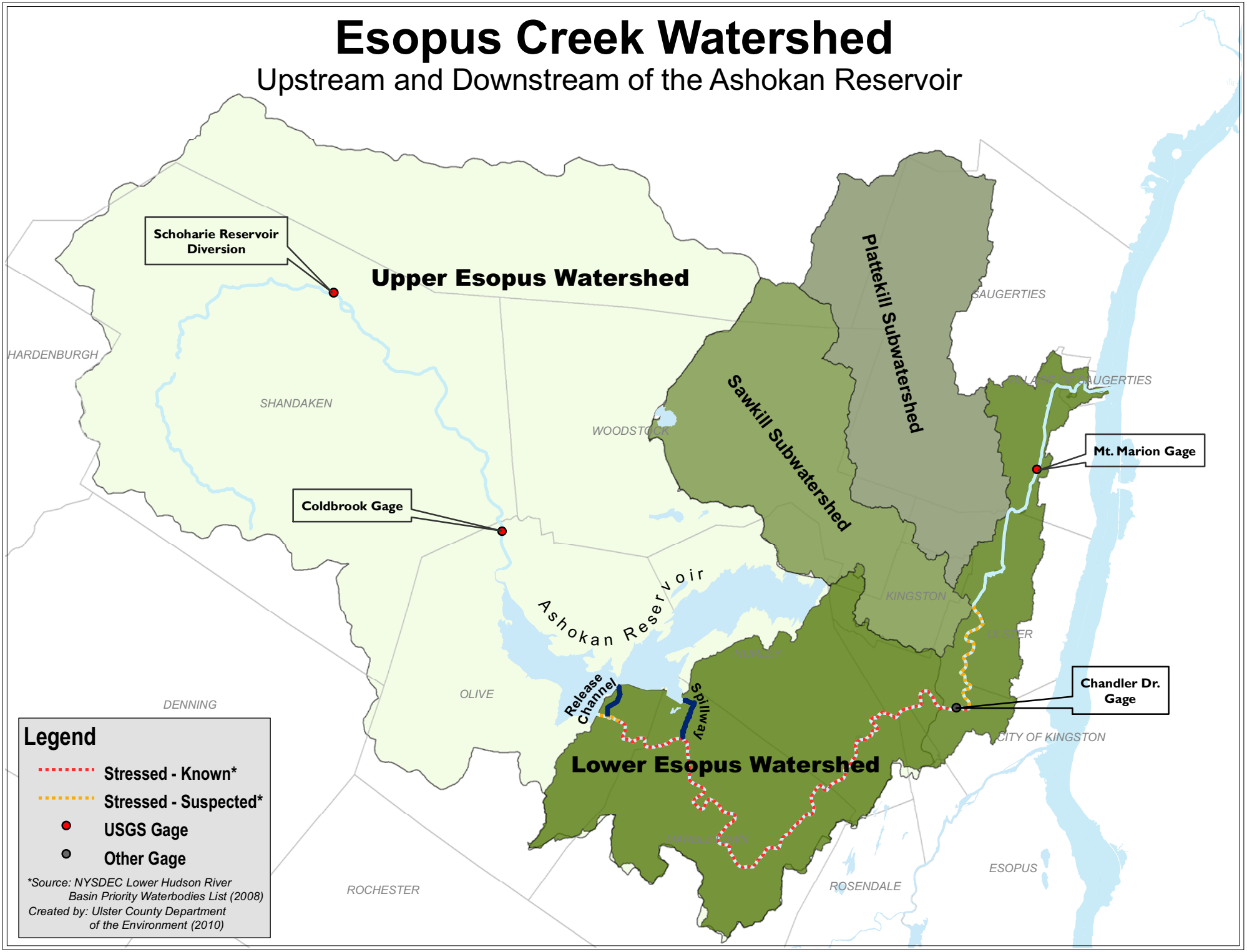
cc:

1. Alex Wade, Waterfront Advisory Board liaison, Village of Saugerties
2. Amanda LaValle, Coordinator, Ulster County Department of the Environment*
3. Art Snyder, Director , Ulster County Emergency Services*
4. Bill Rudge, Natural Resources Supervisor, NYS DEC Region 3*
5. Candace Balmer, LEWP Project Coordinator; RCAP Solutions*
6. Cory Halwick, Wastewater Superintendent, Town of Ulster*
7. Dave Corrigan, Permits Inspector, NYS DOT Region 8, NYS DOT*
8. Dennis Doyle, Planning Director, Ulster County Planning Department
9. Deborah DeWan, Deputy Director, Ashokan Foundation Inc.*
10. Fred Wadnola, Chair, Ulster County Legislature
11. Gary Bellows, Town Supervisor, Town of Hurley*
12. Gary Capella, Executive Director, Ulster County Soil and Water Conservation District
13. Gary Firda, Surface Water Specialist, USGS*
14. Helen Chase, representative at large, Town of Olive*
15. Jay Simpson, Staff Attorney, Riverkeeper
16. Jim Maloney, Ulster County Legislator
17. John Bonacic, New York State Senator
18. John Garesche, New Lands Committee, Woodstock Land Conservancy*
19. John Gill, Town Board, Town of Hurley; Gill's Farm Markets, Inc.*
20. Julia Bronson, Town Board, Town of Marbletown*
21. Kathy Capella, District Conservationist, USDA NRCS
22. Kelly Myers, Village Trustee, Village of Saugerties*
23. Ken Kosinski, Section Chief, NYC Watershed, NYS DEC*
24. Kevin Cahill, New York State Assembly Member
25. Kevin Grieser, Director, Trees for Tribs, Hudson River Estuary Prog., NYS DEC Region 3*
26. Mari-Beth DeLucia, Delaware River Project Director, The Nature Conservancy*
27. Mary McNamara, Education, Recreation & Outreach Committee, LEWP *
28. Maurice Hinchey, Unites States Congressional Representative
29. Michael Flaherty, Director, Fisheries Department, NYS DEC Region 3*
30. Michael Hein, Ulster County Executive
31. Pat Ferracane, Bureau of Water Assessment and Mapping, NYS DEC Region 3*
32. Peter Lopez, New York State Assembly Member
33. Philip Bein, Watershed Inspector General, NYS Attorney General's Office
34. Ralph Swenson, City Engineer, City of Kingston
35. Renno Budziak, Town & County Planning Board, Town of Ulster*
36. Scott Cuppett, Watershed Prog. Manager, Hudson River Estuary Prog., NYS DEC Region 3*
37. Spider Barbour, CAC & Administrative representative, Town of Saugerties*
38. Susan Bolitzer, President, Esopus Creek Conservancy
39. Steve Noble, Environmental Educator, Parks and Recreation Department, City of Kingston*
40. Teresa Rusinek, Educator, Cornell Cooperative Extension- Ulster County*
41. Tim Neu, Director, Ashokan Foundation Inc.*
42. Tom Snow, Program Coordinator, NYC Watershed Program, NYS DEC*
43. Tom Story, Resident Engineer, NYS DOT Region 8*
44. Tricia Aspinwall, Project Planner, Army Corps of Engineers
45. Mark Woythal, Instream Habitat Protection Unit, NYS DEC*

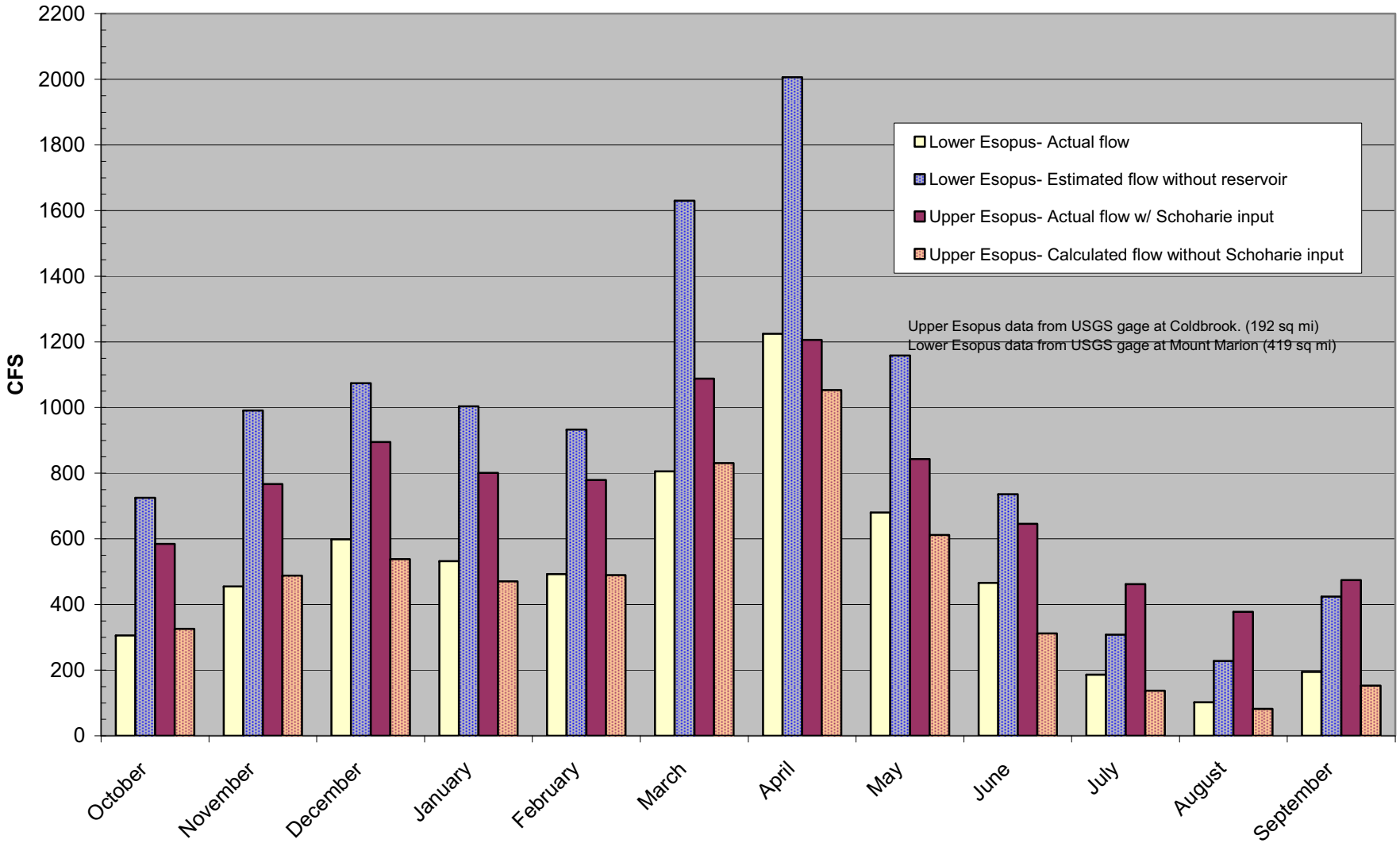
*Attendees at January 13, 2010 meeting between Willie Janeway, Regional Director, NYS DEC Region 3 and the Lower Esopus Watershed Partnership (LEWP) to discuss reservoir releases.

Esopus Creek Watershed

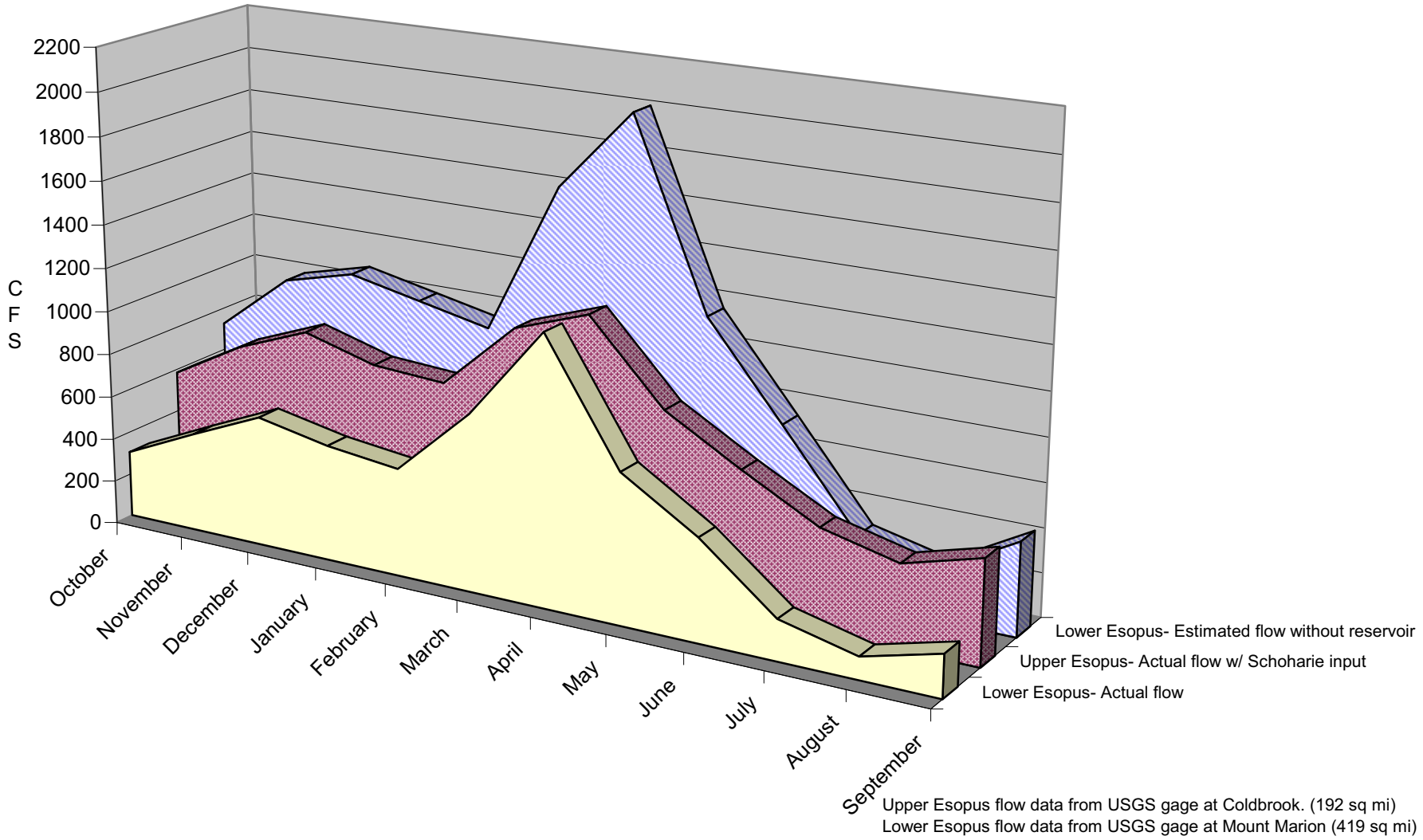
Upstream and Downstream of the Ashokan Reservoir



Esopus Creek- Average Monthly Discharge (1970-2008)



Esopus Creek- Average Monthly Discharge (1970-2008)



Upper Esopus flow data from USGS gage at Coldbrook. (192 sq mi)
Lower Esopus flow data from USGS gage at Mount Marion (419 sq mi)

Table 3
Schedule Of Releases (cfs)
With 35 mgd Available

	Winter		Spring	Summer			Fall	
Cannonsville	Dec 1 -	Apr 1 -	May 1 -	Jun 1 -	Jun 16 -	Jul 1 -	Sep 1 -	Oct 1 -
Storage Zone	Mar 31	Apr 30	May 31	Jun 15	Jun 30	Aug 31	Sep 30	Nov 30
L1-a	1500	1500	*	*	1500	1500	1500	1500
L1-b	250	*	*	*	*	350	275	250
L1-c	110	110	225	275	275	275	140	110
L2	80	80	215	260	260	260	115	80
L3	70	70	100	175	175	175	95	70
L4	55	55	75	130	130	130	55	60
L5	50	50	50	120	120	120	50	50

	Winter		Spring	Summer			Fall	
Pepacton	Dec 1 -	Apr 1 -	May 1 -	Jun 1 -	Jun 16 -	Jul 1 -	Sep 1 -	Oct 1 -
Storage Zone	Mar 31	Apr 30	May 31	Jun 15	Jun 30	Aug 31	Sep 30	Nov 30
L1-a	700	700	*	*	700	700	700	700
L1-b	185	*	*	*	*	250	200	185
L1-c	85	85	120	150	150	150	100	85
L2	65	65	110	140	140	140	85	60
L3	55	55	80	100	100	100	55	55
L4	45	45	50	85	85	85	40	40
L5	40	40	40	80	80	80	30	30

	Winter		Spring	Summer			Fall	
Neversink	Dec 1 -	Apr 1 -	May 1 -	Jun 1 -	Jun 16 -	Jul 1 -	Sep 1 -	Oct 1 -
Storage Zone	Mar 31	Apr 30	May 31	Jun 15	Jun 30	Aug 31	Sep 30	Nov 30
L1-a	190	190	*	*	190	190	190	190
L1-b	100	*	*	*	*	125	85	95
L1-c	65	65	90	110	110	110	75	60
L2	45	45	85	100	100	100	70	45
L3	40	40	50	75	75	75	40	40
L4	35	35	40	60	60	60	30	30
L5	30	30	30	55	55	55	25	25

* Storage zone does not apply during this period. Releases will be made in accordance with zone L1-c.