APPENDIX A
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Swinging Bridge Hydroelectric Project (FERC No. 10482)
Mongaup Falls Hydroelectric Project (FERC No. 10481)
Rio Hydroelectric Project (FERC No. 9690)
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APPENDIX B

COMMENTS ON PAD AND STUDY REQUESTS

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June 20, 2017

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RE: Eagle Creek Hydro Power – Rio, Mongaup Falls, and Swinging Bridge Hydroelectric Projects

Dear Ms. Bose,

Thank you for providing the Delaware Tribe with information regarding the above referenced project. The Mongaup River is of special interest to our Tribe. Unfortunately, we cannot attend the scoping meeting. We request a conference call to discuss this project and its potential effects. We also request that electronic versions of the project information be sent to the Pennsylvania Office.

We ask that in the event a concentration of artifacts and/or in the unlikely event any human remains are accidentally unearthed during the project that all work is halted until a qualified archaeologist can evaluate the find and the Delaware Tribe of Indians is informed of the inadvertent discovery.

Delaware Tribe Comment #1

If you have any questions, feel free to contact this office by phone at (610) 761-7452 or by e-mail at sbachor@delawaretribe.org.

Sincerely,

Susan Bachor
Delaware Tribe Historic Preservation Representative

To: Federal Energy Regulatory Commission
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FILED
SECRETARY OF THE
COMMISSION

2017 JUN 27 P 3:11

FEDERAL ENERGY
REGULATORY COMMISSION

Project: **Rio Project No. 9690-112**
Mongaup Falls Project No. 10481-067
Swinging Bridge Project No. 10482-017

Date: June 22, 2017

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ORIGINAL

ENVIRONMENTAL ASSESSMENT- COMMENTS

The purposes of this review are to identify reasonable alternatives to the proposed action and to furnish information on the resources at issue.

Mine is a fisheries issue. It has often been observed that the **BROOK TROUT, Salvelinus fontinalis** (also called Natives or Speckled Trout) is the "canary in the mine". It thrives in only pure, cool and clean waters.

So valuable is this fish, that it has been designated as New York State Fish since 1975.

This relates to the Environmental Assessment for the projects under consideration because this project area holds some of the most remarkable Brook Trout waters in New York State.

I refer to 1+ miles of Black Lake Brook from Toronto Reservoir to Cliff Lake Reservoir and 1+ miles of Black Lake Brook from Cliff Lake Reservoir to the Mongaup River just below the Swinging Bridge Powerhouse. These combined 2+ miles constitute an amazing (but threatened) Brook Trout Fishery. (See attached highlighted map.)

What's the Threat? This remarkable fishery merits an adequate "min-flow" as these sections require valve releases from both Toronto and Cliff Lake to prevent the repeated dewatering which has been occurring most summers.

THE MIN-FLOW IS INADEQUATE. Before the construction of these projects, nature did a better job of providing adequate stream flow. Now streams flow is artificially controlled. Complaints in the past that the brook has dried-up have not been responded to, so either:

A. Boyar Comment #1

1. **"Min-flows" must be recalculated to prevent dewatering of this important Brook Trout Fishery, or**
2. **If "min-flows" are correctly calculated, they must be met and adhered to in order to prevent decimation of this fishery by dewatering.**

A. Boyar Comment #1, cont...

CONCLUDING COMMENTS:

These Projects must take into account all of the resources of the Project Area. I wish to speak up for the remarkable Brook Trout fishery in the public waters known as Black Lake Brook between Toronto Reservoir outlet and Cliff Lake and from Cliff Lake outlet to the Mongaup River. Current policies and practices put this Brook Trout population at risk.

The threat to our New York State Fish, the Brook Trout, must be reviewed and reconsidered so that the drastic dewatering which has been occurring historically in the waters described herein is remedied as part of any relicensing requirements.

A. Boyar Comment #2

Respectfully submitted,

ANDREW BOYAR

20170628-4008 FERC PDF (Unofficial) 06/28/2017

Telephone Memo

To: Public Files
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Date: June 28, 2017
Dockets: P-9690-112, 10481-067, and 10482-117
Project: Mongaup River Projects

Subject: Consultation with the Delaware Tribe of Indians Regarding the Relicensing of the Mongaup River Projects

On Wednesday, June 28, 2017, Quinn Emmering, Project Coordinator for the Mongaup River Projects, and I had a telephone conference at my office with Susan Bachor, Delaware Tribe Historic Preservation Representative. Our telephone conference was based on a letter Susan filed with us on June 20, 2017, requesting such a meeting with us involving the Mongaup River Projects. Susan stated that the Mongaup River is considered a significant waterway with the Delaware Tribe of Indians (Tribe) and was used historically as means of transportation over the many years the Tribe occupied the territory. Susan expressed that because there was no new construction or ground disturbing activities associated with the relicensing of the Mongaup Projects the Tribe would probably not have any concerns or issues at this time. However, she would like to have the opportunity to review any cultural resources documents or reports that may result from the relicensing.

Delaware Tribe (letter 2)
Comment #1

NEW YORK COUNCIL TROUT UNLIMITED
PO Box 815
Port Ewen New York 12466

Ron Urban, Chairman
Email: ronsgonefishing@aol.com

June 28, 2017

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington DC 20426

Projects: **Rio Project No. 9690-112**
Mongaup Falls Project No. 10481-067
Swinging Bridge Project No. 10482-017

Dear FERC Commissioners:

I write and comment this day relative to the above noted projects now under review with purpose of providing information and alternatives concerning the resources in the above relicensing project. I comment on behalf of the New York State Council Trout Unlimited on issues pertaining to the fishery which is an integral component of the projects. We believe that the resources of the applicant can be managed for improved benefit to the fishery with enhanced public recreational opportunities without undue burden on the applicant.

TU Comment #1

This watershed and the chain of reservoirs, generating stations and the connecting river and feeder streams constitute remarkable trout habitat. As such, it has been a blue-ribbon Brown and Brook Trout fishery in the past. We have reports of dewatering issues, and dried up streams just when water releases are needed the most. Those problems can be cured with better management practices including aeration valves to increase oxygen content coupled with suitable minimum flow requirements that are consistently met. We have reports of total dewatering which are particularly devastating to the Brook Trout population below both Cliff Lake and Toronto Reservoir. We believe that particular attention should be paid to this Brook Trout habitat.

TU Comment #2

It has often been observed that the **BROOK TROUT, Salvelinus fontinalis** (also called Natives or Speckled Trout) is the "canary in the mine". It thrives in only pure, cool and clean waters. So valuable is this fish, that it has been designated as New York State Fish since 1975.

I direct your specific attention to 1+ miles of Black Lake Brook from Toronto Reservoir to Cliff Lake Reservoir and 1+ miles of Black Lake Brook from Cliff Lake

TU Comment #3

Reservoir to the Mongaup River just below the Swinging Bridge Powerhouse. These combined 2+ miles constitute an amazing (but threatened) Brook Trout Fishery. (See attached highlighted location map.)

What's the Threat? This remarkable fishery merits an adequate "minimum-flow" (these sections require valve releases from both Toronto and Cliff Lake) to prevent the repeated dewatering which has been occurring.

TU Comment #3, cont...

THE MIN-FLOW IS INADEQUATE. Before the construction of these projects, nature did a better job of providing adequate stream flow. Now stream flow is artificially controlled. Complaints in the past that the brook has dried-up have not resolved the problem, so either:

1. **"Min-flows" must be recalculated to prevent dewatering of this important Brook Trout Fishery, or**

2. **If "min-flows" are correctly calculated, they must be met and adhered to in order to prevent decimation of this fishery by Dewatering.**

Also, installation of aeration valves at both of these impoundments would improve the overall health of the Black Lake Brook.

TU Comment #4

THE SYSTEM GENERALLY

We also want to comment on the fishery of the Mongaup System generally. This system is contiguous to NY State Public access areas and there are a number of roads abutting the "Mongaup".

Certainly, field conditions exist that would address the need for :

1. Enhanced access and
2. Handicapped access.

We would like to see more small car parking areas (pull offs) throughout the system. Now in place is a '2' car parking area at Akerson Road. This is a good working example, but even this example begs the question if 4-6 car parking wouldn't be even better. This parking area is below Rio Powerhouse. The Akerson Road parking area is a good example of a cost effective way to provide enhanced access to the fishery. (see photo attached)

We urge that more access areas like the one pictured are warranted because:

1. Small capital investment (a sign is sometimes all that is needed and many access roads, public and private are already in place) and

TU Comment #5

2. More small parking access areas will spread out fishing pressure making for a better fishing experience.
3. This recreational fishing opportunity needs to be made compliant with The Americans with Disabilities Act by installing and providing handicapped Access. One of Trout Unlimited's initiatives is to provide veterans with opportunities to fish and a number of our veterans have mobility issues that suitable handicap access would address. We want to do more work with veterans and better access to waters which heal is an initiative that everyone can support.

TU Comment #5, cont...

CONCLUSION:

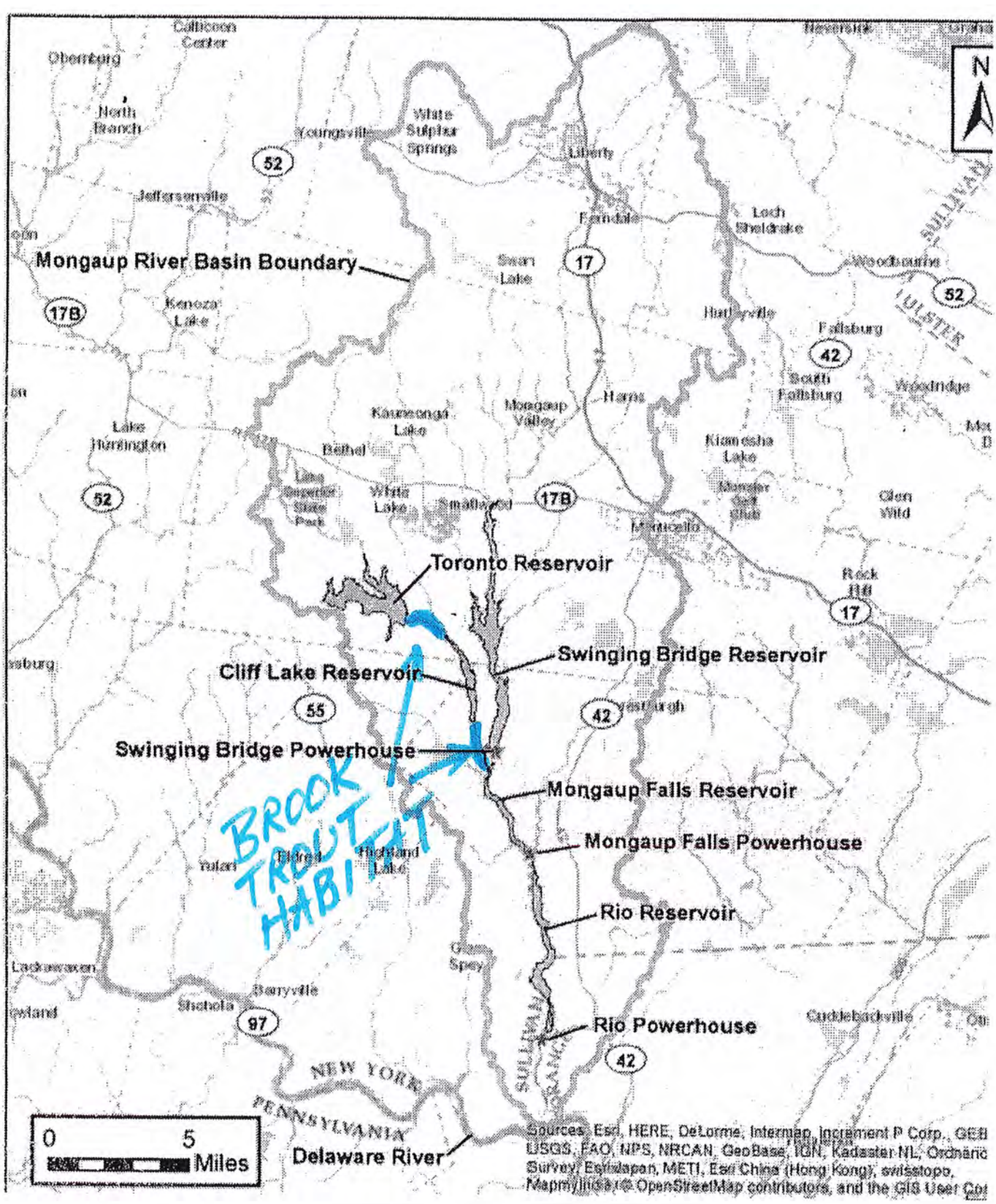
These Projects must take into account all of the resources of the Project Area. We believe that a hard look must be given to the remarkable Brook Trout fishery in the public waters known as Black Lake Brook between Toronto Reservoir outlet and Cliff Lake and from Cliff Lake outlet to the Mongaup River. Current policies and practices can be improved with a better minimum flow and an aeration valve for releases. The threat to our New York State Fish, the Brook Trout, must be reviewed and reconsidered so that the drastic dewatering which has been occurring historically in these waters is remedied as part of any relicensing requirements.

The relicensing review offers an opportunity to provide the public with greater access to a remarkable fishery via installation of handicap access and increased pocket-parking areas. These objectives can be accomplished without heavy capital costs and the investment required would vastly improve the project generally.

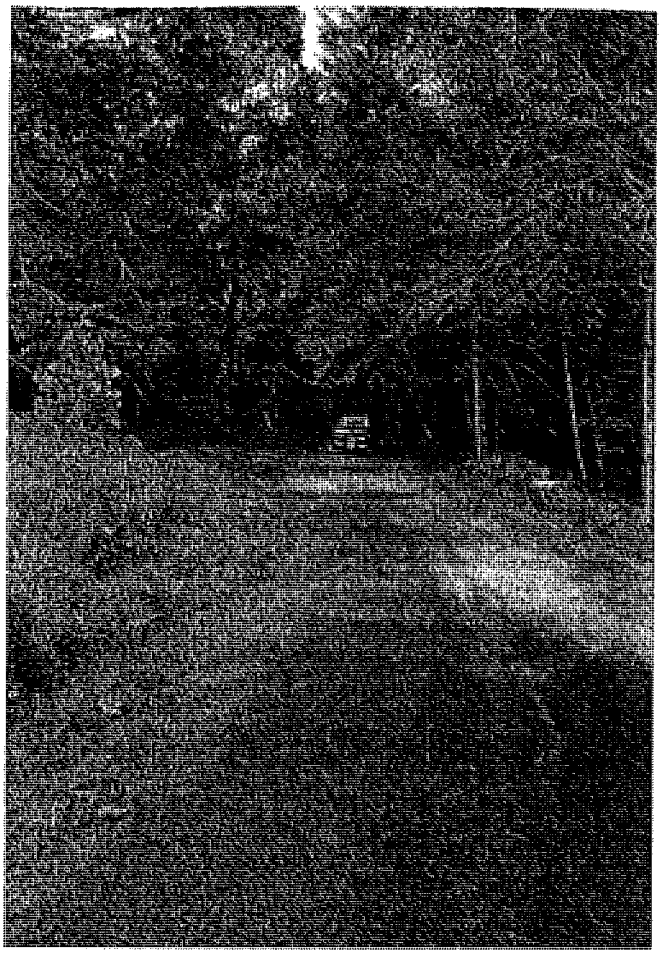
TU Comment #6

Respectfully submitted,

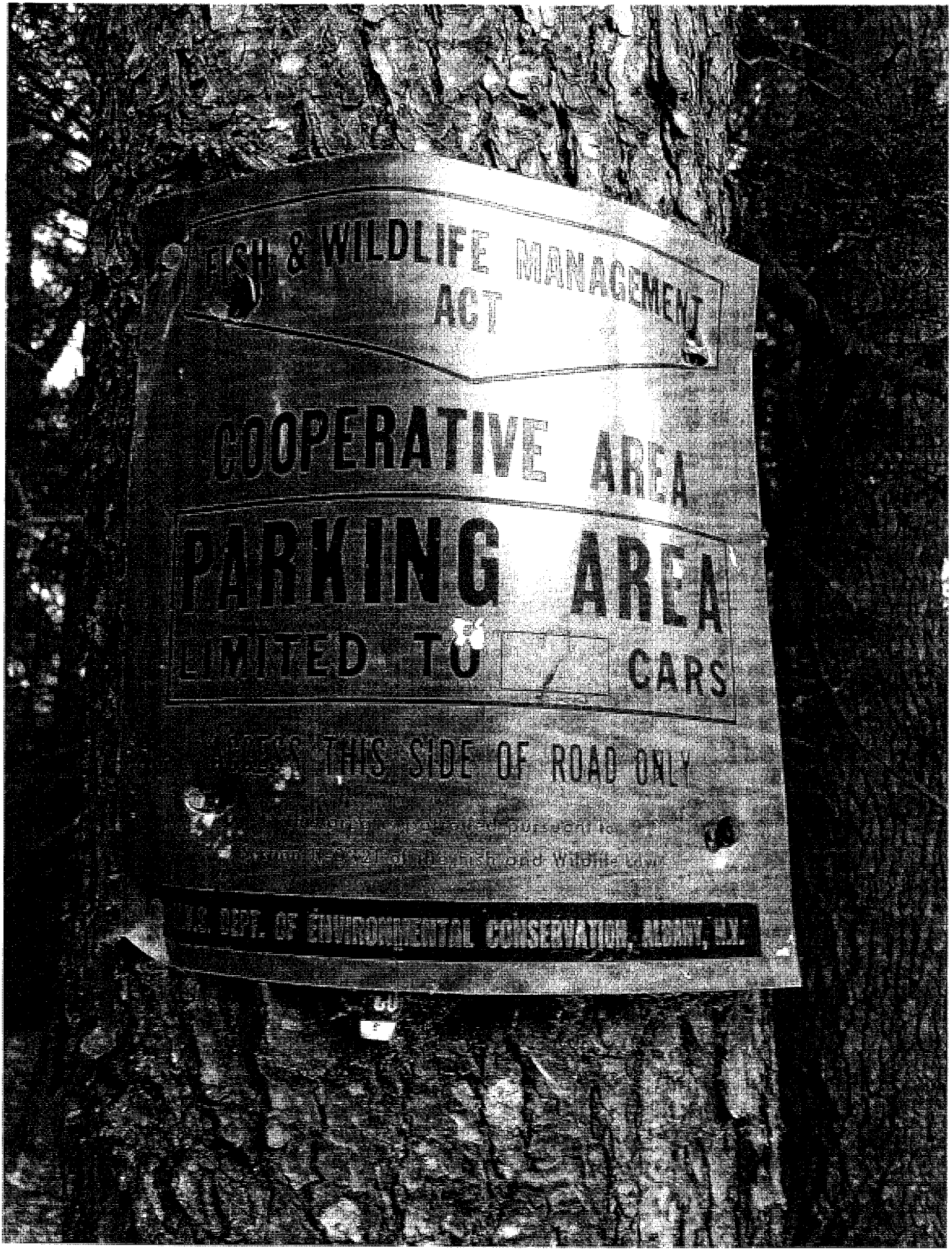
RON URBAN


Mongaup River Basin Boundary
Toronto Reservoir
Swinging Bridge Reservoir
Cliff Lake Reservoir
Swinging Bridge Powerhouse
Mongaup Falls Reservoir
Mongaup Falls Powerhouse
Rio Reservoir
Rio Powerhouse
Delaware River
BROOK TROUT HABITAT
NEW YORK
PENNSYLVANIA
0 5 Miles
N


STATE LAND
WILDLIFE
MANAGEMENT
AREA
RESTRICTED
AREA






FISH & WILDLIFE MANAGEMENT
ACT
COOPERATIVE AREA
PARKING AREA
LIMITED TO CARS
THIS SIDE OF ROAD ONLY

MYRON B ROCK, Whitestone, NY.
TORONTO EAST ACCESS RECREATIONAL SITE IS IMPORTANT TO MY FAMILY FOR THE PAST 40 YEARS THAT I HAVE BEEN LIVING IN THE TOWN OF BETHEL. WE SUPPORT EAGLE CREEK'S PRE-APPLICATION DOCUMENT'S STATEMENT THAT SWIMMING WILL NOT BE PROHIBITED BUT NOT ENCOURAGED. WE CANNOT PERMIT DEVELOPERS OR LOCAL HOMEOWNERS TO KEEP THE PUBLIC OUT OF THE AREA THAT IS A PUBLIC RECREATIONAL AREA UNDER FERC AUTHORITY.

M. Rock
Comment #1

Kimberly D. Bose ORIGINAL 7/2/17

FERC

888 1st st NE

Washington, DC 20426

FILED
SECRETARY OF THE
COMMISSION
2017 JUL 12 P 4:19
FEDERAL ENERGY
REGULATORY COMMISSION

P-10482-117

RE: Toronto Reservoir P-10482-117

L. Furmigli Comment #1

I am writing to urge you to enforce the federal license with Eagle Creek. Public Access to the Toronto Reservoir must be maintained. I have been coming to Smallwood, NY for 50 years, every summer. I am the 3rd generation of my family to do so. Ever since I was a little kid we would travel to the reservoir. I remember a long hike along a bumpy dirt road, picking blueberries along the shoreline, skipping rocks into the water & then a nice swim to cool off. The rocks along the shore were great for lying in the sun to dry off before the long hike back. We found the most beautiful pieces of driftwood, one of which my Dad made into a table, another graces my home in California as a reminder that summer & Smallwood are right around the corner. Please preserve public access to this area so future generations can also learn to skip rocks across the surface of the water.

L. Furmigli Comment #1, cont...

Thank you

Lynne Furmigli

14 Mohican Trail S.
Smallwood, NY 12778

1515 Westmont Ave
Campbell, CA
95008

20170711-0039 FERC PDF (Unofficial) 07/10/2017

ORIGINAL

Joyce Caracci
56 East Cherry Trail, PO Box 104
Smallwood,New York 12778
631-870-9320
luvmaine24@gmail.com
July 5,2017

FILED
SECRETARY OF THE
COMMISSION

2017 JUL 10 P 3:37

FEDERAL ENERGY
REGULATORY COMMISSION

Ms.Kimberly D.Bose
Federal Energy Regulatory Commission
88 First Street, NE
Washington DC 20426

Dear Ms. Bose:

I am contacting you in regard to The Toronto Reservoir Project **# (P-10482-117)**.

The reservoir is a natural source of beauty and wildlife that my family has enjoyed for many years. The birds, the tranquil location and wildlife have been a source for kayaking, canoeing and meditating. As a supporter of " THE FRIENDS of TORONTO", I urge you to support public access to this beautiful reservoir. As a Federal area, please preserve the Toronto Reservoir for the public and for the Brook Trout who seem to be dwindling in number.

J. Caracci Comment #1

Additionally, I suggest that the access road be made more ,"ACCESSIBLE" and the " PRIVATE PROPERTY" signs erected by Eagle Creek be placed elsewhere. The public, especially people in the community have a right to access the road.

Thank you for listening to the PUBLIC !!!!

J. Caracci Comment #2

Sincerely yours,

Joyce Caracci

Joyce Caracci

56 East Cherry Trail, PO Box 104, Smallwood 12778

20170801-0089 FERC PDF (Unofficial) 07/31/2017

ORIGINAL

Robert Vasta (Friends of Toronto)

P.O. Box 148

Smallwood, NY 12778

FILED
SECRETARY OF THE
COMMISSION

2017 JUL 31 P 4:08

FEDERAL ENERGY
REGULATORY COMMISSION

July 7, 2017

RE: Toronto Reservoir Project #(P-10482-117)

Kimberly D. Bose, FERC

888 First St., NE

Washington, DC 20426

Dear Ms. Bose:

I am writing to share why public access should remain open to the Toronto Reservoir. I personally have fished there since the early 70's. It is an area of raw beauty, and complete tranquility. The area is medicinal and actually can help alleviate the stresses of everyday living. This is something that should be available to all classes of people, not just a select few. I want to share my childhood with my daughter as well. With life going a million miles a minute, this kind of retreat is of the utmost importance to have and be able to share with family and friends. We need to be able to enjoy the outdoors more and this is one of the few ways that we can do that. FERC needs to enforce its federal license with Eagle Creek, and keep the public access available.

Sincerely,

Robert Vasta

Robert Vasta
Comment #1

Robert Vasta

Phone: 845-866-4440

Email: Bobstack373@gmail.com

20170714-0134 FERC PDF (Unofficial) 07/14/2017

Elizabeth Aviles

20 Aster Court

Brooklyn, NY 11229

FILED
SECRETARY OF THE
COMMISSION

2017 JUL 14 P 2:31

FEDERAL ENERGY
REGULATORY COMMISSION

RE: Toronto Reservoir Project #(P-10482-117)

July 8, 2017

ORIGINAL

Kimberly D. Bose, FERC

888 First St., NE

Washington, DC 20426

Dear Ms. Kimberly D. Bose,

I am writing in hopes of reaching someone who can help with what's going on at the Toronto Reservoir. It would be greatly appreciated if Eagle Creek would keep the public access open so that my family can continue to enjoy the area as it has for years before the new homes were built. I don't think the area should be limited to the wealthy only. Actually, I believe it better serves those who are on the lower end of the financial income population. Look at Governor Christie, is that what we want this world to come to. The beaches were all closed and yet his family was on the beach all by themselves. This was disgraceful and unjust. As a Friend of Toronto, I ask that the area be kept public.

Thank you for your time.

E. Aviles Comment #1

Most Sincerely,

Elizabeth Aviles

718-924-0142

20170714-0133 FERC PDF (Unofficial) 07/14/2017

Piera Pierucci

11 Mohawk Trail

Smallwood, NY 12778

Phone: 845-583-7247

Email: Pierava158@gmail.com

FILED
SECRETARY OF THE
COMMISSION

2017 JUL 14 P 2:31

FEDERAL ENERGY
REGULATORY COMMISSION

ORIGINAL

July 8, 2017

Kimberly D. Bose, FERC

888 First St., NE

Washington, DC 20426

RE: Toronto Reservoir Project # (P-10482-117)

Dear Ms. Bose:

My husband and I belong to The Friends of Toronto. Our family has been using the Toronto Reservoir area for hunting, fishing, etc. as a tradition for decades prior to these upper class homes being built along the shores of the reservoir. It isn't fair, that the few owner's of these homes have sole use to the area. Toronto Reservoir should be available to everyone as it always has been. FERC needs to enforce its federal license with Eagle Creek Now! I want to continue to share this lovely area with my grandchildren.

P. Pierucci
Comment #1

Sincerely,

Piera Pierucci

Piera Pierucci

Kenneth M. Steinglass, MD
300 East 74th Street
New York, NY 10021
212-327-4232 (H)
914-393-8696 (C)
kms5@columbia.edu

July 8, 2017

Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Dr. Quinn C. Emmering, Ph.D.
Federal Energy Regulatory Commission
Division of Hydropower Licensing
Office of Energy Projects
888 First Street, NE
Suite 611-07
Washington, DC 20426 and by email to <quinn.emmering@ferc.gov>

Mr. Robert A. Gates
EVP, Operations
Eagle Creek renewable Energy, LLC
116 North State Street
PO Box 167
Neshkoro, WI 54960-0167

Re: Swinging Bridge Project No. 10482-017

Dear Sirs:

I am writing to you regarding the status of Toronto Reservoir, as a very concerned longtime resident of White Lake in the Town of Bethel, NY, where I have owned and enjoyed my home for over thirty years.

The recreational use of the Toronto Reservoir is an invaluable asset to our residential and vacation communities. I do not own property on the reservoir, but ramp access and adequate water levels are critical to the enjoyment of hundreds of families, to the beauty of this region and to the welfare of our fish, animal and bird (including bald eagle) populations. Over my many years in the community, it has become very clear to me that the difference of just a few feet of water level has an enormous impact on the shoreline, accessibility and recreational use of this precious resource.

I respectfully request that FERC and Eagle Creek Renewable Energy, LLC recognize these concerns and arrive at a licensing agreement that addresses these issues.

Most sincerely,

K. Steinglass
Comment #1

Kenneth Steinglass, MD

July 9, 2016

ORIGINAL

FILED
SECRETARY OF THE
COMMISSION

2017 JUL 17 P 4:16

FEDERAL ENERGY
REGULATORY COMMISSION

Dear Kimberly D. Bose,

I am a homeowner in Sullivan County, NY and a member of **Friends of Toronto Reservoir**.

This letter is in regards to the **Toronto Reservoir Project P-10482-117.**

Public access to Toronto Reservoir is very important to me and my family. It is part of the reason I live here – the swimming and kayaking.

Please enforce FERC's federal license with Eagle Creek now.

E. Pearl Comment #1

Thank you,

Dr. Ena Pearl
40 Orange Ave. (PO Box 533)
Smallwood, NY
12778

From: Nick LaHowchic [mailto:NLaHowchic@diannicltd.com]
Sent: Wednesday, July 12, 2017 12:10 PM
To: Gibson, James <Jim.Gibson@hdrinc.com>
Subject: Questionnaire Submission for Eagle Creek Hydro Project Licensing - FERC 10481, 10482, 9690
Importance: High

Mr. Jim Gibson,
Attached find my submission of the Swinging Bridge, Mongaup Falls, and Rio Hydroelectric Projects Pre-Application Document Information Questionnaire
For including in supplied information for both Eagle Creek, FERC and other agencies.

Please confirm your receipt of the attached for inclusion.

Please advise if there is anything else I must do to have my thoughts and questions considered in Eagle Creek's License application Process.

Please add my email address to all public information concerning this Eagle Creek matter.

Thank you in advanced for your help in this matter.

Sincerely,

Nicholas J LaHowchic
PO Box 27
12 Misty Lane
White Lake, NY 12786
614-561-7100



This email has been checked for viruses by AVG antivirus software.
www.avg.com

Swinging Bridge, Mongaup Falls, and Rio Hydroelectric Projects
Pre-Application Document Information Questionnaire

Eagle Creek Hydro Power, LLC, Eagle Creek Water Resources, LLC, and Eagle Creek Land Resources, LLC (collectively "Eagle Creek") is the Licensee and operator of the Swinging Bridge Hydroelectric Project (FERC No. 10482), Mongaup Falls Hydroelectric Project (FERC No, 10481), and Rio Hydroelectric Project (FERC No. 9690) (collectively "Mongaup River Hydroelectric Projects"). The Mongaup River Hydroelectric Projects are located on the Mongaup River in Sullivan and Orange Counties, New York.

Eagle Creek, with assistance from HDR and TRC, is beginning the Federal Energy Regulatory Commission (FERC) relicensing process for the Mongaup River Hydroelectric Projects. Accordingly, Eagle Creek is preparing a Pre-Application Document (PAD) in support of the process.

The PAD provides FERC and other entities with existing, relevant, and reasonably available information pertaining to the three projects. This information is intended to help identify items of interest and related information needs, develop study requests and study plans, and prepare documents related to analyzing the relicensing application to be prepared by Eagle Creek. To prepare the PAD, Eagle Creek will use information in its possession and information obtained from others. This PAD Questionnaire is being used by Eagle Creek to help identify sources of existing, relevant, and reasonably available information that is not currently in Eagle Creek's possession. Comments and/or questions regarding this request may be sent to Jim Gibson with HDR by email at jim.gibson@hdrinc.com or phone at (315) 414-2202.

Please return this completed questionnaire by email to Jim Gibson (of HDR) at jim.gibson@hdrinc.com or in the enclosed, self-addressed, stamped envelope within 30 days of receipt to allow for any follow-up contact that may be needed. Not responding within 30 days indicates that you are not aware of any existing, relevant, and reasonably available information that describes the existing Mongaup River Hydroelectric Projects' environment.

Eagle Creek will be promoting the use of electronic communication via email and a web site throughout the relicensing process. **Therefore, we request that all parties who intend to be engaged in the relicensing process provide your email address below.**

We respectfully request the following information:

1. Information regarding the person completing the questionnaire:

Name & Title	Nicholas J. LaHowchic
Organization	
Address	P.O. 27, 12 Misty Lane, White Lake, NY 12786
Phone	Cell 614-561-7100
Email Address	NLaHowchic@diannicltd.com

2. Do you or your organization know of existing, relevant, and reasonably available information that describes the existing Mongaup River Hydroelectric Projects' environment (i.e., information regarding the Mongaup River in or close to the Mongaup River Hydroelectric Projects)?

X Yes *(If yes, please complete Nos. 2a through 2d)* No *(If no, please go to No. 3)*

a. If yes, please circle the specific resource area(s) that the information relates to:

- Geology and soils
- Water resources
- Fish and aquatic resources
- Wildlife and botanical resources
- Wetlands, riparian, and littoral habitat
- Rare, threatened, and endangered species
- Recreation and land use
- Aesthetic resources
- Cultural resources
- Socioeconomic resources
- Tribal resources
- Other resource information

b. Please briefly describe the information referenced above or list available documents *(additional information may be provided on page 4 of this questionnaire).*

SEE ATTACHED Pages 1-4

c. Where can we obtain this information?

SEE ATTACHED Pages 1-4

d. Please indicate whether there is a specific representative you wish to designate for a potential follow-up contact for the resource area(s) checked above *(additional information may be provided on page 4 of this questionnaire).*

Representative Contact(s) Information

Name	
Address	
Phone	
Email Address	

Name	
Address	
Phone	
Email Address	

3. Do you or your organization plan to participate in the Mongaup River Hydroelectric Projects relicensing proceeding?

__ Yes X No

4. We are interested in your comments. If you have comments and/or questions regarding the Mongaup River Hydroelectric Projects, or the relicensing process, please provide below. In addition, this questionnaire has been sent to the people/organizations shown on the attached distribution list; please let us know of anyone else you believe should receive this questionnaire that is not included on the attached distribution list.

SEE ATTACHED Pages 1-4

Comments and/or questions may be sent to: jim.gibson@hdrinc.com.

As noted above, please return this questionnaire via email or in the enclosed, self-addressed, stamped envelope within 30 days of receipt to allow for follow-up contact. Not responding within 30 days indicates that you are not aware of any existing, relevant, and reasonably available information that describes the existing Project environ

SUMMARY

1. **Water Levels** - Both the Toronto and Swinging Bridge Reservoirs (see Section 5.8.2) should be managed to equivalent water level guidelines during June 1st through September 30th of between the existing 99.35% and 99.07% of full elevations (1,220 feet for Toronto and 1070 feet for Swinging Bridge). The rationale which guides this recommendation comes from the 2015 FERC Form 80 which stated that the Toronto Reservoir utilizes 42% of its designed capacity recreation day level or 8.4 times that of the designed capacity recreation day level of Swinging Bridge Reservoir. Toronto Reservoir is noted to be more utilized than Swinging Bridge which is only utilized 5% of its designed recreational day level capacity.[See attached for more detail] N.L. #1

2. **Aesthetic Resources** - The Aesthetic Resources (see Section 5.9) presentation should be revised in paragraph three to correct their write-up to state that BOTH the Toronto and Swinging Bridge Reservoirs have a majority of lands abutting this part of the Project owned by private residential lots or private associations(for Toronto approx. 99%, for Swinging Bridge approx. 80%).. Cliff Lake, Mongaup Falls and Rio ONLY have the majority of lands abutting the balance of the Project owned by Eagle Creek or the NYSDEC, or have established conservation easement. [See attached for more detail] N.L. #2

3. **Mongaup River Hydroelectric System Normal Conditions Operating Plan –** (see Page 10-13) There is a need to bring the Toronto and Swinging Bridge Reservoirs into tighter water level control to achieve the summer recreational requirements of highly utilized reservoirs for the surrounding towns and communities. The full elevation heights of all dams and spillways need to be reviewed and assessed based on known mentioned levels of maximum safe overflow that surpass spillways and existing flash board heights to ascertain with enhancements the maximum water levels that can be stored and managed in a synchronized manner to achieve both operational and other environment requirements. Additionally the rule that minimum out flow from Swinging Bridge and downstream reservoirs should be revised to be no greater than the natural stream system inbound flow when the inbound flow is less than 100 cfs while meeting operational efficiencies or drought/emergency targets We should not be creating artificial outbound flows of the rivers or streams without serious rationale being considered that would override safe storage of water for power and recreation, the prime reasons for the water system. [see attached for more detail] N.L. #3

4. **Socioeconomic Resources** – The paragraph on Sullivan County needs to be revised as it misses much of the recent relevant investment and growth activity in the county. Sullivan County (see Section 5.11) has been and is again becoming a major vacation destination during the summer and other months (no different from the Hamptons in Long Island, the seashore in New Jersey or Candlewood Lake, CN) besides being a growing rural community. The statistics used in this area do not seem to recognize the documented recent and planned future increases in summer population, tourism and new 2nd vacation homeowners (non-voting residents) within a 15 mile radius of Toronto and Swinging Bridge Reservoirs which now exist or are currently under construction in the area. [see attached for more detail] N.L. #4

5. **Land Use Management** - Shoreline management guidelines (see Section 5.8.9) should be revised to allow resident abutting landowners on Toronto and Swinging Bridge Reservoirs, by permit and approval of Eagle Creek and at homeowner cost, periodically during low water levels to be able to modify the grade and finish of their adjacent shorelines to increase the useful use of the shoreline for boating and bathing within the boundaries of the two reservoirs during the summer months. No shoreline land should be removed from the reservoirs. only relocated within the reservoir to improve shoreline access. N.L. #5

DETAIL BACKGROUND INFORMATION

1. **Water Levels** - The Orange & Rockland Energy Company and future owners since 1990 FERC approval must/should have been planning for changes to the Toronto Reservoir similar to the Swing Bridge Reservoir for recreation, boating, fishing, bathing and tighter water level guidelines and commitments given some of the known activities.
    a. In 1990 the property surrounding the Toronto Reservoir was largely undeveloped and mostly owned by Orange & Rockland at the time, the Iroquois Hunting & Fishing Club and a few residential homeowners.
    b. In 1999 Orange & Rockland sold much of the property, lakeside and otherwise to a residential home developer and builder for profit who, from the beginning, had the intention to subdivide the property, lakeside and otherwise, into 5 acre residential home lots for sale to the general public. Thereafter approximately 400 new home lots were defined around the Toronto Reservoir with today approximately 100 new homes occupy lakeside lots , numerous lots sold pending home building and additional other lots for sale around or near the reservoir.
    c. As of today approximately 77% of the Toronto Reservoir shoreline abuts to residential lots with the balance of 23% owned by the Iroquois H&F Club, most of which still undeveloped but for a number of lakeside member homes. Additionally town residents from Bethel, Smallwood and other close towns have been increasing their use of the reservoir in all the ways mentioned above as witnessed not only by the activity on the reservoir (42% of the designed capacity recreation days for Toronto) but by the public litigation that transpired to keep the Toronto Dam public access open for the various town residents..
    d. In 2012 the current owner of the energy company, Eagle Creek, completed their due diligence prior to their purchase of the prior owner. In their due diligence for the purchase they should have found the historical records of the prior owner's sale of the adjacent land abutting the Toronto Reservoir to a residential home developer. Based on their broad experience in the water energy business as well as the requirements existing for water recreation on the Swinging Bridge Reservoir they understand that would require changing requirements to Toronto to be similar to Swinging Bridge and the need to reassess the entire system for it to operate differently to achieve its operating goals and requirements. They should have known that Toronto, like Swinging Bridge Reservoir which had numerous residential homes on and near the reservoir, would need to have the same recreation and pleasure considerations, which included more stable water levels during summer months, higher average water levels to support the fish population for recreation, etc.
        i. Some of the items that could be made to be very similar to Swinging Bridges Reservoir guidelines include;
            1. Maintaining a maximum drawdown of 97.9% of Toronto's full elevation or 26 feet below 1,220 feet elevation or 1,194 feet.
            2. Like Swinging Bridge target to maintain between 99.35%of full elevation on June 1st every year or 1,212 feet to 99.07% by September 30th or 1,209 feet unless there is a declared drought or other emergency
            3. Like Swinging Bridge Reservoir invest in better controlling Obermeyer and vertical gates on the Toronto spillway.

N.L. #6

2. **Aesthetic Resources** – There are two fundamentally different types of reservoirs in the Mongaup River Hydro system – those that are heavily populated by home residents' lakeside, adjacent home owners and populated adjourning towns and those that are abutted and surrounded by basically undeveloped forest. This was known when Eagle Creek examined and then purchased the water energy company.
    a. Their deep experience in this type of business and due diligence examination would have told them many of the deficiencies that existed in the new company they were about to purchase which would have included the useful life and efficacy of all the equipment and what changing requirements were needed because of their method of operating as well as expected change from the FERC 1990 approved license based on changes over the last 30 years and over the next 30 years to the environment effected by and effecting their business model.
    b. Managing a five reservoir system with known constraints is what this and similar systems have been for some time. The 1990 FERC license describes one that in 1989 was examined, surveyed, studied and made operational nearly 30 years ago to meet the requirements of that time coming forward. What is needed in the Eagle Creek PAD is a reassessment of all needed capabilities and constraints based on the today's and some part of the next 30 years of their new license grounded in the realities of today's technology, environment and known constraints approved operation.
    c. The need to more fully utilize the Toronto and Swinging Bridge Reservoirs different for recreation and energy as noted in number 1, above.
    d. The need to revise the capabilities of Cliff Lake, Mongaup Falls and Rio, the reservoirs with mostly undeveloped abutting and surrounding property. Based on the operating statistics presented in the PAD all three of these reservoirs with vertical gate or flash board enhancements could hold continually a significant increase in water level.
        1. Cliff Lake based on some of the statistics presented can be managed to a capacity higher than its current 13" flash boards , could be drawn down lower than 23.1 feet , could have a different higher holding elevation than Swinging Bridge if the control gates between the two were actively managed
        2. On Mongaup Falls Reservoir there is mention that while the full elevation of the spill way is 935 feet that during major reservoir accumulation water crosses the spillway at 942.2 feet. Could not the elevation of the reservoir be raised by some kind of automated gates and/or flash boards above the spillway greater than the 4'10" current flashboards to 8-10 feet?
        3. On the Rio Reservoir there is mention that while the full elevation of the spillway is 815 feet that during major reservoir accumulation water crosses the spillway at 825 feet. As a spillway dam could the 5 foot flash board be increased in height, automated with vertical gates to average higher mean water levels?
        4. With the 3 above listed reservoirs being located in undeveloped areas with little or no housing or commercial development, only limited access facilities for fishing and boating could not the levels of water be enhanced to better control the total water system needs for recreation, energy and downstream flow matching nature's inflow or when needed for defined purposes secondary outflow needs?

N.L. #7

N.L. #8

3. **Mongaup River Hydroelectric System Normal Conditions Operating Plan – See Number 2, above.**

4. **Socioeconomic Resources** – The review of recent and current changes and planned changes to Sullivan County have the potential to remake the area a rediscovered tourist and vacation center.

   a. The Center for Discovery in Harris, NY has continued to expand bringing more employees and families of disabled children and adults to Sullivan County
   b. Bethel Woods Center for the Arts in Bethel, NY opened in 2006 which is only three – five miles from the Toronto – Swinging Bridge Reservoirs has brought hundreds of thousands of new tourists and vacationers to Sullivan County to attend concerts, visit the museum or have their children participate in education programs
   c. Monticello Motor Club, Monticello, NY opened in 2008 as a private country club for automotive enthusiasts with a 4.1 mile long motor racing which has over 440 individuals with family members who visit or live part-time in the greater Monticello area
   d. EPR, Inc. the REIT is in Thompson, NY establishing the destination property formally on the old Concorde Resort land (some 6-8 miles from the Toronto – Swinging Bridge Reservoirs) which is currently under construction. Over $1.2 billion is being invested to complete over seven hundred hotel/lodge rooms, an indoor water park, and reconstructed U.S. Open quality golf course and new golf club house.
   e. The Veria Lifestyle in Thompson, NY located on the old Kutchers land is currently building a new 131 room Wellness Center Hotel and Spa with a reconstructed 18 hole golf course.
   f. At Chapin Estate, Bethel, NY a gated 2,500 acre development of 5-15 acre residential lot community is with a new development partner re-launching the final build out of all residential lots throughout the Chapin Estate property for resident members and guests. Additionally hundreds of residential lots are located lakeside or off lake on both Toronto and Swinging Bridge Reservoirs.

   This is of course an in process list for 2017-2018 which could more than likely increase the recreational use of both Toronto and Swing Bridge Reservoirs by many new multi-town residents and vacationers during the summer months as well as throughout the year . We should be studying the best practical scenario for the foreseeable future and planning for more active use of the two recreational reservoirs, Toronto and Swinging Bridge over the next 30 years under license. Again this request is well within the boundaries and calls for improvements for the enjoyable use of both recreational reservoirs. I am requesting broad benchmarking from other water energy systems to see how regulations from other water systems could improve our communities' use of all the five reservoirs.

N.L. #9

Oksana Tatis, KAUNEONGA LAKE, NY.
Hello!

I would like to take the time to tell you a little bit about the importance of the Toronto Reservoir to the residents of Bethel, New York.

I have been vacationing here for 19 years and finally moved to Bethel from New York City in April 2016. I have friends who have been living here all their lives, as well as friends who have returned to Bethel after retiring from city living. We all have many, and very fond memories that take place at Toronto Reservoir. Many residents of Bethel were extremely disappointed and heartbroken to find out that there are people who are trying to take the reservoir away from us. When all of the drama began between Chapin Estates, FERC, and Bethel residents, we were harassed and kicked out of the boat launch by a hired "security guard", photographed without our consent, as well as disrespected by the man who owns the house next the the boat launch by Smallwood. If people were trespassing on private property, the kind of treatment mentioned above might be warranted, however the Toronto Reservoir is public property, and so are the roads that leads to it, thereforr the sense of entitlement coming from certain Chapin Estate homeowners as well as Steve Dubrovsky is unfounded.

O. Tatis Comment #1

Please take a moment to consider the fact that Chapin Estates did not exist 16 years ago. And although the land that Chapin occupies is private, the water and shoreline is not. Let us be realistic; most, if not all of the Chapin Estate homeowners are not year-round residents. Is it fair that Toronto Reservoir be closed off to people who have enjoyed it all their lives, through all the seasons? Does it make sense that Toronto Reservoir be made available only to those who enjoy it over the weekends during a 2 month period out of the entire year? Is this really going to be another example of how the affluent get to hoard natural resources for themselves while people who are less fortunate lose yet another source of natural beauty that offers peace of mind, tranquility, and improved quality of life? I have a brother with autism who has a hard time being in crowded places. Often times White Lake, Lake Superior, and Smallwood Lake, are simply not the best options for my brother. My family has been taking him to Toronto to get some exercise and sun for almost two decades! Where will people like my brother be able to find peace and quiet? What about hard workers who want to dip their feet in the water after a long day? Toronto Reservoir means so much to the people of Bethel. It would be a great tragedy if it were taken away from us by people who will not utilize the reservoir nearly as much as Bethel residents already have for years. Please sympathize with the residents of Bethel, New York... Toronto reservoir is one of the few gems left for us to enjoy freely.

O. Tatis Comment #2

Sincerely,
Oksana Tatis

917-568-6566

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oksana.a.tatis@gmail.com
P-l0482-117

Nicholas J LaHowchic, White Lake, NY.
INFO CONCERNING RELICENSING OF THE MONGAUP RIVER PROJECT
1. Water Levels - Both the Toronto and Swinging Bridge Reservoirs (see Section 5.8.2) should be managed to equivalent water level guidelines during June 1st through September 30th of between the existing 99.35% and 99.07% of full elevations (1,220 feet for Toronto and 1070 feet for Swinging Bridge). The rationale which guides this recommendation comes from the 2015 FERC Form 80 which stated that the Toronto Reservoir utilizes 42% of its designed capacity recreation day level or 8.4 times that of the designed capacity recreation day level of Swinging Bridge Reservoir. Toronto Reservoir is noted to be more utilized than Swinging Bridge which is only utilized 5% of its designed recreational day level capacity.[See attached for more detail}

The Orange & Rockland Energy Company and future owners since 1990 FERC approval must/should have been planning for changes to the Toronto Reservoir similar to the Swing Bridge Reservoir for recreation, boating, fishing, bathing and tighter water level guidelines and commitments given some of the known activities.
a.In 1990 the property surrounding the Toronto Reservoir was largely undeveloped and mostly owned by Orange & Rockland at the time, the Iroquois Hunting & Fishing Club and a few residential homeowners.
b.In 1999 Orange & Rockland sold much of the property, lakeside and otherwise to a residential home developer and builder for profit who, from the beginning, had the intention to subdivide the property, lakeside and otherwise, into 5 acre residential home lots for sale to the general public. Thereafter approximately 400 new home lots were defined around the Toronto Reservoir with today approximately 100 new homes occupy lakeside lots , numerous lots sold pending home building and additional other lots for sale around or near the reservoir.
c.As of today approximately 77% of the Toronto Reservoir shoreline abuts to residential lots with the balance of 23% owned by the Iroquois H&F Club, most of which still undeveloped but for a number of lakeside member homes. Additionally town residents from Bethel, Smallwood and other close towns have been increasing their use of the reservoir in all the ways mentioned above as witnessed not only by the activity on the reservoir (42% of the designed capacity recreation days for Toronto) but by the public litigation that transpired to keep the Toronto Dam public access open for the various town residents..
d.In 2012 the current owner of the energy company, Eagle Creek, completed their due diligence prior to their purchase of the prior owner. In their due diligence for the purchase they should have found the historical records of the prior owner’s sale of the adjacent land abutting the Toronto Reservoir to a residential home developer. Based on their broad experience in the water energy business as well as the requirements existing for water recreation on the Swinging Bridge Reservoir they understand that would require changing requirements to Toronto to be similar to Swinging Bridge and the need to reassess the entire system for it to operate differently to achieve its operating goals and requirements. They should have known that Toronto, like Swinging Bridge Reservoir which had numerous residential homes on and near the reservoir, would need to have the same recreation and pleasure considerations, which

included more stable water levels during summer months, higher average water levels to support the fish population for recreation, etc.
i.Some of the items that could be made to be very similar to Swinging Bridges Reservoir guidelines include;
1.Maintaining a maximum drawdown of 97.9% of Toronto's full elevation or 26 feet below 1,220 feet elevation or 1,194 feet.
2.Like Swinging Bridge target to maintain between 99.35%of full elevation on June 1st every year or 1,212 feet to 99.07% by September 30th or 1,209 feet unless there is a declared drought or other emergency
3.Like Swinging Bridge Reservoir invest in better controlling Obermeyer and vertical gates on the Toronto spillway.

2. Aesthetic Resources - The Aesthetic Resources (see Section 5.9) presentation should be revised in paragraph three to correct their write-up to state that BOTH the Toronto and Swinging Bridge Reservoirs have a majority of lands abutting this part of the Project owned by private residential lots or private associations(for Toronto approx. 99%, for Swinging Bridge approx. 80%).. Cliff Lake, Mongaup Falls and Rio ONLY have the majority of lands abutting the balance of the Project owned by Eagle Creek or the NYSDEC, or have established conservation easement. [See attached for more detail]

3. Mongaup River Hydroelectric System Normal Conditions Operating Plan – (see Page 10-13) There is a need to bring the Toronto and Swinging Bridge Reservoirs into tighter water level control to achieve the summer recreational requirements of highly utilized reservoirs for the surrounding towns and communities. The full elevation heights of all dams and spillways need to be reviewed and assessed based on known mentioned levels of maximum safe overflow that surpass spillways and existing flash board heights to ascertain with enhancements the maximum water levels that can be stored and managed in a synchronized manner to achieve both operational and other environment requirements. Additionally the rule that minimum out flow from Swinging Bridge and downstream reservoirs should be revised to be no greater than the natural stream system inbound flow when the inbound flow is less than 100 cfs while meeting operational efficiencies or drought/emergency targets We should not be creating artificial outbound flows of the rivers or streams without serious rationale being considered that would override safe storage of water for power and recreation, the prime reasons for the water system. [see attached for more detail]

4. Socioeconomic Resources – Needs updating w/summertime population

N.L. #1 (Second letter)

Town of Bethel
Supervisor's Office
3454 Route 55 North
P. O. Box 300
White Lake, New York 12786

Daniel Sturm
Town Supervisor
Extension 12

Phone (845) 583-4350. Fax (845) 583-0225

Erin [illegible]
Confidential Secretary

FILED
SECRETARY OF THE COMMISSION
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FEDERAL ENERGY REGULATORY COMMISSION

ORIGINAL

July 17, 2017

Robert A. Gates, EVP Operations
Eagle Creek Renewable Energy, LLC
116 North State Street
PO Box 167
Neshkoro, WI 54960-0167

Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: Comments on Scoping Document 1
Docket Numbers: P-9690-112 and/or 10482-117

Dear Sirs/Madams:

The Town of Bethel has established a policy to support resident health and improve the health and welfare of the residents of the Town of Bethel. Additionally, the Town Board has repeatedly called for the public to have meaningful access to the Toronto East Access for recreational purposes.

The constant mandated releases of water from Swinging Bridge Reservoir and the resultant releases from Toronto Reservoir have resulted in a continual negative effect on the recreational use of these lakes. The increase in frequent periods of drought has exacerbated the problem. The Bethel Town Board urges the Commission to consider the public's right to meaningful recreational access when evaluating the mandated releases.

Town of Bethel Comment #1

Adequate water levels are also important to the area economy. Optimal water levels promote a healthy community, tourism and home ownership and thereby contribute to the economy through spending at local restaurants, shops, gas stations etc., and also by providing a stronger property tax base.

Town of Bethel Comment #2

On behalf of the Bethel Town Board I additionally respectfully request the following actions:

Town of Bethel Comment #3

That it is ensured that the public have meaningful access to the Toronto East Access for recreational purposes. Consistent with this Commission's previous findings, said recreational access shall not prohibit swimming.

Town of Bethel Comment #3, cont...

That it is ensured that the Toronto East Access be open to the public from dawn to dusk.

Town of Bethel Comment #4

That it be ensured that the access road to the Toronto East Access be maintained and kept in a fashion that allows for the public to have meaningful use of the Toronto East Access for recreational purposes.

Town of Bethel Comment #5

And that it be ensured that water levels in the reservoir be maintained at a level that allow for the public to have meaningful use of the Toronto East Access for recreational purposes.

Town of Bethel Comment #6

The Town Board also encourages the Commission to consider handicapped accessible improvements.

Town of Bethel Comment #7

The Toronto East Access is an important resource in this community. Its continued access by the public, specifically Bethel residents, cannot be overstated. Meaningful access for recreational purposes should be a priority.

Sincerely,

Daniel Sturm
Supervisor

Town of Bethel

Supervisor's Office

Daniel Sturm
Town Supervisor

3454 Route 55, P.O. Box 300
White Lake, New York 12786

Erin Lynch
Confidential Secretary

(845) 583-4350 ext. 12

December 28, 2016

HDR, Inc.
Attn: Jim Gibson, Project Manager
1304 Buckley Road
Suite 202
Syracuse, NY 13212-4311

Re: Pre-Application Document Questionnaire
Eagle Creek Hydro Power, LLC Relicensing

Dear Mr. Gibson:

Enclosed please find completed pre-application questionnaire on behalf of the Bethel Town Board for the Swinging Bridge (FERC No. 10482), Mongaup Falls (FERC No. 10481) and Rio Hydroelectric (FERC No. 9690) Projects.

Very truly yours,

Daniel Sturm

Town Website: www.town.bethel.ny.us **Email: bethelsupervisor@libertybiz.rr.com**
Fax: (845) 583-0225

Swinging Bridge, Mongaup Falls, and Rio Hydroelectric Projects
Pre-Application Document Information Questionnaire

Eagle Creek Hydro Power, LLC, Eagle Creek Water Resources, LLC, and Eagle Creek Land Resources, LLC (collectively "Eagle Creek") is the Licensee and operator of the Swinging Bridge Hydroelectric Project (FERC No. 10482), Mongaup Falls Hydroelectric Project (FERC No, 10481), and Rio Hydroelectric Project (FERC No. 9690) (collectively "Mongaup River Hydroelectric Projects"). The Mongaup River Hydroelectric Projects are located on the Mongaup River in Sullivan and Orange Counties, New York.

Eagle Creek, with assistance from HDR and TRC, is beginning the Federal Energy Regulatory Commission (FERC) relicensing process for the Mongaup River Hydroelectric Projects. Accordingly, Eagle Creek is preparing a Pre-Application Document (PAD) in support of the process.

The PAD provides FERC and other entities with existing, relevant, and reasonably available information pertaining to the three projects. This information is intended to help identify items of interest and related information needs, develop study requests and study plans, and prepare documents related to analyzing the relicensing application to be prepared by Eagle Creek. To prepare the PAD, Eagle Creek will use information in its possession and information obtained from others. This PAD Questionnaire is being used by Eagle Creek to help identify sources of existing, relevant, and reasonably available information that is not currently in Eagle Creek's possession. Comments and/or questions regarding this request may be sent to Jim Gibson with HDR by email at jim.gibson@hdrinc.com or phone at (315) 414-2202.

Please return this completed questionnaire by email to Jim Gibson (of HDR) at jim.gibson@hdrinc.com or in the enclosed, self-addressed, stamped envelope within 30 days of receipt to allow for any follow-up contact that may be needed. Not responding within 30 days indicates that you are not aware of any existing, relevant, and reasonably available information that describes the existing Mongaup River Hydroelectric Projects' environment.

Eagle Creek will be promoting the use of electronic communication via email and a web site throughout the relicensing process. **Therefore, we request that all parties who intend to be engaged in the relicensing process provide your email address below.**

We respectfully request the following information:

1. Information regarding the person completing the questionnaire:

Name & Title	Daniel Sturm, Town Supervisor
Organization	Town of Bethel
Address	PO Box 300, White Lake NY 12786
Phone	(845) 583-4350 x12
Email Address	bethelsupervisor@libertybiz.rr.com

2. Do you or your organization know of existing, relevant, and reasonably available information that describes the existing Mongaup River Hydroelectric Projects' environment (i.e., information regarding the Mongaup River in or close to the Mongaup River Hydroelectric Projects)?

✓ Yes *(If yes, please complete Nos. 2a through 2d)* __ No *(If no, please go to No. 3)*

a. If yes, please circle the specific resource area(s) that the information relates to:

- Geology and soils
- Water resources
- Fish and aquatic resources
- Wildlife and botanical resources
- Wetlands, riparian, and littoral habitat
- Rare, threatened, and endangered species
- Recreation and land use
- Aesthetic resources
- Cultural resources
- Socioeconomic resources
- Tribal resources
- Other resource information

b. Please briefly describe the information referenced above or list available documents *(additional information may be provided on page 4 of this questionnaire).*

Swinging Bridge FERC Licnse No. 10482

c. Where can we obtain this information?

Existing FERC License. available on the FERC Website.

d. Please indicate whether there is a specific representative you wish to designate for a potential follow-up contact for the resource area(s) checked above *(additional information may be provided on page 4 of this questionnaire).*

Representative Contact(s) Information

Name	Daniel Sturm, Town Supervisor
Address	PO Box 300, White Lake NY 12786
Phone	(845) 583-4350 x12
Email Address	bethelsupervisor@libertybiz.rr.com

Name	
Address	
Phone	
Email Address	

3. Do you or your organization plan to participate in the Mongaup River Hydroelectric Projects relicensing proceeding?

__ Yes ✓ No

4. We are interested in your comments. If you have comments and/or questions regarding the Mongaup River Hydroelectric Projects, or the relicensing process, please provide below. In addition, this questionnaire has been sent to the people/organizations shown on the attached distribution list; please let us know of anyone else you believe should receive this questionnaire that is not included on the attached distribution list.

The Town of Bethel Town Board would like to ensure that all existing recreational and land use requirements specifically for the Swinging Bridge FERC No. 10482 are upheld in the relicensing.

Town of Bethel Comment #1 (second letter)

Comments and/or questions may be sent to: jim.gibson@hdrinc.com.

As noted above, please return this questionnaire via email or in the enclosed, self-addressed, stamped envelope within 30 days of receipt to allow for follow-up contact. Not responding within 30 days indicates that you are not aware of any existing, relevant, and reasonably available information that describes the existing Project environment.

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Iroquois Hunting and Fishing Club Inc.
c/o Thomas D Kirk
7 Dogwood Court
Middlebury CT 06762

Robert A Gates
EVP Operations
Eagle Creek Renewable Energy
116 North State Street
P.O. Box 167
Neshkoro, WI 54960-0167
Bob.gates@eaglecreekre.com

Reference: P-10482 Toronto Reservoir, Relicensing

Sirs,

I represent the Iroquois Hunting and fishing Club, Inc., a private organization owning real property adjoining Toronto Reservoir. We are a fishing and hunting organization with a keen interest in maintaining and improving the environmental quality and recreational opportunity of the Toronto Reservoir and the surrounding region. Our members, along with the general public, have for decades enjoyed the myriad of recreation activities on and around the reservoir. Regrettably, we have also suffered the diminishment of those opportunities and witnessed the damage to the flora and fauna especially piscifauna, to the Reservoir and surrounding area during periods when the reservoir level was lowered.

This letter transmits our request, in the context of the opportunity afforded the public under the FERC process for relicensing, to propose examinations and studies for impacts to the reservoir, the surrounding area and the community. We are requesting that Eagle Creek, through FERC, perform a number of studies and evaluations of the reservoir and the impact changing and lowered water level(s) may have on environmental and ecological condition, flora and fauna health and diversity, ecological health, and recreational opportunity impacted by the operation of the Reservoir under the requested FERC license renewal.

IH&FC Comment #1

Accordingly we request the following investigations be conducted to thoroughly evaluate the potential for damage and harm to the reservoir environment and the effect on recreational opportunities. Specifically we request:

1. Geology Study: Investigation and examination to identify unique or sensitive physical features on the reservoir and land adjacent to it.

IH&FC Comment #2

2. Water resources and wetlands resources study: Describe the surface water, ground water and wetlands resources on the site and adjacent area of the Reservoir. Include state classification or designations placed on these resources as part of New York State environmental Law to reflect the best use, relative importance within the ecosystem or the function or value of the resource.

IH&FC Comment #3

Also include any special designation to these areas established as part of the local regional or Statewide planning efforts conducted by the Sullivan County Planning Department, the New York State Department of State , the New York State Department of Environmental Conservation, Sullivan County and or the Town of Bethel

IH&FC Comment #3, cont...

3. Terrestrial and Aquatic Ecology :
    a. Describe the water surface environs on the site and the general reservoir area.
    b. Describe the terrestrial vegetation and aquatic vegetation (type, diversity, dominance, rare, threatened, endangered (local, NYS and Federal), etc.) within and around the general reservoir area.
    c. Describe and characterize the fauna, including all birds, insects, mammals etc., which use the site or are in close proximity to the site. Describe and characterize the fauna which use the reservoir and surrounding area for feeding, nesting, roosting or resting throughout the year.
    d. Demonstrate compliance of the activity with the Federal Bald Eagle Guidelines. A discussion should also be included regarding the need for a taking permit pursuant to 6 NYCRR 182.
    e. Describe and characterize throughout the spring and summer months, the aquatic organisms (type, distribution, dominance, rare, endangered, threatened, etc.) found in the near shore area at the reservoir. Describe and characterize throughout the spring and summer months, the aquatic organisms (type, site, dominance, rare, endangered etc.) found in the near shore area at the project site. This should include fish, reptiles and amphibians. If no data for this area exists, then sampling collection for this area will be required. Consider seasonal use patterns and the relative importance of these habitats to individual species, the project area and its environs and population level.
    f. Specifically for Fish and reservoir-residing creatures: A comprehensive survey of fish species and benthic micro and macro invertebrates, pollution and eco-system health should be conducted during the range of seasons to include spawning season and periods of varying water levels. Surveying should be conducted across the span of the seasons to insure seasonal affects are understood and recorded. Include spawning season for all game and forage fish species. The examination should be performed in a comprehensive manner to include shallow areas of the Lake both developed and undeveloped areas and deeper water sections, including the area near and adjacent to the Dam and Dam tower. If advisable, non-lethal methods such as electrofishing could be performed. Through the capture of fish, the biological health and potential benefits of the Lake for aquatic species can be determined.
    g. Water quality: A comprehensive study of the water quality on a seasonal basis to examine the impact of varying water levels on water quality and the impact of changes if any on flora and fauna diversity and abundance. This study should include examination of turbidity and its impact on rooted aquatic plants using a Secchi Disk.
    h. A comprehensive study of the impact of water level changes, frequency and rate of water level changes on fish mortality and reproduction associated the past practices of the reservoir and anticipated future use of the reservoir for energy generation purposes.

IH&FC Comment #4

4. Water and Surface Navigability: Provide a detailed evaluation of the existing water surface use patterns in the near-shore area of the proposed project. Include types and sizes of boats, sailing vessels, and personal watercraft using the water in the project area. Identify and describe general patterns of boat traffic flow.

IH&FC Comment #5

IH&FC Comment #6

5. Aesthetic Resources. Describe scenic views known to be of importance or value to the area residents. Photographs of the site and its environs should be incorporated into this section.

IH&FC Comment #7

6. Potential Significant Environmental Impacts and Mitigation. Identify and describe short-term, long-term, cumulative and other associated environmental impacts and issues as identified herein. With the description of the environmental setting as a basis for comparison, the description of the impacts will include both a quantitative and qualitative assessment of the potential for the impact to occur and the magnitude and importance of the impact. The time frame in which the impact is anticipated will also be identified. Identify adverse impacts from all aspects of the project, temporary or permanent in nature. If beneficial impacts are identified, describe them in a similar manner. This section will also identify all proposed mitigation to reduce or eliminate the potential adverse impacts. For example, the impact to the fishery and anticipated recovery timeframe.

Thanks you for your attention to these important issues and our collective concerns. Speaking for all the members of the Iroquois Fishing and Hunting Club we look forward to working cooperatively with Eagle Creek, FERC, NYSDEC and all interested parties in an effort to improve the ecological quality and recreational opportunities of the Reservoir.

Very Truly Yours,

Thomas D. Kirk

for
Iroquois Hunting and Fishing Club Inc.

cc: IHFC Board
Atty Baum
Federal Energy Regulatory Commission,
NYDEC
Sullivan County DPW

.

Project# 10482-117 P.O. Box 512

ORIGINAL Smallwood, New York 12778

July 22, 2017

Kimberly D. Bose
FERC
888 First St. NE
Washington, DC 20426

FILED
SECRETARY OF THE
COMMISSION
2017 JUL 28 P 2:
FEDERAL ENERGY
REGULATORY COMMISSION

Dear Ms. Bose,

As residents of Smallwood, New York, Town of Bethel since 1942, my family and I have frequented Toronto Reservoir, swimming in that clear water, watching spectacular sunsets, gazing at the rising moon and the twinkling of the stars. Toronto has been a source of serenity and admiration of nature's beauty.

As Eagle Creek prepares to renew its federal license, we Friends of Toronto ask you to enforce the current licence agreement, keeping the public access of Toronto Reservoir including fishing, boating & swimming, so that our grandchildren,

C. Maher
Comment #1

great grandchildren and beyond could enjoy what my family has enjoyed for the past 75 years.

C. Maher Comment #1, cont...

Yours truly,
Carole A. Maher
and
family
Tel. 845-583-4874

Project # 10782-117

ORIGINAL

FILED
SECRETARY OF THE
COMMISSION

2017 JUL 31 P 3:51

FEDERAL ENERGY
REGULATORY COMMISSION

Notes

865 Lakeview Drive
Smallwood, NY
July 24 2017
Re Toronto #P10482-117

Dear Ms Bose,

I am with Friends of Toronto and I would like to tell how Toronto Reservoir has always been a destination of beauty for our family to enjoy.

Please continue public access as has been the case in my life here for 70 years. We all want FERC to enforce the terms of the federal license to Eagle Creek

Thank you,
Sincerely,
Rick Davis

R.C. Comment #1

20170801-0101 FERC PDF (Unofficial) 07/31/2017

United States Department of the Interior

NATIONAL PARK SERVICE
NORTHEAST REGION
15 State Street
Boston, Massachusetts 02109-3572

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

July 24, 2017
ER 17/00264
Filed Electronically

Review of Notice of Intent to File License Application, Pre-Application Document (PAD), Commencement of Pre-filing Process, Scoping, Soliciting Comments on the PAD and SD, Study Requests, Rio Hydroelectric Project (P-9690-112), Mongaup Falls Hydroelectric Project (P-10481-067), and Swinging Bridge Hydroelectric Project (P-10482-117), Sullivan, Orange Counties, New York. ER 17/0264

Dear Secretary Bose:

The National Park Service (NPS) has reviewed the PAD for the above referenced hydroelectric projects and offers the following comments.

These projects were among the first set of relicensings undertaken under the Electric Consumers Protection Act of 1986 which amended the Federal Power Act, and its associated regulations. The NPS Hydro Program http://www.nps.gov/hydro was established as a direct result of EPCA in order to provide technical assistance to stakeholders, including the applicants, in the FERC licensing process. Our program was not involved in the initial FERC license proceedings as funding and staff for the programs were not in place until late 1990. For the current relicensings, NPS staff, both Hydro Program and from the Upper Delaware Scenic and Recreational River UPDE (the National Wild and Scenic River designation managed by the NPS into which the Mongaup River flows), attended the site visits, agency and public meetings held in June of 2017.

NPS Units Potentially Affected by the Relicensing

The project impact area, or the area in which NPS units are potentially affected by this relicensing, includes an area much larger than the "Project Area" delineated by the applicant, which focuses solely on an area within the Mongaup River Watershed. This larger area of considerations includes sections of the Delaware River upstream and downstream of the Mongaup River due to existing rules governing flow management for the Delaware Basin established by the Amended 1954 Supreme Court Decree (https://water.usgs.gov/osw/odrm/decree.html).

NPS Comment #1

As such, the NPS' position is the Project Area includes several National Wild and Scenic River System segments established by Congress between 1965 and 2000. These include the lower 5200 feet of the Mongaup River within the designated boundary of the Upper Delaware Scenic and Recreational River https://www.nps.gov/upde/index.htm, as well as extensive reaches of the Delaware River upstream and downstream of the Mongaup River. These reaches include the 73.4 miles of the main stem Delaware River, 69 miles of which are above the Mongaup River, and 4.4 miles of which are below. This section of the Delaware forms the New York-Pennsylvania border from River Mile 330.1 to River Mile 256.7. Portions of the Delaware River further downstream include the Middle Delaware National Scenic and Recreational River, which flows through Delaware Water Gap National Recreation Area (DEWA) which constitutes the New Jersey-Pennsylvania border and extends from River Mile 250 to River Mile 210 (https://www.nps.gov/dewa/index.htm), in addition to the Lower Delaware National Wild And Scenic River (LODE) https://www.nps.gov/lode/index.htm), which includes 38.9 miles of the Delaware River which forms the Pennsylvania and New Jersey border.

NPS Comment #1, cont...

This entire project impact area may potentially be impacted by flow releases from the Mongaup River system upstream and downstream of the Mongaup River due to water management mandates established in the Amended 1954 Supreme Court Decree. Releases from the Mongaup River system count towards the USGS Montague Gage flow target, and the resulting ramifications of hydropower and recreational water releases have potential adverse impacts on the rest of the system. Releases from the Mongaup River are factored into compensating water releases from New York City reservoirs on the East and West Branches of the Delaware River directed by the USGS Office of the Delaware River Master (https://water.usgs.gov/osw/odrm/) in this office's daily design, and more water from the Mongaup often means less water from upriver reservoirs, on short if any notice to recreational and other users.

NPS' Wild and Scenic Rivers Responsibilities

In 1968, Congress passed the Wild and Scenic Rivers Act (WSRA) which "declared to be the policy of the United States that certain selected rivers of the Nation, which with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." https://www.rivers.gov/wsr-act.php

NPS Comment #2

Each designated river in the national system is managed in a way that protects and enhances the values that prompted its designation. In 1978, Congress designated the Upper Delaware River as a component of the National Wild and Scenic River system, and thus as a unit of the National Park System. This and the other Delaware River designations are administered by the National Park Service. The Upper Delaware Scenic and Recreational River (UPDE) is a partnership river, managed in collaboration with the Upper Delaware Council (UDC) http://www.upperdelawarecouncil.org/ which is made up of representatives from UDC member Pennsylvania Townships and New York Towns bordering the river.

The 55,575 acre Upper Delaware Scenic and Recreational River Corridor ridgetop to ridgetop boundary, approximately 1/4 to 1/2 mile inland from either river bank, was established to meet the resource protection requirements of the Wild and Scenic Rivers Act. The land area within this boundary is mostly privately-owned; the National Park Service owns a total of 31 acres within the corridor.

As the longest and one of the cleanest free-flowing (undammed) rivers in the eastern United States, the Delaware maintains high water quality, ecological integrity, cultural, geological, recreational, and scenic values that are exceptional among the large river systems in this region.

The NPS has responsibility for implementing section 7 of the Wild and Scenic Rivers Act (WSRA 16 USC 1278 Section 7(a)) which provides that each river designated into the NWSRS with permanent protection from federally licensed or assisted dams, diversions, channelization or other water resources projects that would have a direct and adverse effect on its free-flowing condition, water quality, or "outstandingly remarkable values"; or, *for projects upstream, downstream, or on a tributary to the designated segments, that would invade or unreasonably diminish the segment's fish and wildlife, scenic, or recreational resources* (Interagency Wild and Scenic Rivers Coordinating Council, 2004). Outstandingly Remarkable Values (ORVs) are defined by the Wild and Scenic Rivers Act as the characteristics that make a river worthy of special protection. At UPDE, DEWA, and LODE, identified ORVs include the free-flowing condition, water quality, cultural, ecological, geological, recreational, and scenic resources and values. These are described in detail in the Delaware River Basin Wild and Scenic Values report (NPS 2012a) and the Delaware River Basin Wild and Scenic Values Workshop report (NPS 2012b).

NPS Comment #2, cont...

The NPS Statement of Interest (Attached as Appendix A) considers the potential effects of the Mongaup River Hydropower Relicensing Project located on this tributary to UPDE, and to additional Wild and Scenic River designations upstream and downstream of the Mongaup under the invade or unreasonably diminish standard. The ORVs which may be considered under this standard include potential impacts to the Delaware River's free-flowing condition, and its water quality, scenic, recreational, and fish and wildlife resources and values. The Mongaup River is the 2nd largest tributary to the Delaware River within UPDE, and based upon the watershed area, and contributes on average 15% of the flow volume of the Delaware River where it enters at River Mile 261.1. Under some release regimes (approximately 970 cfs maximum discharge), the Mongaup River may contribute over 55% of the flow volume (1750 cfs) at the USGS Montague Gage at River Mile 247.

Comprehensive Plans

The NPS has prepared a number of plans associated with DEWA, UPDE and LOWE. They include, but are not limited to the following.

UPDE

https://www.nps.gov/upde/learn/management/upload/Upper-Delaware-River-Management-Plan-1986.pdf
Final River Management Plan for the Upper Delaware Scenic and Recreational River, November 1986

https://www.nps.gov/upde/learn/management/upload/Delaware-River-Basin_WSR-Values_Publication_Screen-Version_09-27-2012-rotated-full-screen-mode.pdf
Delaware River Basin National Wild and Scenic River Values, September 2012

https://www.nps.gov/upde/learn/management/upload/UPDE_FD_SP-1.pdf
Foundation Document Upper Delaware Scenic and Recreational River, February 2014

https://www.nps.gov/upde/learn/management/upload/UPDE_OV_SP.pdf
Foundation Document Overview Upper Delaware Scenic and Recreational River, November 2013

https://www.nps.gov/upde/learn/management/upload/UPDE_FinalParkMgmtGoals_1_31_15.pdf
Upper Delaware Scenic and Recreational River: Purpose and Management Goals, January 2015

DEWA

https://www.nps.gov/dewa/parkmgmt/upload/DEWAGMPSummary1987.pdf
Delaware Water Gaps National Recreation Area General Management Plan Summary, May 1987

https://www.nps.gov/dewa/learn/management/upload/DEWA_FD_lowres.pdf
Foundation Document Delaware Water Gap National Recreation Area and Middle Delaware National Scenic and Recreational River, October 2014

NPS is currently developing the Draft Visitor Use Management for the Delaware Water Gap National Recreation Area and Middle Delaware National Scenic and Recreational River.
https://parkplanning.nps.gov/projectHome.cfm?projectID=55912

LODE

https://www.nps.gov/upde/learn/management/upload/Delaware-River-Basin_WSR-Values_Publication_Screen-Version_09-27-2012-rotated-full-screen-mode.pdf
Delaware River Basin National Wild and Scenic River Values, September 2012

https://www.nps.gov/lode/learn/management/upload/15YlodePartner-11x32-2.pdf Lower Delaware Wild and Scenic River Management Committee Action Plan Lower and Scenic River Partnership Plan: 2000 – 2014.

https://www.nps.gov/lode/getinvolved/planning.htm LODE Management Goals, updated February 2015.

The above referenced completed plans may constitute Comprehensive Plans under Section 10a of the Federal Power Act; the NPS intends to submit them to FERC for such consideration.

Current Relicensing Study and Information Needs

Although, as the applicant states in their PAD, these projects were among the first to receive an initial license under ECPA and its regulations, 30 years have passed since that time. The ground conditions have changed, including recreational use patterns, land ownership and development, flora and fauna habitat, rainfall and climate patterns, as well as water quality and quantities available for competing uses. Many sites and issues were not studied specifically during the previous process and others that were considered need to be re-evaluated. Numerous changes have been made to the license, including the February 7, 2007 FERC Order that amended License Article 401 in association with the 2004 Recreational Usage Report required under License Article 408. These releases have resulted in changing conditions in the Delaware River.

The NPS requests that the applicant prepare a Recreational Use and Needs Assessment Study based on the Study Plan Criteria found in FERC's Regulations, 18 CFR Section 5.9(b).

NPS Comment #3

Recreation Site Inventory, Use, and Needs Assessment

1. *Describe the goals and objectives of each study proposal and the information to be obtained*;

The purpose of this study is to identify and study the quantity, quality, and adequacy of the land- based recreational facilities associated with and in close proximity to the existing impoundments with public access, including Toronto and Swinging Bridge, and the project area. (Please see discussion of project area to be evaluated below). The study should evaluate facilities, including put-in and take-out facilities for trailered boats, car top and carry in, campsites, multi-use trails, parking and road access, seasons of operation, maintenance, and sanitary facilities. The study should examine the facilities that are necessary for public access to the impoundments, parking lot size consistent with projected usage, erosion control, and those whose needs are characterized under the "Americans with Disabilities Act" or ADA, including angling and access options.

Study goals include:

- obtain information about the condition of existing recreation facilities and access sites at and in close proximity to the project and along project-affected waters and lands with public access;
- obtain information about existing recreation use and opportunities, access, and present and future use estimates for sites within the project-affected area;
- conduct an assessment of the need to enhance recreation opportunities and access at the project;
- present the recreation use and opportunities at the project within the larger context of regional opportunities; and

NPS Comment #4

- lay the foundation for preparation of a Recreation Management Plan (RMP) for the Project that will be included in the license application.

Study components include:

A. Recreation Site Inventory

An inventory form should be used for site visits at all publicly accessible sites within the project- affected area to document existing facilities and resources. These will include project sites and informal sites.

Amenities at each site, such as the presence and type of restrooms, types of activities supported, parking spaces, and parking surface, will be recorded along with digital photos and GPS points. This inventory will identify and characterize public facilities and resources, and the conditions of those facilities. Formal and informal river access sites will be visually assessed and photographed to record any opportunities or challenges for craft or anglers. The inventory should be one of the first tasks of the study and should cover all four seasons. The study should review land ownership (including the applicants) surrounding the project area and investigate shoreline slope conditions (e.g., steepness, length) for alternative public access options.

NPS Comment #4, cont...

The results of the inventory will provide baseline information regarding existing recreation facilities and resources at the projects and along project-affected waters, including bypassed reaches. The inventory information will be assessed in conjunction with a visitor intercept survey.

B. Recreation Use and Needs Survey

The use and needs assessment will document recreation activity types known to occur or potentially occurring at in the project-affected area.

Use Survey: Two components should be used to collect existing and potential (future) recreational visitor use data:

1) existing public use (traffic counters, spot counts, and visitor intercept interviews);
2) potential visitors through a mailed and/or online questionnaire.

This data is needed in order to identify potential users including those who choose not to use project facilities for a variety of reasons. Potential surveys could utilize existing member databases of NGOs and user groups in the region, Federal, state and local user information, such as visitor counts and existing user surveys at facilities outside the project area that may offer an indication of why project facilities are not chosen.

C. Future Use Assessment

Future use estimates should be calculated by assessing future demand for recreation activities and population trends for the expected term of the new license. Growth in recreation activities and recreation use projections for the anticipated growth in recreational use through 2060 should be developed using Outdoor Recreation in American Life: A

National Assessment of Demand and Supply Trends (Cordell et al., 1999), Outdoor Recreation Participation in the United States – Projections to 2060 (Bowker et al., 2012), as well as numerous additional sources and commonly used methodologies. Current use estimates should be projected with indexed values of expected changes in the number of recreation days for given activities at the projects to estimate future recreation use in the project for 10-year increments out to 2050.

2. *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;*

See Appendix A which forms the basis for any NPS Section 7 evaluation under the WSRA.

3. *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;*

Requester is a Federal Agency, National Park Service.

NPS Comment #4, cont...

4. *Describe existing information concerning the subject of the study proposal, and the need for additional information;*

The PAD provides information on existing recreation facilities and opportunities provided on project lands and in the vicinity of the project; however, the applicant is proposing no new additional studies for a project that was licensed thirty years ago. There have been considerable changes in population density related to development in the vicinity of the projects, recreational use patterns and needs have changed as a result, have affected the way in which the public uses these resources.

Existing information is primarily in the Form 80 data submitted by the licensee during the course of the current license. There is no accurate, recent information on the number of recreational users in the area and the adequacy of the facilities currently available, and there has been no public discourse regarding the state of existing facilities until the present relicensings regarding recreational uses and potential additional and/or updated facilities.

5. *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;*

This study would provide new information regarding adequate access and facilities for a diverse cross-section of recreational users. This study is vital to defining access facilities that can best be adapted for boaters, anglers, hikers, hunters, and other potential user groups. FERC and the applicant should be aware of the conditions on the ground, and the needs of user groups, before a new license is issued.

6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge;*

This type of study is routinely prepared in relicensing proceedings, sources and methods for gathering data are accepted by the FERC and the scientific community. https://www.ferc.gov/industries/hydropower/gen-info/guidelines/recreat-dev-hydro-licen.pdf

7. *Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.*

This type of study is routinely performed in FERC relicensings.

NPS Comment #4, cont...

Flow Study - Scheduled Recreational Releases

Another area of NPS concern is associated with the February 7, 2007 FERC Order that amended License Article 401 relative to the 2004 Recreational Usage Report required under License Article 408. Recreational releases often result in changes to conditions in the Delaware River, and by association, recreational use and access. User data since the amendment should be included in the above requested study, including user experiences on the Delaware River during recreational flow releases.

Under the current License Order, there is no specific set of criteria under which the licensee can cancel or modify scheduled releases below Rio, nor a time frame prior to any changes in which to inform the public. These release forecasts are factored into the River Master's daily flow designs and prescribed releases from NYC days in advance, and cancellations play havoc with the ability to accomplish flow targets and can and often do adversely affect water-dependent natural resources and recreational use. Regardless of whether any changes in flows are made, an internet based system (with text notifications to those who sign up for flow release alerts) should be developed in order to give recreational users an opportunity to obtain real time release data in advance as well as to confirm that flows will in fact be provided on a particular day. There should be specific criteria for what constitutes an emergency (non-economic) condition which would necessitate the cancellation or modification of scheduled releases below the Rio dam.

NPS Comment #5

The NPS requests the following Flow Study to evaluate base flows and controlled recreational boating releases in the Mongaup River, and their impacts on upstream and downstream river conditions. These conditions would include flows and temperature conditions at established USGS gages on the Delaware River, resulting in potential effects of aquatic and recreational resources.

1. *Describe the goals and objectives of each study proposal and the information to be obtained*;

The overall goal of this study is to understand, correlate and define how Mongaup Project releases (or cancellation of forecast releases provided to the River Master) influence resulting

temperature and flow conditions at USGS gages on the Delaware River upstream and downstream of the Mongaup River in the Delaware system. The Applicant should document the extent to which the high flow releases from the Rio Project influence Delaware River flows, especially in low flow periods. The applicant should also provide a record of all the times when scheduled releases provided to the USGS River Master were canceled, or significantly reduced, and for what reason.

Upstream Delaware River Conditions

This would include providing data on resulting cubic feet per second (CFS) flows, river height (stage), and water temperatures at USGS gages during the timeframe of influence of Mongaup system releases (when factored into the USGS River Master's daily design for compensating releases from New York City (NYC) reservoirs that affect the Delaware system upstream of the Mongaup River. A total of 69 miles (94%) of the designated Upper Delaware Scenic and Recreational River is above the Mongaup River.

NPS Comment #5, cont...

Those potentially affected above-the-Mongaup locations include:
West Branch of the Delaware River at Hale Eddy, NY,
East Branch of the Delaware River at Fish's Eddy, NY
Delaware River at Lordville, NY,
Delaware River at Callicoon, NY,
Delaware River above the Lackawaxen River near Barryville, NY,
Delaware River at Barryville, NY
Delaware River at Barryville, NY (temperature only)

Downstream Delaware River Conditions

An additional analysis of resulting flow conditions for these same parameters at USGS gages on the Delaware River downstream of the Mongaup River is needed to document the potential influence of planned, but cancelled Mongaup Project releases which have been factored into the River Master's design for compensating releases. These cancellations of planned releases (especially with minimal or no prior notice) cause significant shortfalls to the Montague flow target and result in lower- than-expected Delaware River flows from the Mongaup all the way down to the Delaware River at Easton, PA USGS gage (River Mile 183.66), 77.44 downstream of the confluence with the Mongaup. They also disrupt recreational boaters who often travel considerable distances and make plans based on the scheduled releases. Below this point, the Beltsville Reservoir in the Lehigh River watershed can be directed by the Delaware River Basin Commission to provide more water to ensure that the Trenton flow target is met.

Those potentially affected below-the-Mongaup locations include:
Delaware River at Matamoras/Port Jervis, PA
Delaware River at Montague, NJ

Delaware River at Tocks Island, NJ
Delaware River at Belvidere, NJ
Delaware River at Easton, PA

The NPS; therefore, requests the following:

The applicant provide an analysis of the degree to which the flows in the bypassed reach below the Rio Project have been in compliance with the 100 cfs or 60 cfs minimum release included in the 401 Certification for the Project. This study would involve a desktop analysis of the past 5-10 years of instantaneous gauge data from the U.S. Geological Survey (USGS) gauges below the Rio Project.

The Applicant conduct habitat mapping for all of the relevant reaches. This mapping should identify the type of habitat in each section (e.g., pool, riffle, run), along with depths, velocities, and substrates. We request that habitat mapping also be conducted in the additional tributary streams and upstream areas included in the fisheries study to provide data into the available habitat in these areas.

NPS Comment #5, cont...

<u>Mongaup River Conditions</u>

The NPS requests that the applicant provide an analysis of the degree to which the flows in the bypassed reach below the Rio Project have been in compliance with the 100 cfs or 60 cfs minimum release included in the 401 Certification for the Project. This study would involve a desktop analysis of the past 5-10 years of instantaneous gauge data from the U.S. Geological Survey (USGS) gauges below the Rio Project.

The NPS requests that the Applicant conduct habitat mapping for all of the relevant Mongaup River reaches. This mapping should identify the type of habitat in each section (e.g., pool, riffle, run), along with depths, velocities, and substrates. We request that habitat mapping also be conducted in the additional tributary streams and upstream areas included in the fisheries study to provide data into the available habitat in these areas.

2. *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;*

See Appendix A which forms the basis for any NPS Section 7 evaluation under the WSRA.

The Delaware River is the last major river on the Atlantic coast undammed the length of its main stem (330 miles), providing important historic spawning and rearing habitat for sea-run migratory fish as found on few other in the U.S. These fish include declining species such as American shad and American eel, whose range wide populations are buttressed by the Delaware River. The Upper Delaware River also supports the best naturalized wild trout fishery in the eastern U.S., and provides habitat for state and Federally endangered species such as bridle

shiner (Notropis bifrenatus) and dwarf wedgemussel (Alasmidonta herterodon). The Upper Delaware supports the largest and most important inland bald eagle (Haliaeetus leucocephalus) wintering habitat in the Northeastern U.S., based upon annual use, the number of eagles using the area, and a robust breeding population. The Upper Delaware River is also heavily used by recreational interests (the Upper Delaware River supports one of the largest canoe livery industries in the U.S.), with UPDE's annual visitation being approximately 247,300 visitors. Predictable flows, and adequate water, are critical to all these natural and recreational resources.

3. *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;*

Requester is a Federal Agency, National Park Service.

4. *Describe existing information concerning the subject of the study proposal, and the need for additional information;*

NPS Comment #5, cont...

The flow studies conducted during the previous relicensing and the PAD provides no information regarding how flows under the current license influence resulting flows in the Delaware River. Existing historical flow data for USGS gages is readily available online, and an analysis that compares the influence of Mongaup Project releases on resulting Delaware River flows upstream and downstream of the Mongaup River is a desktop exercise for the licensee.

5. *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;*

The operation of the hydroelectric projects on the Mongaup River and the resulting compensating releases directed by the USGS River Master, affect flows in the Delaware River upstream and downstream of the Mongaup River. With Mongaup releases counting toward the Montague flow target and factored into the USGS Delaware River Master's daily compensating release design from the NYC reservoirs, an amount of water equal to what's being released from the Mongaup (up to 970 cfs) may be withheld from NYC reservoirs on the East and West Branches of the Delaware. With the Montague flow target being 1750 cfs under normal conditions, and typical summer flows ranging from 1100-1400 cfs on sections of the UPDE, 970 cfs withheld from the upper river is extremely significant, perhaps influencing dewatering in sections of the river, elevated water temperatures, and the survival of aquatic life found in the river containing 51 fish species, and 9 species of freshwater mussels, including the state and Federally-endangered dwarf wedgemussel (Alasmidonta heterodon). These volumes of water are also very significant for recreational interests as well, perhaps determining whether paddlers have to get out of their boats and drag them across shallow gravel bars and dewatered riverbed which negatively impacts benthic aquatic organisms.

6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule*

including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge;

The recommended study would analyze and compare resulting flows for various USGS gage locations on the Delaware River above and below the Mongaup River under timeframes of influence and non-influence by Mongaup Project releases.

7. *Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.*

This is a desktop exercise for the licensee. The USGS gage data could be readily analyzed and correlated with Mongaup releases with little difficulty. The cost would be relatively minimal.

NPS Comment #5, cont...

The NPS appreciates the opportunity to comment on the PAD and to offer study requests. We looks forward to working with the applicant and other stakeholders during this relicensing. Questions or comments should be addressed to Kevin Mendik at kevin_mendik@nps.gov or Don Hamilton at don_hamilton@nps.gov.

Sincerely,



Kevin Mendik
NPS Northeast Region
Hydro Program Manager

Appendix A

National Park Service Statement of Interest Associated With the Relicensing of the Rio Hydroelectric Project (P-9690-112), Mongaup Falls Hydroelectric Project (P-10481-067), and Swinging Bridge Hydroelectric Project (P-10482-117)

II. Description of Project Area (Area of Potential Impact)

☐ Scenic Section ☐ Recreational Section ☒ Both Scenic and Recreational

Narrative: The project area is the lower 5200 feet of the Mongaup River within the UPDE designated boundary, and the main stem Delaware River above and below the mouth of the Mongaup River. This entire area may potentially be impacted by flow releases from the Mongaup River system, due to the rules by which flows in the Delaware River are managed and the ramifications of hydropower and recreational water releases on the rest of the system.

The Mongaup River is the 2nd largest tributary to the Delaware River within UPDE, with a ___ square mile watershed containing 344 miles of rivers and streams. It flows into the Delaware at River Mile 261.1, where it contributes 15% of the flow volume of the Delaware River at that point. The Mongaup River is designated by the New York State Department of Environmental Conservation as a Class B(T) stream. The best usages for Class B(T) waters are primary and secondary contact recreation and fishing, with waters suitable for fish propagation and survival, including where trout survival is an additional best use to the classification.

The Delaware River Basin Commission (DRBC) has classified as "Outstanding Basin Waters" the Delaware River and the Mongaup River within UPDE's established boundaries. These waters are classified as having exceptionally high scenic, recreational, and ecological values that require special protection. The DRBC established the Special Protection Waters program in 1992 to institute protections that provide for no measurable degradation of existing water quality, except towards natural conditions (DRBC 2008; Available online at http://www.state.nj.us/drbc/programs/quality/spw.html). Water uses protected under DRBC's designation include maintenance and propagation of resident game fish and other aquatic life, passage of anadromous fish, wildlife habitat, and recreation.

IV. Effects of the Proposed Project - Invade and Diminish Standard

Section 7(a) of the WSRA provides a specific standard for review of developments that are located below or above or on a stream tributary to a designated river. This is the standard being applied for this determination. Such developments may occur as long as the project "will not invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area as of the date of designation . . ." (Interagency Wild and Scenic Rivers Coordinating Council, 2004).

Potential impacts of the Mongaup River Hydropower Relicensing Project could influence the free flow, water quality, and scenic, recreational, and fish and wildlife values under the WSRA. These values are fundamental to the visitor experience at the UPDE. They are also among the ORVs for which the Upper Delaware was designated.

A. Free-Flow (including free-flowing condition, within-channel conditions, hydrological processes)

Impact Summary: Potential flow impacts from this project are expected to be minor and temporary.

NPS Comment #6

ORV: Maintaining free-flowing conditions is integral to the designated status of the Upper Delaware Scenic and Recreational River under the WSRA, supports the integrity of the UPDE ORVs, and is a key component of future management (NPS 2012a).

Description:

Short-Term Effects:

- ***Flow:*** : Short-term flow effects on flow are possible due to proposed hydropower and recreational water releases that count towards the USGS Montague Gage flow target, potentially resulting in less water being released from New York City reservoirs toward meeting this flow target, affecting water flows in the Delaware River above the Mongaup River. In addition, planned releases from the Mongaup system provided days in advance by the hydropower operator to the Rivermaster factor into the Rivermaster's prescribed releases from New York City reservoirs. These planned hydropower releases are often cancelled, resulting in Montague Gage flow target underages, and less water for all of the Delaware River below the Mongaup River.

Long-Term Effects:

- No long-term effects on flow are anticipated from the proposed management of these projects.

NPS Comment #6, cont...

B. Fish and Wildlife Values

Impact Summary: Impacts on fish and wildlife values from this project are potentially significant. The ecological "building blocks" that predicable flows sustain can be impacted by widely fluctuating yo-yo releases that prevent intact functioning ecosystems from maintaining key components and processes.

ORV: The Delaware River and its high quality tributaries exhibit some of the highest ecological integrity of any of the large river systems in this region, resulting in high water quality and good in-channel conditions, that contribute directly to the high quality, abundant, and diverse assemblages of fish and wildlife species found here (NPS, 2012a). These include Threatened and Endangered species such as dwarf wedgemussel (*Alasmidonta heterodon*), brook floater mussel (*Alasmidonta varicosa*), and bridle shiner (*Notropis bifrenatus*). As the last major river on the Atlantic coast undammed the length of its main stem, the Delaware provides important historic spawning and rearing habitat for sea-run migratory fish such as American shad (*Alosa sapidissima*) and American eel (*Anguilla rostrata*) as found on few other rivers. The Delaware system supports high quality aquatic insect assemblages, a full complement and extraordinary abundance of freshwater mussels, declining species such as brook trout (*Salvelinus fontinalus*), and is an important breeding and wintering habitat for a robust population of bald eagles (*Haliaeetus leucocephalus*).

Description: The high quality fish and wildlife assemblages found here are sustained by ecological "building blocks" that include exceptional water quality (high dissolved oxygen, low turbidity/high water

NPS Comment #7

clarity), and good in-channel conditions that include streambed with unimbedded clean gravel and a lack of fine sediments/silt.

Short-Term Effects: Short-term effects on fish and wildlife will occur during extremely low flow events that may dewater substrate and cause organisms to abandon habitat. Fish and other mobile species may survive these events by moving to suitable habitat. These low flow events may suppress wildlife activity.

- Temperature: Short-term elevated river temperature events may suppress wildlife activity and stress aquatic organisms.

  Water quality characteristics that can also be affected by increased water temperature include water pH, dissolved oxygen concentrations, and solute solubility (http://water.usgs.gov/edu/temperature.html).

NPS Comment #7, cont...

Long-Term Effects: More significant and long-term effects may result from potentially dewatered substrate, strandings of aquatic organisms, and increased water temperatures that may result in mortality of fish, freshwater mussels, aquatic insects, and other aquatic organisms.

Suppressed aquatic insect populations in dewatered locales may also greatly influence fish populations in those areas. Aquatic insects are the primary food source for many fish. An average of 70 percent of freshwater fish species depending on them as a food source (Healey, 1984).

Also, many species of fish spawn in gravel, depositing eggs in the void spaces between the framework of gravel particles. The eggs require fresh, moving water in this type of habitat to survive and grow. If beds of finer gravel are missing from systems such as the lower Mongaup River due to erratic, flushing flows, this is likely to be lost as spawning habitat for some species of fish. Erratic, flushing flows may also preclude the lower Mongaup River as suitable habitat for freshwater mussels, aquatic insects, and other aquatic life that would otherwise use it under more stable, predictable flow scenarios.

C. Scenic Resources and Values

Impact Summary: Potential impacts on scenic values from this project are expected to be minor and temporary.

NPS Comment #8

ORV: Scenic resources are an ORV for UPDE, DEWA, and LODE, as stated in the NPS Delaware River Basin National Wild and Scenic River Values report (2012a0).

Description:

Short-Term Effects:

Long-Term Effects:

- Recurring periods of suspended sediment, turbid water flow, and poor visibility downstream of the crossing site are likely to occur with higher flow events following the disturbance of the riverbed at the crossing site, and with remobilization of sediment deposited downstream of the crossing site. These recurring events are likely to be more significant with the greater volume of sediment mobilized by the contingency wet crossing method.

NPS Comment #8, cont...

4. Recreational Resources and Values

Impact Summary: Potential impacts on recreational values from this project are mixed, but are expected to be minor and temporary.

ORV: The Upper Delaware Scenic and Recreational River corridor's pristine resources offer outstanding river recreation in close proximity to the most densely populated region in the United States (NPS, 2014). All other ORVs contribute to the values of UPDE, DEWA, and LODE as a recreational resources where visitors enjoy boating, biking, hiking, fishing, hunting, wildlife watching, fall foliage, scenic touring and experience the rich cultural heritage of the area. (NPS, 2012a)

NPS Comment #9

Description:

Short-Term Effects:

- There may be short-term effects on local recreation as a result of unpredictable, erratic flows in the lower Mongaup River and the Delaware River affected by hydropower releases. These could include impacts to recreational fishing, boating, swimming, and wildlife watching that may be impaired during periods of low water in sections of the Delaware River resulting from hydropower releases that contribute to the Montague flow target.

Long-Term Effects:

V. Magnitude and Extent of Potential Off-Site Changes

The magnitude and extent of potential off-site changes could be significant. As stated above, the operation of these hydroelectric projects, whether releasing larger quantities of water for hydropower generation or whitewater recreational boating on the lower Mongaup River, can potentially affect compensating water releases from New York City reservoirs on the East and West Branches of the Delaware River and on the Neversink River. The effects and influence could therefore be far-reaching, including 69 miles upriver on the Delaware to the confluence of the main stem Delaware River, and another 17 miles up the West Branch of the Delaware River (to releases from the Cannonsville Reservoir) and 35 miles up the East Branch of the Delaware River to the Pepacton Reservoir). The influence of Mongaup releases (or non-releases) downstream on the Delaware River may extend as far down as River Mile 183.66 (77.44 miles downstream of the Mongaup), the upstream-most point where directed releases from the Beltsville Reservoir in the Lehigh River watershed can make up for deficient flows (as a result of cancelled Mongaup releases and resulting Montague flow target deficits) that need to be supplemented by lower basin reservoirs to achieve the Trenton flow target.

NPS Comment #10

20170725-0009 FERC PDF (Unofficial) 07/24/2017

John Caracci
3 Stratton Ave., PO Box 104
Smallwood,New York 12778
631-478-3471
jj1212yw@gmail.com
July 5,2017

ORIGINAL

FILED
SECRETARY OF THE
COMMISSION

2017 JUL 24 P 3:18

FEDERAL ENERGY
REGULATORY COMMISSION

Ms.Kimberly D.Bose
Federal Energy Regulatory Commission
88 First Street, NE
Washington DC 20426

Dear Ms. Bose:

J. Caracci Comment #1

I am contacting you in regard to The Toronto Reservoir Project **# (P-10482-117).** The reservoir is a natural source of beauty and wildlife that my family has enjoyed for many years. The birds, the tranquil location and wildlife have been a source for kayaking, canoeing and meditating. As a supporter of " THE FRIENDS of TORONTO", I urge you to support public access to this beautiful reservoir.

J. Caracci Comment #2

As a Federal area, please preserve the Toronto Reservoir for the public and for the Brook Trout who seem to be dwindling in number. As a fisherman, I am concerned about the fate of the Brook Trout.

J. Caracci Comment #3

Also, I recommend that the access road be made more ,"ACCESSIBLE" and the " PRIVATE PROPERTY" signs erected by Eagle Creek be placed elsewhere. The local community needs to be ,"welcomed" to the reservoir, not shunned from admission1

Thank you for your attention to a fight that has lasted more than 15 years!!!

Sincerely yours,

John Caracci

3 Stratton Avenue, PO Box 104, Smallwood 12778

Travis Caracci
7 Heights Road
Northport, New York 11768
631- 974-7601
July 16,2017

ORIGINAL

FILED
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COMMISSION

2017 JUL 24 P 3:18

FEDERAL ENERGY
REGULATORY COMMISSION

Ms.Kimberly D.Bose
Federal Energy Regulatory Commission
88 First Street, NE
Washington DC 20426

Dear Ms. Bose:

T. Caracci Comment #1

I am contacting you in regard to The Toronto Reservoir Project **# (P-10482-117).** The reservoir is a natural source of beauty and wildlife that my family has enjoyed for many years. The birds, the tranquil location and wildlife have been a source for kayaking, canoeing and meditating. As a supporter of " THE FRIENDS of TORONTO", I urge you to support public access to this beautiful reservoir.

T. Caracci Comment #2

As a Federal area, please preserve the Toronto Reservoir for the public and for the Brook Trout who seem to be dwindling in number. As a fisherman, I am concerned about the fate of the Brook Trout.

T. Caracci Comment #3

Also, I recommend that the access road be made more ,"ACCESSIBLE" and the " PRIVATE PROPERTY" signs erected by Eagle Creek be placed elsewhere. The local community needs to be ,"welcomed" to the reservoir, not shunned from admission. My family has enjoyed the beauty of the shores.

Thank you for your assistance. This natural source of beauty needs to be shared!

Sincerely yours,

Travis Caracci (7 Heights Road, Northport, N.Y.)

P-10482-017

7/25/2017

A. Abramson
Comment #1

The deadline for filing comments about the swinging Bridge Project (No. 10482-017) is July 29th. I am a resident t of Bethel, NY and have lived on the Toronto Reservoir for the past 12 years. I have obtained the 1992 FERC "Order Issuing License" It was concluded that on balance, a 30-cfs minimum flow would be in the best public interest because it would provide about 70 percent of the maximum WUA for adult brown trout, without affecting the creditable generating capability for the Swinging Bridge Project". However the DEC says the minimum flow would be 100cfs. And that FERC must defer to the NY State DEC.

It is now 25 years later. Toronto Reservoir has many residents living around the periphery. Water levels are now very important. I would like to know what up to date data we have indicating the health of our fish in the streams leading out of the Mongaup/ swinging bridge waters. If the CFS is less then 100cfs flow then height of the water will be higher and will satisfy all who are dependent of the flow.

What is the effect of increase CFS flows on the fish within the reservoir? Has this study been done? It would seem that FERC and the DEC should address this subject. When not in a peak power demand period what should the CFS levels be?

I realize that power, fish and people all share this wonderful resource....Toronto Reservoir. I believe that if some studies are authorized to see what effects the varying flows have that a more intelligent decision can be made.

Thank you....Allan Abramson, MD PO Box 566, White Lake, NY 112786

A. Abramson
Comment #1
continued

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2017 JUL 25 A 10 14
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REGULATORY COMMISSION

TOWN OF THOMPSON

William J. Rieber, Jr.
Supervisor

4052 State Route 42 • Monticello, New York 12701-3221
(845) 794-2500 Ext. 306 • Fax: (845) 794-8600
Email: supervisor@townofthompson.com

July 25, 2017

ORIGINAL

FILED
SECRETARY OF THE
COMMISSION
2017 JUL 31 P 4:27
FEDERAL ENERGY
REGULATORY COMMISSION

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: Swinging Bridge Project P-10482-117

Dear Ms. Bose:

The Town of Thompson has most of the easterly side of Swinging Bridge Reservoir within our boundary. The reservoir provides a vital recreational and residential component of our economy and our quality of life. When we experienced drought conditions several years ago, the effect of extremely low water levels absolutely devastated the community and the businesses that depend on it for survival.

Town of Thompson Comment #1

Though I am not a hydrogeologist, my reading of the background research provided by the Swinging Bridge Property Owner's Association leads me to concur that releases greater than 30 CFM will achieve little benefit to the brown trout population downstream. Reason should and must prevail weighing the small added benefit of 100 CFM minimum releases against the investments of hundreds of residents in their lake properties.

Town of Thompson Comment #2

I have attached a copy of Swinging Bridge Property Owner's Association's "BACKGROUND RESEARCH ON MANDATED OUTFOW FROM THE LAKE." If, after your review, the study is un-refuted, then the minimum 30 cfm release standard should become part of the licensing permit.

Town of Thompson Comment #3

Thank you.

Very truly yours,

William J. Rieber, Jr.
Supervisor
Town of Thompson

Swinging Bridge
Property Owners' Association
P. O. Box 1, Mongaup Valley, New York 12762
www.swingingbridgepoa.com
SBPOA@hvc.rr.com

July 26, 2012

Town of Thompson Comment #4

BACKGROUND RESEARCH ON MANDATED OUTFLOW FROM THE LAKE

The information included here is from the FERC operating license for the lake. Page references match our copy and may be different from others. In writing this, I am working under the understanding that the mandated outflows from the lake are between 60 cfs and 100 cfs at all times. The 100 cfs is the norm and may be reduced down to 60 cfs in drought conditions. It is also understood that a period of low inflow is necessary before the outflow can be reduced. Art Goodman Secretary

In the course of the license hearings, various outflow amounts were discussed ranging from 30 cfs up to 150 cfs. The 150 cfs (Department of the Interior) was ruled out. Page 7 reads that FERC recommended a minimum outflow of 30 cfs, the minimum of 100 cfs was included in the 401 water quality certificate. It is a guess that the reduction to 60 cfs occurred after the disastrous drought period some time ago which brought lake levels well into the 1050's range.

The key numbers are summarized on the chart found on page 68. The increase from 30 to 100 cfs only increases the weighted usable area (WUA) from 71,000 square feet to 88,000 square ft, or a percentage from 70% to 88%. The questions that comes to mind –**is it worth an additional 15% of trout habitat to release all that water?**

On page 7, the document states that *"I conclude that, on balance, a 30-cfs minimum flow would be in the best public interest, because it would provide about 70 percent of the maximum WUA for adult brown trout, without affecting the creditable generating capability of the Swinging Bridge Project. A minimum flow greater than 30 cfs would provide more habitat, but the small increase in habitat and anticipated angler use wouldn't justify the disproportionately great loss of power benefits."*

On page 68, a summary statement reads: *"Our studies of this additional minimum flow option shows that there would be only a negligible habitat benefit from increasing the minimum flow above 30 cfs, and that it would reduce the projects power benefits substantially."*

Referring to the 100 cfs outflow on page 79, license states "....would unnecessarily waste the power potential of a renewable resource".

LICENSE EXTRACTS

NOTE: page numbers refer to our original copy. Number in brackets refer to Appendix F in the Pre-application Document 1.

page 4 [F-2]
Sections 4(e) and 10(a)(1) of the Act require the Commission to give equal consideration to all uses of the waterway on which a project is located. When the Commission reviews a project, the environment, recreation, fish and wildlife, and other nondevelopmental values of the project are considered equally with power and other developmental values. In determining whether, and under what conditions, a hydropower license should be issued, the Commission must weigh the various economic and environmental tradeoffs involved in the decision.

page6 [F-4]
A 30-cfs minimum flow release would provide about 71,000 square feet, or about 70 percent, of the maximum adult brown trout habitat. The 30-cfs flow would increase the weighted useable area (WUA) over existing conditions by about 23,000 square feet. 4/ A 30-cfs release would reduce the power benefits of the project by about $54,000 annually. The loss of power benefits would result from the loss of about 2,291 MWh of energy generation (see table 1).

A 100-cfs flow (DEC recommendation) would provide about 88,000 square feet or about 86 percent of the maximum adult brown trout habitat. The 100-cfs flow would increase the WUA over the 30-cfs flow by about 17,000 square feet. A 100-cfs flow would reduce the power benefits of the project about $553,000 annually or $419,000 more annually than a 30-cfs flow. The $419,000 incremental loss of power benefits over the loss at 30 cfs would result from the additional loss of about 3,300 MWh of energy and about 4 MW of the project's dependable capacity (see table 1).

Staff's studies show that the very large increase in power benefit loss between the minimum flows of 30 to 100 cfs would result primarily from the loss of valuable dependable capacity benefits. Above a minimum flow of 50 cfs, the project could not store enough water daily to operate at its full capacity for four hours each day, as the regional generating guidelines require for the generating capability of an operating plant to be credited as dependable capacity. All minimum flows above 50 cfs would cause a loss of valuable generating capability, as well as a loss of energy.

page 7 [F-5]
I conclude that, on balance, a 30-cfs minimum flow would be in the best public interest, because it would provide about 70 percent of the maximum WUA for adult brown trout, without affecting the creditable generating capability of the Swinging Bridge Project. A minimum flow greater than 30 cfs would provide more habitat, but the small increase in habitat and anticipated angler use wouldn't justify the disproportionately greater loss of power benefits.

In light of the above, I find, pursuant to Section 10(j)(2)(A) that FWS's minimum flow recommendation of 150 cfs is inconsistent with Section 10(a)(1) of the Act; adoption of FWS's minimum flow recommendation would not allow me to conclude that the project, as conditioned, is best adapted to a comprehensive plan for beneficial uses of the waterway. Although I find that

DEC's recommended minimum flow of 100 cfs is more restrictive than necessary to enhance the fishery resources and would unnecessarily waste the power potential of a renewable resource. this stipulated flow is included in the section 401 water quality certificate issued by the DEC for the Swinging Bridge Project on September 11, 1989. Consequently, this 100 cfs minimum flow will become a part of the license issued for the project, and is included in the license as Article 401 instead of staff's recommendation of at least 30 cfs. Article 401 also includes a requirement to release a minimum flow of 10 cfs from Toronto Dam into Black Lake Creek and 10 cfs from Cliff Lake Dam into Black Lake Creek. There is an agreement between O&R, DEC and FWS on these minimum flow releases for Black Lake Creek. I concur with these minimum flow releases; the releases would improve aquatic conditions in 17,500 feet of Black Lake Creek at reasonable cost.

page 9 [F-7]
Pursuant to Section 10(j) of the Act, staff made a preliminary determination that Interior's recommendation for the licensee to release a minimum flow of 150 cfs from the Swinging Bridge Dam would be inconsistent with Section 10(a) of the Act. On September 25, 1991, staff notified Interior that Interior's minimum flow recommendation was inconsistent because implementation of the flow recommendation would impact the project's dependable capacity and economic benefits, which currently flow to O&R's ratepayers, yet provide only minimal benefits to the fishery resources.

page 68 [F-63]
Table 9. Power-Loss Cost and WUA Gain for Adult Brown Trout at Various Minimum Flows Released from the Swinging Bridge Project, FERC No. 10482 (Source: Staff).

Table 9. Power-Loss Cost and WUA Gain for Adult Brown Trout at Various Minimum Flows Released from the Swinging Bridge Project, FERC No. 10482 (Source: Staff).

Minimum Flow (cfs)	Annual Power (MWh)	WUA (Square Feet)	Percent of Dependable Capacity	Incremental WUA Gain (Per 1,000 ft)
30	$[illegible]	[illegible]	[illegible]	Base Condition
50	$[illegible]	[illegible]	[illegible]	[illegible]
100	$556,000	$5,300	[illegible]	[illegible]
150	$791,000	$7,300	[illegible]	[illegible]

The data show that there would be a very large increase in the incremental cost (due to lost power benefits) of additional habitat that would be gained by increasing the minimum flow at Swinging Bridge from 30 to 100 cfs. Our studies show that the very large increase in power benefit loss between the minimum flows of 30 and 100 cfs would result primarily from the loss of valuable dependable capacity benefits. Above a minimum flow of 50 cfs, the project could not store enough water daily to operate at its full capacity for four hours each day, as the regional generating guidelines require for the generating capability of an operating plant to be credited as dependable capacity. All minimum flows above 50 cfs would cause a loss of valuable generating capability, as well as a loss of energy.

We studied the additional option of providing a 50-cfs minimum flow, which would provide enhancement for adult brown trout habitat without affecting the project's dependable capacity. The data show that a 50-cfs minimum flow release would provide about 73,000 square feet or about 73 percent of the optimum adult brown trout habitat. A 50-cfs flow requirement would increase WUA compared to a 30-cfs flow release by only benefits of the project about $79,000 more annually than a 30-cfs flow, so that the incremental gain in WUA of a 50-cfs flow over a 30-cfs flow would be about 25 square feet for each $1,000 loss in power benefits annually. Our studies of this additional minimum flow option shows that there would be only a negligible habitat benefit from increasing the minimum flow above 30 cfs, and that it would reduce the project's power benefits substantially.

page 79 [F-74]
Swinging Bridge Project, FERC No. 10482: We believe that Interior's recommendation for O&R to release a continuous minimum flow from the Swinging Bridge dam of 150 cfs is inconsistent with Section 10(a) of the Act. Interior's flow recommendation for the Swinging Bridge Project would severely reduce the project's dependable capacity and economic benefits, which now flow to O&R's ratepayers. The value of the annual power losses that would occur with Interior's minimum flow recommendation for the Swinging Bridge Project is $791,000. We believe that this amount of loss in power benefits annually is incommensurate with the amount of environmental benefits that would be realized through the imposition of Interior's recommended minimum flow and would severely undermine the benefits of the project to O&R's ratepayers.

In lieu of Interior's flow recommendation, we will recommend for inclusion in any license issued for the Swinging Bridge Project that 30 cfs be released from the Swinging Bridge Dam. It should be noted that DEC's recommendation to maintain a minimum flow release of 100 cfs from the Swinging Bridge Dam is included as a condition of the section 401 water quality certificate issued by DEC for the Swinging Bridge Project on September 11, 1989. Although we find that DEC's recommended minimum flow of 100 cfs at Swinging Bridge is more restrictive than necessary to enhance the fishery resources and would unnecessarily waste the power potential of a renewable resource, this stipulated flow included in the water quality certificate will become a part of the license issued for the Swinging Bridge Project.

We therefore recommend that the licensee, for any license issued for the Swinging Bridge Project, maintain a minimum flow at or above 30 cfs for the Swinging Bridge Project, while the certification requires the maintenance of the higher 100 cfs for the project. Since the licensee's maintenance of the higher flow would be permitted by our recommendation, there is no conflict between the respective provisions. The certification requirements comply with both Section 10j of the Act (in regard to DEC's recommendation) and Section 401 of the Clean Water Act, and are consistent with past Commission orders

page 36 [F-32]
The Delaware River Basin Commission (DRBC) commented on the minimum flows proposed by O&R (letters from Gerald M. Hansler, Executive Director DRBC, May 24, 1989). The DRBC stated that O&R's proposed continuous release of 60 cfs from Rio dam to support downstream habitat and wildlife would deplete reservoir system storage in the event of drought and, therefore, recommends additional study. Further studies were recommended to consider the impacts of lesser releases during drought periods. On February 2, 1990, DRBC (letter from David B. Everett, P. E., Chief Engineer, DRBC, February 2, 1990) commented on the additional studies which O&R had undertaken at our request. DRBC addresses their particular concern for project impacts of the

agencies' recommended minimum flow release regimes during multiyear droughts such as had occurred from 1961 to 1967. In a letter dated April 19, 1990, DRBC requested information on the volume of water remaining available under different scenarios, not just the pool elevation. DRBC recommends O&R consider minimum flow releases during drought conditions that are equal to one-half O&R's proposals where the proposed flow was greater than 10 cfs.

The DRBC has an agreement with O&R with respect to water supply from the Mongaup Basin when hydrological conditions are adverse (drought).

20170726-0014 FERC PDF (Unofficial) 07/25/2017

E Fine
142 South Rd
Scarsdale NY 10583

ORIGINAL



For Maggie A. Smallwood

FILED
SECRETARY OF THE
COMMISSION
2017 JUL 25 P 3:21
FEDERAL ENERGY
REGULATORY COMMISSION

D. Bose

FERC

888 1st St NE
Washington, DC 20426

Toronto Reservoir Project
10482-117
from Elana FINE -
member of Friends of Toronto

Toronto Reservoir is a
Free public resource
that should be open to
the public for swimming
boating. I have loved
bathing & kayaking there
in 3 season (Spring, Summer
Fall) Loved seeing stripers
for families who can't have
limited reservoir.
Roads need to be maintained
Elana FINE 142 Garth Rd Scarsdale
NY 10583

Project # 10482-117

E. Fine Comment #1

20170726-0014 FERC PDF (Unofficial) 07/25/2017

20170801-0085 FERC PDF (Unofficial) 07/31/2017

Tophat 62 @ gmail.com
845-583-4278
James and Helen Noeth
PO Box 116
Mongaup Valley, NY 12762

ORIGINAL

July 25, 2017

Re: Toronto Reservoir Project # P-10482-117

Dear Ms. Bose;

I am writing in regards to the Toronto Reservoir Project # P-10482-117 to renew Eagle Creeks Federal license.

I am connected with Friends of Toronto and a local resident here in Sullivan County. Our family has enjoyed the Public access on Toronta Reservoir with its pristine waters for fishing, swimming, boating and exploring. We enjoy the accessibility of the roads leading into the access on horseback and bicycle.

Noeth Comment #1

Please renew Eagle Creeks license so we can continue to enjoy all the beauty Toronto has to offer to the public.

Please feel free to contact us at the above address or contact info.

Thanking you,

I remain

Very truly yours,

James & Helen Noeth

Friends of Toronta

FILED
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COMMISSION
2017 JUL 31 P 4:08
FEDERAL ENERGY
REGULATORY COMMISSION

Queen's. The streets are filled with never ending movement. People travel from A to B with a fervor; there isn't enough time in the day, always moving never resting. Never taking the time to stop and listen to the birds, or smelling the blooming trees; a rarity among a city of tar and concrete. This was my childhood. I grew up in the middle of the polish enclave, at night the sounds of car alarms screeching and couples fighting would be my lullaby; just waiting for the weekend.

Saturday morning my parents would wake us up bright and early; taking the three hour car ride to our refuge. Bethel, New York represented so much: our connection to nature, our freedom from the polluted air corroding our little lungs, our peace and quiet. The Toronto Reservoir provided the backdrop to my most cherished memories. Family picnics on the shore, my dad teaching me to swim, hiking the trails while chasing the flying grasshoppers. These are the memories that I hold dear to my heart, they fill me with nostalgia but also a fierce determination. That fateful day when my parents told me people were closing the road to the lake, it was the day my innocence died. I realized justice was not blind she had dollars signs shining brightly in her eyes. A man corrupted by money was closing a road he had no right to close.

Though this is not a story of accepting defeat.

That day I learned to fight.

The Woodstone Company thought they succeeded by closing our road, we just found other ways to enjoy OUR lake. Taking the boat out became a weekend tradition in the summer. My dad would wake up early to prep the boat, check the engine and fill the tank. My mom would pack our bags, our lunch, and our dog. All I had to do was bring myself.

The life jacket may have been annoying, scratchy and uncomfortable in the summer heat. The smell of plastic pungent. It was a fair price to pay for feeling the wind in your hair, the spray of lake creating magical rainbows.

To me the reservoir isn't just a piece of land, its the embodiment of happy times, of my childhood, without the worries of adulthood.

Winning the fight, opening the road, brought a sense of peace. It was the knowledge that the lake was waiting for me to bring my children, and my grandchildren, for them to also have a piece of nature in there hearts. For me to tell them stories of my childhood, to spend hours bonding with a fishing rod in our hands; "look little Jimmy thats where your mom beat your grandparents in the fishing contest."

A. Segarceanu Comment #1

By limiting access to the lake you are preventing new families from experiencing the refuge that is the Toronto Reservoir. Preventing children from experiencing the wonderful summers I had at the lake. I know that the misguided "No Swimming" signs are just that misguided, unwarranted and just false propaganda to further the narrative that the lake should be closed to the public. It is the Woodstone's company not being able to accept defeat and the just law. I know this, but new families don't. They see the beautiful lake, perfect for swimming, perfect for creating life long memories. Then they see the signs. They begin to fear the lake. Most of the time there aren't older families there to dissuade new couples from believing the signs, from believing that the lake isn't anything other than a natural haven, a refuge. New families see the sign and never come back. Then the lake becomes a little less public.

I write to you, to share my wonderful memories of the lake, to share its importance in my life, and to protect it for others to enjoy.

We the people of Bethel will always fight.
We will fight for our refuge, fight for the things we love, and fight for our right to the lake.
Thank you,
Ana Segarceanu
516-439-6655
Friends of Toronto

Project # P-10482-117

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

July 26, 2017

Mr. Robert A. Gates
EVP Operations
Eagle Creek Renewable Energy, LLC.
PO Box 167
Neshkoro, WI 54960-0167

RE: Rio (FERC No. 9690), Mongaup Falls (FERC No. 10481), and Swinging Bridge (FERC No. 10482) Hydroelectric Projects - Comments on Pre-Application Document, Scoping Document 1, and Study Requests

Dear Mr. Gates:

The U.S. Fish and Wildlife Service (Service) has reviewed the March 30, 2017, Preliminary Application Document (PAD) submitted by Eagle Creek Hydro Power, LLC, Eagle Creek Water Resources, LLC, and Eagle Creek Land Resources, LLC, collectively referred to as Eagle Creek Hydro (Applicant), as well as the May 30, 2017, Scoping Document 1 (SD1) issued by the Federal Energy Regulatory Commission (FERC), for the Rio (FERC No. 9690), Mongaup Falls (FERC No. 10481), and Swinging Bridge Hydroelectric Projects (FERC No. 10482). The three projects, collectively known as the Mongaup River Hydroelectric Projects (Project or Projects), are located on the Mongaup River in Sullivan and Orange Counties, New York. The Service attended the June 21, 2017, environmental site review and the June 22, 2017, scoping meetings for the Projects.

The Rio Hydroelectric Project works consist of: (1) a 264-foot-long ungated concrete overflow spillway with 5-foot-high flashboards; (2) a west abutment consisting of a 22-foot-long intake structure, 99-foot-long concrete abutment, and a 540-foot-long earth-fill embankment; (3) an east abutment consisting of 102-foot-long concrete abutment wall and a 460-foot-long earth-fill embankment; (4) a reservoir with a surface area of 460 acres, with a full pond elevation of 815 feet U.S. Geological Survey (USGS), and a storage capacity of 3,650 acre-feet with a 10-foot maximum drawdown; (5) an 11-foot-diameter, 7,000-foot-long above ground steel penstock leading to a 65-foot-high, 40-foot-diameter steel plate surge tank; (6) a 4-foot diameter, 100-foot-long below ground polyethylene penstock leading from the steel penstock to a minimum-flow powerhouse containing one Francis generating unit rated at 837 kilowatts (kW) and a maximum hydraulic capacity of 120 cubic feet per second (cfs), which discharges into a

38-foot-long, 10-foot-wide tailrace; (7) a 10-foot-diameter, 270-foot-long underground steel penstock that bifurcates into two parallel 7-foot-diameter, 90-foot-long steel branch penstocks leading from the surge tank to the main powerhouse containing two Francis generating units each rated at 5,000 kW and a total maximum hydraulic capacity of 870 cfs, which discharges into a 45-foot-wide, 225-foot-long tailrace with a 650-foot-long concrete weir at the downstream end; (8) a 7,600-foot-long above ground transmission line from the minimum-flow powerhouse; (9) a 150-foot-long buried transmission line from the main powerhouse; and (10) appurtenant facilities. The Rio Dam is located approximately 4.5 miles upstream from the confluence of the Mongaup River with the Delaware River.

The Mongaup Falls Hydroelectric Project works consist of: (1) a 156-foot-long ungated, concrete gravity spillway equipped with 4-foot-10-inch-high flashboards; (2) an 83-foot-long earth dam section with a concrete core wall on the right abutment (looking downstream); (3) a 125-foot-long concrete retaining wall on the left abutment; (4) a 20-foot-long intake house adjacent to the spillway; (5) a low earth closure dike, approximately 250-feet-long; (5) a reservoir with a surface area of 120 acres, with a full pond elevation of 935 feet USGS, and a reservoir volume of 1,779 acre-feet; (6) a 2,650-foot-long, wood-stave penstock with a steel surge tank 125 feet from the powerhouse; (7) a powerhouse containing four generating units with a total capacity of 4 megawatts (MW) and a total maximum hydraulic capacity of 620 cfs; (8) a minimum flow outlet structure downstream of the intake; (9) a 2.3-kilovolt (kV) underground transmission line 100-feet-long; (10) the Black Brook dam and former Black Brook diversion; and (11) appurtenant facilities. The Mongaup Falls Dam is located approximately 9.1 miles upstream from the confluence of the Mongaup River with the Delaware River.

The Swinging Bridge Hydroelectric Project consists of three developments: Swinging Bridge, Cliff Lake, and Toronto Reservoir. The Swinging Bridge development works consist of: (1) a 975-foot-long earth-fill dam, 135-feet-high and 25-feet-wide; (2) a 250-foot-wide separate ledge-rock side channel spillway equipped with 5-foot-high Obermeyer gates and five vertical lift gates; (3) a reservoir with a surface area of 1,000 acres, with a full pond elevation of 1,070 feet USGS, and a useable storage capacity of 17,222 acre-feet with a 22-foot maximum drawdown; (4) a 692-foot-long, steel-lined concrete penstock to Unit No. 1 (out of service since 2005) with a gate tower; (5) an out-of-service powerhouse containing Unit No. 1; (7) a concrete-lined tunnel connected to a 188-foot-long steel penstock with a steel surge tank to supply Unit No. 2; (7) a powerhouse containing one generating unit (Unit No. 2) with a rated capacity of 6.75 MW with a maximum hydraulic capacity of 1,015 cfs ; (8) a minimum flow outlet; (9) a 2.3-kV underground transmission line 150-feet-long; and (10) appurtenant facilities. The Swinging Bridge Dam is located approximately 12 miles upstream from the confluence of the Mongaup River with the Delaware River.

The Cliff Lake development works consist of: (1) a 100-foot-long concrete overflow spillway equipped with 13-inch-high, pin-type flashboards; (2) a 270-foot-long earth embankment with a 20-foot-wide crest (right side of overflow spillway looking downstream); (3) a 150-foot-long concrete gravity non-overflow wall (left side of overflow spillway looking downstream); (4) a 95-foot-long earth embankment joining the left abutment with the non-overflow wall; (5) a reservoir with a surface area of 190 acres, with a full pond elevation of 1,071.1 feet USGS, and a storage capacity of 2,873 acre-feet with a 23.1-foot maximum drawdown; (6) a 4-foot by 4-foot

sluice gate; (7) a 2,100-foot-long, unlined horseshoe-shaped tunnel with a submerged intake that conveys water from Cliff Lake to the Swinging Bridge Reservoir; (8) a 5-foot by 5-foot lift gate located approximately 55 feet from the tunnel outlet; and (9) appurtenant facilities.

The Toronto Reservoir development works consist of: (1) a 1,620-foot-long earth-fill dam with a maximum height of 103 feet, a crest width of 25 feet, and an impervious core; (2) a 50-foot-wide concrete and rock side channel spillway at its west end, equipped with 5-foot-high, pin-type flashboards; (3) a gate tower with a 4-foot by 5-foot upper gate and a 3-foot by 5-foot lower gate; (4) a reservoir with a surface area of 860 acres, with a full pond elevation of 1,220 feet USGS, and a storage capacity of 25,211 acre-feet with a 50-foot maximum drawdown; (5) a 565-foot-long, 8-foot by 8-foot reinforced-concrete, horseshoe-shaped conduit that conveys water from Toronto Reservoir downstream to Cliff Lake; and (6) appurtenant facilities.

The Cliff Lake and Toronto Reservoir Dams are located on Black Lake Creek, a tributary to the Mongaup River, approximately 1.5 and 5.4 miles, respectively, upstream from the confluence of Black Lake Creek with the Mongaup River. Black Lake Creek joins the Mongaup River approximately 0.7 miles downstream from the Swinging Bridge Dam. Flows from Black Lake Creek are diverted into the Swinging Bridge Reservoir through the 2,100-foot-long, unlined horseshoe-shaped tunnel connecting Cliff Lake Reservoir with Swinging Bridge Reservoir.

Comments on the Pre-Application Document

The PAD is well-organized and addresses most of the key issues for the Projects. We offer the following specific comments on the PAD by section:

In Section 1, the Swinging Bridge development spillway is primarily bedrock, not concrete. There is no description of the trashracks and their clear-spacing associated with the intakes for the Projects. The Service recommends that this information be included in the PAD. Additionally, we recommend that this information, as well as intake velocities, be included in Section 4.3.3. These figures are directly related to potential fisheries impacts due to entrainment.

USFWS Comment #1

In Section 1, the horseshoe-shaped conduit that connects the discharge from Toronto Reservoir to Cliff Lake discharges into Black Lake Creek and travels approximately 2 miles downstream to Cliff Lake. We recommend clarifying how this conduit connects to Cliff Lake in this section. The Service also recommends including that 5-foot flashboards are present on the Mongaup Falls Dam in the project description.

USFWS Comment #2

In Section 4.2, the Applicant indicates that the current Projects' boundaries will be updated during the relicensing process. We recommend that all bypassed reaches of the Mongaup River, Black Lake Creek, and Black Brook, to their confluence with the Mongaup River, be included in the Projects' boundaries. The Projects divert water from and alter the flows in the reaches. We also recommend that these revised boundaries be added to Figure 5.1-1.

USFWS Comment #3

In Section 4.3.1, we recommend including that the Swinging Bridge Dam spillway routes water back into Black Lake Creek, a bypassed reach, not immediately into the Mongaup River.

USFWS Comment #4

In Section 4.3.2, we recommend including the gate openings and depths for the Swinging Bridge Dam. The Service also recommends including details regarding the operation of the bypass outlet when the minimum flow powerhouse is offline. It is our understanding that this outlet opens automatically as was required under the April 3, 2013, amendment for the construction of the minimum flow powerhouse at Rio.

USFWS Comment #5

In Section 4.3.6, we note that the tailrace for the Rio minimum-flow powerhouse returns to the Mongaup River approximately 300 feet downstream from the dam. During the environmental site review, we observed that gravel deposits have accumulated above the tailrace. This has reduced connectivity between the tailrace and the pool at the base of the dam. The Service recommends that connectivity be restored in this area as these deposits are believed to be derived from the landslide associated with the November 2014 failure of the minimum-flow powerhouse penstock.

USFWS Comment #6

In Section 4.4, the Applicant notes that it is operating under a draft operating plan that was developed in consultation with the New York State Department of Environmental Conservation (NYSDEC) and the Delaware River Basin Commission. This plan is presented in Appendix D of the PAD. The Service recommends that the Applicant consult with us in the continued development, and final approval, of the operating plan for these Projects as we expect that the final approval of this operating plan will be a necessary component of the relicensing of these Projects.

USFWS Comment #7

In Table 4.4-1, the Applicant provides the minimum flow requirements as issued in the NYSDEC 401 Water Quality Certifications issued for the Projects. We recommend that the 20 cfs minimum flow requirement for Black Brook be included in the table, although we are aware that this development is not currently in use.

USFWS Comment #8

In Section 4.4, the Applicant states that the minimum target elevation for the Toronto Reservoir is 1,170 feet to permit the use of the upper outlet works for protection of the water quality. The upper outlet invert is listed in Section 4.3.2 as 1,179.5 feet. We recommend clarifying this discrepancy.

USFWS Comment #9

In Section 4.4.1 and in Table 4.4-4, information regarding the daily and monthly average flows for the Mongaup River downstream of the Rio Project is provided. Daily average flows will not adequately describe the flows of this peaking system, as flows can vary several hundred cfs over a matter of minutes. The Service recommends revising Table 4.4-4 to present the minimum, maximum, and exceedance values based on instantaneous data. Additionally, providing data over a period of record from 1939 to 2017 averages over two different flow regimes as the 100 cfs minimum flow required as a result of the original licensing should have adjusted the minimum and 90 percent exceedance values upward considerably. We recommend providing these data separately for both the time period before and the time period after the original licensing. These data are an important component of monitoring compliance with minimum flow requirements. An initial analysis of the gauge data for 2016 indicates that there were frequent periods below 100 cfs.

USFWS Comment #10

In Section 4.7, the Applicant indicates that an amendment may be pursued to install a minimum flow unit at the Swinging Bridge Project. The Service is concerned with the timing of this potential amendment as relicensing is intended to be a comprehensive review of the existing Projects. At this time, we recommend pursuing any potential minimum flow unit at Swinging Bridge as part of the relicensing process.

USFWS Comment #11

In Sections 5.1.3 and 5.4.1, the Applicant indicates there are five dams associated with the three Mongaup River Projects. The Service recommends that this be changed to six, as the Black Brook Dam is part of the Mongaup Falls Project, and was likely excluded. Additionally, we recommend that Black Brook be added to Section 5.4.1. Figure 5.2-1 may be better labeled as Figure 5.1-3 as it refers to and is first referenced in Section 5.1.

USFWS Comment #12

In Section 5.2.6, the Applicant provides descriptions of the reservoir shorelines; however, sources provided are from the 1980s. Considerable development and shoreline changes have occurred in the last 25 years. We recommend that updated information be provided. Additionally, there are no descriptions of the stream banks as indicated in the section heading, nor any information provided regarding the Black Brook Reservoir.

USFWS Comment #13

In Section 5.4.1, the Applicant describes the existing fisheries information. The Service notes that information for Black Brook and the bypassed reach of the Mongaup River for the Mongaup Falls Project are not included under the Area Streams subsection. The Applicant provided a summary of the entrainment studies conducted in 1992 and 1993 as a component of the original licensing that concluded that entrainment effects are small at all of the Projects. We address this study in our entrainment study request, below. The scientific name for brown trout is *Salmo trutta*, not *Salmo trutte*.

USFWS Comment #14

Comments on Scoping Document 1

The SD1 is well-prepared and presents the context and primary areas of concern for the Projects. We offer the following specific comments on the SD1 by section:

In Section 3.1.1, the Rio Dam is listed as having an elevation of 805 feet; however, this is the elevation at the maximum allowable drawdown for the Project. The Rio Dam elevation should be 815 feet, as presented in the PAD. Please correct the elevation for the Rio Dam.

USFWS Comment #15

In Section 3.1.2, the Toronto Reservoir elevation is noted to be held above 1,187.7 feet prior to June 1 to ensure that there is enough water to provide a 10 cfs minimum flow without drawing down the reservoir below 1,170 feet to permit the use of the upper outlet works for protection of water quality. Since the Toronto Reservoir provides the majority of the storage in this system, it is likely that this elevation is held to provide the higher 100 cfs minimum flow from the Rio Reservoir. Please confirm and correct the minimum flow referenced.

USFWS Comment #16

In Section 3.1.2, the Cliff Lake elevations are listed as being held between 1,170 feet and 1,220 feet. The PAD indicates that the crest elevation of Cliff Lake is 1,171 feet. The

USFWS Comment #17

1,220 foot elevation is the crest of Toronto Reservoir. This latter number should likely be 1,147.9 feet since the PAD indicates that there is a 23.1 foot allowable drawdown for Cliff Lake. Please verify the elevations for Cliff Lake.

USFWS Comment #17, cont...

In Section 3.1.2, there is no mention of the Project operations for the minimum flow powerhouse at the Rio Project in relation to the 100 cfs minimum flow. Please add more information regarding the minimum flow powerhouse at the Rio Project.

USFWS Comment #18

In Section 3.2.1, the Applicant proposes to continue to operate and maintain the Projects as required in the existing license. We note that the Black Brook Dam and penstock, which are components of the Mongaup Falls Project in the current license, are no longer operated or maintained for power production, as required under Section 10(c) of the Federal Power Act. The Service recommends that the Applicant and the FERC consider these facilities for removal to enhance the aquatic environment in Black Brook, a high quality trout stream.

USFWS Comment #19

In Section 4.1.2, we recommend that the geographic scope of the cumulatively affected resources include the Delaware River, both upstream and downstream from the confluence with the Mongaup River, as variable flows from the Mongaup River may affect resources in the Delaware River, including federally listed species. Comparison of gauge data from both the Mongaup River and downstream areas of the Delaware River indicate that peaking flows from the Mongaup River Projects can represent 10 to 60 percent of the flow in the Delaware River, especially during low flow periods. Analysis of the upstream portions of the Delaware River, below the New York City Reservoirs, are necessary as flows from the Mongaup River can be used to meet minimum flow requirements in the Delaware River below the Mongaup River, as directed by the USGS Rivermaster, such that upstream releases can be decreased, thus impacting resources upstream of the confluence. It is our understanding that the Applicant files a schedule of planned hydro releases with the Rivermaster's Office. A two-turbine release from the Rio Project can contribute 870 cfs toward a court-ordered[1] 1,750 cfs flow target in Montague, New Jersey, and upstream releases are often lowered days in advance to account for travel time over approximately 100 miles of river and to conserve water in the basin. In situations where planned hydro releases from the Mongaup River do not occur, low flows can occur both upstream and downstream of the confluence of the Mongaup and Delaware Rivers.

USFWS Comment #20

In Section 4.2.1, the Service recommends that the effects of continued Project operations on erosion of shorelines and stream banks due to impoundment fluctuations and peaking flows be addressed in the Environmental Assessment (EA). Erosion due to the Projects' operations can decrease water quality and negatively impact aquatic resources. In Section 4.2.3, we recommend that the effects of continued Project operations on aquatic habitat and fisheries in Black Lake Creek, Black Brook, and Mongaup River, including their bypassed reaches, be addressed in the EA.

USFWS Comment #21

In Section 4.2.4, we recommend that herpetofauna be included among the wildlife evaluated in the EA. In Section 4.2.5, the scientific name for the Indiana bat is *Myotis sodalis*, not *M. sodalist*.

USFWS Comment #22

[1] New Jersey v. New York, 347 U.S. 995, 74 S. Ct. 842, 98 L. Ed. 1127 (1954)

In Section 9.0, the following comprehensive plan is cited:

> New York State Department of Environmental Conservation. 1979. Hudson River Basin water and related land resources: Level B study report and environmental impact statement. Albany, New York. September 1979.

We also recommend that a comparable document for the Delaware River Basin also be cited:

> The Delaware River Basin Commission. 1981. The Delaware River Basin: The final report and environmental impact statement of the Level B study. West Trenton, New Jersey. May 1981.

The Service also recommends that the U.S. Fish and Wildlife Service, Fisheries USA, comprehensive plan be included in the list of Comprehensive Plans for the Projects.

USFWS Comment #23

Study Requests

The Service requests that the Applicant conduct the following studies to address information gaps in the PAD and provide the information necessary to assess the effects of the Projects and determine appropriate Protection, Mitigation, and Enhancement (PME) measures.

I. Fishery Surveys

1. *Goals and Objectives*

The goals and objectives of this study are to provide information on the existing fishery resources in the vicinity of the Projects, including areas upstream and downstream of the dams, to aid in the determination of what the Projects impacts may be. Updated fisheries data are needed to assess the overall health of the fishery and current population sizes that are needed to inform our recommendations.

The Service recommends that the Applicant conduct thorough fisheries surveys in the vicinity of the Projects. These surveys should include the Projects' reservoirs (and the Black Brook diversion impoundment), the Mongaup River from above the Swinging Bridge Reservoir to the confluence with the Delaware River, Black Lake Creek from above the Toronto Reservoir to the confluence with the Mongaup River, and Black Brook from above the diversion impoundment to the confluence with the Mongaup River. A variety of sampling gear, including gill nets, trap nets, seines, and electroshocking should be used as appropriate for site conditions. The study should be done for one full year, with provision for a second year of study if data collected are inadequate based on review by the Service and the NYSDEC. Information to be collected includes species, size, age, sex, and condition, as well as movement patterns and habitat utilization. Standard water quality data (i.e., water temperature, dissolved oxygen (DO), pH, and conductivity) should be collected in conjunction with these surveys. While these studies should focus on general fishery resources, we request the collection of additional targeted information for important game, interjurisdictional, and migratory species in the vicinity of the Projects. Targeted efforts are recommended for walleye (*Sander vitreus*), trout species [brook trout

USFWS Comment #24

(*Salvenlinus fontinalis*), brown trout, and rainbow trout (*Oncorhynchus mykiss*)], bass species [largemouth bass (*Micropterus salmoides*) and smallmouth bass (*M. dolomieu*)], American shad (*Alosa sapidissima*), white sucker (*Catostomus commersonii*), and American eel (*Anguilla rostrata*), a species that has been historically noted as occurring within the Mongaup River watershed above the Projects.[2] For these species, we recommend that detailed abundance, stock estimates, and movement patterns be examined that may utilize nighttime surveys for walleye, movement analyses for walleye and white sucker, and additional study in smaller tributaries for trout reproduction.

For all fisheries data obtained, the Service recommends that a thorough analysis be done, using as much quantitative data as there is available to compare and contrast the changes during the current period as compared to the fisheries data collected during the original licensing in the 1980s. Special attention should be paid to changes in diversity and quality of the fishery, species specific changes, and within size-class and age-class changes over time. Species known or expected to occur in the vicinity of the Projects that are not represented in the quantitative data should be included and discussed in the study results.

USFWS Comment #24, cont...

2. *Resource Management Goals*

The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel (*Alasmidonta heterodon*), known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle (*Haliaeetus leucocephalus*) population.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

There is no recent information regarding fisheries in the vicinity of the Projects. There are some data available from the original licensing in the 1980s; however, 30 years of changes in angling pressure, stocking efforts, water quality, water quantity, habitat availability, minimum flows, and seasonal impoundment fluctuation limits have likely altered the fishery. Data from the original licensing will be helpful in determining changes and trends over the last 30 years.

[2] Dittman., D.E., L.S. Machut and J.H. Johnson. 2009. American eel history, status, and management options: Delaware River Drainage. Final Report for New York State Contract #C005548, comprehensive study of the American eel. Tunison Laboratory of Aquatic Science, USGS, Great Lakes Science Center, Cortland, New York. 102 pp.

5. *Nexus to Projects Operations and Effects*

The Projects' dams serve as barriers to upstream and downstream fish migration. Fish moving downstream are subjected to potential mortality from impingement and entrainment. The Projects alter flows in bypassed reaches, modify flows downstream from the Projects, and impact habitats in the impoundments via fluctuations.

USFWS Comment #24, cont...

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard scientific collecting techniques used in most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would involve one field crew sampling on a seasonal basis and as needed for specific species. The study would last for 1-2 years. The actual cost is unknown and would depend upon the gear types used, number of sampling locations, local labor costs, the ability to combine multiple studies (e.g., fisheries and water quality) into one task, etc. The existing literature is inadequate to fully address the impacts of the Projects, and there are no alternatives to conducting standard fishery surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.

II. <u>Fish Entrainment and Mortality, Fish Protection, and Upstream and Downstream Passage Studies</u>

USFWS Comment #25

1. *Goals and Objectives*

The goals and objectives of this study are to provide information on potential fish entrainment and mortality as well as fish protection and upstream and downstream passage structures that could be utilized at the Projects. The information obtained will allow the Service's fishway engineers to evaluate the potential effectiveness of various options.

The Service recommends that the Applicant evaluate whether the existing facilities are able to keep all fish species and size classes out of the turbines. Most Projects in New York have incorporated 1"-clear-spaced trashracks, or smaller depending on the species encountered, to prevent the entrainment of the majority of adult fish. These Projects all have larger trashrack spacing and likely entrain fish. We recommend a literature review and on-site investigations of existing facilities. This study would involve a desktop analysis of entrainment risk based on: 1) the Projects facilities and operations including: trashrack spacing, water depths, intake locations and sizes, flows, resulting intake velocities, water quality, and daily and seasonal changes in Project operations; and 2) the biological characteristics of the fishery including: swimming and burst speeds, where in the water column fish are likely to be moving, daily and seasonal movement patterns, and life history for all within species size classes. Abundance estimates from the fisheries study will be useful in weighting the overall rate of entrainment at the Projects. The methodology for the determination of risk should be clearly explained.

While we are not recommending site-specific entrainment studies at this time, we are interested in the collection of any available field data that may provide insight into entrainment at the Projects. These Projects all have relatively long penstocks with surge tanks to accommodate changes in system pressure. It is possible and has been anecdotally observed that fish that are entrained at hydro projects may enter a surge tank and reside there for some time. The Service recommends that the Applicant study whether any entrained fish can be located within the surge tanks at the Projects. This observational study would result in data that would be inherently qualitative and presence-based (i.e., an absence or low number of fish collected would not be an indication of low rates of entrainment). These data would be used to complement the desktop entrainment risk analysis as any fish collected would provide insight into the fish species and size classes that are actually entrained at the Projects.

USFWS Comment #25, cont...

The Service recommends that the Applicant evaluate the potential for entrainment mortality at the Projects through a desktop analysis of previous entrainment mortality studies at projects with similar head, turbine, and operational characteristics, as available. Entrainment mortality is known to vary considerably from project to project based on individual site characteristics and previous studies have been plagued by issues with study design and collection efficiency. Any studies cited should include the location, the project characteristics, the species, sizes, and condition of any fish species tested, the measured rates of injury/mortality, and an indication of the error associated with these measurements (e.g., collection efficiency, confidence intervals). Additionally, a critical analysis of the cited studies incorporating and citing available comments by the resources agencies on the study should be presented.

The Service recommends that the Applicant collect site-specific data from the Projects and conduct a preliminary analysis for feasibility to aid in the design of protection and passage facilities. We recommend that this effort include all the developments among the Projects including the Toronto, Cliff Lake, and Black Brook developments. The Applicant should examine alternatives that would effectively pass fish upstream and downstream around the dams and turbines. These alternatives may include any existing trash sluices located close to the intakes; however, we are aware that there will be no available sluices for the Rio and Swinging Bridge Projects. Special attention should be given to upstream and downstream passage alternatives for American eel at all of the Projects as this species is a priority for population restoration.

The Service recommends that the Applicant review our Fish Passage Engineering and Design Criteria[3] as well as any other relevant literature for available passage designs for these Projects, as well as information on the relative effectiveness of each design. Existing facilities at other dams should be investigated. Careful attention should be paid to attraction flows, guidance mechanisms, and velocities. The fish moving downriver must be diverted away from the turbines and guided to any downstream passage facility. Adequate attraction and conveyance flows must be provided. The passage facility should not create a bottleneck that would delay movement or expose the fish to excessive predation. All passage facilities should be designed to prevent blockage from ice and debris and should be as maintenance-free as is feasible. These

[3] https://www.fws.gov/northeast/fisheries/pdf/USFWS_R5_2017_Fish_Passage_Engineering_Design_Criteria.pdf

facilities must be able to operate under all flow conditions experienced in the Mongaup River and across the range in reservoir elevations experienced in the reservoirs.

2. *Resource Management Goals*

The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.

USFWS Comment #25, cont...

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

The PAD does not provide any information regarding protection and passage options.

Section 5.4.1 in the PAD does describe the results of an entrainment study that was conducted in 1992 as a component of the original licensing effort. We do not consider the results of this study to be reliable or useful for more than a qualitative, presence-based analysis of entrainment at the Mongaup Project and entrainment of alewife (*Alosa pseudoharengus*) in the winter months at the Rio and Swinging Bridge Projects, which was the stated goal of the study at those Projects.

This conclusion is based on several issues with the study:

1) The study was conducted in an atypical, drought year, and was seasonally biased. No entrainment sampling was conducted at Rio or Swinging Bridge outside of the winter months. Mongaup Falls was operated infrequently or not at all in the months of June-August and consequently little sampling was conducted. Entrainment estimates were based on calculated abundances that depended on plant flow, which was atypically low as a result of drought conditions. As a result, the abundances and representativeness of entrainment during the warmer months, when many fish species are active, was not representative of, and biased downward, compared to a normal year at Mongaup Falls and not presented at all for Rio and Swinging Bridge.

2) The collection efficiencies at the Projects were extremely poor. At both the Rio and Swinging Bridge Projects, two small 1-square-meter nets were placed relatively far below

the draft tubes. Collection efficiency was only examined at Swinging Bridge, and these results were applied to Rio. The efficiencies across all tests at Swinging Bridge ranged from 2.4 to 8.5 percent, which were unacceptably low. At the Mongaup Project, a full coverage net frame was placed over the draft tube of Unit 4, but not over the remaining units. Collection efficiencies for one-unit releases with Unit 4 alone were 86 to 93 percent, which could have been acceptable. However, the study assumes, and observed, a marked decrease in efficiency with multiple (up to four-) unit operation. For an unknown reason, the efficiency of one- to four-unit operation was calculated to be 89.6 to 95.9 percent, and averaged to approximately 91.6 percent. Actual collection efficiencies ranged from 12.7 percent to 91.0 percent, with no four turbine release greater than 14.8 percent. The authors may have assumed that a recapture rate of 25 percent was expected, and attempted to extrapolate this to weighted expected efficiency for the whole Project. This still does not explain how they derived 90.7 percent efficiency for a four turbine release. Ultimately, less than 15 percent recapture rates were observed for four turbine releases, and nearly all of the measured releases were conducted with four turbines.

USFWS Comment #25, cont...

3) The study predicts low entrainment at the Projects due to the depth and location of the intakes partly due to the potential for low DO at the intakes in the summer months. Swinging Bridge Unit 1 has the deepest intake, and was recorded as having the most anoxic conditions in the study; however, this unit is no longer in operation. Swinging Bridge Unit 2 and Rio were both found to have more marginal DO conditions with relatively anoxic conditions during the warmest months, while Mongaup Falls was only found to have one period of anoxic conditions on August 4, 1993. No sampling was conducted during the warmer months at either Rio or Swinging Bridge, so there is no data presented to test this assumption for these Projects; however, the August 4 sampling date at Mongaup Falls was found to have a DO concentration within the intake zone of influence of 0.8 to 1.3 parts per million, a level presented as lethal to highly stressful for most species of fish. On that same date, entrainment at the facility included eight species of fish and a large number of individuals, primarily of alewife, but also including other panfish and game species (i.e., largemouth bass). A 12.7 percent collection efficiency was observed for alewife on that date. The potential for entrainment at the Mongaup Project apparently exists even at anoxic conditions, and places this claim in doubt at the other Projects.

4) The survival estimate of 70 percent is based on a limited number of entrainment mortality studies with no critical analysis of the studies themselves. There are now many more studies available to reference in this type of analysis. No mortality information was included from the actual field study.

In conclusion, we do not concur that a claim of minimal entrainment and mortality for all species can be derived from the 1992 entrainment study alone. What data do exist indicate that entrainment does occur and the potential for negative impacts to the fishery resource may exist. An updated analysis with current fishery data is needed.

5. *Nexus to Projects Operations and Effects*

The Projects dams entrain and can cause mortality to fish and serve as barriers to upstream and downstream fish migration. The Rio Dam blocks the upstream movement of all species in the Mongaup River, including migratory species from the Delaware River. The Rio Dam blocks approximately 4.8 miles of the mainstem river up to Mongaup Falls, the historical natural barrier to upstream movement for most species in the Mongaup River. This is 33 square miles of the basin, which represents approximately one-sixth of the drainage area of the basin above the Rio Project. This includes access to potentially high quality habitat in Black Brook and numerous smaller tributaries.

American eel have historically been located above Mongaup Falls[4], and the Mongaup Falls and Swinging Bridge dams would block upstream movement of this species, if passage were available at the Rio Dam. The existence of barriers to migration for this species and the loss of access to available habitat have been noted as one of the primary threats for this species. American eel were noted as the most abundant species in the Mongaup River below the Rio Dam in previous studies. These Projects have blocked access to approximately 193 sq. mi. of the basin for American eel.

USFWS Comment #25, cont...

Native brook trout populations, as well as other resident species, are also isolated by these upper Projects' dams into smaller stream segments within: 1) the lower Black Lake Creek and the Mongaup River between Swinging Bridge Dam and Mongaup Falls, and 2) Black Lake Creek between Cliff Lake Dam and Toronto Dam. This later segment is partially isolated due to a hydraulic connection between Cliff Lake and Swinging Bridge Reservoir. Large areas of the basin are not accessible to brook trout or other resident fish species upstream of these segments.

Fish moving downstream are subjected to potential mortality from impingement and entrainment. New licenses issued for projects throughout New York have incorporated 1-inch clear-spaced trashracks to physically exclude most adult fish from the turbines, alternate downstream passage routes, and other features (e.g., reduced approach velocities, adequate plunge pools, etc.) to encourage safe downstream fish passage. The existing downstream fish passage structures may not be adequate. If upstream passage for American eel is provided, downstream passage for these species will be of special concern.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard literature reviews and site-specific data collection techniques common to most hydro licensing activities. A study of entrainment within surge tanks has not been widely conducted previously, although it has the potential to provide useful field data for comparison with desktop studies. We are interested in exploring this opportunity with the FERC and the Applicant.

[4] Dittman., D.E,. L.S. Machut and J.H. Johnson. 2009. American eel history, status, and management options: Delaware River Drainage. Final Report for New York State Contract #C005548, Comprehensive study of the American eel. Tunison Laboratory of Aquatic Science, USGS, Great Lakes Science Center, Cortland, New York. 102 pp.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would involve moderate literature review, discussions with fishway engineers, and site-specific data collection. Collection of any entrained fish in the surge tanks could involve seasonal events of draining the surge tanks through available valves and potentially be conducted in conjunction with routine maintenance operations. The overall study could be completed in less than 1 year, but may require more time to design effective facilities. The actual cost is unknown and would depend upon the number of alternatives examined. The existing information in the PAD is inadequate to allow a thorough examination of alternatives. However, most of the information needed should be available in the existing literature.

USFWS Comment #25, cont...

III. Flow Studies

1. *Goals and Objectives*

The goals and objectives of this study are to determine whether the existing releases are appropriate for the downstream portions of the Mongaup River and Black Lake Creek as well as their bypassed reaches. This study should extend down to the confluence of the Mongaup River with the Delaware River.

The Projects operate in a ponding fashion, thus varying flows downstream of the Project. The Projects divert flows from the main river channels, creating bypassed reaches. The current license requires minimum flow releases as follows: 1) 100 cfs below the Swinging Bridge powerhouse and 10 cfs below both the Toronto and Cliff Lake dams; 2) 70 cfs below the Mongaup Falls Dam in the bypassed reach and 20 cfs below the Mongaup Falls powerhouse; and 3) 100 cfs below the Rio Dam. We request that flow studies be conducted to determine whether these are the appropriate minimum base flows. A Delphi approach may be possible, which is simpler and less expensive than more complex studies such as using the Instream Flow Incremental Methodology (IFIM); however, the complexity of the resources and issues involved in this relicensing may necessitate a more formal, quantitative study.

USFWS Comment #26

The Delphi approach requires the creation of a "team" that should identify target species and life stages, with appropriate priorities for each, and a range of flows to be viewed for the reaches studied. We recommend and will support this methodology if the team consists primarily of qualified biologists from the resource agencies, and a qualified biologist representing the Applicant. A neutral facilitator is also essential. This study is intended to evaluate the habitat and resources in the reaches studied, and other parties can provide input related to their concerns in relation to the results derived from this study during the relicensing process. During the study, the Applicant would provide a variety of flows to the reaches, starting with lower flows and working up to the highest flow to be studied. During each flow, the team will examine the habitat and "score" it for each species/life stage. The final data will then be used in conjunction with fisheries and habitat mapping data to negotiate flow regimes for the reaches in relation to the other resources and issues at the Projects. If an IFIM study is conducted, it would follow established protocols and involve a quantitative analysis of modeled habitat availability for different life stages of the target species.

The ability of the Applicant to regularly provide for the minimum flow below the Rio Dam has never been evaluated. The Service recommends that the Applicant provide an analysis of the degree to which the flows in the bypassed reach below the Rio Project have been in compliance with the 100 cfs or 60 cfs minimum release included in the 401 Certification for the Project. This study would involve a desktop analysis of the past 5-10 years of instantaneous gauge data from the USGS gauges below the Rio Project. These data will help determine the consistency of compliance with the required minimum flow and if the existing methods of provision are adequate.

The Service recommends that the Applicant conduct habitat mapping for all of the relevant reaches. This mapping, which is an essential component of both a Delphi study and an IFIM study, should identify the type of habitat in each section (e.g., pool, riffle, run), along with depths, velocities, and substrates. We request that habitat mapping also be conducted in the additional tributary streams and upstream areas included in the fisheries study to provide data regarding the available habitat in these areas. This information will be used to determine the amount of available habitat under different flows and in adjacent tributaries. Flows selected by the Delphi study will be primarily evaluated by their ability to maximize habitat availability for the species studied.

USFWS Comment #26, cont...

We also recommend that the Applicant conduct an analysis of the effects of the releases from the Rio Project on the downstream and upstream portions of the Delaware River, where the federally listed dwarf wedgemussel is known to occur. Effects to the resources in the National Park Service's Upper Delaware National Scenic and Recreation River may occur, up to the tributaries affected by the New York City reservoirs. This study would involve a desktop analysis of the past 5-10 years of instantaneous data from the USGS gauges below the Rio Project and in the Delaware River upstream and downstream from the confluence with the Mongaup River. The Applicant should study the extent to which the high flow releases from the Rio Project influence the Delaware River flows, especially in low flow periods, and highlight any times when scheduled releases provided to the USGS Rivermaster were canceled and for what reason.

2. *Resource Management Goals*

The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

The PAD provides no information regarding how the minimum flows required by the current license for Black Lake Creek were developed, nor does it describe the benefits of these flows or the impacts of not having higher flow releases.

A detailed IFIM study was conducted for the Mongaup River during the original licensing. The current flows in the Mongaup River were determined largely by their inclusion by the NYSDEC in the 401 Water Quality Certifications for the Projects, and were greater than the flows proposed by the previous applicant and recommended by the FERC, but less than the flows recommended by the Service. We have reproduced these requests in Table 1 below.

USFWS Comment #26, cont...

Table 1. Comparison of flow releases proposed by previous licensee (Orange and Rockland, O&R) and recommended by NYSDEC and the Service.

Project and Reach	Proposed and Recommended Minimum Flows (cfs) O&R[1]	NYSDEC[4]	FWS[5]
Swinging Bridge			
Black Lake Creek			
Downstream from Toronto Dam	10	10 [2]	10
Downstream from Cliff Lake Dam	10	10	10
Mongaup River			
Downstream from powerhouse	30	100 [3]	150
Mongaup Falls			
Mongaup River			
Downstream from Mongaup Falls Dam	40	70	80
Downstream from powerhouse	40	90	100
Black Brook			
Downstream from diversion dam	20	20	20
Rio			
Mongaup River			
Downstream from dam	60	100	150
Downstream from powerhouse	60	100	150

[1]O&R original proposed minimum flows

[2]75 cfs maximum release

[3]555 cfs maximum release

[4]Flows required in 401 water quality certifications (issued September 11, 1989) and recommended in letter of January 16, 1990. O&R aggred to these flows in a Memorandum of Understanding with NYSDEC signed July 13, 1990.

[5]Flows recommended in letter of July 14, 1989

The license orders from the FERC for the Projects focus on changes in available habitat for adult brown trout as the justification for its recommendations[5]. However, the IFIM studies conducted

USFWS Comment #26, cont...

[5] The FERC's Ecological Assessment (EA) did not appropriately follow the IFIM method in reaching its conclusion. The IFIM was designed to produce data on a variety of species and life stages. These data were intended as tools to

examined the available habitat for a variety of species and life stages across all of the Projects. While there were modest increases in adult brown trout habitat at flows above the FERC recommendation, these were not the most important increases in habitat that resulted from the study. At Swinging Bridge, the NYSDEC and Service recommendations increased spawning and incubation habitat for brown trout by 132 and 186 percent, respectively. A similar trend was observed for the Mongaup River below the Mongaup Falls powerhouse. For these isolated stream segments, the ability of all life stages to succeed is an important component of a healthy fishery. This trend was also present below the Rio Dam. Also below the Rio Dam, the higher releases request by the NYSDEC and the Service increased American shad spawning habitat by 275 to 359 and 931 to 1,097 percent and incubation habitat by 83 to 179 and 168 to 479 percent, respectively, depending on habitat type. These differences represent acres of available habitat for species of concern in a habitat with a very limited aerial extent and are important for these resources.

Ultimately, the environmental measures required at the Projects during the original licensing consisted of some limitations on fluctuations during the recreation and bass spawning seasons, monitoring of water quality, and the minimum flows in the reaches to be studied. These Projects have large fluctuations in impoundment levels and river flows, high ramping rates, and no adequate fish passage or protection facilities.

USFWS Comment #26, cont...

The available habitat, fisheries resources, and issues at the Projects have likely changed since the original licensing. The flow releases from these Projects have multiple benefits to a variety of species as well as to water quality, and the appropriate flow regimes will be determined as part of a holistic look at all of the competing issues.

5. *Nexus to Projects Operations and Effects*

Operation of the Projects affects flows in the Mongaup and Delaware Rivers. The existing minimum flows may not provide adequate mitigation for these impacts. This study is necessary to determine the appropriate flow regime for the impacted reaches. We have described the potential impacts to the downstream and upstream areas of the Delaware River in our comments on SD1, above.

6. *Methodology Consistent with Accepted Practice*

The recommended study would use a standard Delphi or IFIM study design that has been used in many hydro licensing activities. The analysis of compliance and downstream flow effects is also a common activity during relicensing.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would depend on the method chosen and involve multiple meetings to establish the study team and identify the flow ranges, target species, and life stages to be studied.

help stakeholders negotiate an appropriate flow regime. The methodology recognizes consideration of multiple species not just one species and life stage as was done in the EA.

The actual study would likely take multiple days in the field across all the Projects, and depend on the number of flows to be viewed and the difficulties encountered in providing and stabilizing these flows. Several follow-up meetings would be necessary to review the data and negotiate the final flows. The habitat mapping will be done separately and likely will take a crew of people a seasonal effort. The gauge data could be readily analyzed with little difficulty.

The cost will depend on the method chosen and will depend on the number of flows to be viewed, the difficulty in providing these flows, and the number of meetings necessary to complete the study and negotiations.

USFWS Comment #26, cont...

IV. Water Quality

1. *Goals and Objectives*

The goals and objectives of this study are to provide baseline water quality information to allow a proper determination of the potential impacts at the Projects. These data are necessary to evaluate how water quality may influence the current condition of the fishery and the adequacy of the minimum flows at the Projects as they relate to water quality. These studies should include water temperature and DO on a continuous basis for at least 1 year, along with monthly sampling of other parameters such as pH, turbidity, and conductivity. An additional year of monitoring may be requested based on a review of the first year's results. This information will be used to document baseline water quality conditions and to determine potential impacts from the Projects' operations. We recommend that additional water quality data, beyond the data currently collected below the Projects' powerhouses, be collected from the impoundments, the bypassed reaches, and areas upstream and downstream from the Projects as well as tributary streams that are sampled for the fisheries study. These additional locations are necessary to evaluate water quality across the variety of areas impacted by the Projects' operations. Temperature in the tributary streams is of particular concern for trout species.

USFWS Comment #27

2. *Resource Management Goals*

The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

The Applicant has been conducting ongoing water quality monitoring below the powerhouses for all three Projects and these data will continue to be collected during the study period. There are no data available for the bypassed reaches, Black Lake Creek, in the impoundments, or in the tributary streams to the Mongaup River.

5. *Nexus to Projects Operations and Effects*

The Projects impound the river and create multiple bypassed reaches. This could impact such water quality factors as temperature and DO, which are critical to the quality of the aquatic habitat. The Projects have a history of water quality issues that require detailed analysis.

USFWS Comment #27, cont...

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard scientific water quality sampling techniques used in most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would be an extension of ongoing efforts and would involve a crew monitoring continuous measurement devices and collecting monthly samples while undertaking other work such as fisheries or macroinvertebrate surveys. In addition, temperature and DO loggers would be installed, with data being periodically downloaded. The actual cost is unknown but would be relatively low. Existing data may not be sufficient.

V. Impoundment Fluctuation Studies

1. Goals and Objectives

USFWS Comment #28

The goals and objectives of this study are to provide information regarding the habitat in the impoundments and how it is impacted by changes in water levels. This information will then be used to determine what impacts need to be addressed and whether an alternative operational mode may be more desirable.

These Projects have large maximum and target fluctuation ranges. These fluctuations create a zone around the impoundment shoreline that is periodically dewatered. The habitat in this zone is usually not as valuable to aquatic organisms and plants as the habitat with more constant water levels. These fluctuations can impact wetlands and shallow littoral vegetation, as well as the invertebrates, fish, birds, mammals, amphibians, and reptiles that use these habitats.

The Service recommends that the Applicant conduct an impoundment fluctuation study. This study will assist in the determination of what fish and wildlife resources are being impacted and to what degree. The study should consist of mapping the aerial extent and habitat in the fluctuation zones at full pond and at drawdowns consistent with Project operations. The maps should identify the extent of the changes in, and adjacent to, the impoundment areas, substrate

and type of habitat, the depth at various pond levels, and any important habitat types (i.e., wetlands and submerged aquatic vegetation) that may be present. Steep slopes, fluctuations in stream flow, and fluctuations in reservoir elevations can lead to mass movement, and we recommend that eroding or potentially erodible areas within the fluctuation zone be evaluated and included in the maps.

We recommend that the Applicant study the range of flow releases evaluated in the flow studies in relation to the potential for impoundment fluctuations at the Projects. This would involve deriving a calculation of storage at the Projects at different depths and the degree to which different flow releases can be maintained at differing starting elevations. Estimates should be quantitative and based on million gallons per day estimates of the releases in relation to total storage. This would be an extension of the current draft operating plan.

The Service recommends that the Applicant prepare a consolidated figure or table that presents all of the relevant elevations for Project operations. This figure or table should include the dam crest, maximum and minimum fluctuation ranges, any intake/outlet gate inverts (and height), any required seasonal limitations on fluctuations and their duration, and the target elevations proposed by the Applicant and their duration.

USFWS Comment #28, cont...

2. *Resource Management Goals*

The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.

3. Public Interest

The requestor is a resource agency.

4. Existing Information

The PAD provides information related to the maximum and target fluctuation levels of the Projects. Additionally, there is a draft operations plan that provides information related to refill rates based on seasonal targets in reservoir elevations. There are no data provided regarding habitat within the impoundments that may be affected by the Projects operations.

5. Nexus to Projects Operations and Effects

The Projects operate in a ponding fashion and large fluctuations occur in the reservoirs that impact shoreline habitats in the vicinity of the Projects.

6. Methodology Consistent with Accepted Practice

The recommended study uses standard study techniques used in many hydro licensing activities at projects with ponding operations.

7. Level of Effort, Cost, and Why Alternative Studies Will Not Suffice

The level of effort would be moderate and would involve one crew surveying the impoundments as well as the preparation of a desktop analysis of the effect of different elevations on habitat and flows on elevations. The actual cost is unknown but would depend on the variety of habitats found in the impoundments.

USFWS Comment #28, cont...

VI. Wetland Delineation

1. *Goals and Objectives*

The goals and objectives of this study are to identify key aquatic habitat areas in the vicinity of the Projects. The study will provide information on the extent and quality of wetlands and aquatic vegetation and the wildlife they support.

The Service recommends that the Applicant document all wetlands and other aquatic vegetation within the vicinity of the Projects. This information is necessary to characterize the aquatic habitats and the wildlife they support in the Projects vicinity.

USFWS Comment #29

2. *Resource Management Goals*

The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

The PAD provides the Service's National Wetland Inventory (NWI) and NYSDEC delineations of wetlands, but these surveys are not precise enough to capture all regulated wetlands, thus there is a need for wetland vegetation surveys. No information is provided regarding submerged aquatic vegetation.

5. *Nexus to Project Operations and Effects*

Operation of the Projects affects water levels and velocities, as well as the timing and location of releases. These factors can impact aquatic vegetation and wetlands, which can be important habitats for fish and wildlife. The information will be used to determine what, if any, impacts the Projects are having on these resources and what the appropriate protection and mitigation measures might be.

6. *Methodology Consistent with Accepted Practice*

The NWI maps are frequently used as the starting point in delineating wetlands. We expect the Applicant to use techniques commonly accepted by the scientific community.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort and cost are relatively low. Much of the information will be collected during habitat mapping of the impoundments and stream reaches for other studies. We recommend this study to ensure that there are no gaps in the wetland and aquatic vegetation information for the Projects. The remaining information can probably be collected during field work related to other studies. No alternative studies have been proposed.

USFWS Comment #29, cont...

VII. Macroinvertebrates

1. *Goals and Objectives*

The goals and objectives of this study are to provide information regarding the macroinvertebrate community. Macroinvertebrate communities are closely linked to water quality and represent the food base for fisheries. We request that 1 year of macroinvertebrate community sampling, including freshwater mussels, be conducted. An additional year of monitoring may be requested based on a review of the first year's results. This information will be used to document the current macroinvertebrate community and water quality conditions and to determine potential impacts from the operation of the Projects. Data should be collected from the impoundments, the bypassed reaches, and areas upstream and downstream from the Projects. We do not expect this study to extend beyond the confluence with the Delaware River as ample data are available on the macroinvertebrates in that system.

USFWS Comment #30

2. *Resource Management Goals*

The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish

species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

The PAD provides some information related to benthic macroinvertebrates, but there is no recent site-specific information. Data are presented from the original licensing and for one 1999 study at the confluence of the Mongaup with the Delaware River that was considered indeterminate. No information is presented regarding freshwater mussels in the basin.

USFWS Comment #30, cont...

5. *Nexus to Projects Operations and Effects*

The Projects interrupt the downstream movement of benthic macroinvertebrates that are important forage for fish and interrupt the downstream transport of food sources upon which benthic macroinvertebrates depend. The Projects have bypassed reaches that may not be adequately watered by existing minimum flows such that the macroinvertebrate community may be negatively affected. Freshwater mussels are dependent on fish host species and the Projects' dams block fish movement both upstream and downstream. The turbine intakes may impinge or entrain fish, resulting in mortality. The operation of the Projects may also affect the amount of habitat available for mussels within the Project boundaries in the impoundments.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard macroinvertebrate sampling techniques used in most FERC relicensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would be low and would involve one crew collecting data and conducting surveys while undertaking other work such as fisheries or water quality surveys. The actual cost is unknown but should be relatively low.

VIII. Bald Eagles

1. *Goals and Objectives*

The goals and objectives of this study are to provide information regarding the bald eagle population at the Projects. This study will provide information related to the effects of the Projects on the population during winter feeding activities and inform management of this important resource.

Bald eagles are a protected species under Federal and State law and the Mongaup Valley has a noted population of bald eagles with multiple viewing areas installed and maintained by the NYSDEC. The Service recommends that the Applicant conduct a study providing information regarding current nesting locations at the Projects and the feeding and foraging activities of bald eagles in the reservoirs and near the tailraces. This study would involve collecting data from the NYSDEC and conducting 1 year of field observation of feeding activity, noting location, number of eagles, and identity of food resources, if possible.

USFWS Comment #31

2. *Resource Management Goals*

The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

The PAD provides some general information on bald eagles, but there is no site-specific information on nesting or feeding activity presented. One of the stated goals of the 1992 entrainment study during the original licensing was to evaluate the availability of entrained alewife for winter feeding of bald eagles. There is no current information related to the importance of this resource to the bald eagles in the vicinity of the Projects.

5. *Nexus to Projects Operations and Effects*

The Projects provide habitat for fish and entrain fish that may be a primary source of nutrition for bald eagles in the vicinity of the Projects. Any mitigation measures related to water level fluctuations and fish entrainment may influence this protected species.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard avian monitoring techniques.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would be low and would involve one crew collecting data and making observations over one or two field seasons.

USFWS Comment #31, cont...

IX. Swinging Bridge Spillway Habitat

1. *Goals and Objectives*

The goals and objectives of this study are to provide information regarding the potential for the Swinging Bridge spillway to provide habitat for macroinvertebrates and herpetofauna at this Project.

We observed during the environmental site review for the Swinging Bridge Project that leakage and potentially recent spillage had created a series of pools and some small amount of flow through the spillway area of the Project. These habitats were quite abundantly occupied by macroinvertebrates and eggs and tadpoles of herpetofauna. The Service recommends that the Applicant study the consistency and volume of leakage in this area and the potential to provide some flow that would support these communities, which are important forage species for a variety of fish and wildlife species.

USFWS Comment #32

2. *Resource Management Goals*

The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

There is no existing information in the PAD regarding this habitat.

5. *Nexus to Projects Operations and Effects*

The Swinging Bridge Project can negatively impact the macroinvertebrate community, as discussed in the Macroinvertebrates study request, and hydro projects with impoundment

fluctuations have been shown to negatively impact herpetofauna communities through dewatering of seasonal wetlands and exposure of aestivating species during the winter months.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard habitat assessment techniques.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would be low and would involve one crew collecting data and making observations over one field season.

USFWS Comment #32, cont...

X. Black Brook Dam Removal

1. *Goals and Objectives*

The goals and objectives of this study are to provide information regarding the potential for removing the Black Brook Dam, a component of the Mongaup Falls Project.

The Black Brook Dam and diversion are no longer utilized for Project operations nor maintained beyond dam safety standards. As this is no longer an integral part of the Mongaup Falls Project, we recommend that the Applicant study the potential to remove this dam on Black Brook, a noted trout fishery.

2. *Resource Management Goals*

The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

There is little information in the PAD regarding this dam or its impoundment. The potential to remove this dam is unknown.

USFWS Comment #33

5. *Nexus to Projects Operations and Effects*

The dam is a component of the Mongaup Falls Project that impacts the potential movement of fish and the macroinvertebrate community, as discussed above. The impoundment may increase thermal inputs into this cold water system.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard dam removal assessment techniques.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would be low and would involve a desktop analysis of dam removal options and costs and potentially some sediment sampling behind the dam.

USFWS Comment #33, cont...

Foregoing Studies in Lieu of Protection, Mitigation, and Enhancement Measures

We anticipate that the Applicant will pursue a settlement agreement for these Projects. As such, during the development of the Study Plan that must be approved by the FERC during the Integrated Licensing Process, there may be an opportunity to reduce some of these studies in scope, or even forego some of them, if agreements can be reached up front regarding certain PME measures. The Service recommends that, prior to the development of the Draft Study Plan, the Applicant convene a meeting with the stakeholders to determine which studies could be reduced or eliminated in return for agreements to proceed with certain PME measures.

USFWS Comment #34

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We recommend that the Draft Study Plan developed by the Applicant incorporate all of the above-listed studies. The study proposals incorporated into the Draft Study Plan should be as detailed as possible so that all parties understand the proposed studies prior to study plan approval.

Thank you for the opportunity to comment on this PAD and the SD1 and the opportunity to provide study recommendations. If you have any questions or desire additional information, please contact John Wiley at 607-753-9334.

Sincerely,

Signed. Secord

for David A. Stilwell
Field Supervisor

cc: TU, Plattsburgh, NY (W. Wellman)
NYSDEC, New Paltz, NY (J. Murray)
DOI, SOL, Newton, MA (A. Tittler)

NPS, Boston, MA (K. Mendick)
FERC, New York, NY (Q. Emmering)

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FEDERAL ENERGY
REGULATORY COMMISSION

Communications Memo

To: Public Files
From: Quinn Emmering
Date: August 8, 2017
Docket: P-10482
Project: Swinging Bridge Hydroelectric Project

Subject: Comments of Judy and Gary Knee regarding the Swinging Bridge Project under P-10482

On August 8, 2017, I received a mailed letter with four photos (postmarked July 26, 2017) in my office mailbox from Judy and Gary Knee, property owners on the north end of the Swinging Bridge reservoir. Their letter includes comments regarding water levels on the Swinging Bridge reservoir. The accompanying photos are images of their dock and shoreline on the Swinging Bridge reservoir.

JUDY AND GARY KNEE 907 STARLIGHT ROAD, MONTICELLO, NEW YORK 12701

FEDERAL ENERGY REGULAORY COMMISSION JULY 26, 2017
888 FIRST STREET. N.E.
WASHINGTON, DC 20426

RE: SWINGING BRIDGE RESERVOIR
PROJECT LICENSE RENEWAL
PROJECT #10482

ATTENTION: MR. Quinn C. Emmering

Dear Mr. Emmering,

Our names are Judy and Gary Knee residents on the North End of Swinging Bridge Reservoir. We had the pleasure of meeting you at the Swinging Bridge Reservoir Bus tour and again at the morning at the Scoping Meeting June 22, 2017. At Your request I am enclosing pictures presented at that meeting and a summary of my presentation.

We are not attorneys, lobbyists, politicians, biologists or environmental engineers. We are residents who are retired and who have common sense to see that A NO or LOW INPUT WATER FLOW, PLUS THE MANDATORY RELEASES OF 100 CFS, PLUS THE GENERATION RELEASES BY EAGLE CREEK AND KYACK WHITE WATER RELEASES… EQUALS A DISASTEROUS NEGATIVE RESULT.

Knee Comment #1

As very unhappy residents and tax payers, it is our contention that a full environmental study be completed by certified experts in the field, who can determine the correct management of this lake.

Knee Comment #2

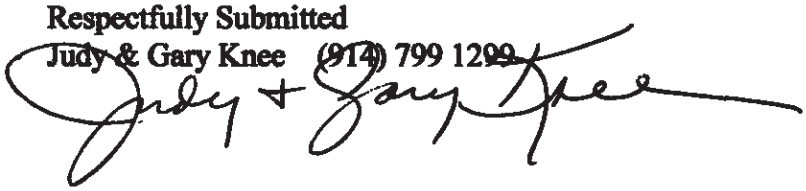
It is our hope, that releases closer to 30 CFS which could turn a NEGATIVE into a POSITIVE namely…..ALLOWING FOR STORAGE OF WATER TO BE USED IN EMMERGENCY SITUATIONS AND TO ALLOW FOR ENOUGH WATER TO BE MAINTAINED AT 1070 ABOVE SEA LEVEL WITH A 1065 ABOVE SEA LEVEL AS A LOW, thus allowing enough water to generated by the owners of the Lake and other demands. This lake has been reduced many, many times over the years to be in the 1050's which completely devastates the lake all around and not just at the North End.

Knee Comment #3

Enclosed are pictures in front of our home that clearly indicate the NORTH END of the lake when it is beautiful and when it is not. When water is completely lost it is useless with extremely dangerous conditions for the entire reservoir.

Knee Comment #4

Respectfully Submitted
Judy & Gary Knee (914) 799 1299




TWO
GUYS


WO
GUYS


North End Swinging bridge Reservoir

Views North End Swinging bridge Reservoir



20170727-3011 FERC PDF (Unofficial) 07/27/2017

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426
July 27, 2017
OFFICE OF ENERGY PROJECTS

Project No. 9690-112–New York
Rio Hydroelectric Project
Eagle Creek Hydro, LLC

Project No. 10481-067–New York
Mongaup Falls Hydroelectric Project
Eagle Creek Hydro, LLC

Project No. 10482-117–New York
Swinging Bridge Hydroelectric Project
Eagle Creek Hydro, LLC

Mr. Robert Gates
EVP Operations
Eagle Creek Renewable Energy, LLC
116 North State Street
PO Box 167
Neshkoro, WI 54960-0167

Reference: Request for Studies and Additional Information

Dear Mr. Gates:

After reviewing the Mongaup River Project's Pre-Application Document (PAD), the transcripts of the scoping meetings held June 22, 2017, and participating in a project environmental site review on June 21, 2017, we have determined that additional information is needed to adequately assess potential project effects on environmental resources. We have 11 study requests (enclosed in Schedule A) for aquatic, fisheries, terrestrial, recreational, and cultural resources. We also have additional information needs (enclosed in Schedule B). Please provide the requested additional information in your proposed study plan, which must be filed by September 12, 2017.

Please include in your proposed study plan a master schedule that includes the estimated start and completion date of all field studies, when progress reports will be filed, who will receive the reports and in what format, and the filing date of the initial study report. All studies, including fieldwork, should be initiated and completed during the first study season (unless a second study season is necessary), and the study reports should be filed as a complete package. If, based on the study results, you are likely to

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propose any plans for measures to address project effects, drafts of those plans should be filed with your Preliminary Licensing Proposal (or draft license application).

Please note that we may request additional studies or information at a later time, including upon receipt and review of scoping comments/study requests, due July 29, 2017, and your proposed study plan.

If you have any questions, please contact Quinn Emmering at (202) 502-6382, or via e-mail at quinn.emmering@ferc.gov.

Sincerely,

Timothy Konnert, Chief
West Branch
Division of Hydropower Licensing

Enclosures: Schedule A – Study Requests
Schedule B – Additional Information

cc: Mailing List
Public Files

Schedule A

Study Requests

After reviewing the information in the Pre-Application Document (PAD), we have identified information that is needed to assess project effects. As required by section 5.9 of the Commission's regulations, we have addressed the seven study request criteria in the study requests that follow.

Study Request #1 – Reservoir Water Level Fluctuation / Operations Model

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

FERC Comment #1

The goal of this study is to develop an operations model that may be used to predict reservoir elevations for each of the Mongaup River project reservoirs under various operation constraints (e.g., minimum flow, reservoir level, etc.). The operations model should support an assessment of potential project effects on aquatic, terrestrial, recreation and land use, and aesthetic resources that may result from proposed or recommended project operational scenarios. Specifically, for each project reservoir, the model should be able use historic inflows to predict reservoir outflow, reservoir elevations and surface areas, and corresponding project generation at an appropriate time-step.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission (Commission) must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Project operations affect reservoir elevations on a seasonal, weekly, daily, and potentially hourly basis. Therefore, project operations may affect several environmental resources. Understanding the effect of proposed and recommended project operations on generation and reservoir water levels, storage, and surface area, is essential to understand how the Mongaup River projects' operation affects these resources and, therefore, relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

FERC Comment #1, cont...

The PAD provided general information about the magnitude of the licensed limits for water level fluctuation in the projects reservoirs and provided information on the hydrology of the Mongaup River, and hydraulic capacities of the projects and the proposed operations.

While this information is available, it is insufficient to fully inform an analysis of how proposed and potential project operations may affect generation and the environmental resources discussed above.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project operations have the potential to affect reservoir elevations for each of the five reservoirs associated with the Mongaup River projects on a seasonal, weekly, daily, and even hourly basis. The requested operations model should provide information on reservoir water surface area, elevations, and fluctuation rates and support an assessment of potential project effects on aquatic, terrestrial, recreation and land use, and aesthetic resources associated with the reservoirs and that may result from proposed and/or recommended project operational scenarios. This information will inform the development of potential license conditions that consider the non-developmental values of the project, as well as their power and developmental values.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data*

collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

Eagle Creek should develop, calibrate, and validate an operations model that integrates each of the three Mongaup River projects and supports the evaluation of proposed and potential recommendations for the project operations, at an hourly (or better) time-step and under various reservoir inflow and outflow conditions. The operations model should be capable of predicting reservoir elevations, surface areas, available storage, and generation that would result from various operational scenarios.

FERC Comment #1, cont...

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of the study is approximately $150,000. Eagle Creek did not propose an alternative study.

Study Request #2 – Aquatic Habitat Mapping of the Projects' Reservoirs

Goals and Objectives

FERC Comment #2

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to map the aquatic habitat within each of the five reservoirs associated with the Mongaup River projects, evaluate the types of aquatic habitats that occur, and identify any potential effects project operations may have on this habitat.

Specifically, the objectives of the study are to:

1. Survey and map the aquatic habitat types distributed within the reservoirs, from the upper extent of each impoundment to the associated dam.

2. Describe the potential influences of the projects' operations on aquatic habitats within the impoundments.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

FERC Comment #2, cont...

Aquatic habitats in the projects' reservoirs support an aquatic ecosystem that provides public opportunities, including sport fisheries. This study would provide information needed to determine the effects of project operations on this resource relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Upon review of Eagle Creek's PAD, we find aquatic habitat data for the projects' reservoirs to be very limited. Eagle Creek generally implies that there is a sufficient amount of existing information to support the licensing process, including information on the aquatic habitat resulting from study and/or monitoring in support of the current license. However, the PAD did not include sufficiently detailed information to allow us to determine if the information is adequate to support the Commission's licensing process. As such, additional aquatic habitat information, including the mapped locations of aquatic habitats within each of the projects' reservoirs is needed to evaluate the projects effects on aquatic resources.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Currently, water levels in the projects' reservoirs fluctuate on a seasonal, weekly, daily, and even hourly basis due to the projects' load-following peaking operations. As a result, any aquatic habitat exposed under low water levels may be adversely affected and/or inhibit the utilization of aquatic habitats by aquatic species during various life stages. These events may also cause fish or other aquatic species (e.g., mussels and macroinvertebrates) stranding and associated mortality.

This requested study would help establish a baseline condition and the health of the aquatic habitat within the projects' reservoirs and assist in forming the basis for inclusion of potential license articles to protect the aquatic resources.

FERC Comment #2, cont...

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Using generally accepted practices in the scientific community:

1. Conduct field surveys of aquatic habitat during full-pool from the head of each of the projects' reservoirs to the associated dam.

2. Categorize habitat survey information per accepted practices in the scientific community (e.g., habitat type, substrate type, depths, etc.) and plot on aerial maps. Also record in-situ water quality conditions (temperature, dissolved oxygen (DO), pH, conductivity) and the presence of invasive aquatic vegetation (species and location).

3. Prepare a report that includes a summary of the data collected. Include in the report, aerial habitat maps that demarcate proposed minimum and maximum reservoir elevations, habitat descriptions, project operations and reservoir elevations and surface areas during the surveys, effects of

proposed project operations on the aquatic habitat(s), and in-situ water quality data. Include all data used to develop the report in an appendix.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

FERC Comment #2, cont...

The estimated cost of this work is approximately $100,000 and may be completed within one study season. It is anticipated that two technicians and a biologist would spend about 40 hours in each reservoir to conduct field work. Report preparation would require about a month of a biologist's and/or GIS specialist's time to complete.

We recognize, however, that if more detailed information exists on aquatic habitat in the project reservoirs than what was provided in the PAD, and we determine it to be sufficient to inform our environmental analysis, this requested study should not be necessary.

Study Request #3 – Baseline Fisheries Population Study

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

FERC Comment #3

The goal of this study is to gather baseline fisheries data throughout the projects' area. These data are needed to identify the fish species that occur in the projects' impoundments, tailwaters, downstream riverine corridors, and bypassed reaches as well as to evaluate any potential project effects. Specifically, the objectives of the study are to:

1. Determine the relative abundance and distribution of fish species within the project impoundments, tailwaters, riverine corridors, and bypass reaches within the projects' area.

2. Describe the distribution of fish species within the aquatic habitats and compare and contrast current data with historic survey data.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

FERC Comment #3, cont...

Fish populations in the Mongaup River support a sport fishery. The effect of project operation on this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

A review of the PAD, revealed that the New York State Department of Environmental Conservation (NYSDEC) conducted surveys of fish populations for portions of the project area prior to 1980 and in 1987 the prior licensee conducted fish surveys in support of its license application. While this information is existing, project operations, particularly minimum instream flow requirements, were changed when the current license was issued and it appears that no new fisheries data has been collected since those project operational changes occurred, as a result, fisheries population data are needed to evaluate the projects' effects on this resource.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Potential project effects on fishery resources may include fish entrainment through the generating units, minimum instream flows, and peaking flow operations. Information on the abundance and distribution of the existing fish community would help to identify whether adverse effects are occurring and/or determine whether the current license conditions are protective of the resource as intended.

The applicant is proposing to continue providing the existing minimum flows. Flow releases from the projects have the potential to affect the suitability of aquatic habitat in these reaches, and in turn fishery resources. This requested study would help establish the current baseline condition on the health of the fishery in the projects' area of the Mongaup River basin under the current projects' operation. These data would also assist in informing potential license articles to protect fishery resources in the Mongaup River.

FERC Comment #3, cont...

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Using generally accepted practices in the scientific community:

1. Conduct electrofishing surveys in each of the project impoundments, tailwaters, and downstream riverine corridors, including boat or backpack electrofishing within the bypassed reaches. Conduct sampling during late-summer or fall in order to observe annual juvenile production (juvenile fish would be large enough to collect). Establish sampling locations that represent the full extent and types of habitat in the study area.

2. Separately target upstream and downstream migrating American eels for sampling using generally accepted methods, such as electrofishing, trap/fyke netting, eel pots, etc. to provide data on the abundance of

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American eels at various life stages, and where they tend to congregate. Conduct the study in late spring/early summer to target upstream migrating juvenile eels (i.e., elvers and yellow eels), and during the fall to target downstream migrating adults eels (i.e. silver eels).

3. Identify to species and count all collected fish while weighing and measuring only a subsample. Measure eye diameters of captured American eels for use in the evaluating silver eels phase. Identify and record the habitat type and substrate of each sampling location, and record in-situ water quality conditions (temperature, DO, pH, conductivity).

4. Prepare a report that includes a summary of the data from the above studies. Include tabular summaries of fish species collected by station, plus data on lengths, weights, condition factors, and in-situ habitat conditions. Also include specific information relating to American eel population characteristics, such as areas at the base of the dams where elvers congregate, and the abundance of potential downstream migrating silver eels. Include all data used to develop the report (including date and time of collection) within an appendix to the report.

FERC Comment #3, cont...

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $100,000 and may be completed within one study season. It is anticipated that three technicians and a biologist would spend about 160 hours conducting field work for each project. Report preparation would require about 60 hours by a biologist. Eagle Creek did not propose an alternative study.

Study Request #4 – Stream Reach Water Quality Study

FERC Comment #4

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to monitor and evaluate water quality within area streams affected by project operations to support an evaluation of the existing minimum instream flow requirements to meet state water quality standards.

Specifically, the study objective is to monitor water quality (e.g., dissolved Oxygen and temperature) on area stream reaches where current water quality data is limited or non-existent.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

FERC Comment #4, cont...

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Water quality in project affected reaches of area streams support an aquatic ecosystem that provides public opportunities, including sport fisheries. Ensuring that the effect of project operations pertaining to this resource is considered in a reasoned way is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Pursuant to its existing license, Eagle Creek has monitored summer and fall dissolved Oxygen and water temperature downstream of the Swinging Bridge, Mongaup Falls, and Rio Powerhouses since 2011 and the PAD summarizes these monitoring results. In addition, a U.S. Geological Survey (USGS) gage station (Station No.

01433500) has collected water quality data immediately downstream of the Rio Project's tailrace on the Mongaup River since October 1, 2013. However, there are several reaches of area streams that are affected by project operations where water quality monitoring does not appear to have been conducted and no water quality data has been presented. These reaches include:

- Black Lake Creek between Toronto Reservoir and Cliff Lake,
- Black Lake Creek between Cliff Lake Reservoir and its confluence with the Mongaup River,
- the Mongaup River between the Swinging Bridge Powerhouse No. 2 and the Mongaup Falls Project reservoir,[1]
- the Mongaup Falls Project's bypassed reach on the Mongaup River, and
- the Rio Project's bypassed reach on the Mongaup River.

FERC Comment #4, cont...

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The existing license requires Eagle Creek to release minimum flows from the project's reservoirs to the five area stream reaches mentioned above. The presence of upstream project reservoirs and the projects' operations alter the stream flow which subsequently affects water quality.

This requested study would help establish the baseline water quality condition within these five affected area stream reaches and aid in determining the adequacy of the minimum instream flow release for protecting water quality and assist in forming the basis for inclusion of potential license articles to protect water quality and aquatic resources therein.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally*

[1] We recognize that Eagle Creek monitors the water quality 0.3 miles downstream of the Swinging Bridge Powerhouse No. 2 tailrace.

accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

1. Using generally accepted practices in the scientific community monitor water quality (DO and water temperature) from June 1 through September 30 on a fifteen minute interval at the following locations:

   - Black Lake Creek at the discharge of the Toronto Reservoir,
   - Immediately upstream of the mouth of Black Lake Creek at Cliff Lake,
   - Black Lake Creek at the discharge of Cliff Lake,
   - Black Lake Creek immediately upstream of its confluence with the Mongaup River,
   - Mongaup River immediately upstream of the Mongaup Falls Project reservoir,
   - Mongaup River immediately downstream of the Mongaup Falls Project's minimum flow outlet structure discharge (upper extent of the bypass reach),
   - Mongaup River immediately upstream of the Mongaup Falls tailrace (lower extent of the bypassed reach),
   - Mongaup River immediately downstream of the Rio minimum flow powerhouse (upper extent of the bypassed reach), and
   - Mongaup River immediately upstream of the Rio Project's tailrace (lower extent of the bypassed reach).

2. Document and record stream flows within each project affected stream reach during the study period on the same 15 minute interval that water quality data is collected.

3. Record ambient air temperature at each water quality monitoring location during the study period.

4. Prepare a comprehensive water quality study report for each of the projects' affected stream reaches that incorporates all existing water quality data collected pursuant to the current license and USGS gage Station No. 01433500, the new water quality data collected pursuant to this study request, and consider the influence of ambient air temperature and stream flows on water quality within the project affected stream reaches.

FERC Comment #4, cont...

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $40,000 and may be completed within one study season. It is anticipated that it will take two technicians, eight days to deploy and retrieve the monitoring equipment (including travel and staging) and about 80 to 100 hours for oversight and report preparation by a senior biologist.

FERC Comment #4, cont...

Study Request #5 – Reservoir Water Quality Study

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goals and objectives of this study are to monitor baseline water quality conditions within the projects' reservoirs to support an evaluation of the existing condition and potential effects on aquatic habitats within project reservoirs and determine if reservoir water quality meets state water quality standards.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

FERC Comment #5

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Water quality in the projects' reservoirs support aquatic habitats and public recreational opportunities, such as swimming, boating, and fishing. Therefore, evaluating the effect of the projects' operations on reservoir water quality is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The PAD provide very little information about the water quality within the projects' reservoirs. Swinging Bridge Reservoir was assessed and included in the NYSDEC 2002 *Water Body Inventory / Priority Waterbodies List* (NYSDEC 2002) as an impaired water body.[2] That assessment noted that hydrologic impacts associated with hydropower generation may have been an issue affecting the reservoir's water quality and influenced its inclusion on the list. However, Swinging Bridge Reservoir was not included NYSDEC's proposed final Section 303(d) list in 2016 (NYSDEC 2016). The PAD also acknowledges that during the summer, the hypolimnion in Toronto and Swinging Bridge reservoirs, become anoxic; however, the source of this information appears to be limited and possibly anecdotal. Similarly, the PAD notes that Rio reservoirs hypolimnion becomes anoxic when thermally stratified and cites Orange and Rockland Utilities 1988 license application for the project (Orange and Rockland 1998). The PAD also notes that the Mongaup Falls reservoir hypolimnion does remain oxygenated during the summer months and contributes this to project operations and subsequent turbulence within the reservoir that disrupt the development of a thermocline; however, no citation or supporting data is provided in the PAD.

FERC Comment #5, cont...

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Water quality in the projects' reservoirs may affect aquatic habitats and influence public recreation opportunities within the reservoirs. As mentioned above and

[2] Toronto, Cliff Lake, Mongaup Falls, and Rio reservoirs were not assessed in the 2002 inventory.

demonstrated in the Mongaup Falls reservoir, project operational regimes can influence the water quality within a reservoir. Additionally, water discharged from project reservoirs may affect aquatic habitats and biota within the receiving stream reaches. Understanding the existing water quality conditions within the projects' reservoirs is necessary to inform the need for, and the development of, potential license conditions to protect water quality within the reservoirs and downstream riverine reaches for aquatic habitats and biota and recreational opportunities.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

FERC Comment #5, cont...

1. Using generally accepted practices in the scientific community monitor water quality (e.g., water temperature and DO) within each of the projects' reservoirs from ice-off in the spring until ice-on in the winter. Water quality data must be monitored at appropriate locations within each reservoir and at 1-meter increments in depth from the reservoir surface to its bottom. An additional monitoring location must be established at the project intakes (depth and location) within each reservoirs. Data collected should be sufficiently robust to evaluate and consider what, if any, short- and/or long-term (seasonal) influences project operations may have on reservoir water quality (e.g., thermocline depth, water temperature, etc.).

2. Prepare a comprehensive water quality study report for each of the projects' reservoirs that incorporates the water quality data collected pursuant to this study request and as appropriate, the in-situ water quality data collected pursuant to the aquatic habitat mapping study discussed above.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $110,000 and may be completed within one study season. It is anticipated that it will take two technicians, 28 days to

deploy, maintain, and retrieve the monitoring equipment (including travel and staging) and about 80-100 hours for oversight and report preparation by a senior biologist.

FERC Comment #5, cont...

Study Request #6 – Special-status Wildlife Species and Habitat Assessment

Goals and Objectives

§5.9 (b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to develop additional information to supplement the existing information necessary to address the potential effects of project operations and maintenance (O&M), land management activities, and recreation use on the presence of special-status wildlife species[3] and their habitat. The specific information to be obtained is the type, abundance, and general distribution of special-status wildlife species and their habitat within the project area, required to assess the potential effects of the project on these species.

FERC Comment #6

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

[3] Special-status wildlife species include federally listed threatened and endangered species, proposed species, candidate species, and species of concern; state protected species; and species of conservation concern.

Special-status species are of particular interest because of their rarity and ecological functions. Ensuring that environmental measures pertaining to these resources are considered in a reasoned way is relevant to the Commission's public interest determination. Additionally, this information may be needed to ensure compliance with the Endangered Species Act.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

Special-status wildlife species, such as federally listed northern long-eared bat, Indiana bat, and bog turtle as well as several state-listed species are identified in the PAD as potentially occurring in the project area. NYSDEC has indicated that bald eagles use all five reservoirs associated with the projects in the winter, but no information was provided regarding potential breeding pairs using the projects. NYSDEC also indicated that state-listed peregrine falcon nests and timber rattlesnake are found in the project area. NYSDEC conducted surveys for the New York State Breeding Bird Atlas from 2000 to 2005 which provided a list of potential bird species in the project area including species of conservation concern such as the wood thrush, Canada warbler, and bobolink. There are, however, no comprehensive surveys to identify the abundance, timing, activities, and general distribution of special-status wildlife species or their habitats within the project area.

FERC Comment #6, cont...

This information will inform the development of potential license conditions that consider the non-developmental values of the project, as well as their power and developmental values. Additionally, this information may be needed to ensure compliance with the Endangered Species Act.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project O&M as well as recreation use associated with the project, have the potential to affect special-status wildlife species and their habitat in the project area. This study will assist in identifying special-status wildlife species within the project area and the need for measures to reduce or eliminate effects.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Office Review

Prior to field surveys, the candidate list of special-status wildlife species should be confirmed and developed in consultation with the U.S. Fish and Wildlife Service (FWS) and NYSDEC and include all special-status species currently identified in the PAD. Consultation with resource agencies should also determine recommended survey protocols for each species. Habitat maps and/or aerial photographs should be used to determine habitats that have the potential to support special-status wildlife species for field surveys.

FERC Comment #6, cont...

Field Surveys

Field surveys for special-status wildlife in appropriate habitats should be conducted by individuals with experience conducting wildlife field surveys; knowledge of animal taxonomy and animal ecology and classification; familiarity with the wildlife of the area; and experience with analyzing impacts of a project on native wildlife species.

Field surveys should cover the entire area directly and indirectly affected by the project during the appropriate seasons. Multiple surveys should be conducted to locate all potential special-status wildlife species and should also assess seasonal habitat use when relevant (e.g. bat maternity sites and winter hibernacula). Survey protocols should follow accepted and agency recommended wildlife species survey guidelines and protocols.[4] Some project features may also provide suitable roosting and hibernating habitat for special-status bat species and therefore should also be surveyed. The abundance, distribution, and habitat use (including raptor nest sites) of all special-status species should be documented and the locations of all special-status species and their potential habitat should be indicated on maps showing the relationship to project features.

[4] Available through the FWS's IPaC system at https://ecos.fws.gov/ipac/.

A report should be prepared that includes the results (including photo documentation) of the surveys and mapping efforts and identifies, describes, and assesses the extent to which project-related actions and activities may affect special-status wildlife species and their habitat. The report will include the issues addressed, objectives, study area, methods, analysis, results, discussion, and conclusions. The report should also include documentation of consultation with relevant resource agencies.

FERC Comment #6, cont...

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $180,000, based on one study season and the amount of habitat that has the potential to support special-status wildlife species. It's anticipated that a technician and a biologist would spend one week of desktop review and planning in preparation for field work. One biologist and two technicians would spend about 300 hours conducting field work. Report preparation is estimated at six weeks of a biologist's and technician's time to complete.

Study Request #7 – Special-status Plant Species and Noxious Weed Assessment

FERC Comment #7

Goals and Objectives

§5.9 (b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to develop additional information to supplement the existing information necessary to address the potential effects of project O&M and recreation use on the presence of special-status plant species[5] and the presence and potential spread of noxious terrestrial and aquatic weed species.[6] The specific information to be obtained is the type, abundance, and general distribution of special-status and terrestrial and aquatic noxious weed species within the project area, required to

[5] Special-status plant species include federally listed threatened and endangered species, proposed species, candidate species, and species of concern; state protected species; and watch list species.

[6] A noxious weed is any plant designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property.

assess the potential effect of the project on these species.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

FERC Comment #7, cont...

Special-status species are of particular interest because of their rarity and/or ecological functions. Noxious weeds are resources of particular interest because of their potential effects on natural ecosystems. Noxious weeds can degrade wildlife habitats, crowd out beneficial native species, create fire hazards, and result in economic losses. Ensuring that environmental measures pertaining to these resources are considered in a reasoned way is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

Special-status plant species, such as the federally listed small whorled pogonia as well as state-listed species have been identified in the PAD as potentially occurring in the project area. NYSDEC indicated that state-listed riverbank quillwort, dwarf sand-cherry, and swamp buttercup also occur in the project area. Additionally, a list of potential terrestrial and aquatic noxious weed species was provided in the PAD, however no surveys for noxious weed species have ever been conducted.

Currently, there is very limited information concerning the rare plant and noxious

weed species that may be present, their relative abundance, habitat associations, locations, information on the possible effects of project O&M activities and recreation use on these populations as well as the potential effects of noxious weed species on native plant diversity and habitat quality.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project O&M as well as recreation use associated with the project, have the potential to destroy special-status plant species as well as introduce and spread noxious weeds in the project area. This study will assist in identifying special-status plants and noxious weeds within the project area and provide baseline information from which to evaluate project alternatives and/or develop and evaluate specific proposals for protection, mitigation, and enhancement of rare plant populations and their habitats and control of noxious weeds.

FERC Comment #7, cont...

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Office Review

Prior to field surveys, the current list of special-status plants identified in the PAD should be confirmed and developed in consultation with FWS and NYSDEC. Field surveys should examine habitat maps and/or aerial photographs to determine vegetation cover types that have the potential to support special-status plant species.

Field Surveys

Field surveys for special-status plants of appropriate habitats should be conducted by individuals with experience conducting floristic field surveys; knowledge of plant taxonomy and plant community ecology and classification; familiarity with the plants of the area; and experience with analyzing impacts of a project on native plant species.

Field surveys should be floristic and cover the entire area affected by the project during the appropriate blooming periods. Multiple surveys should be conducted to locate all potential special-status species. Two study seasons should be performed to confirm the presence of rare, special-status plant species. The survey protocol will follow accepted special-status plant survey guidelines. The abundance and distribution of all special-status species should be documented and indicated on maps showing the relationship to proposed project features.

Aquatic[7] and noxious weed surveys should map noxious weed occurrence and distribution and be conducted in conjunction with the special-status plant surveys using generally accepted practices in the scientific community. All remaining aquatic habitats not covered in Study Request #2 should also be surveyed for aquatic noxious weed species. The surveys will serve to identify the current extent of weed infestations in a general sense throughout the project area, the species that occur, and the relative abundance of each species.

FERC Comment #7, cont...

After completion of the field surveys, prepare a report that includes the results of the surveys and mapping efforts and identifies, describes, and assesses the extent to which project-related actions and activities may affect special-status plants and noxious weeds. The report should include the issues addressed, objectives, study area, methods, analysis, results, project-specific maps with known occurrences of special-status plants and noxious weed species, discussion, and conclusions.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $86,000, based on two study seasons and depending upon the amount of habitat that has the potential to support special-status species and noxious weed species. It's anticipated that a technician would spend one week of desktop review and planning in preparation for field work. One biologist and a single technician would spend about 100 hours conducting field work. Report preparation would require about two weeks of a biologist's and technician's time to complete.

[7] Aquatic weed species associated with lacustrine habitats are included in Study Request #2 – Aquatic Habitat Mapping of the Projects' Reservoirs.

Study Request #8 – Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goals of the Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment are to: (1) obtain information about the condition of existing recreation facilities and access sites at the projects; and existing recreation use, access, and demand at the projects; (2) conduct an assessment of the need to enhance recreation opportunities and access at the projects; (3) quantify and map the relationship between reservoir surface area and reservoir levels; and (4) develop a Recreation Management Plan for the implementation of any enhancement measures and long-term monitoring of recreation demand and adequacy of facilities at the projects over the terms of new licenses.

FERC Comment #8

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Recreation has been identified as a project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is "consistent with the needs of the area to the extent that such development is not

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inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Section 5.8 of the PAD provides a summary of project-related recreation activities and recreation facilities. It also provides a general discussion of recreation demand in the region. However, the PAD provides no project-specific information regarding visitor perceptions of recreation at the projects, nor any information of how project operations may affect the visitor experience. Public recreation access and reservoir levels were two of the primary topics discussed by members of the public during the June 22, 2017, scoping meetings. Furthermore, there is an extensive record of a variety of conflicts associated with public recreation access at the projects. Information on visitor perceptions of the adequacy of public access and facilities, current use, and whether existing access facilities in the area are meeting recreation demand would inform future license conditions related to public access and recreation facilities. Information on reservoir surface area would inform our analysis of the impact of project operations on recreational opportunities at the projects.

FERC Comment #8, cont...

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The projects include five reservoirs and one bypassed reach with recreational opportunities. An analysis of existing recreation use and access at the projects would help form the basis for determining the projects' ability to enhance public recreation opportunities. Also, an assessment of the current level of recreation use and how project operation may affect use would provide information necessary to develop a Recreation Management Plan for efficient management of the recreational components of the projects over the terms of new licenses.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

1. Update existing data on recreation resources adjacent to and within the projects through site assessment and consultation with public and private recreation providers.

2. Update the inventory of informal and formal public and private waterfront recreational sites/facilities within and adjacent to the project boundaries. Identify all informal and formal public and private recreational sites/facilities within the project areas.

FERC Comment #8, cont...

3. Develop and implement a site condition evaluation criterion of measurable and manageable indicators for facilities and dispersed recreation area conditions. Site condition assessments should be conducted at all formal and informal publicly accessible recreation sites. Eagle Creek Hydro should also consult with the NYSDEC to evaluate the need of including other NYSDEC recreational developments that serve the projects into the site condition assessment.

4. The use and needs assessment should include all recreation activity types known to occur or potentially occurring at the projects. Specific methods should include visitor observations and on-site visitor intercept surveys at formal and informal public recreation areas at the project reservoirs and riverine areas, including the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace.

5. Specific methods for each sampling approach in the use and needs assessment:

   - the visitor observations should capture information such as location, date, time, weather, number of vehicles, watercraft (if any), number of recreation users or party size, and recreation activity engaged in; and
   - the visitor survey sampling should be based on a stratified random sample that includes all seasons, various locations, and various times of week and day to enable representative responses from the visitors, while

ensuring interview coverage during key times (e.g., holiday and weekend days, shoulder seasons, fishing and hunting seasons).

6. The survey instrument should include items that assess visitor perceptions of crowding, recreational conflict, conflicts between the public and adjacent property owner(s), welcoming public access, adequacy and placement of signage, adequacy of recreation facilities and access to the projects, and effects of project operations and management on recreation and recreation opportunities at the projects (e.g., fluctuating reservoir levels and minimum flow releases).

7. In conjunction with Study #10 requested below, consult with stakeholder groups to develop a whitewater boating-specific addendum to the survey instrument that would rate satisfaction with the current whitewater boating flow release schedule, access facilities, and boating information. The study report should include an assessment of opportunities to modify or enhance the current whitewater flow release schedule, boater access facilities, and/or boating information.

FERC Comment #8, cont...

8. Annual recreation use by activity type and season should be quantified to include both formal and informal publicly accessible recreation sites.

9. The needs assessment should also include a future demand estimate from both current use and unmet demand based on guidance from Haas et al. (2007). Specifically, the following information should be integrated to provide an estimate of future recreation demand at the projects: (1) prior and current project use data; (2) state, regional, and national recreation trend data; and (3) population growth data.

10. Quantify the relationship between reservoir surface area and reservoir levels (i.e., reservoir elevation) for the range of operation (i.e., full pool to minimum reservoir level) at each project reservoir. This relationship should also be mapped to visually assess the effects of reservoir levels on reservoir surface area and identify specific areas that may become inaccessible at lower reservoir levels.

11. Identify potential measures to alleviate or reduce any negative effects of project operations, to enhance existing recreation opportunities, and (if appropriate) provide additional public access at the project reservoirs or

riverine reaches (potential locations, type of facilities and access, and any associated costs).

12. Using the information from all recreation studies, develop a Recreation Management Plan for the projects. The plan should be included in the license application and should include, at a minimum: (1) description of any proposed protection, mitigation, and enhancement measures, including: location of any proposed facilities and/or access areas (including descriptions and figures depicting the relationship of any proposed facilities to the existing project boundaries), proposed ownership and management of any proposed facilities, associated capital, and O&M costs, and a timeline for implementation; (2) description of operation and management measures associated with project-related recreation access and facilities; and (3) an adaptive plan for future monitoring of recreation use, impacts, and adequacy of project-related facilities to meet demand over the term of the new license.

FERC Comment #8, cont...

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of the Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment is $95,000, including study plan development, field data collection, reservoir surface area modeling and mapping, study report preparation, and development of the Recreation Management Plan. One field season should be sufficient to collect the required data and prepare the study report.

Study Request #9 – Shoreline Management Assessment

Goals and Objectives

FERC Comment #9

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goals of the Shoreline Management Assessment are to: (1) obtain information on the adequacy and appropriateness of current shoreline management practices, and (2) develop a Shoreline Management Plan in consultation with relevant stakeholders.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

FERC Comment #9, cont...

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Recreation has been identified as a project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is "consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The PAD includes only limited information on shoreline management in Sections 5.8.5 and 5.8.9. We note that, although it did not include it in the PAD, Eagle Creek Hydro did file the current "shoreline management guidelines" with the Commission on June 5, 2015. During the June 22, 2017, scoping meetings, several shoreline property owners expressed concerns regarding shoreline management issues and reservoir levels. Additionally, there is an extensive record of complaints related to shoreline management issues. Therefore, Commission staff needs information on current shoreline management practices in order to determine whether these practices are adequate and appropriate.

FERC Comment #9, cont...

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The projects include five reservoirs. Currently, private residential and commercial developments are primarily located on the Toronto and Swinging Bridge reservoirs. Eagle Creek Hydro is directly responsible for shoreline management at the projects. Additionally, project operations directly impact reservoir levels, and reservoir levels affect shoreline management practices. An assessment of current shoreline management practices would provide the information necessary to develop a Shoreline Management Plan that would be implemented over the terms of any new licenses issued for the projects.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

1. Develop a questionnaire to solicit information from shoreline property owners at each project reservoir about their recreation activity participation, areas visited, perspectives about reservoir levels and current shoreline

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management practices, perceived conflicts and crowding, and their satisfaction with or desire for recreational opportunities and facilities.

2. The applicant should consult with representatives of the various shoreline property owners on the most effective means of distributing the questionnaire. Regardless of how the questionnaire is distributed (i.e., mail, email, or internet), the applicant should follow the Dillman (2014) tailored design method. This method would help ensure that property owners have ample opportunity to complete the survey and would help increase survey response rates. The applicant should also consult with interested stakeholders, including property owner representatives and the NYSDEC, and Commission staff in the development of the questionnaire before it conducts the study.

3. Prepare a detailed report of the study results, and use these results in conjunction with the results of the other recreation studies to inform the development of a Shoreline Management Plan. Interested stakeholders should be given the opportunity to comment on the draft plan. The plan should be included in the license application and should include, at a minimum: (1) a detailed description of all rules, regulations, guidelines, and measures associated with non-project use or occupancy of project lands, (2) documentation of consultation with interested stakeholders, (3) an appendix containing stakeholder comments on the draft plan and Eagle Creek Hydro's responses to them, and (4) an adaptive plan for future plan revisions that includes provisions for consultation with relevant stakeholders.

FERC Comment #9, cont...

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of the Shoreline Management Assessment is $30,000, including questionnaire development and distribution, study report development, and drafting of a Shoreline Management Plan. This figure could vary depending on how the questionnaire is distributed.

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Study Request #10 – Whitewater Boating Assessment

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goals and objectives of the Whitewater Boating Assessment are to: (1) evaluate the adequacy and appropriateness of the current whitewater boating opportunities at the projects, including flow releases and access facilities; (2) assess whitewater boating opportunities in the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace; and (3) identify potential measures to enhance whitewater boating opportunities at the projects over the terms of new licenses.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

FERC Comment #10

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Recreation has been identified as a project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is "consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The PAD includes only limited information on recreation at the projects, including whitewater boating, in Section 5.8.1. The PAD briefly describes the Rio Project's whitewater boating access facility and references the current whitewater boating flow release schedule, but does not include the study report from the whitewater boating study conducted in the spring of 1990 that is referenced in the current license order.[8] Furthermore, the PAD does not include any information on the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

FERC Comment #10, cont...

The current license for the Rio Project requires scheduled weekend whitewater flow releases based on a study completed in the spring of 1990. Project operations have a direct impact on whitewater boating below the main powerhouse tailrace because the Rio Project generates power during times of peak demand, which are typically weekdays in the summer. Therefore, an analysis of the current flow release schedule would determine if any changes are necessary, and would inform potential license conditions related to the whitewater flow release schedule. Additionally, project operations divert flows from the Mongaup River below the Rio Project's minimum flow powerhouse that could possibly provide whitewater boating opportunities. An analysis of project operations relative to a range of boatable flows would help inform potential license conditions pertaining to whitewater boating opportunities in the bypassed reach.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally*

[8] *See* 59 FERC ¶ 62,035

accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

The Whitewater Boating Assessment will have two primary components:

1. For the current whitewater boating opportunities below the Rio Project's main powerhouse tailrace, in conjunction with the overall recreation study (Study # 8) requested above, evaluate the current flow release schedule, boater access facilities, and boating information provided at the projects. Obtain any available study report or data from the study conducted in 1990. Consult with stakeholder groups and Commission staff to determine if the existing information is adequate. If inadequate, then conduct a whitewater boating study based on accepted practices (i.e. Whittaker et al., 2005).
2. For the bypassed reach, use accepted practices for a whitewater boating study as described in Whittaker et al. (2005). The study should use a sequential three-phased approach.

FERC Comment #10, cont...

- Phase I: Use a desktop analysis to identify access options for the bypassed reach, create a gradient profile, and identify any other flow-related information that may be pertinent to recreation in the bypassed reach.
- Phase II: Use experienced whitewater boaters to conduct an on-land feasibility assessment by scouting the bypassed reach to examine potential quality and characteristics of boating opportunities, estimate potential flow ranges, identify obvious hazards, and determine whether an on-water controlled flow study is needed to evaluate whitewater recreational opportunities in the bypassed reach.
- Phase III: If determined to be necessary by Phase II, use an on-water controlled flow evaluation to determine the acceptable minimum and optimal instream flow needed for whitewater boating in the bypassed reach.

Prepare a study report for each phase of the study. The Phase I report should include a description and maps of potential access options to the bypassed reach, and any additional pertinent information identified about flows and recreation in the bypassed reach. The Phase II report should include an assessment of study participants' evaluations for potential quality and characteristics of boating opportunities (e.g. difficulty, type of run, type of craft likely suitable for the run), estimated potential flow ranges, obvious hazards (e.g. woody growth in the river bed), and recommendations for implementing Phase III. The Phase III report (if necessary) should include a description

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of the whitewater boating attributes of the range of flows examined (e.g. difficulty, unique features, portage requirements), determine the acceptable and optimal flows for the reach, the frequency of availability of the identified flows under current and any proposed project operation modifications, and incorporate relevant results from other studies to identify any competing recreational uses (e.g. fishing) or other resource needs (e.g. aquatic habitat) that may be adversely affected by any scheduled releases.

FERC Comment #10, cont...

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

Eagle Creek Hydro should develop the detailed study protocol, logistics, and schedule in consultation with interested stakeholders. The estimated cost of the whitewater boating assessment is approximately $45,000, depending upon the adequacy of existing information and the extent of fieldwork conducted.

Study Request #11 – Cultural Resources

Goals and Objectives

FERC Comment #11

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to locate cultural resources that are eligible for the National Register of Historic Places (National Register) and may be affected by project O&M (including recreational activities associated with the projects reservoirs) within the FERC project boundary and respective area of potential effects (APE).[9] Such cultural resources would include archaeological sites, project facilities, historic structures, and other places of religious and cultural significance to Indian tribes. The study would determine an APE to locate cultural resources and assess specific project-related effects to any cultural resource determined to be eligible for the National Register. If existing or

[9] This study would comply with all aspects as specified in the implementing regulations (36 CFR Part 800) of section 106 of the National Historic Preservation Act, as amended.

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potential project-related adverse effects are identified on National Register-eligible cultural resources, a historic properties management plan (HPMP) would be crafted to resolve any such adverse effects and made part of any new licenses issued by the Commission.[10]

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

The results of the cultural resources study would be reviewed and commented by the New York State Historic Preservation Officer (SHPO) and any involved Indian tribe. The APE (including a description and map) would also need to be approved by the New York SHPO prior to conducting field investigations related to the cultural resources study. Any National Register eligibility recommendations to cultural resources located within the APE would also need to be approved by the New York SHPO. If existing or potential project-related adverse effects are identified on National Register-eligible properties within the project's APE, the Advisory Council on Historic Preservation (Council) must be notified and given an opportunity to comment.[11]

FERC Comment #11, cont...

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Issuing new licenses by the Commission is considered a federal undertaking, pursuant to section 106 of the National Historic Preservation Act (section 106), and requires the Commission to take into account any existing or potential project-related adverse effects to historic properties (i.e., those cultural resources determined eligible for the National Register).

[10] Using the information and findings from the cultural resources study, a draft HPMP would be filed with a draft license application, and a final HPMP with a final license application. Prior to filing the draft and final HPMPs with the draft (or PLP) and final licenses, respectively, the HPMPs would be submitted to the New York SHPO and any involved Indian tribe for review and comment.

[11] This is usually done by the Commission when they issue a draft programmatic agreement involving a new or original license.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The cultural resources section within the PAD (section 5.10) provided an APE for the projects. Section 5.10 also provided a general cultural context about cultural and historic resources in and near the project area and provided a brief summary of archaeological and historic resources within the vicinity of the projects. Section 5.10 also noted the comments from the Bureau of Indian Affairs stating that the projects are located within a historic Delaware tribal area.

Although the PAD highlighted several undetermined National Register-eligible cultural resources in and near the project vicinity, the information provided is insufficient.[12] For example, the Swinging Bridge Hydroelectric Plant is a project facility and is within the projects' APE, but its National Register eligibility remains undetermined despite the power plant being more than 50 years old, meeting the age criteria for consideration for inclusion in the National Register. There are other project facilities (i.e., other powerhouses, wood stave penstocks, surge tanks, diversion dams, employee housing) within the APE that also meet the 50-year-old age criteria, but are not mentioned in the PAD, nor are they considered for their National Register eligibility. There is also evidence for non-project historic foundations and potentially related archaeological sites that date prior to the Civil War and exist within the projects' APE. Several historic towns dating the 19th century were known to have been inundated by the project reservoirs. Historic roads are also known near the project area, and some may have crossed into the projects' APE. There is also a potential for pre-contact archaeological sites existing within the projects' APE along the former water courses within the Mongaup River Basin which had served as a historic and traditional area for

FERC Comment #11, cont...

[12] Note that a 1987 finding from the New York SHPO stating that the projects would have no effect on districts, sites, buildings, structures, objects, or archaeological resources eligible for listing in the National Register was based on the previous relicensing process more than 25 years ago, and does not apply to the new proposed license, which, in turn, constitutes a new undertaking, pursuant to section 106. Methods used in the 1980s to assess cultural resources for project effects and National Register eligibility would not be accepted under current section 106 standards. At present, none of the FERC project boundary for the projects has been systematically inventoried for historic properties and where assessments for project-related effects to such properties has not been conducted.

aboriginal groups associated with the Delaware Indians for hundreds of years prior to European contact.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project O&M have the potential to adversely affect project facilities, some of which meet the age criteria for National Register eligibility. Fluctuating water levels produced by the projects within the five reservoirs have the potential to adversely affect inundated town sites, above-ground associated historic foundations and archaeological sites, of which there is no existing information on how extensive any of these cultural resources are, or where they may exist. There is also the potential of pre-contact aboriginal archaeological sites being adversely affected by the reservoirs. Unauthorized activities by relic collectors utilizing designated project recreational areas could have additional adverse effects on archaeological resources along the shoreline of the reservoirs within the APE.

FERC Comment #11, cont...

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

The cultural resources study plan should include the following proposed measures and associated tasks:

1. Upon the issuance of the Commission's Study Plan Determination, submit a definition of the projects' APE and associated APE to the New York SHPO for concurrence. Written concurrence from the New York SHPO should be obtained prior to conducting field work associated with this study.

2. Conduct a systematic cultural resources survey and inventory within the projects' APE. This would include a systematic pedestrian survey within all accessible areas of the APE using a crew of qualified professional

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archaeologists[13] where all cultural resources encountered would be recorded, mapped, and photographed in compliance with standards set forth by the New York SHPO. Such survey methods would reflect Phase 1A and IB archaeological assessment guidelines provided by the New York SHPO. Once archaeological resources are located and determined to be potentially affected by the projects, National Register eligibility of each site would be assessed using Phase II assessments or other appropriate measures agreed to by the New York State SHPO.

3. Conduct a survey of all built environment resources (i.e., above ground structures) that would include all project facilities and non-project facilities with the APE. Each built environment resource would need to be assessed as either eligible or not eligible for inclusion in the National Register, and such assessments would need to be done by a qualified architectural historian or other similarly qualified professional.[14] Work conducted should meet the New York SHPO recommended standards for historic resources survey, including maps, site records, and photographs. The possibility of establishing a historic district associated with some or all of the project facilities should be considered that would include both contributing and non-contributing elements. Specific project-related effects would also need to be determined on each built environment resource located with the APE.

FERC Comment #11, cont...

4. Contact the Delaware Nation and Delaware Tribe to see if they know of any place of religious or cultural significance (i.e., traditional cultural properties, past villages or sites, gathering areas) and allow them to comment on the cultural resources study in draft and final form. If such cultural resources exist within the APE, assess National Register eligibility (if applicable), and potential or existing project-related effects. This element of the study should be conducted by a knowledgeable person with anthropological training when talking and gaining information from the Indian tribes.

5. State in the study plan, that if there are historic properties within the APE

[13] See Secretary of the Interior's standards and guidelines for archeology and historic preservation.

[14] Ibid.

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that would be potentially affected by the project, that a draft HPMP would be crafted, in consultation with the New York SHPO and involved Indian tribes, and filed with a draft license application (or PLP), and that a final HPMP, first reviewed by the New York SHPO and involved Indian tribes, would be filed with the final license application.[15] The HPMP would provide measures to resolve any existing or potential project-related adverse effects to historic properties.

6. Prepare a cultural resources report based on the tasks above, including a detailed section on the cultural history of the project area, previous studies near and within the projects' APE, methodologies used for field surveys for archaeological resources, built environment resources and pertinent information from Indian tribes on places of religious and cultural importance.[16] Include a section that details the consultation history with the New York SHPO, involved Indian tribes, and any other persons or entities who participated or commented on the cultural resources study. Include a section that details the cultural resources located within the projects' APE, which ones were determined eligible or not eligible for the National Register, and which ones are being adversely affected by existing or future project-related activities. This report should be crafted by a qualified cultural resources professional.

FERC Comment #11, cont...

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

[15] For crafting a HPMP, use the Council and FERC's Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects, issued May 20, 2002.

[16] Due to sensitive archaeological information and maps, mark the cultural resources study report as "privileged' and request that the Secretary of Commission place it in our non-public file. Also distribute the same cultural resources study report to the New York SHPO and interested Indian tribes. This should also be done for any HPMP filed with the Commission.

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The estimated cost of the study and report preparation is approximately $100,000 and should be completed within one study season. Eagle Creek did not propose an alternative study.

FERC Comment #11, cont...

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Schedule B

Additional Information

Aquatic Resources

1. The PAD, section 6.3 *Potential Studies*, states that an instream flow study for bypass and river reaches within the basin was completed by Stetson-Harza (1988), and that Lawler et al. completed a study on the effects of the projects on water quality, fish stranding, and streambank scouring (LMS 1999). However, these studies were not provided with the PAD. So that we may determine whether the studies are sufficient to meet our information needs and support a licensing decision please file the referenced studies and include with the proposed study plan.

FERC Comment #12

2. The PAD, section 5.4.1, states that Lawler et al., conducted empirical entrainment studies at the Mongaup Falls, Swinging Bridge, and Rio Projects in 1992 and 1993 (LMS 1994). However, these studies were not provided with the PAD. So that we may determine whether the studies are sufficient to meet our information needs and support a licensing decision please file the referenced studies and include with the proposed study plan.

FERC Comment #13

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Eagle Creek Renewable Energy Application for New License	Swinging Bridge Hydroelectric Project (No. 10482) Mongaup Falls Hydroelectric Project (No. 10481) Rio Hydroelectric Project (No. 9690)

AMERICAN WHITEWATER, KAYAK AND CANOE CLUB OF NEW YORK, AND APPALACHIAN MOUNTAIN CLUB STUDY REQUESTS IN RESPONSE TO NOTICE OF INTENT TO FILE LICENSE APPLICATION, FILING OF PRE-APPLICATION DOCUMENT (PAD), COMMENCEMENT OF PRE-FILING PROCESS, AND SCOPING; REQUEST FOR COMMENTS ON THE PAD AND SCOPING DOCUMENT, AND IDENTIFICATION OF ISSUES AND ASSOCIATED STUDY REQUESTS REGARDING THE MONGAUP RIVER HYDROELECTRIC PROJECTS (FERC PROJECT NOS. P-10482, P-10481, AND P-9690)

American Whitewater (AW), Kayak and Canoe Club of New York (KCCNY), and Appalachian Mountain Club (AMC) submit the following Study Requests in response to the Pre-Application Document (PAD) filed by Eagle Creek Renewable Energy ("the Licensee") for the Mongaup River Hydroelectric Projects (FERC Project Nos. P-10482, P-10481, and P-9690), located in the towns of Deerpark in Orange County and the towns of Bethel, Forestburgh, Highland, Lumberland, and Thompson in Sullivan County, New York. The Mongaup River Hydroelectric Projects consist of three developments: (1) Swinging Bridge (including Cliff Lake, and Toronto Reservoirs); (2) Mongaup Falls Hydroelectric Project; and, (3) Rio Hydroelectric Project. Combined, the three Projects have a FERC authorized generating capacity of 26.55 MW.

American Whitewater is a national non-profit 501(c)(3) river conservation and recreation organization founded in 1954. With approximately 6,000 members and 100 affiliate clubs, representing tens of thousands of whitewater paddlers across the nation, American Whitewater's mission is to protect and restore our nation's whitewater resources and to enhance opportunities to enjoy them safely. Our members are primarily conservation-oriented kayakers and canoeists, many of whom live and/or engage in recreational boating in the New York and New England region within easy proximity of the Mongaup River.

The Kayak and Canoe Club of New York (KCCNY) is a paddling club founded in 1959 representing boaters primarily in New York, New Jersey, and Pennsylvania. KCCNY organizes weekend boating outings and offers instructional opportunities for paddlers ranging from beginner to expert. The organization is noted for its longstanding efforts at conservation and river

management, participating in FERC hydropower proceedings to make river resources available for recreational use including on the Mongaup River.

Since 1876, the Appalachian Mountain Club has promoted the protection, enjoyment, and understanding of the mountains, forests, waters, and trails of the Appalachian region. It is the largest conservation and recreation organization in the Northeast with more than 90,000 members. The AMC has long been involved with the relicensing of FERC hydropower projects in the northeast region. The AMC has interests in both river-based and land-based recreation and conservation.

The Mongaup River is a highly valued whitewater boating resource that is enjoyed by thousands of paddlers each year in search of a predictable and enjoyable boating opportunity that is accessible to paddlers of varying abilities. The Mongaup draws boaters from Massachusetts to Pennsylvania seeking a stretch of continuous Class II/III whitewater with a remote feel, and although boaters are never too far from a road, they don't see it until the very end. One of the few boatable rivers during dry months, the Mongaup is a frequent destination for paddling clubs in the region, including KCCNY and the Connecticut Chapter of the AMC.

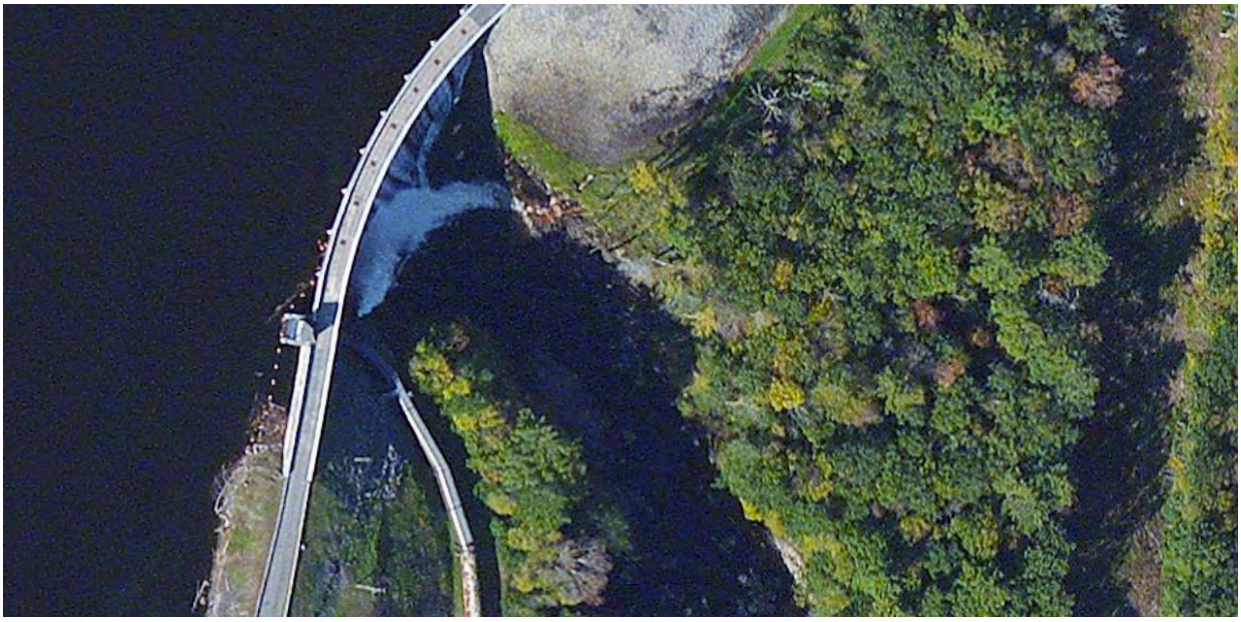
The river is characterized by its ample surf opportunities, along with an eddyhopper's dream, and rocks everywhere in the "miracle mile" keep paddlers thinking several moves ahead. There are challenges for every skill level. Along with the whitewater features, the natural surroundings along the Mongaup are a major draw. Lush, green and isolated, the Mongaup gives one a sense of primitive nature only a short drive from New York City. While on the river, visitors frequently see eagles and other wildlife, providing a close-up view of their majesty.

Project Facilities & Operations

The Rio Dam is the lower most of the Mongaup hydroelectric projects and is a 1500-foot wide, 101-foot tall earthen dam that impounds the Mongaup River and creates the Rio Reservoir, extending upstream from the Rio Dam to the near the tailrace of the Mongaup Falls Project. At the Rio Dam, the drainage area is 195 mi^2. At its maximum elevation of 815 feet at the top of its 5-foot flashboards, the reservoir has 15,037 acre-feet of storage and a usable storage volume of 3,560 acre-feet down to a lower pool elevation of 805 feet, although the target elevation ranges from an elevation ranging from 807 to 815 feet. Between May 15 and June 30, the pool elevation is maintained between 813.5 and 814.5 feet.

At Rio, flows from the Mongaup River are diverted through an 11-foot diameter, 7,000-foot penstock to a 10 MW powerhouse containing two 5 MW Francis turbines, each with a rated discharge of 435 cfs. The penstock bypasses the natural river channel, dramatically reducing flows, leaving only 100 cfs in the natural river channel, damaging aquatic habitat and eliminating all naturally variable flows. While the unnatural aquatic habitat in the bypassed reach is utilized by anglers, boating opportunities in the natural river channel between the dam and the powerhouse are all but eliminated except on a handful of days in the past decade when flows above the dam exceed the generating capacity of the project.

From the base of the Rio Dam at an elevation of approximately 714 feet to the bottom of the tailrace at an elevation of 630 feet, the bypassed reach drops approximately 84 feet over 1.5 miles, or approximately 56 feet per mile. This gradient is similar to the gradient of the river between the powerhouse and the Delaware River, which is a 3-mile reach that boaters use during scheduled whitewater releases. Flows into the bypassed reach are released through the low-flow generator, with flows ranging from 60-120 cfs, or through a 3-foot diameter outlet pipe.



At the Rio Powerhouse, the Licensee generates using one or two turbines, releasing either 435 cfs or 870 cfs into the tailrace, resulting in flows into the lower Mongaup of either 535 cfs or 970 cfs when joined with the 100 cfs minimum flow in the bypassed reach. The Rio Project is a peaking project, generating when demand is high and energy prices are profitable except for minimum flows that are passed through its low-flow turbine in the natural river channel. The Project is also required to pass flows when safety conditions require releases. In addition, the Licensee is required to release whitewater flows bi-weekly between April 15 – October 31, alternating between a single turbine and double turbine releases for four hours. Overall, however, the bulk of generation at the Rio Project is due to peaking operations.

Project Recreation

The Licensee is required, under Article 401 of its 1992 FERC license, to provide a 4-hour whitewater release on alternating weekend days on every other weekend between April 15 – October 31. Under the 1992 license, the Licensee was required to provide a single turbine whitewater release of 435 cfs on each of the whitewater release days. The FERC license further required the Licensee to study the impact of providing two turbine releases pursuant to Article 408, and in 2007, ordered the Licensee to provide one 2-turbine whitewater release of 870 cfs on one day each month on one of the alternating whitewater release days. The scheduled whitewater releases required under the FERC license represent only a small percentage of the overall generation at the Rio Project. Table 1 below is the current release schedule.

Table 1

2017 Rio Project Whitewater Release Schedule

Date	Day	Time	# of Units
4/15/2017	Saturday	11:00 - 15:00	1
4/30/2017	Sunday	11:00 - 15:00	2
5/13/2017	Saturday	11:00 - 15:00	1
5/28/2017	Sunday	11:00 - 15:00	2
6/10/2017	Saturday	11:00 - 15:00	1
6/25/2017	Sunday	11:00 - 15:00	2
7/8/2017	Saturday	11:00 - 15:00	1
7/23/2017	Sunday	11:00 - 15:00	2
8/5/2017	Saturday	11:00 - 15:00	1
8/20/2017	Sunday	11:00 - 15:00	2
9/2/2017	Saturday	11:00 - 15:00	1
9/17/2017	Sunday	11:00 - 15:00	2
9/30/2017	Saturday	11:00 - 15:00	1
10/15/2017	Sunday	11:00 - 15:00	2
10/28/2017	Saturday	11:00 - 15:00	1

Whitewater boaters from throughout the Northeast region hold the Mongaup River in high regard. Over the 3-mile whitewater stretch leading from the powerhouse to the Delaware River, the difficulty gradually increases, providing an ideal boating opportunity for developing whitewater boaters. Toward the end of the run is a ~3/4 mile rock and boulder garden that is the highlight of the run, providing a great opportunity for novices to practice eddy hopping down a rapid.





Based on the monthly generation data in Appendix E in the PAD, Table 2 below calculates the generating hours for one turbine by dividing the monthly generation by 5 MW and then comparing it to the number of release hours monthly (e.g., 1-barrel release followed by a 2-barrel release for 4 hours = 12 boating hours). Comparing generation to releases, we estimate that scheduled whitewater releases accounted for between 5 and 7 percent of generation in each of the past two years.

Table 2

2015	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
Generating Hrs	781	153	179	305	120	75	21	1634
Boating Hrs	8	16	12	12	12	12	16	88
%	1%	10%	7%	4%	10%	16%	78%	5%
2016								
Generating Hrs	181	348	118	216	343	66	58	1330
Boating Hrs	12	12	12	12	12	16	12	88
%	7%	3%	10%	6%	3%	24%	21%	7%

Unfortunately, the public is not provided with information on non-scheduled boatable releases via Waterline or other similar system that would provide short-term advance notification of planned releases. While the project often generates during periods of peak demand when temperatures are high, boaters are reluctant to drive long distances on the chance that the river will be boatable due to project generation.

AW, et al.
Comment #1

AW, et al.
Comment #2

Unlike other hydropower projects that provide whitewater boating releases in bypassed river reaches, the Rio Project provides no scheduled releases into the bypassed reach that would provide an opportunity for whitewater boating in the natural river channel. By comparison, at the Deerfield River in Massachusetts, Great River Hydro annually provides 32 scheduled whitewater boating releases from the No. 5 Dam in Monroe, MA, providing significant economic benefits to surrounding communities in the Charlemont, MA area.

AW, et al.
Comment #3

Project operations at Rio preclude whitewater recreation between the dam and the powerhouse on all but a handful of days over the past decade. The length, gradient and available flows are more than sufficient to provide a quality whitewater boating experience, extending the length of the whitewater boating reach by 50 percent over what is currently available below the powerhouse.



The current mode of operation fails to provide a sufficient number of whitewater boating opportunities between the powerhouse and the convergence of the Mongaup and Delaware rivers. In addition, the lack of public information in advance of planned generational releases further limits the recreational use of the resource, and the lack of scheduled acceptable or optimal boatable flows into the bypassed reach completely eliminates boating opportunity between the dam and the powerhouse.

AW, et al.
Comment #4

Our organizations are seeking to expand opportunities for whitewater boating below the Rio Dam, improve access at put in and take out locations, and establish an effective means of notifying the boating community when boatable flows are available in and below the project boundary.

Study Requests

AW, et al. Comment #5

We hereby request several studies per 18 CFR 5.9(b).

1. Controlled-flow Whitewater Boating and Access Study

(1) Describe the goals and objectives of each study proposal and the information to be obtained.

The goal of these whitewater flow studies is to assess the presence, quality, access needs, flow information needs, and preferred flow ranges for river-based boating resources in a stepwise manner. The information to be obtained can be generally characterized as quantitative and qualitative descriptions of:

- Assess the effects of a range of optimal and acceptable flows on whitewater recreation opportunities for whitewater paddling in the natural river channel, including the bypassed reach, from the Rio Dam to the confluence of the Mongaup River with the Delaware River;
- The frequency, timing, duration and predictability of optimal and acceptable paddling flows under current, proposed, and alternative modes of operation;
- Identify the need for, and define adequate put-in and take-out points that promote car-top boating, and also identify the needs for parking areas;
- The location, challenge, and other recreational attributes associated with specific rapids and other river features;
- The access needs of whitewater boating use and the current and potential river access options for whitewater and other paddling;
- The flow information needs of whitewater boating and the current and potential flow information distribution system.

Thus, the information to be obtained for the whitewater paddling study is a combination of user-generated flow preferences and other data, information on current and proposed operation (e.g. discharges), geographic information and basic recreational information.

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.

The requester is not a resource agency.

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.

The Mongaup River offers the public a high quality whitewater boating resource when flow conditions are suitable. Conducting the necessary studies and implementing measures to ensure

AW, et al. Comment #5, cont...

that the public has access to high quality outdoor recreational resources is in the public interest. It is widely accepted that outdoor recreation has significant benefits to participants including health, well-being, and quality of life. Outdoor recreation also has proven economic benefits for communities located near recreational resources.

Expanding recreation opportunities on the Mongaup River has the potential to offer the region additional economic benefits. FERC has stated in "A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria" (March 2012) that *"to fully evaluate the project's effect on whitewater recreation opportunities and to balance potential enhancement opportunities with their cost, a controlled-flow whitewater boating study is relevant to Commission's public interest determination."*

The Licensee provides 15 scheduled whitewater releases from the Rio powerhouse on a bi-weekly basis between April 15 – October 31 ranging from 435 cfs to 870 cfs in accordance with its FERC License as amended. These scheduled releases attract a large number of boaters from throughout the northeast and mid-Atlantic regions.

(4) Describe existing information concerning the subject of the study proposal, and need for additional information.

Paddlers from throughout the Northeast and mid-Atlantic region highly value whitewater boating below the Rio Dam powerhouse tailrace. The Mongaup is easily accessible to large numbers of kayakers and canoeists living in New York and Connecticut, and is a frequent destination for paddling trips organized by the Kayak and Canoe Club of New York and the Appalachian Mountain Club. Offering a steady supply of Class II/III rapids, the reach is important to those looking to develop their paddling skills and enjoy a scenic and fun advanced beginner/lower intermediate boating experience.

While the Lower Mongaup from the tailrace to the confluence with the Delaware is well known at flows of 535 cfs (435 cfs generation plus 100 cfs min flow) and 970 cfs (870 cfs generation plus 100 cfs min flow), the suitability for boating at other flows is largely unknown. At the lower range, flows below the tailrace less than 535 cfs are noticeably less enjoyable than the single turbine release based on anecdotal information. Above 970 cfs, anecdotal accounts by boaters report that higher flows may provide optimal boating flows for more advanced boaters.

By contrast, the Upper Mongaup from the Rio Dam to the tailrace is largely unknown. Anecdotal accounts by the handful of boaters who have paddled this reach confirm that under certain unknown flow conditions, this reach can provide a quality whitewater boating experience. When combined with generation flows on the Lower Mongaup, this 4.5-mile reach is of exceptional quality. Adding flows into to the bypassed reach at the Rio Dam can provide a range of flows that are suitable for evaluation in a controlled-flow whitewater boating study.

Conducting a controlled-flow study will provide FERC with additional information for its NEPA analysis with regard to the frequency, timing, and velocity of scheduled whitewater releases in any future license, and in particular, on the virtually unknown and utilized bypassed reach below the Rio Dam.

AW, et al. Comment #5, cont...

(5) Explain any nexus between Project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

The Mongaup River Projects control flows in the Mongaup River from Swinging Bridge to Rio by fluctuating water levels in the impoundments and storage reservoirs. The projects operate in a peaking mode, altering the natural flow regime. At the Mongaup Falls and the Rio projects, flows are diverted into penstocks leading to powerhouses, dramatically reducing the flows available in the natural river channel or bypassed reaches, eliminating naturally variable flows and damaging aquatic habitat. The diversion of natural flows through hydropower operations alters the landscape in the natural river channel, and reduces recreational opportunities that would otherwise be available.

In the case of the Rio project, a 1.5-mile stretch of the river below the dam, project operations eliminate boating opportunities immediately below the dam when natural high flow events and inflows would provide suitable conditions. Below the powerhouse, the Licensee's peaking operations result in unpredictable flow levels on all but 15 scheduled whitewater release days. While the number of days monthly on which the Licensee generates for some portion of the day varies, the Licensee often generates on a near daily basis to some extent based on flows measured on the USGS gage below the Rio Project. An analysis of the Licensee's operations would demonstrate the extent to which generational flows could be better timed to provide recreational opportunity in and below the project boundary. The Licensee should also explore any alterations to existing equipment and facilities that would enhance its ability to provide controlled flows into project waters.

(6) Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

The study we request on the Mongaup River Projects follow the standard methodology as described in Whittaker, et. al. (2005). This methodology is designed to assess the presence, quality, and preferred flow ranges for river-based boating resources in a step-wise manner. The process steps are generally 1) desktop analyses, 2) on-land feasibility assessment, 3) on-water single flow assessment, 4) on-water multiple flow assessment. We expect and request the full implementation of this methodology. Because the quality of the resource has not been fully analyzed with current metrics, we request that multiple on-water flow assessments be conducted.

The study should focus on two reaches in the Rio Project boundary: 1) the lower reach below the Rio powerhouse that is currently utilized during scheduled whitewater releases, and, 2) the bypassed reach beginning at the Rio Dam that only rarely spills above the required minimum flows. The Licensee should work with the boating groups to identify target flows for the evaluation.

We will work with the licensee to document the known information regarding the river. We will provide volunteers and technical support for the studies as appropriate. We hope to work collaboratively with the Licensee on this study. The whitewater boating study methodology we have requested has been used on dozens of other FERC regulated reaches.

Given that the project currently lacks an Obermeyer or other gate through which it can quickly manipulate flows into the bypassed reach, the Licensee will need to spill calculated flows into the bypassed reach presumably over the flashboards. We recommend that the Licensee schedule the flow study either immediately before or after the May 15 – June 30 period when the pool elevation rises to between 813.5 to 814.5 feet, coming within 6 inches of the top of the flashboards. We estimate that a 2-inch spill over the flashboards would result in a spill of approximately 500 cfs based on the design specifications contained in the PAD.

(7) Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

We are willing to work with the licensee on the whitewater paddling controlled-flow study to keep costs reasonable and the quality of information high. The information that is already known can jump-start the study process and avoid duplicate effort. The studies will need to integrate this information and then organize flow studies during which several flows are paddled by boaters. The consultants usually employ still image and video documentation, surveys of the boaters, a guided conversation among the boaters, and subsequently a written report. Given the collaborative approach sought by the paddling community, including in-kind contributions of time and expertise, a consultant should be able to complete this study on behalf of the licensee for a very reasonable cost. We estimate that the cost of conducting the controlled flow whitewater boating study will be approximately $30,000, including the field work and final report preparation.

The Licensee's PAD proposes no whitewater feasibility analysis. This no-action step would reveal nothing about the current project impacts on whitewater recreation or opportunities for protection, mitigation, or enhancement measures. We currently do not know the relationship between specific low and moderate flows and the paddling experiences they provide. A desktop analysis can't generate this information. Without this information we cannot fully define the project impacts, nor propose and consider provision of releases that provide targeted recreational experiences.

AW, et al. Comment #5, cont...

Conclusion

We respectively request that FERC accept these comments and direct the licensee to conduct the requested studies to address the concerns raised. Thank you for considering these comments.

Respectfully submitted this 28th day of July, 2017.

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UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Eagle Creek Renewable Energy Application for New License	Swinging Bridge Hydroelectric Project (No. 10482) Mongaup Falls Hydroelectric Project (No. 10481) Rio Hydroelectric Project (No. 9690)

CERTIFICATE OF SERVICE

Pursuant to Rule 2010 of the Commission's Rules of Practice and Procedure, I hereby certify that I have this day caused the foregoing **American Whitewater, Kayak and Canoe Club of New York, and Appalachian Mountain Club's Study Requests in Response to the Pre-Application Document for the Swinging Bridge, Mongaup Falls and Rio Hydroelectric Projects (P-10482, P-10481, and P-9690)** to be served upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated this 28th day of July 2017.

Megan Hooker
American Whitewater

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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July 28, 2017

Robert A. Gates
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Re: Rio Hydroelectric Project (FERC No. 9690)
Mongaup Falls Hydroelectric Project (FERC No. 10481)
Swinging Bridge Hydroelectric Project (FERC No. 10482)

Comments on Pre-Application Document, and Scoping Document 1
Study Request for the Mongaup River Projects

Dear Mr. Gates:

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the March 2017 *Pre-Application Document* (PAD) submitted by co-licensees Eagle Creek Hydro Power, LLC; Eagle Creek Water Resources, LLC; and Eagle Creek Land Resources, LLC (collectively referred to as Eagle Creek Hydro) for relicensing the existing Rio Hydroelectric Project (FERC No. 9690), Mongaup Falls Hydroelectric Project (FERC No. 10481), and Swinging Bridge Hydroelectric Project (FERC No. 10482). The three projects, collectively referred to as the "Mongaup River Projects", are located on the Mongaup River in Sullivan County, New York and a portion of the Rio Project is located in Orange County, New York.

The NYSDEC attended the June 21, 2017 environmental site review and the June 22, 2017, scoping meetings for the Mongaup River Projects.

Comments on the Pre-Application Document

The Pre-Application Document (PAD) is generally well-organized and addresses most of the key issues for the Mongaup River Projects. The New York State Department of Environmental Conservation formally concurs with all of the comments made by the U.S. Fish and Wildlife Service (USFWS) regarding the PAD as detailed in their response letter dated July 26, 2017.

NYSDEC Comment #1

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Re: Rio Hydroelectric Project (FERC No. 9690)
Mongaup Falls Hydroelectric Project (FERC No. 10481)
Swinging Bridge Hydroelectric Project (FERC No. 10482)

Comments on Pre-Application Document, and Scoping Document 1
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Comments on Scoping Document 1

Scoping Document 1 (SD1) is generally well-organized and addresses most of the key issues for the Mongaup River Projects. The New York State Department of Environmental Conservation formally concurs with all of the comments made by the U.S. Fish and Wildlife Service (USFWS) regarding the SD1 as detailed in their response letter dated July 26, 2017.

NYSDEC Comment #2

Study Requests

The New York State Department of Environmental Conservation requests that the Applicant conduct the following studies:

I. Fish Surveys

The Applicant should conduct comprehensive fisheries surveys within the vicinity of the Mongaup River Projects. Comprehensive sampling for fisheries data collection should include, but not be limited to, the use of electrofishing, gill netting, trap netting, minnow traps, seining, and angling. The survey work should be done for at least 1 full year; with an option for a second year of study should the data collected be deemed inadequate upon review by the NYSDEC and the USFWS. The survey should cover at least three seasons (spring, summer, and fall), and all four seasons, if possible. The information collected should include species identification, size, age, sex, and condition, as well as movement patterns and habitat utilization. Standard water quality data (e.g. water temperature, dissolved oxygen, pH, and conductivity) should also be collected in conjunction with these surveys. These studies should focus on the general fishery resources.

NYSDEC Comment #3

1. *Goals and Objectives*

The goals and objectives of this study are to provide information on the existing fishery and resources in the vicinity of the Mongaup River Projects, including areas upstream and downstream of the dam, to aid in the determination of what the impacts of this Project may be. The information to be collected should include both temporal and spatial aspects of species distribution; age, size, sex and condition data; habitat utilization; and fish movement patterns. Reference reaches should be established in streams below each dam and population and abundance (numbers of fish and biomass) estimates that are representative of the section be conducted for each fish

species. These population and abundance estimates should then be compared to other fisheries of the area.

2. *Resource Management Goals*

NYSDEC's mission is "*to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being.*" The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access.

NYSDEC Comment #3, cont...

3. *Public Interest*

The requestor is a state resource agency.

4. *Existing Information*

There is no recent information regarding fisheries in the vicinity of the Mongaup River Projects. There are some data available from the original licensing in the 1980s; however, 30 years of changes in angling pressure, stocking efforts, water quality, water quantity, habitat availability, minimum flows, and seasonal impoundment fluctuation limits have likely altered the fishery. Data from the original licensing will be helpful in determining changes and trends over the last 30 years.

DEC Fisheries can provide all historic data in their files pertaining to the fisheries resources within and outside the project area. This will enable the applicant to compare changes in the fish populations to different reservoir release regimes through time.

5. *Nexus to Project Operations and Effects*

The Mongaup River Projects' dams serves as a barrier to upstream and downstream migration to fish. Fish moving downstream are subjected to potential mortality from impingement and entrainment. The Project alters flows in the bypassed reach, modifies flows downstream from the Mongaup River Projects, and impacts habitats in the impoundment via fluctuations.

Re: Rio Hydroelectric Project (FERC No. 9690)
Mongaup Falls Hydroelectric Project (FERC No. 10481)
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Comments on Pre-Application Document, and Scoping Document 1
Study Request for the Mongaup River Projects

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard scientific collecting techniques used in most hydro licensing activities.

NYSDEC Comment #3, cont...

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would involve one field crew sampling on a seasonal basis. The study would last for 1-2 years. The actual cost is unknown and would depend upon the gear types used, number of sampling locations, local labor costs, the ability to combine multiple studies (e.g., fisheries, macroinvertebrates and water quality) into one task, etc. The existing literature is inadequate to fully address project impacts, and there are no alternatives to conducting standard fishery surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.

II. Macroinvertebrate Surveys

Information is needed regarding macroinvertebrate (e.g. aquatic insects, mussels … etc.) populations in the impoundment and downstream of the dam and tailrace as well as the by-pass reaches of the Mongaup River Projects. A critical evaluation (both qualitative and quantitative) of macroinvertebrate communities in all instream habitats affected by the operation of the Mongaup River Projects is needed. Information regarding the aquatic insects and mussels in the flowing waters of the State of New York are of great importance to the NYSDEC.

NYSDEC Comment #4

Sampling should be conducted seasonally and include the use of both shallow water and deep water sampling gear. Collections should be stratified by microhabitat (sediment size). Macroinvertebrates will be identified to species. Since any one sampling year may experience atypical environmental conditions (dry year verses wet year; low water verses high water; colder verse warmer temperature years) the Department recommends more than 1 year of data collection to try to capture typical environmental conditions and to establish current baseline conditions in the flowing waters affected by the Mongaup River Projects.

1. *Goals and Objectives*

The goals and objectives of this study are to provide information on the existing benthic macroinvertebrate populations upstream and downstream of the facilities that are

impacted by Mongaup River Projects operations. This information will be used to assess impacts the Mongaup River Projects may have on the aquatic ecosystem, assess if current water quality standards are impaired and determine mitigation for these impacts. This information is necessary to the §401 WQC application for the Projects and their compliance with State water quality standards.

2. *Resource Management Goals*

NYSDEC's mission is "*to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being.*" The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access.

NYSDEC Comment #4, cont...

3. *Public Interest*

The requestor is a state resource agency.

4. *Existing Information*

The PAD provides some information related to benthic macroinvertebrates, but there is no recent site specific information regarding freshwater mussels and other macroinvertebrate species in the basin. Sampling is needed in the vicinity of the dam, in the by-passed reach and the impoundment are necessary to help determine minimum flow needs and the macroinvertebrate data will be considered by NYSDEC in connection with its review of the §401 WQC application for the Project.

5. *Nexus to Project Operations and Effects*

The Mongaup River Projects alter the natural flows upstream and downstream. These areas are important for macroinvertebrate propagation and survival. Fish and wildlife species rely on the macroinvertebrate community as a food source and can be impacted by reductions in macroinvertebrate production. Freshwater mussels depend on fish host species and the Mongaup River Projects' dams blocks fish movement both upstream and downstream. The turbine intakes may impinge or entrain fish, resulting in mortality. The Mongaup River Projects may also affect the amount of habitat available for mussels within the Mongaup River Projects boundaries in the impoundment.

Re: Rio Hydroelectric Project (FERC No. 9690)
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Comments on Pre-Application Document, and Scoping Document 1
Study Request for the Mongaup River Projects

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard scientific collecting techniques used in most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would involve one field crew sampling on a seasonal basis. The study would last for 1-2 years. The actual cost is unknown and would depend upon the gear types used, number of sampling locations, local labor costs, the ability to combine multiple studies (e.g., fisheries, macroinvertebrates, and water quality) into one task, etc. The existing literature is inadequate to fully address projects impacts, and there are no alternatives to conducting standard macroinvertebrate surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.

NYSDEC Comment #4, cont...

III. Fish Protection, Upstream and Downstream Passage Studies

The Mongaup River Projects dams serve as a barrier to upstream and downstream fish migration. Fish moving downstream are subjected to potential mortality from impingement and entrainment. New licenses issued for projects on similar rivers throughout New York State, have incorporated 1" –clear spaced trashracks to physically exclude most adult fish from the turbines, alternate downstream passage routes, and other features (e.g., reduced approach velocities, adequate plunge pools, ... etc.) to encourage safe downstream fish passage.

NYSDEC Comment #5

The Applicant should explore alternatives to keep all fish species out of the turbines, and any other species found in abundance during fishery surveys. They also need to develop alternatives to effectively pass fish downstream around the dam. These alternatives may include modifying any existing trash sluices located close to the intakes.

This study should include a literature search of available passage designs for the species of concern, as well as information on the relative effectiveness of each design. Existing facilities at other dams should be investigated. Careful attention should be paid to attraction flows, guidance mechanisms and velocities. The fish moving downriver must be diverted away from the turbines and guided to the downstream passage facility. Adequate attraction and conveyance flows must be provided. The passage facility should not create a bottleneck that would delay downstream movement or expose the fish to excessive predation. All passage facilities should be designed to prevent blockage from

ice and debris and should be as maintenance-free as is feasible. They must be able to operate under all flow conditions experienced in the Mongaup River Basin.

In addition to literature review and on-site investigations of existing facilities, the Applicant should collect site-specific data from the Mongaup River Projects to aid in the design of protection and passage facilities. This information should include flows, velocities, water depths, and substrates.

The Applicant should also collect information on the passage requirements of the fish species found in the Mongaup River Basin. This information should include swimming speeds (including burst speeds), where in the water column these fish are likely to be moving, different forms of attractants or repellents (e.g., sound, light, …etc.) that may help guide each species … etc.

NYSDEC Comment #5, cont...

Black Brook Dam Removal: The Black Brook Dam and associated diversion to the Mongaup Falls Generating Facility is no longer utilized. Although it is located at a natural waterfall it is possible that this dam impedes migration of aquatic organisms up or down stream. A thorough analysis of the potential to improve aquatic connectivity by removing this dam should be included in the studies and considered as an option to mitigate the continuing impacts to aquatic resources throughout this watershed.

NYSDEC Comment #6

1. *Goals and Objectives*

The goals and objectives of this study are to provide information on potential fish passage and protection structures that could be utilized at these sites. The information obtained will allow NYSDEC aquatic biologists and USFWS's fishway engineers to evaluate the potential effectiveness of various options.

2. *Resource Management Goals*

NYSDEC's mission is "*to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being.*" The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access.

Re: Rio Hydroelectric Project (FERC No. 9690)
Mongaup Falls Hydroelectric Project (FERC No. 10481)
Swinging Bridge Hydroelectric Project (FERC No. 10482)

Comments on Pre-Application Document, and Scoping Document 1
Study Request for the Mongaup River Projects

3. *Public Interest*

The requestor is a state resource agency.

4. *Existing Information*

The PAD does not provide any information regarding protection and passage options. There is little information in the PAD regarding Black Brook Dam or its impoundment. The potential to remove Black Brook Dam is unknown.

The New York State Department of Environmental Conservation concurs with the conclusion made by the U.S. Fish and Wildlife Service (USFWS) regarding the reliability and usefulness of the entrainment study referenced in Section 5.4.1 of the PAD. An updated analysis with current fishery data is needed.

NYSDEC Comment #6, cont...

5. *Nexus to Project Operations and Effects*

Dams block fish movements both upstream and downstream. The turbine intakes may impinge or entrain fish, resulting in mortality. The existing minimum flow release structures may not be adequate for fish passage.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard literature reviews and site-specific data collection techniques common to most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would involve moderate literature review, discussions with fishway engineers, discussions with fisheries biologists, and site-specific data collection. The study could be completed in less than 1 year, but may require more time to design effective facilities. The actual cost is unknown and would depend upon the number of alternatives examined. The existing information in the PAD is inadequate to allow a thorough examination of alternatives. However, most of the information needed should be available in the existing literature.

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Comments on Pre-Application Document, and Scoping Document 1
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IV. Base Flow Studies and Habitat Analysis

Flow studies should be conducted to determine whether the existing flows are the appropriate minimum base flows. The base flow studies should be presented in a manner that will allow the regulatory agencies to determine the effect in which the minimum base flow requirements, appearing in the future license and 401 Water Quality Certification, will have on downstream habitat, tailrace habitat, impoundment habitat, and all existing and potentially modified recreational uses of the aquatic resources. NYSDEC recommends a thorough analysis of all available historic survey data and information obtained during biological and geomorphic surveys associated with this relicensing process.

NYSDEC Comment #7

Flow study data should be obtained by either the use of the Delphi approach or the Instream Flow Incremental Methodology (IFIM).

The Applicant should also conduct habitat mapping for the downstream study reach. This mapping should identify the type of habitat in each section (e.g., run, riffle, pool) along with depths, velocities, and substrates. The information will need to be collected and presented in a manner that will allow it to be incorporated into analysis of the current base flow regime. Predicted summer water temperatures during minimum flow and power generation releases through the bypass reach and main stream should be modeled under all proposed release scenarios. This should be done for each stream reach below each of the five dams with a minimum release, all the way to the Delaware River.

1. *Goals and Objectives*

The goals and objectives of this study are to determine whether the existing base flow requirements provide appropriate protection for aquatic resources, or whether a different flow regime is necessary.

2. *Resource Management Goals*

NYSDEC's mission is "*to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being.*" The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access.

Re: Rio Hydroelectric Project (FERC No. 9690)
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Comments on Pre-Application Document, and Scoping Document 1
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3. *Public Interest*

The requestor is a state resource agency.

4. *Existing Information*

The PAD provides no information regarding how the minimum flows required by the current license for Black Lake Creek were developed, nor does it describe the benefits of these flows or the impacts of not having higher flow releases.

A detailed IFIM study was conducted for the Mongaup River during the original licensing. The current flows in the Mongaup River were determined largely by their inclusion by the NYSDEC in the 401 Water Quality Certifications for the Projects, and were greater than the flows proposed by the previous applicant and recommended by the FERC, but less than the flows recommended by the Service.

NYSDEC Comment #7, cont...

The available habitat, fisheries resources, and issues at the Mongaup River Projects have likely changed since the original licensing. The flow releases from these Mongaup River Projects have multiple benefits to a variety of species as well as to water quality, and the appropriate flow regimes will be determined as part of a holistic look at all of the competing issues.

5. *Nexus to Project Operations and Effects*

Operation of the hydroelectric project results in a somewhat variable flow regime downstream from the Project. The existing base flows may or may not provide adequate mitigation for these fluctuations. This study is necessary to determine the appropriate mitigation for these impacts.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses a standard Delphi study design that has been used in many hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort and cost will be moderate and will depend on the details of the implemented studies. The Delphi approach would be less costly than the IFIM process. However, the complexity of the resources and issues involved in this relicensing may necessitate a more formal, quantitative study.

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V. Water Quality

Baseline water quality studies are needed to allow a proper determination of potential project impacts. These studies should include water temperature and dissolved oxygen (DO) on a continuous basis for at least 1 full year, along with monthly sampling of other parameters such a pH, turbidity, and conductivity. An additional year of monitoring may be needed based on a review of the first year's study results. This information will be used to document baseline water quality conditions and to determine potential impacts from the Projects operations. Data should be collected from the impoundments, the by-passed reaches and the areas upstream and downstream from the Mongaup River Projects. Existing water quality information collected in support of issuance of Section 401 Water Quality Certification will need to be summarized in a manner that will allow appropriate analysis of the current flow regime. Methods for mitigating water quality problems (i.e. modifications to infrastructure, or changes to existing operations) should be fully explored and modeled as to their potential effectiveness.

NYSDEC Comment #8

1. *Goals and Objectives*

The goals and objectives of this study are to provide baseline water quality information.

2. *Resource Management Goals*

NYSDEC's mission is "*to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being.*" The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access.

3. *Public Interest*

The requestor is a state resource agency.

4. *Existing Information*

The Applicant has been conducting ongoing water quality monitoring below the powerhouses for all three Mongaup River Projects. This data will continue to be collected during the study period. There are no data available for the bypassed

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reaches, Black Lake Creek, in the impoundments, or in the tributary streams to the Mongaup River.

5. *Nexus to Projects Operations and Effects*

The existing Mongaup River Projects impounds the Mongaup Creek and its tributaries in multiple locations. These impoundments and releases have the potential to impact such water quality factors as temperature and DO, which are critical to the quality of the aquatic habitat. This is of particular concern during summer with low flows.

NYSDEC Comment #8, cont...

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard water quality sampling techniques commonly used in most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would be low and would involve a crew monitoring continuous measurement devices and collecting monthly samples while undertaking other work such as fisheries or macroinvertebrate surveys. In addition, temperature and DO loggers would be installed, with data being periodically downloaded. The actual cost is unknown but would be relatively low. The existing data for the immediate vicinity of the Mongaup River Projects are limited. Consideration should be given to installing USGS gaging stations below each of the dams for both the short term needs of this study as well as future monitoring.

VI. Wetland Delineation

The applicant should document all wetlands within the Projects vicinity. An accurate analysis of the location and type of freshwater wetland resources is necessary to determine current and future affects to the wetland resources and the wildlife that inhabit them. The NYSDEC and the USFWS's wetland maps were consulted. However, the NYSDEC Freshwater Wetland Regulatory Maps are only intended to show the approximate location of state regulated wetlands and therefore should not be considered a source to characterize the presence of wetland habitat in the hydroelectric project area. Although the USFWS National Wetland Inventory (NWI) is intended to characterize freshwater wetland habitats it is based primarily on remote sensing so that it should be considered a large scale, general and approximate habitat inventory. The USFWS NWI Maps are not intended to represent federal jurisdiction of wetland areas by the United

NYSDEC Comment #9

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States Army Corps of Engineers and Environmental Protection Agency. Locations where any physical modification to the land throughout the current and future license terms may require wetland delineations that will need to be field verified. The Applicant should also identify any aquatic vegetation found in the Mongaup River Projects vicinity. This information is necessary to characterize the aquatic habitats in the Mongaup River Projects vicinity.

1. *Goals and Objectives*

The goals and objectives of this study are to identify key aquatic habitat areas in the Projects vicinity. The study will provide information on the extent and quality of wetlands and aquatic vegetation and the impacts to these habitats by current and future operations.

NYSDEC Comment #9, cont...

2. *Resource Management Goals*

NYSDEC's mission is "*to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being.*" The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access.

3. *Public Interest*

The requestor is a state resource agency.

4. *Existing Information*

The PAD provides the National Wetland Inventory (NWI) and NYSDEC delineations of wetlands within the boundaries of the Mongaup River Projects, however, no formal surveys of wetland vegetation or aquatic plants have been undertaken for the Project. Generally, NWI and NYSDEC delineations are not precise enough to capture all regulated wetlands, thus there is a need for wetland vegetation and aquatic plant surveys for these Mongaup River Projects.

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Swinging Bridge Hydroelectric Project (FERC No. 10482)

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5. *Nexus to Project Operations and Effects*

Operation of this Project affects water levels and velocities, as well as the timing and location of releases. These factors can impact aquatic vegetation and wetlands, which can be important habitats for fish and wildlife. The information will be used to determine what, if any, impacts the Mongaup River Projects may have on these resources and what the appropriate protection and mitigation measures might be.

NYSDEC Comment #9, cont...

6. *Methodology Consistent with Accepted Practice*

The New York State Department of Environmental Conservation and NWI maps are frequently used as the starting point in delineating wetlands. The NYSDEC expects the Applicant to use techniques commonly accepted by the scientific community.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort and associated costs should be relatively low. Much of the readily available information is already presented in the PAD, and the remaining information can probably be collected during field work related to other studies. No alternative studies have been proposed.

VII. Public Access

The NYSDEC's Bureau of Fisheries delivers a diverse program and annually conducts a wide array of activities to accomplish its mission to: "*Conserve and enhance New York State's abundant and diverse populations of freshwater fishes while providing the public with quality recreational opportunities.*"

NYSDEC Comment #10

1. *Goals and Objectives*

The goals and objectives of this study are to provide information on the existing public access facilities in the vicinity of the Mongaup River Projects (within 1 mile upstream and downstream of the Project's boundary), including the potential to create additional public access where feasible. The current condition of the existing public access facilities and the need for improvements, especially upgrades that would be necessary to ensure the facilities are Universally Accessible and are ADA compliant, should be the focus of this study. The study should address the potential impacts that any proposed access improvements, and increased public visitation and use, might have on sensitive natural resources found in the vicinity of the Mongaup River Projects (i.e.

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NY State-listed Threatened and Endangered species). Specifically, NYSDEC would like to see an evaluation of alternatives for improving access to Cliff Lake and identify any potential impacts that the increased use of Cliff Lake may have on the fishery or nesting eagles.

Expansion of stream access below all the projects should be looked at, including additional parking, foot trails and the potential for permanent easement with NYSDEC for Public Fishing Rights should be explored on all properties not owned by NYSDEC.

2. *Resource Management Goals*

NYSDEC's mission is "*to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being.*" The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access.

NYSDEC Comment #10, cont...

3. *Public Interest*

The requestor is a state resource agency.

4. *Existing Information*

Section 5.7.3 in the PAD describes the recreational facilities within the Project Boundary and the surrounding area. The Applicant has produced a brochure showing the recreational facilities surrounding the project, but is not required to submit the Licensed Hydropower Development Recreation Report Form 80.

5. *Nexus to Projects Operations and Effects*

The 2014-2019 NYS State Comprehensive Outdoor Recreation Plan (SCORP) was written by the New York State Office of Parks and Recreation and Historic Preservation (NYSOPRHP) and Sullivan County and Orange County, New York is listed as having a moderate to slightly high need for additional fishing, boating, and swimming access as referenced in Table 3.10 (Relative Index of Need) in the SCORP. The Mongaup River Projects utilize a public resource and most licensees are required to provide public access to the extent practicable within constrains of protection of life and property.

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6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard techniques used in most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would involve field site visits to the existing facilities with the parties of interest and recreational surveys of use as well as investigating the potential to add new access sites. The actual cost is unknown and would depend upon the number of observational and interview surveys to be conducted. The ability to combine multiple studies (e.g., fisheries, recreation observational surveys, macroinvertebrate surveys, and water quality) into one task may help to reduce the overall cost. The existing literature is inadequate to fully address project impacts, and there are no alternatives to conducting standard recreation surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.

NYSDEC Comment #10, cont...

VIII. Bald Eagle

Bald eagles are a protected species under federal and State law. The Mongaup Valley has a noted population of bald eagles during both the winter and breeding seasons. The highly visible and accessible annual winter concentration of eagles in the Mongaup River Projects' vicinity from December through March is a valuable recreational asset and has resulted in the installation of multiple viewing blinds and areas by the NYSDEC. The Mongaup River Projects have, in large part, created this high-quality eagle wintering area, as well as important breeding habitat. Therefore, the operations of the Projects facilities have the potential to significantly impact bald eagle use of the area.

NYSDEC Comment #11

1. *Goals and Objectives*

NYSDEC requests that the Applicant conduct a study that will provide information regarding the current winter roosting and nesting locations on and near the Mongaup River Projects. The study should discuss and describe foraging activities of bald eagles in the reservoirs and near the tailraces of the Projects powerhouses. The goals and objectives of this study are to provide current and specific information regarding the bald eagle population and habitat use within the vicinity of the Mongaup River Projects. This study will collect data related to the effects of the Mongaup River Projects on both breeding and winter eagle use of the area. The study will also assess the availability of food resources, specifically entrained alewives and other fish

species, for wintering bald eagles and relate this resource availability to eagle foraging activities and winter overnight roost site selection. Information from this study will guide and improve management of this important resource.

This study would involve collecting any existing data from the NYSDEC, and other available sources. NYSDEC recommends conducting 1 additional year of targeted field observations of bald eagle foraging activities in the vicinity of the Mongaup River Projects, noting the location, number of eagles, and identity of food resource, if possible. Additionally, the study would identify, through field observations, important winter overnight roost sites and assess the current forage bases (alewife abundance) in the Mongaup River Projects' reservoirs and the current and projected (with the potential installation of modified intake trashracks) fish entrainment rates as they relate to current and future bald eagle winter use of the area.

NYSDEC Comment #11, cont...

2. *Resource Management Goals*

NYSDEC's mission is "*to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being.*" The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access.

3. *Public Interest*

The requestor is a state resource agency.

4. *Existing Information*

The PAD provides some information bald eagles generally, but no site-specific information on nesting, winter roosting, or feeding activity is presented. One of the stated goals of the 1992 entrainment study during the last relicensing was to evaluate the availability of entrained alewife for winter feeding of bald eagles. There is no current information related to the importance of this resource to the bald eagles in the vicinity of the Projects.

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5. *Nexus to Projects Operations and Effects*

The Projects provide habitat for a fishery and entrain fish that are a primary source of nutrition for bald eagles in the vicinity of the Projects. Any mitigation measures related to fluctuations and entrainment may influence this protected species.

NYSDEC Comment #11, cont...

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard avian monitoring techniques. The study will also use and incorporate data from the fisheries survey and fish passage studies, which will use standard scientific collecting techniques used in most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would be low and would involve one crew collecting data and observations over one field season. Assessment of the forage base and entrainment rates for each of the Projects will be completed as part of the fisheries survey and fish passage studies and will not require any additional field effort.

VIII. Impoundment Fluctuation Studies

NYSDEC Comment #12

The Mongaup River Projects have large maximum and target fluctuation ranges. These fluctuations create a zone around the impoundment shoreline that is periodically dewatered. The habitat in this zone is usually not as valuable to aquatic organisms and plants as the habitat with more constant water levels. These fluctuations can impact wetlands and shallow littoral vegetation, as well as the invertebrates, fish, birds, mammals, amphibians, and reptiles that use these habitats.

The NYSDEC recommends that the Applicant conduct an impoundment fluctuation study. This study will assist in the determination of what fish and wildlife resources are being impacted and to what degree. The study should consist of mapping the aerial extent and habitat in the fluctuation zones at full pond and at drawdowns consistent with Project operations. The maps should identify the extent of the changes in, and adjacent to, the impoundment areas, substrate and type of habitat, the depth at various pond levels, and any important habitat types (i.e., wetlands and submerged aquatic vegetation) that may be present. Steep slopes, fluctuations in stream flow, and fluctuations in reservoir elevations can lead to mass movement, and we recommend that eroding or potentially erodible areas within the fluctuation zone be evaluated and included in the maps.

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The NYSDEC recommend that the Applicant study the range of flow releases evaluated in the flow studies in relation to the potential for impoundment fluctuations at the Projects. This would involve deriving a calculation of storage at the Mongaup River Projects at different depths and the degree to which different flow releases can be maintained at differing starting elevations. Estimates should be quantitative and based on million gallons per day estimates of the releases in relation to total storage. This would be an extension of the current draft operating plan.

The NYSDEC recommends that the Applicant prepare a consolidated figure or table that presents all of the relevant elevations for Mongaup River Project operations. This figure or table should include the dam crest, maximum and minimum fluctuation ranges, any intake/outlet gate inverts (and height), any required seasonal limitations on fluctuations and their duration, and the target elevations proposed by the Applicant and their duration.

NYSDEC Comment #12, cont...

In addition, the NYSDEC recommends that the Applicant develop a table or chart that clearly shows the volume released from each reservoir (i.e. Cliff Lake, Toronto Reservoir, and Swinging Bridge Reservoir) to meet the minimum flow target over the course of the year compared to the amount released for generation on a typical year. This should also be modelled to show the range of likely operations during high and low power demand years. Ideally these volumes would be graphically represented to show how they relate to vertical drawdowns in each waterbody. This could also be done to account for typical high and low water years.

1. *Goals and Objectives*

The goals and objectives of this study are to provide information regarding the habitat in the impoundments and how it is impacted by changes in water levels. This information will then be used to determine what impacts need to be addressed and whether an alternative operational mode may be more desirable.

2. *Resource Management Goals*

NYSDEC's mission is "*to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being.*" The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access.

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3. *Public Interest*

The requestor is a state resource agency.

4. *Existing Information*

The PAD provides information related to the maximum and target fluctuation levels of the Projects. Additionally, there is a draft operations plan that provides information related to refill rates based on seasonal targets in reservoir elevations. There are no data provided regarding habitat within the impoundments that may be affected by the Projects operations.

NYSDEC Comment #12, cont...

5. *Nexus to Projects Operations and Effects*

The Projects operate in a ponding fashion and large fluctuations occur in the reservoirs that impact shoreline habitats in the vicinity of the Projects. Additionally, this comparison should help to put into perspective some of the public concerns that the existing minimum flow releases are the bulk of the reason for the drawdown elevation dropping significantly at times.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard study techniques used in many hydro licensing activities at projects with ponding operations.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would be moderate and would involve one crew surveying the impoundments as well as the preparation of a desktop analysis of the effect of different elevations on habitat and flows on elevations. The actual cost is unknown but would depend on the variety of habitats found in the impoundments.

Foregoing Studies in Lieu of Protection, Mitigation, and Enhancement Measures

Under the Integrated Licensing Process being used for this relicensing, the Licensee is required to file and have approved by the Federal Energy Regulatory Commission a formal Study Plan. As such, there may be an opportunity to reduce some of these studies in scope, or even forgo some of them, if agreements can be reached up front regarding

NYSDEC Comment #13

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certain Protection, Mitigation, and Enhancement (PME) measures. The New York State Department of Environmental Conservation recommends that the Applicant convene a meeting with the stakeholders after receiving all of the study requests to determine which studies could be reduced or eliminated in return for agreements to proceed with certain PME measures.

The Draft Study Plan developed by the Applicant should incorporate all of the above-listed studies. The study proposals incorporated into the Draft Study Plan should be as detailed as possible so that all parties know exactly what is being agreed to when the Study Plan is approved.

NYSDEC Comment #13, cont...

Thank you for the opportunity to comment on this PAD and the opportunity to provide study requests. If you have any questions or desire additional information, please contact me at (845) 256-3040.

Sincerely,

Joseph R. Murray
Environmental Analyst 1
joseph.murray@dec.ny.gov

ecc: John Petronella, NYSDEC
Mike Flaherty, NYSDEC
Brian Drumm, NYSDEC
Nate Ermer, NYSDEC
Jon Binder, NYSDEC
John Wiley, USFWS
Kevin Mendik, NPS
Quinn Emmering, FERC

Swinging Bridge Project P-10482-117

I have been coming to the area in and around Toronto Reservoir for nearly fifty years and have summered here with my wife and my children during that time. I have witnessed the area in or near its hay day, during its decline and now again witnessing its resurgence. I have seen Toronto Reservoir when there wasn't any development along the shorelines and I have witnessed the dramatic change in usage during the past fifteen or so years.

I now own a home within a few hundred feet of the Toronto Dam and have so for the last nine years. During that time I have had visibility over much of the actions, activities and usage that take place on Toronto Reservoir and the Toronto Access areas. Despite the numerous comments submitted to FERC that I and perhaps some other of the homeowners around Toronto are trying to deny the public their access to this resource, this is simply not true. Despite the fact that my family and I have been harassed, threatened and had false remarks made about us both in the newspapers and on social media I do believe that the public's ability to access these natural resources is an important aspect that must be protected. At the same time I also believe that anyone using any of these areas should do so under the laws, rules and regulations that exist. Those rules and laws include usage guidelines by the Hydropower operator, local rules and laws and state regulations. This is the only request that I have made with respect to the public access to Toronto, nothing else. There was a history of hostilities between some of the public and the land developer; this has nothing to do with me. Despite the fact that those issues are now history, many would still like to use this backdrop story to create a hostile environment, spread false information and create a rich/ poor narrative that the 'wealthy are trying to deprive the public their right of access and keep it all for themselves'. Nothing is further from the truth.

M. Bushell Comment #1

The Toronto East Access area is difficult to access, far from public access roads and highways and difficult for emergency or police services to reach. As a result there are unsafe and unlawful activities that have taken place in this area with more often than not little or no response from the Hydropower operator or police services despite their commitment to do so. Prior to the development around Toronto there was little usage and boating activity. Now there is increased usage and many high powered boats both through day usage and those who have purchased homes on the lake.

M. Bushell Comment #2

Prior to the land development the public had access to the Dam area through a small, mostly unused town road. Approximately seven or so years ago that road became a private road through some transaction between the developer and the town. It was the developer who then rebuilt the road and made it passable as it is today since it is a crossroad between the two large parcels of land that were developed. When Eagle Creek bought the Hydro Project from Alliance the road was still private and a legal action commenced to allow the Hydro Operator and the public to utilize this still private road, now with public access, to reach the Toronto East Access area.

M. Bushell Comment #3

All of the public access areas managed by the Hydro operator for all of the Hydro projects should be managed and developed in an equal handed manner. The Swinging Bridge North Public Access area is a substantial parcel of land which the public could use and enjoy as well but has not been developed and maintained. It has a large parking area with defined parking spaces and is very accessible to public roads, highways and emergency services and could be

M. Bushell Comment #4

developed for public recreation and usage as it was intended. It was never developed as planned in the license and has been in disrepair and neglected for many years.

M. Bushell Comment #4, cont...

To the credit of Eagle Creek in comparison to the previous Hydro Operator, they seem to have invested in their water works operations and to some extent in the development and enhancement of some of their public access areas but have not done so to all of their public access areas. It is in the public interest that all of the defined access areas be developed as 'warm and welcoming' areas for the public to enjoy according to the laws, rules and regulations which all should be obeyed and enforced as a safety priority by Eagle Creek.

M. Bushell Comment #5

There are many who would like to go back to the 'good old days' when things were simple and there seemed to be far fewer issues, but that is not the way the world works. Things have changed in so many ways, there are issues, hazards and complications that were not even on our radar screens thirty years ago. We live in today's world now and we must deal with the environment and factors as they exist today and do the best we can do today to provide for public safety, proper public access and usage, protection of private property, adequate recreational water levels, protection and respect for the environment and natural resources and do the best that is possible to plan for more of the same in the future.

M. Bushell Comment #6

Many thanks,

Marc Bushell

97 Top Ridge Trail

PO Box 462

White Lake, New York 12786

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Eagle Creek Hydro, LLC, Eagle Creek Water Resources, LLC, and Eagle Creek Land Resources, LLC	Project No. 9690-112 Project No. 10481-067 Project No. 10482-117

COMMENTS ON PRE-APPLICATION DOCUMENT, SCOPING COMMENTS, AND STUDY REQUESTS OF HOMEOWNERS ON TORONTO

Pursuant to the Commission's Notice issued May 30, 2017, in the above-captioned dockets, Homeowners on Toronto, Inc. ("HOOT") submits its comments on the Pre-Application Document ("PAD"), scoping comments, and study requests in the matter of the relicensing of the Swinging Bridge, Mongaup Falls, and Rio Hydroelectric Projects, FERC Project Nos. 10482, 10481, and 9690, respectively (collectively, "Mongaup River Projects" or "projects"), currently licensed to Eagle Creek Hydro, LLC, Eagle Creek Water Resources, LLC, and Eagle Creek Land Resources, LLC ("Eagle Creek" or "licensees").[1] Eagle Creek proposes to continue to operate the projects under the same terms and conditions as the current project licenses, with no additional or changed facilities.[2]

Eagle Creek's Pre-Application Document and the Commission's SD1 fail to adequately address the severe negative impacts of the pulsing operations currently

HOOT Comment #1

[1] HOOT also supports the comments of the Iroquois Hunting and Fishing Club, Inc. (July 18, 2017, eLibrary No. 20170718-5083) and Town of Bethel's Pre-Application Questionnaire (July 18, 2017, eLibrary No. 20170718-5149) submitted in this proceeding.

[2] Scoping Document 1, Mongaup River Projects ("SD1") at 14 (May 30, 2017), eLibrary No. 20170530-3012 ("SD1").

allowed at Toronto Reservoir under the 1992 Swinging Bridge Project license.[3] It is essential that the licensees' studies and the Commission's NEPA environmental document fully quantify and evaluate these impacts. This information is necessary so that the Commission can meet its obligation to only issue a license best adapted to the public interest and a comprehensive plan for the Mongaup River, including operating protocols for Toronto Reservoir that appropriately balance the multiple uses of that reservoir.

HOOT Comment #1, cont...

COMMUNICATIONS

Communications regarding these proceedings should be directed to:

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INTERESTS OF HOOT

HOOT is a not-for-profit entity representing owners of property surrounding Toronto Reservoir, one of three reservoirs within the Swinging Bridge Project, FERC Project No. 10482. The Swinging Bridge Project is the furthest upstream of the three Mongaup River projects at issue in this relicensing proceeding; and Toronto Reservoir is the furthest upstream of the three reservoirs within the Swinging Bridge Project.

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[3] *Orange & Rockland Utils., Inc.*, 59 FERC ¶ 62,034 (1992) (subsequent history omitted).

Some of HOOT's members are homeowners who have their primary homes on lots adjoining Toronto Reservoir; others have second homes on or near the Reservoir. These homes and properties represent a substantial investment by each of HOOT's respective members, and that investment is significantly affected by the operation of the projects and maintenance of the project reservoirs. In addition, as members of the public who enjoy the aesthetic setting, recreational facilities, and access to Toronto Reservoir and the other reservoirs at issue in these proceedings; as residents who participate in boating, fishing, and other activities at project facilities; and as taxpayers in Sullivan County, where the Delaware and Mongaup Rivers flow and where the Swinging Bridge Project is located, HOOT's members have a direct interest in the terms and conditions of any new licenses issued for the projects.

HOOT Comment #2

COMMENTS ON PAD AND SD1

Since the original Swinging Bridge Project license was issued 25 years ago, there have been material changes in the uses and population around Toronto Reservoir, as well as increased appreciation of the environmental harms caused by significant reservoir fluctuations. Consistent with the purpose behind the Federal Power Act's requirement of periodic relicensings, these new conditions and priorities necessitate a Commission reassessment of the appropriate balance among the competing uses of the Toronto Reservoir.[4] This reassessment must be based on information about current conditions, not the conditions underlying the original 1992 license.

HOOT Comment #3

[4] Eagle Creek suggests that the fact that the original project licenses were issued after the 1986 Electric Consumers Protection Act (ECPA), and thus "underwent a comprehensive environmental analysis," means that the data generated for that licensing proceeding can be relied on in this relicensing, 30 years later. Eagle Creek Hydro Power, LLC, Pre-Application Document at 127 (Mar. 30, 2017), eLibrary No. 20170330-5442 ("PAD"). On the contrary, in deliberating legislation that became ECPA, a House

I. THE COMMISSON'S NEPA ENVIRONMENTAL DOCUMENT MUST CONSIDER THE RECREATIONAL, AESTHETIC, SOCIOECONOMIC, AND ENVIRONMENTAL HARMS CAUSED BY EXTREME DRAWDOWNS OF TORONTO RESERVOIR

Eagle Creek proposes no changes to the projects' existing facilities and operations.[5] Nor does Eagle Creek propose to conduct any studies;[6] instead, it relies to a significant degree on studies conducted in the 1980s for the original Mongaup River project licensings.[7] Changed circumstances in the project area make both of Eagle Creek's proposals untenable with respect to Toronto Reservoir.

HOOT Comment #4

A. Current Toronto Reservoir License Conditions and Draft Operating Plan

The current Swinging Bridge Project license does not include any provisions directly regulating the surface elevation of Toronto Reservoir.[8] Moreover, while the Mongaup River projects are "currently operating under a draft operating plan that was developed in consultation with the NYSDEC and the Delaware River Basin

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Committee emphasized that the basic goal of the relicensing process is to periodically ensure that a particular hydroelectric project remains the most suitable use of a national resource. The Committee's 1986 report reproduces President Theodore Roosevelt's 1908 Rainy River Veto statement:

> The public must retain the control of the great waterways. It is essential that any permit to obstruct them for reasons and on conditions that seem good at the moment should be subject to revision when changed conditions demand.
>
> . . . .
>
> Provision should be made for the termination of the grant or privilege at a definite time, leaving to future generations the power or authority to renew or extend the concession in accordance with the conditions which may prevail at that time.

H.R. Rep. No. 99-507, at 11-12 (1986), *reprinted in* 1986 U.S.C.C.A.N. 2496, 2498.

[5] SD1 at 14.

[6] SD1 at 21.

[7] PAD § 6.3 at 127-28.

[8] *Woodstone Lakes Dev., L.L.C. v. S. Energy NY-Gen, L.L.C.*, 95 FERC ¶ 61,152, at 61,494 n.5 (2001) (subsequent history omitted).

Commission,"[9] the existing draft plan provides no obligation to maintain the surface elevation of Toronto Reservoir at a reasonable level. In contrast to the Draft Operating Plan's rules for Swinging Bridge Reservoir, which are intended to protect recreational uses, the draft plan's rules for Toronto Reservoir are intended only to ensure the minimum flows required under the license and to allow use of the reservoir's upper outlet to Cliff Lake Reservoir. The Draft Operating Plan sets the maximum Reservoir Target Elevation for Toronto at 1,220 msl (i.e., full pond[10]) and sets the Reservoir's minimum Reservoir Target Elevation at 1,170 msl (i.e., the level of the upper outlet to Cliff Lake Reservoir)—a potential swing of 50 feet.[11]

In normal conditions, the Draft Operating Plan provides that Toronto Reservoir could be drawn down to as low as 1,170 msl, and only needs to refill to 1,187.7 msl by the beginning of the summer.[12] Those figures represent only target minimum reservoir levels, which, as the licensees point out, are not binding.[13]

In 2009, HOOT members met with AER NY-Gen, the licensee of the Swinging Bridge Project at that time, regarding reservoir levels. Following that meeting, the licensee stated in a letter[14] that it would use its "best efforts" to achieve a "target reservoir elevation" of 1,215 msl, plus or minus 5 feet, from Memorial Day to Labor Day; "attempt

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[9] PAD § 4.4 at 22; *see also* PAD, App. D, Draft Operating Plan and Drought Conditions Operating Plan ("Draft Operating Plan").

[10] PAD at 2.

[11] Draft Operating Plan at 10.

[12] *Id.* at 11.

[13] PAD at 23.

[14] Attach. E, Letter from Joseph Klimaszewski, Jr. to Dr. Hal Teitelbaum at 2 (Apr. 27, 2009). Representatives of the current licensees orally committed to HOOT in October 2012, to abide by the 2009 letter agreement.

to begin the season within the upper region of this range as safety permits"; and use its "best efforts" to make 1,190 msl the minimum during the rest of the year.[15] The licensee also stated that "downstream interests must take first priority relating to water use" because "Toronto Reservoir was built, *and is licensed*, as a storage reservoir for the rest of the Mongaup Basin."[16]

Based on the available USGS data,[17] it appears that the licensee achieved those 2009 Toronto Reservoir targets in Water Years 2011, 2013, and 2014; in Water Years 2010 (the first full water year after the licensee's "best efforts" commitment), 2015, and 2016, the reservoir elevation was over 1,210 msl for only a portion of the summer; and in Water Year 2012, the reservoir remained below 1,210 msl throughout the summer.

While the target range in the 2009 letter allows elevations that are insufficient for recreation or aesthetic purposes, and the licensee has not maintained even those levels consistently, the data show that even in the absence of license conditions, and under a license that the licensee interprets as requiring that "downstream interests must take first priority,"[18] Toronto Reservoir levels far higher than the minimum allowed by the Draft Operating Plan are achievable. Indeed, the Draft Operating Plan includes far more

HOOT Comment #5

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[15] *Id*. at 2.

[16] *Id*. at 1 (emphasis added).

[17] Month-end data through Water Year 2013; daily data starting in Water Year 2014. Attach. A, Water Year Summary for Toronto Reservoir, USGS, https://waterdata.usgs.gov/nwis/wys_rpt?wys_water_yr=2006&site_no=01433100&agency_cd=USGS&adr_water_years=2006%2C2007%2C2008%2C2009%2C2010%2C2011%2C2012%2C2013%2C2014%2C2015%2C2016&referred_module (Use "Select a water year" drop down box to navigate to water years 2006 through 2013, individually, and click "Go." For water years 2014 through 2016, click box for "62614 Elevation, lake/res, (Ins.)" for "Available Parameters," then click "Go." For water year 2017, use "Available data for this site" drop down box to navigate to "Time-series: Daily Data" and click box for "62614 Elevation, lake/res, (Ins.)" for "Available Parameters." Change "Output Format" to "Table" and change "Begin Date" to "2016-10-01." Click "Go.").

[18] Attach. E at E-1.

restrictive criteria for Swinging Bridge Reservoir: a summer minimum of 7.5 feet below current full pool (1,065 msl), with a recommendation that the licensee fill the reservoir to within 4.5 feet of full pool by the beginning of the summer, and draw it down to no more than 6.5 feet below full pool by the end of September.[19] The drawdowns allowed for Swinging Bridge Reservoir, while far less than those allowed for Toronto, are still significant compared to the many other projects in the eastern United States that have been converted to run-of-river, or pulsing within a much smaller bandwidth,[20] at relicensing.

HOOT Comment #5, cont...

A modern license for the Swinging Bridge Project should set operating curves for the project that take account of the fact that Toronto Reservoir, like Swinging Bridge Reservoir, is heavily used for recreation in the summer months, as well as the environmental damage caused by low reservoir levels and fluctuations. Any new license issued should treat Toronto Reservoir no worse than Swinging Bridge Reservoir, given that there is now significant public recreation use and housing development on both reservoirs. For example, at the beginning of the summer, the reservoir could be full at 1,220 msl—*i.e.*, with 50 feet of storage above the existing target minimum—thanks to

HOOT Comment #6

[19] Draft Operating Plan at 10-11. If Swinging Bridge is authorized to refill to 1,070 msl, the Draft Operating Plan minimum elevations will each increase by 2.5 feet. *Id.* at 11.

[20] *See, e.g.*, *FirstLight Hydro Generating Co. & City of Norwich Dept. of Pub. Utils.*,145 FERC ¶ 61,157, Art. 402 and P 57 (2013) (run-of-river operation, within a 6-inch bandwidth) (subsequent history omitted); *Pub. Serv. Co. of N. H.*, 159 FERC ¶ 62,070, P 27 (2017) (run-of-river with 0.4-foot bandwidth) (subsequent history omitted); *Ga. Power Co.*, 149 FERC ¶ 62,210, PP 22, 35 (2014) (reservoir levels within a 3-foot bandwidth 99% of the hours in the year, and within a 2-foot bandwidth 85% of the hours in the year) (subsequent history omitted).

spring rain and runoff.[21] If the licensees operated the reservoir to maintain an elevation of 1,218 msl, plus or minus 2 feet, during the recreation season, they could use Toronto Reservoir inflows and up to 4 feet of stored water to generate electricity in the hot summer months,[22] in addition to providing recreation and aesthetic benefits. While reductions below 1,216 msl would not be ideal, in exceptional circumstances (such as severe drought) it would be possible to release some additional water without rendering the reservoir unsafe for recreation.

HOOT Comment #6, cont...

B. Recreation and Aesthetic Impacts

Even if the lack of any license requirements as to reservoir elevation was appropriate when the original Swinging Bridge Project license was issued in 1992, it is not now. In 1992, there was little residential development on the Toronto Reservoir.

HOOT Comment #7

Nine years later, in 2001, when it ruled that a party requesting additional license requirements had not provided persuasive evidence of material changes in conditions at Toronto Reservoir, the Commission stated that "[t]he shoreline is largely undeveloped, with a few homes."[23]

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[21] When the original license was issued in 1992, the Commission stated that at Toronto, "[i]n general, water is stored from November through May, and released from June through October." 59 FERC at 63,095. From a power generation perspective, that operation seems sensible. In recent years, however, the licensee has often lowered Toronto significantly (far more than can be accounted for by the 10 cfs minimum flows) between November and May. *See, e.g.*, Attach. A at A-16 (reservoir elevation was at its nadir in mid-March, 2015); *see also* Attach. A at A-12, A-4, and A-7; Attach. A at A-20 (reservoir elevation drawn down approximately 5 feet during April 2016 (from 1,215 msl to 1,210 msl), so that the elevation of Toronto Reservoir was well below the 1,215 msl target at the start of the 2016 recreation season).

[22] HOOT recognizes that fluctuations of up to 4 feet, while more than an order of magnitude less than what is allowed under the current license, are still very significant, particularly from an environmental perspective. HOOT would support a narrower bandwidth or run-of-river operation.

[23] *Woodstone Lakes Dev., LLC & Woodstone Toronto Dev., LLC v. S. Energy NY-Gen, LLC*, 95 FERC ¶ 61,451, at 62,638 (2001).

Conditions in the project area have changed significantly. As the PAD correctly notes,[24] from the 1920s to the 1970s, this part of New York was a favorite summer resort destination for residents of New York City. In the 1980s, tourism to the area declined precipitously, and most of the resorts closed.

Since the turn of the century, however, tourism to Sullivan County has been making a recovery.[25] Today, in addition to the existing community of nearly 1,000 homes near the reservoir,[26] there are more than 100 homes on or very near the shoreline of Toronto Reservoir, with hundreds more as-yet-undeveloped lots in the Chapin Estate subdivision, and a 50-room resort hotel in the works.[27] Bethel Woods Center for the Arts, a not-for-profit performing arts center and museum located at the site of the 1969 Woodstock festival in Bethel, New York, less than 6 miles from Toronto Reservoir, opened in 2006. Sullivan County's Comprehensive Plan calls "[r]ealizing the untapped potential of tourism in Sullivan County," including outdoor recreation, one of its "key

HOOT Comment #8

[24] PAD at 121.

[25] *See* Attach. F, Daniel Axelrod, *Sullivan County Basks in Tourism Boom*, Times Herald-Record (July 27, 2017, 9:10 PM), http://www.recordonline.com/news/20170727/sullivan-county-basks-in-tourism-boom.

[26] According to the 2010 census, there were 998 housing units in the nearby community of Smallwood, approximately 25% of which were occupied year-round, and most of the remainder of which were used seasonally. *Community Facts: Smallwood, New York*, U.S. Census Bureau, https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF (last visited July 28, 2017). Smallwood community members frequently walk to the Toronto Reservoir east access point for recreation.

[27] *See, e.g.*, Daniel Axelrod, *$100M Plan Would Add Luxury Resort to Chapin Estate Community in Sullivan*, Times Herald-record (July 9, 2017, 6:13 PM), http://www.recordonline.com/news/20170709/100m-plan-would-add-luxury-resort-to-chapin-estate-community-in-sullivan.

policy issue[s]."[28] Demand for recreational amenities in the project area is significantly greater than it was in 1992, and can be expected to continue to grow.

As a relatively quiet reservoir with required public access, Toronto Reservoir, when full, is a vital recreation and aesthetic resource for the community. *See* Attach. B at B-1 to B-2. However, the extensive mud flats left behind as the reservoir drops are an eyesore.[29]

HOOT Comment #9

At the reduced water levels that occur all too frequently at Toronto Reservoir,[30] it is impossible to use the reservoir for any water-based recreational activities, and both individual homeowner docks and the recreational public access points required by the existing Swinging Bridge Project license at Toronto Reservoir[31] are unusable.[32] When the reservoir is below 1,212 msl, a vehicle attempting to approach the water's edge to put a boat in the water at the Moscoe Road public launch faces a significant risk of becoming mired in the mud flats.

Nor can members of the public who might otherwise travel to the area to enjoy the reservoir predict whether or when access will be available. As a result, it is the informed belief of HOOT's members that recreational use of Toronto Reservoir by the

HOOT Comment #10

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[28] *Policy Area V: Economic Development*, at V-79 http://webapps.co.sullivan.ny.us/DOCS/DPEM/Sullivan2020/TourismGoals.pdf (last visited July 28, 2017).

[29] Attach. B at B-4 to B-9, B-11 to B-17, and B-19 to B-24; Attach. C at C-5 to C-12 and C-17 to C-20. The extent of the mud flats exposed as water levels decline also suggests that Eagle Creek's characterization of Toronto Reservoir as "relatively steep-sided" (PAD § 5.4.1 at 48) is inaccurate. *See also* Victor Whitman, *Dried-Up Toronto Reservoir Upsets Neighbors*, Times Herald-Record (Mar. 31, 2009, 2:00 AM), http://www.recordonline.com/article/20090331/NEWS/903310315.

[30] *See* Attach. A.

[31] Swinging Bridge Project License, Article 405, 59 FERC at 63,089.

[32] *See, e.g.*, Attach. B at B-4 to B-5, B-7 to B-9, B-11, B-13 to B-17, B-20 to B-21, and B-23 to B-24; Attach. C at C-5 to C-12.

public would be significantly greater if the reservoir level were reliably maintained at or above 1,216 msl, with current water levels and expected levels over the next 14 days posted on a website.[33] Furthermore, reduced water levels (particularly below 1,214 msl[34]) can be dangerous to individuals who manage to access the reservoir, as underwater obstacles may be hidden just below the surface.[35] And those individuals who engage in recreation despite the danger and difficulty of access (and those who live on the shoreline) must also contend with the unpleasant odor given off by the exposed mud flats.

HOOT Comment #10, cont...

In the absence of license requirements regarding the reservoir level, the licensees' operational choices result in the reservoir level often failing to reach even the minimum necessary for aesthetics and recreation. HOOT urges the Commission to clarify and broaden the NEPA scoping for the Swinging Bridge Project to ensure that the effects of both reservoir fluctuations and low reservoir elevations at Toronto Reservoir are assessed with respect to all recreation resource issues, and that increased residential development near Toronto Reservoir and growth in tourism are considered with respect to the

HOOT Comment #11

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[33] Advance warning of significant lowering would also allow homeowners to have boats removed from the water before the boats are damaged or destroyed by being stranded on dry land or rocks. *See* Attach. B at B-4 and B-5.

[34] The reservoir topography is such that some locations are adversely affected even at higher water elevations. Some residents cannot safely navigate from their docks when the water level is below 1,215 msl. As water levels decrease, more docks become unusable, as do the public access points. Attach. C; *see also* Attach. D, *Toronto Reservoir*, New York State Department of Environmental Conservation, http://www.dec.ny.gov/outdoor/61540.html (last visited July 28, 2017), which suggests even more dramatic changes in reservoir appearance and surface area from reservoir drawdown than do the satellite images. HOOT supports Commission Staff's proposed study of the surface area of Toronto Reservoir at various elevations, including mapping to "visually assess the effects of reservoir levels on reservoir surface area and identify specific areas that may become inaccessible at lower reservoir levels" (FERC, Request for Studies and Additional Information at A-26 (July 27, 2011), eLibrary No. 20170727-3011), as the available information is incomplete and not entirely consistent.

[35] *See* Attach. B at B-24 (the top of the boulder visible in the upper left quadrant of the photo is at approximately 1,210 msl, so it presents a submerged hazard when the water level is below approximately 1,213 msl; it is rarely marked).

adequacy of existing recreational access and the adequacy and capacity of existing recreational facilities.[36]

HOOT Comment #11, cont...

C. Environmental Impacts

The drawdowns permitted by the current Toronto Reservoir rule curve, or even the less extreme, but still very significant, drawdowns more commonly experienced,[37] clearly have environmental impacts. Eagle Creek provides no information about those impacts in its PAD, nor does it propose any studies that would allow the Commission to understand the nature and magnitude of the impacts, such as (in addition to HOOT's study requests detailed below) updating the 1987 and pre-1980 fisheries data on which Eagle Creek proposes to rely,[38] and studies of benthic invertebrates;[39] invasive species;[40] rare, threatened, and endangered species;[41] wetland and riparian vegetation;[42] and terrestrial wildlife[43] actually present in or near the project's reservoirs. HOOT members have observed what they believe to be aquatic habitat exposed to the air when reservoir levels drop; members have also observed that bald eagles and golden eagles are seen more frequently when reservoir levels are high. Studies of these resource impacts are needed.

HOOT Comment #12

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[36] SD1 § 4.2.6, bullet 1 at 20.

[37] *See* Attach. A.

[38] PAD at 51.

[39] *See* PAD at 62, and § 5.4.7 at 64.

[40] *Id.* § 5.5 at 65.

[41] *Id.* § 5.7 at 80.

[42] *Id.* § 5.6.1 at 78.

[43] *Id.* § 5.6.2 at 78.

The Commission's NEPA scoping should also be clarified and broadened to ensure that the effects of both reservoir fluctuations and low reservoir elevations are assessed with respect to the following: geologic and soils resources;[44] water quality;[45] reservoir fish populations;[46] aquatic habitat, including bass spawning habitat;[47] migratory fish;[48] riparian and wetland habitat and associated wildlife, including waterfowl and wetland-dependent birds;[49] special-status wildlife and botanical species;[50] invasive species;[51] and federally listed and proposed endangered, threatened, and candidate plant and animal species.[52]

HOOT Comment #13

D. Socioeconomic Impacts

Toronto Reservoir levels have a significant impact on the local economy. As noted above, HOOT members' anecdotal observations (as well as common sense) indicate that tourism is adversely affected by low water levels at Toronto Reservoir. "[A]rts, entertainment, and recreation and accommodation and food services" represent 10.3% of employment in Sullivan County.[53] Increased recreational visits produced by enhanced reservoir access, facilities, and aesthetics could have significant impacts on this sector of the local economy.

HOOT Comment #14

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[44] SD1 § 4.2.1 at 19. Reservoir fluctuations may cause erosion.

[45] *Id.* § 4.2.2, bullet 2 at 19.

[46] *Id.* § 4.2.3, bullet 1 at 19.

[47] *Id.* bullet 2 at 19.

[48] *Id.* bullet 3 at 19.

[49] *Id.* § 4.2.4, bullet 1 at 19-20.

[50] *Id.* bullet 3 at 20.

[51] *Id.* bullet 4 at 20.

[52] *Id.* § 4.2.5 at 20.

[53] PAD at 125.

In addition, the residential development in the vicinity of Toronto Reservoir provides a substantial share of the property tax revenues for the Town of Bethel.[54] Reduced water levels in Toronto Reservoir have a significant adverse effect on nearby residents' quality of life, and thus, presumably, depress property values and new development near the reservoir, as well as local government property tax revenues.

HOOT Comment #15

Recreation at Toronto Reservoir also serves a public health purpose. The University of Wisconsin Population Health Institute/Robert Wood Johnson Foundation's County Health Rankings have placed Sullivan County 61st out of New York's 62 counties on health indicators for the last 7 years.[55] Among the factors included in that ranking is "access to exercise opportunities."[56] While overall, in 2017, 91% of New Yorkers have adequate access to locations for physical activity, only 62% of Sullivan County residents have such access.[57] The variety of physical activities available at a reservoir—particularly one, like Toronto, in a relatively peaceful, natural setting—benefit both physical and mental health. Expanding and enhancing public recreational opportunities at Toronto Reservoir would advance the public interest by helping to reduce the deficit of access to exercise opportunities in Sullivan County.

HOOT Comment #16

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[54] *See, e.g.*, Fritz Mayer, *Chapin Estate Presses On With Another Subdivision*, The River Reporter (Mar. 29-Apr. 4, 2007), http://www.riverreporter.com/issues/07-03-29/news-chapin.html.

[55] *Sullivan, New York*, County Health Rankings & Roadmaps, http://www.countyhealthrankings.org/app/new-york/2017/rankings/sullivan/county/outcomes/overall/snapshot (last visited July 28, 2017).

[56] *Id.*

[57] *Id.*

HOOT urges the Commission to broaden the NEPA scoping to include consideration of the effects on socioeconomic resources of both reservoir fluctuations and low reservoir elevations.

HOOT Comment #16, cont...

RESPONSE TO REQUEST FOR INFORMATION

In SD1, the Commission requested that stakeholders submit, *inter alia*, "existing information and any data that would help to describe the past and present actions and effects of the project… on environmental and socioeconomic resources."[58] HOOT has attached or linked to a variety of information and data that demonstrate the impact of project operations.

HOOT Comment #17

STUDY REQUESTS

HOOT requests that the Commission require Eagle Creek to conduct the following studies as it develops its license applications:

A. Toronto Reservoir Water Quality Data

1) Goals, objectives, and information to be obtained:

The PAD does not discuss the impact of Swinging Bridge Project operations on the water quality in Toronto Reservoir. The PAD does not include or cite to any water quality data for Toronto Reservoir;[59] if such data exist, Eagle Creek should provide the data and an analysis of how the reservoir's ability to meet state water quality criteria, including the "best usage" for Class B waters, is affected by project operations. If such data do not exist, Eagle Creek should conduct a water quality study on which to base an analysis of the impact of project operations on Toronto Reservoir water quality.

HOOT Comment #18

2) If applicable, the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied:

As stated in the PAD,[60] the New York State Department of Environmental Conservation designates Toronto Reservoir as "Class B," with the following best

[58] SD1 at 22.

[59] PAD § 5.3.6 at 42.

[60] PAD § 5.3.5 at 40-41.

usage: "Primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival." The corresponding water quality requirements are also included in the PAD.

3) Any relevant public interest considerations in regard to the proposed study:

Current project operations may result in Toronto Reservoir being unsuitable for its best uses during some or all of the year. A study of the impacts is necessary so that the Commission can condition any new license to ensure that going forward, the project is best adapted in the public interest.

4) Existing information concerning the subject of the study proposal, and the need for additional information:

HOOT is not aware of any water quality data for Toronto Reservoir, nor of any study of the impact of project operations on Toronto Reservoir water quality.[61] The latter is necessary to allow the Commission to assess the impacts of current project operations and alternative operating regimes; the former is a necessary component of the latter.

HOOT Comment #18, cont...

5) Nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements:

Reservoir fluctuations may result in, *inter alia*, increased suspended solids and turbidity. Low reservoir levels may result in depleted dissolved oxygen. Both fluctuations and low water levels may make the reservoir unsuitable for "fish, shellfish, and wildlife propagation and survival."[62] The results of the study may indicate that a new license should require a different operational regime to better protect water quality.

6) Explanation of how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge:

HOOT does not propose any particular study methodology, but reserves the right to comment on the methodology in the Proposed Study Plan.

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[61] The PAD (at 135) cites a 1999 study entitled "Effects of Hydroelectric Operations on Water Quality, Fish Stranding, And Streambank Scouring in the Mongaup River," which was prepared by Lawler, Matusky & Skelly Engineers for Orange & Rockland Utilities in 1999. That study is available from FERC's eLibrary (Orange & Rockland Utils., Inc., Effects of Hydroelectric Operations on Water Quality, Fish Stranding, and Streambank Scouring in the Mongaup River (June 30, 1999) eLibrary No. 19990708-0270), but did not study Toronto Reservoir (*see id*. at 4).

[62] PAD § 5.3.5 at 41.

7) Considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs:

To the extent water quality data for Toronto Reservoir are already available, the licensees may be able to avoid the effort and cost of a field study.

HOOT Comment #18, cont...

B. Aquatic Habitat Study

1) Goals, objectives, and information to be obtained:

The licensees should study whether and to what extent project operations affect littoral habitat, including (but not limited to) largemouth bass spawning habitat. The PAD notes (at 60) that largemouth bass make their nests in vegetation and woody debris. It also states (§ 5.4.1 at 48) that "[r]eservoir margins are relatively steep-sided and consist of rubble and gravel with little or no rooted aquatic vegetation. The substrate composition, coupled with the reservoir's steep sides, limits the availability of littoral habitat." Given that broad swaths of the shoreline are dewatered for significant portions of the year, it seems likely that current project operations also contribute to the lack of littoral habitat. For example, if the reservoir were kept close to full pool, could rooted aquatic vegetation increase? How would the amount and distribution of woody debris be affected? Would such changes increase the availability of largemouth bass spawning habitat, and would such an increase cause the largemouth bass population to increase? What would be the impact of changed operations on adult largemouth bass habitat? Similar analysis should be performed with respect to other sport fisheries present in the project area.

HOOT Comment #19

2) If applicable, the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied:

As stated in the PAD,[63] the New York State Department of Environmental Conservation designates Toronto Reservoir as "Class B," with the following best usage: "Primary and secondary contact recreation and fishing. *These waters shall be suitable for fish, shellfish, and wildlife propagation and survival*."

3) Any relevant public interest considerations in regard to the proposed study:

The availability and quality of aquatic habitat impacts the health of the reservoir ecosystem, with resulting impacts on recreation.

4) Existing information concerning the subject of the study proposal, and the need for additional information:

HOOT is not aware of existing information on this topic.

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[63] PAD § 5.3.5 at 40-41 (emphasis added).

5) Nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements:

Fluctuations in the reservoir elevation can reasonably be expected to hinder the formation of littoral habitat, as potential habitat is by turns entirely submerged, on the shoreline, and fully dewatered. Study results demonstrating that an alternative operating regime would improve aquatic habitat may suggest that such an alternative operating regime would be better adapted in the public interest and for a comprehensive plan for the water resource.

6) Explanation of how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge:

HOOT Comment #19, cont...

HOOT does not propose any particular study methodology, but reserves the right to comment on the methodology in the Proposed Study Plan.

7) Considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs:

A direct study of the impact of different operating regimes on littoral habitat in Toronto Reservoir is plainly infeasible, as it would require the licensees to test operating regimes over multiple study seasons. A more reasonable approach may be to review information from reservoirs with similar substrate, gradient, etc., that are subject to different operating regimes, e.g. run-of-river. Information may already exist regarding whether existing habitat for various species in the river system is adequate.

C. Toronto Reservoir Recreation Needs and Impacts Study

1) Goals, objectives, and information to be obtained:

HOOT Comment #20

The licensee should study the impact of Toronto Reservoir elevation and reservoir fluctuations on recreation use at the reservoir; estimate the future recreation demand for Toronto Reservoir; evaluate the adequacy of existing recreation facilities; study the potential for developing new recreation facilities; and develop a Recreation Plan for Toronto Reservoir. Among other scenarios, the licensee should estimate likely recreation use if Toronto Reservoir water level were maintained at 1,218 msl, plus or minus 2 feet, during the recreation season, and at 1,215 msl, plus or minus 5 feet, year-round, and should compare that estimated use against current recreational capacity at the reservoir.

2) If applicable, the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied:

As noted above, the Sullivan County Planning Board seeks to increase tourism to Sullivan County, including outdoor recreation.

3) Any relevant public interest considerations in regard to the proposed study:

As described above, Toronto Reservoir elevation levels and fluctuations have a significant impact on the availability and safety of recreation at the reservoir.

4) Existing information concerning the subject of the study proposal, and the need for additional information:

Eagle Creek's FERC Form 80s provide a starting point; such recreation use data can be compared against existing USGS reservoir elevation data or, to the extent Eagle Creek's records are more detailed, the licensees' own data. The study should also incorporate data on expected population growth, recreation trends, and other factors that affect the demand for recreation.

5) Nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements:

HOOT Comment #20, cont...

As described above, Toronto Reservoir elevation levels and fluctuations have a significant impact on the availability and safety of recreation at the reservoir. Quantification of that impact will inform the Commission's decisionmaking with respect to both Toronto Reservoir operating regime and recreation-related license requirements.

6) Explanation of how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge:

HOOT does not propose any particular study methodology, but reserves the right to comment on the methodology in the Proposed Study Plan.

7) Considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs:

To the extent Eagle Creek has historical recreation demand, reservoir elevation, and reservoir fluctuation data, it may be able to reduce the cost associated with this proposed study. It should nevertheless gather and analyze daily data during at least one study season.

D. Socioeconomic Impacts Study

HOOT Comment #21

1) Goals, objectives, and information to be obtained:

The licensee should study the impact of Toronto Reservoir elevation and reservoir fluctuations, including under other operational regimes such as run-of-river or pulsing only within a 4 foot bandwidth of full pool, on the local economy. In particular, it should study the economic effects of the recreation impacts demonstrated by the requested Recreation Needs and Impacts Study, including multiplier effects. The licensee should also quantify the contribution of development near Toronto Reservoir to the local property tax base, and estimate the impacts of the project reservoirs on land use and tax base.

2) If applicable, the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied:

Not applicable.

3) Any relevant public interest considerations in regard to the proposed study:

As noted above, recreation is a significant component of the Sullivan County economy, and Toronto Reservoir elevation and fluctuations likely affect the types and level of recreational visits to the Swinging Bridge Project. Reservoir operations may therefore significantly affect local economic development.

HOOT Comment #21, cont...

Toronto Reservoir and its operations also have a significant impact on land use and development and the local property tax base.

4) Existing information concerning the subject of the study proposal, and the need for additional information:

Information on land use and the property tax base affected by the Swinging Bridge Project is available from Sullivan County, New York.

5) Nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements:

Toronto Reservoir elevation levels and fluctuations have a significant impact on the availability of recreation at the reservoir, which in turn affects the local economy and property tax base. Quantification of that impact will inform the Commission's decisionmaking with respect to both Toronto Reservoir operating regime and recreation-related license requirements.

6) Explanation of how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge:

Input-output economic models, such as IMPLAN, are widely used and accepted for estimating the total economic impacts of recreation and tourism. The

contribution of development near Toronto Reservoir to the local property tax base can be calculated from public Sullivan County property tax data, and economic modeling could be used to project the property tax impacts of new development in areas near the Swinging Bridge Project reservoirs.

7) Considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.

Once the results of the proposed Recreation Needs and Impacts Study are available, well-established input-output modeling techniques should make it relatively easy to estimate the economic impact of the recreation visits and tourism associated with different reservoir operating regimes. HOOT does not have an estimate of the level of effort and cost needed to estimate project impacts on the local property tax base.

HOOT Comment #21, cont...

CONCLUSION

HOOT appreciates the opportunity to present its Scoping Comments and Study Requests with respect to the relicensing of the Mongaup River Projects. In addition to considering these comments, HOOT respectfully requests that the Commission ensure that the substantial impacts of Swinging Bridge Project operations on recreation, aesthetics, and the natural environment are properly studied and considered in the relicensing process by, among other things, ordering the studies requested above.

HOOT Comment #22

Respectfully submitted,

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July 31, 2017

ATTACHMENT A

USGS Data for Toronto Reservoir, Water Years 2006-2016

USGS
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Water-Data Report 2006

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

Upper Delaware Basin
Middle Delaware-Mongaup-Brodhead Subbasin

LOCATION.--Lat 41°37′15″, long 74°49′55″ referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.

DRAINAGE AREA.--22.9 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--January 1926 to current year.

REVISED RECORDS.--WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE.--Nonrecording gage, usually daily readings about 0900. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.). All capacity figures given herein are based on zero storage at minimum operating pool level, 1,165.0 ft.

REMARKS.--Reservoir is formed by an earthfill dam completed July 24, 1926. Storage began Jan. 13, 1926. Usable capacity 1,098.2 mil ft³ between elevations 1,165.0 ft, minimum operating pool, and 1,220.0 ft, top of permanent flashboards. Capacity below elevation 1,165.0 ft, minimum operating pool, about 26.8 mil ft³. Reservoir is used for storage of water for power. Figures given herein represent contents above 1,165.0 ft. Records provided by Mirant New York, Inc. Elevation from reading on or nearest last day of month.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,186.4 mil ft³, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), -26.8 mil ft³, Nov. 15, 1928, elevation, 1,144.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 1,152.7 mil ft³, June 30, elevation, 1,221.5 ft; minimum contents observed, 847.2 mil ft³, Sept. 13, elevation, 1,212.3 ft.

MONTH-END ELEVATION AND CONTENTS

WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006

Date	Elevation (feet) *	Contents (million gallons)	Change in contents (equivalent in ft³/s)
Sept. 30	1,213.9	895.0	
Oct. 31	1,220.0	1,098.2	+75.9
Nov. 30	1,220.4	1,112.6	+5.6
Dec. 31	1,221.1	1,137.9	+9.5
CAL YR 2005	--	--	+0.9
Jan. 31	1,220.1	1,101.8	-13.5
Feb. 28	1,219.6	1,084.2	-7.3
Mar. 31	1,217.9	1,025.2	-22.0
Apr. 30	1,216.0	961.4	-24.6
May 31	1,218.2	1,035.5	+27.7
June 30	1,221.5	1,152.7	+45.2
July 31	1,219.0	1,063.2	-33.4
Aug. 31	1,214.3	907.4	-58.2
Sept. 30	1,213.3	876.9	-11.8
WTR YR 2006	--	--	-0.6

***** Elevation from reading on or nearest last day of month.

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

Upper Delaware Basin
Middle Delaware-Mongaup-Brodhead Subbasin

LOCATION.--Lat 41°37′15″, long 74°49′55″ referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.

DRAINAGE AREA.--22.9 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--January 1926 to current year.

REVISED RECORDS.--WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE.--Nonrecording gage, usually daily readings about 0900. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.). All capacity figures given herein are based on zero storage at minimum operating pool level, 1,165.0 ft.

REMARKS.--Reservoir is formed by an earthfill dam completed July 24, 1926. Storage began Jan. 13, 1926. Usable capacity 1,098.2 mil ft³ between elevations 1,165.0 ft, minimum operating pool, and 1,220.0 ft, top of permanent flashboards. Capacity below elevation 1,165.0 ft, minimum operating pool, about 26.8 mil ft³. Reservoir is used for storage of water for power. Figures given herein represent contents above 1,165.0 ft. Records provided by Mirant New York, Inc. until May 2007, and Alliance Energy New York as of May 2007. Elevation from reading on or nearest last day of month.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,186.4 mil ft³, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), -26.8 mil ft³, Nov. 15, 1928, elevation, 1,144.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 1,130.6 mil ft³, Apr. 18, elevation, 1,220.9 ft; minimum contents observed, 496.8 mil ft³, Sept. 28, elevation, 1,199.2 ft.

MONTH-END ELEVATION AND CONTENTS

WATER YEAR OCTOBER 2006 TO SEPTEMBER 2007

Date	Elevation (feet) *	Contents (million gallons)	Change in contents (equivalent in ft³/s)
Sept. 30	1,213.3	876.9	
Oct. 31	1,214.4	910.5	+12.5
Nov. 30	1,211.8	832.5	-30.1
Dec. 31	1,212.8	861.9	+11.0
CAL YR 2006	--	--	-7.8
Jan. 31	1,216.5	978.0	+43.3
Feb. 28	1,216.7	984.6	+2.7
Mar. 31	1,218.3	1,039.0	+20.3
Apr. 30	1,219.7	1,087.7	+18.8
May 31	1,216.0	961.4	-47.2
June 30	1,214.9	926.1	-13.6
July 31	1,212.8	861.9	-24.0
Aug. 31	1,206.3	679.2	-68.2
Sept. 30	1,199.2	496.8	-70.4
WTR YR 2007	--	--	-12.1

***** Elevation from reading on or nearest last day of month.

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Water-Data Report 2008

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

Upper Delaware Basin
Middle Delaware-Mongaup-Brodhead Subbasin

LOCATION.--Lat 41°37′15″, long 74°49′55″ referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.

DRAINAGE AREA.--22.9 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--January 1926 to current year.

REVISED RECORDS.--WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE.--Nonrecording gage, usually daily readings about 0900. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.). All capacity figures given herein are based on zero storage at minimum operating pool level, 1,165.0 ft.

REMARKS.--Reservoir is formed by an earthfill dam completed July 24, 1926. Storage began Jan. 13, 1926. Usable capacity 1,098.2 mil ft^3 between elevations 1,165.0 ft, minimum operating pool, and 1,220.0 ft, top of permanent flashboards. Capacity below elevation 1,165.0 ft, minimum operating pool, about 26.8 mil ft^3. Reservoir is used for storage of water for power. Figures given herein represent contents above 1,165.0 ft. Records provided by Mirant New York, Inc. until May 2007, and Alliance Energy New York as of May 2007. Elevation from reading on or nearest last day of month.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,186.4 mil ft^3, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), -26.8 mil ft^3, Nov. 15, 1928, elevation, 1,144.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 1,025.2 mil ft^3, Apr. 9, 11, 16, elevation, 1,217.9 ft; minimum contents observed, 378.3 mil ft^3, Oct. 8, 17, 19, 22, 24, 26, elevation, 1,194.0 ft.

MONTH-END ELEVATION AND CONTENTS

WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Date	Elevation (feet) *	Contents (million gallons)	Change in contents (equivalent in ft^3/s)
Sept. 30	1,199.2	496.8	
Oct. 31	1,195.0	400.0	-36.1
Nov. 30	1,198.5	480.0	+30.9
Dec. 31	1,203.2	597.4	+43.8
CAL YR 2007	--	--	-8.4
Jan. 31	1,204.0	618.2	+7.8
Feb. 29	1,208.5	739.0	+48.2
Mar. 31	1,215.0	929.2	+71.0
Apr. 30	1,216.9	991.3	+24.0
May 31	1,217.7	1,018.4	+10.1
June 30	1,217.5	1,011.6	-2.6
July 31	1,215.3	938.9	-27.1
Aug. 31	1,214.2	904.2	-13.0
Sept. 30	1,209.3	761.2	-55.2
WTR YR 2008	--	--	+8.4

***** Elevation from reading on or nearest last day of month.

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

Upper Delaware Basin
Middle Delaware-Mongaup-Brodhead Subbasin

LOCATION.--Lat 41°37′15″, long 74°49′55″ referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.

DRAINAGE AREA.--22.9 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--January 1926 to current year.

REVISED RECORDS.--WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE.--Nonrecording gage, usually daily readings about 0900. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.). All capacity figures given herein are based on zero storage at minimum operating pool level, 1,165.0 ft.

REMARKS.--Reservoir is formed by an earthfill dam completed July 24, 1926. Storage began Jan. 13, 1926. Usable capacity 1,098.2 mil ft^3 between elevations 1,165.0 ft, minimum operating pool, and 1,220.0 ft, top of permanent flashboards. Capacity below elevation 1,165.0 ft, minimum operating pool, about 26.8 mil ft^3. Reservoir is used for storage of water for power. Figures given herein represent contents above 1,165.0 ft. Records provided by Alliance Energy New York. Elevation from reading on or nearest last day of month.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,186.4 mil ft^3, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), -26.8 mil ft^3, Nov. 15, 1928, elevation, 1,144.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 766.8 mil ft^3, Oct. 1, elevation, 1,209.5 ft; minimum contents observed, 98.8 mil ft^3, Feb. 8, elevation, 1,177.5 ft.

MONTH-END ELEVATION AND CONTENTS

WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009

Date	Elevation (feet) *	Contents (million gallons)	Change in contents (equivalent in ft^3/s)
Sept. 30	1,209.3	761.2	
Oct. 31	1,198.5	480.0	-105
Nov. 30	1,187.1	246.7	-90.0
Dec. 31	1,184.2	198.3	-18.1
CAL YR 2008	--	--	-12.6
Jan. 31	1,179.0	118.9	-29.6
Feb. 28	1,180.0	133.1	+5.9
Mar. 31	1,193.5	367.8	+87.6
Apr. 30	1,195.3	406.7	+15.0
May 31	1,198.4	477.6	+26.5
June 30	1,200.8	536.2	+22.6
July 31	1,201.1	543.7	+2.8
Aug. 31	1,206.9	695.3	+56.6
Sept. 30	1,206.6	687.3	-3.1
WTR YR 2009	--	--	-2.3

***** Elevation from reading on or nearest last day of month.

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

Upper Delaware Basin
Middle Delaware-Mongaup-Brodhead Subbasin

LOCATION.--Lat 41°37′15″, long 74°49′55″ referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.

DRAINAGE AREA.--22.9 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--January 1926 to current year.

REVISED RECORDS.--WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE.--Nonrecording gage, usually daily readings about 0900. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.). All capacity figures given herein are based on zero storage at minimum operating pool level, 1,165.0 ft.

REMARKS.--Reservoir is formed by an earthfill dam completed July 24, 1926. Storage began Jan. 13, 1926. Usable capacity 1,098.2 mil ft^3 between elevations 1,165.0 ft, minimum operating pool, and 1,220.0 ft, top of permanent flashboards. Capacity below elevation 1,165.0 ft, minimum operating pool, about 26.8 mil ft^3. Reservoir is used for storage of water for power. Figures given herein represent contents above 1,165.0 ft. Records provided by Alliance Energy New York. Elevation from reading on or nearest last day of month.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,186.4 mil ft^3, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), about -26.8 mil ft^3, Nov. 15, 1928, elevation, 1,144.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 964.7 mil ft^3, May 23, 25, elevation, 1,216.1 ft; minimum contents observed, 461.1 mil ft^3, Jan. 7, elevation, 1,197.7 ft.

MONTH-END ELEVATION AND CONTENTS

WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

Date	Elevation (feet) *	Contents (million gallons)	Change in contents (equivalent in ft^3/s)
Sept. 30	1,206.6	687.3	
Oct. 31	1,204.5	631.4	-20.9
Nov. 30	1,201.4	551.3	-30.9
Dec. 31	1,197.9	465.8	-31.9
CAL YR 2009	--	--	+8.5
Jan. 31	1,201.2	546.2	+30.0
Feb. 28	1,202.5	579.4	+13.7
Mar. 31	1,212.8	861.9	+106
Apr. 30	1,215.0	929.2	+26.0
May 31	1,216.0	961.4	+12.0
June 30	1,215.0	929.2	-12.4
July 31	1,209.8	775.2	-57.5
Aug. 31	1,208.6	741.8	-12.5
Sept. 30	1,207.3	706.2	-13.7
WTR YR 2010	--	--	+0.6

***** Elevation from reading on or nearest last day of month.

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

Upper Delaware Basin
Middle Delaware-Mongaup-Brodhead Subbasin

LOCATION.--Lat 41°37′15″, long 74°49′55″ referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.

DRAINAGE AREA.--22.9 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--January 1926 to current year.

REVISED RECORDS.--WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE.--Nonrecording gage, usually daily readings about 0900. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.). All capacity figures given herein are based on zero storage at minimum operating pool level, 1,165.0 ft.

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EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,186.4 mil ft³, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), about -26.8 mil ft³, Nov. 15, 1928, elevation, 1,144.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 1,112.6 mil ft³, Apr. 30, May 1, elevation, 1,220.4 ft; minimum contents observed, 546.3 mil ft³, Feb. 6, elevation, 1,201.2 ft.

MONTH-END ELEVATION AND CONTENTS

WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Date	Elevation (feet) *	Contents (million ft³)	Change in contents (equivalent in ft³/s)
Sept. 30	1,207.3	706.2	
Oct. 31	1,210.9	806.4	+37.4
Nov. 30	1,212.4	850.1	+16.9
Dec. 31	1,208.6	741.8	-40.4
CAL YR 2010	--	--	+8.8
Jan. 31	1,201.8	561.4	-67.4
Feb. 28	1,202.3	574.2	+5.3
Mar. 31	1,216.4	974.7	+150
Apr. 30	1,220.4	1,112.6	+53.2
May 31	1,216.4	974.7	-51.5
June 30	1,218.3	1,039.0	+24.8
July 31	1,213.8	892.0	-54.9
Aug. 31	1,216.2	968.0	+28.4
Sept. 30	1,217.3	1,004.8	+14.2
WTR YR 2011	--	--	+9.5

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01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

Upper Delaware Basin
Middle Delaware-Mongaup-Brodhead Subbasin

LOCATION.--Lat 41°37′15″, long 74°49′55″ referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.

DRAINAGE AREA.--22.9 mi².

SURFACE-WATER RECORDS

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REVISED RECORDS.--WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

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EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,186.4 mil ft³, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), about -26.8 mil ft³, Nov. 15, 1928, elevation, 1,144.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 1,052.8 mil ft³, Oct. 2, elevation, 1,218.7 ft; minimum contents observed, 465.8 mil ft³, Sept. 18, elevation, 1,197.9 ft.

MONTH-END ELEVATION AND CONTENTS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Date	Elevation (feet) *	Contents (million gallons)	Change in contents (equivalent in ft^3/s)
Sept. 30	1,217.3	1,004.8	
Oct. 31	1,213.0	867.8	-51.1
Nov. 30	1,205.9	668.4	-76.9
Dec. 31	1,207.4	708.9	+15.1
CAL YR 2011	--	--	-1.0
Jan. 31	1,200.7	533.8	-65.4
Feb. 29	1,201.1	543.7	+4.0
Mar. 31	1,202.4	576.8	+12.4
Apr. 30	1,203.6	607.8	+12.0
May 31	1,207.7	717.0	+40.8
June 30	1,206.5	684.6	-12.5
July 31	1,203.3	600.0	-31.6
Aug. 31	1,200.0	516.3	-31.2
Sept. 30	1,200.0	516.3	0.0
WTR YR 2012	--	--	-15.4

***** Elevation from reading on or nearest last day of month.

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

Upper Delaware Basin
Middle Delaware-Mongaup-Brodhead Subbasin

LOCATION.--Lat 41°37′15″, long 74°49′55″ referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.

DRAINAGE AREA.--22.9 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--January 1926 to current year.

REVISED RECORDS.--WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE.--Nonrecording gage, usually daily readings about 0900. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.). All capacity figures given herein are based on zero storage at minimum operating pool level, 1,165.0 ft.

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EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,186.4 mil ft³, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), about -26.8 mil ft³, Nov. 15, 1928, elevation, 1,144.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 984.6 mil ft³, June 29, elevation, 1,216.7 ft; minimum contents observed, 516.3 mil ft³, Oct. 1, elevation, 1,200.0 ft.

MONTH-END ELEVATION AND CONTENTS
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Date	Elevation (feet) *	Contents (million gallons)	Change in contents (equivalent in ft³/s)
Sept. 30	1,200.0	516.3	
Oct. 31	1,202.6	582.0	+24.5
Nov. 30	1,204.4	628.8	+18.1
Dec. 31	1,206.2	676.5	+17.8
CAL YR 2012	--	--	-1.0
Jan. 31	1,208.0	725.2	+18.2
Feb. 28	1,207.0	698.0	-11.2
Mar. 31	1,207.7	717.0	+7.1
Apr. 30	1,209.2	758.4	+16.0
May 31	1,210.0	780.8	+8.4
June 30	1,213.9	895.0	+44.1
July 31	1,213.2	873.8	-7.9
Aug. 31	1,210.9	806.4	-25.2
Sept. 30	1,210.4	792.2	-5.5
WTR YR 2013	--	--	+8.7

***** Elevation from reading on or nearest last day of month.

USGS Water-Year Summary 2014

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

LOCATION - Lat 41°37'15", long 74°49'55" referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.
DRAINAGE AREA - 22.9 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - January 1926 to September 2013 (month-end elevations and contents). October 2013 to current year (daily observation elevations).

REVISED RECORDS - WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE - Nonrecording gage read daily. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.).

COOPERATION - Elevation record and capacity table (1952) provided by Alliance Energy New York.

REMARKS - Reservoir is formed by an earthfill dam completed July 24, 1926. Storage began Jan. 13, 1926. Usable capacity, 1,098.2 mil ft³ between elevations 1,165.0 ft, minimum operating pool, and 1,220.0 ft, top of permanent flashboards. Capacity below elevation 1,165.0 ft, minimum operating pool, about 26.8 mil ft³. Figures given herein represent usable contents above 1,165.0 ft. Reservoir is used for storage of water for power.

Capacity table (elevation, in feet, and usable contents, in millions of cubic feet)

Elevation	Contents	Elevation	Contents
1,165.0	0.0	1,205.0	644.5
1,175.0	68.7	1,215.0	929.2
1,185.0	211.4	1,220.0	1,098.2
1,195.0	400.0	1,222.5	1,190.2

EXTREMES FOR PERIOD OF RECORD - Maximum contents observed, 1,186.4 mil ft³, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), about -26.8 mil ft³, Nov. 15, 1928, elevation, 1,144.5 ft.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2017, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [July 27, 2017], at URL //nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&105370&adr_begin_date=2013-10-01&adr_end_date=2014-09-30&site_no=01433100&agency_cd=USGS

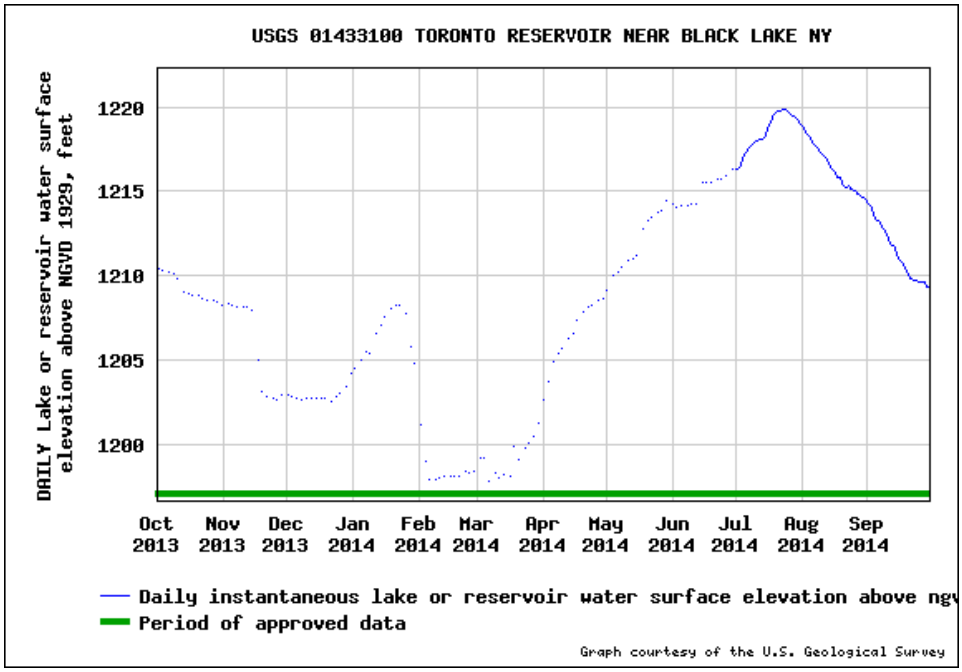
Water-Data Report 2014

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY -- Continued

LAKE OR RESERVOIR WATER SURFACE ELEVATION ABOVE NGVD 1929, FEET
YEAR 2013-10-01 to 2014-09-30
DAILY INSTANTANEOUS VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
	2013	2013	2013	2014	2014	2014	2014	2014	2014	2014
1	1,210.40	---	1,203.00	---	---	---	1,202.70	1,209.20	1,214.30	1,216.30
2	---	---	---	1,204.50	1,201.20	1,199.20	---	---	---	1,216.30
3	1,210.30	1,208.40	1,202.90	---	---	---	1,203.80	---	1,214.10	1,216.50
4	---	---	---	---	1,199.00	1,199.20	---	1,210.00	---	1,216.90
5	---	1,208.30	1,202.80	1,205.00	---	---	---	---	1,214.20	1,217.20
6	1,210.20	---	---	---	1,198.00	1,197.90	1,204.90	1,210.20	---	1,217.40
7	---	1,208.20	---	1,205.50	---	---	---	---	---	1,217.60
8	1,210.10	---	1,202.70	---	---	---	1,205.40	1,210.50	1,214.20	1,217.70
9	---	---	---	1,205.40	1,198.00	1,198.40	---	---	---	1,217.80
10	1,209.80	1,208.20	1,202.80	---	---	---	1,205.70	---	1,214.30	1,218.00
11	---	---	---	---	1,198.10	1,198.10	---	1,210.90	---	1,218.00
12	---	1,208.20	1,202.80	1,206.60	---	---	---	---	1,214.30	1,218.10
13	1,209.10	---	---	---	1,198.20	1,198.30	1,206.30	1,211.00	---	1,218.10
14	---	1,208.00	---	1,207.10	---	---	---	---	---	1,218.20
15	1,209.00	---	1,202.80	---	---	---	1,206.60	1,211.20	1,215.50	1,218.30
16	---	---	---	1,207.60	1,198.20	1,198.20	---	---	---	1,218.80
17	1,208.90	1,205.00	1,202.80	---	---	---	1,207.40	---	1,215.50	1,219.10
18	---	---	---	---	1,198.20	1,199.90	---	1,212.80	---	1,219.40
19	---	1,203.20	1,202.80	1,208.10	---	---	---	---	1,215.50	1,219.60
20	1,208.90	---	---	---	1,198.20	1,199.10	1,207.90	1,213.30	---	1,219.70
21	---	1,202.90	---	1,208.30	---	---	---	---	---	1,219.80
22	1,208.70	---	1,202.60	---	---	---	1,208.20	1,213.50	1,215.70	1,219.80
23	---	---	---	1,208.30	1,198.50	1,199.80	---	---	---	1,219.90
24	1,208.60	1,202.80	1,202.90	---	---	---	1,208.30	---	1,215.70	1,219.90
25	---	---	---	---	1,198.40	1,200.10	---	1,213.80	---	1,219.80
26	---	1,202.70	1,203.10	1,207.80	---	---	---	---	1,215.90	1,219.70
27	1,208.60	---	---	---	1,198.50	1,200.50	1,208.60	1,213.90	---	1,219.60
28	---	1,203.00	---	1,205.80	---	---	---	---	---	1,219.50
29	1,208.50	---	1,203.50	---		---	1,208.70	1,214.50	1,216.30	1,219.40
30	---	---	---	1,204.80		1,201.30	---	---	---	1,219.30
31	1,208.30		1,204.20	---		---		---		1,219.10
Mean										1,218.54
Max										1219.90
Min										1216.30

Day	Aug	Sep
	2014	2014
1	1,218.90	1,214.40
2	1,218.70	1,214.20
3	1,218.50	1,214.00
4	1,218.30	1,213.70
5	1,218.10	1,213.40
6	1,217.90	1,213.30
7	1,217.80	1,213.20
8	1,217.60	1,212.90
9	1,217.40	1,212.70
10	1,217.30	1,212.40
11	1,217.10	1,212.20
12	1,217.00	1,211.90
13	1,216.80	1,211.80
14	1,216.60	1,211.70
15	1,216.30	1,211.20
16	1,216.20	1,211.00
17	1,216.00	1,210.80
18	1,215.80	1,210.60
19	1,215.80	1,210.40
20	1,215.40	1,210.00
21	1,215.30	1,209.80
22	1,215.20	1,209.80
23	1,215.30	1,209.70
24	1,215.10	1,209.70
25	1,215.10	1,209.60
26	1,215.00	1,209.60
27	1,214.90	1,209.60
28	1,214.90	1,209.60
29	1,214.70	1,209.40
30	1,214.70	1,209.40
31	1,214.60	
Mean	1,216.40	1,211.40
Max	1218.90	1214.40
Min	1214.60	1209.40


USGS 01433100 TORONTO RESERVOIR NEAR BLACK LAKE NY
DAILY Lake or reservoir water surface elevation above NGVD 1929, feet
1220
1215
1210
1205
1200
Oct 2013
Nov 2013
Dec 2013
Jan 2014
Feb 2014
Mar 2014
Apr 2014
May 2014
Jun 2014
Jul 2014
Aug 2014
Sep 2014
Daily instantaneous lake or reservoir water surface elevation above ngv
Period of approved data
Graph courtesy of the U.S. Geological Survey

USGS Water-Year Summary 2015

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

LOCATION - Lat 41°37'15", long 74°49'55" referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.
DRAINAGE AREA - 22.9 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - January 1926 to September 2013 (month-end elevations and contents). October 2013 to current year (daily observation elevations).

REVISED RECORDS - WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE - Nonrecording gage read daily. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.).

COOPERATION - Elevation record and capacity table (1952) provided by Alliance Energy New York.

REMARKS - Reservoir is formed by an earthfill dam completed July 24, 1926. Storage began Jan. 13, 1926. Usable capacity, 1,098.2 mil ft³ between elevations 1,165.0 ft, minimum operating pool, and 1,220.0 ft, top of permanent flashboards. Capacity below elevation 1,165.0 ft, minimum operating pool, about 26.8 mil ft³. Figures given herein represent usable contents above 1,165.0 ft. Reservoir is used for storage of water for power.

Capacity table (elevation, in feet, and usable contents, in millions of cubic feet)

Elevation	Contents	Elevation	Contents
1,165.0	0.0	1,205.0	644.5
1,175.0	68.7	1,215.0	929.2
1,185.0	211.4	1,220.0	1,098.2
1,195.0	400.0	1,222.5	1,190.2

EXTREMES FOR PERIOD OF RECORD - Maximum contents observed, 1,186.4 mil ft³, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), about -26.8 mil ft³, Nov. 15, 1928, elevation, 1,144.5 ft.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2017, National Water Information System data available on the World Wide Web
(USGS Water Data for the Nation), accessed [July 27, 2017],
at URL //nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&105370&adr_begin_date=2014-10-01&adr_end_date=2015-09-30&site_no=01433100&agency_cd=USGS

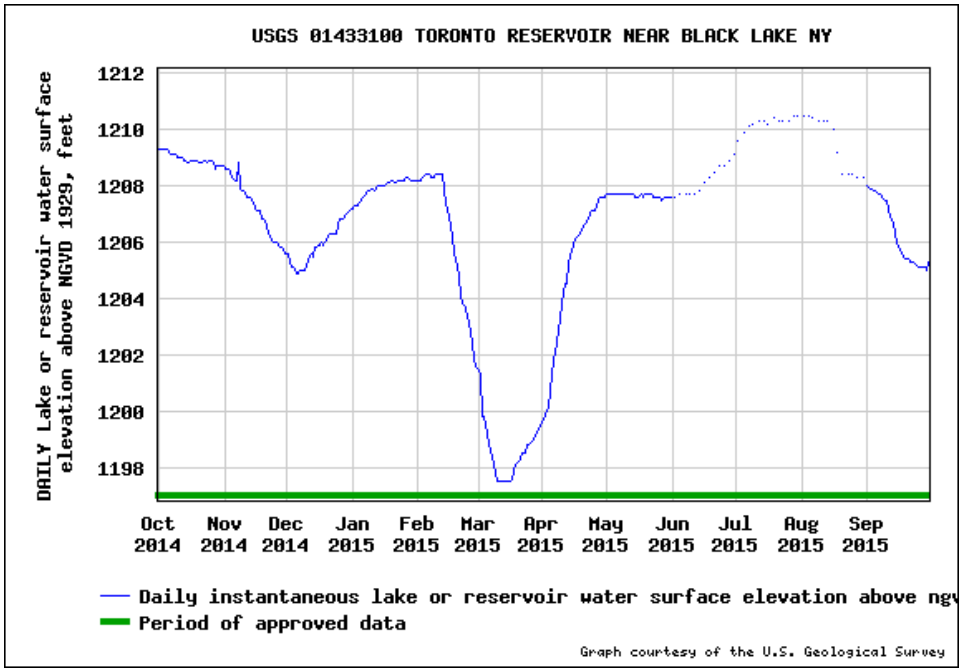
Water-Data Report 2015

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY -- Continued

LAKE OR RESERVOIR WATER SURFACE ELEVATION ABOVE NGVD 1929, FEET
YEAR 2014-10-01 to 2015-09-30
DAILY INSTANTANEOUS VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
	2014	2014	2014	2015	2015	2015	2015	2015	2015	2015
1	1,209.30	1,208.70	1,205.60	1,207.20	1,208.20	1,201.50	1,199.70	1,207.70	---	---
2	1,209.30	1,208.60	1,205.30	1,207.30	1,208.20	1,201.30	1,199.90	1,207.70	1,207.60	1,209.60
3	1,209.30	1,208.60	1,205.10	1,207.30	1,208.30	1,199.80	1,200.20	1,207.70	---	---
4	1,209.30	1,208.50	1,205.10	1,207.40	1,208.40	1,199.80	1,200.70	1,207.70	1,207.70	---
5	1,209.30	1,208.30	1,204.90	1,207.50	1,208.40	1,199.20	1,201.30	1,207.70	---	1,209.90
6	1,209.20	1,208.20	1,204.90	1,207.60	1,208.40	1,198.80	1,201.80	1,207.70	---	---
7	1,209.10	1,208.20	1,205.00	1,207.70	1,208.30	1,198.60	1,202.40	1,207.70	1,207.70	1,210.10
8	1,209.10	1,208.80	1,205.00	1,207.80	1,208.30	1,198.40	1,202.90	1,207.70	---	---
9	1,209.10	1,207.90	1,205.00	1,207.80	1,208.40	1,197.80	1,203.30	1,207.70	1,207.70	1,210.20
10	1,209.00	1,207.80	1,205.10	1,207.90	1,208.40	1,197.50	1,203.80	1,207.70	---	---
11	1,209.00	1,207.70	1,205.40	1,207.80	1,208.40	1,197.50	1,204.50	1,207.70	1,207.70	---
12	1,209.00	1,207.60	1,205.60	1,207.90	1,208.40	1,197.50	1,204.50	1,207.70	---	1,210.30
13	1,208.90	1,207.60	1,205.50	1,208.00	1,207.80	1,197.50	1,205.30	1,207.70	---	---
14	1,208.90	1,207.50	1,205.80	1,208.00	1,207.40	1,197.50	1,205.70	1,207.60	1,207.80	1,210.30
15	1,208.80	1,207.40	1,205.80	1,208.00	1,206.90	1,197.50	1,205.90	1,207.60	---	---
16	1,208.90	1,207.20	1,205.90	1,208.00	1,206.60	1,197.50	1,206.10	1,207.60	1,208.10	1,210.20
17	1,208.90	1,207.10	1,206.00	1,208.10	1,206.20	1,197.60	1,206.20	1,207.70	---	---
18	1,208.90	1,207.10	1,205.90	1,208.10	1,205.60	1,197.90	1,206.30	1,207.60	1,208.30	---
19	1,208.90	1,206.80	1,206.00	1,208.20	1,205.20	1,198.10	1,206.40	1,207.70	---	1,210.40
20	1,208.80	1,206.80	1,206.20	1,208.20	1,204.70	1,198.20	1,206.60	1,207.70	---	---
21	1,208.80	1,206.60	1,206.30	1,208.10	1,204.10	1,198.30	1,206.70	1,207.70	1,208.50	1,210.30
22	1,208.80	1,206.30	1,206.30	1,208.20	1,203.80	1,198.50	1,206.80	1,207.70	---	---
23	1,208.90	1,206.20	1,206.30	1,208.20	1,203.70	1,198.50	1,207.00	1,207.60	1,208.70	1,210.30
24	1,208.80	1,206.00	1,206.30	1,208.20	1,203.30	1,198.80	1,207.10	1,207.60	---	---
25	1,208.90	1,206.00	1,206.60	1,208.20	1,203.20	1,198.80	1,207.10	1,207.60	1,208.70	---
26	1,208.90	1,206.00	1,206.80	1,208.30	1,202.40	1,198.90	1,207.30	1,207.60	---	1,210.30
27	1,208.80	1,205.90	1,206.80	1,208.30	1,201.90	1,199.00	1,207.50	1,207.50	---	---
28	1,208.60	1,205.80	1,206.90	1,208.20	1,201.60	1,199.10	1,207.60	1,207.60	1,208.90	1,210.50
29	1,208.70	1,205.70	1,207.00	1,208.20		1,199.20	1,207.60	1,207.60	---	---
30	1,208.70	1,205.60	1,207.10	1,208.20		1,199.40	1,207.60	1,207.60	1,209.10	1,210.50
31	1,208.70		1,207.20	1,208.20		1,199.60		1,207.60		---
Mean	1,208.95	1,207.22	1,205.89	1,207.94	1,206.23	1,198.63	1,204.86	1,207.65		
Max	1209.30	1208.80	1207.20	1208.30	1208.40	1201.50	1207.60	1207.70		
Min	1208.60	1205.60	1204.90	1207.20	1201.60	1197.50	1199.70	1207.50		

Day	Aug	Sep
	2015	2015
1	---	1,208.00
2	1,210.50	1,207.90
3	---	1,207.90
4	1,210.50	1,207.80
5	---	1,207.80
6	1,210.40	1,207.70
7	---	1,207.70
8	---	1,207.60
9	1,210.30	1,207.50
10	---	1,207.50
11	1,210.30	1,207.20
12	---	1,206.90
13	1,210.30	1,206.70
14	---	1,206.30
15	---	1,206.00
16	1,210.00	1,205.80
17	---	1,205.60
18	1,209.20	1,205.50
19	---	1,205.40
20	1,208.40	1,205.40
21	---	1,205.30
22	---	1,205.30
23	1,208.40	1,205.30
24	---	1,205.20
25	1,208.40	1,205.10
26	---	1,205.10
27	1,208.30	1,205.10
28	---	1,205.10
29	---	1,205.00
30	1,208.30	1,205.30
31	---	
Mean		1,206.33
Max		1208.00
Min		1205.00


USGS 01433100 TORONTO RESERVOIR NEAR BLACK LAKE NY
DAILY Lake or reservoir water surface elevation above NGVD 1929, feet
1212
1210
1208
1206
1204
1202
1200
1198
Oct 2014
Nov 2014
Dec 2014
Jan 2015
Feb 2015
Mar 2015
Apr 2015
May 2015
Jun 2015
Jul 2015
Aug 2015
Sep 2015
Daily instantaneous lake or reservoir water surface elevation above ngv
Period of approved data
Graph courtesy of the U.S. Geological Survey

USGS Water-Year Summary 2016

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY

LOCATION - Lat 41°37'15", long 74°49'55" referenced to North American Datum of 1927, Sullivan County, NY, Hydrologic Unit 02040104, at dam on Black Lake Creek, and 2.5 mi southeast of village of Black Lake.
DRAINAGE AREA - 22.9 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - January 1926 to September 2013 (month-end elevations and contents). October 2013 to current year (daily observation elevations).

REVISED RECORDS - WSP 1552: 1951-54. WSP 1702: 1959 (M). WDR NY-85-1: 1984. WDR NY-86-1: 1985. WDR NY-90-1: Drainage area.

GAGE - Nonrecording gage read daily. Datum of gage is NGVD of 1929 (levels by Orange and Rockland Utilities, Inc.).

COOPERATION - Elevation record and capacity table (1952) provided by Alliance Energy New York.

REMARKS - Reservoir is formed by an earthfill dam completed July 24, 1926. Storage began Jan. 13, 1926. Usable capacity, 1,098.2 mil ft³ between elevations 1,165.0 ft, minimum operating pool, and 1,220.0 ft, top of permanent flashboards. Capacity below elevation 1,165.0 ft, minimum operating pool, about 26.8 mil ft³. Figures given herein represent usable contents above 1,165.0 ft. Reservoir is used for storage of water for power.

Capacity table (elevation, in feet, and usable contents, in millions of cubic feet)

Elevation	Contents	Elevation	Contents
1,165.0	0.0	1,205.0	644.5
1,175.0	68.7	1,215.0	929.2
1,185.0	211.4	1,220.0	1,098.2
1,195.0	400.0	1,222.5	1,190.2

EXTREMES FOR PERIOD OF RECORD - Maximum contents observed, 1,186.4 mil ft³, Apr. 4, 2005, elevation, 1,222.4 ft; minimum contents observed (after first filling), about -26.8 mil ft³, Nov. 15, 1928, elevation, 1,144.5 ft.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2017, National Water Information System data available on the World Wide Web
(USGS Water Data for the Nation), accessed [July 27, 2017],
at URL //nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&105370&adr_begin_date=2015-10-01&adr_end_date=2016-09-30&site_no=01433100&agency_cd=USGS

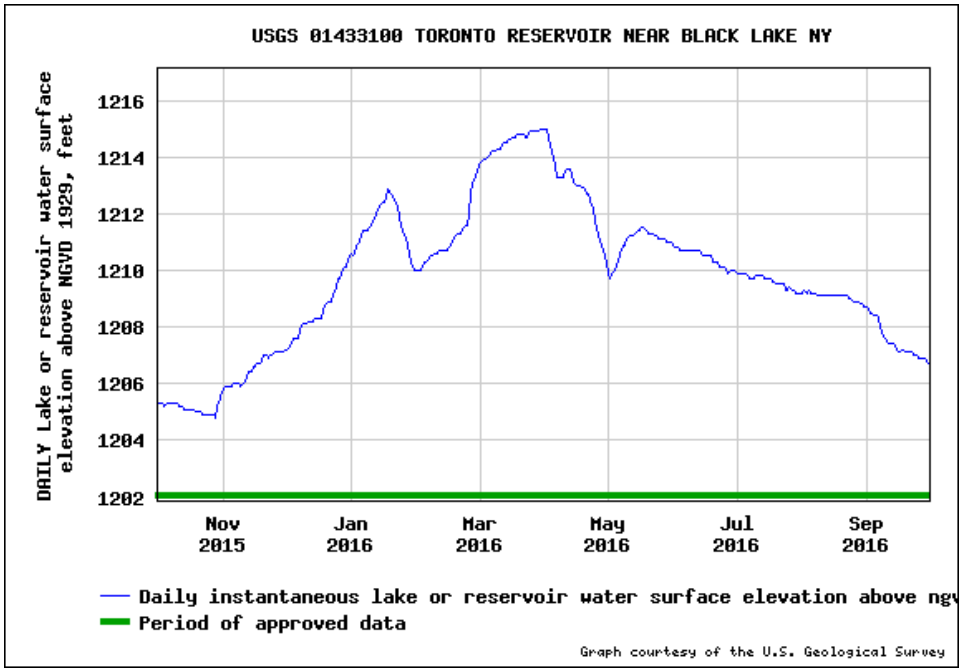
Water-Data Report 2016

01433100 TORONTO RESERVOIR NEAR BLACK LAKE, NY -- Continued

LAKE OR RESERVOIR WATER SURFACE ELEVATION ABOVE NGVD 1929, FEET
YEAR 2015-10-01 to 2016-09-30
DAILY INSTANTANEOUS VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
	2015	2015	2015	2016	2016	2016	2016	2016	2016	2016
1	1,205.30	1,205.80	1,207.20	1,210.50	1,210.00	1,213.70	1,215.00	1,209.90	1,210.90	1,209.90
2	1,205.30	1,205.90	1,207.30	1,210.60	1,210.00	1,213.80	1,215.00	1,209.70	1,210.80	1,209.90
3	1,205.30	1,205.90	1,207.40	1,210.90	1,210.10	1,213.90	1,214.70	1,209.90	1,210.80	1,209.90
4	1,205.20	1,205.90	1,207.60	1,211.00	1,210.30	1,213.90	1,214.40	1,210.00	1,210.70	1,209.90
5	1,205.30	1,205.90	1,207.60	1,211.20	1,210.30	1,214.00	1,214.00	1,210.20	1,210.70	1,209.90
6	1,205.30	1,206.00	1,207.60	1,211.40	1,210.40	1,214.10	1,213.70	1,210.30	1,210.70	1,209.80
7	1,205.30	1,206.00	1,207.90	1,211.40	1,210.50	1,214.20	1,213.30	1,210.60	1,210.70	1,209.70
8	1,205.30	1,206.00	1,208.00	1,211.40	1,210.50	1,214.20	1,213.30	1,210.90	1,210.70	1,209.70
9	1,205.30	1,205.90	1,208.10	1,211.50	1,210.60	1,214.20	1,213.30	1,210.90	1,210.70	1,209.70
10	1,205.30	1,206.00	1,208.10	1,211.60	1,210.60	1,214.30	1,213.30	1,211.10	1,210.70	1,209.80
11	1,205.20	1,206.10	1,208.20	1,211.80	1,210.70	1,214.30	1,213.50	1,211.20	1,210.70	1,209.80
12	1,205.20	1,206.20	1,208.20	1,212.00	1,210.70	1,214.40	1,213.60	1,211.20	1,210.70	1,209.80
13	1,205.10	1,206.40	1,208.20	1,212.10	1,210.70	1,214.50	1,213.60	1,211.20	1,210.70	1,209.80
14	1,205.10	1,206.40	1,208.30	1,212.30	1,210.70	1,214.50	1,213.40	1,211.30	1,210.60	1,209.70
15	1,205.10	1,206.60	1,208.30	1,212.40	1,210.70	1,214.60	1,213.10	1,211.40	1,210.50	1,209.70
16	1,205.10	1,206.60	1,208.30	1,212.40	1,210.80	1,214.60	1,213.00	1,211.40	1,210.50	1,209.70
17	1,205.10	1,206.70	1,208.30	1,212.60	1,211.00	1,214.70	1,213.00	1,211.50	1,210.50	1,209.70
18	1,205.10	1,206.70	1,208.60	1,212.85	1,211.10	1,214.70	1,213.00	1,211.50	1,210.50	1,209.60
19	1,205.00	1,206.80	1,208.70	1,212.70	1,211.20	1,214.80	1,212.90	1,211.40	1,210.50	1,209.60
20	1,205.00	1,207.00	1,208.85	1,212.60	1,211.30	1,214.80	1,212.80	1,211.30	1,210.30	1,209.50
21	1,205.00	1,207.00	1,208.90	1,212.50	1,211.30	1,214.80	1,212.70	1,211.30	1,210.30	1,209.50
22	1,204.90	1,206.90	1,208.90	1,212.20	1,211.40	1,214.80	1,212.70	1,211.30	1,210.30	1,209.50
23	1,204.90	1,207.00	1,209.10	1,211.90	1,211.50	1,214.70	1,212.30	1,211.20	1,210.10	1,209.50
24	1,204.90	1,207.00	1,209.40	1,211.60	1,211.60	1,214.70	1,212.20	1,211.20	1,210.10	1,209.30
25	1,204.90	1,207.10	1,209.70	1,211.40	1,212.00	1,214.90	1,211.70	1,211.10	1,210.10	1,209.30
26	1,204.90	1,207.10	1,209.70	1,211.10	1,212.70	1,214.90	1,211.50	1,211.10	1,210.00	1,209.40
27	1,204.90	1,207.10	1,209.90	1,210.90	1,213.10	1,214.90	1,211.00	1,211.10	1,209.90	1,209.30
28	1,204.80	1,207.10	1,210.10	1,210.60	1,213.30	1,214.90	1,210.90	1,211.10	1,210.00	1,209.30
29	1,205.20	1,207.10	1,210.10	1,210.30	1,213.50	1,214.90	1,210.70	1,211.00	1,210.00	1,209.20
30	1,205.50	1,207.20	1,210.40	1,210.00		1,215.00	1,210.30	1,211.00	1,210.00	1,209.20
31	1,205.70		1,210.60	1,210.00		1,215.00		1,211.00		1,209.20
Mean	1,205.15	1,206.51	1,208.63	1,211.54	1,211.12	1,214.51	1,212.93	1,210.95	1,210.46	1,209.61
Max	1205.70	1207.20	1210.60	1212.85	1213.50	1215.00	1215.00	1211.50	1210.90	1209.90
Min	1204.80	1205.80	1207.20	1210.00	1210.00	1213.70	1210.30	1209.70	1209.90	1209.20

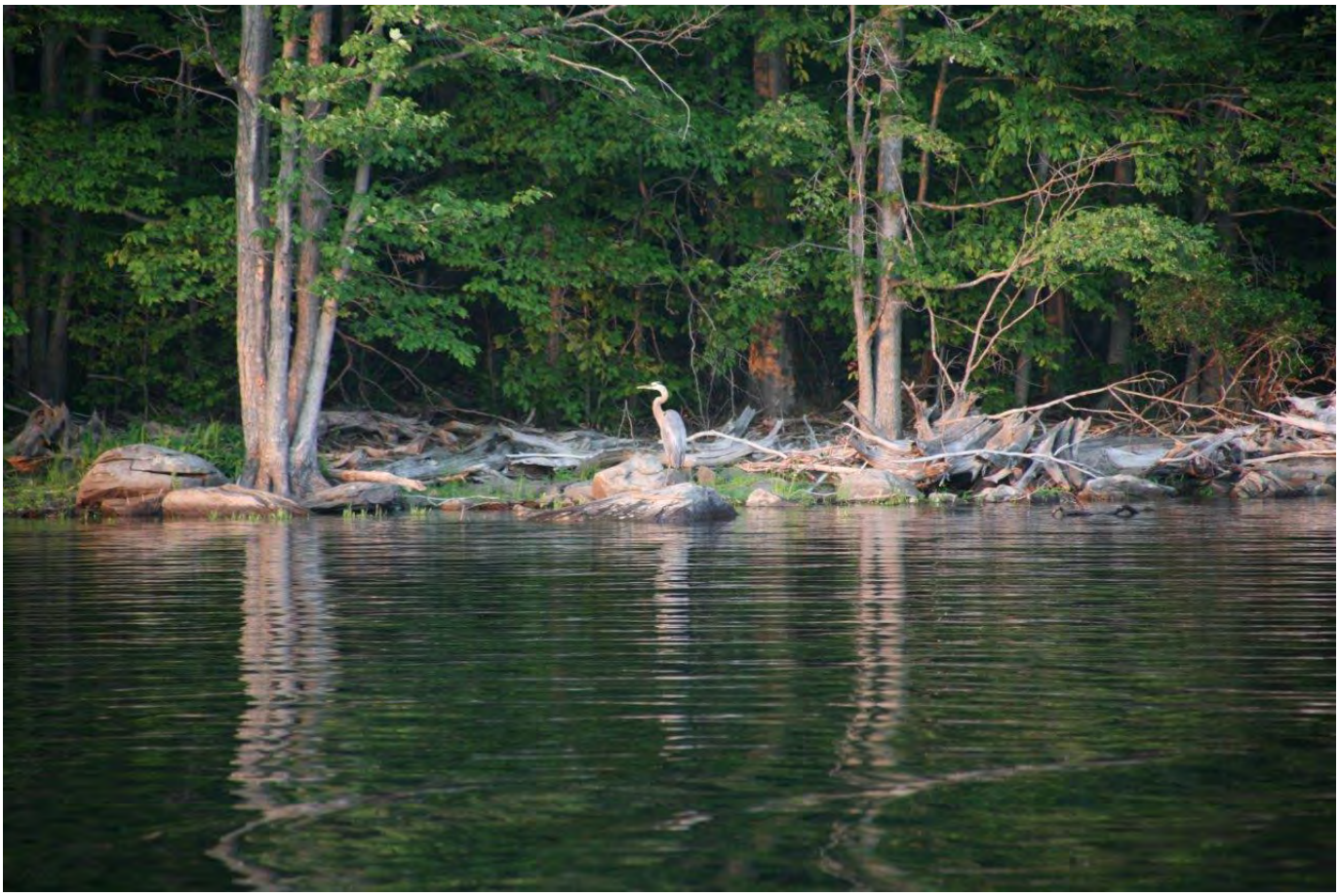
Day	Aug 2016	Sep 2016
1	1,209.20	1,208.70
2	1,209.30	1,208.50
3	1,209.20	1,208.50
4	1,209.30	1,208.40
5	1,209.20	1,208.40
6	1,209.20	1,208.30
7	1,209.20	1,208.00
8	1,209.10	1,207.80
9	1,209.10	1,207.60
10	1,209.10	1,207.50
11	1,209.10	1,207.40
12	1,209.10	1,207.40
13	1,209.10	1,207.40
14	1,209.10	1,207.30
15	1,209.10	1,207.20
16	1,209.10	1,207.10
17	1,209.10	1,207.20
18	1,209.10	1,207.20
19	1,209.10	1,207.10
20	1,209.10	1,207.10
21	1,209.10	1,207.10
22	1,209.10	1,207.10
23	1,209.00	1,207.00
24	1,209.00	1,207.00
25	1,208.90	1,206.90
26	1,208.90	1,206.90
27	1,208.90	1,206.90
28	1,208.90	1,206.90
29	1,208.80	1,206.80
30	1,208.70	1,206.70
31	1,208.70	
Mean	1,209.06	1,207.45
Max	1209.30	1208.70
Min	1208.70	1206.70



https://waterdata.usgs.gov/nwis/dv?cb_62614=on&format=html&site_no=01433100&referred_module=sw&period=&begin_date=2016-10-1&end_date=2017-07-27

ATTACHMENT B

Photographs of Toronto Reservoir with Associated Reservoir Elevation Data



June 18, 2006
Reservoir elevation 1,218.2 feet msl as of May 31, 2006, Attach A at A-1.
Reservoir elevation 1,221.5 feet msl as of June 30, 2006, Attach. A at A-1.



July 9, 2006
Reservoir elevation 1,221.5 feet msl as of June 30, 2006, Attach. A at A-1.
Reservoir elevation 1,219 feet msl as of July 31, 2006, Attach. A at A-1.



Aug. 19, 2007
Reservoir elevation 1,209.6 feet msl as of Aug. 19, 2007, Attach. B at B-3.
Reservoir elevation 1,206.3 feet msl as of Aug. 31, 2007, Attach. A at A-2.



Aug. 24, 2007
Reservoir elevation 1,209.6 feet msl as of Aug. 19, 2007, Attach. B at B-3.
Reservoir elevation 1,206.3 feet msl as of Aug. 31, 2007, Attach. A at A-2.



Aug. 24, 2007
Reservoir elevation 1,209.6 feet msl as of Aug. 19, 2007, Attach. B at B-3.
Reservoir elevation 1,206.3 feet msl as of Aug. 31, 2007, Attach. A at A-2.



Aug. 25, 2007
Reservoir elevation 1,209.6 feet msl as of Aug. 19, 2007, Attach. B at B-3.
Reservoir elevation 1,206.3 feet msl as of Aug. 31, 2007, Attach. A at A-2.



Aug. 25, 2007
Reservoir elevation 1,209.6 feet msl as of Aug. 19, 2007, Attach. B at B-3.
Reservoir elevation 1,206.3 feet msl as of Aug. 31, 2007, Attach. A at A-2.



Oct. 11, 2008
Reservoir elevation 1,209.3 feet msl as of Sept. 30, 2008, Attach. A at A-4.
Reservoir elevation approx. 1,204.6 feet msl as of Oct. 12, 2008, Attach. B at B-10.
Reservoir elevation 1,198.5 feet msl as of Oct. 31, 2008, Attach. A at A-4.



Oct. 11, 2008
Reservoir elevation 1,209.3 feet msl as of Sept. 30, 2008, Attach. A at A-4.
Reservoir elevation approx. 1,204.6 feet msl as of Oct. 12, 2008, Attach. B at B-10.
Reservoir elevation 1,198.5 feet msl as of Oct. 31, 2008, Attach. A at A-4.



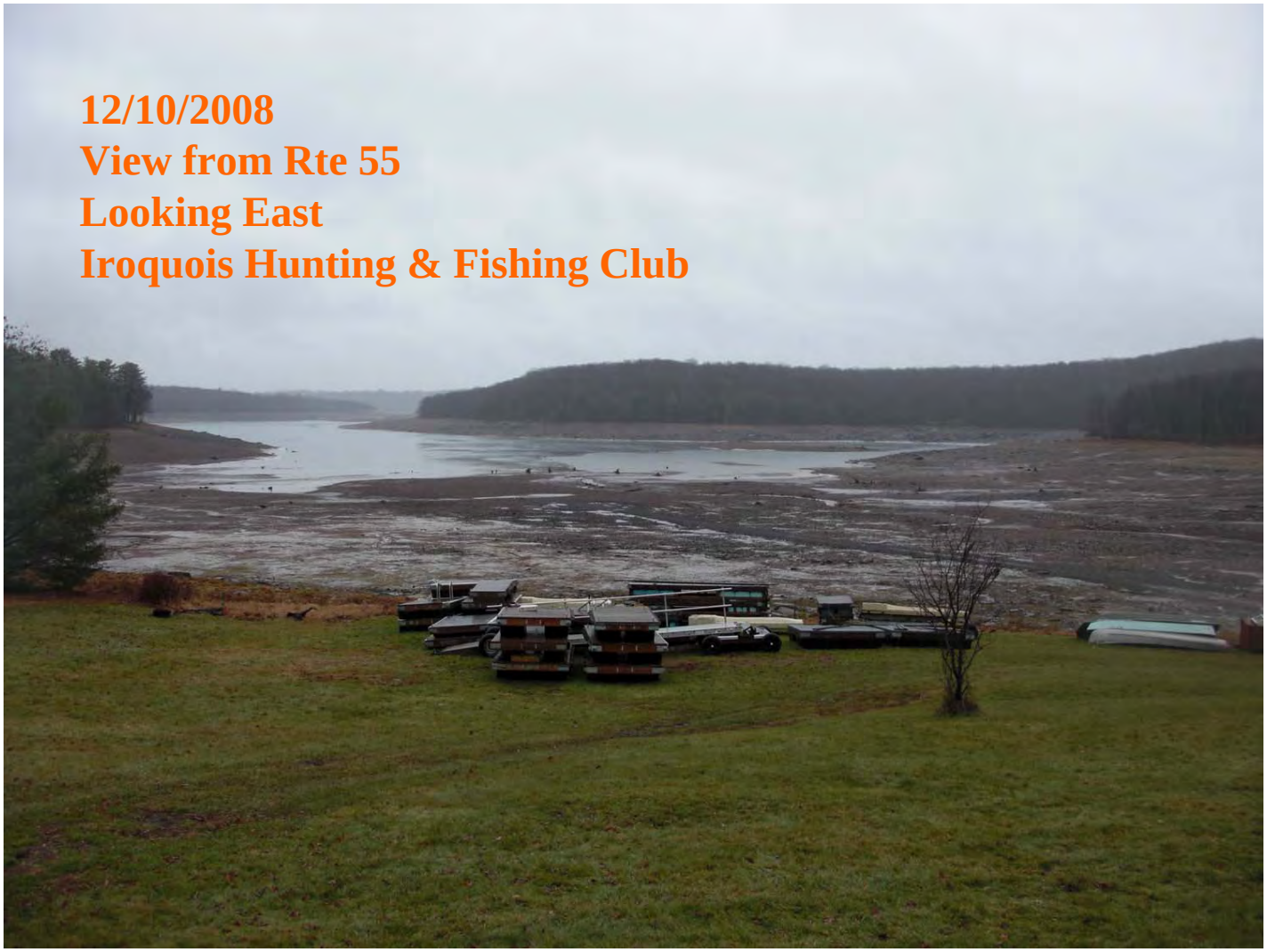
Oct. 12, 2008
Reservoir elevation 1,209.3 feet msl as of Sept. 30, 2008, Attach. A at A-4.
Reservoir elevation approx. 1,204.6 feet msl as of Oct. 12, 2008, Attach. B at B-10.
Reservoir elevation 1,198.5 feet msl as of Oct. 31, 2008, Attach. A at A-4.



Dec. 9, 2008
Reservoir elevation 1,187.1 feet msl as of Nov. 30, 2008, Attach. A at A-4.
Reservoir elevation 1,184.2 feet msl as of Dec. 31, 2008, Attach. A at A-4.



Dec. 9, 2008
Reservoir elevation 1,187.1 feet msl as of Nov. 30, 2008, Attach. A at A-4.
Reservoir elevation 1,184.2 feet msl as of Dec. 31, 2008, Attach. A at A-4.



Dec. 10, 2008
Reservoir elevation 1,187.1 feet msl as of Nov. 30, 2008, Attach. A at A-4.
Reservoir elevation 1,184.2 feet msl as of Dec. 31, 2008, Attach. A at A-4.



Dec. 10, 2008
Reservoir elevation 1,187.1 feet msl as of Nov. 30, 2008, Attach. A at A-4.
Reservoir elevation 1,184.2 feet msl as of Dec. 31, 2008, Attach. A at A-4.



Dec. 10, 2008
Reservoir elevation 1,187.1 feet msl as of Nov. 30, 2008, Attach. A at A-4.
Reservoir elevation 1,184.2 feet msl as of Dec. 31, 2008, Attach. A at A-4.



Dec. 10, 2008
Reservoir elevation 1,187.1 feet msl as of Nov. 30, 2008, Attach. A at A-4.
Reservoir elevation 1,184.2 feet msl as of Dec. 31, 2008, Attach. A at A-4.



Dec. 10, 2008
Reservoir elevation 1,187.1 feet msl as of Nov. 30, 2008, Attach. A at A-4.
Reservoir elevation 1,184.2 feet msl as of Dec. 31, 2008, Attach. A at A-4.



Mar. 21, 2009
Reservoir elevation 1,193.5 feet msl as of Mar. 31, 2009, Attach. A at A-4.



Mar. 21, 2009
Reservoir elevation 1,193.5 feet msl as of Mar. 31, 2009, Attach. A at A-4.



Mar. 21, 2009
Reservoir elevation 1,193.5 feet msl as of Mar. 31, 2009, Attach. A at A-4.



May 17, 2009
Reservoir elevation 1,195.3 feet msl as of Apr. 30, 2009, Attach. A at A-4.
Reservoir level approx. 1,197 feet msl as of May 17, 2009, Attach. B at B-22.
Reservoir level 1,198.4 feet msl as of May 31, 2009, Attach. A at A-4.



May 17, 2009
Reservoir elevation 1,195.3 feet msl as of Apr. 30, 2009, Attach. A at A-4.
Reservoir level approx. 1,197 feet msl as of May 17, 2009, Attach. B at B-22.
Reservoir level 1,198.4 feet msl as of May 31, 2009, Attach. A at A-4.



David Knudsen, What's Up – or Rather, Down – With Toronto Reservoir?, Catskills Buyer Agency (July 6, 2009), http://www.catskill4sale.com/catskill4sale/2009/07/whats-up-or-rather-down-with-toronto-reservoir.html. Reservoir elevation 1,200.8 feet msl as of June 30, 2009, Attach. A at A-4.



David Knudsen, What's Up – or Rather, Down – With Toronto Reservoir?, Catskills Buyer Agency (July 6, 2009), http://www.catskill4sale.com/catskill4sale/2009/07/whats-up-or-rather-down-with-toronto-reservoir.html. Reservoir elevation 1,200.8 feet msl as of June 30, 2009, Attach. A at A-4.



June 21, 2014
Reservoir elevation 1,215.5 feet msl as of June 19, 2014, Attach. A at A-10.
Reservoir elevation 1,215.7 feet msl as of June 22, 2014, Attach. A at A-10.



June 24, 2014
Reservoir elevation 1,215.7 feet msl as of June 24, 2014, Attach. A at A-10.



July 29, 2017
Reservoir elevation approx. 1,215.4 feet msl as of July 29, 2017, Attach. B at B-27.



July 29, 2017
Reservoir elevation approx. 1,215.4 feet msl as of July 29, 2017, Attach. B at B-27.



July 29, 2017
Reservoir elevation approx. 1,215.4 feet msl as of July 29, 2017, Attach. B at B-27.



July 29, 2017
Reservoir elevation approx. 1,215.4 feet msl as of July 29, 2017, Attach. B at B-27.



July 29, 2017
Reservoir elevation approx. 1,215.4 feet msl as of July 29, 2017, Attach. B at B-27.



July 29, 2017
Reservoir elevation approx. 1,215.4 feet msl as of July 29, 2017, Attach. B at B-27.

ATTACHMENT C

Satellite Images of Toronto Reservoir with Associated Reservoir Elevation Data



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Sept. 30, 2006) (last visited July 28, 2017).
Reservoir elevation 1,213.3 feet msl as of Sept. 30, 2006, Attach. A at A-1.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Sept. 30, 2006) (last visited July 28, 2017).
Reservoir elevation 1,213.3 feet msl as of Sept. 30, 2006, Attach. A at A-1.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Sept. 30, 2006) (last visited July 28, 2017).
Reservoir elevation 1,213.3 feet msl as of Sept. 30, 2006, Attach. A at A-1.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Sept. 30, 2006) (last visited July 28, 2017).
Reservoir elevation 1,213.3 feet msl as of Sept. 30, 2006, Attach. A at A-1.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (May 3, 2009) (last visited July 28, 2017).
Reservoir elevation 1,195.3 feet msl as of Apr. 30, 2009, Attach. A at A-4.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (May 3, 2009) (last visited July 28, 2017).
Reservoir elevation 1,195.3 feet msl as of Apr. 30, 2009, Attach. A at A-4.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (May 3, 2009) (last visited July 28, 2017).
Reservoir elevation 1,195.3 feet msl as of Apr. 30, 2009, Attach. A at A-4.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (May 3, 2009) (last visited July 28, 2017).
Reservoir elevation 1,195.3 feet msl as of Apr. 30, 2009, Attach. A at A-4.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Oct. 10, 2009) (last visited July 28, 2017).
Reservoir elevation 1,206.6 feet msl as of Sept. 30, 2009, Attach. A at A-5.
Reservoir elevation 1,204.5 feet msl as of Oct. 31, 2009, Attach. A at A-5.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Oct. 10, 2009) (last visited July 28, 2017).
Reservoir elevation 1,206.6 feet msl as of Sept. 30, 2009, Attach. A at A-5.
Reservoir elevation 1,204.5 feet msl as of Oct. 31, 2009, Attach. A at A-5.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Oct. 10, 2009) (last visited July 28, 2017).
Reservoir elevation 1,206.6 feet msl as of Sept. 30, 2009, Attach. A at A-5.
Reservoir elevation 1,204.5 feet msl as of Oct. 31, 2009, Attach. A at A-5.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Oct. 10, 2009) (last visited July 28, 2017).
Reservoir elevation 1,206.6 feet msl as of Sept. 30, 2009, Attach. A at A-5.
Reservoir elevation 1,204.5 feet msl as of Oct. 31, 2009, Attach. A at A-5.



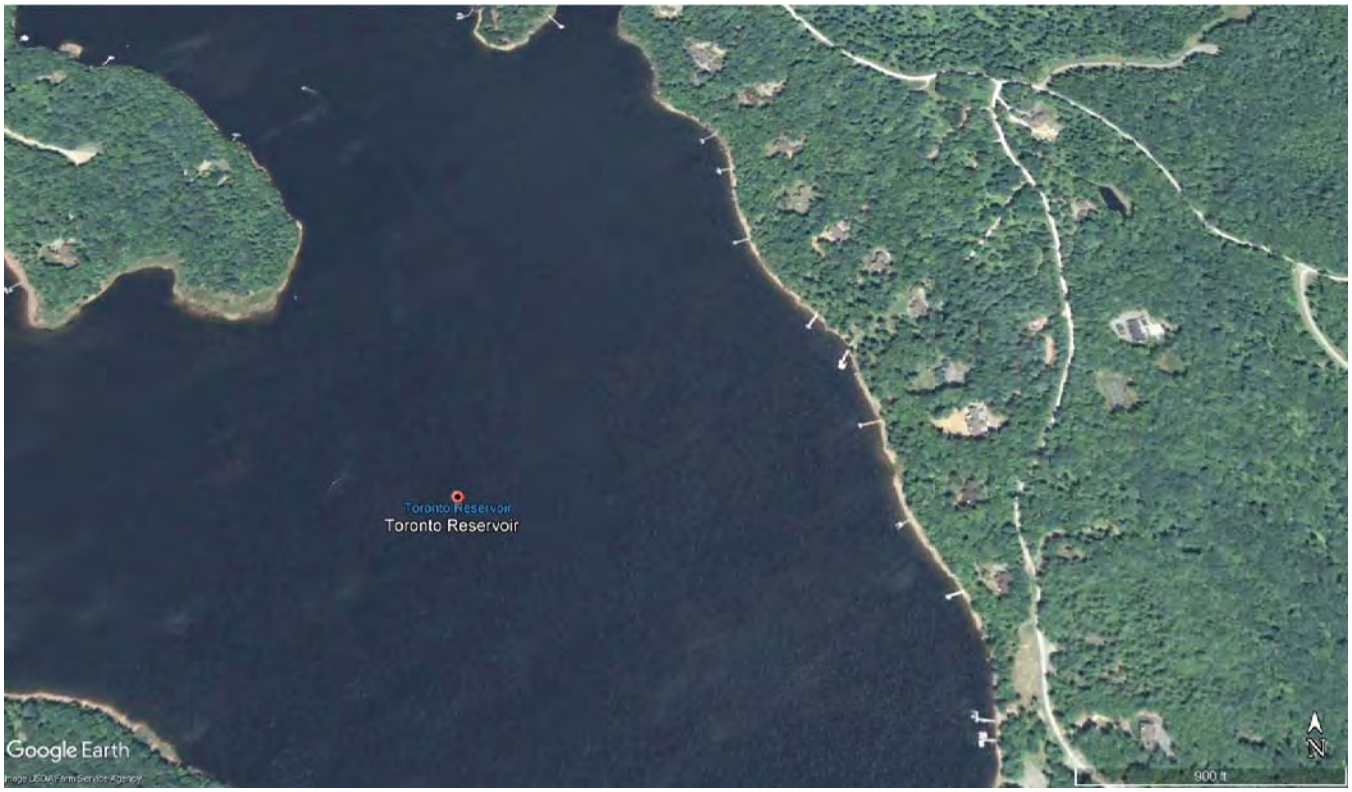
Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (May 26, 2011) (last visited July 28, 2017).
Reservoir elevation 1,216.4 feet msl as of May 31, 2011, Attach. A at A-6.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (May 26, 2011) (last visited July 28, 2017).
Reservoir elevation 1,216.4 feet msl as of May 31, 2011, Attach. A at A-6.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (May 26, 2011) (last visited July 28, 2017).
Reservoir elevation 1,216.4 feet msl as of May 31, 2011, Attach. A at A-6.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (May 26, 2011) (last visited July 28, 2017).
Reservoir elevation 1,216.4 feet msl as of May 31, 2011, Attach. A at A-6.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Apr. 17, 2016) (last visited July 28, 2017).
Reservoir elevation 1,213 feet msl as of Apr. 17, 2016, Attach. A at A-18.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Apr. 17, 2016) (last visited July 28, 2017).
Reservoir elevation 1,213 feet msl as of Apr. 17, 2016, Attach. A at A-18.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Apr. 17, 2016) (last visited July 28, 2017).
Reservoir elevation 1,213 feet msl as of Apr. 17, 2016, Attach. A at A-18.



Toronto Reservoir, White Lake, NY, 41°37'35.92" N, 74°50'10.14" W, *Google Earth* (Apr. 17, 2016) (last visited July 28, 2017).
Reservoir elevation 1,213 feet msl as of Apr. 17, 2016, Attach. A at A-18.

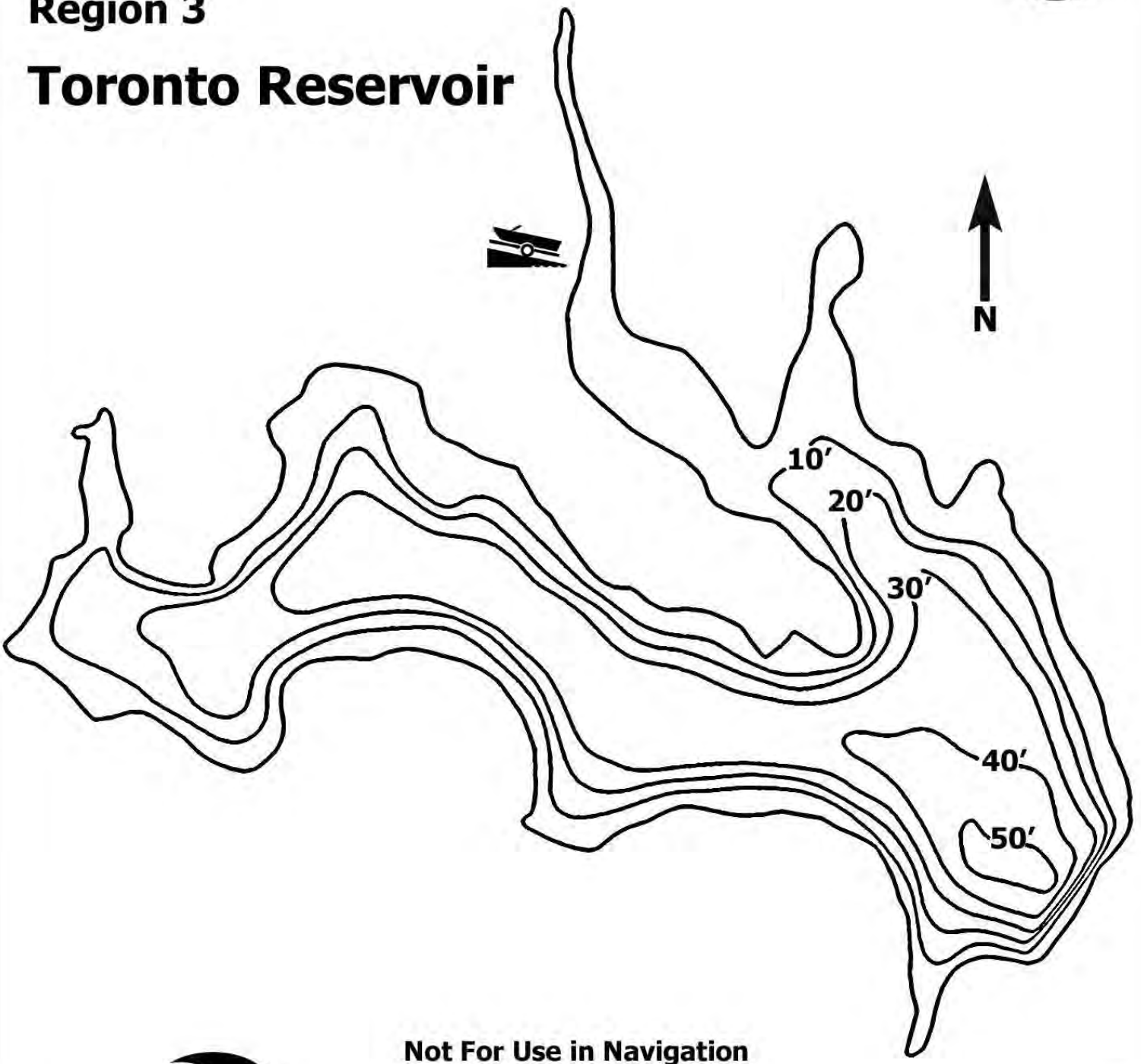
ATTACHMENT D

New York State Department of Environmental Conservation
Contour Map of Toronto Reservoir

New York State Department of Environmental Conservation
Division of Fish, Wildlife and Marine Resources
Lake Map Series

Region 3

Toronto Reservoir



Not For Use in Navigation



Toronto Reservoir

County: Sullivan **Town: Bethel**

Surface Area: 834.1 Acres **Mean Depth: 19.7ft**

Fish Species Present: Largemouth Bass, Chain Pickerel, Panfish

Scale: 0 1640 ft

ATTACHMENT E

Letter from Joseph Klimaszewski, Jr., to
Dr. Hal Teitelbaum and Mrs. Jennifer Teitelbaum
(Apr. 27, 2009)

VIA EMAIL

April 27, 2009

Dr. Hal Teitelbaum, MD, MBA
Mrs. Jennifer Teitelbaum
C/O Crystal Run Healthcare
155 Crystal Run Road
Middletown, NY 10941

Re: Reservoir Levels in Toronto Reservoir

Dear Dr. and Mrs. Teitelbaum:

Please accept our gratitude for agreeing to meet with us last week and for your gracious hospitality. We appreciate the time you made to understand the reservoir water level issues, how those issues affect the Mongaup Basin, and the associated safety considerations. Your expression of support for public access, an essential part of the operation of all of the projects, was also welcomed.

We share your desire to make provisions for positive recreational experiences, and to maintain the aesthetics of the Toronto Reservoir and the other projects within the Mongaup Basin. We were pleased to learn that other homeowners in the vicinity of the Toronto Reservoir are committed to supporting these activities as well.

Our goal is to safely try to meet needs of the homeowners and the public, as well as the functional needs and interests in the entire basin, thus satisfying the requirements of our licenses.

At AER NY-Gen, LLC, we commit to operate the projects in a manner designed to achieve these goals. Due to the varied interests served, this will need to be accomplished in multiple steps. As the Federal Energy Regulatory Commission (FERC) recently re-stated, Toronto Reservoir was built, and is licensed, as a storage reservoir for the rest of the Mongaup basin. Therefore, the downstream interests must take first priority relating to water use. We are offering the following proposal as a first step in addressing the issues we discussed until a long-term solution can be implemented.

We propose to use our best efforts to operate the Toronto Reservoir to achieve a target reservoir elevation of 1215 feet plus or minus (+/-) 5 feet from Memorial Day through the Monday one week after Labor Day. We will attempt to begin the season within the upper region of this range as safety permits. During the balance of the year, we will use our best efforts to operate the Toronto Reservoir to achieve a minimum reservoir elevation of 1190 feet. We commit to communicate upcoming changes in reservoir elevation as far in advance as possible in order to provide adequate notice to our neighbors.

This commitment is subject to several specific factors, including:

- safety considerations;
- adequate inflows and meteorological conditions;
- license requirements;
- requirements of any governmental entities such as FERC, Delaware River Basin Commission (DRBC), NYISO, and others;
- riparian and water rights;
- water necessary for emergency, life support, human health, or domestic purposes;
- emergency conditions;
- project repair or maintenance, and
- energy generation requirements.

The New York State Independent System Operator (NYISO), which regulates our hydropower generation sales, requires us to offer our output into the market each day. Occasionally, the NYISO requires us to generate energy during periods of high demand and system emergencies. During the summer recreational season as described above, it is our intention to use water from the Toronto Reservoir to generate energy only at the direction of the NYISO or as otherwise required by the Federal Power Act.

Routine elevations higher than those outlined above cannot be safely maintained. Based on our meeting, we believe that you share our commitment to safety. The ability of the project to move water downstream in a controlled manner is critical to maintaining public and project safety. This was made evident in 2005 when the downstream infrastructure was significantly damaged, partly as a result of uncontrolled releases from the Toronto Reservoir. Furthermore, as part of the efforts made to repair the sinkhole that developed in the Swinging Bridge dam in 2005, one of the two generating units at Swinging Bridge was retired. The result is a reduced ability to move water from the reservoirs quickly. It is primarily for these reasons that, in any operation of the projects, AER NY-Gen, LLC places safety as our paramount consideration.

Last summer we were able to maintain target reservoir elevation levels similar to those proposed for this year, despite the same considerations. And, we believe we will be able to keep the water in the reservoir at the proposed levels in the future, pending the development of a long-term solution.

Because the reservoir and license were not designed to operate in this manner (higher levels Memorial Day through seven days after Labor Day), a long-term solution is necessary to be able to sustain the target elevations. Several options are available, but none are without complexity

and the potential for significant capital expenditures. The options are not economically feasible without outside financial support. Additionally, all options currently under consideration would require local and community support, as well as support/approval from the regulatory agencies. We acknowledge and appreciate your offer to vigorously support efforts with these parties to address the needed modifications.

We urge you to discuss our proposal with your neighbors. We look forward to improving our relationship with you through more open and direct communication. Your support with the restoration of the required public access, and to reach a long term solution to the Toronto reservoir water levels, and is both needed and welcomed. I look forward to hearing from you in the very near future and to working with you as we implement these changes.

Best regards,

Joseph Klimaszewski, Jr.
Vice President – Operations and New Development
For AER NY-Gen, LLC

C: Samuel Nappi – Chairman
David Moore, Esq. – Troutman Sanders, LLP
Hon. Maurice Hinchey – U. S. House of Representatives
Hon. John J. Bonacic – NYS Senate
Hon. Aileen Gunther – NYS Assembly
Ms. Heather Campbell – FERC
Mr. Willie Janeway – NYSDEC, Region 3
Mr. Daniel Sturm – Town of Bethel

ATTACHMENT F

Times Herald-Record Article, July 28, 2017

OUR REGION

Sullivan basks in tourism boom



The Blueberry Festival in Ellenville is among the tourist attractions in Ulster County, which saw a 6 percent increase to $554.1 million in 2016 from $532.7 million in 2015 in tourist spending. [TIMES HERALD-RECORD FILE PHOTO]



Sims Foster and his wife, Kirsten, own the Arnold House in Livingston Manor. The couple owns four inns in Sullivan County, helping to drive tourism. [JIM SABASTIAN/FOR THE TIMES HERALD-RECORD]

Visitor spending rose 37% last year; Orange, Ulster also posted gains

By Daniel Axelrod
Times Herald-Record

Three years. Four inns. Two kids. My, how things have changed for Sims and Kirsten Foster.

Since 2014, the husband and wife team has opened four small Sullivan County hotels, with business booming, and birthed babies.

Both left lucrative careers in New York City – him as a vice president for an international hotel management company, her as an economist with the Federal Reserve – to open their inns.

But as much as the two early 40-somethings' lives have changed, Sullivan County's tourism market has transformed even more since its dark days in the 1990s.

Sullivan County's visitor spending skyrocketed 37 percent to $419.2 million in 2016 from $388.3 million in 2015, according to a newly released report from the Oxford Economics company, which tracks New York tourism.

"Growing up, when I heard New York City residents, they were like: 'Oh, I'm from the city and you're country folk,' and there was this 'us and them' attitude," said Sims Foster, a Livingston Manor native. "Now, everyone wants to be from the country. Nothing makes our guests happier than to be confused with full-time locals."

Hoteliers, restaurateurs and entrepreneurs like the Fosters are part of why Sullivan County's tourism is growing, said Roberta Byron-Lockwood, president and CEO of the Sullivan Catskills tourism bureau.

They're conjuring dreams of mountains and streams, rendering the Catskills as a hip, laid-back alternative to big city hustle and bustle, promoting trails over traffic to the Hamptons.

"The Catskills are the new Hamptons," Byron-Lockwood said. "That's how travel agencies and the public are discussing us."

Elsewhere locally, tourism revenues also rose, but less dramatically. Orange County's visitor spending grew 3.6 percent to $474.7 million in 2016 from $457.9 million in 2015, and Ulster County saw a 6 percent increase to $554.1 million from $532.7 million.

Between the beers, bands, biking, hiking, fishing and artsy activities, it's no secret why local visitor spending is up, said Orange County Tourism Director Susan Hawvermale.

"We have such a wide variety of attractions," Hawvermale said. "If you want the craft beverage trail, you can go to wineries, cideries and breweries. If you want history, we have so much of it, and if you want arts and culture, there are just so many places to go."

In Sullivan County, Sims Foster and Byron-Lockwood said residents have written a new tourism narrative. Out with the borscht belt resorts and boarding houses; in with the quaint and quirky, nature and nonconformists, fishing, foraging and farms.

Combined, the Fosters' four properties have 47 rooms. But each inn has no more than 14 rooms, and they represent different sides of Sullivan County.

The North Branch Inn is about relaxation and romance near old orchard land, with a small, ever-changing menu of hyper-local fare, veggie and herb gardens, craft ciders on tap, and lilacs, hydrangea and rhododendron galore.

Callicoon's 9 River Road inn, along the Delaware River, is about losing one's self in smalltown life along the river.

The Arnold House in Livingston Manor sates guests in a lively tavern full of pub food, and loud musical acts play in a big barn.

Eight miles east, the Fosters' newest inn, the nine-week-old DeBruce, is about fine dining with 10-course meals, hiking and fishing in the Willowemoc Creek.

"What's amazing to me is watching the area struggle for so long and trying to find its identity," Sims Foster said of Sullivan County. "Hope was lost by a generation" longing for tourism dollars, he added. But now those welcoming the Catskills' visitors are "focusing on the natural gifts of our area and communicating that story to our guests. And that's why we've been filling our rooms."

–daxelrod@th-record.com

Tourism impact

Sullivan County

	Visitor spending	Jobs	Local taxes generated
2015	$382.3M	4,561	$25.9M
2016	$419.2M	4,814	$28.1M

Orange County

	Visitor spending	Jobs	Local taxes generated
2015	$457.9M	9,299	$30.7M
2016	$474.7M	9,348	$32.1M

Ulster County

	Visitor spending	Jobs	Local taxes generated
2015	$532.7M	8,598	$36.2M
2016	$554.1M	8,825	$37.8M

CERTIFICATE OF SERVICE

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused the foregoing document to be served upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated on this 31st day of July, 2017.

/s/ *Rebecca J. Baldwin*
Rebecca J. Baldwin

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July 31, 2017

VIA ELECTRONIC FILING

Hon. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: Project No. 9690: Rio Hydroelectric Project
Project No. 10481: Mongaup Falls Hydroelectric Project,
Project No. 10482: Swinging Bridge Hydroelectric Project

COMMENTS ON PRE-APPLICATION DOCUMENT / STUDY REQUEST

Dear Secretary Bose:

On March 30, 2017, a Pre-Application Document ("PAD")[1] was filed by co-licensees Eagle Creek Hydro Power, LLC, Eagle Creek Water Resources, LLC, and Eagle Creek Land Resources, LLC (collectively referred to as "Eagle Creek Hydro") with the Federal Energy Regulatory Commission (the "Commission") seeking the relicensing of three existing hydroelectric projects: (1) Rio Hydroelectric Project (FERC No. 9690), (2) Mongaup Falls Hydroelectric Project (FERC No. 10481), and (3) Swinging Bridge Hydroelectric Project (FERC No. 10482) (collectively, the "Mongaup River Projects"). Pursuant to Part 5 of the Commission's regulations (18 CFR § 5.9) and Scoping Document 1, which was issued on May 30, 2017, the Swinging Bridge Property Owners' Association (the "SBPOA") hereby submits its comments on the PAD and the proposed scope of studies to be conducted in this Integrated Relicensing Proceeding ("ILP").[2] The SBPOA is an association of approximately 132 homeowners located on the Swinging Bridge Reservoir – the site of one of the three Mongaup River Projects – and, therefore, has a direct stake in the outcome of this proceeding.[3]

SBPOA Comment #1

[1] FERC Dockets P-10482, *et.al*: *Swinging Bridge Hydroelectric Project*, Pre-Application Document (Filed March 30, 2017).

[2] On July 27, 2017, the Commission's Division of Hydropower Licensing submitted nine (9) requests proposing studies substantially similar to the study proposed herein by the SBPOA. The SBPOA respectfully requests that any areas identified by the SBPOA as requiring analysis, and not included in the Division of Hydropower Licensing's proposals, be included in those studies.

[3] For further context, Swinging Bridge Reservoir is the largest and most heavily used public access body of water in the surrounding geographical area. The reservoir is accessible by two free public launches and two marinas, having launching, docking storage, lodging, and food services. Several hundred dwellings are either on the reservoir or on adjacent properties with reservoir rights. Accordingly, the Swinging Bridge Reservoir is an important economic and recreational asset to the area.

SBPOA Comment #1 cont.

Of utmost importance to the SBPOA is maintenance of adequate water levels on the Swinging Bridge Reservoir. The SBPOA's main focus in this ILP, therefore, is to ensure that minimum flows are set at a level that supports aquatic resources in, and recreational use of, the Mongaup and Delaware Rivers while at the same time avoiding depletion of the Swinging Bridge Reservoir during dry conditions, the impacts of which are shown in the adjacent images.





The SBPOA understands that various steps have been taken since issuance of the initial licenses for the Mongaup River Projects in 1992 to address and maintain adequate water levels in the Swinging Bridge Reservoir, one such step being Eagle Creek Hydro's development, in conjunction with the New York State Department of Environmental Conservation ("NYSDEC"), the Delaware River Basin Commission ("DRBC"), and the Delaware River Master, of the *Mongaup River Hydroelectric System Normal Conditions Operating Plan* (the "Operating Plan").[4] The Operating Plan contains, among other things, procedures for maintaining minimum flows in the Mongaup River while avoiding the depletion of reservoir storage during dry conditions. The SBPOA appreciates the drafters' development of the Operating Plan in an attempt to balance competing requirements. The Operating Plan is, however, restricted in what it can achieve because, as noted by its drafters, it is bound by the "operating requirements of the FERC licenses . . . ."[5] As such, change must start with modifications to the FERC licenses. In order to do so, new studies must be conducted and introduced into the record addressing minimum flows necessary to simultaneously support aquatic resources and reservoir water levels.

SBPOA Comment #2

Minimum flow releases were debated extensively when the original licenses were issued with flows between a minimum of 30 cubic feet per second ("cfs") and a maximum of 150 cfs being proposed. Initially, Commission Staff supported the minimum flow release of 30 cfs, as originally proposed by Orange and Rockland Utilities, as best promoting the public interest.[6] The minimum flow release of 30 cfs was considered optimal because it provided about 70% of

[4] Drought emergency rules were also developed and are contained in the *Mongaup River Hydroelectric System Drought Conditions Operating Plan*. *See* PAD Attachment D.
[5] Operating Plan, at 5.
[6] FERC Docket P-10482: *Order Issuing License* (April 14, 1992), at p. 5 (the "Swinging Bridge License") (Fred E. Springer, Director, Office of Hydropower Licensing, stated, "I conclude that, on balance, a 30-cfs minimum flow would be in the best public interest, because it would provide about 70 percent of the maximum WUA for adult brown trout, without affecting the creditable generating capability of the Swinging Bridge Project. A minimum flow greater than 30 cfs would provide more habitat, but the small increase in habitat and anticipated angler use wouldn't justify the disproportionately greater loss of power benefits.").

the maximum weighted usable area for adult brown trout habitat without affecting the generating capability of the Swinging Bridge Project. However, a minimum flow release of 60 cfs and a maximum of 100 cfs were ultimately placed in the license.[7] The data upon which these minimum flows were evaluated and determined is now almost 30 years old. As discussed further below, new studies must be conducted to evaluate whether minimum flow releases could be set at a lower level (*e.g.* 30 cfs) taking into consideration changes in climate, sediment, recreational usage, current adult brown trout statistics, *etc.*

SBPOA Comment #3

Eagle Creek Hydro, however, states that it does not intend to conduct any additional studies during the ILP. According to Eagle Creek Hydro:

> "Based on the robust nature of the study performed in support of issuing the Project's existing licenses, as well as the protection, mitigation, and enhancement (PM&E) measures associated with the Project's existing licenses, Eagle Creek believes that there is a sufficient amount of existing data for the majority of the resource areas to support the relicensing process.
>
> In support of the original licensing process, instream flow studies were performed in order to evaluate the potential impact of the Projects on aquatic resources associated with bypass and river reaches within the Basin. The studies focused on minimum stream flows and water quality, as well as the minimum flows needed to support the balance between downstream brown trout habitat with the resident warmwater species habitat, as well as recreation associated with the reservoirs (Stetson-Harza 1988). Based on the robust nature of the studies that were performed, Eagle Creek believes that these study efforts and results can be used in support of the pending relicensing proceedings."[8]

SBPOA Comment #3, cont...

The Commission should reject Eagle Creek Hydro's attempt to use 30 year old data.

With licenses issued in 1992, the Mongaup River Projects were among the first to receive an initial license under the 1986 Electric Consumers Protection Act amendment to the Federal Power Act and its corresponding regulations. Since that time, the ground conditions have changed, including recreational use patterns, significant deposits of sediment on the lake floor, land ownership and development, flora and fauna habitat, rainfall and climate patterns, as well as water quality and quantities available for competing uses, thereby rendering then-existing studies, such as the Stetson-Harza Mongaup River Instream Flow Study relied upon by Eagle Creek Hydro, completely outdated. Many sites and issues were not studied specifically during the previous licensing process and others that were considered need to be re-evaluated. In

SBPOA Comment #4

[7] *See* Swinging Bridge License, at p. 6-7, 60.
[8] PAD at 127.

addition, Eagle Creek Hydro has, or soon will, install multiple low-flow generators at the Mongaup Project. Numerous changes have been also made to the license, including the February 7, 2007 FERC Order that amended License Article 401 in association with the 2004 Recreational Usage Report required under License Article 408. Accordingly, pursuant to the Commission regulations (18 CFR § 5.9 [b]), the SBPOA respectfully requests that the Commission direct Eagle Creek Hydro prepare a new Flow Study.

SBPOA Comment #4, cont...

Request for Flow / Recreational Use Study

1. *Describe the goals and objectives of each study proposal and the information to be obtained*;

The purpose of this study is to examine the impact of the current minimum flow releases on water levels in the Swinging Bridge Reservoir and, if such minimum flow releases currently do not maintain adequate levels, whether they can be lowered to raise water levels during drought periods while maintaining adequate habitat for the adult brown trout.

Study goals include:

- Obtain information on changes and increases in recreational usage of the Swinging Bridge Reservoir by lakeshore residents and others outside the immediate area;
- Obtain information on changes to recreational usage of the Mongaup River;
- Obtain information on whether current minimum flow releases have maintained adequate water levels in the Swinging Bridge Reservoir for recreational purposes in all years since the initial license were issued for the months April through October;
- Obtain information on sediment deposits on bottom of Swinging Bridge Reservoir to determine if current minimum water levels still support recreational uses;
- Obtain information on current adult brown trout population;
- Obtain information on whether minimum flow levels could be reduced without materially impacting adult brown trout habitat and recreational usage of Mongaup River;
- Obtain information on the effect of low water levels on aquatic species within the Swinging Bridge Reservoir; and
- Obtain information that the impact of installed or planned low-flow generators will have on minimum flow releases and reservoir water levels.

SBPOA Comment #5

2. *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied*;

Not applicable.

3. *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*;

Requester is not a resource agency.

There are several public interest considerations in regard to the proposed study.

To bet promote the public interest, minimum flow releases, and associated minimum reservoir water levels, should be set at a rate that best balances recreational uses on the reservoir with other aquatic, terrestrial, recreation and land use, and aesthetic resources. In 1992, Commission Staff believed that a minimum flow release of 30 cfs best promoted the public interest. Significant changes to the area require taking a fresh look at minimum flow rates to determine whether current license requirements remain appropriate.

Public interest considerations should also include the impact that minimum flow releases have on electric output of the Mongaup River Projects. In an effort to reduce greenhouse gas emissions, the 2015 New York State Energy Plan and the New York State Public Service Commission's recently adopted Clean Energy Standard both call for 50% of New York's electric load to be produced by renewable resources, such as the Mongaup River Projects, by 2030. The negative impacts that higher minimum flow releases have on the projects' electric output and, in turn, New York's emissions reductions goals should also be considered in a public interest determination.

SBPOA Comment #5, cont...

In addition, New York Governor Andrew Cuomo recently announced the closure of Indian Point Nuclear Generating Units 1 and 2, located in southeastern New York, as are the Mongaup River Projects. Accordingly, decreased electric output from the projects should also be considered in light of southeastern New York's imminent loss of 1,000 megawatts of nuclear power and the inability to move power to this region from western New York because of transmission constraints.

4. *Describe existing information concerning the subject of the study proposal, and the need for additional information*;

According to Eagle Creek Hydro, the instream flow studies used in support of the original licensing process 30 years ago "can be used in support of the pending relicensing proceedings." However, as noted above, ground conditions have changed, significant sediment has accumulated, as well as changes in recreational use patterns, land ownership and development, flora and fauna habitat, rainfall and climate patterns, as well as water quality and quantities available for competing uses, thereby rendering existing studies, such as the Stetson-Harza Mongaup River Instream Flow Study from 1988, completely outdated. Indeed, maintaining current minimum water levels becomes completely irrelevant if accumulated sediment on the reservoir floor prohibits recreational boating. Considerable changes in population density in the area have also likely had an impact on recreational use. Updated studies must be conducted not only to evaluate whether initial projections were accurate but to reflect the aforementioned changes.

5. *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements*;

This study would provide new information regarding whether current minimum flow releases are set appropriately to maintain water levels in the Swinging Bridge Reservoir given numerous changes that have occurred over the last 30 years.

Eagle Creek Hydro, in conjunction with the NYSDEC, DRBC, and the Delaware River Master, recently developed the *Mongaup River Hydroelectric System Normal Conditions Operating Plan.* This plan, however, was based on current license minimum flow requirements and may not accurately reflect current conditions. FERC and the Eagle Creek Hydro should be aware of current conditions and the adequacy (or inadequacy) of the existing minimum flow requirements as this information will have a direct bearing on new license requirements.

SBPOA Comment #5, cont...

6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge*;

This type of study is routinely prepared in relicensing proceedings and sources and methods for gathering data are accepted by the Commission and the scientific community. Indeed, a similar study was accepted by the Commission in issuing the original licenses for the Mongaup River Projects. The SBPOA is merely asking that the same study be updated to reflect changes that have occurred in the last 30 years.

7. *Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.*

With respect to minimum flow release, this should be a desktop exercise for the licensee possibly including data from a new USGS flow meter installed at the head of the Swinging Bridge Reservoir.[9] As such, the cost would be relatively minimal. There are no alternative studies proposed that would meet information needs.

Cost for remaining components of the proposed study (*e.g.* sediment deposits and recreational usage) should also be minimal.

On July 27, 2017, the Commission's Division of Hydropower Licensing submitted nine (9) study requests that propose studies substantially similar to that of the SBPOA contained herein. In addition, if the Commission adopts of the study request of the National Park Service, filed on

[9] *See,* https://waterdata.usgs.gov/nwis/uv?cb_00065=on&cb_00060=on&format=gif_stats&period=7&site_no=01432900.

July 24, 2017, in this proceeding, much of the data compiled in that study could be used to complete the SBPOA's proposed study.

SBPOA Comment #5, cont...

The SBPOA appreciates the opportunity to comment on the PAD and Scoping Document 1 and to request additional studies. The SBPOA looks forward to working with Eagle Creek Hydroand other stakeholders during the ILP.

Respectfully submitted,

/s/ *Steven D. Wilson*

Steven D. Wilson

Attorney for Swinging Bridge Property Owners Association

cc: Ralph Cheney, President
Swinging Bridge Property Owners Association

ORIGINAL

P-10482-117

FILED
SECRETARY OF THE
COMMISSION

2017 JUL 31 P 3:51

FEDERAL ENERGY
REGULATORY COMMISSION

To whom it may concern,

This letter is in reference to the reservoir project #P-10482-117. My name is William J. Crumley of Smallwood N.Y. and I am with Friends of Toronto. I think Public access to Toronto reservoir is important to myself and my family for many reasons. Please enforce your federal licence with Eagle Creek now.

Thank you

William J. Crumley / 845-796-6385

W. Crumley
Comment #1

20170801-0100 FERC PDF (Unofficial) 07/31/2017

APPENDIX C
RESPONSE TO COMMENTS

Response to Comments on the Pre-Application Document, Scoping Document 1, and Study Requests
Prepared in Support of Relicensing the Mongaup River Hydroelectric Projects (P-9690, P-10481, P-10482)

Comment #	Comment	Response to Comment
June 20, 2017 – Delaware Tribe of Indians Comments on Archaeological Resources		
1	We ask that in the event a concentration of artifacts and/or in the unlikely event any human remains are accidentally unearthed during the project that all work is halted until a qualified archaeologist can evaluate the find and the Delaware Tribe of Indians is informed of the inadvertent discovery.	Comment noted.
June 22, 2017 – Andrew Boyar Comments on the Environmental Assessment		
1	THE MIN-FLOW IS INADEQUATE. Before the construction of these projects, nature did a better job of providing adequate stream flow. Now streams flow is artificially controlled. Complaints in the past that the brook has dried-up have not been responded to, so either: 1. "Min-flows" must be recalculated to prevent dewatering of this important Brook Trout Fishery, or 2. If "min-flows" are correctly calculated, they must be met and adhered to in order to prevent decimation of this fishery by dewatering.	Comment noted. With the potential exception of one maintenance activity, Eagle Creek is not aware of any time that the required minimum flows have not been provided or any time that brooks or creeks associated with the Projects have dried up.
2	These Projects must take into account all of the resources of the Project Area. I wish to speak up for the remarkable Brook Trout fishery in the public waters known as Black Lake Brook between Toronto Reservoir outlet and Cliff Lake and from Cliff Lake outlet to the Mongaup River. Current policies and practices put this Brook Trout population at risk. The threat to our New York State Fish, the Brook Trout, must be reviewed and reconsidered so that the drastic dewatering which has been occurring historically in the waters described herein is remedied as part of any relicensing requirements.	Comment noted.
June 28, 2017 – Consultation with the Delaware Tribe of Indians Regarding the Relicensing of the Mongaup River Projects (FERC memo)		
1	Susan stated that the Mongaup River is considered a significant waterway with the Delaware Tribe of Indians (Tribe) and was used historically as means of transportation over the many years the Tribe occupied the territory. Susan expressed that because there was no new construction or ground disturbing activities associated with the relicensing of the Mongaup Projects the Tribe would probably not have any concerns or issues at this time. However, she would like to have the opportunity to review any cultural resources documents or reports that may result from the relicensing.	Comment noted.
June 28, 2017 – Trout Unlimited (TU) Comments on the Relicensing of the Mongaup River Projects		
1	We believe that the resources of the applicant can be managed for improved benefit to the fishery with enhanced public recreational opportunities without undue burden on the applicant.	Comment directed to FERC noted.
2	This watershed and the chain of reservoirs, generating stations and the connecting river and feeder streams constitute remarkable trout habitat. As such, it has been a blue-ribbon Brown and Brook Trout fishery in the past. We have reports of dewatering issues, and dried up streams just when water releases are needed the most. Those problems can be cured with better management practices including aeration valves to increase oxygen content coupled with suitable minimum flow requirements that are consistently met. We have reports of total dewatering which are particularly devastating to the Brook Trout population below both Cliff Lake and Toronto Reservoir. We believe that particular attention should be paid to this Brook Trout habitat.	Comment noted; however, Eagle Creek is not aware of occurrences of dewatering any creeks or brooks associated with the Projects. In addition, Eagle Creek notes that the "blue-ribbon Brown and Brook trout fishery" associated with Black Lake Creek is likely the result of the presence of the Projects, as well as Eagle Creek's compliance with providing the required 10 cfs minimum flow below Toronto and Cliff Lake Dams. In addition, there is no indication for the need for aeration valves or other modifications to the existing release structures.
3	I direct your specific attention to 1 + miles of Black Lake Brook from Toronto Reservoir to Cliff Lake Reservoir and 1 + miles of Black Lake Brook from Cliff Lake Reservoir to the Mongaup River just below the Swinging Bridge Powerhouse. These combined 2+ miles constitute an amazing (but threatened) Brook Trout Fishery. (See attached highlighted location map.) This remarkable fishery merits an adequate "minimum-flow" (these sections require valve releases from both Toronto and Cliff Lake) to prevent the repeated dewatering which has been occurring.	Comment noted; however, Eagle Creek is not aware of occurrences of dewatering any creeks or brooks associated with the Projects.
4	THE MIN-FLOW IS INADEQUATE. Before the construction of these projects, nature did a better job of providing adequate stream flow. Now stream flow is artificially controlled. Complaints in the past that the brook has dried-up have not resolved the problem, so either: 1. "Min-flows" must be recalculated to prevent dewatering of this important Brook Trout Fishery, or 2. If "min-flows" are correctly calculated, they must be met and adhered to in order to prevent decimation of this fishery by Dewatering. Also, installation of aeration valves at both of these impoundments would improve the overall health of the Black Lake Brook.	Comment noted; however, given the natural hydrology of the watershed and the ability of the reservoirs, which were constructed between 1923 and 1939, to provide a flow into Black Lake Creek during drier periods, Eagle Creek questions the statement that "nature did a better job of providing adequate streamflow."

Comment #	Comment	Response to Comment
5	We also want to comment on the fishery of the Mongaup System generally. This system is contiguous to NY State Public access areas and there are a number of roads abutting the "Mongaup". Certainly, field conditions exist that would address the need for: 1. Enhanced access and 2. Handicapped access. We would like to see more small car parking areas (pull offs) throughout the system. Now in place is a '2' car parking area at Akerson Road. This is a good working example, but even this example begs the question if 4-6 car parking wouldn't be even better. This parking area is below Rio Powerhouse. The Akerson Road parking area is a good example of a cost effective way to provide enhanced access to the fishery. (see photo attached) We urge that more access areas like the one pictured are warranted because: 1. Small capital investment (a sign is sometimes all that is needed and many access roads, public and private are already in place) and 2. More small parking access areas will spread out fishing pressure making for a better fishing experience. 3. This recreational fishing opportunity needs to be made compliant with The Americans with Disabilities Act by installing and providing handicapped Access. One of Trout Unlimited's initiatives is to provide veterans with opportunities to fish and a number of our veterans have mobility issues that suitable handicap access would address. We want to do more work with veterans and better access to waters which heal is an initiative that everyone can support.	Comment directed to FERC noted.
6	These Projects must take into account all of the resources of the Project Area. We believe that a hard look must be given to the remarkable Brook Trout fishery in the public waters known as Black Lake Brook between Toronto Reservoir outlet and Cliff Lake and from Cliff Lake outlet to the Mongaup River. Current policies and practices can be improved with a better minimum flow and an aeration valve for releases. The threat to our New York State Fish, the Brook Trout, must be reviewed and reconsidered so that the drastic dewatering which has been occurring historically in these waters is remedied as part of any relicensing requirements. The relicensing review offers an opportunity to provide the public with greater access to a remarkable fishery via installation of handicap access and increased pocket-parking areas. These objectives can be accomplished without heavy capital costs and the investment required would vastly improve the project generally.	Comment directed to FERC noted; however, Eagle Creek is not aware of occurrences of the downstream dewatering noted in the comment.
July 1, 2017 – Myron B Rock Comments on the Toronto Reservoir		
1	Toronto East Access Recreational Site is important to my family for the past 40 years that I have been living in the Town of Bethel. We support Eagle Creek's Pre-Application Document's statement that swimming will not be prohibited but not encouraged. We cannot permit developers or local homeowners to keep the public out of the area that is a public recreational area under FERC authority.	Comment directed to FERC noted.
July 2, 2017 – Lynne Furmigli Comments on the Toronto Reservoir		
1	I am writing to urge you to enforce the federal license with Eagle Creek. Public Access to the Toronto Reservoir must be maintained…Please preserve public access to this area so future generations can also learn to skip rocks across the surface of this water. (i.e., Commenter provided narrative of her historical use and enjoyment of the Toronto Reservoir recreation site and wants access to remain public).	Comment directed to FERC noted.
July 5, 2017 – Joyce Caracci Comments on the Toronto Reservoir		
1	As a supporter of "THE FRIENDS of TORONTO," I urge you to support public access to this beautiful reservoir. As a Federal area, please preserve the Toronto Reservoir for the public and for the Brook Trout who seem to be dwindling in number.	Comment directed to FERC noted.

Comment #	Comment	Response to Comment
2	Additionally, I suggest that the access road be made more, "ACCESSIBLE" and the "PRIVATE PROPERTY" signs erected by Eagle Creek be placed elsewhere. The public, especially people in the community have a right to access the road. Thank you for listening to the PUBLIC!!!	Comment directed to FERC noted; however, Eagle Creek notes that these signs were erected by a third party and not under the direction of Eagle Creek.
July 7, 2017 – Robert Vasta Comments on the Toronto Reservoir		
1	FERC needs to enforce its federal license with Eagle Creek, and keep the public access available.	Comment directed to FERC noted.
July 8, 2017 – Elizabeth Aviles Comments on the Toronto Reservoir		
1	I am writing in hopes of reaching someone who can help with what's going on at the Toronto Reservoir. It would be greatly appreciated if Eagle Creek would keep the public access open so that my family can continue to enjoy the area as it has for years before the new homes were built. I don't think the area should be limited to the wealthy only. Actually, I believe it better serves those who are on the lower end of the financial income population. Look at Governor Christie, is that what we want this world to come to. The beaches were all closed and yet his family was on the beach all by themselves. This was disgraceful and unjust. As a Friend of Toronto, I ask that the area be kept public.	Comment directed to FERC noted.
July 8, 2017 – Piera Pierucci Comments on the Toronto Reservoir		
1	My husband and I belong to The Friends of Toronto. Our family has been using the Toronto Reservoir area for hunting, fishing, etc. as a tradition for decades prior to these upper class homes being built along the shores of the reservoir. It isn't fair, that the few owner's of these homes have sole use to the area. Toronto Reservoir should be available to everyone as it always has been. FERC needs to enforce its federal license with Eagle Creek Now! I want to continue to share this lovely area with my grandchildren.	Comment directed to FERC noted.
July 8, 2017 – Kenneth Steinglass Comments on the Toronto Reservoir		
1	The recreational use of the Toronto Reservoir is an invaluable asset to our residential and vacation communities. I do not own property on the reservoir, but ramp access and adequate water levels are critical to the enjoyment of hundreds of families, to the beauty of this region and to the welfare of our fish, animal and bird (including bald eagle) populations. Over my many years in the community, it has become very clear to me that the difference of just a few feet of water level has an enormous impact on the shoreline, accessibility and recreational use of this precious resource. I respectfully request that FERC and Eagle Creek Renewable Energy, LLC recognize these concerns and arrive at a licensing agreement that addresses these issues.	Comment directed to FERC noted.
July 9, 2017 – Ena Pearl Comments on the Toronto Reservoir		
1	Public access to Toronto Reservoir is very important to me and my family. It is part of the reason I live here - the swimming and kayaking. Please enforce FERC's federal license with Eagle Creek now.	Comment directed to FERC noted.
July 12, 2017 – Nicholas LaHowchic Comments on the PAD		
1	**Water Levels** - Both the Toronto and Swinging Bridge Reservoirs (see Section 5.8.2) should be managed to equivalent water level guidelines during June 1st through September 30th of between the existing 99.35% and 99.07% of full elevations (1,220 feet for Toronto and 1070 feet for Swinging Bridge). The rationale which guides this recommendation comes from the 2015 FERC Form 80 which stated that the Toronto Reservoir utilizes 42% of its designed capacity recreation day level or 8.4 times that of the designed capacity recreation day level of Swinging Bridge Reservoir. Toronto Reservoir is noted to be more utilized than Swinging Bridge which is only utilized 5% of its designed recreational day level capacity. [See attached for more detail]	Comment directed to FERC noted.
2	**Aesthetic Resources** - The Aesthetic Resources (see Section 5.9) presentation should be revised in paragraph three to correct their write-up to state that BOTH the Toronto and Swinging Bridge Reservoirs have a majority of lands abutting this part of the Project owned by private residential lots or private associations (for Toronto approx. 99%, for Swinging Bridge approx. 80%). Cliff Lake, Mongaup Falls and Rio ONLY have the majority of lands abutting the balance of the Project owned by Eagle Creek or the NYSDEC, or have established conservation easement. [See attached for more detail]	Comment noted.

Response to Comments on the Pre-Application Document, Scoping Document 1, and Study Requests
Prepared in Support of Relicensing the Mongaup River Hydroelectric Projects (P-9690, P-10481, P-10482)

Comment #	Comment	Response to Comment
3	**Mongaup River Hydroelectric System Normal Conditions Operating Plan** - (see Page 10-13) There is a need to bring the Toronto and Swinging Bridge Reservoirs into tighter water level control to achieve the summer recreational requirements of highly utilized reservoirs for the surrounding towns and communities. The full elevation heights of all dams and spillways need to be reviewed and assessed based on known mentioned levels of maximum safe overflow that surpass spillways and existing flash board heights to ascertain with enhancements the maximum water levels that can be stored and managed in a synchronized manner to achieve both operational and other environment requirements. Additionally the rule that minimum out flow from Swinging Bridge and downstream reservoirs should be revised to be no greater than the natural stream system inbound flow when the inbound flow is less than 100 cfs while meeting operational efficiencies or drought/emergency targets. We should not be creating artificial outbound flows of the rivers or streams without serious rationale being considered that would override safe storage of water for power and recreation, the prime reasons for the water system. [see attached for more detail]	Eagle Creek is proposing to conduct a number of studies that will assess the impacts of minimum flows, and reservoir elevations and fluctuations.
4	**Socioeconomic Resources** - The paragraph on Sullivan County needs to be revised as it misses much of the recent relevant investment and growth activity in the county. Sullivan County (see Section 5.11) has been and is again becoming a major vacation destination during the summer and other months (no different from the Hamptons in Long Island, the seashore in New Jersey or Candlewood Lake, CN) besides being a growing rural community. The statistics used in this area do not seem to recognize the documented recent and planned future increases in summer population, tourism and new 2nd vacation homeowners (non-voting residents) within a 15 mile radius of Toronto and Swinging Bridge Reservoirs which now exist or are currently under construction in the area. [see attached for more detail]	Comment noted.
5	**Land Use Management** - Shoreline management guidelines (see Section 5.8.9) should be revised to allow resident abutting landowners on Toronto and Swinging Bridge Reservoirs, by permit and approval of Eagle Creek and at homeowner cost, periodically during low water levels to be able to modify the grade and finish of their adjacent shorelines to increase the useful use of the shoreline for boating and bathing within the boundaries of the two reservoirs during the summer months. No shoreline land should be removed from the reservoirs only relocated within the reservoir to improve shoreline access.	Eagle Creek is proposing to conduct a shoreline management assessment as described in the Proposed Study Plan.
6	**1. Water Levels** - The Orange & Rockland Energy Company and future owners since 1990 FERC approval must/should have been planning for changes to the Toronto Reservoir similar to the Swing Bridge Reservoir for recreation, boating, fishing, bathing and tighter water level guidelines and commitments given some of the known activities. a. In 1990 the property surrounding the Toronto Reservoir was largely undeveloped and mostly owned by Orange & Rockland at the time, the Iroquois Hunting & Fishing Club and a few residential homeowners. b. In 1999 Orange & Rockland sold much of the property, lakeside and otherwise to a residential home developer and builder for profit who, from the beginning, had the intention to subdivide the property, lakeside and otherwise, into 5 acre residential home lots for sale to the general public. Thereafter approximately 400 new home lots were defined around the Toronto Reservoir with today approximately 100 new homes occupy lakeside lots, numerous lots sold pending home building and additional other lots for sale around or near the reservoir. c. As of today approximately 77% of the Toronto Reservoir shoreline abuts to residential lots with the balance of 23% owned by the Iroquois H&F Club, most of which still undeveloped but for a number of lakeside member homes. Additionally town residents from Bethel, Smallwood and other close towns have been increasing their use of the reservoir in all the ways mentioned above as witnessed not only by the activity on the reservoir (42% of the designed capacity recreation days for Toronto) but by the public litigation that transpired to keep the Toronto Dam public access open for the various town residents. d. In 2012 the current owner of the energy company, Eagle Creek, completed their due diligence prior to their purchase of the prior owner. In their due diligence for the purchase they should have found the historical records of the prior owner's sale of the adjacent land abutting the Toronto Reservoir to a residential home developer. Based on their broad experience in the water energy business as well as the requirements existing for water recreation on the Swinging Bridge Reservoir they understand that would require changing requirements to Toronto to be similar to Swinging Bridge and the need to reassess the entire system for it to operate differently to achieve its operating goals and requirements. They should have known that Toronto, like Swinging Bridge Reservoir which had numerous residential	Comment noted. Eagle Creek is proposing to conduct studies that will assess minimum flows, and reservoir elevations and fluctuations as described in the Proposed Study Plan.

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	homes on and near the reservoir, would need to have the same recreation and pleasure considerations, which included more stable water levels during summer months, higher average water levels to support the fish population for recreation, etc. i. Some of the items that could be made to be very similar to Swinging Bridges Reservoir guidelines include; 1. Maintaining a maximum drawdown of 97.9% of Toronto's full elevation or 26 feet below 1,220 feet elevation or 1,194 feet. 2. Like Swinging Bridge target to maintain between 99.35% of full elevation on June 1st every year or 1,212 feet to 99.07% by September 30th or 1,209 feet unless there is a declared drought or other emergency. 3. Like Swinging Bridge Reservoir invest in better controlling Obermeyer and vertical gates on the Toronto spillway. 4.	
7	**2. Aesthetic Resources -** There are two fundamentally different types of reservoirs in the Mongaup River Hydro system - those that are heavily populated by home residents' lakeside, adjacent home owners and populated adjourning towns and those that are abutted and surrounded by basically undeveloped forest. This was known when Eagle Creek examined and then purchased the water energy company. a. Their deep experience in this type of business and due diligence examination would have told them many of the deficiencies that existed in the new company they were about to purchase which would have included the useful life and efficacy of all the equipment and what changing requirements were needed because of their method of operating as well as expected change from the FERC 1990 approved license based on changes over the last 30 years and over the next 30 years to the environment effected by and effecting their business model. b. Managing a five reservoir system with known constraints is what this and similar systems have been for some time. The 1990 FERC license describes one that in 1989 was examined, surveyed, studied and made operational nearly 30 years ago to meet the requirements of that time coming forward. What is needed in the Eagle Creek PAD is a reassessment of all needed capabilities and constraints based on the today's and some part of the next 30 years of their new license grounded in the realities of today's technology, environment and known constraints approved operation. c. The need to more fully utilize the Toronto and Swinging Bridge Reservoirs different for recreation and energy as noted in number 1, above. d. The need to revise the capabilities of Cliff Lake, Mongaup Falls and Rio, the reservoirs with mostly undeveloped abutting and surrounding property. Based on the operating statistics presented in the PAD all three of these reservoirs with vertical gate or flash board enhancements could hold continually a significant increase in water level. 1. Cliff Lake based on some of the statistics presented can be managed to a capacity higher than its current 13" flash boards, could be drawn down lower than 23.1 feet, could have a different higher holding elevation than Swinging Bridge if the control gates between the two were actively managed. 2. On Mongaup Falls Reservoir there is mention that while the full elevation of the spill way is 935 feet that during major reservoir accumulation water crosses the spillway at 942.2 feet. Could not the elevation of the reservoir be raised by some kind of automated gates and/or flash boards above the spillway greater than the 4'10" current flashboards to 8-10 feet? 3. On the Rio Reservoir there is mention that while the full elevation of the spillway is 815 feet that during major reservoir accumulation water crosses the spillway at 825 feet. As a spillway dam could the 5 foot flash board be increased in height, automated with vertical gates to average higher mean water levels? 4. With the 3 above listed reservoirs being located in undeveloped areas with little or no housing or commercial development, only limited access facilities for fishing and boating could not the levels of water be enhanced to better control the total water system needs for recreation, energy and downstream flow matching nature's inflow or when needed for defined purposes secondary outflow needs?	Comment noted. Eagle Creek is proposing to conduct studies that will assess minimum flows, and reservoir elevations and fluctuations as described in the Proposed Study Plan.

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8	**3.** Mongaup River Hydroelectric System Normal Conditions Operating Plan - See Number 2, above.	Comment noted. Eagle Creek is proposing to conduct studies that will assess minimum flows, and reservoir elevations and fluctuations as described in the Proposed Study Plan.
9	**4. Socioeconomic Resources -** The review of recent and current changes and planned changes to Sullivan County have the potential to remake the area a rediscovered tourist and vacation center. a. The Center for Discovery in Harris, NY has continued to expand bringing more employees and families of disabled children and adults to Sullivan County. b. Bethel Woods Center for the Arts in Bethel, NY opened in 2006 which is only three –five miles from the Toronto - Swinging Bridge Reservoirs has brought hundreds of thousands of new tourists and vacationers to Sullivan County to attend concerts, visit the museum or have their children participate in education programs. c. Monticello Motor Club, Monticello, NY opened in 2008 as a private country club for automotive enthusiasts with a 4.1 mile long motor racing which has over 440 individuals with family members who visit or live part-time in the greater Monticello area d. EPR, Inc. the REIT is in Thompson, NY establishing the destination property formally on the old Concorde Resort land (some 6-8 miles from the Toronto - Swinging Bridge Reservoirs) which is currently under construction. Over $1.2 billion is being invested to complete over seven hundred hotel/lodge rooms, an indoor water park, and reconstructed U.S. Open quality golf course and new golf club house. e. The Veria Lifestyle in Thompson, NY located on the old Kutchers land is currently building a new 131 room Wellness Center Hotel and Spa with a reconstructed 18 hole golf course. f. At Chapin Estate, Bethel, NY a gated 2,500 acre development of 5-15 acre residential lot community is with a new development partner re-launching the final build out of all residential lots throughout the Chapin Estate property for resident members and guests. Additionally hundreds of residential lots are located lakeside or off lake on both Toronto and Swinging Bridge Reservoirs. This is of course an in process list for 2017-2018 which could more than likely increase the recreational use of both Toronto and Swing Bridge Reservoirs by many new multi-town residents and vacationers during the summer months as well as throughout the year . We should be studying the best practical scenario for the foreseeable future and planning for more active use of the two recreational reservoirs, Toronto and Swinging Bridge over the next 30 years under license. Again this request is well within the boundaries and calls for improvements for the enjoyable use of both recreational reservoirs. I am requesting broad benchmarking from other water energy systems to see how regulations from other water systems could improve our communities' use of all the five reservoirs.	Comment noted. Eagle Creek is proposing to conduct studies that will assess minimum flows, and reservoir elevations and fluctuations as described in the Proposed Study Plan.
July 12, 2017 – Oksana Tatis Comments on the Toronto Reservoir		
1	Many residents of Bethel were extremely disappointed and heartbroken to find out that there are people who are trying to take the reservoir away from us. When all of the drama began between Chapin Estates, FERC, and Bethel residents, we were harassed and kicked out of the boat launch by a hired "security guard", photographed without our consent, as well as disrespected by the man who owns the house next to the boat launch by Smallwood. If people were trespassing on private property, the kind of treatment mentioned above might be warranted, however the Toronto Reservoir is public property, and so are the roads that leads to it, therefore the sense of entitlement coming from certain Chapin Estate homeowners as well as Steve Dubrovsky is unfounded.	Comment directed to FERC noted.
2	Please take a moment to consider the fact that Chapin Estates did not exist 16 years ago. And although the land that Chapin occupies is private, the water and shoreline is not. Let us be realistic; most, if not all of the Chapin Estate homeowners are not year-round residents. Is it fair that Toronto Reservoir be closed off to people who have enjoyed it all their lives, through all the seasons? Does it make sense that Toronto Reservoir be made available only to those who enjoy it over the weekends during a 2 month period out of the entire year? Is this really going to be another example of how the affluent get to hoard natural	Comment directed to FERC noted.

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	resources for themselves while people who are less fortunate lose yet another source of natural beauty that offers peace of mind, tranquility, and improved quality of life? I have a brother with autism who has a hard time being in crowded places. Often times White Lake, Lake Superior, and Smallwood Lake, are simply not the best options for my brother. My family has been taking him to Toronto to get some exercise and sun for almost two decades! Where will people like my brother be able to find peace and quiet? What about hard workers who want to dip their feet in the water after a long day? Toronto Reservoir means so much to the people of Bethel. It would be a great tragedy if it were taken away from us by people who will not utilize the reservoir nearly as much as Bethel residents already have for years. Please sympathize with the residents of Bethel, New York... Toronto reservoir is one of the few gems left for us to enjoy freely.	
July 17, 2017 - Nicholas LaHowchic Additional Comments on the PAD		
1	Socioeconomic Resources – Needs updating w/summertime population.	Comment noted.
July 17, 2017 - The Town of Bethel Comments on SD1		
1	The constant mandated releases of water from Swinging Bridge Reservoir and the resultant releases from Toronto Reservoir have resulted in a continual negative effect on the recreational use of these lakes. The increase in frequent periods of drought has exacerbated the problem. The Bethel Town Board urges the Commission to consider the public's right to meaningful recreational access when evaluating the mandated releases.	Comment directed to FERC noted.
2	Adequate water levels are also important to the area economy. Optimal water levels promote a healthy community, tourism and home ownership and thereby contribute to the economy through spending at local restaurants, shops, gas stations etc., and also by providing a stronger property tax base.	Comment directed to FERC noted.
3	On behalf of the Bethel Town Board, I additionally respectfully request the following actions: That it is ensured that the public have meaningful access to the Toronto East Access for recreational purposes. Consistent with this Commission's previous findings, said recreational access shall not prohibit swimming.	Comment directed to FERC noted.
4	That it is ensured that the Toronto East Access be open to the public from dawn to dusk.	Comment directed to FERC noted.
5	That it be ensured that the access road to the Toronto East Access be maintained and kept in a fashion that allows for the public to have meaningful use of the Toronto East Access for recreational purposes.	Comment directed to FERC noted.
6	And that it be ensured that water levels in the reservoir be maintained at a level that allow for the public to have meaningful use of the Toronto East Access for recreational purposes.	Comment directed to FERC noted.
7	The Town Board also encourages the Commission to consider handicapped accessible improvements.	Comment directed to FERC noted.
July 18, 2017 – The Town of Bethel Resubmits the Pre-Application Document Questionnaire		
1	The Town of Bethel Town Board would like to ensure that all existing recreational and land use requirements specifically for the Swinging Bridge FERC No. 10482 are upheld in the relicensing.	Comment directed to FERC noted.
July 18, 2017 – Iroquois Hunting and Fishing Club Inc. Comments on the PAD and Study Requests		
1	This letter transmits our request, in the context of the opportunity afforded the public under the FERC process for relicensing, to propose examinations and studies for impacts to the reservoir, the surrounding area and the community. We are requesting that Eagle Creek, through FERC, perform a number of studies and evaluations of the reservoir and the impact changing and lowered water level(s) may have on environmental and ecological condition, flora and fauna health and diversity, ecological health, and recreational opportunity impacted by the operation of the Reservoir under the requested FERC license renewal.	Comment noted and addressed in PSP discussion.
2	Accordingly we request the following investigations be conducted to thoroughly evaluate the potential for damage and harm to the reservoir environment and the effect on recreational opportunities. Specifically we request: 1. Geology Study: Investigation and examination to identify unique or sensitive physical features on the reservoir and land adjacent to it.	Comment noted and addressed in PSP discussion.
3	2. Water resources and wetlands resources study: Describe the surface water, ground water and wetlands resources on the site and adjacent area of the Reservoir. Include state classification or designations placed on these resources as part of New York State environmental Law to reflect the best use, relative importance within the ecosystem or the function or value of the resource. Also include any special designation to these areas established as part of the local regional or Statewide planning efforts conducted by the Sullivan County Planning Department, the New York State Department of State, the New York State Department of Environmental Conservation, Sullivan County and or the Town of Bethel.	Comment noted and addressed in PSP discussion.

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4	3. Terrestrial and Aquatic Ecology : a. Describe the water surface environs on the site and the general reservoir area. b. Describe the terrestrial vegetation and aquatic vegetation (type, diversity, dominance, rare, threatened, endangered (local, NYS and Federal), etc.) within and around the general reservoir area. c. Describe and characterize the fauna, including all birds, insects, and mammals etc., which use the site or are in close proximity to the site. Describe and characterize the fauna which use the reservoir and surrounding area for feeding, nesting, roosting or resting throughout the year. d. Demonstrate compliance of the activity with the Federal Bald Eagle Guidelines. A discussion should also be included regarding the need for a taking permit pursuant to 6 NYCRR 182. e. Describe and characterize throughout the spring and summer months, the aquatic organisms (type, distribution, dominance, rare, endangered, threatened, etc.) found in the near shore area at the reservoir. Describe and characterize throughout the spring and summer months, the aquatic organisms (type, site, dominance, rare, endangered etc.) found in the near shore area at the project site. This should include fish, reptiles and amphibians. If no data for this area exists, then sampling collection for this area will be required. Consider seasonal use patterns and the relative importance of these habitats to individual species, the project area and its environs and population level. f. Specifically for Fish and reservoir-residing creatures: A comprehensive survey of fish species and benthic micro and macro invertebrates, pollution and eco-system health should be conducted during the range of seasons to include spawning season and periods of varying water levels. Surveying should be conducted across the span of the seasons to insure seasonal affects are understood and recorded. Include spawning season for all game and forage fish species. The examination should be performed in a comprehensive manner to include shallow areas of the Lake both developed and undeveloped areas and deeper water sections, including the area near and adjacent to the Dam and Dam tower. If advisable, non-lethal methods such as electrofishing could be performed. Through the capture of fish, the biological health and potential benefits of the Lake for aquatic species can be determined. g. Water quality: A comprehensive study of the water quality on a seasonal basis to examine the impact of varying water levels on water quality and the impact of changes if any on flora and fauna diversity and abundance. This study should include examination of turbidity and its impact on rooted aquatic plants using a Secchi Disk. h. A comprehensive study of the impact of water level changes, frequency and rate of water level changes on fish mortality and reproduction associated the past practices of the reservoir and anticipated future use of the reservoir for energy generation purposes.	Comment noted and addressed in PSP discussion.
5	4. Water and Surface Navigability: Provide a detailed evaluation of the existing water surface use patterns in the near-shore area of the proposed project. Include types and sizes of boats, sailing vessels, and personal watercraft using the water in the project area. Identify and describe general patterns of boat traffic flow.	Comment noted and addressed in PSP discussion.
6	5. Aesthetic Resources. Describe scenic views known to be of importance or value to the area residents. Photographs of the site and its environs should be incorporated into this section.	Comment noted and addressed in PSP discussion.
7	6. Potential Significant Environmental Impacts and Mitigation. Identify and describe short-term, long-term, cumulative and other associated environmental impacts and issues as identified herein. With the description of the environmental setting as a basis for comparison, the description of the impacts will include both a quantitative and qualitative assessment of the potential for the impact to occur and the magnitude and importance of the impact. The time frame in which the impact is anticipated will also be identified. Identify adverse impacts from all aspects of the project, temporary or permanent in nature. If beneficial impacts are identified, describe them in a similar manner. This section will also identify all proposed mitigation to reduce or eliminate the potential adverse impacts. For example, the impact to the fishery and anticipated recovery timeframe.	Comment noted and addressed in PSP discussion.

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	July 22, 2017 – C. Maher Comments on the Toronto Reservoir	
1	As Eagle Creek prepares to renew its federal license, we Friends of Toronto ask you to enforce the current license agreement, keeping the public access of Toronto Reservoir including fishing, boating, and swimming, so that our grandchildren, great grandchildren and beyond could enjoy what my family has enjoyed for the past 75 years.	Comment directed to FERC noted.
	July 24, 2017 – R.C. Comments on the Toronto Reservoir	
1	Please continue public access, as has been the case in my life here for 70 years. We all want FERC to enforce the terms of its federal license to Eagle Creek.	Comment directed to FERC noted.
	July 24, 2017 – NPS Comments on the PAD and Study Requests	
1	N**PS Units Potentially Affected by the Relicensing** The project impact area, or the area in which NPS units are potentially affected by this relicensing, includes an area much larger than the "Project Area" delineated by the applicant, which focuses solely on an area within the Mongaup River Watershed. This larger area of considerations includes sections of the Delaware River upstream and downstream of the Mongaup River due to existing rules governing flow management for the Delaware Basin established by the Amended 1954 Supreme Court Decree (https://water.usgs.gov/osw/odrm/decree.html). As such, the NPS' position is the Project Area includes several National Wild and Scenic River System segments established by Congress between 1965 and 2000. These include the lower 5200 feet of the Mongaup River within the designated boundary of the Upper Delaware Scenic and Recreational River https://www.nps.gov/upde/index.htm, as well as extensive reaches of the Delaware River upstream and downstream of the Mongaup River. These reaches include the 73.4 miles of the main stem Delaware River, 69 miles of which are above the Mongaup River, and 4.4 miles of which are below. This section of the Delaware forms the New York-Pennsylvania border from River Mile 330.1 to River Mile 256.7. Portions of the Delaware River further downstream include the Middle Delaware National Scenic and Recreational River, which flows through Delaware Water Gap National Recreation Area (DEWA) which constitutes the New Jersey-Pennsylvania border and extends from River Mile 250 to River Mile 210, (https://www.nps.gov/dewa/index.htm), in addition to the Lower Delaware National Wild And Scenic River (LODE) (https://www.nps.gov/lode/index.htm), which includes 38.9 miles of the Delaware River which forms the Pennsylvania and New Jersey border. This entire project impact area may potentially be impacted by flow releases from the Mongaup River system upstream and downstream of the Mongaup River due to water management mandates established in the Amended 1954 Supreme Court Decree. Releases from the Mongaup River system count towards the USGS Montague Gage flow target, and the resulting ramifications of hydropower and recreational water releases have potential adverse impacts on the rest of the system. Releases from the Mongaup River are factored into compensating water releases from New York City reservoirs on the East and West Branches of the Delaware River directed by the USGS Office of the Delaware River Master (https://water.usgs.gov/osw/odrm/) in this office's daily design, and more water from the Mongaup often means less water from upriver reservoirs, on short if any notice to recreational and other users.	Comment noted.
2	**NPS' Wild and Scenic Rivers Responsibilities** In 1968, Congress passed the Wild and Scenic Rivers Act (WSRA) which "declared to be the policy of the United States that certain selected rivers of the Nation, which with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." https://www.rivers.gov/wsr-act.php Each designated river in the national system is managed in a way that protects and enhances the values that prompted its designation. In 1978, Congress designated the Upper Delaware River as a component of the National Wild and Scenic River system, and thus as a unit of the National Park System. This and the other Delaware River designations are administered by the National Park Service. The Upper Delaware Scenic and Recreational River (UPDE) is a partnership river, managed in collaboration with the Upper Delaware Council (UDC) http://www.upperdelawarecouncil.org/ which is made up of	Comment noted.

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	representatives from UDC member Pennsylvania Townships and New York Towns bordering the river. The 55,575 acre Upper Delaware Scenic and Recreational River Corridor ridgetop to ridgetop boundary, approximately 1/4 to 1/2 mile inland from either river bank, was established to meet the resource protection requirements of the Wild and Scenic Rivers Act. The land area within this boundary is mostly privately-owned; the National Park Service owns a total of 31 acres within the corridor. As the longest and one of the cleanest free-flowing (undammed) rivers in the eastern United States, the Delaware maintains high water quality, ecological integrity, cultural, geological, recreational, and scenic values that are exceptional among the large river systems in this region. The NPS has responsibility for implementing section 7 of the Wild and Scenic Rivers Act (WSRA 16 USC 1278 Section 7(a)) which provides that each river designated into the NWSRS with permanent protection from federally licensed or assisted dams, diversions, channelization or other water resources projects that would have a direct and adverse effect on its free-flowing condition, water quality, or "outstandingly remarkable values"; or, *for projects upstream, downstream, or on a tributary to the designated segments, that would invade or unreasonably diminish the segment's fish and wildlife, scenic, or recreational resources* (Interagency Wild and Scenic Rivers Coordinating Council, 2004). Outstandingly Remarkable Values (ORVs) are defined by the Wild and Scenic Rivers Act as the characteristics that make a river worthy of special protection. At UPDE, DEWA, and LODE, identified ORVs include the free-flowing condition, water quality, cultural, ecological, geological, recreational, and scenic resources and values. These are described in detail in the Delaware River Basin Wild and Scenic Values report (NPS 2012a) and the Delaware River Basin Wild and Scenic Values Workshop report (NPS 2012b). The NPS Statement of Interest (Attached as Appendix A) considers the potential effects of the Mongaup River Hydropower Relicensing Project located on this tributary to UPDE, and to additional Wild and Scenic River designations upstream and downstream of the Mongaup under the invade or unreasonably diminish standard. The ORVs which may be considered under this standard include potential impacts to the Delaware River's free-flowing condition, and its water quality, scenic, recreational, and fish and wildlife resources and values. The Mongaup River is the 2nd largest tributary to the Delaware River within UPDE, and based upon the watershed area, and contributes on average 15% of the flow volume of the Delaware River where it enters at River Mile 261.1. Under some release regimes (approximately 970 cfs maximum discharge), the Mongaup River may contribute over 55% of the flow volume (1750 cfs) at the USGS Montague Gage at River Mile 247.	
3	**Current Relicensing Study and Information Needs** Although, as the applicant states in their PAD, these projects were among the first to receive an initial license under ECPA and its regulations, 30 years have passed since that time. The ground conditions have changed, including recreational use patterns, land ownership and development, flora and fauna habitat, rainfall and climate patterns, as well as water quality and quantities available for competing uses. Many sites and issues were not studied specifically during the previous process and others that were considered need to be re-evaluated. Numerous changes have been made to the license, including the February 7, 2007 FERC Order that amended License Article 401 in association with the 2004 Recreational Usage Report required under License Article 408. These releases have resulted in changing conditions in the Delaware River. The NPS requests that the applicant prepare a Recreational Use and Needs Assessment Study based on the Study Plan Criteria found in FERC's Regulations, 18 CFR Section 5.9(b).	Eagle Creek is proposing to conduct studies that assess the Projects' impacts on a variety of resources, including recreation, fisheries, wildlife, and water quality and quantity as described in the Proposed Study Plan.
4	**Recreation Site Inventory, Use, and Needs Assessment** 1. *Describe the goals and objectives of each study proposal and the information to be obtained*; The purpose of this study is to identify and study the quantity, quality, and adequacy of the land-based recreational facilities associated with and in close proximity to the existing impoundments with public access, including Toronto and Swinging Bridge, and the project area. (Please see discussion of project area to be evaluated below). The study	Eagle Creek is proposing to conduct a Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment (Section 11 of PSP) and a Whitewater Boating Assessment as described in the Proposed Study Plan.

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	should evaluate facilities, including put-in and take-out facilities for trailered boats, car top and carry in, campsites, multi-use trails, parking and road access, seasons of operation, maintenance, and sanitary facilities. The study should examine the facilities that are necessary for public access to the impoundments, parking lot size consistent with projected usage, erosion control, and those whose needs are characterized under the *"*Americans with Disabilities Act*"* or ADA, including angling and access options. Study goals include: • obtain information about the condition of existing recreation facilities and access sites at and in close proximity to the project and along project-affected waters and lands with public access; • obtain information about existing recreation use and opportunities, access, and present and future use estimates for sites within the project-affected area; • conduct an assessment of the need to enhance recreation opportunities and access at the project; • present the recreation use and opportunities at the project within the larger context of regional opportunities; and • lay the foundation for preparation of a Recreation Management Plan (RMP) for the Project that will be included in the license application. Study components include: A. Recreation Site Inventory An inventory form should be used for site visits at all publicly accessible sites within the project-affected area to document existing facilities and resources. These will include project sites and informal sites. Amenities at each site, such as the presence and type of restrooms, types of activities supported, parking spaces, and parking surface, will be recorded along with digital photos and GPS points. This inventory will identify and characterize public facilities and resources, and the conditions of those facilities. Formal and informal river access sites will be visually assessed and photographed to record any opportunities or challenges for craft or anglers. The inventory should be one of the first tasks of the study and should cover all four seasons. The study should review land ownership (including the applicants) surrounding the project area and investigate shoreline slope conditions (e.g., steepness, length) for alternative public access options. The results of the inventory will provide baseline information regarding existing recreation facilities and resources at the projects and along project-affected waters, including bypassed reaches. The inventory information will be assessed in conjunction with a visitor intercept survey. B. Recreation Use and Needs Survey The use and needs assessment will document recreation activity types known to occur or potentially occurring at in the project-affected area. *Use Survey*: Two components should be used to collect existing and potential (future) recreational visitor use data: 1) existing public use (traffic counters, spot counts, and visitor intercept interviews); 2) Potential visitors through a mailed and/or online questionnaire. This data is needed in order to identify potential users including those who choose not to use project facilities for a variety of reasons. Potential surveys could utilize existing member databases of NGOs and user groups in the region, Federal, state and local user information, such as visitor counts and existing user surveys at facilities outside the project area that may offer an indication of why project facilities are not chosen.	

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	C. Future Use Assessment Future use estimates should be calculated by assessing future demand for recreation activities and population trends for the expected term of the new license. Growth in recreation activities and recreation use projections for the anticipated growth in recreational use through 2060 should be developed using Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends (Cordell et al., 1999), Outdoor Recreation Participation in the United States – Projections to 2060 (Bowker et al., 2012), as well as numerous additional sources and commonly used methodologies. Current use estimates should be projected with indexed values of expected changes in the number of recreation days for given activities at the projects to estimate future recreation use in the project for 10-year increments out to 2050. 2. *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;* See Appendix A which forms the basis for any NPS Section 7 evaluation under the WSRA. 3. *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;* Requester is a Federal Agency, National Park Service. 4. *Describe existing information concerning the subject of the study proposal, and the need for additional information;* The PAD provides information on existing recreation facilities and opportunities provided on project lands and in the vicinity of the project; however, the applicant is proposing no new additional studies for a project that was licensed thirty years ago. There have been considerable changes in population density related to development in the vicinity of the projects, recreational use patterns and needs have changed as a result, have affected the way in which the public uses these resources. Existing information is primarily in the Form 80 data submitted by the licensee during the course of the current license. There is no accurate, recent information on the number of recreational users in the area and the adequacy of the facilities currently available, and there has been no public discourse regarding the state of existing facilities until the present relicensings regarding recreational uses and potential additional and/or updated facilities. 5. *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;* This study would provide new information regarding adequate access and facilities for a diverse cross-section of recreational users. This study is vital to defining access facilities that can best be adapted for boaters, anglers, hikers, hunters, and other potential user groups. FERC and the applicant should be aware of the conditions on the ground, and the needs of user groups, before a new license is issued. 6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge;* This type of study is routinely prepared in relicensing proceedings, sources and methods for gathering data are accepted by the FERC and the scientific community. https://www.ferc.gov/industries/hydropower/gen-info/guidelines/recreat-dev-hydro-licen.pdf. 7. *Describe considerations of level of effort and cost, as applicable, and why* proposed *alternative studies would not be sufficient to meet the stated information needs*. This type of study is routinely performed in FERC relicensings.	

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5	**Flow Study - Scheduled Recreational Releases** Another area of NPS concern is associated with the February 7, 2007 FERC Order that amended License Article 401 relative to the 2004 Recreational Usage Report required under License Article 408. Recreational releases often result in changes to conditions in the Delaware River, and by association, recreational use and access. User data since the amendment should be included in the above requested study, including user experiences on the Delaware River during recreational flow releases. Under the current License Order, there is no specific set of criteria under which the licensee can cancel or modify scheduled releases below Rio, nor a time frame prior to any changes in which to inform the public. These release forecasts are factored into the River Master's daily flow designs and prescribed releases from NYC days in advance, and cancellations play havoc with the ability to accomplish flow targets and can and often do adversely affect water-dependent natural resources and recreational use. Regardless of whether any changes in flows are made, an internet based system (with text notifications to those who sign up for flow release alerts) should be developed in order to give recreational users an opportunity to obtain real time release data in advance as well as to confirm that flows will in fact be provided on a particular day. There should be specific criteria for what constitutes an emergency (non-economic) condition which would necessitate the cancellation or modification of scheduled releases below the Rio dam. The NPS requests the following Flow Study to evaluate base flows and controlled recreational boating releases in the Mongaup River, and their impacts on upstream and downstream river conditions. These conditions would include flows and temperature conditions at established USGS gages on the Delaware River, resulting in potential effects of aquatic and recreational resources. 1. *Describe the goals and objectives of each study proposal and the information to be obtained*; The overall goal of this study is to understand, correlate and define how Mongaup Project releases (or cancellation of forecast releases provided to the River Master) influence resulting temperature and flow conditions at USGS gages on the Delaware River upstream and downstream of the Mongaup River in the Delaware system. The Applicant should document the extent to which the high flow releases from the Rio Project influence Delaware River flows, especially in low flow periods. The applicant should also provide a record of all the times when scheduled releases provided to the USGS River Master were canceled, or significantly reduced, and for what reason. <u>Upstream Delaware River Conditions</u> This would include providing data on resulting cubic feet per second (CFS) flows, river height (stage), and water temperatures at USGS gages during the timeframe of influence of Mongaup system releases (when factored into the USGS River Master's daily design for compensating releases from New York City (NYC) reservoirs that affect the Delaware system upstream of the Mongaup River. A total of 69 miles (94%) of the designated Upper Delaware Scenic and Recreational River is above the Mongaup River. Those potentially affected above-the-Mongaup locations include: West Branch of the Delaware River at Hale Eddy, NY, East Branch of the Delaware River at Fish's Eddy, NY Delaware River at Lordville, NY, Delaware River at Callicoon, NY, Delaware River above the Lackawaxen River near Barryville, NY, Delaware River at Barryville, NY Delaware River at Barryville, NY (temperature only)	Eagle Creek is proposing a Reservoir Water Level Fluctuation/Operation Model Study, which will be used to evaluate current and proposed Project operation as described in the Proposed Study Plan.

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	Downstream Delaware River Conditions An additional analysis of resulting flow conditions for these same parameters at USGS gages on the Delaware River downstream of the Mongaup River is needed to document the potential influence of planned, but cancelled Mongaup Project releases which have been factored into the River Master's design for compensating releases. These cancellations of planned releases (especially with minimal or no prior notice) cause significant shortfalls to the Montague flow target and result in lower-than-expected Delaware River flows from the Mongaup all the way down to the Delaware River at Easton, PA USGS gage (River Mile 183.66), 77.44 downstream of the confluence with the Mongaup. They also disrupt recreational boaters who often travel considerable distances and make plans based on the scheduled releases. Below this point, the Beltsville Reservoir in the Lehigh River watershed can be directed by the Delaware River Basin Commission to provide more water to ensure that the Trenton flow target is met. Those potentially affected below-the-Mongaup locations include: Delaware River at Matamoras/Port Jervis, PA Delaware River at Montague, NJ Delaware River at Tocks Island, NJ Delaware River at Belvidere, NJ Delaware River at Easton, PA The NPS; therefore, requests the following: The applicant provide an analysis of the degree to which the flows in the bypassed reach below the Rio Project have been in compliance with the 100 cfs or 60 cfs minimum release included in the 401 Certification for the Project. This study would involve a desktop analysis of the past 5-10 years of instantaneous gauge data from the U.S. Geological Survey (USGS) gauges below the Rio Project. The Applicant conduct habitat mapping for all of the relevant reaches. This mapping should identify the type of habitat in each section (e.g., pool, riffle, run), along with depths, velocities, and substrates. We request that habitat mapping also be conducted in the additional tributary streams and upstream areas included in the fisheries study to provide data into the available habitat in these areas. Mongaup River Conditions The NPS requests that the applicant provide an analysis of the degree to which the flows in the bypassed reach below the Rio Project have been in compliance with the 100 cfs or 60 cfs minimum release included in the 401 Certification for the Project. This study would involve a desktop analysis of the past 5-10 years of instantaneous gauge data from the U.S. Geological Survey (USGS) gauges below the Rio Project. The NPS requests that the Applicant conduct habitat mapping for all of the relevant Mongaup River reaches. This mapping should identify the type of habitat in each section (e.g., pool, riffle, run), along with depths, velocities, and substrates. We request that habitat mapping also be conducted in the additional tributary streams and upstream areas included in the fisheries study to provide data into the available habitat in these areas. 2. *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;* See Appendix A which forms the basis for any NPS Section 7 evaluation under the WSRA. The Delaware River is the last major river on the Atlantic coast undammed the length of its main stem (330 miles), providing important historic spawning and rearing habitat for sea-run migratory fish as found on few other in the U.S. These fish include	

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	declining species such as American shad and American eel, whose range wide populations are buttressed by the Delaware River. The Upper Delaware River also supports the best naturalized wild trout fishery in the eastern U.S., and provides habitat for state and Federally endangered species such as bridle shiner (Notropis bifrenatus) and dwarf wedgemussel (Alasmidonta herterodon). The Upper Delaware supports the largest and most important inland bald eagle (Haliaeetus leucocephalus) wintering habitat in the Northeastern U.S., based upon annual use, the number of eagles using the area, and a robust breeding population. The Upper Delaware River is also heavily used by recreational interests (the Upper Delaware River supports one of the largest canoe livery industries in the U.S.), with UPDE's annual visitation being approximately 247,300 visitors. Predictable flows, and adequate water, are critical to all these natural and recreational resources. 3. *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;* Requester is a Federal Agency, National Park Service. 4. *Describe existing information concerning the subject of the study proposal, and the need for additional information;* The flow studies conducted during the previous relicensing and the PAD provides no information regarding how flows under the current license influence resulting flows in the Delaware River. Existing historical flow data for USGS gages is readily available online, and an analysis that compares the influence of Mongaup Project releases on resulting Delaware River flows upstream and downstream of the Mongaup River is a desktop exercise for the licensee. 5. *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;* The operation of the hydroelectric projects on the Mongaup River and the resulting compensating releases directed by the USGS River Master, affect flows in the Delaware River upstream and downstream of the Mongaup River. With Mongaup releases counting toward the Montague flow target and factored into the USGS Delaware River Master's daily compensating release design from the NYC reservoirs, an amount of water equal to what's being released from the Mongaup (up to 970 cfs) may be withheld from NYC reservoirs on the East and West Branches of the Delaware. With the Montague flow target being 1750 cfs under normal conditions, and typical summer flows ranging from 1100-1400 cfs on sections of the UPDE, 970 cfs withheld from the upper river is extremely significant, perhaps influencing dewatering in sections of the river, elevated water temperatures, and the survival of aquatic life found in the river containing 51 fish species, and 9 species of freshwater mussels, including the state and Federally-endangered dwarf wedgemussel (Alasmidonta heterodon). These volumes of water are also very significant for recreational interests as well, perhaps determining whether paddlers have to get out of their boats and drag them across shallow gravel bars and dewatered riverbed which negatively impacts benthic aquatic organisms. 6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge;* The recommended study would analyze and compare resulting flows for various USGS gage locations on the Delaware River above and below the Mongaup River under timeframes of influence and non-influence by Mongaup Project releases. 7. *Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs*. This is a desktop exercise for the licensee. The USGS gage data could be readily analyzed and correlated with Mongaup releases with little difficulty. The cost would be relatively minimal.	

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6	**Appendix A** **IV. Effects of the Proposed Project - Invade and Diminish Standard** Section 7(a) of the WSRA provides a specific standard for review of developments that are located below or above or on a stream tributary to a designated river. This is the standard being applied for this determination. Such developments may occur as long as the project "will not invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area as of the date of designation..." (Interagency Wild and Scenic Rivers Coordinating Council, 2004). Potential impacts of the Mongaup River Hydropower Relicensing Project could influence the free flow, water quality, and scenic, recreational, and fish and wildlife values under the WSRA. These values are fundamental to the visitor experience at the UPDE. They are also among the ORVs for which the Upper Delaware was designated. **A. Free-Flow** (including free-flowing condition, within-channel conditions, hydrological processes) **Impact Summary:** Potential flow impacts from this project are expected to be minor and temporary. **ORV:** Maintaining free-flowing conditions is integral to the designated status of the Upper Delaware Scenic and Recreational River under the WSRA, supports the integrity of the UPDE ORVs, and is a key component of future management (NPS 2012a). **Description:** ***Short-Term Effects:*** ***Flow:*** : Short-term flow effects on flow are possible due to proposed hydropower and recreational water releases that count towards the USGS Montague Gage flow target, potentially resulting in less water being released from New York City reservoirs toward meeting this flow target, affecting water flows in the Delaware River above the Mongaup River. In addition, planned releases from the Mongaup system provided days in advance by the hydropower operator to the Rivermaster factor into the Rivermaster's prescribed releases from New York City reservoirs. These planned hydropower releases are often cancelled, resulting in Montague Gage flow target underages, and less water for all of the Delaware River below the Mongaup River. ***Long-Term Effects:*** No long-term effects on flow are anticipated from the proposed management of these projects.	Information noted.
7	**Appendix A** **B. Fish and Wildlife Values** **Impact Summary:** Impacts on fish and wildlife values from this project are potentially significant. The ecological "building blocks" that predicable flows sustain can be impacted by widely fluctuating yo-yo releases that prevent intact functioning ecosystems from maintaining key components and processes. **ORV:** The Delaware River and its high quality tributaries exhibit some of the highest ecological integrity of any of the large river systems in this region, resulting in high water quality and good in-channel conditions, that contribute directly to the high quality, abundant, and diverse assemblages of fish and wildlife species found here (NPS, 2012a). These include Threatened and Endangered species such as dwarf wedgemussel (*Alasmidonta heterodon*), brook floater mussel (*Alasmidonta varicosa*), and bridle shiner (*Notropis bifrenatus*). As the last major river on the Atlantic coast undammed the length of its main stem, the Delaware provides important historic spawning and rearing habitat for sea-run migratory fish such as American shad (*Alosa sapidissima*) and American eel (*Anguilla rostrata*) as found on few other rivers. The Delaware system supports high quality aquatic insect assemblages, a full complement and extraordinary abundance of freshwater mussels, declining species such as brook trout (*Salvelinus fontinalus*), and is an important breeding and wintering habitat for a robust population of bald eagles (*Haliaeetus leucocephalus*). **Description:** The high quality fish and wildlife assemblages found here are sustained by ecological "building blocks" that	Information noted.

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	include exceptional water quality (high dissolved oxygen, low turbidity/high water clarity), and good in-channel conditions that include streambed with unimbedded clean gravel and a lack of fine sediments/silt. ***Short-Term Effects:*** Short-term effects on fish and wildlife will occur during extremely low flow events that may dewater substrate and cause organisms to abandon habitat. Fish and other mobile species may survive these events by moving to suitable habitat. These low flow events may suppress wildlife activity. ***Temperature:*** Short-term elevated river temperature events may suppress wildlife activity and stress aquatic organisms. Water quality characteristics that can also be affected by increased water temperature include water pH, dissolved oxygen concentrations, and solute solubility (http://water.usgs.gov/edu/temperature.html). ***Long-Term Effects:*** More significant and long-term effects may result from potentially dewatered substrate, strandings of aquatic organisms, and increased water temperatures that may result in mortality of fish, freshwater mussels, aquatic insects, and other aquatic organisms. Suppressed aquatic insect populations in dewatered locales may also greatly influence fish populations in those areas. Aquatic insects are the primary food source for many fish. An average of 70 percent of freshwater fish species depending on them as a food source (Healey, 1984). Also, many species of fish spawn in gravel, depositing eggs in the void spaces between the framework of gravel particles. The eggs require fresh, moving water in this type of habitat to survive and grow. If beds of finer gravel are missing from systems such as the lower Mongaup River due to erratic, flushing flows, this is likely to be lost as spawning habitat for some species of fish. Erratic, flushing flows may also preclude the lower Mongaup River as suitable habitat for freshwater mussels, aquatic insects, and other aquatic life that would otherwise use it under more stable, predictable flow scenarios.	
8	**Appendix A** **C. Scenic Resources and Values** **Impact Summary:** Potential impacts on scenic values from this project are expected to be minor and temporary. **ORV:** Scenic resources are an ORV for UPDE, DEWA, and LODE, as stated in the NPS Delaware River Basin National Wild and Scenic River Values report (2012a0). **Description:** ***Short-Term Effects:*** ***Long-Term Effects:*** Recurring periods of suspended sediment, turbid water flow, and poor visibility downstream of the crossing site are likely to occur with higher flow events following the disturbance of the riverbed at the crossing site, and with remobilization of sediment deposited downstream of the crossing site. These recurring events are likely to be more significant with the greater volume of sediment mobilized by the contingency wet crossing method.	Information noted.
9	**Appendix A** **4. Recreational Resources and Values** **Impact Summary:** Potential impacts on recreational values from this project are mixed, but are expected to be minor and temporary. **ORV:** The Upper Delaware Scenic and Recreational River corridor's pristine resources offer outstanding river recreation in close proximity to the most densely populated region in the United States (NPS, 2014). All other ORVs contribute to the values of UPDE, DEWA, and LODE as a recreational resources where visitors enjoy boating, biking, hiking, fishing, hunting, wildlife watching, fall foliage, scenic touring and experience the rich cultural heritage of the area. (NPS, 2012a) **Description:**	Information noted.

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	Short-Term Effects: There may be short-term effects on local recreation as a result of unpredictable, erratic flows in the lower Mongaup River and the Delaware River affected by hydropower releases. These could include impacts to recreational fishing, boating, swimming, and wildlife watching that may be impaired during periods of low water in sections of the Delaware River resulting from hydropower releases that contribute to the Montague flow target. ***Long-Term Effects:***	
10	**V. Magnitude and Extent of Potential Off-Site Changes** The magnitude and extent of potential off-site changes could be significant. As stated above, the operation of these hydroelectric projects, whether releasing larger quantities of water for hydropower generation or whitewater recreational boating on the lower Mongaup River, can potentially affect compensating water releases from New York City reservoirs on the East and West Branches of the Delaware River and on the Neversink River. The effects and influence could therefore be far-reaching, including 69 miles upriver on the Delaware to the confluence of the main stem Delaware River, and another 17 miles up the West Branch of the Delaware River (to releases from the Cannonsville Reservoir) and 35 miles up the East Branch of the Delaware River to the Pepacton Reservoir). The influence of Mongaup releases (or non-releases) downstream on the Delaware River may extend as far down as River Mile 183.66 (77.44 miles downstream of the Mongaup), the upstream-most point where directed releases from the Beltsville Reservoir in the Lehigh River watershed can make up for deficient flows (as a result of cancelled Mongaup releases and resulting Montague flow target deficits) that need to be supplemented by lower basin reservoirs to achieve the Trenton flow target.	Information noted.
July 24, 2017 – John Caracci Comments on the Toronto Reservoir		
1	I am contacting you in regard to The Toronto Reservoir Project # **(P-10482-117).** The reservoir is a natural source of beauty and wildlife that my family has enjoyed for many years. The birds, the tranquil location and wildlife have been a source for kayaking, canoeing and meditating. As a supporter of "THE FRIENDS of TORONTO", I urge you to support public access to this beautiful reservoir.	Comment directed to FERC noted.
2	As a Federal area, please preserve the Toronto Reservoir for the public and for the Brook Trout who seem to be dwindling in number. As a fisherman, I am concerned about the fate of the Brook Trout.	Comment directed to FERC noted.
3	Also, I recommend that the access road be made more, "ACCESSIBLE" and the “PRIVATE PROPERTY" signs erected by Eagle Creek be placed elsewhere. The local community needs to be, "welcomed" to the reservoir, not shunned from admission! Thank you for your attention to a fight that has lasted more than 15 years!!!	Comment directed to FERC noted; however, Eagle Creek notes that these signs were erected by a third party and not under the direction of Eagle Creek.
July 24, 2017 - Travis Caracci Comments on the Toronto Reservoir		
1	I am contacting you in regard to The Toronto Reservoir Project # **(P-10482-117).** The reservoir is a natural source of beauty and wildlife that my family has enjoyed for many years. The birds, the tranquil location and wildlife have been a source for kayaking, canoeing and meditating. As a supporter of "THE FRIENDS of TORONTO", I urge you to support public access to this beautiful reservoir.	Comment directed to FERC noted.
2	As a Federal area, please preserve the Toronto Reservoir for the public and for the Brook Trout who seem to be dwindling in number. As a fisherman, I am concerned about the fate of the Brook Trout.	Comment directed to FERC noted.
3	Also, I recommend that the access road be made more, "ACCESSIBLE" and the “PRIVATE PROPERTY" signs erected by Eagle Creek be placed elsewhere. The local community needs to be, "welcomed" to the reservoir, not shunned from admission. My family has enjoyed the beauty of these shores.	Comment directed to FERC noted; however, Eagle Creek notes that these signs were erected by a third party and not under the direction of Eagle Creek.
July 25, 2017 – Allan Abramson Comments on the Toronto Reservoir		
1	The deadline for filing comments about the swinging Bridge Project (No. 10482-017) is July 29th. I am a resident of Bethel, NY and have lived on the Toronto Reservoir for the past 12 years. I have obtained the 1992 FERC "Order Issuing License" It was concluded that on balance, a 30-cfs minimum flow would be in the best public interest because it would provide about 70 percent of the maximum WUA for adult brown trout, without affecting the creditable generating capability for the Swinging Bridge Project". However the DEC says the minimum flow would be 100 cfs. And that FERC must defer to the NY State DEC.	Comment directed to FERC noted.

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	It is now 25 years later. Toronto Reservoir has many residents living around the periphery. Water levels are now very important. I would like to know what up to date data we have indicating the health of our fish in the streams leading out of the Mongaup/ swinging bridge waters. If the CFS is less than 100 cfs flow then height of the water will be higher and will satisfy all who are dependent of the flow. What is the effect of increase CFS flows on the fish within the reservoir? Has this study been done? It would seem that FERC and the DEC should address this subject. When not in a peak power demand period what should the CFS levels be? I realize that power, fish and people all share this wonderful resource.... Toronto Reservoir. I believe that if some studies are authorized to see what effects the varying flows have that a more intelligent decision can be made.	
July 25, 2017 – The Town of Thompson, NY Comments on the PAD		
1	The reservoir provides a vital recreational and residential component of our economy and our quality of life. When we experienced drought conditions several years ago, the effect of extremely low water levels absolutely devastated the community and the businesses that depend on it for survival.	Comment directed to FERC noted.
2	Though I am not a hydrogeologist, my reading of the background research provided by the Swinging Bridge Property Owner's Association leads me to concur that releases greater than 30 CFM will achieve little benefit to the brown trout population downstream. Reason should and must prevail weighing the small added benefit of 100 CFM minimum releases against the investments of hundreds of residents in their lake properties.	Comment directed to FERC noted.
3	I have attached a copy of Swinging Bridge Property Owner's Association's "BACKGROUND RESEARCH ON MANDATED OUTFOW FROM THE LAKE." If, after your review, the study is un-refuted, then the minimum 30 cfm release standard should become part of the licensing permit.	Comment directed to FERC noted.
4	**Background Research on Mandated Outflow from the Lake** The information included here is from the FERC operating license for the lake. Page references match our copy and may be different from others. In writing this, I am working under the understanding that the mandated outflows from the lake are between 60 cfs and 100 cfs at all times. The 100 cfs is the norm and may be reduced down to 60 cfs in drought conditions. It is also understood that a period of low inflow is necessary before the outflow can be reduced. Art Goodman Secretary In the course of the license hearings, various outflow amounts were discussed ranging from 30 cfs up to 150 cfs. The 150 cfs (Department of the Interior) was ruled out. Page 7 reads that FERC recommended a minimum outflow of 30 cfs, the minimum of 100 cfs was included in the 401 water quality certificate. It is a guess that the reduction to 60 cfs occurred after the disastrous drought period some time ago which brought lake levels well into the 1050's range. The key numbers are summarized on the chart found on page 68. The increase from 30 to 100 cfs only increases the weighted usable area (WUA) from 71,000 square feet to 88,000 square ft, or a percentage from 70% to 88%. The questions that comes to mind – **is it worth an additional 16% of trout habitat to release all that water?** On page 7, the document states that: *"I conclude that, on balance, a 30-cfs minimum flow would be in the best public interest, because it would provide about 70 percent of the maximum WUA for adult brown trout, without affecting the creditable generating capability of the Swinging Bridge Project. A minimum flow greater than 30 cfs would provide more habitat, but the small increase in habitat and anticipated angler use wouldn't justify the disproportionately great loss of power benefits."* On page 68, a summary statement reads: *"Our studies of this additional minimum flow option shows that there would be only a negligible habitat benefit from increasing the minimum flow above 30 cfs, and that it would reduce the projects power benefits substantially."* Referring to the 100 cfs outflow on page 79, license states " ....would unnecessarily waste the power potential of a renewable resource".	Comment directed to FERC noted.

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July 25, 2017 – Elana Fine Comments on the Toronto Reservoir		
1	Toronto Reservoir is a free public resource that should be open to the public for swimming and boating. I have loved bathing and kayaking there in 3 seasons (spring, summer, and fall). Loved seeing it open for families whom have limited resources. Roads need to be maintained.	Comment directed to FERC noted.
July 25, 2017 – James and Helen Noeth Comment on the Toronto Reservoir		
1	Please renew Eagle Creek's license so we can continue to enjoy all the beauty Toronto has to offer to the public.	Comment directed to FERC noted.
July 26, 2017 – Ana Segarceanu Comments on the Toronto Reservoir		
1	By limiting access to the lake you are preventing new families from experiencing the refuge that is the Toronto Reservoir. Preventing children from experiencing the wonderful summers I had at the lake. I know that the misguided "No Swimming" signs are just that misguided, unwarranted and just false propaganda to further the narrative that the lake should be closed to the public. It is the Woodstone's company not being able to accept defeat and the just law. I know this, but new families don't. They see the beautiful lake, perfect for swimming, perfect for creating life long memories. Then they see the signs. They begin to fear the lake.	Comment directed to FERC noted.
July 26, 2017 – USFWS Comments on the PAD, Comments on SD1, and Study Requests		
1	<u>Comments on the Pre-Application Document</u> The PAD is well-organized and addresses most of the key issues for the Projects. We offer the following specific comments on the PAD by section: In Section 1, the Swinging Bridge development spillway is primarily bedrock, not concrete. There is no description of the trashracks and their clear-spacing associated with the intakes for the Projects. The Service recommends that this information be included in the PAD. Additionally, we recommend that this information, as well as intake velocities, be included in Section 4.3.3. These figures are directly related to potential fisheries impacts due to entrainment.	The Swinging Bridge development spillway has a 250-foot-wide, concrete spillway structure. Downstream of the concrete spillway structure, the spillway channel consists of exposed bedrock. The trashrack clear-spacing for each intake structure and associated intake velocities are the following: • Swinging Bridge: 2.6 inches clear spacing with an approximate intake velocity of 0.90 cfs (pursuant to the 1992-1994 Entrainment Studies) • Mongaup Falls: 1.7 inches clear spacing with an approximate intake velocity of 2.14 cfs (pursuant to the 1992-1994 Entrainment Studies) • Rio: 2.9 inches clear spacing with an approximate intake velocity of 2.64 cfs (pursuant to the 1992-1994 Entrainment Studies)
2	In Section 1, the horseshoe-shaped conduit that connects the discharge from Toronto Reservoir to Cliff Lake discharges into Black Lake Creek and travels approximately 2 miles downstream to Cliff Lake. We recommend clarifying how this conduit connects to Cliff Lake in this section. The Service also recommends including that 5-foot flashboards are present on the Mongaup Falls Dam in the project description.	To be clarified in future submittals and application to FERC. Flows from the outlet tower at the Toronto Development are released through a 460-foot long, 8-foot-by-8-foot, horseshoe-shaped conduit constructed of reinforced concrete. The concrete conduit discharges into Black Lake Creek approximately 2 miles upstream of Cliff Lake Reservoir. The 4-foot-10-inch-high flashboards at Mongaup Falls Dam are included in the Project Description in Section 1 of the PAD and will be included in future submittals to FERC.
3	In Section 4.2, the Applicant indicates that the current Projects' boundaries will be updated during the relicensing process. We recommend that all bypassed reaches of the Mongaup River, Black Lake Creek, and Black Brook, to their confluence with the Mongaup River, be included in the Projects' boundaries. The Projects divert water from and alter the flows in the reaches. We also recommend that these revised boundaries be added to Figure 5.1-1.	To be addressed in the application to be filed with FERC.
4	In Section 4.3.1, we recommend including that the Swinging Bridge Dam spillway routes water back into Black Lake Creek, a bypassed reach, not immediately into the Mongaup River.	Comment noted. To be included in the application to be filed with FERC. Flows over the Swinging Bridge spillway would discharge into Black Lake Creek downstream of the Cliff Lake development, which subsequently discharges into the Mongaup River below the Swinging Bridge Dam. Flows through the Swinging Bridge powerhouse discharge to the Mongaup River.
5	In Section 4.3.2, we recommend including the gate openings and depths for the Swinging Bridge Dam. The Service also recommends including details regarding the operation of the bypass outlet when the minimum flow powerhouse is offline. It is our understanding that this outlet opens automatically as was required under the April 3, 2013, amendment for the construction of the minimum flow powerhouse at Rio.	Comment noted.

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6	In Section 4.3.6, we note that the tailrace for the Rio minimum-flow powerhouse returns to the Mongaup River approximately 300 feet downstream from the dam. During the environmental site review, we observed that gravel deposits have accumulated above the tailrace. This has reduced connectivity between the tailrace and the pool at the base of the dam. The Service recommends that connectivity be restored in this area as these deposits are believed to be derived from the landslide associated with the November 2014 failure of the minimum-flow powerhouse penstock.	Comment noted.
7	In Section 4.4, the Applicant notes that it is operating under a draft operating plan that was developed in consultation with the New York State Department of Environmental Conservation (NYSDEC) and the Delaware River Basin Commission. This plan is presented in Appendix D of the PAD. The Service recommends that the Applicant consult with us in the continued development, and final approval, of the operating plan for these Projects as we expect that the final approval of this operating plan will be a necessary component of the relicensing of these Projects.	Comment noted.
8	In Table 4.4-1, the Applicant provides the minimum flow requirements as issued in the NYSDEC 401 Water Quality Certifications issued for the Projects. We recommend that the 20 cfs minimum flow requirement for Black Brook be included in the table, although we are aware that this development is not currently in use.	Comment noted. To be addressed in the application to be filed with FERC.
9	In Section 4.4, the Applicant states that the minimum target elevation for the Toronto Reservoir is 1,170 feet to permit the use of the upper outlet works for protection of the water quality. The upper outlet invert is listed in Section 4.3.2 as 1,179.5 feet. We recommend clarifying this discrepancy.	The two outlet gates at the Toronto development are at elevations 1,143.5 ft and 1,179.5 feet. The Toronto Reservoir is maintained at a minimum target elevation of 1,170 feet during the winter months during which time the 10 cfs continuous minimum flow is provided via the lower outlet. Via spring inflows, the Toronto Reservoir is raised to at least elevation 1,187.7 feet by June 1, which allows sufficient water to provide the 10 cfs continuous minimum flow via the upper outlet during the summer months (i.e., to avoid lowering the reservoir below elevation 1,179.5 feet during the summer months).
10	In Section 4.4.1 and in Table 4.4-4, information regarding the daily and monthly average flows for the Mongaup River downstream of the Rio Project is provided. Daily average flows will not adequately describe the flows of this peaking system, as flows can vary several hundred cfs over a matter of minutes. The Service recommends revising Table 4.4-4 to present the minimum, maximum, and exceedance values based on instantaneous data. Additionally, providing data over a period of record from 1939 to 2017 averages over two different flow regimes as the 100 cfs minimum flow required as a result of the original licensing should have adjusted the minimum and 90 percent exceedance values upward considerably. We recommend providing these data separately for both the time period before and the time period after the original licensing. These data are an important component of monitoring compliance with minimum flow requirements. An initial analysis of the gauge data for 2016 indicates that there were frequent periods below 100 cfs.	As appropriate, flow data will be provided associated with the applicable study report(s) and application to be filed with FERC. Note that when inflows are less than 100 cfs, the minimum flow may be reduced to 60 cfs, or lower with approval from the NYSDEC. Potential reductions below 100 cfs associated with the USGS gage were performed in accordance with appropriate notifications and approvals of FERC and the NYSDEC.
11	In Section 4.7, the Applicant indicates that an amendment may be pursued to install a minimum flow unit at the Swinging Bridge Project. The Service is concerned with the timing of this potential amendment as relicensing is intended to be a comprehensive review of the existing Projects. At this time, we recommend pursuing any potential minimum flow unit at Swinging Bridge as part of the relicensing process.	The Swinging Bridge Project has an existing FERC license scheduled to expire on March 31, 2022. Eagle Creek is currently pursuing authorization for installation and operation of Unit No. 3 through a separate amendment process, as compared to the relicensing process, given the existing contract between Eagle Creek and the New York State Energy Research and Development Authority (NYSERDA) that requires that the new base flow unit be operational by July 31, 2019. The contract is based on Eagle Creek's successful bid for New York renewable energy incentives associated with the development and in support of New York State's Clean Energy Standard (CES) and goal that 50 percent of New York's electricity come from renewable energy sources by 2030. Eagle Creek's proposed minimum base flow unit has been determined by NYSERDA to support both the CES and the State's goal. Based on the contract between Eagle Creek and NYSERDA, if the Unit No. 3 is not operational by July 31, 2019, the NYSERDA contract will become null and void and Eagle Creek will lose the financial deposits paid to New York State to date.
12	In Sections 5.1.3 and 5.4.1, the Applicant indicates there are five dams associated with the three Mongaup River Projects. The Service recommends that this be changed to six, as the Black Brook Dam is part of the Mongaup Falls Project, and was likely excluded. Additionally, we recommend that Black Brook be added to Section 5.4.1. Figure 5.2-1 may be better labeled as Figure 5.1-3 as it refers to and is first referenced in Section 5.1.	The Black Brook Development will be added to future description of dams within the Mongaup River Basin and the Project area.

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13	In Section 5.2.6, the Applicant provides descriptions of the reservoir shorelines; however, sources provided are from the 1980s. Considerable development and shoreline changes have occurred in the last 25 years. We recommend that updated information be provided. Additionally, there are no descriptions of the stream banks as indicated in the section heading, nor any information provided regarding the Black Brook Reservoir.	Comment noted.
14	In Section 5 .4.1, the Applicant describes the existing fisheries information. The Service notes that information for Black Brook and the bypassed reach of the Mongaup River for the Mongaup Falls Project are not included under the Area Streams subsection. The Applicant provided a summary of the entrainment studies conducted in 1992 and 1993 as a component of the original licensing that concluded that entrainment effects are small at all of the Projects. We address this study in our entrainment study request, below. The scientific name for brown trout is *Salmo trutta,* not *Salmo trutte.*	Comment noted.
15	Comments Scoping Document 1 The SDI is well-prepared and presents the context and primary areas of concern for the Projects. We offer the following specific comments on the SDI by section: In Section 3 .1.1, the Rio Dam is listed as having an elevation of 805 feet; however, this is the elevation at the maximum allowable drawdown for the Project. The Rio Dam elevation should be 815 feet, as presented in the PAD. Please correct the elevation for the Rio Dam.	See Eagle Creek comment letter to FERC dated July 28, 2017.
16	In Section 3.1.2, the Toronto Reservoir elevation is noted to be held above 1,187.7 feet prior to June 1 to ensure that there is enough water to provide a 10 cfs minimum flow without drawing down the reservoir below 1,170 feet to permit the use of the upper outlet works for protection of water quality. Since the Toronto Reservoir provides the majority of the storage in this system, it is likely that this elevation is held to provide the higher 100 cfs minimum flow from the Rio Reservoir. Please confirm and correct the minimum flow referenced.	Comment directed to FERC noted.
17	In Section 3.1.2, the Cliff Lake elevations are listed as being held between 1,170 feet and 1,220 feet. The PAD indicates that the crest elevation of Cliff Lake is 1,171 feet. The 1,220 foot elevation is the crest of Toronto Reservoir. This latter number should likely be 1,147.9 feet since the PAD indicates that there is a 23.1 foot allowable draw down for Cliff Lake. Please verify the elevations for Cliff Lake.	See Eagle Creek comment letter to FERC dated July 28, 2017.
18	In Section 3.1.2, there is no mention of the Project operations for the minimum flow powerhouse at the Rio Project in relation to the 100 cfs minimum flow. Please add more information regarding the minimum flow powerhouse at the Rio Project.	Comment directed to FERC noted.
19	In Section 3.2.1, the Applicant proposes to continue to operate and maintain the Projects as required in the existing license. We note that the Black Brook Dam and penstock, which are components of the Mongaup Falls Project in the current license, are no longer operated or maintained for power production, as required under Section l0(c) of the Federal Power Act. The Service recommends that the Applicant and the FERC consider these facilities for removal to enhance the aquatic environment in Black Brook, a high quality trout stream.	Comment directed to FERC noted.
20	In Section 4.1.2, we recommend that the geographic scope of the cumulatively affected resources include the Delaware River, both upstream and downstream from the confluence with the Mongaup River, as variable flows from the Mongaup River may affect resources in the Delaware River, including federally listed species. Comparison of gauge data from both the Mongaup River and downstream areas of the Delaware River indicate that peaking flows from the Mongaup River Projects can represent 10 to 60 percent of the flow in the Delaware River, especially during low flow periods. Analysis of the upstream portions of the Delaware River, below the New York City Reservoirs, are necessary as flows from the Mongaup River can be used to meet minimum flow requirements in the Delaware River below the Mongaup River, as directed by the USGS Rivermaster, such that upstream releases can be decreased, thus impacting resources upstream of the confluence. It is our understanding that the Applicant files a schedule of planned hydro releases with the Rivermaster's Office. A two-turbine release from the Rio Project can contribute 870 cfs toward a court-ordered 1,750 cfs flow target in Montague, New Jersey, and upstream releases are often lowered days in advance to account for travel time over approximately 100 miles of river and to conserve water in the basin. In situations where planned hydro releases from the Mongaup River do not occur, low flows can occur both upstream and downstream of the confluence of the Mongaup and Delaware Rivers.	Comment directed to FERC noted. See Response to Study Request by NPS.

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21	In Section 4.2.1, the Service recommends that the effects of continued Project operations on erosion of shorelines and stream banks due to impoundment fluctuations and peaking flows be addressed in the Environmental Assessment (EA). Erosion due to the Projects' operations can decrease water quality and negatively impact aquatic resources. In Section 4.2.3, we recommend that the effects of continued Project operations on aquatic habitat and fisheries in Black Lake Creek, Black Brook, and Mongaup River, including their bypassed reaches, be addressed in the EA.	Comment directed to FERC noted.
22	In Section 4.2.4, we recommend that herpetofauna be included among the wildlife evaluated in the EA. In Section 4.2.5, the scientific name for the Indiana bat is *Myotis sodalis*, not *M. sodalist.*	Comment directed to FERC noted.
23	In Section 9.0, the following comprehensive plan is cited: New York State Department of Environmental Conservation. 1979. Hudson River Basin water and related land resources: Level B study report and environmental impact statement. Albany, New York. September 1979. We also recommend that a comparable document for the Delaware River Basin also be cited: The Delaware River Basin Commission. 1981. The Delaware River Basin: The final report and environmental impact statement of the Level B study. West Trenton, New Jersey. May 1981. The Service also recommends that the U.S. Fish and Wildlife Service, Fisheries USA, comprehensive plan be included in the list of Comprehensive Plans for the Projects.	Comment directed to FERC noted.
24	<u>Study Requests</u> Fishery Surveys 1. *Goals and Objectives* The goals and objectives of this study are to provide information on the existing fishery resources in the vicinity of the Projects, including areas upstream and downstream of the dams, to aid in the determination of what the Projects impacts may be. Updated fisheries data are needed to assess the overall health of the fishery and current population sizes that are needed to inform our recommendations. The Service recommends that the Applicant conduct thorough fisheries surveys in the vicinity of the Projects. These surveys should include the Projects' reservoirs (and the Black Brook diversion impoundment), the Mongaup River from above the Swinging Bridge Reservoir to the confluence with the Delaware River, Black Lake Creek from above the Toronto Reservoir to the confluence with the Mongaup River, and Black Brook from above the diversion impoundment to the confluence with the Mongaup River. A variety of sampling gear, including gill nets, trap nets, seines, and electroshocking should be used as appropriate for site conditions. The study should be done for one full year, with provision for a second year of study if data collected are inadequate based on review by the Service and the NYSDEC. Information to be collected includes species, size, age, sex, and condition, as well as movement patterns and habitat utilization. Standard water quality data (i.e., water temperature, dissolved oxygen (DO), pH, and conductivity) should be collected in conjunction with these surveys. While these studies should focus on general fishery resources, we request the collection of additional targeted information for important game, interjurisdictional, and migratory species in the vicinity of the Projects. Targeted efforts are recommended for walleye *(Sander vitreus),* trout species [brook trout *(Salvenlinusfontinalis),* brown trout, and rainbow trout *(Oncorhynchus mykiss)],* bass species [largemouth bass *(Micropterus salmoides)* and smallmouth bass *(M dolomieu)],* American shad *(Alosa sapidissima),* white sucker *(Catostomus commersonii),* and American eel *(Anguilla rostrata),* a species that has been historically noted as occurring within the Mongaup River watershed above the Projects. For these species, we recommend that detailed abundance, stock estimates, and movement patterns be examined that may utilize nighttime surveys for walleye, movement analyses for walleye and white sucker, and additional study in smaller tributaries for trout reproduction. For all fisheries data obtained, the Service recommends that a thorough analysis be done, using as much quantitative data as there is available to compare and contrast the changes during the current period as compared to the fisheries data collected	Eagle Creek is proposing to perform a Fisheries Survey Study as descripted in the Proposed Study Plan.

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	during the original licensing in the 1980s. Special attention should be paid to changes in diversity and quality of the fishery, species specific changes, and within size-class and age-class changes over time. Species known or expected to occur in the vicinity of the Projects that are not represented in the quantitative data should be included and discussed in the study results. 2. *Resource Management Goals* The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel *(Alasmidonta heterodon),* known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle *(Haliaeetus leucocephalus)* population. 3. *Public Interest* The requestor is a resource agency. 4. *Existing Information* There is no recent information regarding fisheries in the vicinity of the Projects. There are some data available from the original licensing in the 1980s; however, 30 years of changes in angling pressure, stocking efforts, water quality, water quantity, habitat availability, minimum flows, and seasonal impoundment fluctuation limits have likely altered the fishery. Data from the original licensing will be helpful in determining changes and trends over the last 30 years. 5. *Nexus to Projects Operations and Effects* The Projects' dams serve as barriers to upstream and downstream fish migration. Fish moving downstream are subjected to potential mortality from impingement and entrainment. The Projects alter flows in bypassed reaches, modify flows downstream from the Projects, and impact habitats in the impoundments via fluctuations. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard scientific collecting techniques used in most hydro licensing activities. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would involve one field crew sampling on a seasonal basis and as needed for specific species. The study would last for 1-2 years. The actual cost is unknown and would depend upon the gear types used, number of sampling locations, local labor costs, the ability to combine multiple studies (e.g., fisheries and water quality) into one task, etc. The existing literature is inadequate to fully address the impacts of the Projects, and there are no alternatives to conducting standard fishery surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.	

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25	Fish Entrainment and Mortality, Fish Protection, and Upstream and Downstream Passage Studies 1. *Goals and Objectives* The goals and objectives of this study are to provide information on potential fish entrainment and mortality as well as fish protection and upstream and downstream passage structures that could be utilized at the Projects. The information obtained will allow the Service's fishway engineers to evaluate the potential effectiveness of various options. The Service recommends that the Applicant evaluate whether the existing facilities are able to keep all fish species and size classes out of the turbines. Most Projects in New York have incorporated l "-clear-spaced trashracks, or smaller depending on the species encountered, to prevent the entrainment of the majority of adult fish. These Projects all have larger trashrack spacing and likely entrain fish. We recommend a literature review and on-site investigations of existing facilities. This study would involve a desktop analysis of entrainment risk based on: 1) the Projects facilities and operations including: trashrack spacing, water depths, intake locations and sizes, flows, resulting intake velocities, water quality, and daily and seasonal changes in Project operations; and 2) the biological characteristics of the fishery including: swimming and burst speeds, where in the water column fish are likely to be moving, daily and seasonal movement patterns, and life history for all within species size classes. Abundance estimates from the fisheries study will be useful in weighting the overall rate of entrainment at the Projects. The methodology for the determination of risk should be clearly explained. While we are not recommending site-specific entrainment studies at this time, we are interested in the collection of any available field data that may provide insight into entrainment at the Projects. These Projects all have relatively long penstocks with surge tanks to accommodate changes in system pressure. It is possible and has been anecdotally observed that fish that are entrained at hydro projects may enter a surge tank and reside there for some time. The Service recommends that the Applicant study whether any entrained fish can be located within the surge tanks at the Projects. This observational study would result in data that would be inherently qualitative and presence-based (i.e., an absence or low number of fish collected would not be an indication of low rates of entrainment). These data would be used to complement the desktop entrainment risk analysis as any fish collected would provide insight into the fish species and size classes that are actually entrained at the Projects. The Service recommends that the Applicant evaluate the potential for entrainment mortality at the Projects through a desktop analysis of previous entrainment mortality studies at projects with similar head, turbine, and operational characteristics, as available. Entrainment mortality is known to vary considerably from project to project based on individual site characteristics and previous studies have been plagued by issues with study design and collection efficiency. Any studies cited should include the location, the project characteristics, the species, sizes, and condition of any fish species tested, the measured rates of injury/mortality, and an indication of the error associated with these measurements (e.g., collection efficiency, confidence intervals). Additionally, a critical analysis of the cited studies incorporating and citing available comments by the resources agencies on the study should be presented. The Service recommends that the Applicant collect site-specific data from the Projects and conduct a preliminary analysis for feasibility to aid in the design of protection and passage facilities. We recommend that this effort include all the developments among the Projects including the Toronto, Cliff Lake, and Black Brook developments. The Applicant should examine alternatives that would effectively pass fish upstream and downstream around the dams and turbines. These alternatives may include any existing trash sluices located close to the intakes; however, we are aware that there will be no available sluices for the Rio and Swinging Bridge Projects. Special attention should be given to upstream and downstream passage alternatives for American eel at all of the Projects as this species is a priority for population restoration. The Service recommends that the Applicant review our Fish Passage Engineering and Design Criteria as well as any other relevant literature for available passage designs for these Projects, as well as information on the relative effectiveness of each	Eagle Creek is proposing to complete a Fish Passage Study as described in the Proposed Study Plan.

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	design. Existing facilities at other dams should be investigated. Careful attention should be paid to attraction flows, guidance mechanisms, and velocities. The fish moving downriver must be diverted away from the turbines and guided to any downstream passage facility. Adequate attraction and conveyance flows must be provided. The passage facility should not create a bottleneck that would delay movement or expose the fish to excessive predation. All passage facilities should be designed to prevent blockage from ice and debris and should be as maintenance-free as is feasible. These facilities must be able to operate under all flow conditions experienced in the Mongaup River and across the range in reservoir elevations experienced in the reservoirs. 2. *Resource Management Goals* The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population. 3. *Public Interest* The requester is a resource agency. 4. *Existing Information* The PAD does not provide any information regarding protection and passage options. Section 5.4.1 in the PAD does describe the results of an entrainment study that was conducted in 1992 as a component of the original licensing effort. We do not consider the results of this study to be reliable or useful for more than a qualitative, presence-based analysis of entrainment at the Mongaup Project and entrainment of alewife *(Alosa pseudoharengus)* in the winter months at the Rio and Swinging Bridge Projects, which was the stated goal of the study at those Projects. This conclusion is based on several issues with the study: 1) The study was conducted in an atypical, drought year, and was seasonally biased. No entrainment sampling was conducted at Rio or Swinging Bridge outside of the winter months. Mongaup Falls was operated infrequently or not at all in the months of June-August and consequently little sampling was conducted. Entrainment estimates were based on calculated abundances that depended on plant flow, which was atypically low as a result of drought conditions. As a result, the abundances and representativeness of entrainment during the warmer months, when many fish species are active, was not representative of, and biased downward, compared to a normal year at Mongaup Falls and not presented at all for Rio and Swinging Bridge. 2) The collection efficiencies at the Projects were extremely poor. At both the Rio and Swinging Bridge Projects, two small 1-square-meter nets were placed relatively far below the draft tubes. Collection efficiency was only examined at Swinging Bridge, and these results were applied to Rio. The efficiencies across all tests at Swinging Bridge ranged from 2.4 to 8.5 percent, which were unacceptably low. At the Mongaup Project, a full coverage net frame was placed over the draft tube of Unit 4, but not over the remaining units. Collection efficiencies for one-unit releases with Unit 4 alone were 86 to 93 percent, which could have been acceptable. However, the study assumes, and observed, a marked decrease in efficiency with multiple (up to four-) unit operation. For an unknown reason, the efficiency of one- to four-unit operation was calculated to be	

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	89.6 to 95.9 percent, and averaged to approximately 91.6 percent. Actual collection efficiencies ranged from 12.7 percent to 91.0 percent, with no four turbine release greater than 14.8 percent. The authors may have assumed that a recapture rate of 25 percent was expected, and attempted to extrapolate this to weighted expected efficiency for the whole Project. This still does not explain how they derived 90.7 percent efficiency for a four turbine release. Ultimately, less than 15 percent recapture rates were observed for four turbine releases, and nearly all of the measured releases were conducted with four turbines. 3) The study predicts low entrainment at the Projects due to the depth and location of the intakes partly due to the potential for low DO at the intakes in the summer months. Swinging Bridge Unit 1 has the deepest intake, and was recorded as having the most anoxic conditions in the study; however, this unit is no longer in operation. Swinging Bridge Unit 2 and Rio were both found to have more marginal DO conditions with relatively anoxic conditions during the warmest months, while Mongaup Falls was only found to have one period of anoxic conditions on August 4, 1993. No sampling was conducted during the warmer months at either Rio or Swinging Bridge, so there is no data presented to test this assumption for these Projects; however, the August 4 sampling date at Mongaup Falls was found to have a DO concentration within the intake zone of influence of 0.8 to 1.3 parts per million, a level presented as lethal to highly stressful for most species of fish. On that same date, entrainment at the facility included eight species of fish and a large number of individuals, primarily of alewife, but also including other panfish and game species (i.e., largemouth bass). A 12.7 percent collection efficiency was observed for alewife on that date. The potential for entrainment at the Mongaup Project apparently exists even at anoxic conditions, and places this claim in doubt at the other Projects. 4) The survival estimate of 70 percent is based on a limited number of entrainment mortality studies with no critical analysis of the studies themselves. There are now many more studies available to reference in this type of analysis. No mortality information was included from the actual field study. In conclusion, we do not concur that a claim of minimal entrainment and mortality for all species can be derived from the 1992 entrainment study alone. What data do exist indicate that entrainment does occur and the potential for negative impacts to the fishery resource may exist. An updated analysis with current fishery data is needed. 5. *Nexus to Projects Operations and Effects* The Projects dams entrain and can cause mortality to fish and serve as barriers to upstream and downstream fish migration. The Rio Dam blocks the upstream movement of all species in the Mongaup River, including migratory species from the Delaware River. The Rio Dam blocks approximately 4.8 miles of the mainstem river up to Mongaup Falls, the historical natural barrier to upstream movement for most species in the Mongaup River. This is 33 square miles of the basin, which represents approximately one-sixth of the drainage area of the basin above the Rio Project. This includes access to potentially high quality habitat in Black Brook and numerous smaller tributaries. American eel have historically been located above Mongaup Falls, and the Mongaup Falls and Swinging Bridge dams would block upstream movement of this species, if passage were available at the Rio Dam. The existence of barriers to migration for this species and the loss of access to available habitat have been noted as one of the primary threats for this species. American eel were noted as the most abundant species in the Mongaup River below the Rio Dam in previous studies. These Projects have blocked access to approximately 193 sq. mi. of the basin for American eel. Native brook trout populations, as well as other resident species, are also isolated by these upper Projects' dams into smaller stream segments within: 1) the lower Black Lake Creek and the Mongaup River between Swinging Bridge Dam and Mongaup Falls, and 2) Black Lake Creek between Cliff Lake Dam and Toronto Dam. This later segment is partially isolated due to a hydraulic connection between Cliff Lake and Swinging Bridge Reservoir. Large areas of the basin are not accessible to brook trout or other resident fish species upstream of these segments.	

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	Fish moving downstream are subjected to potential mortality from impingement and entrainment. New licenses issued for projects throughout New York have incorporated 1-inch clear-spaced trashracks to physically exclude most adult fish from the turbines, alternate downstream passage routes, and other features (e.g., reduced approach velocities, adequate plunge pools, etc.) to encourage safe downstream fish passage. The existing downstream fish passage structures may not be adequate. If upstream passage for American eel is provided, downstream passage for these species will be of special concern. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard literature reviews and site-specific data collection techniques common to most hydro licensing activities. A study of entrainment within surge tanks has not been widely conducted previously, although it has the potential to provide useful field data for comparison with desktop studies. We are interested in exploring this opportunity with the FERC and the Applicant. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would involve moderate literature review, discussions with fishway engineers, and site-specific data collection. Collection of any entrained fish in the surge tanks could involve seasonal events of draining the surge tanks through available valves and potentially be conducted in conjunction with routine maintenance operations. The overall study could be completed in less than 1 year, but may require more time to design effective facilities. The actual cost is unknown and would depend upon the number of alternatives examined. The existing information in the PAD is inadequate to allow a thorough examination of alternatives. However, most of the information needed should be available in the existing literature.	
26	<u>Flow Studies</u> l. *Goals and Objectives* The goals and objectives of this study are to determine whether the existing releases are appropriate for the downstream portions of the Mongaup River and Black Lake Creek as well as their bypassed reaches. This study should extend down to the confluence of the Mongaup River with the Delaware River. The Projects operate in a ponding fashion, thus varying flows downstream of the Project. The Projects divert flows from the main river channels, creating bypassed reaches. The current license requires minimum flow releases as follows: 1) 100 cfs below the Swinging Bridge powerhouse and 10 cfs below both the Toronto and Cliff Lake dams; 2) 70 cfs below the Mongaup Falls Dam in the bypassed reach and 20 cfs below the Mongaup Falls powerhouse; and 3) 100 cfs below the Rio Dam. We request that flow studies be conducted to determine whether these are the appropriate minimum base flows. A Delphi approach may be possible, which is simpler and less expensive than more complex studies such as using the Instream Flow Incremental Methodology (IFIM); however, the complexity of the resources and issues involved in this relicensing may necessitate a more formal, quantitative study. The Delphi approach requires the creation of a "team" that should identify target species and life stages, with appropriate priorities for each, and a range of flows to be viewed for the reaches studied. We recommend and will support this methodology if the team consists primarily of qualified biologists from the resource agencies, and a qualified biologist representing the Applicant. A neutral facilitator is also essential. This study is intended to evaluate the habitat and resources in the reaches studied, and other parties can provide input related to their concerns in relation to the results derived from this study during the relicensing process. During the study, the Applicant would provide a variety of flows to the reaches, starting with lower flows and working up to the highest flow to be studied. During each flow, the team will examine the habitat and "score" it for each species/life stage. The final data will then be used in conjunction with fisheries and habitat mapping data to negotiate flow regimes for the reaches in relation to the other resources and issues at the Projects. If an IFIM study is	See Section 3 of the Proposed Study Plan.

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	conducted, it would follow established protocols and involve a quantitative analysis of modeled habitat availability for different life stages of the target species. The ability of the Applicant to regularly provide for the minimum flow below the Rio Dam has never been evaluated. The Service recommends that the Applicant provide an analysis of the degree to which the flows in the bypassed reach below the Rio Project have been in compliance with the 100 cfs or 60 cfs minimum release included in the 401 Certification for the Project. This study would involve a desktop analysis of the past 5-10 years of instantaneous gauge data from the USGS gauges below the Rio Project. These data will help determine the consistency of compliance with the required minimum flow and if the existing methods of provision are adequate. The Service recommends that the Applicant conduct habitat mapping for all of the relevant reaches. This mapping, which is an essential component of both a Delphi study and an IFIM study, should identify the type of habitat in each section (e.g., pool, riffle, run), along with depths, velocities, and substrates. We request that habitat mapping also be conducted in the additional tributary streams and upstream areas included in the fisheries study to provide data regarding the available habitat in these areas. This information will be used to determine the amount of available habitat under different flows and in adjacent tributaries. Flows selected by the Delphi study will be primarily evaluated by their ability to maximize habitat availability for the species studied. We also recommend that the Applicant conduct an analysis of the effects of the releases from the Rio Project on the downstream and upstream portions of the Delaware River, where the federally listed dwarf wedgemussel is known to occur. Effects to the resources in the National Park Service's Upper Delaware National Scenic and Recreation River may occur, up to the tributaries affected by the New York City reservoirs. This study would involve a desktop analysis of the past 5-10 years of instantaneous data from the USGS gauges below the Rio Project and in the Delaware River upstream and downstream from the confluence with the Mongaup River. The Applicant should study the extent to which the high flow releases from the Rio Project influence the Delaware River flows, especially in low flow periods, and highlight any times when scheduled releases provided to the USGS Rivermaster were canceled and for what reason. 2. *Resource Management Goals* The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population. 3. *Public Interest* The requestor is a resource agency. 4. *Existing Information* The PAD provides no information regarding how the minimum flows required by the current license for Black Lake Creek were developed, nor does it describe the benefits of these flows or the impacts of not having higher flow releases.	

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	A detailed IFIM study was conducted for the Mongaup River during the original licensing. The current flows in the Mongaup River were determined largely by their inclusion by the NYSDEC in the 401 Water Quality Certifications for the Projects, and were greater than the flows proposed by the previous applicant and recommended by the FERC, but less than the flows recommended by the Service. The license orders from the FERC for the Projects focus on changes in available habitat for adult brown trout as the justification for its recommendations. However, the IFIM studies conducted examined the available habitat for a variety of species and life stages across all of the Projects. While there were modest increases in adult brown trout habitat at flows above the FERC recommendation, these were not the most important increases in habitat that resulted from the study. At Swinging Bridge, the NYSDEC and Service recommendations increased spawning and incubation habitat for brown trout by 132 and 186 percent, respectively. A similar trend was observed for the Mongaup River below the Mongaup Falls powerhouse. For these isolated stream segments, the ability of all life stages to succeed is an important component of a healthy fishery. This trend was also present below the Rio Dam. Also below the Rio Dam, the higher releases request by the NYSDEC and the Service increased American shad spawning habitat by 275 to 359 and 931 to 1,097 percent and incubation habitat by 83 to 179 and 168 to 479 percent, respectively, depending on habitat type. These differences represent acres of available habitat for species of concern in a habitat with a very limited aerial extent and are important for these resources. Ultimately, the environmental measures required at the Projects during the original licensing consisted of some limitations on fluctuations during the recreation and bass spawning seasons, monitoring of water quality, and the minimum flows in the reaches to be studied. These Projects have large fluctuations in impoundment levels and river flows, high ramping rates, and no adequate fish passage or protection facilities. The available habitat, fisheries resources, and issues at the Projects have likely changed since the original licensing. The flow releases from these Projects have multiple benefits to a variety of species as well as to water quality, and the appropriate flow regimes will be determined as part of a holistic look at all of the competing issues. 5. *Nexus to Projects Operations and Effects* Operation of the Projects affects flows in the Mongaup and Delaware Rivers. The existing minimum flows may not provide adequate mitigation for these impacts. This study is necessary to determine the appropriate flow regime for the impacted reaches. We have described the potential impacts to the downstream and upstream areas of the Delaware River in our comments on SD 1, above. 6. *Methodology Consistent with Accepted Practice* The recommended study would use a standard Delphi or IFIM study design that has been used in many hydro licensing activities. The analysis of compliance and downstream flow effects is also a common activity during relicensing. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would depend on the method chosen and involve multiple meetings to establish the study team and identify the flow ranges, target species, and life stages to be studied. The actual study would likely take multiple days in the field across all the Projects, and depend on the number of flows to be viewed and the difficulties encountered in providing and stabilizing these flows. Several follow-up meetings would be necessary to review the data and negotiate the final flows. The habitat mapping will be done separately and likely will take a crew of people a seasonal effort. The gauge data could be readily analyzed with little difficulty. The cost will depend on the method chosen and will depend on the number of flows to be viewed, the difficulty in providing these flows, and the number of meetings necessary to complete the study and negotiations.	

Comment #	Comment	Response to Comment
27	Water Quality 1. *Goals and Objectives* The goals and objectives of this study are to provide baseline water quality information to allow a proper determination of the potential impacts at the Projects. These data are necessary to evaluate how water quality may influence the current condition of the fishery and the adequacy of the minimum flows at the Projects as they relate to water quality. These studies should include water temperature and DO on a continuous basis for at least 1 year, along with monthly sampling of other parameters such as pH, turbidity, and conductivity. An additional year of monitoring may be requested based on a review of the first year's results. This information will be used to document baseline water quality conditions and to determine potential impacts from the Projects' operations. We recommend that additional water quality data, beyond the data currently collected below the Projects' powerhouses, be collected from the impoundments, the bypassed reaches, and areas upstream and downstream from the Projects as well as tributary streams that are sampled for the fisheries study. These additional locations are necessary to evaluate water quality across the variety of areas impacted by the Projects' operations. Temperature in the tributary streams is of particular concern for trout species. 2. *Resource Management Goals* The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population. 3. *Public Interest* The requestor is a resource agency. 4. *Existing Information* The Applicant has been conducting ongoing water quality monitoring below the powerhouses for all three Projects and these data will continue to be collected during the study period. There are no data available for the bypassed reaches, Black Lake Creek, in the impoundments, or in the tributary streams to the Mongaup River. 5. *Nexus to Projects Operations and Effects* The Projects impound the river and create multiple bypassed reaches. This could impact such water quality factors as temperature and DO, which are critical to the quality of the aquatic habitat. The Projects have a history of water quality issues that require detailed analysis. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard scientific water quality sampling techniques used in most hydro licensing activities.	Eagle Creek is proposing to complete a Water Quality Study as described in the Proposed Study Plan.

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	7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would be an extension of ongoing efforts and would involve a crew monitoring continuous measurement devices and collecting monthly samples while undertaking other work such as fisheries or macroinvertebrate surveys. In addition, temperature and DO loggers would be installed, with data being periodically downloaded. The actual cost is unknown but would be relatively low. Existing data may not be sufficient.	
28	<u>Impoundment Fluctuation Studies</u> 1. Goals and Objectives The goals and objectives of this study are to provide information regarding the habitat in the impoundments and how it is impacted by changes in water levels. This information will then be used to determine what impacts need to be addressed and whether an alternative operational mode may be more desirable. These Projects have large maximum and target fluctuation ranges. These fluctuations create a zone around the impoundment shoreline that is periodically dewatered. The habitat in this zone is usually not as valuable to aquatic organisms and plants as the habitat with more constant water levels. These fluctuations can impact wetlands and shallow littoral vegetation, as well as the invertebrates, fish, birds, mammals, amphibians, and reptiles that use these habitats. The Service recommends that the Applicant conduct an impoundment fluctuation study. This study will assist in the determination of what fish and wildlife resources are being impacted and to what degree. The study should consist of mapping the aerial extent and habitat in the fluctuation zones at full pond and at drawdowns consistent with Project operations. The maps should identify the extent of the changes in, and adjacent to, the impoundment areas, substrate and type of habitat, the depth at various pond levels, and any important habitat types (i.e., wetlands and submerged aquatic vegetation) that may be present. Steep slopes, fluctuations in stream flow, and fluctuations in reservoir elevations can lead to mass movement, and we recommend that eroding or potentially erodible areas within the fluctuation zone be evaluated and included in the maps. We recommend that the Applicant study the range of flow releases evaluated in the flow studies in relation to the potential for impoundment fluctuations at the Projects. This would involve deriving a calculation of storage at the Projects at different depths and the degree to which different flow releases can be maintained at differing starting elevations. Estimates should be quantitative and based on million gallons per day estimates of the releases in relation to total storage. This would be an extension of the current draft operating plan. The Service recommends that the Applicant prepare a consolidated figure or table that presents all of the relevant elevations for Project operations. This figure or table should include the dam crest, maximum and minimum fluctuation ranges, any intake/outlet gate inverts (and height), any required seasonal limitations on fluctuations and their duration, and the target elevations proposed by the Applicant and their duration. 2. *Resource Management Goals* The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.	Eagle Creek is proposing to complete a Reservoir Water Level Fluctuation/Operations Model Study and Aquatic Habitat Assessment Study as described in the Proposed Study Plan.

Comment #	Comment	Response to Comment
	3. Public Interest The requestor is a resource agency. 4. Existing Information The PAD provides information related to the maximum and target fluctuation levels of the Projects. Additionally, there is a draft operations plan that provides information related to refill rates based on seasonal targets in reservoir elevations. There are no data provided regarding habitat within the impoundments that may be affected by the Projects operations. 5. Nexus to Projects Operations and Effects The Projects operate in a ponding fashion and large fluctuations occur in the reservoirs that impact shoreline habitats in the vicinity of the Projects. 6. Methodology Consistent with Accepted Practice The recommended study uses standard study techniques used in many hydro licensing activities at projects with ponding operations. 7. Level of Effort, Cost, and Why Alternative Studies Will Not Suffice The level of effort would be moderate and would involve one crew surveying the impoundments as well as the preparation of a desktop analysis of the effect of different elevations on habitat and flows on elevations. The actual cost is unknown but would depend on the variety of habitats found in the impoundments.	
29	<u>Wetland Delineation</u> 1. *Goals and Objectives* The goals and objectives of this study are to identify key aquatic habitat areas in the vicinity of the Projects. The study will provide information on the extent and quality of wetlands and aquatic vegetation and the wildlife they support. The Service recommends that the Applicant document all wetlands and other aquatic vegetation within the vicinity of the Projects. This information is necessary to characterize the aquatic habitats and the wildlife they support in the Projects vicinity. 2. *Resource Management Goals* The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.	Eagle Creek is proposing to complete an Aquatic Habitat Assessment Study as described in the Proposed Study Plan.

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	3. *Public Interest* The requestor is a resource agency. 4. *Existing Information* The PAD provides the Service's National Wetland Inventory (NWI) and NYSDEC delineations of wetlands, but these surveys are not precise enough to capture all regulated wetlands, thus there is a need for wetland vegetation surveys. No information is provided regarding submerged aquatic vegetation. 5. *Nexus to Project Operations and Effects* Operation of the Projects affects water levels and velocities, as well as the timing and location of releases. These factors can impact aquatic vegetation and wetlands, which can be important habitats for fish and wildlife. The information will be used to determine what, if any, impacts the Projects are having on these resources and what the appropriate protection and mitigation measures might be. 6. *Methodology Consistent with Accepted Practice* The NWI maps are frequently used as the starting point in delineating wetlands. We expect the Applicant to use techniques commonly accepted by the scientific community. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort and cost are relatively low. Much of the information will be collected during habitat mapping of the impoundments and stream reaches for other studies. We recommend this study to ensure that there are no gaps in the wetland and aquatic vegetation information for the Projects. The remaining information can probably be collected during field work related to other studies. No alternative studies have been proposed.	
30	<u>Macroinvertebrates</u> 1. *Goals and Objectives* The goals and objectives of this study are to provide information regarding the macroinvertebrate community. Macroinvertebrate communities are closely linked to water quality and represent the food base for fisheries. We request that 1 year of macroinvertebrate community sampling, including freshwater mussels, be conducted. An additional year of monitoring may be requested based on a review of the first year's results. This information will be used to document the current macroinvertebrate community and water quality conditions and to determine potential impacts from the operation of the Projects. Data should be collected from the impoundments, the bypassed reaches, and areas upstream and downstream from the Projects. We do not expect this study to extend beyond the confluence with the Delaware River as ample data are available on the macroinvertebrates in that system. 2. *Resource Management Goals* The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows	Eagle Creek is proposing to complete a Macroinvertebrate and Mussel Survey Study as described in the Proposed Study Plan.

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	and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population. 3. *Public Interest* The requestor is a resource agency. 4. *Existing Information* The PAD provides some information related to benthic macroinvertebrates, but there is no recent site-specific information. Data are presented from the original licensing and for one 1999 study at the confluence of the Mongaup with the Delaware River that was considered indeterminate. No information is presented regarding freshwater mussels in the basin. 5. *Nexus to Projects Operations and Effects* The Projects interrupt the downstream movement of benthic macroinvertebrates that are important forage for fish and interrupt the downstream transport of food sources upon which benthic macroinvertebrates depend. The Projects have bypassed reaches that may not be adequately watered by existing minimum flows such that the macroinvertebrate community may be negatively affected. Freshwater mussels are dependent on fish host species and the Projects' dams block fish movement both upstream and downstream. The turbine intakes may impinge or entrain fish, resulting in mortality. The operation of the Projects may also affect the amount of habitat available for mussels within the Project boundaries in the impoundments. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard macroinvertebrate sampling techniques used in most FERC relicensing activities. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would be low and would involve one crew collecting data and conducting surveys while undertaking other work such as fisheries or water quality surveys. The actual cost is unknown but should be relatively low.	
31	<u>Bald Eagles</u> 1. *Goals and Objectives* The goals and objectives of this study are to provide information regarding the bald eagle population at the Projects. This study will provide information related to the effects of the Projects on the population during winter feeding activities and inform management of this important resource. Bald eagles are a protected species under Federal and State law and the Mongaup Valley has a noted population of bald eagles with multiple viewing areas installed and maintained by the NYSDEC. The Service recommends that the Applicant conduct a study providing information regarding current nesting locations at the Projects and the feeding and foraging activities of bald eagles in the reservoirs and near the tailraces. This study would involve collecting data from the NYSDEC and conducting 1 year of field observation of feeding activity, noting location, number of eagles, and identity of food resources, if possible.	See Section 3 of Proposed Study Plan.

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	2. *Resource Management Goals* The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population. 3. *Public Interest* The requestor is a resource agency. 4. *Existing Information* The PAD provides some general information on bald eagles, but there is no site-specific information on nesting or feeding activity presented. One of the stated goals of the 1992 entrainment study during the original licensing was to evaluate the availability of entrained alewife for winter feeding of bald eagles. There is no current information related to the importance of this resource to the bald eagles in the vicinity of the Projects. 5. *Nexus to Projects Operations and Effects* The Projects provide habitat for fish and entrain fish that may be a primary source of nutrition for bald eagles in the vicinity of the Projects. Any mitigation measures related to water level fluctuations and fish entrainment may influence this protected species. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard avian monitoring techniques. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would be low and would involve one crew collecting data and making observations over one or two field seasons.	
32	<u>Swinging Bridge Spillway Habitat</u> 1. *Goals and Objectives* The goals and objectives of this study are to provide information regarding the potential for the Swinging Bridge spillway to provide habitat for macroinvertebrates and herpetofauna at this Project. We observed during the environmental site review for the Swinging Bridge Project that leakage and potentially recent spillage had created a series of pools and some small amount of flow through the spillway area of the Project. These habitats were quite abundantly occupied by macroinvertebrates and eggs and tadpoles of herpetofauna. The Service recommends that the Applicant study the consistency and volume of leakage in this area and the potential to provide some flow that would support these communities, which are important forage species for a variety of fish and wildlife species. 2. *Resource Management Goals* The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the	See Section 3 of Proposed Study Plan.

Comment #	Comment	Response to Comment
	NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population. 3. *Public Interest* The requestor is a resource agency. 4. *Existing Information* There is no existing information in the PAD regarding this habitat. 5. *Nexus to Projects Operations and Effects* The Swinging Bridge Project can negatively impact the macroinvertebrate community, as discussed in the Macroinvertebrates study request, and hydro projects with impoundment fluctuations have been shown to negatively impact herpetofauna communities through dewatering of seasonal wetlands and exposure of aestivating species during the winter months. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard habitat assessment techniques. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would be low and would involve one crew collecting data and making observations over one field season.	
33	<u>Black Brook Dam Removal</u> 1. *Goals and Objectives* The goals and objectives of this study are to provide information regarding the potential for removing the Black Brook Dam, a component of the Mongaup Falls Project. The Black Brook Dam and diversion are no longer utilized for Project operations nor maintained beyond dam safety standards. As this is no longer an integral part of the Mongaup Falls Project, we recommend that the Applicant study the potential to remove this dam on Black Brook, a noted trout fishery. 2. *Resource Management Goals* The Service is the primary Federal agency responsible for the conservation, protection, and enhancement of fish, wildlife, plants, and the habitats on which they depend. The Mongaup River Basin, in the vicinity of the Projects, is managed by the NYSDEC for a variety of fish species including walleye, brook trout, brown trout, rainbow trout, largemouth bass, and smallmouth bass. The anadromous American shad and catadromous American eel are also primary species of concern. Flows and water quality in the Delaware Basin, including the Mongaup Valley, are closely managed and may impact the federally listed dwarf wedgemussel, known to occur in the Delaware River below the confluence with the Mongaup River. The Mongaup Valley is managed by the NYSDEC to protect both nesting and wintering habitat for a notable bald eagle population.	See Section 3 of Proposed Study Plan.

Comment #	Comment	Response to Comment
	3. *Public Interest* The requestor is a resource agency. 4. *Existing Information* There is little information in the PAD regarding this dam or its impoundment. The potential to remove this dam is unknown. 5. *Nexus to Projects Operations and Effects* The dam is a component of the Mongaup Falls Project that impacts the potential movement of fish and the macroinvertebrate community, as discussed above. The impoundment may increase thermal inputs into this cold water system. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard dam removal assessment techniques. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would be low and would involve a desktop analysis of dam removal options and costs and potentially some sediment sampling behind the dam.	
34	**Foregoing Studies in Lieu of Protection, Mitigation, and Enhancement Measures** We anticipate that the Applicant will pursue a settlement agreement for these Projects. As such, during the development of the Study Plan that must be approved by the FERC during the Integrated Licensing Process, there may be an opportunity to reduce some of these studies in scope, or even forego some of them, if agreements can be reached up front regarding certain PME measures. The Service recommends that, prior to the development of the Draft Study Plan, the Applicant convene a meeting with the stakeholders to determine which studies could be reduced or eliminated in return for agreements to proceed with certain PME measures.	Comment noted.
July 26, 2017 – Judy and Gary Knee Comments on the Swinging Bridge Reservoir (FERC memo)		
1	We are residents who are retired and who have common sense to see that a no or low input water flow, plus the mandatory releases of 100 cfs, plus the generation releases by Eagle Creek and Kayak White Water releases… equals a disastrous negative result.	Comment directed to FERC noted.
2	As very unhappy residents and tax payers, it is our contention that a full environmental study be completed by certified experts in the field, who can determine the correct management of this lake.	Comment directed to FERC noted.
3	It is our hope, that releases closer to 30 CFS which could turn a negative into a positive namely…allowing for storage of water to be used in emergency situations and to allow for enough water to be maintained at 1070 above sea level with a 1065 above sea level as a low, thus allowing enough water to generate by the owners of the lake and other demands. This lake has been reduced many, many times over the years to be in the 1050's which completely devastates the lake all around and not just at the North End.	Comment directed to FERC noted.
4	When water is completely lost it is useless with extremely dangerous conditions for the entire reservoir.	Comment directed to FERC noted.
July 27, 2017 – FERC Additional Information Request and Study Requests		
1	**Study Request #1 – Reservoir Water Level Fluctuation / Operations Model** Goals and Objectives §5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goal of this study is to develop an operations model that may be used to predict reservoir elevations for each of the	Eagle Creek is proposing to complete a Reservoir Water Level Fluctuations/Operations Model Study as described in the Proposed Study Plan.

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	Mongaup River project reservoirs under various operation constraints (e.g., minimum flow, reservoir level, etc.). The operations model should support an assessment of potential project effects on aquatic, terrestrial, recreation and land use, and aesthetic resources that may result from proposed or recommended project operational scenarios. Specifically, for each project reservoir, the model should be able use historic inflows to predict reservoir outflow, reservoir elevations and surface areas, and corresponding project generation at an appropriate timestep. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission (Commission) must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Project operations affect reservoir elevations on a seasonal, weekly, daily, and potentially hourly basis. Therefore, project operations may affect several environmental resources. Understanding the effect of proposed and recommended project operations on generation and reservoir water levels, storage, and surface area, is essential to understand how the Mongaup River projects' operation affects these resources and, therefore, relevant to the Commission's public interest determination. <u>Background and Existing Information</u> §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information* The PAD provided general information about the magnitude of the licensed limits for water level fluctuation in the projects reservoirs and provided information on the hydrology of the Mongaup River, and hydraulic capacities of the projects and the proposed operations. While this information is available, it is insufficient to fully inform an analysis of how proposed and potential project operations may affect generation and the environmental resources discussed above. <u>Project Nexus</u> §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* Project operations have the potential to affect reservoir elevations for each of the five reservoirs associated with the Mongaup River projects on a seasonal, weekly, daily, and even hourly basis. The requested operations model should provide information on reservoir water surface area, elevations, and fluctuation rates and support an assessment of potential project effects on aquatic, terrestrial, recreation and land use, and aesthetic resources associated with the reservoirs and that may result from proposed and/or recommended project operational scenarios. This information will inform the development of potential license conditions that consider the non-developmental values of the project, as well as their power and developmental values.	

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	Proposed Methodology §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* Eagle Creek should develop, calibrate, and validate an operations model that integrates each of the three Mongaup River projects and supports the evaluation of proposed and potential recommendations for the project operations, at an hourly (or better) time-step and under various reservoir inflow and outflow conditions. The operations model should be capable of predicting reservoir elevations, surface areas, available storage, and generation that would result from various operational scenarios. Level of Effort and Cost §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* The estimated cost of the study is approximately $150,000. Eagle Creek did not propose an alternative study.	
2	**Study Request #2 – Aquatic Habitat Mapping of the Projects' Reservoirs** Goals and Objectives §5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goal of this study is to map the aquatic habitat within each of the five reservoirs associated with the Mongaup River projects, evaluate the types of aquatic habitats that occur, and identify any potential effects project operations may have on this habitat. Specifically, the objectives of the study are to: 1. Survey and map the aquatic habitat types distributed within the reservoirs, from the upper extent of each impoundment to the associated dam. 2. Describe the potential influences of the projects' operations on aquatic habitats within the impoundments. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.	Eagle Creek is proposing to complete an Aquatic Habitat Assessment Study as described in the Proposed Study Plan.

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	Aquatic habitats in the projects' reservoirs support an aquatic ecosystem that provides public opportunities, including sport fisheries. This study would provide information needed to determine the effects of project operations on this resource relevant to the Commission's public interest determination. Background and Existing Information §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information* Upon review of Eagle Creek's PAD, we find aquatic habitat data for the projects' reservoirs to be very limited. Eagle Creek generally implies that there is a sufficient amount of existing information to support the licensing process, including information on the aquatic habitat resulting from study and/or monitoring in support of the current license. However, the PAD did not include sufficiently detailed information to allow us to determine if the information is adequate to support the Commission's licensing process. As such, additional aquatic habitat information, including the mapped locations of aquatic habitats within each of the projects' reservoirs is needed to evaluate the projects effects on aquatic resources. Project Nexus §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* Currently, water levels in the projects' reservoirs fluctuate on a seasonal, weekly, daily, and even hourly basis due to the projects' load-following peaking operations. As a result, any aquatic habitat exposed under low water levels may be adversely affected and/or inhibit the utilization of aquatic habitats by aquatic species during various life stages. These events may also cause fish or other aquatic species (e.g., mussels and macroinvertebrates) stranding and associated mortality. This requested study would help establish a baseline condition and the health of the aquatic habitat within the projects' reservoirs and assist in forming the basis for inclusion of potential license articles to protect the aquatic resources. Proposed Methodology §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* Using generally accepted practices in the scientific community: 1. Conduct field surveys of aquatic habitat during full-pool from the head of each of the projects' reservoirs to the associated dam. 2. Categorize habitat survey information per accepted practices in the scientific community (e.g., habitat type, substrate type, depths, etc.) and plot on aerial maps. Also record in-situ water quality conditions (temperature, dissolved oxygen (DO), pH, conductivity) and the presence of invasive aquatic vegetation (species and location). 3. Prepare a report that includes a summary of the data collected. Include in the report, aerial habitat maps that demarcate proposed minimum and maximum reservoir elevations, habitat descriptions, project operations and reservoir elevations and surface areas during the surveys, effects of proposed project operations on the aquatic habitat(s), and in-situ water quality data. Include all data used to develop the report in an appendix.	

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	Level of Effort and Cost §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* The estimated cost of this work is approximately $100,000 and may be completed within one study season. It is anticipated that two technicians and a biologist would spend about 40 hours in each reservoir to conduct field work. Report preparation would require about a month of a biologist's and/or GIS specialist's time to complete. We recognize, however, that if more detailed information exists on aquatic habitat in the project reservoirs than what was provided in the PAD, and we determine it to be sufficient to inform our environmental analysis, this requested study should not be necessary.	
3	**Study Request #3 – Baseline Fisheries Population Study** Goals and Objectives §5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goal of this study is to gather baseline fisheries data throughout the projects' area. These data are needed to identify the fish species that occur in the projects' impoundments, tailwaters, downstream riverine corridors, and bypassed reaches as well as to evaluate any potential project effects. Specifically, the objectives of the study are to: 1. Determine the relative abundance and distribution of fish species within the project impoundments, tailwaters, riverine corridors, and bypass reaches within the projects' area. 2. Describe the distribution of fish species within the aquatic habitats and compare and contrast current data with historic survey data. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Fish populations in the Mongaup River support a sport fishery. The effect of project operation on this resource is relevant to the Commission's public interest determination. Background and Existing Information §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.*	Eagle Creek is proposing to complete a Fisheries Survey Study as described in the Proposed Study Plan.

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	A review of the PAD revealed that the New York State Department of Environmental Conservation (NYSDEC) conducted surveys of fish populations for portions of the project area prior to 1980 and in 1987 the prior licensee conducted fish surveys in support of its license application. While this information is existing, project operations, particularly minimum instream flow requirements, were changed when the current license was issued and it appears that no new fisheries data has been collected since those project operational changes occurred, as a result, fisheries population data are needed to evaluate the projects' effects on this resource. Project Nexus §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* Potential project effects on fishery resources may include fish entrainment through the generating units, minimum instream flows, and peaking flow operations. Information on the abundance and distribution of the existing fish community would help to identify whether adverse effects are occurring and/or determine whether the current license conditions are protective of the resource as intended. The applicant is proposing to continue providing the existing minimum flows. Flow releases from the projects have the potential to affect the suitability of aquatic habitat in these reaches, and in turn fishery resources. This requested study would help establish the current baseline condition on the health of the fishery in the projects' area of the Mongaup River basin under the current projects' operation. These data would also assist in informing potential license articles to protect fishery resources in the Mongaup River. Proposed Methodology §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* Using generally accepted practices in the scientific community: 1. Conduct electrofishing surveys in each of the project impoundments, tailwaters, and downstream riverine corridors, including boat or backpack electrofishing within the bypassed reaches. Conduct sampling during late summer or fall in order to observe annual juvenile production (juvenile fish would be large enough to collect). Establish sampling locations that represent the full extent and types of habitat in the study area. 2. Separately target upstream and downstream migrating American eels for sampling using generally accepted methods, such as electrofishing, trap/fyke netting, eel pots, etc. to provide data on the abundance of American eels at various life stages, and where they tend to congregate. Conduct the study in late spring/early summer to target upstream migrating juvenile eels (i.e., elvers and yellow eels), and during the fall to target downstream migrating adults eels (i.e. silver eels). 3. Identify to species and count all collected fish while weighing and measuring only a subsample. Measure eye diameters of captured American eels for use in the evaluating silver eels phase. Identify and record the habitat type and substrate of each sampling location, and record in-situ water quality conditions (temperature, DO, pH, conductivity). 4. Prepare a report that includes a summary of the data from the above studies. Include tabular summaries of fish species collected by station, plus data on lengths, weights, condition factors, and in-situ habitat conditions. Also include specific information relating to American eel population characteristics, such as areas at the base of the dams where elvers congregate, and the abundance of potential downstream migrating silver eels. Include all data used to develop the report (including date and time of collection) within an appendix to the report.	

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	Level of Effort and Cost §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* The estimated cost of this work is approximately $100,000 and may be completed within one study season. It is anticipated that three technicians and a biologist would spend about 160 hours conducting field work for each project. Report preparation would require about 60 hours by a biologist. Eagle Creek did not propose an alternative study.	
4	**Study Request #4 – Stream Reach Water Quality Study** Goals and Objectives §5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goal of this study is to monitor and evaluate water quality within area streams affected by project operations to support an evaluation of the existing minimum instream flow requirements to meet state water quality standards. Specifically, the study objective is to monitor water quality (e.g., dissolved Oxygen and temperature) on area stream reaches where current water quality data is limited or non-existent. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Water quality in project affected reaches of area streams support an aquatic ecosystem that provides public opportunities, including sport fisheries. Ensuring that the effect of project operations pertaining to this resource is considered in a reasoned way is relevant to the Commission's public interest determination. Background and Existing Information §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information* Pursuant to its existing license, Eagle Creek has monitored summer and fall dissolved Oxygen and water temperature downstream of the Swinging Bridge, Mongaup Falls, and Rio Powerhouses since 2011 and the PAD summarizes these monitoring results. In addition, a U.S. Geological Survey (USGS) gage station (Station No. 01433500) has collected water quality data immediately downstream of the Rio Project's tailrace on the Mongaup River since October 1, 2013. However, there are several reaches of area streams that are affected by project operations where water quality monitoring does not appear to have been conducted and no water quality data has been presented.	Eagle Creek is proposing to complete a Water Quality Study as described in the Proposed Study Plan.

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	These reaches include: • Black Lake Creek between Toronto Reservoir and Cliff Lake, • Black Lake Creek between Cliff Lake Reservoir and its confluence with the • Mongaup River, • the Mongaup River between the Swinging Bridge Powerhouse No. 2 and • the Mongaup Falls Project reservoir, • the Mongaup Falls Project's bypassed reach on the Mongaup River, and • the Rio Project's bypassed reach on the Mongaup River. <u>Project Nexus</u> §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* The existing license requires Eagle Creek to release minimum flows from the project's reservoirs to the five area stream reaches mentioned above. The presence of upstream project reservoirs and the projects' operations alter the stream flow which subsequently affects water quality. This requested study would help establish the baseline water quality condition within these five affected area stream reaches and aid in determining the adequacy of the minimum instream flow release for protecting water quality and assist in forming the basis for inclusion of potential license articles to protect water quality and aquatic resources therein. <u>Proposed Methodology</u> §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* 1. Using generally accepted practices in the scientific community monitor water quality (DO and water temperature) from June 1 through September 30 on a fifteen minute interval at the following locations: • Black Lake Creek at the discharge of the Toronto Reservoir, • Immediately upstream of the mouth of Black Lake Creek at Cliff • Lake, • Black Lake Creek at the discharge of Cliff Lake, • Black Lake Creek immediately upstream of its confluence with the • Mongaup River, • Mongaup River immediately upstream of the Mongaup Falls Project • reservoir, • Mongaup River immediately downstream of the Mongaup Falls • Project's minimum flow outlet structure discharge (upper extent of • the bypass reach), • Mongaup River immediately upstream of the Mongaup Falls tailrace • (lower extent of the bypassed reach), • Mongaup River immediately downstream of the Rio minimum flow • powerhouse (upper extent of the bypassed reach), and • Mongaup River immediately upstream of the Rio Project's tailrace (lower extent of the bypassed reach).	

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	2. Document and record stream flows within each project affected stream reach during the study period on the same 15 minute interval that water quality data is collected. 3. Record ambient air temperature at each water quality monitoring location during the study period. 4. Prepare a comprehensive water quality study report for each of the projects' affected stream reaches that incorporates all existing water quality data collected pursuant to the current license and USGS gage Station No. 01433500, the new water quality data collected pursuant to this study request, and consider the influence of ambient air temperature and stream flows on water quality within the project affected stream reaches. <u>Level of Effort and Cost</u> §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* The estimated cost of this work is approximately $40,000 and may be completed within one study season. It is anticipated that it will take two technicians, eight days to deploy and retrieve the monitoring equipment (including travel and staging) and about 80 to 100 hours for oversight and report preparation by a senior biologist.	
5	**Study Request #5 – Reservoir Water Quality Study** <u>Goals and Objectives</u> §5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goals and objectives of this study are to monitor baseline water quality conditions within the projects' reservoirs to support an evaluation of the existing condition and potential effects on aquatic habitats within project reservoirs and determine if reservoir water quality meets state water quality standards. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Water quality in the projects' reservoirs support aquatic habitats and public recreational opportunities, such as swimming, boating, and fishing. Therefore, evaluating the effect of the projects' operations on reservoir water quality is relevant to the Commission's public interest determination. <u>Background and Existing Information</u> §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*	Eagle Creek is proposing to complete a Water Quality Study as described in the Proposed Study Plan.

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	The PAD provide very little information about the water quality within the projects' reservoirs. Swinging Bridge Reservoir was assessed and included in the NYSDEC 2002 *Water Body Inventory / Priority Waterbodies List* (NYSDEC 2002) as an impaired water body. That assessment noted that hydrologic impacts associated with hydropower generation may have been an issue affecting the reservoir's water quality and influenced its inclusion on the list. However, Swinging Bridge Reservoir was not included NYSDEC's proposed final Section 303(d) list in 2016 (NYSDEC 2016). The PAD also acknowledges that during the summer, the hypolimnion in Toronto and Swinging Bridge reservoirs, become anoxic; however, the source of this information appears to be limited and possibly anecdotal. Similarly, the PAD notes that Rio reservoirs hypolimnion becomes anoxic when thermally stratified and cites Orange and Rockland Utilities 1988 license application for the project (Orange and Rockland 1998). The PAD also notes that the Mongaup Falls reservoir hypolimnion does remain oxygenated during the summer months and contributes this to project operations and subsequent turbulence within the reservoir that disrupt the development of a thermocline; however, no citation or supporting data is provided in the PAD. Project Nexus §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* Water quality in the projects' reservoirs may affect aquatic habitats and influence public recreation opportunities within the reservoirs. As mentioned above and demonstrated in the Mongaup Falls reservoir, project operational regimes can influence the water quality within a reservoir. Additionally, water discharged from project reservoirs may affect aquatic habitats and biota within the receiving stream reaches. Understanding the existing water quality conditions within the projects' reservoirs is necessary to inform the need for, and the development of, potential license conditions to protect water quality within the reservoirs and downstream riverine reaches for aquatic habitats and biota and recreational opportunities. Proposed Methodology §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* 1. Using generally accepted practices in the scientific community monitor water quality (e.g., water temperature and DO) within each of the projects' reservoirs from ice-off in the spring until ice-on in the winter. Water quality data must be monitored at appropriate locations within each reservoir and at 1-meter increments in depth from the reservoir surface to its bottom. An additional monitoring location must be established at the project intakes (depth and location) within each reservoirs. Data collected should be sufficiently robust to evaluate and consider what, if any, short and/ or long-term (seasonal) influences project operations may have on reservoir water quality (e.g., thermocline depth, water temperature, etc.). 2. Prepare a comprehensive water quality study report for each of the projects' reservoirs that incorporates the water quality data collected pursuant to this study request and as appropriate, the in-situ water quality data collected pursuant to the aquatic habitat mapping study discussed above. Level of Effort and Cost §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* The estimated cost of this work is approximately $110,000 and may be completed within one study season. It is anticipated that it will take two technicians, 28 days to deploy, maintain, and retrieve the monitoring equipment (including travel and staging) and about 80-100 hours for oversight and report preparation by a senior biologist.	

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6	**Study Request #6 – Special-status Wildlife Species and Habitat Assessment** Goals and Objectives §5.9 (b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goal of this study is to develop additional information to supplement the existing information necessary to address the potential effects of project operations and maintenance (O&M), land management activities, and recreation use on the presence of special-status wildlife species and their habitat. The specific information to be obtained is the type, abundance, and general distribution of special-status wildlife species and their habitat within the project area, required to assess the potential effects of the project on these species. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Special-status species are of particular interest because of their rarity and ecological functions. Ensuring that environmental measures pertaining to these resources are considered in a reasoned way is relevant to the Commission's public interest determination. Additionally, this information may be needed to ensure compliance with the Endangered Species Act. Background and Existing Information §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.* Special-status wildlife species, such as federally listed northern long-eared bat, Indiana bat, and bog turtle as well as several state-listed species are identified in the PAD as potentially occurring in the project area. NYSDEC has indicated that bald eagles use all five reservoirs associated with the projects in the winter, but no information was provided regarding potential breeding pairs using the projects. NYSDEC also indicated that state-listed peregrine falcon nests and timber rattlesnake are found in the project area. NYSDEC conducted surveys for the New York State Breeding Bird Atlas from 2000 to 2005 which provided a list of potential bird species in the project area including species of conservation concern such as the wood thrush, Canada warbler, and bobolink. There are, however, no comprehensive surveys to identify the abundance, timing, activities, and general distribution of special-status wildlife species or their habitats within the project area. This information will inform the development of potential license conditions that consider the non-developmental values of the project, as well as their power and developmental values. Additionally, this information may be needed to ensure compliance with the Endangered Species Act.	Eagle Creek is proposing to complete an Aquatic Habitat Assessment Study as described in the Proposed Study Plan.

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	Project Nexus §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* Project O&M as well as recreation use associated with the project, have the potential to affect special-status wildlife species and their habitat in the project area. This study will assist in identifying special-status wildlife species within the project area and the need for measures to reduce or eliminate effects. Proposed Methodology §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* Office Review Prior to field surveys, the candidate list of special-status wildlife species should be confirmed and developed in consultation with the U.S. Fish and Wildlife Service (FWS) and NYSDEC and include all special-status species currently identified in the PAD. Consultation with resource agencies should also determine recommended survey protocols for each species. Habitat maps and/or aerial photographs should be used to determine habitats that have the potential to support special-status wildlife species for field surveys. Field Surveys Field surveys for special-status wildlife in appropriate habitats should be conducted by individuals with experience conducting wildlife field surveys; knowledge of animal taxonomy and animal ecology and classification; familiarity with the wildlife of the area; and experience with analyzing impacts of a project on native wildlife species. Field surveys should cover the entire area directly and indirectly affected by the project during the appropriate seasons. Multiple surveys should be conducted to locate all potential special-status wildlife species and should also assess seasonal habitat use when relevant (e.g. bat maternity sites and winter hibernacula). Survey protocols should follow accepted and agency recommended wildlife species survey guidelines and protocols. Some project features may also provide suitable roosting and hibernating habitat for special-status bat species and therefore should also be surveyed. The abundance, distribution, and habitat use (including raptor nest sites) of all special-status species should be documented and the locations of all special-status species and their potential habitat should be indicated on maps showing the relationship to project features. A report should be prepared that includes the results (including photo documentation) of the surveys and mapping efforts and identifies, describes, and assesses the extent to which project-related actions and activities may affect special-status wildlife species and their habitat. The report will include the issues addressed, objectives, study area, methods, analysis, results, discussion, and conclusions. The report should also include documentation of consultation with relevant resource agencies. Level of Effort and Cost §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* The estimated cost of this work is approximately $180,000, based on one study season and the amount of habitat that has the potential to support special-status wildlife species. It's anticipated that a technician and a biologist would spend one week of desktop review and planning in preparation for field work. One biologist and two technicians would spend about 300 hours conducting field work. Report preparation is estimated at six weeks of a biologist's and technician's time to complete.	

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7	**Study Request #7 – Special-status Plant Species and Noxious Weed Assessment** Goals and Objectives §5.9 (b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goal of this study is to develop additional information to supplement the existing information necessary to address the potential effects of project O&M and recreation use on the presence of special-status plant species and the presence and potential spread of noxious terrestrial and aquatic weed species. The specific information to be obtained is the type, abundance, and general distribution of special status and terrestrial and aquatic noxious weed species within the project area, required to assess the potential effect of the project on these species. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Special-status species are of particular interest because of their rarity and/or ecological functions. Noxious weeds are resources of particular interest because of their potential effects on natural ecosystems. Noxious weeds can degrade wildlife habitats, crowd out beneficial native species, create fire hazards, and result in economic losses. Ensuring that environmental measures pertaining to these resources are considered in a reasoned way is relevant to the Commission's public interest determination. Background and Existing Information §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.* Special-status plant species, such as the federally listed small whorled pogonia as well as state-listed species have been identified in the PAD as potentially occurring in the project area. NYSDEC indicated that state-listed riverbank quillwort, dwarf sand-cherry, and swamp buttercup also occur in the project area. Additionally, a list of potential terrestrial and aquatic noxious weed species was provided in the PAD, however no surveys for noxious weed species have ever been conducted. Currently, there is very limited information concerning the rare plant and noxious weed species that may be present, their relative abundance, habitat associations, locations, information on the possible effects of project O&M activities and recreation use on these populations as well as the potential effects of noxious weed species on native plant diversity and habitat quality.	Eagle Creek is proposing to complete an Aquatic Habitat Assessment Study as described in the Proposed Study Plan.

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	Project Nexus §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* Project O&M as well as recreation use associated with the project, have the potential to destroy special-status plant species as well as introduce and spread noxious weeds in the project area. This study will assist in identifying special-status plants and noxious weeds within the project area and provide baseline information from which to evaluate project alternatives and/or develop and evaluate specific proposals for protection, mitigation, and enhancement of rare plant populations and their habitats and control of noxious weeds. Proposed Methodology §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* Office Review Prior to field surveys, the current list of special-status plants identified in the PAD should be confirmed and developed in consultation with FWS and NYSDEC. Field surveys should examine habitat maps and/or aerial photographs to determine vegetation cover types that have the potential to support special-status plant species. Field Surveys Field surveys for special-status plants of appropriate habitats should be conducted by individuals with experience conducting floristic field surveys; knowledge of plant taxonomy and plant community ecology and classification; familiarity with the plants of the area; and experience with analyzing impacts of a project on native plant species. Field surveys should be floristic and cover the entire area affected by the project during the appropriate blooming periods. Multiple surveys should be conducted to locate all potential special-status species. Two study seasons should be performed to confirm the presence of rare, special-status plant species. The survey protocol will follow accepted special-status plant survey guidelines. The abundance and distribution of all special status species should be documented and indicated on maps showing the relationship to proposed project features. Aquatic and noxious weed surveys should map noxious weed occurrence and distribution and be conducted in conjunction with the special-status plant surveys using generally accepted practices in the scientific community. All remaining aquatic habitats not covered in Study Request #2 should also be surveyed for aquatic noxious weed species. The surveys will serve to identify the current extent of weed infestations in a general sense throughout the project area, the species that occur, and the relative abundance of each species. After completion of the field surveys, prepare a report that includes the results of the surveys and mapping efforts and identifies, describes, and assesses the extent to which project-related actions and activities may affect special-status plants and noxious weeds. The report should include the issues addressed, objectives, study area, methods, analysis, results, project-specific maps with known occurrences of special-status plants and noxious weed species, discussion, and conclusions. Level of Effort and Cost §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*	

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	The estimated cost of this work is approximately $86,000, based on two study seasons and depending upon the amount of habitat that has the potential to support special-status species and noxious weed species. It's anticipated that a technician would spend one week of desktop review and planning in preparation for field work. One biologist and a single technician would spend about 100 hours conducting field work. Report preparation would require about two weeks of a biologist's and technician's time to complete.	
8	**Study Request #8 – Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment** <u>Goals and Objectives</u> §5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goals of the Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment are to: (1) obtain information about the condition of existing recreation facilities and access sites at the projects; and existing recreation use, access, and demand at the projects; (2) conduct an assessment of the need to enhance recreation opportunities and access at the projects; (3) quantify and map the relationship between reservoir surface area and reservoir levels; and (4) develop a Recreation Management Plan for the implementation of any enhancement measures and long-term monitoring of recreation demand and adequacy of facilities at the projects over the terms of new licenses. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Recreation has been identified as a project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is "consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination. <u>Background and Existing Information</u> §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information* Section 5.8 of the PAD provides a summary of project-related recreation activities and recreation facilities. It also provides a general discussion of recreation demand in the region. However, the PAD provides no project-specific information regarding visitor perceptions of recreation at the projects, nor any information of how project operations may affect the visitor experience. Public recreation access and reservoir levels were two of the primary topics discussed by members of the public during the June 22, 2017, scoping meetings. Furthermore, there is an extensive record of a variety of conflicts associated with public recreation access at the projects. Information on visitor perceptions of the adequacy of public access and facilities,	Eagle Creek is proposing to complete a Recreation Study as described in the Proposed Study Plan.

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	current use, and whether existing access facilities in the area are meeting recreation demand would inform future license conditions related to public access and recreation facilities. Information on reservoir surface area would inform our analysis of the impact of project operations on recreational opportunities at the projects. Project Nexus §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* The projects include five reservoirs and one bypassed reach with recreational opportunities. An analysis of existing recreation use and access at the projects would help form the basis for determining the projects' ability to enhance public recreation opportunities. Also, an assessment of the current level of recreation use and how project operation may affect use would provide information necessary to develop a Recreation Management Plan for efficient management of the recreational components of the projects over the terms of new licenses. Proposed Methodology §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* 1. Update existing data on recreation resources adjacent to and within the projects through site assessment and consultation with public and private recreation providers. 2. Update the inventory of informal and formal public and private waterfront recreational sites/facilities within and adjacent to the project boundaries. Identify all informal and formal public and private recreational sites/facilities within the project areas. 3. Develop and implement a site condition evaluation criterion of measurable and manageable indicators for facilities and dispersed recreation area conditions. Site condition assessments should be conducted at all formal and informal publicly accessible recreation sites. Eagle Creek Hydro should also consult with the NYSDEC to evaluate the need of including other NYSDEC recreational developments that serve the projects into the site condition assessment. 4. The use and needs assessment should include all recreation activity types known to occur or potentially occurring at the projects. Specific methods should include visitor observations and on-site visitor intercept surveys at formal and informal public recreation areas at the project reservoirs and riverine areas, including the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace. 5. Specific methods for each sampling approach in the use and needs assessment: • the visitor observations should capture information such as location, date, time, weather, number of vehicles, watercraft (if any), number of recreation users or party size, and recreation activity engaged in; and • the visitor survey sampling should be based on a stratified random sample that includes all seasons, various locations, and various times of week and day to enable representative responses from the visitors, while ensuring interview coverage during key times (e.g., holiday and weekend days, shoulder seasons, fishing and hunting seasons). 6. The survey instrument should include items that assess visitor perceptions of crowding, recreational conflict, conflicts between the public and adjacent property owner(s), welcoming public access, adequacy and placement of signage, adequacy of recreation facilities and access to the projects, and effects of project operations and management on recreation and recreation opportunities at the projects (e.g., fluctuating reservoir levels and minimum flow releases). 7. In conjunction with Study #10 requested below, consult with stakeholder groups to develop a whitewater boating-specific addendum to the survey instrument that would rate satisfaction with the current whitewater boating flow release schedule,	

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	access facilities, and boating information. The study report should include an assessment of opportunities to modify or enhance the current whitewater flow release schedule, boater access facilities, and/or boating information. 8. Annual recreation use by activity type and season should be quantified to include both formal and informal publicly accessible recreation sites. 9. The needs assessment should also include a future demand estimate from both current use and unmet demand based on guidance from Haas et al. (2007). Specifically, the following information should be integrated to provide an estimate of future recreation demand at the projects: (1) prior and current project use data; (2) state, regional, and national recreation trend data; and (3) population growth data. 10. Quantify the relationship between reservoir surface area and reservoir levels (i.e., reservoir elevation) for the range of operation (i.e., full pool to minimum reservoir level) at each project reservoir. This relationship should also be mapped to visually assess the effects of reservoir levels on reservoir surface area and identify specific areas that may become inaccessible at lower reservoir levels. 11. Identify potential measures to alleviate or reduce any negative effects of project operations, to enhance existing recreation opportunities, and (if appropriate) provide additional public access at the project reservoirs or riverine reaches (potential locations, type of facilities and access, and any associated costs). 12. Using the information from all recreation studies, develop a Recreation Management Plan for the projects. The plan should be included in the license application and should include, at a minimum: (1) description of any proposed protection, mitigation, and enhancement measures, including: location of any proposed facilities and/or access areas (including descriptions and figures depicting the relationship of any proposed facilities to the existing project boundaries), proposed ownership and management of any proposed facilities, associated capital, and O&M costs, and a timeline for implementation; (2) description of operation and management measures associated with project-related recreation access and facilities; and (3) an adaptive plan for future monitoring of recreation use, impacts, and adequacy of project-related facilities to meet demand over the term of the new license. <u>Level of Effort and Cost</u> §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* The estimated cost of the Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment is $95,000, including study plan development, field data collection, reservoir surface area modeling and mapping, study report preparation, and development of the Recreation Management Plan. One field season should be sufficient to collect the required data and prepare the study report.	
9	**Study Request #9 – Shoreline Management Assessment** <u>Goals and Objectives</u> §5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goals of the Shoreline Management Assessment are to: (1) obtain information on the adequacy and appropriateness of current shoreline management practices, and (2) develop a Shoreline Management Plan in consultation with relevant stakeholders. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable.	Eagle Creek is proposing to complete a Shoreline Management Assessment Study as described in the Proposed Study Plan.

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	§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Recreation has been identified as a project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is "consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination. <u>Background and Existing Information</u> §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information* The PAD includes only limited information on shoreline management in Sections 5.8.5 and 5.8.9. We note that, although it did not include it in the PAD, Eagle Creek Hydro did file the current "shoreline management guidelines" with the Commission on June 5, 2015. During the June 22, 2017, scoping meetings, several shoreline property owners expressed concerns regarding shoreline management issues and reservoir levels. Additionally, there is an extensive record of complaints related to shoreline management issues. Therefore, Commission staff needs information on current shoreline management practices in order to determine whether these practices are adequate and appropriate. <u>Project Nexus</u> §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* The projects include five reservoirs. Currently, private residential and commercial developments are primarily located on the Toronto and Swinging Bridge reservoirs. Eagle Creek Hydro is directly responsible for shoreline management at the projects. Additionally, project operations directly impact reservoir levels, and reservoir levels affect shoreline management practices. An assessment of current shoreline management practices would provide the information necessary to develop a Shoreline Management Plan that would be implemented over the terms of any new licenses issued for the projects. <u>Proposed Methodology</u> §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* 1. Develop a questionnaire to solicit information from shoreline property owners at each project reservoir about their recreation activity participation, areas visited, perspectives about reservoir levels and current shoreline management practices, perceived conflicts and crowding, and their satisfaction with or desire for recreational opportunities and facilities. 2. The applicant should consult with representatives of the various shoreline property owners on the most effective means of distributing the questionnaire. Regardless of how the questionnaire is distributed (i.e., mail, email, or internet), the applicant	

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	should follow the Dillman (2014) tailored design method. This method would help ensure that property owners have ample opportunity to complete the survey and would help increase survey response rates. The applicant should also consult with interested stakeholders, including property owner representatives and the NYSDEC, and Commission staff in the development of the questionnaire before it conducts the study. 3. Prepare a detailed report of the study results, and use these results in conjunction with the results of the other recreation studies to inform the development of a Shoreline Management Plan. Interested stakeholders should be given the opportunity to comment on the draft plan. The plan should be included in the license application and should include, at a minimum: (1) a detailed description of all rules, regulations, guidelines, and measures associated with non-project use or occupancy of project lands, (2) documentation of consultation with interested stakeholders, (3) an appendix containing stakeholder comments on the draft plan and Eagle Creek Hydro's responses to them, and (4) an adaptive plan for future plan revisions that includes provisions for consultation with relevant stakeholders. <u>Level of Effort and Cost</u> §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* The estimated cost of the Shoreline Management Assessment is $30,000, including questionnaire development and distribution, study report development, and drafting of a Shoreline Management Plan. This figure could vary depending on how the questionnaire is distributed.	
10	**Study Request #10 – Whitewater Boating Assessment** <u>Goals and Objectives</u> §5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goals and objectives of the Whitewater Boating Assessment are to: (1) evaluate the adequacy and appropriateness of the current whitewater boating opportunities at the projects, including flow releases and access facilities; (2) assess whitewater boating opportunities in the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace; and (3) identify potential measures to enhance whitewater boating opportunities at the projects over the terms of new licenses. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* Not applicable. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Recreation has been identified as a project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is "consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination.	Eagle Creek is proposing to complete a Whitewater Boating Assessment Study as described in the Proposed Study Plan.

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	Background and Existing Information §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information* The PAD includes only limited information on recreation at the projects, including whitewater boating, in Section 5.8.1. The PAD briefly describes the Rio Project's whitewater boating access facility and references the current whitewater boating flow release schedule, but does not include the study report from the whitewater boating study conducted in the spring of 1990 that is referenced in the current license order. Furthermore, the PAD does not include any information on the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace. Project Nexus §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* The current license for the Rio Project requires scheduled weekend whitewater flow releases based on a study completed in the spring of 1990. Project operations have a direct impact on whitewater boating below the main powerhouse tailrace because the Rio Project generates power during times of peak demand, which are typically weekdays in the summer. Therefore, an analysis of the current flow release schedule would determine if any changes are necessary, and would inform potential license conditions related to the whitewater flow release schedule. Additionally, project operations divert flows from the Mongaup River below the Rio Project's minimum flow powerhouse that could possibly provide whitewater boating opportunities. An analysis of project operations relative to a range of boatable flows would help inform potential license conditions pertaining to whitewater boating opportunities in the bypassed reach. Proposed Methodology §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* The Whitewater Boating Assessment will have two primary components: 1. For the current whitewater boating opportunities below the Rio Project's main powerhouse tailrace, in conjunction with the overall recreation study (Study # 8) requested above, evaluate the current flow release schedule, boater access facilities, and boating information provided at the projects. Obtain any available study report or data from the study conducted in 1990. Consult with stakeholder groups and Commission staff to determine if the existing information is adequate. If inadequate, then conduct a whitewater boating study based on accepted practices (i.e. Whittaker et al., 2005). 2. For the bypassed reach, use accepted practices for a whitewater boating study as described in Whittaker et al. (2005). The study should use a sequential three-phased approach. • Phase I: Use a desktop analysis to identify access options for the bypassed reach, create a gradient profile, and identify any other flow-related information that may be pertinent to recreation in the bypassed reach. • Phase II: Use experienced whitewater boaters to conduct an on-land feasibility assessment by scouting the bypassed reach to examine potential quality and characteristics of boating opportunities, estimate potential flow ranges, identify obvious hazards, and determine whether an on-water controlled flow study is needed to evaluate whitewater recreational opportunities in the bypassed reach. • Phase III: If determined to be necessary by Phase II, use an onwater controlled flow evaluation to determine the acceptable minimum and optimal instream flow needed for whitewater boating in the bypassed reach. Prepare a study report for each phase of the study. The Phase I report should include a description and maps of potential	

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	access options to the bypassed reach, and any additional pertinent information identified about flows and recreation in the bypassed reach. The Phase II report should include an assessment of study participants' evaluations for potential quality and characteristics of boating opportunities (e.g. difficulty, type of run, type of craft likely suitable for the run), estimated potential flow ranges, obvious hazards (e.g. woody growth in the river bed), and recommendations for implementing Phase III. The Phase III report (if necessary) should include a description of the whitewater boating attributes of the range of flows examined (e.g. difficulty, unique features, portage requirements), determine the acceptable and optimal flows for the reach, the frequency of availability of the identified flows under current and any proposed project operation modifications, and incorporate relevant results from other studies to identify any competing recreational uses (e.g. fishing) or other resource needs (e.g. aquatic habitat) that may be adversely affected by any scheduled releases. Level of Effort and Cost §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* Eagle Creek Hydro should develop the detailed study protocol, logistics, and schedule in consultation with interested stakeholders. The estimated cost of the whitewater boating assessment is approximately $45,000, depending upon the adequacy of existing information and the extent of fieldwork conducted.	
11	**Study Request #11 – Cultural Resources** Goals and Objectives §5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.* The goal of this study is to locate cultural resources that are eligible for the National Register of Historic Places (National Register) and may be affected by project O&M (including recreational activities associated with the projects reservoirs) within the FERC project boundary and respective area of potential effects (APE). Such cultural resources would include archaeological sites, project facilities, historic structures, and other places of religious and cultural significance to Indian tribes. The study would determine an APE to locate cultural resources and assess specific project-related effects to any cultural resource determined to be eligible for the National Register. If existing or potential project-related adverse effects are identified on National Register-eligible cultural resources, a historic properties management plan (HPMP) would be crafted to resolve any such adverse effects and made part of any new licenses issued by the Commission. §5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.* The results of the cultural resources study would be reviewed and commented by the New York State Historic Preservation Officer (SHPO) and any involved Indian tribe. The APE (including a description and map) would also need to be approved by the New York SHPO prior to conducting field investigations related to the cultural resources study. Any National Register eligibility recommendations to cultural resources located within the APE would also need to be approved by the New York SHPO. If existing or potential project-related adverse effects are identified on National Register-eligible properties within the project's APE, the Advisory Council on Historic Preservation (Council) must be notified and given an opportunity to comment. §5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.* The Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Issuing new licenses by the Commission is considered a federal undertaking, pursuant to section 106 of the National Historic Preservation Act (section 106), and requires the Commission to take into account any existing or potential project related adverse effects to historic properties (i.e., those cultural resources determined eligible for the National Register).	Eagle Creek is proposing to complete a Cultural Resources Study as described in the Proposed Study Plan.

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	Background and Existing Information §5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information* The cultural resources section within the PAD (section 5.10) provided an APE for the projects. Section 5.10 also provided a general cultural context about cultural and historic resources in and near the project area and provided a brief summary of archaeological and historic resources within the vicinity of the projects. Section 5.10 also noted the comments from the Bureau of Indian Affairs stating that the projects are located within a historic Delaware tribal area. Although the PAD highlighted several undetermined National Register-eligible cultural resources in and near the project vicinity, the information provided is insufficient. For example, the Swinging Bridge Hydroelectric Plant is a project facility and is within the projects' APE, but its National Register eligibility remains undetermined despite the power plant being more than 50 years old, meeting the age criteria for consideration for inclusion in the National Register. There are other project facilities (i.e., other powerhouses, wood stave penstocks, surge tanks, diversion dams, employee housing) within the APE that also meet the 50-year-old age criteria, but are not mentioned in the PAD, nor are they considered for their National Register eligibility. There is also evidence for non-project historic foundations and potentially related archaeological sites that date prior to the Civil War and exist within the projects' APE. Several historic towns dating the 19th century were known to have been inundated by the project reservoirs. Historic roads are also known near the project area, and some may have crossed into the projects' APE. There is also a potential for pre-contact archaeological sites existing within the projects' APE along the former water courses within the Mongaup River Basin which had served as a historic and traditional area for aboriginal groups associated with the Delaware Indians for hundreds of years prior to European contact. Project Nexus §5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.* Project O&M have the potential to adversely affect project facilities, some of which meet the age criteria for National Register eligibility. Fluctuating water levels produced by the projects within the five reservoirs have the potential to adversely affect inundated town sites, above-ground associated historic foundations and archaeological sites, of which there is no existing information on how extensive any of these cultural resources are, or where they may exist. There is also the potential of pre-contact aboriginal archaeological sites being adversely affected by the reservoirs. Unauthorized activities by relic collectors utilizing designated project recreational areas could have additional adverse effects on archaeological resources along the shoreline of the reservoirs within the APE. Proposed Methodology §5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.* The cultural resources study plan should include the following proposed measures and associated tasks: 1. Upon the issuance of the Commission's Study Plan Determination, submit a definition of the projects' APE and associated APE to the New York SHPO for concurrence. Written concurrence from the New York SHPO should be obtained prior to conducting field work associated with this study. 2. Conduct a systematic cultural resources survey and inventory within the projects' APE. This would include a systematic pedestrian survey within all accessible areas of the APE using a crew of qualified professional archaeologists where all	

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	cultural resources encountered would be recorded, mapped, and photographed in compliance with standards set forth by the New York SHPO. Such survey methods would reflect Phase 1A and IB archaeological assessment guidelines provided by the New York SHPO. Once archaeological resources are located and determined to be potentially affected by the projects, National Register eligibility of each site would be assessed using Phase II assessments or other appropriate measures agreed to by the New York State SHPO. 3. Conduct a survey of all built environment resources (i.e., above ground structures) that would include all project facilities and non-project facilities with the APE. Each built environment resource would need to be assessed as either eligible or not eligible for inclusion in the National Register, and such assessments would need to be done by a qualified architectural historian or other similarly qualified professional. Work conducted should meet the New York SHPO recommended standards for historic resources survey, including maps, site records, and photographs. The possibility of establishing a historic district associated with some or all of the project facilities should be considered that would include both contributing and non-contributing elements. Specific project-related effects would also need to be determined on each built environment resource located with the APE. 4. Contact the Delaware Nation and Delaware Tribe to see if they know of any place of religious or cultural significance (i.e., traditional cultural properties, past villages or sites, gathering areas) and allow them to comment on the cultural resources study in draft and final form. If such cultural resources exist within the APE, assess National Register eligibility (if applicable), and potential or existing project-related effects. This element of the study should be conducted by a knowledgeable person with anthropological training when talking and gaining information from the Indian tribes. 5. State in the study plan, that if there are historic properties within the APE that would be potentially affected by the project, that a draft HPMP would be crafted, in consultation with the New York SHPO and involved Indian tribes, and filed with a draft license application (or PLP), and that a final HPMP, first reviewed by the New York SHPO and involved Indian tribes, would be filed with the final license application. The HPMP would provide measures to resolve any existing or potential project-related adverse effects to historic properties. 6. Prepare a cultural resources report based on the tasks above, including a detailed section on the cultural history of the project area, previous studies near and within the projects' APE, methodologies used for field surveys for archaeological resources, built environment resources and pertinent information from Indian tribes on places of religious and cultural importance. Include a section that details the consultation history with the New York SHPO, involved Indian tribes, and any other persons or entities who participated or commented on the cultural resources study. Include a section that details the cultural resources located within the projects' APE, which ones were determined eligible or not eligible for the National Register, and which ones are being adversely affected by existing or future project-related activities. This report should be crafted by a qualified cultural resources professional. <u>Level of Effort and Cost</u> §5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.* The estimated cost of the study and report preparation is approximately $100,000 and should be completed within one study season. Eagle Creek did not propose an alternative study.	
12	**Additional Information** **Aquatic Resources** The PAD, section 6.3 *Potential Studies*, states that an instream flow study for bypass and river reaches within the basin was completed by Stetson-Harza (1988), and that Lawler et al. completed a study on the effects of the projects on water quality, fish stranding, and streambank scouring (LMS 1999). However, these studies were not provided with the PAD. So that we may determine whether the studies are sufficient to meet our information needs and support a licensing decision please file the referenced studies and include with the proposed study plan.	Eagle Creek will provide the requested information with the Proposed Study Plan.

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13	The PAD, section 5.4.1, states that Lawler et al., conducted empirical entrainment studies at the Mongaup Falls, Swinging Bridge, and Rio Projects in 1992 and 1993 (LMS 1994). However, these studies were not provided with the PAD. So that we may determine whether the studies are sufficient to meet our information needs and support a licensing decision please file the referenced studies and include with the proposed study plan.	Eagle Creek will provide the requested information with the Proposed Study Plan.
July 28, 2017 – AW, KCCNY, and AMC Comments on the PAD, Comments on SD1 and Study Requests		
1	Unfortunately, the public is not provided with information on non-scheduled boatable releases via Waterline or other similar system that would provide short-term advance notification of planned releases. While the project often generates during periods of peak demand when temperatures are high, boaters are reluctant to drive long distances on the chance that the river will be boatable due to project generation.	Comment noted.
2	Unlike other hydropower projects that provide whitewater boating releases in bypassed river reaches, the Rio Project provides no scheduled releases into the bypassed reach that would provide an opportunity for whitewater boating in the natural river channel. By comparison, at the Deerfield River in Massachusetts, Great River Hydro annually provides 32 scheduled whitewater boating releases from the No. 5 Dam in Monroe, MA, providing significant economic benefits to surrounding communities in the Charlemont, MA area.	Comment noted.
3	Project operations at Rio preclude whitewater recreation between the dam and the powerhouse on all but a handful of days over the past decade. The length, gradient and available flows are more than sufficient to provide a quality whitewater boating experience, extending the length of the whitewater boating reach by 50 percent over what is currently available below the powerhouse.	Comment noted.
4	The current mode of operation fails to provide a sufficient number of whitewater boating opportunities between the powerhouse and the convergence of the Mongaup and Delaware rivers. In addition, the lack of public information in advance of planned generational releases further limits the recreational use of the resource, and the lack of scheduled acceptable or optimal boatable flows into the bypassed reach completely eliminates boating opportunity between the dam and the powerhouse.	Comment noted.
5	<u>Study Requests</u> <u>Controlled-flow Whitewater Boating and Access Study</u> ***(1) Describe the goals and objectives of each study proposal and the information to be obtained.*** The goal of these whitewater flow studies is to assess the presence, quality, access needs, flow information needs, and preferred flow ranges for river-based boating resources in a stepwise manner. The information to be obtained can be generally characterized as quantitative and qualitative descriptions of: • Assess the effects of a range of optimal and acceptable flows on whitewater recreation opportunities for whitewater paddling in the natural river channel, including the bypassed reach, from the Rio Dam to the confluence of the Mongaup River with the Delaware River; • The frequency, timing, duration and predictability of optimal and acceptable paddling flows under current, proposed, and alternative modes of operation; • Identify the need for, and define adequate put-in and take-out points that promote car-top boating, and also identify the needs for parking areas; • The location, challenge, and other recreational attributes associated with specific rapids and other river features; • The access needs of whitewater boating use and the current and potential river access options for whitewater and other paddling; • The flow information needs of whitewater boating and the current and potential flow information distribution system. Thus, the information to be obtained for the whitewater paddling study is a combination of user generated flow preferences and other data, information on current and proposed operation (e.g. discharges), geographic information and basic recreational information.	Eagle Creek is proposing to complete a Whitewater Boating Assessment Study as described in the Proposed Study Plan.

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	(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied. The requester is not a resource agency. ***(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*** The Mongaup River offers the public a high quality whitewater boating resource when flow conditions are suitable. Conducting the necessary studies and implementing measures to ensure that the public has access to high quality outdoor recreational resources is in the public interest. It is widely accepted that outdoor recreation has significant benefits to participants including health, well-being, and quality of life. Outdoor recreation also has proven economic benefits for communities located near recreational resources. Expanding recreation opportunities on the Mongaup River has the potential to offer the region additional economic benefits. FERC has stated in "A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria" (March 2012) that *"to fully evaluate the project's effect on whitewater recreation opportunities and to balance potential enhancement opportunities with their cost, a controlled-flow whitewater boating study is relevant to Commission's public interest determination."* The Licensee provides 15 scheduled whitewater releases from the Rio powerhouse on a bi-weekly basis between April 15 – October 31 ranging from 435 cfs to 870 cfs in accordance with its FERC License as amended. These scheduled releases attract a large number of boaters from throughout the northeast and mid-Atlantic regions. ***(4) Describe existing information concerning the subject of the study proposal, and need for additional information***. Paddlers from throughout the Northeast and mid-Atlantic region highly value whitewater boating below the Rio Dam powerhouse tailrace. The Mongaup is easily accessible to large numbers of kayakers and canoeists living in New York and Connecticut, and is a frequent destination for paddling trips organized by the Kayak and Canoe Club of New York and the Appalachian Mountain Club. Offering a steady supply of Class II/III rapids, the reach is important to those looking to develop their paddling skills and enjoy a scenic and fun advanced beginner/lower intermediate boating experience. While the Lower Mongaup from the tailrace to the confluence with the Delaware is well known at flows of 535 cfs (435 cfs generation plus 100 cfs min flow) and 970 cfs (870 cfs generation plus 100 cfs min flow), the suitability for boating at other flows is largely unknown. At the lower range, flows below the tailrace less than 535 cfs are noticeably less enjoyable than the single turbine release based on anecdotal information. Above 970 cfs, anecdotal accounts by boaters report that higher flows may provide optimal boating flows for more advanced boaters. By contrast, the Upper Mongaup from the Rio Dam to the tailrace is largely unknown. Anecdotal accounts by the handful of boaters who have paddled this reach confirm that under certain unknown flow conditions, this reach can provide a quality whitewater boating experience. When combined with generation flows on the Lower Mongaup, this 4.5-mile reach is of exceptional quality. Adding flows into to the bypassed reach at the Rio Dam can provide a range of flows that are suitable for evaluation in a controlled-flow whitewater boating study. Conducting a controlled-flow study will provide FERC with additional information for its NEPA analysis with regard to the frequency, timing, and velocity of scheduled whitewater releases in any future license, and in particular, on the virtually unknown and utilized bypassed reach below the Rio Dam.	

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	(5) Explain any nexus between Project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements. The Mongaup River Projects control flows in the Mongaup River from Swinging Bridge to Rio by fluctuating water levels in the impoundments and storage reservoirs. The projects operate in a peaking mode, altering the natural flow regime. At the Mongaup Falls and the Rio projects, flows are diverted into penstocks leading to powerhouses, dramatically reducing the flows available in the natural river channel or bypassed reaches, eliminating naturally variable flows and damaging aquatic habitat. The diversion of natural flows through hydropower operations alters the landscape in the natural river channel, and reduces recreational opportunities that would otherwise be available. In the case of the Rio project, a 1.5-mile stretch of the river below the dam, project operations eliminate boating opportunities immediately below the dam when natural high flow events and inflows would provide suitable conditions. Below the powerhouse, the Licensee's peaking operations result in unpredictable flow levels on all but 15 scheduled whitewater release days. While the number of days monthly on which the Licensee generates for some portion of the day varies, the Licensee often generates on a near daily basis to some extent based on flows measured on the USGS gage below the Rio Project. An analysis of the Licensee's operations would demonstrate the extent to which generational flows could be better timed to provide recreational opportunity in and below the project boundary. The Licensee should also explore any alterations to existing equipment and facilities that would enhance its ability to provide controlled flows into project waters. ***(6) Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge***. The study we request on the Mongaup River Projects follow the standard methodology as described in Whittaker, et. al. (2005). This methodology is designed to assess the presence, quality, and preferred flow ranges for river-based boating resources in a step-wise manner. The process steps are generally 1) desktop analyses, 2) on-land feasibility assessment, 3) on-water single flow assessment, 4) on-water multiple flow assessment. We expect and request the full implementation of this methodology. Because the quality of the resource has not been fully analyzed with current metrics, we request that multiple on-water flow assessments be conducted. The study should focus on two reaches in the Rio Project boundary: 1) the lower reach below the Rio powerhouse that is currently utilized during scheduled whitewater releases, and, 2) the bypassed reach beginning at the Rio Dam that only rarely spills above the required minimum flows. The Licensee should work with the boating groups to identify target flows for the evaluation. We will work with the licensee to document the known information regarding the river. We will provide volunteers and technical support for the studies as appropriate. We hope to work collaboratively with the Licensee on this study. The whitewater boating study methodology we have requested has been used on dozens of other FERC regulated reaches. Given that the project currently lacks an Obermeyer or other gate through which it can quickly manipulate flows into the bypassed reach, the Licensee will need to spill calculated flows into the bypassed reach presumably over the flashboards. We recommend that the Licensee schedule the flow study either immediately before or after the May 15 – June 30 period when the pool elevation rises to between 813.5 to 814.5 feet, coming within 6 inches of the top of the flashboards. We estimate that a 2-inch spill over the flashboards would result in a spill of approximately 500 cfs based on the design specifications contained in the PAD.	

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	(7) Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs. We are willing to work with the licensee on the whitewater paddling controlled-flow study to keep costs reasonable and the quality of information high. The information that is already known can jump-start the study process and avoid duplicate effort. The studies will need to integrate this information and then organize flow studies during which several flows are paddled by boaters. The consultants usually employ still image and video documentation, surveys of the boaters, a guided conversation among the boaters, and subsequently a written report. Given the collaborative approach sought by the paddling community, including in-kind contributions of time and expertise, a consultant should be able to complete this study on behalf of the licensee for a very reasonable cost. We estimate that the cost of conducting the controlled flow whitewater boating study will be approximately $30,000, including the field work and final report preparation. The Licensee's PAD proposes no whitewater feasibility analysis. This no-action step would reveal nothing about the current project impacts on whitewater recreation or opportunities for protection, mitigation, or enhancement measures. We currently do not know the relationship between specific low and moderate flows and the paddling experiences they provide. A desktop analysis can't generate this information. Without this information we cannot fully define the project impacts, nor propose and consider provision of releases that provide targeted recreational experiences.	
July 28, 2017 – NYSDEC Comments on the PAD, Comments on SD1 and Study Requests		
1	<u>Comments on the Pre-Application Document</u> The Pre-Application Document (PAD) is generally well-organized and addresses most of the key issues for the Mongaup River Projects. The New York State Department of Environmental Conservation formally concurs with all of the comments made by the U.S. Fish and Wildlife Service (USFWS) regarding the PAD as detailed in their response letter dated July 26, 2017.	Comment noted. See response to USFWS comments.
2	<u>Comments on Scoping Document 1</u> Scoping Document 1 (SD1) is generally well-organized and addresses most of the key issues for the Mongaup River Projects. The New York State Department of Environmental Conservation formally concurs with all of the comments made by the U.S. Fish and Wildlife Service (USFWS) regarding the SD1 as detailed in their response letter dated July 26, 2017.	Comment noted. See response to USFWS comments.
3	<u>Study Requests</u> <u>Fish Surveys</u> The Applicant should conduct comprehensive fisheries surveys within the vicinity of the Mongaup River Projects. Comprehensive sampling for fisheries data collection should include, but not be limited to, the use of electrofishing, gill netting, trap netting, minnow traps, seining, and angling. The survey work should be done for at least 1 full year; with an option for a second year of study should the data collected be deemed inadequate upon review by the NYSDEC and the USFWS. The survey should cover at least three seasons (spring, summer, and fall), and all four seasons, if possible. The information collected should include species identification, size, age, sex, and condition, as well as movement patterns and habitat utilization. Standard water quality data (e.g. water temperature, dissolved oxygen, pH, and conductivity) should also be collected in conjunction with these surveys. These studies should focus on the general fishery resources. 1. *Goals and Objectives* The goals and objectives of this study are to provide information on the existing fishery and resources in the vicinity of the Mongaup River Projects, including areas upstream and downstream of the dam, to aid in the determination of what the impacts of this Project may be. The information to be collected should include both temporal and spatial aspects of species distribution; age, size, sex and condition data; habitat utilization; and fish movement patterns. Reference reaches should be established in streams below each dam and population and abundance (numbers of fish and biomass) estimates that are representative of the section be conducted for each fish species. These population and abundance estimates should then be compared to other fisheries of the area.	Eagle Creek is proposing to complete a Fisheries Survey Study as described in the Proposed Study Plan.

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	2. *Resource Management Goals* NYSDEC's mission is *"to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."* The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access. 3. *Public Interest* The requestor is a state resource agency. 4. *Existing Information* There is no recent information regarding fisheries in the vicinity of the Mongaup River Projects. There are some data available from the original licensing in the 1980s; however, 30 years of changes in angling pressure, stocking efforts, water quality, water quantity, habitat availability, minimum flows, and seasonal impoundment fluctuation limits have likely altered the fishery. Data from the original licensing will be helpful in determining changes and trends over the last 30 years. DEC Fisheries can provide all historic data in their files pertaining to the fisheries resources within and outside the project area. This will enable the applicant to compare changes in the fish populations to different reservoir release regimes through time. 5. *Nexus to Project Operations and Effects* The Mongaup River Projects' dams serves as a barrier to upstream and downstream migration to fish. Fish moving downstream are subjected to potential mortality from impingement and entrainment. The Project alters flows in the bypassed reach, modifies flows downstream from the Mongaup River Projects, and impacts habitats in the impoundment via fluctuations. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard scientific collecting techniques used in most hydro licensing activities. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would involve one field crew sampling on a seasonal basis. The study would last for 1-2 years: The actual cost is unknown and would depend upon the gear types used, number of sampling locations, local labor costs, the ability to\ combine multiple studies (e.g., fisheries, macroinvertebrates and water quality) into one task, etc. The existing literature is inadequate to fully address project impacts, and there are no alternatives to conducting standard fishery surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.	
4	<u>Macroinvertebrate Surveys</u> Information is needed regarding macroinvertebrate (e.g. aquatic insects, mussels ... etc.) populations in the impoundment and downstream of the dam and tailrace as well as the by-pass reaches of the Mongaup River Projects. A critical evaluation (both qualitative and quantitative) of macroinvertebrate communities in all instream habitats affected by the operation of the Mongaup River Projects is needed. Information regarding the aquatic insects and mussels in the flowing waters of the State of New York are of great importance to the NYSDEC.	Eagle Creek is proposing to complete a Macroinvertebrate and Mussel Survey Study as described in the Proposed Study Plan.

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	Sampling should be conducted seasonally and include the use of both shallow water and deep water sampling gear. Collections should be stratified by microhabitat (sediment size). Macroinvertebrates will be identified to species. Since any one sampling year may experience atypical environmental conditions (dry year verses wet year; low water verses high water; colder verse warmer temperature years) the Department recommends more than 1 year of data collection to try to capture typical environmental conditions and to establish current baseline conditions in the flowing waters affected by the Mongaup River Projects. 1. *Goals and Objectives* The goals and objectives of this study are to provide information on the existing benthic macroinvertebrate populations upstream and downstream of the facilities that are impacted by Mongaup River Projects operations. This information will be used to assess impacts the Mongaup River Projects may have on the aquatic ecosystem, assess if current water quality standards are impaired and determine mitigation for these impacts. This information is necessary to the §401 WQC application for the Projects and their compliance with State water quality standards. 2. *Resource Management Goals* NYSDEC's mission is *"to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."* The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access. 3. *Public Interest* The requester is a state resource agency. 4. *Existing Information* The PAD provides some information related to benthic macroinvertebrates, but there is no recent site specific information regarding freshwater mussels and other macroinvertebrate species in the basin. Sampling is needed in the vicinity of the dam, in the by-passed reach and the impoundment are necessary to help determine minimum flow needs and the macroinvertebrate data will be considered by NYSDEC in connection with its review of the §401 WQC application for the Project. 5. *Nexus to Project Operations and Effects* The Mongaup River Projects alter the natural flows upstream and downstream. These areas are important for macroinvertebrate propagation and survival. Fish and wildlife species rely on the macroinvertebrate community as a food source and can be impacted by reductions in macroinvertebrate production. Freshwater mussels depend on fish host species and the Mongaup River Projects' dams blocks fish movement both upstream and downstream. The turbine intakes may impinge or entrain fish, resulting in mortality. The Mongaup River Projects may also affect the amount of habitat available for mussels within the Mongaup River Projects boundaries in the impoundment. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard scientific collecting techniques used in most hydro licensing activities.	

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	7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would involve one field crew sampling on a seasonal basis. The study would last for 1-2 years. The actual cost is unknown and would depend upon the gear types used, number of sampling locations, local labor costs, the ability to combine multiple studies (e.g., fisheries, macroinvertebrates, and water quality) into one task, etc. The existing literature is inadequate to fully address projects impacts, and there are no alternatives to conducting standard macroinvertebrate surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.	
5	Fish Protection. Upstream and Downstream Passage Studies The Mongaup River Projects dams serve as a barrier to upstream and downstream fish migration. Fish moving downstream are subjected to potential mortality from impingement and entrainment. New licenses issued for projects on similar rivers throughout New York State, have incorporated 1" -clear spaced trash racks to physically exclude most adult fish from the turbines, alternate downstream passage routes, and other features (e.g., reduced approach velocities, adequate plunge pools, ... etc.) to encourage safe downstream fish passage. The Applicant should explore alternatives to keep all fish species out of the turbines, and any other species found in abundance during fishery surveys. They also need to develop alternatives to effectively pass fish downstream around the dam. These alternatives may include modifying any existing trash sluices located close to the intakes. This study should include a literature search of available passage designs for the species of concern, as well as information on the relative effectiveness of each design. Existing facilities at ·other dams should be investigated. Careful attention should be paid to attraction flows, guidance mechanisms and velocities. The fish moving downriver must be diverted away from the turbines and guided to the downstream passage facility. Adequate attraction and conveyance flows must be provided. The passage facility should not create a bottleneck that would delay downstream movement or expose the fish to excessive predation. All passage facilities should be designed to prevent blockage from ice and debris and should be as maintenance-free as is feasible. They must be able to operate under all flow conditions experienced in the Mongaup River Basin. In addition to literature review and on-site investigations of existing facilities, the Applicant should collect site-specific data from the Mongaup River Projects to aid in the design of protection and passage facilities. This information should include flows, velocities, water depths, and substrates. The Applicant should also collect information on the passage requirements of the fish species found in the Mongaup River Basin. This information should include swimming speeds (including burst speeds), where in the water column these fish are likely to be moving, different forms of attractants or repellents (e.g., sound, light, ... etc.) that may help guide each species ... etc.	Eagle Creek is proposing to complete a Fish Passage Study as described in the Proposed Study Plan.
6	*Black Brook Dam Removal:* The Black Brook Dam and associated diversion to the Mongaup Falls Generating Facility is no longer utilized. Although it is located at a natural waterfall it is possible that this dam impedes migration of aquatic organisms up or down stream. A thorough analysis of the potential to improve aquatic connectivity by removing this dam should be included in the studies and considered as an option to mitigate the continuing impacts to aquatic resources throughout this watershed. 1. *Goals and Objectives* The goals and objectives of this study are to provide information on potential fish passage and protection structures that could be utilized at these sites. The information obtained will allow NYSDEC aquatic biologists and USFWS's fishway engineers to evaluate the potential effectiveness of various options.	See Section 3 of the Proposed Study Plan.

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	2. *Resource Management Goals* NYSDEC's mission is *"to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."* The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access. 3. *Public Interest* The requestor is a state resource agency. 4. *Existing Information* The PAD does not provide any information regarding protection and passage options. There is little information in the PAD regarding Black Brook Dam or its impoundment. The potential to remove Black Brook Dam is unknown. The New York State Department of Environmental Conservation concurs with the conclusion made by the U.S. Fish and Wildlife Service (USFWS) regarding the reliability and usefulness of the entrainment study referenced in Section 5.4.1 of the PAD. An Updated analysis with current fishery data is needed. 5. *Nexus to Project Operations and Effects* Dams block fish movements both upstream and downstream. The turbine intakes may impinge or entrain fish, resulting in mortality. The existing minimum flow release structures may not be adequate for fish passage. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard literature reviews and site-specific data collection techniques common to most hydro licensing activities. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would involve moderate literature review, discussions with fishway engineers, discussions with fisheries biologists, and site-specific data collection. The study could be completed in less than 1 year, but may require more time to design effective facilities. The actual cost is unknown and would depend upon the number of alternatives examined. The existing information in the PAD is inadequate to allow a thorough examination of alternatives. However, most of the information needed should be available in the existing literature.	
7	<u>Base Flow Studies and Habitat Analysis</u> Flow studies should be conducted to determine whether the existing flows are the appropriate minimum base flows. The base flow studies should be presented in a manner that will allow the regulatory agencies to determine the effect in which the minimum base flow requirements, appearing in the future license and 401 Water Quality Certification, will have on downstream habitat, tailrace habitat, impoundment habitat, and all existing and potentially modified recreational uses of the aquatic resources. NYSDEC recommends a thorough analysis of all available historic survey data and information obtained during biological and geomorphic surveys associated with this relicensing process.	See Section 3 of the Proposed Study Plan.

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	Flow study data should be obtained by either the use of the Delphi approach or the lnstream Flow Incremental Methodology (IFIM). The Applicant should also conduct habitat mapping for the downstream study reach. This mapping should identify the type of habitat in each section (e.g., run, riffle, pool) along with depths, velocities, and substrates. The information will need to be collected and presented in a manner that will allow it to be incorporated into analysis of the current base flow regime. Predicted summer water temperatures during minimum flow and power generation releases through the bypass reach and main stream should be modeled under all proposed release scenarios. This should be done for each stream reach below each of the five dams with a minimum release, all the way to the Delaware River. 1. *Goals and Objectives* The goals and objectives of this study are to determine whether the existing base flow requirements provide appropriate protection for aquatic resources, or whether a different flow regime is necessary. 2. *Resource Management Goals* NYSDEC's mission is *"to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."* The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access. 3. *Public Interest* The requester is a state resource agency. 4. *Existing Information* The PAD provides no information regarding how the minimum flows required by the current license for Black Lake Creek were developed, nor does it describe the benefits of these flows or the impacts of not having higher flow releases. A detailed IFIM study was conducted for the Mongaup River during the original licensing. The current flows in the Mongaup River were determined largely by their inclusion by the NYSDEC in the 401 Water Quality Certifications for the Projects, and were greater than the flows proposed by the previous applicant and recommended by the FERC, but less than the flows recommended by the Service. The available habitat, fisheries resources, and issues at the Mongaup River Projects have likely changed since the original licensing. The flow releases from these Mongaup River Projects have multiple benefits to a variety of species as well as to water quality, and the appropriate flow regimes will be determined as part of a holistic look at all of the competing issues. 5. *Nexus to Project Operations and Effects* Operation of the hydroelectric project results in a somewhat variable flow regime downstream from the Project. The existing base flows may or may not provide adequate mitigation for these fluctuations. This study is necessary to determine the appropriate mitigation for these impacts.	

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	6. *Methodology Consistent with Accepted Practice* The recommended study uses a standard Delphi study design that has been used in many hydro licensing activities. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort and cost will be moderate and will depend on the details of the implemented studies. The Delphi approach would be less costly than the IFIM process. However, the complexity of the resources and issues involved in this relicensing may necessitate a more formal, quantitative study.	
8	Water Quality Baseline water quality studies are needed to allow a proper determination of potential project impacts. These studies should include water temperature and dissolved oxygen (DO) on a continuous basis for at least 1 full year, along with monthly sampling of other parameters such a pH, turbidity, and conductivity. An additional year of monitoring may be needed based on a review of the first year's study results. This information will be used to document baseline water quality conditions and to determine potential impacts from the Projects operations. Data should be collected from the impoundments, the by-passed reaches and the areas upstream and downstream from the Mongaup River Projects. Existing water quality information collected in support of issuance of Section 401 Water Quality Certification will need to be summarized in a manner that will allow appropriate analysis of the current flow regime. Methods for mitigating water quality problems (i.e. modifications to infrastructure, or changes to existing operations) should be fully explored and modeled as to their potential effectiveness. 1. *Goals and Objectives* The goals and objectives of this study are to provide baseline water quality information. 2. *Resource Management Goals* NYSDEC's mission is *"to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."* The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access. 3. *Public Interest* The requester is a state resource agency. 4, *Existing Information* The Applicant has been conducting ongoing water quality monitoring below the powerhouses for all three Mongaup River Projects. This data will continue to be collected during the study period. There are no data available for the bypassed reaches, Black Lake Creek, in the impoundments, or in the tributary streams to the Mongaup River. 5. *Nexus to Projects Operations and Effects* The existing Mongaup River Projects impounds the Mongaup Creek and its tributaries in multiple locations. These impoundments and releases have the potential to impact such water quality factors as temperature and DO, which are critical to the quality of the aquatic habitat. This is of particular concern during summer with low flows.	Eagle Creek is proposing to complete a Water Quality Study as described in the Proposed Study Plan.

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	6. *Methodology Consistent with Accepted Practice* The recommended study uses standard water quality sampling techniques commonly used in most hydro licensing activities. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would be low and would involve a crew monitoring continuous measurement devices and collecting monthly samples while undertaking other work such as fisheries or macroinvertebrate surveys. In addition, temperature and DO loggers would be installed, with data being periodically downloaded. The actual cost is unknown but would be relatively low. The existing data for the immediate vicinity of the Mongaup River Projects are limited. Consideration should be given to installing USGS gaging stations below each of the dams for both the short term needs of this study as well as future monitoring.	
9	<u>Wetland Delineation</u> The applicant should document all wetlands within the Projects vicinity. An accurate analysis of the location and type of freshwater wetland resources is necessary to determine current and future affects to the wetland resources and the wildlife that inhabit them. The NYSDEC and the USFWS's wetland maps were consulted. However, the NYSDEC Freshwater Wetland Regulatory Maps are only intended to show the approximate location of state regulated wetlands and therefore should not be considered a source to characterize the presence of wetland habitat in the hydroelectric project area. Although the USFWS National Wetland Inventory (NWI) is intended to characterize freshwater wetland habitats it is based primarily on remote sensing so that it should be considered a large scale, general and approximate habitat inventory. The USFWS NWI Maps are not intended to represent federal jurisdiction of wetland areas by the United States Army Corps of Engineers and Environmental Protection Agency. Locations where any physical modification to the land throughout the current and future license terms may require wetland delineations that will need to be field verified. The Applicant should also identify any aquatic vegetation found in the Mongaup River Projects vicinity. This information is necessary to characterize the aquatic habitats in the Mongaup River Projects vicinity. 1. *Goals and Objectives* The goals and objectives of this study are to identify key aquatic habitat areas in the Projects vicinity. The study will provide information on the extent and quality of wetlands and aquatic vegetation and the impacts to these habitats by current and future operations. 2. *Resource Management Goals* NYSDEC's mission is *"to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."* The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access. · 3. *Public Interest* The requester is a state resource agency.	Eagle Creek is proposing to complete an Aquatic Habitat Assessment Study as described in the Proposed Study Plan.

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	4. *Existing Information* The PAD provides the National Wetland Inventory (NWI) and NYSDEC delineations of wetlands within the boundaries of the Mongaup River Projects, however, no formal surveys of wetland vegetation or aquatic plants have been undertaken for the Project. Generally, NWI and NYSDEC delineations are not precise enough to capture all regulated wetlands, thus there is a need for wetland vegetation and aquatic plant surveys for these Mongaup River Projects. 5. *Nexus to Project Operations and Effects* Operation of this Project affects water levels and velocities, as well as the timing and location of releases. These factors can impact aquatic vegetation and wetlands, which can be important habitats for fish and wildlife. The information will be used to determine what, if any, impacts the Mongaup River Projects may have on these resources and what the appropriate protection and mitigation measures might be. 6. *Methodology Consistent with Accepted Practice* The New York State Department of Environmental Conservation and NWI maps are frequently used as the starting point in delineating wetlands. The NYSDEC expects the Applicant to use techniques commonly accepted by the scientific community. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort and associated costs should be relatively low. Much of the readily available information is already presented in the PAD, and the remaining information can probably be collected during field work related to other studies. No alternative studies have been proposed.	
10	Public Access The NYSDEC's Bureau of Fisheries delivers a diverse program and annually conducts a wide array of activities to accomplish its mission to: *"Conserve and enhance New York State's abundant and diverse populations of freshwater fishes while providing the public with quality recreational opportunities."* 1. *Goals and Objectives* The goals and objectives of this study are to provide information on the existing public access facilities in the vicinity of the Mongaup River Projects (within 1 mile upstream and downstream of the Project's boundary), including the potential to create additional public access where feasible. The current condition of the existing public access facilities and the need for improvements, especially upgrades that would be necessary to ensure the facilities are Universally Accessible and are ADA compliant, should be the focus of this study. The study should address the potential impacts that any proposed access improvements, and increased public visitation and use, might have on sensitive natural resources found in the vicinity of the Mongaup River Projects (i.e. NY State-listed Threatened and Endangered species). Specifically, NYSDEC would like to see an evaluation of alternatives for improving access to Cliff Lake and identify any potential impacts that the increased use of Cliff Lake may have on the fishery or nesting eagles. Expansion of stream access below all the projects should be looked at, including additional parking, foot trails and the potential for permanent easement with NYSDEC for Public Fishing Rights should be explored on all properties not owned by NYSDEC.	Eagle Creek is proposing to complete a Recreation Study as described in the Proposed Study Plan.

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	2. *Resource Management Goals* NYSDEC's mission is *"to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, .land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."* The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access. 3. *Public Interest* The requester is a state resource agency. 4. *Existing Information* Section 5.7.3 in the PAD describes the recreational facilities within the Project Boundary and the surrounding area. The Applicant has produced a brochure showing the recreational facilities surrounding the project, but is not required to submit the Licensed Hydropower Development Recreation Report Form 80. 5. *Nexus to Projects Operations and Effects* The 2014-2019 NYS State Comprehensive Outdoor Recreation Plan (SCORP) was written by the New York State Office of Parks and Recreation and Historic Preservation (NYSOPRHP) and Sullivan County and Orange County, New York is listed as having a moderate to slightly high need for additional fishing, boating, and swimming access as referenced in Table 3.10 (Relative Index of Need) in the SCORP. The Mongaup River Projects utilize a public resource and most licensees are required to provide public access to the extent practicable within constrains of protection of life and property. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard techniques used in most hydro licensing activities. 7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would involve field site visits to the existing facilities with the parties of interest and recreational surveys of use as well as investigating the potential to add new access sites. The actual cost is unknown and would depend upon the number of observational and interview surveys to be conducted. The ability to combine multiple studies (e.g., fisheries, recreation observational surveys, macroinvertebrate surveys, and water quality) into one task may help to reduce the overall cost. The existing literature is inadequate to fully address project impacts, and there are no alternatives to conducting standard recreation surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.	
11	<u>Bald Eagles</u> Bald eagles are a protected species under federal and State law. The Mongaup Valley has a noted population of bald eagles during both the winter and breeding seasons. The highly visible and accessible annual winter concentration of eagles in the Mongaup River Projects' vicinity from December through March is a valuable recreational asset and has resulted in the installation of multiple viewing blinds and areas by the NYSDEC. The Mongaup River Projects have, in large part, created this high-quality eagle wintering area, as well as important breeding habitat. Therefore, the operations of the Projects facilities have the potential to significantly impact bald eagle use of the area.	See Section 3 of the Proposed Study Plan.

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	1. *Goals and Objectives* NYSDEC requests that the Applicant conduct a study that will provide information regarding the current winter roosting and nesting locations on and near the Mongaup River Projects. The study should discuss arid describe foraging activities of bald eagles in the reservoirs and near the tail races of the Projects powerhouses. The goals and objectives of this study are to provide current and specific information regarding the bald eagle population and habitat use within the vicinity of the Mongaup River Projects. This study will collect data related to the effects of the Mongaup River Projects on both breeding and winter eagle use of the area. The study will also assess the availability of food resources, specifically entrained alewives and other fish species, for wintering bald eagles and relate this resource availability to eagle foraging activities and winter overnight roost site selection. Information from this study will guide and improve management of this important resource. This study would involve collecting any existing data from the NYSDEC, and other available sources. NYSDEC recommends conducting 1 additional year of targeted field observations of bald eagle foraging activities in the vicinity of the Mongaup River Projects, noting the location, number of eagles, and identity of food resource, if possible. Additionally, the study would identify, through field observations, important winter overnight roost sites and assess the current forage bases (alewife abundance) in the Mongaup River Projects' reservoirs and the current and projected (with the potential installation of modified intake trashracks) fish entrainment rates as they relate to current and future bald eagle winter use of the area. 2. *Resource Management Goals·* NYSDEC's mission is *"to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people ·Of the state and their overall economic and social well-being."* The natural resource management goals within the Mongaup River Projects areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access. 3. *Public Interest* The requestor is a state resource agency. 4. *Existing Information* The PAD provides some information bald eagles generally, but no. site-specific information on nesting, winter roosting, or feeding activity is presented. One of the stated goals of the 1992 entrainment study during the last relicensing was to evaluate the availability of entrained alewife for winter feeding of bald eagles. There is no current information related to the importance of this resource to the bald eagles in the vicinity of the Projects. 5. *Nexus to Projects Operations and Effects* The Projects provide habitat for a fishery and entrain fish that are a primary source of nutrition for bald eagles in the vicinity of the Projects. Any mitigation measures related to fluctuations and entrainment may influence this protected species. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard avian monitoring techniques. The study will also use and incorporate data from the fisheries survey and fish passage studies, which will use standard scientific collecting techniques used in most hydro licensing activities.	

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	7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice* The level of effort would be low and would involve one crew collecting data and observations over one field season. Assessment of the forage base and entrainment rates for each of the Projects will be completed as part of the fisheries survey and fish passage studies and will not require any additional field effort.	
12	<u>Impoundment Fluctuation Studies</u> The Mongaup River Projects have large maximum and target fluctuation ranges. These fluctuations create a zone around the impoundment shoreline that is periodically dewatered. The habitat in this zone is usually not as valuable to aquatic organisms and plants as the habitat with more constant water levels. These fluctuations can impact wetlands and shallow littoral vegetation, as well as the invertebrates, fish, birds, mammals, amphibians, and reptiles that use these habitats. The NYSDEC recommends that the Applicant conduct an impoundment fluctuation study. This study will assist in the determination of what fish and wildlife resources are being impacted and to what degree. The study should consist of mapping the aerial extent and habitat in the fluctuation zones at full pond and at drawdowns consistent with Project operations. The maps should identify the extent of the changes in, and adjacent to, the impoundment areas, substrate and type of habitat, the depth at various pond levels, and any important habitat types (i.e., wetlands and submerged aquatic vegetation) that may be present. Steep slopes, fluctuations in stream flow, and fluctuations in reservoir elevations can lead to mass movement, and we recommend that eroding or potentially erodible areas within the fluctuation zone be evaluated and included in the maps. The NYSDEC recommend that the Applicant study the range of flow releases evaluated in the flow studies in relation to the potential for impoundment fluctuations at the Projects. This would involve deriving a calculation of storage at the Mongaup River Projects at different depths and the degree to which different flow releases can be maintained at differing starting elevations. Estimates should be quantitative and based on million gallons per day estimates of the releases in relation to total storage. This would be an extension of the current draft operating plan. The NYSDEC recommends that the Applicant prepare a consolidated figure or table that presents all of the relevant elevations for Mongaup River Project operations. This figure or table should include the dam crest, maximum and minimum fluctuation ranges, any intake/outlet gate inverts (and height), any required seasonal limitations on fluctuations and their duration, and the target elevations proposed by the Applicant and their duration. In addition, the NYSDEC recommends that the Applicant develop a table or chart that clearly shows the volume released from each reservoir (i.e. Cliff Lake, Toronto Reservoir, and Swinging Bridge Reservoir) to meet the minimum flow target over the course of the year compared to the amount released for generation on a typical year. This should also be modelled to show the range of likely operations during high and low power demand years. Ideally these volumes would be graphically represented to show how they relate to vertical drawdowns in each waterbody. This could also be done to account for typical high and low water years. 1. *Goals and Objectives* The goals and objectives of this study are to provide information regarding the habitat in the impoundments and how it is impacted by changes in water levels. This information will then be used to determine what impacts need to be addressed and whether an alternative operational mode may be more desirable. 2. *Resource Management Goals* NYSDEC's mission is *"to conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."* The natural resource management goals within the Mongaup River Projects	Eagle Creek is proposing to complete a Reservoir Water Level Fluctuation/Operations Model Study and Aquatic Habitat Assessment Study as described in the Proposed Study Plan.

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	areas, as well as immediately outside of those areas, will be consistent with our mission while focusing on protecting and enhancing fish and wildlife habitat, and improving public access. 3. *Public Interest* The requester is a state resource agency. 4. *Existing Information* The PAD provides information related to the maximum and target fluctuation levels of the Projects. Additionally, there is a draft operations plan that provides information related to refill rates based on seasonal targets in reservoir elevations. There are no data provided regarding habitat within the impoundments that may be affected by the Projects operations. 5. *Nexus to Projects Operations and Effects* The Projects operate in a ponding fashion and large fluctuations occur in the reservoirs that impact shoreline habitats in the vicinity of the Projects. Additionally, this comparison should help to put into perspective some of the public concerns that the existing minimum flow releases are the bulk of the reason for the drawdown elevation dropping significantly at times. 6. *Methodology Consistent with Accepted Practice* The recommended study uses standard study techniques used in many hydro licensing activities at projects with ponding operations. 7. *Level of Effort, Cost, and Why Alterative Studies Will Not Suffice* The level of effort would be moderate and would involve one crew surveying the impoundments as well as the preparation of a desktop analysis of the effect of different elevations on habitat and flows on elevations. The actual cost is unknown but would depend on the variety of habitats found in the impoundments.	
13	**Foregoing Studies in Lieu of Protection, Mitigation, and Enhancement Measures** Under the Integrated Licensing Process being used for this relicensing, the Licensee is required to file and have approved by the Federal Energy Regulatory Commission a formal Study Plan. As such, there may be an opportunity to reduce some of these studies in scope, or even forgo some of them, if agreements can be reached up front regarding certain Protection, Mitigation, and Enhancement (PME) measures. The New York State Department of Environmental Conservation- recommends that the Applicant convene a meeting with the stakeholders after receiving all of the study requests to determine which studies could be reduced or eliminated in return for agreements to proceed with certain PME measures. The Draft Study Plan developed by the Applicant should incorporate all of the above listed studies. The study proposals incorporated into the Draft Study Plan should be as detailed as possible so that all parties know exactly what is being agreed to when the Study Plan is approved.	
July 28, 2017 – Marc Bushell Comments on the Toronto Reservoir		
1	Despite the numerous comments submitted to FERC that I and perhaps some other of the homeowners around Toronto are trying to deny the public their access to this resource, this is simply not true. Despite the fact that my family and I have been harassed, threatened and had false remarks made about us both in the newspapers and on social media I do believe that the public's ability to access these natural resources is an important aspect that must be protected. At the same time I also believe that anyone using any of these areas should do so under the laws, rules and regulations that exist. Those rules and laws include usage guidelines by the Hydropower operator, local rules and laws and state regulations. This is the only request that I have	Comment directed to FERC noted.

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	made with respect to the public access to Toronto, nothing else. There was a history of hostilities between some of the public and the land developer; this has nothing to do with me. Despite the fact that those issues are now history, many would still like to use this backdrop story to create a hostile environment, spread false information and create a rich/ poor narrative that the 'wealthy are trying to deprive the public their right of access and keep it all for themselves'. Nothing is further from the truth.	
2	The Toronto East Access area is difficult to access, far from public access roads and highways and difficult for emergency or police services to reach. As a result there are unsafe and unlawful activities that have taken place in this area with more often than not little or no response from the Hydropower operator or police services despite their commitment to do so. Prior to the development around Toronto there was little usage and boating activity. Now there is increased usage and many high powered boats both through day usage and those who have purchased homes on the lake.	Comment directed to FERC noted.
3	Prior to the land development the public had access to the Dam area through a small, mostly unused town road. Approximately seven or so years ago that road became a private road through some transaction between the developer and the town. It was the developer who then rebuilt the road and made it passable as it is today since it is a crossroad between the two large parcels of land that were developed. When Eagle Creek bought the Hydro Project from Alliance the road was still private and a legal action commenced to allow the Hydro Operator and the public to utilize this still private road, now with public access, to reach the Toronto East Access area.	Comment directed to FERC noted.
4	All of the public access areas managed by the Hydro operator for all of the Hydro projects should be managed and developed in an equal handed manner. The Swinging Bridge North Public Access area is a substantial parcel of land which the public could use and enjoy as well but has not been developed and maintained. It has a large parking area with defined parking spaces and is very accessible to public roads, highways and emergency services and could be developed for public recreation and usage as it was intended. It was never developed as planned in the license and has been in disrepair and neglected for many years.	Comment directed to FERC noted.
5	To the credit of Eagle Creek in comparison to the previous Hydro Operator, they seem to have invested in their water works operations and to some extent in the development and enhancement of some of their public access areas but have not done so to all of their public access areas. It is in the public interest that all of the defined access areas be developed as 'warm and welcoming' areas for the public to enjoy according to the laws, rules and regulations which all should be obeyed and enforced as a safety priority by Eagle Creek.	Comment directed to FERC noted.
6	There are many who would like to go back to the 'good old days' when things were simple and there seemed to be far fewer issues, but that is not the way the world works. Things have changed in so many ways, there are issues, hazards and complications that were not even on our radar screens thirty years ago. We live in today's world now and we must deal with the environment and factors as they exist today and do the best we can do today to provide for public safety, proper public access and usage, protection of private property, adequate recreational water levels, protection and respect for the environment and natural resources and do the best that is possible to plan for more of the same in the future.	Comment directed to FERC noted.
July 31, 2017 – The Homeowners on Toronto Inc. (HOOT) Comments on the PAD, Comments on SD1, and Study Requests		
1	Eagle Creek's Pre-Application Document and the Commission's SD1 fail to adequately address the severe negative impacts of the pulsing operations currently allowed at Toronto Reservoir under the 1992 Swinging Bridge Project license. It is essential that the licensees' studies and the Commission's NEPA environmental document fully quantify and evaluate these impacts. This information is necessary so that the Commission can meet its obligation to only issue a license best adapted to the public interest and a comprehensive plan for the Mongaup River, including operating protocols for Toronto Reservoir that appropriately balance the multiple uses of that reservoir.	Comment directed to FERC noted.
2	<u>Interests of HOOT</u> Some of HOOT's members are homeowners who have their primary homes on lots adjoining Toronto Reservoir; others have second homes on or near the Reservoir. These homes and properties represent a substantial investment by each of HOOT's respective members, and that investment is significantly affected by the operation of the projects and maintenance of the project reservoirs. In addition, as members of the public who enjoy the aesthetic setting, recreational facilities, and access to Toronto Reservoir and the other reservoirs at issue in these proceedings; as residents who participate in boating, fishing, and other activities at project facilities; and as taxpayers in Sullivan County, where the Delaware and Mongaup Rivers flow and	Comment directed to FERC noted.

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	where the Swinging Bridge Project is located, HOOT's members have a direct interest in the terms and conditions of any new licenses issued for the projects.	
3	Comments on PAD and SD1 Since the original Swinging Bridge Project license was issued 25 years ago, there have been material changes in the uses and population around Toronto Reservoir, as well as increased appreciation of the environmental harms caused by significant reservoir fluctuations. Consistent with the purpose behind the Federal Power Act's requirement of periodic relicensings, these new conditions and priorities necessitate a Commission reassessment of the appropriate balance among the competing uses of the Toronto Reservoir. This reassessment must be based on information about current conditions, not the conditions underlying the original 1992 license.	Comment directed to FERC noted.
4	Eagle Creek proposes no changes to the projects' existing facilities and operations. Nor does Eagle Creek propose to conduct any studies; instead, it relies to a significant degree on studies conducted in the 1980s for the original Mongaup River project licensings. Changed circumstances in the project area make both of Eagle Creek's proposals untenable with respect to Toronto Reservoir.	Comment directed to FERC noted.
5	Current Toronto Reservoir License Conditions and Draft Operating Plan Based on the available USGS data, it appears that the licensee achieved those 2009 Toronto Reservoir targets in Water Years 2011, 2013, and 2014; in Water Years 2010 (the first full water year after the licensee's "best efforts" commitment), 2015, and 2016, the reservoir elevation was over 1,210 msl for only a portion of the summer; and in Water Year 2012, the reservoir remained below 1,210 msl throughout the summer. While the target range in the 2009 letter allows elevations that are insufficient for recreation or aesthetic purposes, and the licensee has not maintained even those levels consistently, the data show that even in the absence of license conditions, and under a license that the licensee interprets as requiring that "downstream interests must take first priority," Toronto Reservoir levels far higher than the minimum allowed by the Draft Operating Plan are achievable. Indeed, the Draft Operating Plan includes far more restrictive criteria for Swinging Bridge Reservoir: a summer minimum of 7.5 feet below current full pool (1,065 msl), with a recommendation that the licensee fill the reservoir to within 4.5 feet of full pool by the beginning of the summer, and draw it down to no more than 6.5 feet below full pool by the end of September. The drawdowns allowed for Swinging Bridge Reservoir, while far less than those allowed for Toronto, are still significant compared to the many other projects in the eastern United States that have been converted to run-of-river, or pulsing within a much smaller bandwidth, at relicensing.	Comment directed to FERC noted.
6	A modern license for the Swinging Bridge Project should set operating curves for the project that take account of the fact that Toronto Reservoir, like Swinging Bridge Reservoir, is heavily used for recreation in the summer months, as well as the environmental damage caused by low reservoir levels and fluctuations. Any new license issued should treat Toronto Reservoir no worse than Swinging Bridge Reservoir, given that there is now significant public recreation use and housing development on both reservoirs. For example, at the beginning of the summer, the reservoir could be full at 1,220 msl—*i.e.*, with 50 feet of storage above the existing target minimum—thanks to spring rain and runoff. If the licensees operated the reservoir to maintain an elevation of 1,218 msl, plus or minus 2 feet, during the recreation season, they could use Toronto Reservoir inflows and up to 4 feet of stored water to generate electricity in the hot summer months, in addition to providing recreation and aesthetic benefits. While reductions below 1,216 msl would not be ideal, in exceptional circumstances (such as severe drought) it would be possible to release some additional water without rendering the reservoir unsafe for recreation.	Comment directed to FERC noted.
7	Recreation and Aesthetic Impacts Even if the lack of any license requirements as to reservoir elevation was appropriate when the original Swinging Bridge Project license was issued in 1992, it is not now.	Comment noted.

Comment #	Comment	Response to Comment
8	Conditions in the project area have changed significantly. As the PAD correctly notes, from the 1920s to the 1970s, this part of New York was a favorite summer resort destination for residents of New York City. In the 1980s, tourism to the area declined precipitously, and most of the resorts closed. Since the turn of the century, however, tourism to Sullivan County has been making a recovery. Today, in addition to the existing community of nearly 1,000 homes near the reservoir, there are more than 100 homes on or very near the shoreline of Toronto Reservoir, with hundreds more as-yet-undeveloped lots in the Chapin Estate subdivision, and a 50-room resort hotel in the works.	Comment noted.
9	Demand for recreational amenities in the project area is significantly greater than it was in 1992, and can be expected to continue to grow. As a relatively quiet reservoir with required public access, Toronto Reservoir, when full, is a vital recreation and aesthetic resource for the community. *See* Attach. B at B-1 to B-2. However, the extensive mud flats left behind as the reservoir drops are an eyesore.	Comment noted.
10	At the reduced water levels that occur all too frequently at Toronto Reservoir, it is impossible to use the reservoir for any water-based recreational activities, and both individual homeowner docks and the recreational public access points required by the existing Swinging Bridge Project license at Toronto Reservoir are unusable. When the reservoir is below 1,212 msl, a vehicle attempting to approach the water's edge to put a boat in the water at the Moscoe Road public launch faces a significant risk of becoming mired in the mud flats. Nor can members of the public who might otherwise travel to the area to enjoy the reservoir predict whether or when access will be available. As a result, it is the informed belief of HOOT's members that recreational use of Toronto Reservoir by the public would be significantly greater if the reservoir level were reliably maintained at or above 1,216 msl, with current water levels and expected levels over the next 14 days posted on a website. Furthermore, reduced water levels (particularly below 1,214 msl) can be dangerous to individuals who manage to access the reservoir, as underwater obstacles may be hidden just below the surface. And those individuals who engage in recreation despite the danger and difficulty of access (and those who live on the shoreline) must also contend with the unpleasant odor given off by the exposed mud flats.	Comment noted.
11	In the absence of license requirements regarding the reservoir level, the licensees' operational choices result in the reservoir level often failing to reach even the minimum necessary for aesthetics and recreation. HOOT urges the Commission to clarify and broaden the NEPA scoping for the Swinging Bridge Project to ensure that the effects of both reservoir fluctuations and low reservoir elevations at Toronto Reservoir are assessed with respect to all recreation resource issues, and that increased residential development near Toronto Reservoir and growth in tourism are considered with respect to the adequacy of existing recreational access and the adequacy and capacity of existing recreational facilities.	Comment noted.
12	<u>Environmental Impacts</u> The drawdowns permitted by the current Toronto Reservoir rule curve, or even the less extreme, but still very significant, drawdowns more commonly experienced, clearly have environmental impacts. Eagle Creek provides no information about those impacts in its PAD, nor does it propose any studies that would allow the Commission to understand the nature and magnitude of the impacts, such as (in addition to HOOT's study requests detailed below) updating the 1987 and pre-1980 fisheries data on which Eagle Creek proposes to rely, and studies of benthic invertebrates; invasive species; rare, threatened, and endangered species; wetland and riparian vegetation; and terrestrial wildlife actually present in or near the project's reservoirs. HOOT members have observed what they believe to be aquatic habitat exposed to the air when reservoir levels drop; members have also observed that bald eagles and golden eagles are seen more frequently when reservoir levels are high. Studies of these resource impacts are needed.	Eagle Creek is proposing to complete studies to evaluate the potential effects of the Project operations on the environment as described in the Proposed Study Plan.
13	The Commission's NEPA scoping should also be clarified and broadened to ensure that the effects of both reservoir fluctuations and low reservoir elevations are assessed with respect to the following: geologic and soils resources; water quality; reservoir fish populations; aquatic habitat, including bass spawning habitat; migratory fish; riparian and wetland habitat and associated wildlife, including waterfowl and wetland-dependent birds; special-status wildlife and botanical species; invasive species; and federally listed and proposed endangered, threatened, and candidate plant and animal species.	Comment directed to FERC noted.

Comment #	Comment	Response to Comment
14	Socioeconomic Impacts Toronto Reservoir levels have a significant impact on the local economy. As noted above, HOOT members' anecdotal observations (as well as common sense) indicate that tourism is adversely affected by low water levels at Toronto Reservoir. "[A]rts, entertainment, and recreation and accommodation and food services" represent 10.3% of employment in Sullivan County. Increased recreational visits produced by enhanced reservoir access, facilities, and aesthetics could have significant impacts on this sector of the local economy.	Comment noted.
15	In addition, the residential development in the vicinity of Toronto Reservoir provides a substantial share of the property tax revenues for the Town of Bethel. Reduced water levels in Toronto Reservoir have a significant adverse effect on nearby residents' quality of life, and thus, presumably, depress property values and new development near the reservoir, as well as local government property tax revenues.	Comment noted.
16	Recreation at Toronto Reservoir also serves a public health purpose. The University of Wisconsin Population Health Institute/Robert Wood Johnson Foundation's County Health Rankings have placed Sullivan County 61st out of New York's 62 counties on health indicators for the last 7 years. Among the factors included in that ranking is "access to exercise opportunities." While overall, in 2017, 91% of New Yorkers have adequate access to locations for physical activity, only 62% of Sullivan County residents have such access. The variety of physical activities available at a reservoir—particularly one, like Toronto, in a relatively peaceful, natural setting—benefit both physical and mental health. Expanding and enhancing public recreational opportunities at Toronto Reservoir would advance the public interest by helping to reduce the deficit of access to exercise opportunities in Sullivan County. HOOT urges the Commission to broaden the NEPA scoping to include consideration of the effects on socioeconomic resources of both reservoir fluctuations and low reservoir elevations.	Comment noted.
17	Response to Request for Information In SD1, the Commission requested that stakeholders submit, *inter alia*, "existing information and any data that would help to describe the past and present actions and effects of the project… on environmental and socioeconomic resources." HOOT has attached or linked to a variety of information and data that demonstrate the impact of project operations.	Comment directed to FERC noted.
18	Study Requests ***A. Toronto Reservoir Water Quality Data*** 1) Goals, objectives, and information to be obtained: The PAD does not discuss the impact of Swinging Bridge Project operations on the water quality in Toronto Reservoir. The PAD does not include or cite to any water quality data for Toronto Reservoir; if such data exist, Eagle Creek should provide the data and an analysis of how the reservoir's ability to meet state water quality criteria, including the "best usage" for Class B waters, is affected by project operations. If such data do not exist, Eagle Creek should conduct a water quality study on which to base an analysis of the impact of project operations on Toronto Reservoir water quality. 2) If applicable, the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied: As stated in the PAD, the New York State Department of Environmental Conservation designates Toronto Reservoir as "Class B," with the following best usage: "Primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival." The corresponding water quality requirements are also included in the PAD. 3) Any relevant public interest considerations in regard to the proposed study: Current project operations may result in Toronto Reservoir being unsuitable for its best uses during some or all of the year. A study of the impacts is necessary so that the Commission can condition any new license to ensure that going forward, the project is best adapted in the public interest.	Eagle Creek is proposing to complete a Water Quality Study as described in the Proposed Study Plan.

Comment #	Comment	Response to Comment
	4) Existing information concerning the subject of the study proposal, and the need for additional information: HOOT is not aware of any water quality data for Toronto Reservoir, nor of any study of the impact of project operations on Toronto Reservoir water quality. The latter is necessary to allow the Commission to assess the impacts of current project operations and alternative operating regimes; the former is a necessary component of the latter. 5) Nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements: Reservoir fluctuations may result in, *inter alia*, increased suspended solids and turbidity. Low reservoir levels may result in depleted dissolved oxygen. Both fluctuations and low water levels may make the reservoir unsuitable for "fish, shellfish, and wildlife propagation and survival." The results of the study may indicate that a new license should require a different operational regime to better protect water quality. 6) Explanation of how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge: HOOT does not propose any particular study methodology, but reserves the right to comment on the methodology in the Proposed Study Plan. 7) Considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs: To the extent water quality data for Toronto Reservoir are already available, the licensees may be able to avoid the effort and cost of a field study.	
19	***B. Aquatic Habitat Study*** 1) Goals, objectives, and information to be obtained: The licensees should study whether and to what extent project operations affect littoral habitat, including (but not limited to) largemouth bass spawning habitat. The PAD notes (at 60) that largemouth bass make their nests in vegetation and woody debris. It also states (§ 5.4.1 at 48) that "[r]eservoir margins are relatively steep-sided and consist of rubble and gravel with little or no rooted aquatic vegetation. The substrate composition, coupled with the reservoir's steep sides, limits the availability of littoral habitat." Given that broad swaths of the shoreline are dewatered for significant portions of the year, it seems likely that current project operations also contribute to the lack of littoral habitat. For example, if the reservoir were kept close to full pool, could rooted aquatic vegetation increase? How would the amount and distribution of woody debris be affected? Would such changes increase the availability of largemouth bass spawning habitat, and would such an increase cause the largemouth bass population to increase? What would be the impact of changed operations on adult largemouth bass habitat? Similar analysis should be performed with respect to other sport fisheries present in the project area. 2) If applicable, the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied: As stated in the PAD, the New York State Department of Environmental Conservation designates Toronto Reservoir as "Class B," with the following best usage: "Primary and secondary contact recreation and fishing. *These waters shall be suitable for fish, shellfish, and wildlife propagation and survival*." 3) Any relevant public interest considerations in regard to the proposed study: The availability and quality of aquatic habitat impacts the health of the reservoir ecosystem, with resulting impacts on recreation. 4) Existing information concerning the subject of the study proposal, and the need for additional information: HOOT is not aware of existing information on this topic.	Eagle Creek is proposing to complete an Aquatic Habitat Assessment Study as described in the Proposed Study Plan.

Comment #	Comment	Response to Comment
	5) Nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements: Fluctuations in the reservoir elevation can reasonably be expected to hinder the formation of littoral habitat, as potential habitat is by turns entirely submerged, on the shoreline, and fully dewatered. Study results demonstrating that an alternative operating regime would improve aquatic habitat may suggest that such an alternative operating regime would be better adapted in the public interest and for a comprehensive plan for the water resource. 6) Explanation of how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge: HOOT does not propose any particular study methodology, but reserves the right to comment on the methodology in the Proposed Study Plan. 7) Considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs: A direct study of the impact of different operating regimes on littoral habitat in Toronto Reservoir is plainly infeasible, as it would require the licensees to test operating regimes over multiple study seasons. A more reasonable approach may be to review information from reservoirs with similar substrate, gradient, etc., that are subject to different operating regimes, e.g. run-of-river. Information may already exist regarding whether existing habitat for various species in the river system is adequate.	
20	***C. Toronto Reservoir Recreation Needs and Impacts Study*** 1) Goals, objectives, and information to be obtained: The licensee should study the impact of Toronto Reservoir elevation and reservoir fluctuations on recreation use at the reservoir; estimate the future recreation demand for Toronto Reservoir; evaluate the adequacy of existing recreation facilities; study the potential for developing new recreation facilities; and develop a Recreation Plan for Toronto Reservoir. Among other scenarios, the licensee should estimate likely recreation use if Toronto Reservoir water level were maintained at 1,218 msl, plus or minus 2 feet, during the recreation season, and at 1,215 msl, plus or minus 5 feet, year-round, and should compare that estimated use against current recreational capacity at the reservoir. 2) If applicable, the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied: As noted above, the Sullivan County Planning Board seeks to increase tourism to Sullivan County, including outdoor recreation. 3) Any relevant public interest considerations in regard to the proposed study: As described above, Toronto Reservoir elevation levels and fluctuations have a significant impact on the availability and safety of recreation at the reservoir. 4) Existing information concerning the subject of the study proposal, and the need for additional information: Eagle Creek's FERC Form 80s provide a starting point; such recreation use data can be compared against existing USGS reservoir elevation data or, to the extent Eagle Creek's records are more detailed, the licensees' own data. The study should also incorporate data on expected population growth, recreation trends, and other factors that affect the demand for recreation. 5) Nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements: As described above, Toronto Reservoir elevation levels and fluctuations have a significant impact on the availability and safety of recreation at the reservoir. Quantification of that impact will inform the Commission's decision making with respect	Eagle Creek is proposing to complete a Recreation Study as described in the Proposed Study Plan.

Comment #	Comment	Response to Comment
	to both Toronto Reservoir operating regime and recreation-related license requirements. 6) Explanation of how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge: HOOT does not propose any particular study methodology, but reserves the right to comment on the methodology in the Proposed Study Plan. 7) Considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs: To the extent Eagle Creek has historical recreation demand, reservoir elevation, and reservoir fluctuation data, it may be able to reduce the cost associated with this proposed study. It should nevertheless gather and analyze daily data during at least one study season.	
21	***D. Socioeconomic Impacts Study*** 1) Goals, objectives, and information to be obtained: The licensee should study the impact of Toronto Reservoir elevation and reservoir fluctuations, including under other operational regimes such as run-of-river or pulsing only within a 4 foot bandwidth of full pool, on the local economy. In particular, it should study the economic effects of the recreation impacts demonstrated by the requested Recreation Needs and Impacts Study, including multiplier effects. The licensee should also quantify the contribution of development near Toronto Reservoir to the local property tax base, and estimate the impacts of the project reservoirs on land use and tax base. 2) If applicable, the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied: Not applicable. 3) Any relevant public interest considerations in regard to the proposed study: As noted above, recreation is a significant component of the Sullivan County economy, and Toronto Reservoir elevation and fluctuations likely affect the types and level of recreational visits to the Swinging Bridge Project. Reservoir operations may therefore significantly affect local economic development. Toronto Reservoir and its operations also have a significant impact on land use and development and the local property tax base. 4) Existing information concerning the subject of the study proposal, and the need for additional information: Information on land use and the property tax base affected by the Swinging Bridge Project is available from Sullivan County, New York. 5) Nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements: Toronto Reservoir elevation levels and fluctuations have a significant impact on the availability of recreation at the reservoir, which in turn affects the local economy and property tax base. Quantification of that impact will inform the Commission's decision making with respect to both Toronto Reservoir operating regime and recreation-related license requirements.	See Section 3 of the Proposed Study Plan.

Comment #	Comment	Response to Comment
	6) Explanation of how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge: Input-output economic models, such as IMPLAN, are widely used and accepted for estimating the total economic impacts of recreation and tourism. The contribution of development near Toronto Reservoir to the local property tax base can be calculated from public Sullivan County property tax data, and economic modeling could be used to project the property tax impacts of new development in areas near the Swinging Bridge Project reservoirs. 7) Considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs. Once the results of the proposed Recreation Needs and Impacts Study are available, well-established input-output modeling techniques should make it relatively easy to estimate the economic impact of the recreation visits and tourism associated with different reservoir operating regimes. HOOT does not have an estimate of the level of effort and cost needed to estimate project impacts on the local property tax base.	
22	In addition to considering these comments, HOOT respectfully requests that the Commission ensure that the substantial impacts of Swinging Bridge Project operations on recreation, aesthetics, and the natural environment are properly studied and considered in the relicensing process by, among other things, ordering the studies requested above.	Comment directed to FERC noted.
July 31, 2017 – Swinging Bridge Property Owners' Association Comments on the PAD and Study Requests		
1	The SBPOA is an association of approximately 132 homeowners located on the Swinging Bridge Reservoir – the site of one of the three Mongaup River Projects – and, therefore, has a direct stake in the outcome of this proceeding. Of utmost importance to the SBPOA is maintenance of adequate water levels on the Swinging Bridge Reservoir. The SBPOA's main focus in this ILP, therefore, is to ensure that minimum flows are set at a level that supports aquatic resources in, and recreational use of, the Mongaup and Delaware Rivers while at the same time avoiding depletion of the Swinging Bridge Reservoir during dry conditions, the impacts of which are shown in the adjacent images.	Comment directed to FERC noted.
2	The SBPOA appreciates the drafters' development of the Operating Plan in an attempt to balance competing requirements. The Operating Plan is, however, restricted in what it can achieve because, as noted by its drafters, it is bound by the "operating requirements of the FERC licenses . . . ." As such, change must start with modifications to the FERC licenses. In order to do so, new studies must be conducted and introduced into the record addressing minimum flows necessary to simultaneously support aquatic resources and reservoir water levels.	Comment directed to FERC noted.
3	However, a minimum flow release of 60 cfs and a maximum of 100 cfs were ultimately placed in the license. The data upon which these minimum flows were evaluated and determined is now almost 30 years old. As discussed further below, new studies must be conducted to evaluate whether minimum flow releases could be set at a lower level (*e.g.* 30 cfs) taking into consideration changes in climate, sediment, recreational usage, current adult brown trout statistics, *etc*. Eagle Creek Hydro, however, states that it does not intend to conduct any additional studies during the ILP… The Commission should reject Eagle Creek Hydro's attempt to use 30 year old data.	Comment directed to FERC noted.
4	With licenses issued in 1992, the Mongaup River Projects were among the first to receive an initial license under the 1986 Electric Consumers Protection Act amendment to the Federal Power Act and its corresponding regulations. Since that time, the ground conditions have changed, including recreational use patterns, significant deposits of sediment on the lake floor, land ownership and development, flora and fauna habitat, rainfall and climate patterns, as well as water quality and quantities available for competing uses, thereby rendering then-existing studies, such as the Stetson-Harza Mongaup River Instream Flow Study relied upon by Eagle Creek Hydro, completely outdated. Many sites and issues were not studied specifically during the previous licensing process and others that were considered need to be re-evaluated. In addition, Eagle Creek Hydro has, or soon will, install multiple low-flow generators at the Mongaup Project. Numerous changes have been also made to the license, including the February 7, 2007 FERC Order that amended License Article 401 in association with the 2004 Recreational Usage Report required under License Article 408. Accordingly, pursuant to the Commission regulations (18 CFR § 5.9 [b]), the SBPOA respectfully requests that the Commission direct Eagle Creek Hydro prepare a new Flow Study.	Comment directed to FERC noted.

Comment #	Comment	Response to Comment
5	**Request for Flow / Recreational Use Study** 1. *Describe the goals and objectives of each study proposal and the information to be obtained*; The purpose of this study is to examine the impact of the current minimum flow releases on water levels in the Swinging Bridge Reservoir and, if such minimum flow releases currently do not maintain adequate levels, whether they can be lowered to raise water levels during drought periods while maintaining adequate habitat for the adult brown trout. Study goals include: • Obtain information on changes and increases in recreational usage of the Swinging Bridge Reservoir by lakeshore residents and others outside the immediate area; • Obtain information on changes to recreational usage of the Mongaup River; • Obtain information on whether current minimum flow releases have maintained adequate water levels in the Swinging Bridge Reservoir for recreational purposes in all years since the initial license were issued for the months April through October; • Obtain information on sediment deposits on bottom of Swinging Bridge Reservoir to determine if current minimum water levels still support recreational uses; • Obtain information on current adult brown trout population; • Obtain information on whether minimum flow levels could be reduced without materially impacting adult brown trout habitat and recreational usage of Mongaup River; • Obtain information on the effect of low water levels on aquatic species within the Swinging Bridge Reservoir; and • Obtain information that the impact of installed or planned low-flow generators will have on minimum flow releases and reservoir water levels. 2. *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied*; Not applicable. 3. *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*; Requester is not a resource agency. There are several public interest considerations in regard to the proposed study. To best promote the public interest, minimum flow releases, and associated minimum reservoir water levels, should be set at a rate that best balances recreational uses on the reservoir with other aquatic, terrestrial, recreation and land use, and aesthetic resources. In 1992, Commission Staff believed that a minimum flow release of 30 cfs best promoted the public interest. Significant changes to the area require taking a fresh look at minimum flow rates to determine whether current license requirements remain appropriate. Public interest considerations should also include the impact that minimum flow releases have on electric output of the Mongaup River Projects. In an effort to reduce greenhouse gas emissions, the 2015 New York State Energy Plan and the New York State Public Service Commission's recently adopted Clean Energy Standard both call for 50% of New York's electric load to be produced by renewable resources, such as the Mongaup River Projects, by 2030. The negative impacts that higher minimum flow releases have on the projects' electric output and, in turn, New York's emissions reductions goals should also be considered in a public interest determination.	Comment directed to FERC noted. Eagle Creek is proposing to complete a Reservoir Water Level Fluctuations/Operation Model Study as described in the Proposed Study Plan.

Comment #	Comment	Response to Comment
	In addition, New York Governor Andrew Cuomo recently announced the closure of Indian Point Nuclear Generating Units 1 and 2, located in southeastern New York, as are the Mongaup River Projects. Accordingly, decreased electric output from the projects should also be considered in light of southeastern New York's imminent loss of 1,000 megawatts of nuclear power and the inability to move power to this region from western New York because of transmission constraints. 4. *Describe existing information concerning the subject of the study proposal, and the need for additional information*; According to Eagle Creek Hydro, the instream flow studies used in support of the original licensing process 30 years ago "can be used in support of the pending relicensing proceedings." However, as noted above, ground conditions have changed, significant sediment has accumulated, as well as changes in recreational use patterns, land ownership and development, flora and fauna habitat, rainfall and climate patterns, as well as water quality and quantities available for competing uses, thereby rendering existing studies, such as the Stetson-Harza Mongaup River Instream Flow Study from 1988, completely outdated. Indeed, maintaining current minimum water levels becomes completely irrelevant if accumulated sediment on the reservoir floor prohibits recreational boating. Considerable changes in population density in the area have also likely had an impact on recreational use. Updated studies must be conducted not only to evaluate whether initial projections were accurate but to reflect the aforementioned changes. 5. *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements*; This study would provide new information regarding whether current minimum flow releases are set appropriately to maintain water levels in the Swinging Bridge Reservoir given numerous changes that have occurred over the last 30 years. Eagle Creek Hydro, in conjunction with the NYSDEC, DRBC, and the Delaware River Master, recently developed the *Mongaup River Hydroelectric System Normal Conditions Operating Plan.* This plan, however, was based on current license minimum flow requirements and may not accurately reflect current conditions. FERC and the Eagle Creek Hydro should be aware of current conditions and the adequacy (or inadequacy) of the existing minimum flow requirements as this information will have a direct bearing on new license requirements. 6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge*; This type of study is routinely prepared in relicensing proceedings and sources and methods for gathering data are accepted by the Commission and the scientific community. Indeed, a similar study was accepted by the Commission in issuing the original licenses for the Mongaup River Projects. The SBPOA is merely asking that the same study be updated to reflect changes that have occurred in the last 30 years. 7. *Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs*. With respect to minimum flow release, this should be a desktop exercise for the licensee possibly including data from a new USGS flow meter installed at the head of the Swinging Bridge Reservoir. As such, the cost would be relatively minimal. There are no alternative studies proposed that would meet information needs. Cost for remaining components of the proposed study (*e.g.* sediment deposits and recreational usage) should also be minimal.	

Comment #	Comment	Response to Comment
	On July 27, 2017, the Commission's Division of Hydropower Licensing submitted nine (9) study requests that propose studies substantially similar to that of the SBPOA contained herein. In addition, if the Commission adopts of the study request of the National Park Service, filed on July 24, 2017, in this proceeding, much of the data compiled in that study could be used to complete the SBPOA's proposed study.	
July 31, 2017 – William Crumley Comments on the Toronto Reservoir		
1	I think public access to Toronto Reservoir is important to myself and my family for many reasons. Please enforce your federal license with Eagle Creek now.	Comment directed to FERC noted.
Informal Request		
July 26, 2017 – NPS (Don Hamilton) Information Request		
1	The National Park Service would like to request records of Eagle Creek Hydro Power's (and the previous utility's) release data for the Rio Hydroelectric Project on the Mongaup River. We need to better understand release regimes, whether for hydroelectric generation or recreational boating, and base flow coming from this operation over time, including the gap in the period of record for the USGS gage below the Rio Reservoir from March 1995 to October 2013.	Eagle Creek is compiling this information to be provided on a later date.

APPENDIX D

PREVIOUS LICENSING STUDY REPORTS

Appendix D.1 - 1978 Mongaup River Special Regulations Area Creel Census Report

Appendix D.2 - 1987 Fisheries Investigation of the Mongaup River and Tributaries in the Vicinity of the Mongaup River Basin Hydroelectric Project

Appendix D.3 - 1994 Entrainment Study Report

Appendix D.4 - 1988 Instream Flow Incremental Methodology (IFIM) Study Report

Appendix D.1

1978 Mongaup River Special Regulations Area Creel Census Report

ATTACHMENT 3

MONGAUP RIVER
SPECIAL REGULATIONS AREA
CREEL CENSUS REPORT
APRIL 1 - SEPTEMBER 30, 1978

PREPARED BY
WILLIAM H. KELLY
SENIOR AQUATIC BIOLOGIST

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
REGION 3 - FISHERIES MANAGEMENT UNIT
NEW PALTZ, NY 12561

Files

DECEMBER 19, 1978

INTRODUCTION

On May 21, 1976, an experimental Special Regulations Fishing Area was initiated on the Mongaup River (10-Del) beginning at the Route 97 bridge and continuing upstream approximately 2.5 miles to a boundary marker located 2000 feet below the Orange and Rockland Utilities Company power station. Regulations were as follows:

Creel Limit

One trout per person per day.

Size Limit

Minimum size 14 inches. All trout smaller than 14 inches shall be immediately returned to the water without unnecessary injury.

Manner Of Taking

Artificial lures only. Possession of bait (dead or alive) prohibited.

Possession

Possession of more than one trout or trout smaller than 14 inches on this section of stream or the banks thereof is prohibited.

For the 1977 and 1978 trout seasons, the minimum size limit was reduced to 12 inches.

The Orange and Rockland Utilities Company owns the entire reach, with the exception of one small private holding of several hundred feet. Fishing is part of the Fish and Wildlife Management Act, a cooperative agreement between this Department and Orange and Rockland Utilities. Water released through hydroelectric generating turbines located at Rio Reservoir Dam located immediately upstream is cool. Also, many injured bait fish ground up by the power turbines are discharged downstream. Thus a very unique situation which favors optimal growth of trout has been created.

As a result of power generation at this facility, flows can be extremely erratic since operation is on a "peak demand" basis with sudden changes of flow often occurring on a daily basis. Brown trout (Salmo trutta) is the dominant species. A few brook trout (Salvelinus fontinalis) enter the catches each year. All fish are of wild origin. Naturally spawning occurs in the mainstream as well as a few small feeder brooks. The section has never been stocked.

The river has a wilderness flavor with access limited to several footpaths leading downhill to the river through mature forest. The quality of the experience is described by one angler as follows: "It was astonishing to realize that we were standing thigh deep in a trout stream barely a two hour drive from our New York City home and fishing for wild trout. Even more incredible was the fact that we had almost three miles of river all to ourselves; in southern New York State that in itself is a miracle"*. Figure 1 presents a map of the area.

THE MONGAUP RIVER CREEL CENSUS: OBJECTIVES AND METHOD

During the 1978 trout season, a creel census was instituted for the purpose of describing the existing fishery in terms of angling effort, catch and catch per unit effort. From these data it would be possible to evaluate the merits of the Special Regulations Program.

CENSUS SCHEDULE

A total of 37 days were censused between April 1st and September 30th. These included 24 weekend days and holidays and 13 weekdays. This intensity of sampling represented coverage of 43% of the weekend days and holidays and 10% of the weekdays in the 183 day period. Table 1 presents the 1978 census schedule.

*New York's Unknown Trout Stream: The Mongaup River by Allen G. Eastby. The Flyfisher, Vol. XI, No. III. 1978

Estimated total number of hours fished*

Estimate total number of anglers x average angler trip =

900 x 3 = 2,700

Estimated total trout caught*

Estimated total number of hours x trout/hour = 2,700 x 0.42 = 1,134

*For weekend days actually censused.

Expanded anglers (for weekend days in period)

$$\frac{\text{weekend days in period}}{\text{weekend days worked}} \times \text{estimated total number of anglers} = \frac{8}{4} \times 900 = 1,800$$

Expanded hours (for weekend days in period)

$$\frac{\text{weekend days in period}}{\text{weekend days worked}} \times \text{estimated total number of hours} = \frac{8}{4} \times 2,700 = 5,400$$

Expanded trout (weekend days in period)

$$\frac{\text{weekend days in period}}{\text{weekend days worked}} \times \text{estimated total trout caught} = \frac{8}{4} \times 1,134 = 2,268$$

FINDINGS

During the 1978 fishing season, more than 1500 anglers fished about 5500 hours and creeled 270 legal sized trout (greater than 12 inches long). As evidence of the excellent quality fishery maintained, about 60 percent of these trout were larger than 14 inches--one pound or greater by weight. Several trout in excess of 20 inches and three pounds in weight were caught. Twenty percent of the trips were successful (one or more trout creeled). Numerous anglers released legal sized trout and these were not counted in the success rate. Brown trout composed 97 percent of the catch and brook trout represented the balance. These and other data are presented in Table 2.

Another Catskill trout stream, the Esopus Creek, is a popular stream for catching large trout (greater than 12 inches) and each year many thousands of anglers fish there. The Mongaup River, by comparison, is a far better stream for taking large trout although it is far less well known. The comparative data which follows illustrates the point.

The census day encompassed a 12 hour period, usually beginning at 7 a.m. and terminating at 7 p.m. At 3 hour intervals, a count was made of all anglers fishing the creek. Between counts, the census agent worked from one end of the creek back toward the starting point where he would start the next count run. Particular attention was devoted toward obtaining information from anglers who had completed their fishing for the day. Information obtained from each angler included number of hours fished, number of trout caught, species of trout caught, lures used, angler origin (home residence), sportsmen's club affiliation and opinion of the Special Regulations program. In addition, the census agent kept daily records of air temperature, water temperature, weather condition and stream condition. Annual estimates of catch and effort were derived using standard statistical procedure. An example of this system follows.

Total number of anglers, total hours fished and total fish caught was calculated separately for weekend days, and weekdays. The following is an example of the procedure used to expand weekend day data:

Completed anglers contacted	100
Hours fished	300
Trout caught	150
Average angler trip (hours)	3.0
Incomplete angler contacted	300
Hours fished	1,000
Trout caught	400
Total anglers contacted (complete & incomplete)	400
Total hours fished (complete & incomplete)	1,300
Total trout caught (complete & incomplete)	550
Trout/hour	0.42

$$\underline{\text{Estimated total number of anglers}}^{*}$$

$$\frac{\text{Total count x count interval (3 hours)}}{\text{Average angler trip (hours)}} = 900 \times \frac{3}{3} = 900$$

4 p.m. during census days, the river remained remarkably cool even during the summer months. Table 4 presents these data. These cooler temperatures produced the necessary conditions for a long growing season. In many streams, mid-summer warming restricts trout growth.

Mongaup River brown trout reflect optimal growth rates for stream resident trout. The 12 inch limit primarily protects yearling fish since most two year olds are larger than 12 inches. The following table presents the age-length relationship.

AGE	# IN SAMPLE	LENGTH RANGE	AVERAGE LENGTH
1+	1	-	7.8
2+	36	10.5 - 15.3	13.3
3+	10	15.5 - 17.0	16.3
4+	4	18.5 - 20.0	19.3

DISCUSSION

The Mongaup River Special Regulations area provides a unique opportunity for catching large brown trout in an unspoiled wilderness setting. Trout greater than 12 inches in length are common in the population, but they are difficult to catch. Access to the river is difficult except for the extreme upper and lower ends and wading is difficult. The trout are well fed and fast growing.

Many Special Regulations areas in New York State are either partially or completely dependent upon planting hatchery trout to provide adequate numbers for fishing. The Mongaup fishery, in contrast, is derived completely from the wild, naturally spawning resident brown trout stocks. This is probably the only fishery in New York State where quality fishing existed prior to establishment of Special Regulations. In this case, these regulations performed the role of protecting a quality situation as opposed to the usual role of building up to a quality situation utilizing small

	Miles of River	Catch Large Trout	Anglers / Mile	Trout / Mile	Hours / Trip	Trout / Trip
Esopus Creek	16.1	530	1175	33	3.0	0.03
Mongaup River	2.5	260	615	104	3.6	0.17

With the 3 trout limit in effect, catches of 1, 2 and 3 trout represented 80, 15 and 5 percent composition of the annual catches. In other words, the Mongaup River fishery is definitely a quality rather than a quantity situation. Very few small fish are caught.

Anglers traveled considerable distances to fish this stream and only 41 percent of the fishermen were of local origin. In fact 47 percent of the anglers were from other states. These data are presented in Table 3. About 20 percent of these anglers belonged to organized sportsmens clubs and 80 percent had no affiliation. Anglers were asked: "Do you favor the existing Special Regulations?" The responses were: 75% in favor, 14% wanted more restrictive regulations and 11% wanted less restrictive regulations.

Using comparative data from aerial angler counts conducted 1976-1978, with 1976 as the baseline, angling pressure increased 20 percent in 1977 and another 13 percent in 1978, or about 33% between 1976 and 1978. This trend is interesting because on a statewide basis, fishing license sales have trended downward for this period. Further, this downward trend has been observed in other waters of Region 3 where aerial overflights have been conducted.

From April through June, the river was most often high due either to natural runoff or power generation, and 70 percent of the annual angling effort occurred. About 82 percent of the annual catch was taken during this period. In the last half of the trout season--July-September, the river was generally low and clear with most of the angling confined to the deeper pools. On an annual basis, 60 percent of the trout were caught on artificial lures and 40 percent on flies. Based on daily water temperatures taken at

hatchery or wild fish.

In recent years, the river has been subject to increased use by kayakers, tube floaters and some canoists. While all of these activities are recognized as self-satisfying beneficial recreational pursuits, these activities are out of keeping with the total fishing experience, aesthetic and otherwise.

A direct clash in values results when flotillas of white water zealots come into view in this remote, pristine setting. On a practical basis, water borne craft can scare trout and thereby reduce the chances of catching fish. Use of the Mongaup River for water crafting is just as acceptable as the trail machine or snowmobile is on a remote Catskill hiking trail. Use of these vehicles is prohibited on hiking trails and we recommend that use of water borne vehicles be prohibited on the Mongaup River.

ACKNOWLEDGEMENTS

Michael C. Gann, Regional Fisheries Manager collated the data, made estimates of annual catch and effort, and provided the age-growth analysis. Richard Henry and Thomas Raffaldi, Fish and Wildlife Technicians, conducted the creel census. This included angler interviews, scale samples, recording air temperatures, water temperatures, weather conditions and water river conditions each day. They did an excellent job.

We also appreciate the interest and cooperation of Mr. Joe Roberty in providing information and trout scale samples.

TABLE 1

1978 MONGAUP RIVER CREEL CENSUS SCHEDULE

APRIL 1 - SEPTEMBER 30

APRIL

SUN	MON	TUES	WED	THUR	FRI	SAT
						(1)
2	3	4	5	6	7	8
(9)	10	11	12	13	14	(15)
6	17	(18)	19	20	21	22
(3)	24	25	26	(27)	28	(29)
0						

JULY

SUN	MON	TUES	WED	THUR	FRI	SAT
						1
(2)	3	(4)	5	(6)	7	(8)
9	10	11	12	13	14	15
(16)	17	18	19	20	(21)	22
23	24	25	26	27	28	(29)
30	31					

MAY

UN	MON	TUES	WED	THUR	FRI	SAT
	1	2	3	4	5	6
	8	(9)	10	11	12	(13)
)	15	16	17	(18)	19	20
	22	23	24	(25)	26	(27)
)	29	30	31			

AUGUST

SUN	MON	TUES	WED	THUR	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	(12)
(13)	14	15	(16)	17	18	(19)
20	21	(22)	23	24	25	(26)
27	28	29	30	31		

JUNE

SUN	MON	TUES	WED	THUR	FRI	SAT
				1	2	(3)
4	5	6	7	8	(9)	10
(1)	12	13	14	(15)	16	(17)
(8)	19	20	21	22	23	24
5	26	(27)	28	29	30	

SEPTEMBER

SUN	MON	TUES	WED	THUR	FRI	SAT
					1	2
3	4	5	6	7	8	(9)
10	11	(12)	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	(30)

	DAYS CENSUSED	DAYS IN SEASON	COVERAGE
WEEKEND & HOLIDAYS	24	56	1:2.3
WEEKDAYS	13	127	1:9.8
	37	183	

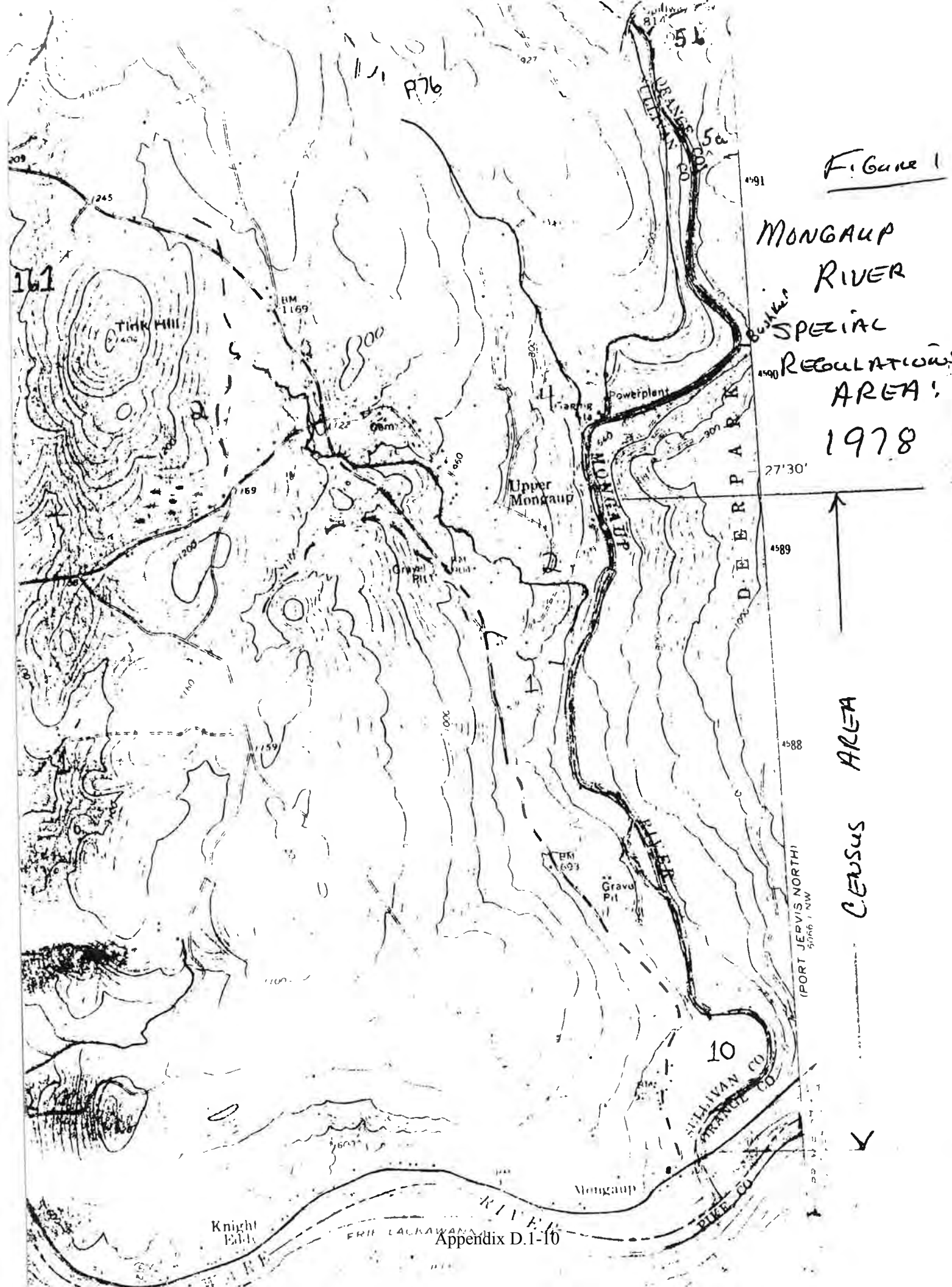

FIGURE 1
MONGAUP RIVER
SPECIAL REGULATIONS AREA:
1978
CENSUS AREA
Tink Hill
Upper Mongaup
Powerplant
Gravel Pit
Knight Eddy
Mongaup
DELAWARE RIVER
27'30'
SULLIVAN CO.
ORANGE CO.
PIKE CO.
(PORT JERVIS NORTH)

TABLE II

1978 MONGAUP CREEK CREEL CENSUS
APRIL 1 - SEPTEMBER 30

I) ANGLER EFFORT AND SUCCESS

Total anglers interviewed	405
Total trout recorded over 12"	57
Total trout recorded over 14"	26
Effort: Anglers per mile	617
Effort: Anglers per acre	70
Success: Trout per hour	0.05
Success: Trout per trip	0.17
Success: Trout per mile	105
Success: Trout per acre	12
Estimated total anglers	1542
Estimated total hours fished	5497

II) ANNUAL CATCH

Estimated brown trout over 12"	262
Estimated brown trout over 14"	157
Estimated brook trout over 12"	10
Estimated brook trout over 14"	0

III) PERCENT COMPOSITION IN CATCH

Brown trout	96.5
Brook trout	3.5
	100.0

TABLE III

MONGAUP CREEL CENSUS - 1978 ORIGIN OF ANGLERS

	TOTAL ANGLERS	PERCENT OF ANNUAL TOTAL
A) NEW YORK STATE RESIDENTS		
LOCAL (ORANGE COUNTY)	128	34
LOCAL (SULLIVAN COUNTY)	26	7
	154	41
OTHER NYS COUNTIES	49	12
SUB-TOTAL: NYS	203	53
B) OUT-OF-STATE RESIDENTS		
NEW JERSEY	146	38
PENNSYLVANIA	31	8
OTHER STATES	2	1
SUB-TOTAL OUT-OF-STATE	179	47
ANNUAL TOTALS	382	100

TABLE IV

RIVER CONDITIONS, AIR AND WATER TEMPERATURES, CATCH AND LURES USED BY MONTH: 1978

	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
River Condition	Generally high: natural runoff	High 65% variable 15% Moderate 20%	High 55% Mod. 35% Low 10%	Low, generally clear	Low, generally clear	Low, generally clear
Mean Air Temperature °F at 4 p.m.	59	69	73	78	79	69
Mean Water Temperature °F at 4 p.m.	43	53	61	66	72	66
Estimated Catch	71	76	76	27	11	11
Percent of Annual Catch	26	28	28	10	4	4
Caught On Lures	71	48	33	0	5	11
Caught On Flies	0	28	43	27	6	0

82% of the annual catch occurred April-June

61% of the annual catch was caught on lures

39% of the annual catch was caught on flies

Appendix D.2

1987 Fisheries Investigation of the Mongaup River and Tributaries in the Vicinity of the Mongaup River Basin Hydroelectric Project

PRELIMINARY

A FISHERIES INVESTIGATION OF THE MONGAUP RIVER AND TRIBUTARIES IN THE VICINITY OF THE MONGAUP RIVER BASIN HYDROELECTRIC PROJECT, ORANGE AND SULLIVAN COUNTIES, NEW YORK, 20 THROUGH 31 JULY 1987

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24 August 1987
DRAFT

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SUMMARY

All fishes collected in July 1987 were previously reported from the Delaware River Watershed (Greeley 1936, Lee et al. 1980, and Smith 1985).

A total of 7692 fish representing 29 species was taken by chain electrofisher, backpack electrofisher, trap net, gill net, and seine net. Five species comprised over 75% of the total combined catch. Alewife (29.3%), was the most abundant species captured followed by white sucker (21.4%), golden shiner (10.4%), blacknose dace (10.2%), and yellow perch (5.1%). Most trout were of wild origin. Freshwater populations of alewife were sampled in Cliff Lake, Rio Reservoir, and Toronto Reservoir, the catadromous American eel was taken only downstream of the Rio Reservoir.

INTRODUCTION

A fisheries investigation of the Mongaup River and tributaries, in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan counties, New York, was conducted by Ichthyological Associates, Inc. (IA), from 20 through 31 July 1987 (Map 1).

MATERIALS AND METHODS

Fish Sampling

A fisheries survey was conducted using chain electrofisher, backpack electrofisher, trap net, gill net, seine net, and observation. A summary of gear selectivity is presented in Appendix A.

Chain Electrofisher (CEF)

A 115-v, 60-cycle, 500-w generator with a 5-hp Briggs & Stratton engine (4.4-amp rating) was used with a rectifier to create a pulsating direct current (DC). The chain electrofisher (40-ft) consisted of two leads with alternating portions of bare copper ground cable. Each end of the 40-ft chain was attached to a wooden pole, one wooden pole has a dead man switch for safety. Fish were

stunned as they passed near the chain (within 8 inches). Personnel netted stunned fish and placed them in a live box until processed.

One pass was made with the chain electrofisher at all stations. Most American eel were not netted but were counted as they passed downstream of the chain electrofisher.

At station MR4 a backpack electrofisher with positive and negative nets (see below, Backpack Electrofisher) was used in addition to the chain electrofisher. The backpack unit was used to collect fish in areas generally difficult to access with the 40-ft chain.

Backpack Electrofisher (BPE)

Two Coffelt Model BP-3 variable voltage (250 or 500 v), pulsed (70/sec) DC backpack electrofishers were used in shallow water areas. On one unit a single net with a on-off control switch was used as the positive electrode; a single dropper wire suspended from the backpack unit was used as the negative electrode. On the second unit two nets were used; the single dropper wire was replaced by the second net which was used as the negative electrode.

All collections were made using high (500 v) voltage. The shocked fish were netted and placed in water-filled containers until processed.

At stations MR6 and MR7 only the backpack electrofisher with the positive and negative nets was used. At stations MR4 (see above, Chain Electrofisher) and BLC1 both backpack electrofishers were used.

Trap Net (TN)

Two sizes of Oneida style trap nets were used; the cotton mesh was treated with tar for preservation. The nets were composed of a rectangular box with a funnel-shaped entrance, two wings, and a lead line that bisected the angle of the wings. The larger trap nets had 1/4-inch square mesh, and a rectangular box 6 feet long, 3 feet deep, and 3 feet wide; the wings measured 50 by 3 feet and the lead measured 75 feet by 3 feet. The smaller trap nets had 3/8-inch square mesh and the box measured 6 feet by 3 feet by 20 inches; the wings measured 15 feet by 20 inches and the lead measured 25 feet by 20 inches. Extending behind the rectangular box of each trap net was a 6-foot tube, 2 feet in diameter, in which fish were trapped. The end of each tube was tied with a slip cord to facilitate fish removal. Both the rectangular box and the tube were held open by metal frames. The wings and leads were equipped with floats on the top lines and lead weights on the bottom lines to keep them upright.

One Alaskan style trap net was used; the cotton mesh was treated with tar for preservation. The net was composed of a rectangular box with a funnel entrance, two wings, and a lead line that bisected the angle of the wings. The trap net had 1/2-inch square mesh. The rectangular box was 16 feet long, 50 inches deep, and 72 inches wide;

the wings measured 9.5 by 4 feet and the lead measured 85 feet by 4 feet. The rectangular box was held open by two 50 by 72 inch tubular metal frames, with a 7 foot funnel at the rear. The fish entered the front of the net through two 40 by 52 inch tubular metal frame openings; each frame was suspended between a wing and the main lead. Inside the box the fish were then funneled through a 22 by 48 inch openning in the front frame then through a 12 inch hoop. The wings and leads were equipped with floats on the top lines and lead weights on the bottom lines to keep them upright.

Gill Net (GN)

Two sizes of monofilament experimental gill nets were used. Three of the nets were 250 ft long and 6 ft high, with 50-ft panels of square mesh sizes of 1 3/4, 2, 2 1/4, 2 1/2, and 3 inches. Two nets were 300 ft long and 8 ft high, with 50-ft panels of square mesh sizes of 1, 1 1/2, 1 3/4, 2, 2 1/4, and 2 1/2 inches. In addition, two Swedish gill nets 300 ft long and 6 ft high were used. Each net had three 100 ft panels of square mesh sizes of 1, 2, and 3 inches. All gill nets had a lead-core bottom line and a floating top line to keep them upright.

Seine Net (SN)

A nylon bag seine (50 ft long, 4 ft high) with 1/4-inch square mesh with a 4 ft x 4 ft bag was used. The net was hauled from deep water (2-5 ft) to shore or parallel to the shore, depending on depth.

Observation

Observations during fish collections were recorded and summarized. As standard field practice, all members of the survey party, weather conditions, time of collection, substrate, cover, and water depth were noted. In addition, rod and reel were used incidentally to sample at selected locations. Air temperature (F) and water temperature were measured with a field thermometer.

Fish Processing

Fish were identified according to Hubbs and Lagler (1970) and Smith (1985), measured (total length to nearest 1.0 mm), and weighed (nearest 1.0 g (wet) for fish from 10 g to 1000 g, nearest 1.0 oz for fish over 1000 g). All fish (except American eel) were measured except if large numbers were collected, in which case, all were counted and a length range determined. Most American eel were not captured; however, they were counted as they drifted downstream of the chain electrofisher. Only larger (Age 1+) salmonids and a subsample of larger game and pan fish were weighed. All fish collected except those which experienced mortality were returned to the water.

RESULTS AND DISCUSSION

Fish Sampling

The scientific and common names of fishes collected or observed during this survey are reported in Table 1.

A total of 7692 fish representing 29 species were collected by chain electrofisher, backpack electrofisher, trap net, gill net, and seine net (Table 2). The alewife (number=2254, 29.3 percent), white sucker (n=1650, 21.4%), golden shiner (n=802, 10.4%), blacknose dace (n=784, 10.2%), and yellow perch (n=392, 5.1%) dominated the catch. Twenty-four species (n=1810, 23.5%) comprised the remainder of the catch.

Catch by Gear

Chain Electrofisher

A total of 2647 fish representing 22 species was captured by chain electrofisher (Table 2). Alewife (n=1097, 41.4%) and white sucker (n=646, 24.4%) dominated and American eel (n=247, 9.3%), blacknose dace (n=183, 6.9%), shield darter (n=101, 3.8%), brown trout (n=85, 3.2%), and fallfish (n=77, 2.9%) were common. Fifteen other fishes were taken and collectively represented 8.0% (n=211) of the chain electrofisher catch.

Backpack Electrofisher

A total of 1181 fish representing eleven species was captured by backpack electrofisher (Table 2). Blacknose dace (n=601, 50.9%) and white sucker (n=471, 39.9%) dominated the catch and American eel (n=66, 5.6%) were common. Other fishes taken which collectively represented 3.6% of the catch were brook trout (n=18), cutlips minnow (n=9), longnose dace (n=6), tesselated darter (n=5), brown trout (n=2), and one each of golden shiner, redbreast sunfish, and bluegill.

Trap Net

A total of 3111 fish representing fifteen species was captured by trap net (Table 2). Alewife (n=1132, 36.4%) and golden shiner (n=771, 24.8%) dominated. Yellow perch (n=276, 8.9%), pumpkinseed (n=226, 7.3%), white sucker (n=169, 5.4%), redbreast sunfish (n=125, 4.0%), largemouth bass (n=114, 3.7%), and yellow bullhead (n=103, 3.3%) were common. Other fishes taken which collectively represented 6.3% of the trap net catch were bluegill (n=78), brown bullhead (n=42), black crappie (n=25), smallmouth bass (n=23), rock bass (n=22) chain pickerel (n=3), and creek chubsucker (n=2).

Gill Net

A total of 614 specimens representing 14 species was taken by gill net (Table 2). White sucker (n=364, 59.3%) was the dominant species. Yellow perch (n=62, 10.1%), yellow bullhead (n=46, 7.5%), smallmouth bass (n=35, 5.7%), golden shiner (n=28, 4.6%), alewife (n=24, 3.9%), and brown trout (n=21, 3.4%) were common. The remaining 5.5% of the catch was comprised of chain pickerel (n=13), brown bullhead (n=7), rock bass (n=6), largemouth bass (n=4), common carp (n=2), and one each of brook trout and fallfish.

Seine Net

A total of 139 fish representing nine species was captured by bag seine (Table 2). Largemouth bass (n=44, 31.6%), pumpkinseed (n=35, 25.2%), and redbreast sunfish (n=34, 24.5%) were the dominant species. Smallmouth bass (n=9, 6.5%) and chain pickerel (n=8, 5.8%) were common. Yellow perch (n=5, 3.6%), golden shiner (n=2, 1.4%), and one each (0.7%, each) of alewife and bluegill were also taken.

Catch by Area

Black Lake Creek, Station BLC2

Station BLC2 was located between Cliff Lake and the confluence of Black Lake Creek and the Mongaup River (Map 1). Blacknose dace

(n=567, 64.7%) and white sucker (n=284, 32.4%) dominated the backpack electrofisher catch at this small stream site (Table 4). In addition, brook trout (n=18, 2.0%) was common and five tesselated darters (0.6%) and one each of brown trout and golden shiner (0.1%, each) were collected.

Black Brook, Station BB1

Station BB1 was located on the bypassed reach of Black Brook between the stream diversion structure which leads to the Mongaup Falls Development and the Black Brook confluence with the Mongaup River (Map 1). The chain electrofisher catch was dominated by brown trout (n=59, 27.8%), yellow perch (n=48, 22.6%), largemouth bass (n=45, 21.2%), and blacknose dace (n=42, 19.8%) (Table 5). White sucker (n=14), longnose dace (n=2), brook trout (n=1), and rock bass (n=1) collectively represented 8.5% of the Black Brook catch.

Toronto Reservoir

Toronto Reservoir was sampled by trap net, gill net, and seine net (Map 1).

Trap Net, Stations TRTN1 through TRTN10

Yellow perch (n=122, 34.0%) was the dominant species taken by trap net (Table 6). Yellow bullhead (n=63, 17.6%), redbreast sunfish (n=58, 16.2%), alewife (n=31, 8.6%), white sucker (n=27, 7.5%), and bluegill (n=27, 7.5%) were abundant. Six other species collectively represented 8.6% of the trap net catch.

Gill Net, Stations TRGN1 through TRGN5

White sucker (n=82, 64.6%) was the most abundant species taken by gill net (Table 7). Yellow perch was common (n=20, 15.8%) and six each (4.7%, each) of chain pickerel, yellow bullhead, and rock bass were taken. Three other species collectively represented 5.5% of the catch.

Seine Net, Stations TRSN1 and TRSN1

Four redbreast sunfish were taken by seine at Station TRSN1 in Toronto Reservoir (Table 8).

Cliff Lake

Cliff Lake was sampled by trap and gill net (Map 1).

Trap Net, Stations CLTN1 through CLTN10

Alewife (n=267, 52.7%) dominated the trap net catch followed by largemouth bass (n=109, 21.5%), pumpkinseed (n=45, 8.9%), yellow perch (n=33, 6.5%) and bluegill (n=21, 4.1%) (Table 9). Five other species comprised 6.3% of the trap net catch.

Gill Net, Stations CLGN1 through CLGN8

White sucker (n=121, 73.3%) was the dominant species taken by gill net in Cliff Lake (Table 10). Smallmouth bass (n=28, 17.0%) was common and seven other species represented 9.7% of the catch.

Mongaup Falls Reservoir

Mongaup Falls Reservoir was sampled by trap net and gill net (Map 1).

Trap Net, Stations MFRTN1 through MFRTN10

Golden shiner (n=403, 50.4%) was the most abundant species (Table 11). White sucker (n=137, 17.2%), pumpkinseed (n=93, 11.6%), yellow perch (n=61, 7.6%), redbreast sunfish (n=32, 4.0%), and yellow bullhead (n=25, 3.1%) were common. An additional seven species represented 6.0% of the catch.

Gill Net, Stations MFRGN1 through MFRGN7

White sucker (n=67, 45.6%) was the dominant species followed by yellow bullhead (n=27, 18.4), yellow perch (n=21, 14.3%), brown trout (n=12, 8.2%), and golden shiner (n=7, 4.8%) and smallmouth bass (n=7, 4.8%) (Table 12). Four other species made up 4.1% of the Mongaup Falls Reservoir gill net catch.

Rio Reservoir

Fish in Rio Reservoir were sampled by trap, gill, and seine nets (Map_1).

Trap Net, Stations RRTN1 through RRTN10

Alewife (n=834, 57.7%) and golden shiner (n=366, 25.3%) dominated the trap net catch (Table 13). Pumpkinseed (n=71, 4.9%), yellow perch (n=60, 4.2%), redbreast sunfish (n=35, 2.4%), and bluegill (n=28, 1.9%) were also abundant. Six other species comprised 3.6% of the catch.

Gill Net, Stations RRGN1 through RRGN6

White sucker (n=94, 53.7%) was the dominate species follow by alewife (n=24, 13.7%), golden shiner (n=21, 12.0%), and yellow perch (n=20, 11.4%) (Table 14). Yellow bullhead (n=8, 4.6%), brown trout (n=6, 3.4%), and brown bullhead (n=2, 1.1%) were also captured.

Seine Net, Stations RRSN1 through RRSN4

Largemouth bass (n=44, 32.6%) was the most abundant species taken by seine followed by pumpkinseed (n=35, 25.9%) and redbreast sunfish (n=30, 22.2%) (Table 15). Smallmouth bass (n=9, 6.7%), chain pickerel (n=8, 5.9%), and yellow perch (n=5, 3.7%) were common. Three other species represented 3.0% of the Rio Reservoir seine catch.

Mongaup River, Stations MR2 through MR7

Station MR2 is located downstream of the Swinging Bridge Powerhouse and upstream of the confluence of the Mongaup River and Black Lake Creek (Table 16, Map 1). Alewife (n=1097, 95.0%) dominated the chain electrofisher catch followed by redbreast sunfish (n=21, 1.8%) and brown trout (n=20, 1.7%). Six other species were taken.

Station MR3 is located downstream of the Mongaup Falls Powerhouse and the confluence of the Mongaup River and Black Brook (Map 1). White sucker (n=15, 42.9%), blacknose dace (n=10, 28.6%), and brook trout (n=6, 17.4%) were the dominate species (Table 16). One each (2.8%, each) of spottail shiner, yellow bullhead, tesselated darter, and yellow perch comprised the remainder of the chain electrofisher catch at Station MR3.

Station MR4 is located in the lower portion of the bypassed reach of the Mongaup River between the Rio Reservoir and the Rio Powerhouse (Map 1). White sucker (n=582, 65.8%) was the most abundant species followed by American eel (n=141, 16.0%) and blacknose dace (n=131, 14.8%) (Table 16). Seven other fishes comprised 3.4% of the electrofisher catch at this site.

Station MR5 is located in the lower portion of the Mongaup River about one-quarter mile upstream of the confluence with the Delaware River (Map 1). American eel (n=106, 29.4%) dominated the chain electrofisher catch followed by shield darter (n=100, 27.7%) and fallfish (n=76, 21.0%) (Table 16). White sucker (n=32, 8.9%), longnose dace (n=21, 5.8%), and cutlips minnow (n=14, 3.9%) were common. Four other fishes (n=12, 3.3%) comprised the remainder of the catch.

Station MR6 was located in the bypassed Mongaup River about 100 yards downstream of the Rio Dam (Map 1). White sucker (n=71, 50.4%), American eel (n=45, 31.9%), and blacknose dace (n=15, 10.6%) dominated the backpack electrofisher catch (Table 16). Seven cutlips minnow (5.0%) and one each (0.7%, each) of brown trout, longnose dace, and bluegill were taken.

Station MR7 was located in the bypassed Mongaup River about 200 yards downstream of the Rio Dam and downstream of a small turbid tributary which reduced the transparency in this study reach to about one foot (Map 1). White sucker (n=116, 70.7%) dominated the backpack

electrofisher catch followed by American eel (n=21, 12.8%), and blacknose dace (n=19, 11.5%) (Table 16). Longnose dace (n=5, 3.0%), cutlips minnow (n=2, 1.2%), and bluegill (n=1, 0.6%) were also taken.

Observation

A summary of water depth, substrate, and habitat types sampled at stream stations and at reservoir seine sites is presented in Table 3a and substrate type for trap net stations is presented in Table 3b.

All brook trout captured were noted to be wild fish. Most brown trout were also noted to be wild. Rainbow trout were of hatchery origin. The largest (287 mm, 252 g) brook trout was taken at Station MFRGN3 (Table 17). Brown trout that weighted more than two pounds were relatively common in Mongaup Falls Reservoir and Rio Reservoir; the largest (748 mm, 5103 g [11 lb 4 oz]) brown trout was taken in Rio Reservoir. Rainbow trout were relatively common at Station MR2; the largest was 380 mm, 680 g.

A few of the sunfish captured appeared to be hybrids; these specimens were reported as the species which characteristics dominated.

Electrofishing gear was efficient at most stations and few missed fish were observed. Turbid conditions at backpack electrofishing Station MR7 resulted in reduced netting efficiency.

Rod and reel were used to sample near stations MR6 and MR7 on 31 July. Four smallmouth bass, four redbreast sunfish, and two bluegill were captured in 30 minutes of angling in the pool at the base of Rio Dam immediately upstream of Station MR6. Two large carp and numerous white sucker were observed in this pool. One largemouth bass and three redbreast sunfish were captured in a large pool between stations MR6 and MR7 in 15 minutes of angling. About one-half dozen white suckers were observed in the head of the pool upstream of where the small turbid tributary entered this bypassed reach.

Black Lake Creek was sampled by rod and reel on 31 July from the base of Cliff Lake Dam to about three-fourths mile downstream of the dam. One beaver was observed and several beaver dams were present. In three hours of angling 12 wild brook trout (5 to 8 inches), one wild brown trout (10 inches), and one yellow perch were captured. Also of note was the presence of a raptor nest.

In 10 minutes of angling where the outlet of Toronto Reservoir discharges into Black Lake Creek, one yellow perch (6 inches) was captured on 30 July. The water temperature of the outlet was 73 F and the water temperature at the surface of the reservoir was 78 F at this time.

Approximately 450 feet of shoreline on Toronto Reservoir near Station TRSN2 was walked, no young-of-year smallmouth bass were observed.

Copies of field notes are included as Appendix B of this report.

Length and Weight

Length and weight data and location of capture for individual rainbow trout, brown trout, brook trout, chain pickerel, white sucker, yellow bullhead, redbreast sunfish, smallmouth bass, largemouth bass, black crappie, and yellow perch are presented in Table 16.

Mongaup 2/mrdocjul

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Table 1. Fish species code and scientific and common names of fishes collected in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan counties, New York, July 1987. Fish species code follows Kretser et al (1980); scientific and common names follow Robins et al (1980).

Code	Scientific Name	Common Name
	Petromyzontidae - lampreys	
207	Petromyzon marinus Linnaeus	sea lamprey
	Anguillidae - freshwater eels	
276	Anguilla rostrata (Lesueur)	American eel
	Clupeidae - herrings	
289	Alosa pseudoharengus (Wilson)	alewife
290	Alosa sapidissima (Wilson)	American shad
	Salmonidae - trouts	
326	Salmo gairdneri Richardson	rainbow trout
328	Salmo trutta Linnaeus	brown trout
329	Salvelinus fontinalis (Mitchill)	brook trout
	Esocidae - pikes	
349	Esox niger Lesueur	chain pickerel
	Cyprinidae - carps and minnows	
365	Cyprinus carpio Linnaeus	common carp
367	Exoglossum maxillingua (Lesueur)	cutlips minnow
377	Notemigonus crysoleucas (Mitchill)	golden shiner
385	Notropis cornutus (Mitchill)	common shiner
390	Notropis hudsonius (Clinton)	spottail shiner
402	Rhinichthys atratulus (Hermann)	blacknose dace
403	Rhinichthys cataractae (Valenciennes)	longnose dace
407	Semotilus corporalis (Mitchill)	fallfish
	Catostomidae - suckers	
419	Catostomus commersoni (Lacepede)	white sucker
421	Erimyzon oblongus (Mitchill)	creek chubsucker
423	Hypentelium nigricans (Lesueur)	northern hog sucker
	Ictaluridae - bullhead catfishes	
443	Ictalurus natalis (Lesueur)	yellow bullhead
444	Ictalurus nebulosus (Lesueur)	brown bullhead
448	Noturus insignis (Richardson)	margined madtom

Table 1. (Con't)

Code	Scientific Name	Common Name
	Centrarchidae - sunfishes	
591	Ambloplites rupestris (Rafinesque)	rock bass
594	Lepomis auritus (Linnaeus)	redbreast sunfish
596	Lepomis gibbosus (Linnaeus)	pumpkinseed
598	Lepomis macrochirus Rafinesque	bluegill
600	Micropterus dolomieui Lacepede	smallmouth bass
601	Micropterus salmoides (Lacepede)	largemouth bass
603	Pomoxis nigromaculatus (Lesueur)	black crappie
	Percidae - perches	
614	Etheostoma olmstedi Storer	tessellated darter
617	Perca flavescens (Mitchill)	yellow perch
623	Percina peltata (Stauffer)	shield darter

MONGAUP1/monrt1a

Table 2. Number of fish taken by chain electrofisher, backpack electrofisher, trap net, gill net, and seine net in the vicinity of the Mongaup River Hydroelectric Project, Orange and Sullivan counties, New York, July 1987.

GEAR	CHAIN ELECTROFISHER		BACKPACK ELECTROFISHER		TRAP NET		GILL NET		SEINE NET		TOTAL CATCH	
	#	%	#	%	#	%	#	%	#	%	#	%
American eel	247	9.33	66	5.59	0	0.00	0	0.00	0	0.00	313	4.07
Alewife	1097	41.44	0	0.00	1132	36.39	24	3.91	1	0.72	2254	29.30
Rainbow trout	6	0.23	0	0.00	0	0.00	0	0.00	0	0.00	6	0.08
Brown trout	85	3.21	2	0.17	0	0.00	21	3.42	0	0.00	108	1.40
Brook trout	8	0.30	18	1.52	0	0.00	1	0.16	0	0.00	27	0.35
Chain pickerel	0	0.00	0	0.00	3	0.10	13	2.12	8	5.76	24	0.31
Common carp	0	0.00	0	0.00	0	0.00	2	0.33	0	0.00	2	0.03
Cutlips minnow	22	0.83	9	0.76	0	0.00	0	0.00	0	0.00	31	0.40
Golden shiner	0	0.00	1	0.08	771	24.78	28	4.56	2	1.44	802	10.43
Common shiner	9	0.34	0	0.00	0	0.00	0	0.00	0	0.00	9	0.12
Spottail shiner	1	0.04	0	0.00	0	0.00	0	0.00	0	0.00	1	0.01
Blacknose dace	183	6.91	601	50.89	0	0.00	0	0.00	0	0.00	784	10.19
Longnose dace	35	1.32	6	0.51	0	0.00	0	0.00	0	0.00	41	0.53
Fallfish	77	2.91	0	0.00	0	0.00	1	0.16	0	0.00	78	1.01
White sucker	646	24.40	471	39.88	169	5.43	364	59.28	0	0.00	1650	21.45
Creek chubsucker	0	0.00	0	0.00	2	0.06	0	0.00	0	0.00	2	0.03
Yellow bullhead	1	0.04	0	0.00	103	3.31	46	7.49	0	0.00	150	1.95
Brown bullhead	0	0.00	0	0.00	42	1.35	7	1.14	0	0.00	49	0.64
Margined madtom	1	0.04	0	0.00	0	0.00	0	0.00	0	0.00	1	0.01
Rockbass	3	0.11	0	0.00	22	0.71	6	0.98	0	0.00	31	0.40
Redbreast sunfish	23	0.87	1	0.08	125	4.02	0	0.00	34	24.46	183	2.38
Pumpkinseed	0	0.00	0	0.00	226	7.26	0	0.00	35	25.18	261	3.39
Bluegill	1	0.04	1	0.08	78	2.51	0	0.00	1	0.72	81	1.05
Smallmouth bass	3	0.11	0	0.00	23	0.74	35	5.70	9	6.47	70	0.91
Largemouth bass	45	1.70	0	0.00	114	3.66	4	0.65	44	31.65	207	2.69
Black crapple	0	0.00	0	0.00	25	0.80	0	0.00	0	0.00	25	0.33
Tesselated darter	4	0.15	5	0.42	0	0.00	0	0.00	0	0.00	9	0.12
Yellow perch	49	1.85	0	0.00	276	8.87	62	10.10	5	3.60	392	5.10
Shield darter	101	3.82	0	0.00	0	0.00	0	0.00	0	0.00	101	1.31
NUMBER OF FISH	2647		1181		3111		614		139		7692	
NUMBER OF FISHES	22		11		15		14		9		29	

Table 3a. Summary of water depth, substrate, and habitat types sampled in the Mongaup River and tributaries in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan counties, New York, July 1987.

STATION	CHANNEL WIDTH (FT) min/max/ave CHANNEL DEPTH (FT) min/max/mean	SUBSTRATE		CHANNEL (%) pool/riffle/run	COVER
BLC2	5.0 / 25.0 / 10.0 0.4 / 1.7 / 0.6	50% rubble 15% boulder	25% gravel 10% sand	40% / 30% / 30%	good to fair instream: boulders, tree roots, grass; trees provide overhead cover
BB1	20.0 / 40.0 / 25.0 0.5 / 4.0 / 1.0	50% boulder 10% bedrock	40% rubble	10% / 60% / 30%	good instream cover with overhead shade
MR2	35.0 / 60.0 / 40.0 0.7 / 1.0 / 0.8	70% rubble 5% boulder	25% gravel	0% / 85% / 15%	instream: filimentous algae; few trees provide poor overhead cover
MR3	21.0 / 50.0 / 40.0 1.0 / 3.3 / 2.0	100% rubble		0% / 30% / 70%	fair instream: rubble and fallen trees; trees along shore provide good overhead cover
MR4	40.0 / 70.0 / 60.0 0.5 / 2.0 / 1.0	50% boulder 5% gravel	45% rubble	30% / 40% / 30%	good instream cover provided by boulders; fair overhead cover provided by trees along shore
MR5	40.0 /102.0 / 37.5 0.5 / 3.0 / 2.0	85% boulder 5% gravel	10% sand	40% / 50% / 10%	good to excellent instream provided by boulders; trees along shore provide overhead cover
MR6	5.0 / 20.0 / 8.0 0.0 / 2.0 / 0.7	80% boulder 10% gravel	10% rubble	0% /100% / 0%	cover in pocket water provided by boulders; overhead cover lacking
MR7	6.0 / 40.0 / 23.0 0.3 / 1.5 / 0.6	80% boulder 10% silt	10% gravel	0% /100% / 0%	cover in pocket water provided by boulders, turbid provides visual cover; overhead cover lacking

MONGAUP2/monrt3a

Table 3b. Summary of water depth, substrate, and habitat sampled at trap net and seine net stations in impoundments in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan counties, New York, July 1987.

STATION	MAXIMUM DEPTH (FT)	SUBSTRATE	COVER
TRIN1	8	rubble/boulder with silt and sand	none
TRIN2	4	boulder/rubble covered with silt; dominated by silt offshore	none
TRIN3	5	rubble/boulder with silt	none
TRIN4	3	rubble/boulder, silt covered	none
TRIN5	4	gravel/sand some rubble covered with silt	none
TRIN6	6	boulder/rubble covered with silt	few boulders provide instream cover
TRIN7	8	silt with patches of boulders and rubble	none
TRIN8	7	boulder/rubble covered with silt	few boulders provide instream cover
TRIN9	6	boulder wiht rubble/gravel civered with silt	none
TRIN10	6	rubble/boulder	none
TRSN1	4	rubble(shale)	fair
TRSN2	5.5	rubble(shale) and gravel	fair
CLIN1	4.1	silt	none
CLIN2	3.4	silt	none
CLIN3	4.9	gravel	none
CLIN4	5.9	gravel	none
CLIN5	4.9	silt	none

Table 3b. (Continued). page 2 of 3

STATION	MAXIMUM DEPTH (FT)	SUBSTRATE	COVER
CLIN6	7.4	silt	none
CLIN7	5.7	silt	none
CLIN8	3.3	silt	none
CLIN9	9.0	silt	none
CLIN10	7.6	silt	none
MFRIN1	7.5	rubble/boulder	none
MFRIN2	9.8	sand/gravel	none
MFRIN3	4.9	sand	none
MFRIN4	5.7	gravel	none
MFRIN5	8.2	gravel/sand	none
MFRIN6	4.1	sand/silt	none
MFRIN7	8.2	sand/silt/gravel	none
MFRIN8	6.9	rubble and gravel	none
MFRIN9	6.6	sand/silt/organic detritus	none
MFRIN10	3.3	sand, silt, gravel	none
RRIN1	9.8	silt	boulders provide instream cover
RRIN2	10.7	silt	none
RRIN3	4.1	silt	none
RRIN4	7.4	silt	none
RRIN5	8.2	soft silt	none
RRIN6	6.6	boulders with soft silt	none
RRIN7	9.0	soft silt	none

STATION	MAXIMUM DEPTH (FT)	SUBSTRATE	COVER
RRIN8	6.6	soft silt and boulders	none
RRIN9	4.9	soft silt and organic detritus	none
RRIN10	4.1	silt and organic detritus	instream: tree stumps, cattail, and alder; overhead: alder
RRSN1	3.5	sand with some gravel and boulder	fair
RRSN2	5	sand with organic detritus and boulders	boulders provide fair instream cover
RRSN3	5	sand/gravel with rubble and detritus	conifers provide overhead cover
RRSN4	5	sand/gravel with organic detritus	instream: aquatic and terrestrial vegetation; overhead: some overhanging trees

MONGAUP2/mrjult3b

Table 4. Number of fish collected by backpack electrofisher in Black Lake Creek in the vicinity of the Mongaup River Basin Hydroelectric Project, Sullivan County, New York, July 1987.

STATION	BLC2	TOTAL CATCH 7/23	
DATE	7/23		
TIME (START)	1735		
TIME (FINISH)	1905		
AIR TEMP. (F)	80		
WATER TEMP. (F)	73		
GEAR	BPE	BACKPACK ELECTROFISHER	
		#	%
Brown trout	1	1	0.11
Brook trout	18	18	2.05
Golden shiner	1	1	0.11
Blacknose dace	567	567	64.73
White sucker	284	284	32.42
Tesselated darter	5	5	0.57
NUMBER OF FISH	876	876	
NUMBER OF FISHES	6	6	

MONGAUP 2/MRJULTBL/A299..H330

Table 5. Number of fish collected by chain electrofisher in Black Brook in the vicinity of the Mongaup River Basin Hydroelectric Project, Sullivan County, New York, July 1987.

LOCATION	BB1	TOTAL CATCH	
STATION	7/21	7/21	
DATE			
TIME (START)	1740		
TIME (FINISH)	1835		
AIR TEMP. (F)	87		
WATER TEMP. (F)	73		
GEAR	CEF	CHAIN ELECTROFISHER	
		#	%
Brown trout	59	59	27.83
Brook trout	1	1	0.47
Blacknose dace	42	42	19.81
Longnose dace	2	2	0.94
White sucker	14	14	6.60
Rockbass	1	1	0.47
Largemouth bass	45	45	21.23
Yellow perch	48	48	22.64
NUMBER OF FISH	212	212	
NUMBER OF FISHES	8	8	

MONGAUP 2/MRJULTBL/A260..H293

Table 6. Number of fish collected by trap net in Toronto Reservoir in the vicinity of the Mongaup River Basin Hydroelectric Project, Sullivan County, New York, July 1987.

STATION	TRTN1	TRTN1	TRTN2	TRNT2	TRNT3	TRNT3	TRNT4	TRNT4	TRNT5	TRNT5	TRNT6	TRNT6	TRNT7	TRNT7	TRNT8	TRNT8	TRNT9	TRNT9	TRNT10	TRNT10	TOTAL CATCH	
DATE	7/29-30	7/30-31	7/29-30	7/30-31	7/29-30	7/30-31	7/29-30	7/30-31	7/29-30	7/30-31	7/29-30	7/30-31	7/29-30	7/30-31	7/29-30	7/30-31	7/29-30	7/30-31	7/29-30	7/30-31	7/29 TO 7/31	
TIME (START)	1615	1625	1622	1610	1630	1615	1650	1624	1700	1630	1720	1643	1725	1647	1740	1930	1750	1700	1600	1700		
TIME (FINISH)	1600	945	1605	1000	1612	1010	1618	1025	1630	1035	1640	1048	1645	1055	1650	1110	1657	1130	1702	1130		
AIR TEMP. (F)	80		90		77		80		80		77		79		79		76		78			
WATER TEMP. (F)	79		79		79		78		79		81		80		80		82		79			
GEAR	SM TN	SM TN	SM TN	SM TN	SM TN	SM TN	SM TN	SM TN	LG TN	LG TN	LG TN	LG TN	LG TN	LG TN	LG TN	LG TN	LG TN	LG TN	AK TN	AK TN	TRAP NET	
																					#	%
Alewife																			23	8	31	8.64
Golden shiner									1			1									2	0.56
White sucker		1							2	3	1	1	1				3		4	11	27	7.52
Creek chubsucker									1											1	2	0.56
Yellow bullhead									4	5		1					1		21	31	63	17.55
Brown bullhead									2											5	7	1.95
Rockbass																	1			1	2	0.56
Redbreast sunfish		7	3	2	15	5	4	4		2		2					2	6	4	2	58	16.16
Pumpkinseed		5			3	1	2	3								1		1	1		17	4.74
Bluegill		2			4		2		2	2		1				2			2	10	27	7.52
Largemouth bass																			1		1	0.28
Yellow perch	9	6	3	5			1	6	1	1	7	2	3	5	5	10			46	12	122	33.98
NUMBER OF FISH	9	21	6	7	22	6	9	13	13	13	8	8	4	5	5	13	7	7	102	81	359	
NUMBER OF FISHES	1	5	2	2	3	2	4	3	7	5	2	6	2	1	1	3	4	2	8	9	12	

MONGALP 2/MAJULTBL/AS65..7599

Table 7. Number of fish collected by gill net in Toronto Reservoir in the vicinity of the Mongaup River Basin Hydroelectric Project, Sullivan County, New York, July 1987.

STATION	TRGN1	TRGN2	TRGN3	TRGN4	TRGN5	TOTAL CATCH 7/29 TO 7/30	
DATE	7/29-30	7/29-30	7/29-30	7/29-30	7/29-30		
TIME (START)	1803	1820	1830	1830	1850		
TIME (FINISH)	1345	1400	1425	1445	1530		
AIR TEMP. (F)	76	76	75	76	75		
WATER TEMP. (F)	80	80	80	80	80		
GEAR	GN #2	GN #3	GN #10	GN #10	GN	GILL NET #	GILL NET %
Chain pickerel		4		2		6	4.72
Fallfish		1				1	0.79
White sucker	1	5	11	65		82	64.57
Yellow bullhead			2	4		6	4.72
Brown bullhead		3				3	2.36
Rockbass		6				6	4.72
Largemouth bass	2			1		3	2.36
Yellow perch			1	19		20	15.75
NUMBER OF FISH	3	19	14	91	0	127	
NUMBER OF FISHES	2	5	3	5	0	8	

MONGAUP 2/MRJULTBL/A333..K365

Table 8. Number of fish collected by seine net in Toronto Reservoir in the vicinity of the Mongaup River Basin Hydroelectric Project, Sullivan County, New York, July 1987.

STATION	TRSN1	TRSN2	TOTAL CATCH	
DATE	7/31	7/31	7/31	
TIME (START)	1230	1240		
TIME (FINISH)	1235	1245		
AIR TEMP. (F)	76	76		
WATER TEMP. (F)	78	78		
GEAR	SN	SN	SEINE NET	
			#	%
Redbreast sunfish	4		4	100.00
NUMBER OF FISH	4	0	4	
NUMBER OF FISHES	1	0	1	

MONGAUP 2/MRJULTBL/A533..I559

Table 9. Number of fish collected by trap net in Cliff Lake in the vicinity of the Mongaup River Basin Hydroelectric Project, Sullivan County, New York, July 1987.

LOCATION		CLTN1	CLTN2	CLTN2	CLTN3	CLTN3	CLTN4	CLTN4	CLTN5	CLTN5	CLTN6	CLTN6	CLTN7	CLTN7	CLTN8	CLTN8	CLTN9	CLTN9	CLTN10	CLTN10	TOTAL CATCH 7/22 TO 7/24	
STATION																						
DATE		7/22	7/22-23	7/23-24	7/22-23	7/23-24	7/22-23	7/23-24	7/22-23	7/23-24	7/22-23	7/23-24	7/22-23	7/23-24	7/22-23	7/23-24	7/22-23	7/23-24	7/22-23	7/23-24		
TIME (START)		1700	1725	1350	1735	1353	1750	1400	1930	1425	1947	1436	2005	1449	2018	1445	2023	1502	2031	1516		
TIME (FINISH)			1349	929	1353	1003	1400	1018	1411	1200	1434	1027	1445	1041	1445	1056	1500	1109	1508	1122		
AIR TEMP. (F)		86	86		86		86		80		83		78		77		76		76			
WATER TEMP. (F)		78	79		79		79		81		81		81		81		81		80			
GEAR		SM TN	SM TN	SM TN	SM TN	SM TN	SM TN	SM TN	AK TN	AK TN	LG TN	LG TN	LG TN	LS TN	LG TN	LG TN	LG TN	LG TN	LG TN	LS TN	TRAP NET	
																					#	%
Alewife	S				10	18			48	92	10	10		43	29	3	4				257	52.66
Yellow bullhead	T									1		1								1	2	0.39
Brown bullhead	O									2	1										4	0.79
Rockbass	L					1				1						4		1			7	1.38
Pumpkinseed	L	2			1			3	11	12	2	3	.1	1			3	2	2	2	45	8.88
Bluegill	E								8	5	1	4		1			2				21	4.14
Smallmouth bass	M									1	1	1	1							5	9	1.78
Largemouth bass								1			80	1		2	1	3	8	2	4	7	109	21.50
Black crappie									2	3		1	1	3							10	1.97
Yellow perch										1				3	1	3	9	11		5	33	6.51
NUMBER OF FISH		0	2	0	11	19	0	4	69	118	95	21	3	53	31	13	26	16	6	20	507	
NUMBER OF FISHES		0	1	0	2	2	0	2	4	9	6	7	3	6	3	4	5	4	2	5	10	

MONGALP 2/MRJULTBL/A103..Y137

Table 10. Number of fish collected by gill net in Cliff Lake in the vicinity of the Mongaup River Basin Hydroelectric Project, Sullivan County, New York, July 1987.

LOCATION									TOTAL CATCH	
STATION	CLGN1	CLGN2	CLGN3	CLGN4	CLGN5	CLGN6	CLGN7	CLGN8	7/22 TO 7/24	
DATE	7/22	7/22	7/22	7/22	7/23	7/22	7/23	7/23		
TIME (START)	1826	1842	1848	1855	1024	1050	1120	1219		
TIME (FINISH)	1007	1040	1100	1130	1500	1442	1409	1320		
AIR TEMP. (F)	85	82	83	81	83	86	85	83		
WATER TEMP. (F)	83	81	81	81	82	82	81	83		
GEAR	GN	GN	GN	GN	GN	GN	GN	GN	GILL NET	
	#1	#10	#2	#9			#2	#9	#	%
Brown trout		3							3	1.82
Chain pickerel	2							2	4	2.42
Common carp				1					1	0.61
White sucker	1	8	1	46		3	34	28	121	73.33
Yellow bullhead		1	1	3					5	3.03
Brown bullhead	1								1	0.61
Smallmouth bass	1		6	2		2	5	12	28	16.97
Largemouth bass				1					1	0.61
Yellow perch			1						1	0.61
NUMBER OF FISH	5	12	9	53	0	5	39	42	165	
NUMBER OF FISHES	4	3	4	5	0	2	2	3	9	

MONGAUP 2/MRJULTBL/A143..N176

Table 11. Number of fish collected by trap net in Mongaup Falls Reservoir in the vicinity of the Mongaup River Basin Hydroelectric Project, Sullivan County, New York, July 1987.

LOCATION	MFRTN1	MFRTN1	MFRTN2	MFRTN2	MFRTN3	MFRTN3	MFRTN4	MFRTN4	MFRTN5	MFRTN5	MFRTN6	MFRTN6	MFRTN7	MFRTN7	MFRTN8	MFRTN8	MFRTN9	MFRTN9	MFRTN10	MFRTN10	TOTAL CATCH	
STATION	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20 TO 7/22	
DATE	1030	1032	1135	1106	1155	1439	1210	1430	1245	1420	1330	1500	1350	1520	1400	1535	1500	1540	1520	1548		
TIME (START)	1050	1415	1103	1424	1435	1326	1423	1317	1413	1309	1447	1045	1530	1217	1500	2100	1500	1201	1545	1145		
TIME (FINISH)	73		78		77		79		84		87		83		87		85		88			
AIR TEMP. (F)	70		72		73		73		73		74		75		75		65		77			
WATER TEMP. (F)	LG TN	LG TN	LG TN	LG TN	LG TN	LG TN	SM TN	SM TN	SM TN	SM TN	AK TN	AK TN	SM TN	SM TN	LG TN	LG TN	LG TN	LG TN	LS TN	LG TN	TRAP NET	
GEAR																					#	%
Chain pickerel											1										1	0.13
Golden shiner					1	1				1	100	301									403	50.44
White sucker	1		5	2	16	2	6	1	10	1	28	35	1				3	1	14	11	137	17.15
Yellow bullhead					1	1					1	22									25	3.13
Brown bullhead					1	1			1		2	8							1	4	18	2.25
Rockbass				1			1														2	0.25
Redbreast sunfish				6		3	18	1			5	4					2	1			32	4.01
Pumpkinseed		1		7	4	4	15	3		1	39	16					1		2		93	11.64
Bluegill											1	1									2	0.25
Smallmouth bass											5	9									14	1.75
Largemouth bass											3	1									4	0.50
Black crappie								1			1	5									7	0.88
Yellow perch		3		2		5	1	1	2	16	11	4	7	9							61	7.63
NUMBER OF FISH	1	4	5	18	23	17	33	7	13	18	197	486	8	9	0	0	6	2	17	15	799	
NUMBER OF FISHES	1	2	1	5	5	7	5	5	3	3	12	11	2	1	0	0	3	2	3	2	13	

MONGAUP 2/MRJULTBL/A182..1219

Table 12. Number of fish collected by gill net in Mongaup Falls Reservoir in the vicinity of the Mongaup River Basin Hydroelectric Project, Sullivan County, New York, July 1987.

LOCATION													
STATION	MFRGN1	MFRGN1	MFRGN2	MFRGN2	MFRGN3	MFRGN3	MFRGN4	MFRGN4	MFRGN5	MFRGN6	MFRGN7	TOTAL CATCH	
DATE	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/21-22	7/20-21	7/20-21	7/20-21	7/22 TO 7/24	
TIME (START)	1600	955	1610	1100	1615	1125	1640	1145	1650	1700	1710		
TIME (FINISH)	950	920	1057	941	1110	946	1130	1006	1140	1245	1300		
AIR TEMP. (F)	90		83		90		86		86	85	85		
WATER TEMP. (F)	76		76		77		77		77	77	76		
GEAR	GN	GN	GN	GN	GN #10	GN #10	GN #9	GN #9	GN #3	GN	GN	GILL NET #	GILL NET %
Brown trout	1	1			1		2		5	1	1	12	8.16
Brook trout					1							1	0.68
Chain pickerel		1			1			1				3	2.04
Common carp											1	1	0.68
Golden shiner					1			1		4	1	7	4.76
White sucker	5	5	5		17	9	6	5	4	6	5	67	45.58
Yellow bullhead					2	2	1		1	10	11	27	18.37
Brown bullhead					1							1	0.68
Smallmouth bass	1	1	1		1		1			1	1	7	4.76
Yellow perch						2	4			5	10	21	14.29
NUMBER OF FISH	7	8	6	0	25	13	14	7	10	27	30	147	
NUMBER OF FISHES	3	4	2	0	8	3	5	3	3	6	7	10	

MONGAUP 2/MRJULTBL/A223..Q257

Table 13. Number of fish collected by trap net in Rio Reservoir in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan counties, New York, July 1987.

STATION	RRTN1	RRTN2	RRTN3	RRTN4	RRTN5	RRTN6	RRTN7	RRTN8	RRTN9	RRTN10	TOTAL CATCH 7/27 TO 7/29	
DATE	7/27-29	7/27-29	7/27-29	7/27-29	7/27-29	7/27-29	7/27-29	7/27-29	7/27-29	7/27-29		
TIME (START)	1345	1400	1408	1430	1440	1505	1517	1525	1535	1700		
TIME (FINISH)	906	916	926	1054	1157	1148	1040	1130	1120	1000		
AIR TEMP. (F)	80	81	77	79	79	78	80	79	81	81		
WATER TEMP. (F)	79	80	80	80	80	81	82	82	82	81		
GEAR	LG TN	LG TN	LG TN	LG TN	LG TN	SM TN	SM TN	SM TN	SM TN	AK TN	TRAP NET #	TRAP NET %
Alewife	21	8	2	799						4	834	57.68
Chain pickerel										2	2	0.14
Golden shiner			1		3					362	366	25.31
White sucker										5	5	0.35
Yellow bullhead				7	3	1				2	13	0.90
Brown bullhead				3	4					6	13	0.90
Rockbass				1	1				2	7	11	0.76
Redbreast sunfish				4	1	3	1		5	21	35	2.42
Pumpkinseed				3	8	8			18	34	71	4.91
Bluegill				4		2			2	20	28	1.94
Black crapple										8	8	0.55
Yellow perch	11		2	18	15		2			12	60	4.15
NUMBER OF FISH	32	8	5	839	35	14	3	0	27	483	1446	
NUMBER OF FISHES	2	1	3	8	7	4	2	0	4	12	12	

MONGAUP 2/MRJULTBL/A368..P404

Table 14. Number of fish collected by gill net in Rio Reservoir in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan counties, New York, July 1987.

STATION	RRGN1	RRGN2	RRGN3	RRGN4	RRGN5	RRGN6	TOTAL CATCH 7/27 TO 7/28	
DATE	7/27-28	7/27-28	7/27-28	7/27-28	7/27-28	7/27-28		
TIME (START)	1720	1720	1740	1750	1800	1810		
TIME (FINISH)	1910	1805	1745	1710	1655	1615		
AIR TEMP. (F)	79	79	77	78	77	77		
WATER TEMP. (F)	81	81	81	80	80	80		
GEAR	GN	GN	GN	GN	GN	GN	GILL NET	
		#9	#2	#3	#1	#10	#	%
Alewife	1	17			1	5	24	13.71
Brown trout	1	2	1			2	6	3.43
Golden shiner	21						21	12.00
White sucker	39	10		10	12	23	94	53.71
Yellow bullhead	1	4	1			2	8	4.57
Brown bullhead	2						2	1.14
Yellow perch	9	4		1		6	20	11.43
NUMBER OF FISH	74	37	2	11	13	38	175	
NUMBER OF FISHES	7	4	2	2	2	5	7	

MONGAUP 2/MRJULTBL/A410..L441

Table 15. Number of fish collected by seine net in Rio Reservoir in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan counties, New York, July 1987.

STATION	RRSN1	RRSN2	RRSN3	RRSN4	TOTAL CATCH 7/29	
DATE	7/29	7/29	7/29	7/29		
TIME (START)	1250	1303	1315	1320		
TIME (FINISH)	1255	1310	1320	1325		
AIR TEMP. (F)	71	71	71	71		
WATER TEMP. (F)			78	79		
GEAR	SN	SN	SN	SN	SEINE NET	
					#	%
Alewife		1			1	0.74
Chain pickerel		2	1	5	8	5.93
Golden shiner	1			1	2	1.48
Redbreast sunfish	13	12	3	2	30	22.22
Pumpkinseed	11		5	19	35	25.93
Bluegill				1	1	0.74
Smallmouth bass		2		7	9	6.67
Largemouth bass	2	2	24	16	44	32.59
Yellow perch				5	5	3.70
NUMBER OF FISH	27	19	33	56	135	
NUMBER OF FISHES	4	5	4	8	9	

MONGAUP 2/MRJULTBL/A495..J529

Table 16. Number of fish collected by backpack and chain electrofisher in Mongaup River in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan counties, New York, July 1987.

STATION	MR2	MR3	MR4	MR5	MR6	MR7	TOTAL CATCH 7/27 TO 7/31	
DATE	7/27	7/28	7/28	7/30	7/31	7/31		
TIME (START)	945	915	1230	905	1020	920		
TIME (FINISH)	1135	1015	1335	1040	1100	1000		
AIR TEMP. (F)	69	63	78	61	(24 C)	(24 C)		
WATER TEMP. (F)	69	62	69	61	(18 C)	(18 C)		
GEAR	CEF	CEF	CEF	CEF			CHAIN ELECTROFISHER	
			BPE		BPE	BPE	BACKPACK ELECTROFISHER	
							#	%
American eel			141	106	45	21	313	11.42
Alewife	1097						1097	40.04
Rainbow trout	6						6	0.22
Brown trout	20		5	1	1		27	0.99
Brook trout	1	6					7	0.26
Cutlips minnow			8	14	7	2	31	1.13
Common shiner				9			9	0.33
Spottail shiner		1					1	0.04
Blacknose dace		10	131		15	19	175	6.39
Longnose dace			12	21	1	5	39	1.42
Fallfish			1	76			77	2.81
White sucker	3	15	582	32	71	116	819	29.89
Yellow bullhead		1					1	0.04
Margined madtom				1			1	0.04
Rockbass	2						2	0.07
Redbreast sunfish	21		2		1		24	0.88
Bluegill			1			1	2	0.07
Smallmouth bass	3						3	0.11
Tesselated darter	2	1		1			4	0.15
Yellow perch		1					1	0.04
Shield darter			1	100			101	3.69
NUMBER OF FISH	1155	35	884	361	141	164	2740	
NUMBER OF FISHES	9	7	10	10	7	6	21	

Table 17. Length and weight of fishes collected in the Mongaup River and tributaries in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan Counties, New York, July 1987.

RAINBOW TROUT

LENGTH (mm)	WEIGHT (g)	STATION
297	242	MR2
300	228	MR2
315	362	MR2
320	290	MR2
325	380	MR2
380	680	MR2

BROWN TROUT

LENGTH (mm)	WEIGHT (g)	STATION
170	68	BLC1
184	70	MR2
184	80	MR2
185	76	BB1
187	72	BB1
190	80	BB1
191	68	BB1
195	90	MR2
197	84	BB1
197	93	MR2
199	84	BB1
203	92	BB1
203	94	MR2
203	102	MR2
205	69	MR6
207	108	MR2
208	102	MR2
208	112	MR2
210	138	MR2
223	144	MR2
228	136	BB1
245	180	MR2
284	240	BB1
290	292	MR2
293	300	MR2
298	290	MR2
310	438	MR2
312	340	MR2
315	384	MR2
330	408	RRGN6
346	460	MR2
356	512	MR5
378	860	MR2
389	604	MFRGN4
392	568	MFRGN5
415	780	MFRGN6

BROWN TROUT (CON'T)

LENGTH (mm)	WEIGHT (g)	STATION
428	918	CLGN2
433	841	MFRGN7
433	910	MFRGN5
435	940	MFRGN4
453	1134	MFRGN5
471	1304	MFRGN1
474	1219	MFRGN1
477	1304	CLGN2
530	1814	RRGN1
530	2041	RRGN2
538	1956	MFRGN5
538	2325	MFRGN3
552	1701	RRGN6
612	2977	MFRGN5
615	2835	RRGN2
621	2523	CLGN2
748	5103	RRGN3

BROOK TROUT

LENGTH (mm)	WEIGHT (g)	STATION
159	42	BLC1
165	60	BB1
223	160	MR2
287	252	MFRGN3

CHAIN PICKEREL

LENGTH (mm)	WEIGHT (g)	STATION
312	174	MFRGN3
322	208	MFRTN6
332	220	MFRGN4
357	268	RRTN10
483	1474	TRGN4
495	800	RRTN10
497	900	MFRGN1
503	964	TRGN2
505	748	CLGN8
530	760	CLGN8
540	1304	TRGN2
558	1134	CLGN1
565	1418	TRGN2
568	805	TRGN4
579	1106	CLGN1
610	1701	TRGN2

WHITE SUCKER

LENGTH (mm)	WEIGHT (g)	STATION
407	376	MR5

YELLOW BULLHEAD

LENGTH (mm)	WEIGHT (g)	STATION
310	305	CLGN4
492	2155	TRTN10

REDBREAST SUNFISH

LENGTH (mm)	WEIGHT (g)	STATION
165	80	MR6

SMALLMOUTH BASS

LENGTH (mm)	WEIGHT (g)	STATION
152	38	MFRTN6
156	52	MFRTN6
156	45	MFRTN6
156	48	MFRTN6
157	52	MFRTN6
161	45	MFRTN6
174	64	MFRTN6
205	95	MFRGN6
210	128	MFRTN6
220	138	MFRGN7
230	156	MFRTN6
230	689	MFRTN6
238	156	MFRTN6
238	196	CLTN7
243	184	CLTN5
253	216	CLTN6
265	244	MFRTN6
266	260	MFRGN4
275	168	MFRTN6
289	295	MFRGN3
327	441	MFRGN1
350	520	MFRGN1
360	589	MFRGN2
360	636	CLGN1
382	742	CLGN3
385	710	CLGN7
390	700	CLGN4
391	846	CLGN3
392	842	CLGN8
393	800	CLGN8

Table 17. (Con't)

SMALLMOUTH BASS (CON'T)

LENGTH (mm)	WEIGHT (g)	STATION
393	830	CLGN8
397	838	CLGN8
401	831	CLGN7
403	834	CLGN3
410	880	CLGN8
412	892	CLGN6
415	972	CLGN8
419	964	CLGN8
420	964	CLGN8
422	892	CLGN6
424	910	CLGN7
425	990	CLGN7
426	1021	CLGN3
427	880	CLGN8
428	1077	CLGN8
430	1077	CLGN8
432	1021	CLGN3
434	1021	CLGN3
434	1106	CLGN4
451	1134	CLGN8
455	1361	CLTN6

LARGEMOUTH BASS

LENGTH (mm)	WEIGHT (g)	STATION
115	10	MFRTN6
124	28	MFRTN6
137	34	MFRTN6
168	68	MFRTN6
323	580	TRGN4
390	1134	TRTN10
414	1077	CLGN4
473	1928	TRGN1
480	1928	TRGN1

BLACK CRAPPIE

LENGTH (mm)	WEIGHT (g)	STATION
103	12	MFRTN6
105	16	MFRTN6
156	56	MFRTN6
223	172	CLTN5
242	210	CLTN7
255	260	MFRTN6
283	372	CLTN7
313	540	CLTN7
329	164	CLTN7
334	652	CLTN5
350	660	CLTN5
362	968	CLTN5
363	824	CLTN5

YELLOW PERCH

LENGTH (mm)	WEIGHT (g)	STATION
192	82	MFRGN4
200	80	MFRGN4
203	102	MFRGN4
208	110	MFRGN4
315	418	CLGN3
325	369	RRGN6
353	454	RRGN6

MONGAUP 2/MONFISH/A200..K293

MAP 1

NOTE: Map 1 is currently being drafted and will be forwarded upon completion.

Appendix Table A. Selectivity of fisheries gear used in the vicinity of the Mongaup River Basin Hydroelectric Project, Orange and Sullivan counties, New York, July 1987.

GEAR	SUITABLE HABITAT	FISHES CAPTURED	LIMITATIONS
Backpack Electrofisher	Shallow water less than one foot in depth with limited escape passage. Very suitable for headwaters.	Fishes of shallow backwater areas in large rivers or lakes. Fishes that inhabit small narrow and shallow streams and "pocket" water.	Skill of netter. Net mesh size limits catch of smaller fish (about 40mm). Conductivity of water.
Chain Electrofisher	Shallow water less than three to four feet in depth with limited escape passage or in areas that can be blocked off by netting. Suitable for population estimates by removal methods.	Fishes that inhabit shallow water. Fishes can swim past chain if they are moving rapidly before they enter the electric field.	Conductivity of water limits effectiveness of gear. Skill of netters. Current velocity, depth, and turbidity (possibly caused by resuspension of soft substrate).
Seine Net	Shallow water with firm, smooth substrate (i.e., sand, gravel, or smooth bedrock).	Fishes that inhabit shallow water and that prefer firm, smooth substrate.	Mesh size limits size of catch, smaller mesh (1/4 inch) generally captures all life stages except young-of-year.
Gill Net (anchored)	Deep, still water.	Fish size limited by largest and smallest mesh size. Fast swimmers (i.e., salmonids) and slower swimmers with poor eyesight (i.e., suckers and carp) effectively captured. Generally selective for bottom fish that prefer deep water.	Fish best at night and/or in turbid water. Ineffective for fishes that swim slowly and that have good eyesight (i.e., centrarchids).
Trap Net	Shallow water with little or no current velocity.	Selective toward shallow water fishes that are migratory and follow the shoreline.	Mesh size limits size of small fish captured.
Rod and Reel	Most accessible waters.	Larger predaceous fishes.	Skill and resourcefulness of angler. Access.

MONGAUP2/mrappjul

Appendix B. Photocopies of field notes taken during fisheries studies conducted on the Mongaup River and tributaries, in the vicinity of the Mongaup River Basin Hydroelectric Project Orange and Sullivan Counties, New York, July 1987.

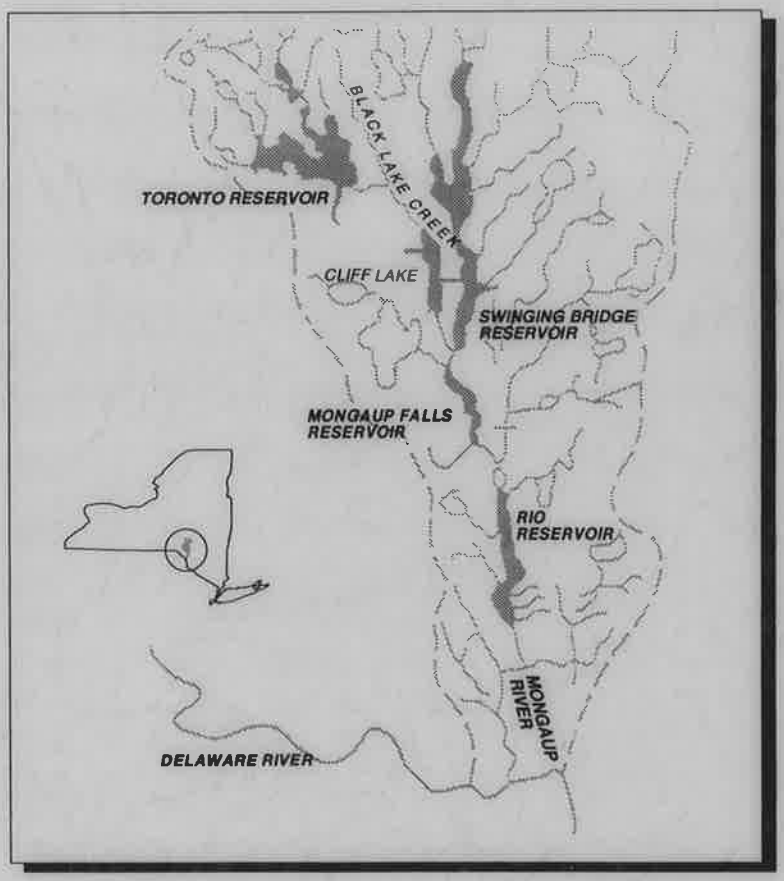
NOTE: Copies of field notes are being forwarded to J. Bizer, Harza, and T. Sullivan, Stetson-Harza, by T. R. Culp, I.A.

Appendix D.3

1994 Entrainment Study Report

ORANGE AND ROCKLAND UTILITIES, INC.
Pearl River, New York

1992 - 1993
ENTRAINMENT STUDIES
Mongaup Hydroelectric Projects



June 1994

STETSON-HARZA
181 Genessee Street
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ORANGE AND ROCKLAND UTILITIES, INC.
Pearl River, New York

1992 - 1993

ENTRAINMENT STUDIES

MONGAUP HYDROELECTRIC PROJECTS

June 1994

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Project No. 657-001

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EXECUTIVE SUMMARY

In accordance with the terms of a Memorandum of Agreement between Orange and Rockland Utilities, Inc. (ORU) and the New York State Department of Environmental Conservation (NYSDEC), ORU has conducted entrainment studies at its Mongaup River hydro projects. The scope of the studies was developed through consultation among ORU, its consultants, and NYSDEC. The purpose of the studies was to describe the species composition, relative abundance, and size distribution of entrained fish and to estimate total annual entrainment at the Mongaup Falls project. The purpose of the winter entrainment sampling at the Swinging Bridge and Rio projects was to characterize the occurrence, relative abundance, and size distribution of alewife during the winter months. In addition, dissolved oxygen (DO) and temperature profiling of each project impoundment in the vicinity of the intakes was conducted to characterize physical and chemical conditions. These water quality data were used to evaluate the potential for entrainment of fish based on DO levels at the intakes and habitat and depth preferences based on temperature. The water quality data, habitat preferences based on water quality and entrainment rates at Mongaup Falls during the April through October period provide a basis for predicting the potential magnitude of entrainment at Swinging Bridge and Rio during non-winter seasons.

Entrained fish were sampled with a full draft tube net at Unit 4 at the Mongaup Falls project and with two 1-m nets each in the tailrace areas of the Swinging Bridge and Rio projects. Sampling took place every two weeks throughout a one-year period at Mongaup Falls and every two weeks from mid-November to late March at Swinging Bridge and Rio. The Mongaup Falls sampling program was interrupted from mid-June through July due to an unscheduled outage for maintenance at Unit 4. Separate day and night samples were taken during most of the sampling period. Collection efficiency of the nets at Mongaup Falls and Swinging Bridge was estimated by releasing known numbers of marked fish into the tailraces and measuring their recovery rates in the nets.

Literature data on the survival of fish passing through hydro turbines were reviewed to assess the potential for survival of entrained fish at the Mongaup River projects. Study sites selected for review had physical characteristics and operating conditions similar to those at the Mongaup hydros.

DO and temperature profiles were measured biweekly except during the winter months when samples were obtained on two occasions. Winter samples were obtained from the intake gatehouse structures at Mongaup Falls and Rio and from the Unit 1 intake gatehouse bridge at Swinging Bridge. DO and temperature were also measured in the tailrace at each project on

the same day as the impoundment profiles. Literature data on DO tolerances and temperature preferences for the common species in the impoundments were used to assess the suitability of conditions for fish in the vicinity of the intakes.

Substantial numbers of alewife were entrained at all of the plants during the winter months. The abundance of alewife varied greatly from sample to sample, and more alewife were entrained during darkness than during daylight. The majority of the alewife were 50 to 80 mm long, with a smaller number in the 110- to 130-mm range. At Mongaup Falls, where an estimate of total annual entrainment was made, 1,730,300 alewife were entrained. April and August had the highest spring and summer estimates with 76,000 and 57,000, respectively. Few alewife were entrained at Mongaup Falls in other months. Total alewife entrainment at Swinging Bridge and Rio during the period November through March was 86,233,947 and 18,211,403 respectively. These estimates may vary substantially from the actual total number entrained due to the low net collection efficiency.

Species other than alewife were entrained at Mongaup Falls primarily from April through October, with seasonal peaks in September and October. Species entrained in substantial numbers (annual totals) were yellow perch, 13,385; sunfish juveniles, 3,027; largemouth bass, 1511; brown trout, 935; and black crappie, 913. Many of the brown trout collected probably originated in the tailrace and were not actually entrained through the plant. The majority of fish entrained for most species were juveniles.

Studies at other small hydro projects show that there are survival of fish passing through turbines, including the species and sizes entrained at the Mongaup plants. For those study sites that have physical characteristics similar to the Mongaup projects, survival of many of the common species ranged from 70 to 90%. Because the Mongaup plants have heads and turbine RPM's somewhat higher than the selected study sites, survival on the order of 70% would be a good approximation of survival at the Mongaup plants.

The DO profiling confirmed earlier data that suggested that low DO conditions would be limiting to fish life in the vicinity of the Swinging Bridge and Rio intakes during summer and early fall. When the temperature profile data and habitat preferences are considered, it is reasonable to assume that few fish will be in the vicinity of these intakes during the summer months. The depth of the intakes at Swinging Bridge and Rio, and their location away from shallow water areas of the impoundments limits the potential exposure of most fishes to the water withdrawal point. DO was suitable for fish in the vicinity of the Mongaup Falls intake throughout the year and from late fall through spring near the intakes at Swinging Bridge and

Rio. The relatively shallow intake at Mongaup Falls and its proximity to a shallow shoreline area is a factor in the entrainment of fish at this plant.

The potential adverse effects of entrainment on the fish populations of the impoundments in the Mongaup hydro system are believed to be small because entrainment losses apparently represent a small portion of the populations. The absolute number of alewife entrained is high, but the populations have maintained themselves for many years with the existing level of entrainment. Species other than alewife are entrained in relatively low numbers, particularly at Swinging Bridge and Rio, where their access to the intakes is limited by reduced water quality and habitat preferences that do not include the intake areas for most species during much of the year. Entrainment at Mongaup Falls was not limited by water quality, but when potential turbine survival on the order of 70% is taken into consideration, the actual loss to through-plant-induced mortality is quite low.

CHAPTER 1

INTRODUCTION

The 1992-1993 entrainment studies conducted on the Mongaup River by Lawler, Matusky & Skelly Engineers (LMS) provide a basis for evaluating the magnitude of entrainment and need for intake fish protection at the Mongaup River hydroelectric stations. Also included in the program was an assessment of alewife availability for eagle forage. The entrainment studies included direct sampling of the station discharges, a literature review of turbine mortality, and a dissolved oxygen (DO) monitoring program in each station's respective impoundment(s).

The entrainment study program was part of a Memorandum of Understanding (follows Chapter 1) between Orange and Rockland Utilities (ORU) and the New York State Department of Environmental Conservation (NYSDEC) that required ORU, following issuance of Federal Energy Regulatory Commission licences, to conduct a study to determine the significance of entrainment at the Swinging Bridge, Mangaup Falls, and Rio power plant intakes. The scope of work was developed through consultation between ORU and its consultants and NYSDEC.

Specific objectives of the entrainment monitoring program were to:

- Estimate the number of fish entrained at the Mongaup Falls hydroelectric station during a one-year period.
- Determine the seasonal occurrence, species composition, and size distribution of fish entrained at the Mongaup Falls hydroelectric station.
- Estimate the relative abundance of fish entrained at the Swinging Bridge and Rio hydroelectric stations during the winter season.
- Determine the occurrence and size distribution of alewife entrained at the Swinging Bridge and Rio hydroelectric stations.
- Characterize the availability of alewives entrained at the Swinging Bridge and Rio hydroelectric stations for eagle forage.
- Turbine mortality literature review.
- Assess potential for non-winter entrainment at Swinging Bridge and Rio based on entrainment characteristics at Mongaup Falls and temperature and dissolved oxygen distributions at Swinging Bridge and Rio.

MEMORANDUM OF UNDERSTANDING

On August 4, 1989, and January 16, 1990, the New York State Department of Environmental Conservation ("DEC") filed consultation comments with the Federal Energy Regulatory Commission ("FERC") pursuant to 18 CFR §4.38 in connection with the Orange and Rockland Utilities, Inc., ("Orange and Rockland") hydropower projects at Swinging Bridge (FERC # 10482), Mongaup Falls (FERC # 10481) and Rio (FERC # 9690). Further, on September 11, 1989 DEC issued water quality certificates to each of the projects, pursuant to §401 of the Clean Water Act [33 USC §1341; 6 NYCRR §608.7].

Simultaneously with the review of the hydropower projects, DEC has, with the Trust for Public Land ("TPL"), been negotiating a major land transfer from Orange and Rockland, the owner and operator of the referenced projects and Clove Development Corporation, a wholly-owned subsidiary of Orange and Rockland. The Agreements reached during the course of this transfer have adequately addressed a number of concerns expressed in DEC's prior consultation comments to FERC.

In order to resolve any uncertainties regarding the scope of agreement between Orange and Rockland and DEC, both parties agreed to the development of this Memorandum of Understanding (the "Memorandum"), setting forth fully and completely the terms and conditions of the agreement reached between Orange and Rockland and DEC concerning the appropriate license conditions to provide for recreational use of, and public access to, the three hydropower projects. This Memorandum will further clarify the scope of these

agreements with regard to the reevaluation and revision of DEC's prior resource management recommendations to the FERC pertaining to public access and recreational use. It is intended by the Parties that a copy of this agreement be provided to the FERC to ensure the development of appropriate terms and conditions to the requisite license(s). Except as specifically modified herein, DEC's August 4, 1989, and January 16, 1990 consultation comments to FERC remain in full force and effect.

I. Description of Proposed Land Transfer

Orange and Rockland and its wholly-owned subsidiary, Clove Development Corporation ("CDC") will transfer interests in approximately 10,894 acres of land to TPL, which will subsequently assign its rights to DEC. These interests will include approximately 6,412 acres in the vicinity of the projects that will be transferred in fee pursuant to two Agreements of Sale (one between Orange and Rockland and TPL, the other between CDC and TPL) as well as approximately 4,482 acres, which will be protected pursuant to four conservation easements.

The lands in which interests will be transferred are shown on the attached maps. These lands, which are largely undeveloped, except as hydroelectric projects, contain important habitat for the endangered bald eagle. They also have significant value for outdoor recreational purposes if they are maintained in their present undeveloped condition. The land transfer will accomplish this purpose, while protecting the continued use and operations of the referenced hydroelectric projects.

The interests to be transferred include fee title to all of the lands between the tailrace of the Rio Project and the Delaware River, as well as most of the lands bordering the Rio and Mongaup Falls impoundments, the southern end of the Swinging Bridge impoundment, and a portion of both banks of the Mongaup River between the impoundments. All of the lands on which project facilities are located are protected by the terms of a "Hydroelectric Facilities Easement." The environmentally sensitive areas surrounding the Cliff Lake and Lebanon Lake watershed are addressed by the conservation easements.

II. Prior DEC Recommendations that are Affected by the Transfer of Fee Interests to DEC

Several of DEC's prior recommendations in its consultation comments to FERC would have required Orange and Rockland to take action or develop facilities on lands that will be conveyed in fee to TPL (and ultimately to DEC). It is the intention of the parties to the land transfer that DEC assume all such responsibilities on land that it will own. As such, these recommendations are superceded and should be deleted. The following recommendations affect lands that will be transferred in fee:

A. Swinging Bridge Project:

1. "Include the . . . Cliff Lake Segment [ ] of Black Lake Creek in the appropriate license. [This] segment [ ] should include riparian buffer strips of sufficient width to ensure public access to the entire length of the stream throughout the term of the license." (Aug. 4 letter at 18).

2. "Provisions [for] parking and angler access to Black Lake Creek about midway between Cliff Lake and the Mongaup River." (Aug. 4 letter at 19).

The entire length of Black Lake Creek from below Cliff Lake Dam to the Mongaup River will be entirely on fee lands being conveyed to TPL and ultimately DEC. Since these lands and the stream segment will now be entirely within its own control, DEC will pursue the appropriate degree of public access without requesting the imposition of the foregoing license conditions by the Commission.

3. "Obtain public fishing rights to that portion of the reservoir surface that is presently controlled by the Iroquois Hunting and Fishing Club." (Aug. 4 letter at 17).

The enhanced public recreational opportunities provided for in the land transfer satisfy DEC's access objectives. In this area, accordingly, DEC no longer believes it is necessary to acquire additional interests along the reservoir or along the Toronto Lake Outlet to accomplish this purpose.

B. Mongaup Falls Project:

1. "The provision for two new angler access sites on the Mongaup River between Swinging Bridge Dam and Mongaup Falls Reservoir (a) A five-car lot situated about half-way between [the powerhouse] and the reservoir...." (Aug. 4 letter at 19).

About 1900 feet of Mongaup River between Swinging Bridge Dam and the road leading to said Dam is on the Hydroelectric Facilities Easement. The remaining 1500 feet of the River between

these two reservoirs is on lands to be transferred in Fee to TPL and ultimately, the State. To the extent that this access site is located on land owned by DEC, DEC will assume all responsibility for it.

> 2. "Develop and maintain two access sites between Mongaup Falls Dam and Rio Reservoir: (1) A five-car parking lot situated midway between Rio Reservoir and the Mongaup Falls Powerhouse..." (Aug. 4 letter at 19).

Of the approximately 3500 feet of River between the Mongaup Falls Dam and the Rio Reservoir, only about 250 feet are on lands to be transferred in fee to TPL and ultimately, the State; the remaining 3250 feet is on Hydroelectric Facilities Easement. To the extent that this access site is located on land owned by DEC, DEC will assume all responsibility for it.

> 3. "Improve the existing boat launching ramp at the North end of the [Mongaup Falls] reservoir, and expand the parking lot to accommodate 10 vehicles and trailers." (Aug. 4 letter at 19).

As noted above, if this access site will be located on land that will be conveyed in fee to DEC, DEC will assume responsibility for it.

C. <u>Rio Project:</u>

> 1. "Improve and maintain the four existing fishing (angler) access sites that were initially developed pursuant to the 1976 cooperative management agreement with DEC. The sites are situated between the Rio Powerhouse and the Route 97 bridge." (Aug. 4 letter at 20).
>
> 2. "The above whitewater accommodations and other recreational amenities

that are ultimately developed pursuant to ORU's Comprehensive Recreational Development Plan and the FERC licenses shall be constructed and maintained at project cost." (Jan. 16 letter at 5).

To the extent that "other recreational amenities" and the access sites specifically described above are all located on land that will be conveyed in fee, they will be within the control of DEC. As noted below (see IV(G)(5)), Orange and Rockland will construct a whitewater access facility located on lands under its control.

III. Prior DEC Recommendations that are Inconsistent with the Proposed Land Transfer

Several provisions of DEC's August 4 letter require amendment as a result of the land transfer as they address points that have since been settled. Accordingly, these recommendations should be modified or deleted, as discussed below.

A. Swinging Bridge Project:

"Continue to consult with the DEC and the U.S. F&WS regarding the need to revise the project boundaries to include those adjacent CDC properties that are considered to be critical to the preservation of this unique environmental niche." (Aug. 4 letter at 16).

"Implement all applicable elements of an endangered species management program for bald eagles on all project lands and waters in the Mongaup River watershed. This program shall be develcped by ORU in cooperation with the DEC and the US Fish and Wildlife Service. It shall include, but not be limited to, identification and protection of significant habitat areas for both wintering and year round birds, project operations, project construction and maintenance, enhancement opportunities, public access, and recreational activities. The

program shall be implemented within one year of issuance of the license." (Aug. 4 letter at 16).

Because the land transfers and conservation easements will protect the bald eagle habitat, no further actions by Orange and Rockland should be required through the licensing process on the lands transferred in fee or subject to the conservation easements. Implementation of the referenced endangered species management program should be applicable to areas within Orange and Rockland's control, i.e., those areas within the Hydroelectric Facilities Easement or other project lands subject to Orange and Rockland's control and not subject to a conservation easement.

B. All three Projects:

1. "DEC will continue to work with ORU regarding the management of affected fishery resources and endangered species. However, it is DEC's position that all other recreational activities should be developed and maintained by ORU in accordance with the articles and conditions attached to the FERC licenses." (Aug. 4 letter at 16).

2. "In summary, ORU should be required to submit, within one year from the date of licensing, a comprehensive Recreational Development Plan for all three projects." (Aug. 4 letter at 21).

DEC concurs that, except as otherwise specifically provided in this Memorandum, the only activities that should be developed and maintained by or at the expense of Orange and Rockland are those that are on lands within the Hydroelectric Facilities Easement and the Conservation Easements or otherwise reserved to Orange and Rockland. Recreation on lands owned by the

State in fee will be the responsibility of the State. To the extent these recommendations are retained as a statement of general principle, they should apply only to lands remaining under Orange and Rockland's control.

C. Swinging Bridge Project - Black Lake Creek:

1. "construct and maintain a five car parking area or pull-off in the vicinity of the road crossing midway between the [Toronto] outlet works and Cliff Lake." (Aug. 4 letter at 18).

2. "DEC also notes that the 9,500 foot long each of Black Lake Creek between Toronto Reservoir and Cliff Lake is not included in the Swinging Bridge Project area. DEC questions this omission..." (Aug. 4 letter at 3).

3. "Include the Toronto ... Segment[ ] of Black Lake Creek in the appropriate license. [This] segment[ ] should include riparian buffer strips of sufficient width to ensure public access to the entire length of the stream throughout the term of the license." (Aug. 4 letter at 18).

Negotiations concerning the land transfer further addressed the need for the proposed access point on Black Lake Creek between Toronto and Cliff Lakes. Orange and Rockland agreed to provide additional access to the Toronto impoundment. DEC agreed to revise its prior recommendations to delete the above three requirements.

D. Swinging Bridge Project - Cliff Lake:

1. "The development and maintenance of a parking lot and cartop boat launching area in the vicinity of the Cliff Lake dam." (Aug. 4 letter at 18).

2. "Recreational fishing access and hiking within the 50-foot wide project perimeter that borders the [Cliff Lake] reservoir." (Aug. 4 letter at 18).

Due to the unspoiled nature of Cliff Lake and its importance as Bald Eagle habitat, DEC agrees with Orange and Rockland that public access should be restricted to a single cartop boat launch and parking area, to be constructed and maintained by DEC. The parking area should be no closer than 2,000 feet from the dam and 2,500 feet from the launch point. Access to the launch area is to be by foot only along DEC's maintenance access road, and only boats that can be carried, or moved by non-motorized means, from the parking lot are to be utilized at this access area. Hiking should be permitted and fishing should be denied along the reservoir's perimeter.

IV. Prior DEC Recommendations that are Consistent with the Provisions of the Proposed Land Transfer

The following recommendations and comments from DEC's August 4, 1989, letter have been reviewed and have been determined to be consistent with the proposed land transfer. These recreational facilities would be located on land that is not part of the transfer or within the hydroelectric easements. Anything within the hydroelectric easement is appropriately the subject of license conditions.

A. Rio Project:

1. "ORU's application for a license to continue to operate the Rio Hydroelectric Project does not include the 8,450 foot-long bypassed

segment of the Mongaup River between the dam and powerhouse. This particular reach of the river will continue to be subject to project-imposed base flows. It is a hydraulic link that is essential to the operation and licensing of this project." (Aug. 4 letter at 4).

This segment is included within the Rio project boundary.

B. Swinging Bridge Project:

1. "Alarm devices and signage that signal the event of fast rising waters and swift currents should also be included along the Swinging Bridge tailwaters for safety purposes." (Aug. 4 letter at 11).

DEC recognizes that license conditions may require Orange and Rockland to place warning devices or signs adjacent to project waters on land(s) that are no longer owned by Orange and Rockland. This would be true below each impoundment. The conveyance documents provide sufficient reservations of access rights to provide for this possibility.

C. Swinging Bridge Project - Toronto:

1. "Develop and maintain a 10-car parking/trailer lot and launching ramp at the terminus of Moscoe Road on the northeastern arm of the reservoir." (Aug. 4 letter at 17).

2. "Construct and maintain a new public access site on the eastern side of the reservoir. The access should include a boat launching ramp and a parking lot to accommodate up to 10 cars with boat trailers." (Aug. 4 letter at 17).

This latter access area supersedes the parking area or pull-off in the vicinity of the road crossing between the Toronto outlet works

and Cliff Lake. The enhanced public recreational opportunities provided for in the land transfer satisfies DEC's access objectives. In this area, accordingly, DEC no longer believes it is necessary to acquire additional interests along the reservoir or along the Toronto Lake Outlet to accomplish this purpose.

> 3. "Construct and maintain a five car parking area in the vicinity of the Toronto Reservoir outlet." (Aug. 4 letter at 18).

The parties recognize that the discharge works present a safety hazard and that the implementation of this requirement and final location of the parking area in the immediate vicinity of the Toronto outlet works will be subject to the terms and conditions established by FERC in the federal license.

D. Swinging Bridge Project - Lebanon Lake:

> "DEC has no objection to the omission of the Lebanon Lake watershed from Swinging Bridge and Mongaup Falls project area(s) with the understanding that an amendment to the appropriate licenses will be required if ORU decides to regulate or divert Lebanon Creek flows for hydroelectric generation purposes at some future date . . ." (Aug. 4 letter at 2-3).

Lebanon Lake is now subject to the provisions of a conservation easement that addresses and satisfies all parties' concerns as long as Lebanon Lake is not regulated or diverted for hydropower use. Bald Eagle habitat protection and public access will be jointly controlled by DEC and Orange and Rockland pursuant to the terms of that easement. DEC recommends that Lebanon Lake not be included within the Swinging Bridge Project as long as Lebanon Lake is not regulated or diverted for hydropower use.

E. Swinging Bridge Project:

1. "DEC recommends that ORU should be required to submit a detailed recreational plan that includes the following elements. . . . Improvements to the maintenance of the present boat launch ramp on the east shore of the reservoir. The parking lot area for the ramp should be expanded to accommodate an additional 25 cars with trailers, terrain permitting." (Aug. 4 letter at 19).

2. "Provision for access trails for shore fishing and hiking to [Swinging Bridge] reservoir areas contained within the 50-foot project perimeter line. The area in question extends from a full pond elevation of 1070 feet, USGS." (Aug. 4 letter at 19).

It should be noted, however, that ownership of the shoreline is fragmented. Continuous access may not be possible and DEC is not recommending that Orange and Rockland be required to provide such access beyond the high water mark on lands not owned or controlled by Orange and Rockland.

3. "The development and maintenance of a new recreational access area on the west shore of the reservoir for boating, fishing and picnicking." (Aug. 4 letter at 19).

Given the location of other access points on the Swinging Bridge impoundment, as well as the transfer in fee of the lands at the south end of that impoundment, DEC would prefer to have Orange and Rockland locate this access site at the north end of the impoundment.

4. "The provision for two new angler access sites on the Mongaup River between Swinging Bridge Dam and Mongaup Falls Reservoir . . . (b) a

five car-lot in the vicinity of the Swinging Bridge powerhouse." (Aug. 4 letter at 19).

F. Mongaup Falls Project:

1. "Develop and maintain two access sites between Mongaup Falls dam and Rio Reservoir: . . . and (2) A five-car parking lot in the vicinity of the powerhouse to provide access to the Mongaup River above the powerhouse." (Aug. 4 letter at 19).

2. "Permit angler access to Black Brook via informal pulloffs along Plank Road." (Aug. 4 letter at 19).

G. Rio Project:

1. "Expand the existing five-car cartop boat access site on Rio Reservoir, situated just west of Rio dam, to accommodate up to ten cars. This site may be utilized as well by fisherman seeking access to the upper end of the Rio bypassed reach." (Aug. 4 letter at 20).

2. "Improve and expand the existing fifteen boat launch ramp and parking area at the upper end of the Rio Reservoir. (Aug. 4 letter at 20).

Upon acquisition of this last site in fee DEC will assume responsibility for the boat launch and parking area.

3. "Develop and maintain a five car parking area with trails to provide angler access to the bypassed reach at the base of the dam." (Aug. 4 letter at 20).

DEC recognizes that the site location of any minimum flow discharge works could present a safety hazard that would necessitate some additional modifications to the access site prior to implementation.

4. "Develop and maintain a new five car parking area or pulloff along the penstock Road, about midway between the dam and powerhouse. Improvement should include trails to provide angler access to the bypassed reach." (Aug. 4 letter at 20).

DEC also recognizes that access to the Mongaup Gorge from the penstock right-of-way is questionable. The best access site, appears to be what is known as the lay-down area, which will be owned by DEC. If the lay-down area does prove to be the best access site, DEC will assume responsibility for construction and maintenance of the parking area. As in the case of the Mongaup Falls Project (see Item F(1)), DEC recognizes that access across the penstock may create some safety concerns that should be addressed during the implementation of this requirement and that additional plans and modifications to the access site might be necessary to comply with the appropriate FERC safety requirements concerning recreational access in the immediate vicinity of project facilities.

5. "Develop and maintain a new ten car parking lot and access trails in the vicinity of the powerhouse to provide angler and whitewater boating entry to the Rio Tailrace (See Whitewater Recreation section)." (Aug. 4 letter at 20).

Orange and Rockland has agreed to provide access for whitewater boating below the Rio Project and will develop and maintain this access facility if it is located on Orange and Rockland's property, as the parties to this Memorandum expect it to be. However, as noted above, all lands below the Rio tailrace will be

transferred in fee. Therefore, DEC no longer recommends that Orange and Rockland be responsible for providing or maintaining access to this segment of the Mongaup River. DEC will assume this responsibility.

Issues Relating to Operating Limitations at Swinging Bridge

Subject to later agreement on acceptable ramping rates and frequency of operations under the terms discussed below, two-unit operation at Swinging Bridge is acceptable to DEC from the standpoint of hydrologic conditions and aquatic habitat in the Mongaup River. DEC does not seek limits on maximum flows below the Swinging Bridge powerhouse that would prevent operation of the second unit; rather, it seeks to limit the occurrence of short "spikes" of on/off operation.

To this end, DEC and Orange and Rockland agree that the later agreement on acceptable ramping rates and frequency of operations will permit daily once-per-day two-unit operation throughout the peak-use hours, and will permit Orange and Rockland to meet its ten-minute reserve requirement to the New York Power Pool, subject in the former case to agreement on limits on up-ramping rates, and in both cases to agreement on limits on down-ramping rates.

DEC and Orange and Rockland agree to continue to consult regarding flows into the Swinging Bridge impoundment from Toronto Reservoir. This consultation will focus upon the operating rule

curves ("ORCs") being developed in the FERC process as well as historical flow information provided by Orange and Rockland.

The ORCs will be developed to permit two unit peaking operation at Swinging Bridge as well as to provide necessary minimum flows throughout the Orange and Rockland system as outlined in the 401 certificates. The parties agree that the ORCs developed will (1) not imperil the Toronto Reservoir contribution to the minimum flow within the Orange and Rockland system; and (2) permit two-unit peaking operations at Swinging Bridge, provided that the minimum flow requirements are met. It is understood that flows in excess of 75 cfs (referenced at page 10 of DEC's August 4 letter) will occur in Black Lake Creek in a manner consistent with the ORCs discussed above. DEC and Orange and Rockland agree to consult on frequency, ramping rates, and magnitude of allowable exceedances of the 75 cfs maximum. Except as described below to protect fish spawning, DEC does not seek elevation limits at the Mongaup Falls impoundment that would indirectly limit the permissible flows from Swinging Bridge.

DEC and Orange and Rockland further agree that elevation limits may be imposed on the Mongaup Falls impoundment to protect fish spawning during the period from May 15 to June 30, provided that such limits contain exceptions that enable Orange and Rockland to respond, pursuant to criteria to be defined by DEC and Orange and Rockland, to emergencies at the request of the New York Power Pool or to high flows. Orange and Rockland and DEC will

continue to consult regarding acceptable ramping rates, within the FERC licensing context.

ORANGE AND ROCKLAND UTILITIES, INC.

Date: BY: _____

Frank E. Fischer
Vice President - Engineering & Production
Orange and Rockland Utilities, Inc.
One Blue Hill Plaza
Pearl River, New York 10965

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Date: BY: _____

Thomas C. Jorling
Commissioner
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, New York 12233

TABLE 2-1

STATION DESIGN CHARACTERISTICS AND TURBINE SPECIFICATIONS
Mongaup River Hydroelectric Projects

		SWINGING BRIDGE		
	MONGAUP FALLS	UNIT 1	UNIT 2	RIO
General Information				
Number of units	4	1	1	2
Design head (ft)	110	110	110	170
Maximum operating horsepower	1,420	6,900	11,500	13,258
Installed capacity (kW)[a]	1,000	5,000	6,750	5,000
Hydraulic Turbine				
Manufacturer	S.M. Smith	S.M. Smith	S.M. Smith	S.M. Smith
Type	Francis	Francis	Francis	Francis
Normal speed (rpm)	360	300	240	360
Diameter runner (in.)	42	49	61	53
Hydraulic capacity (cfs)[a]	155	640	980	435
Shaft position	Vertical	Vertical	Vertical	Vertical

[a]Each unit.

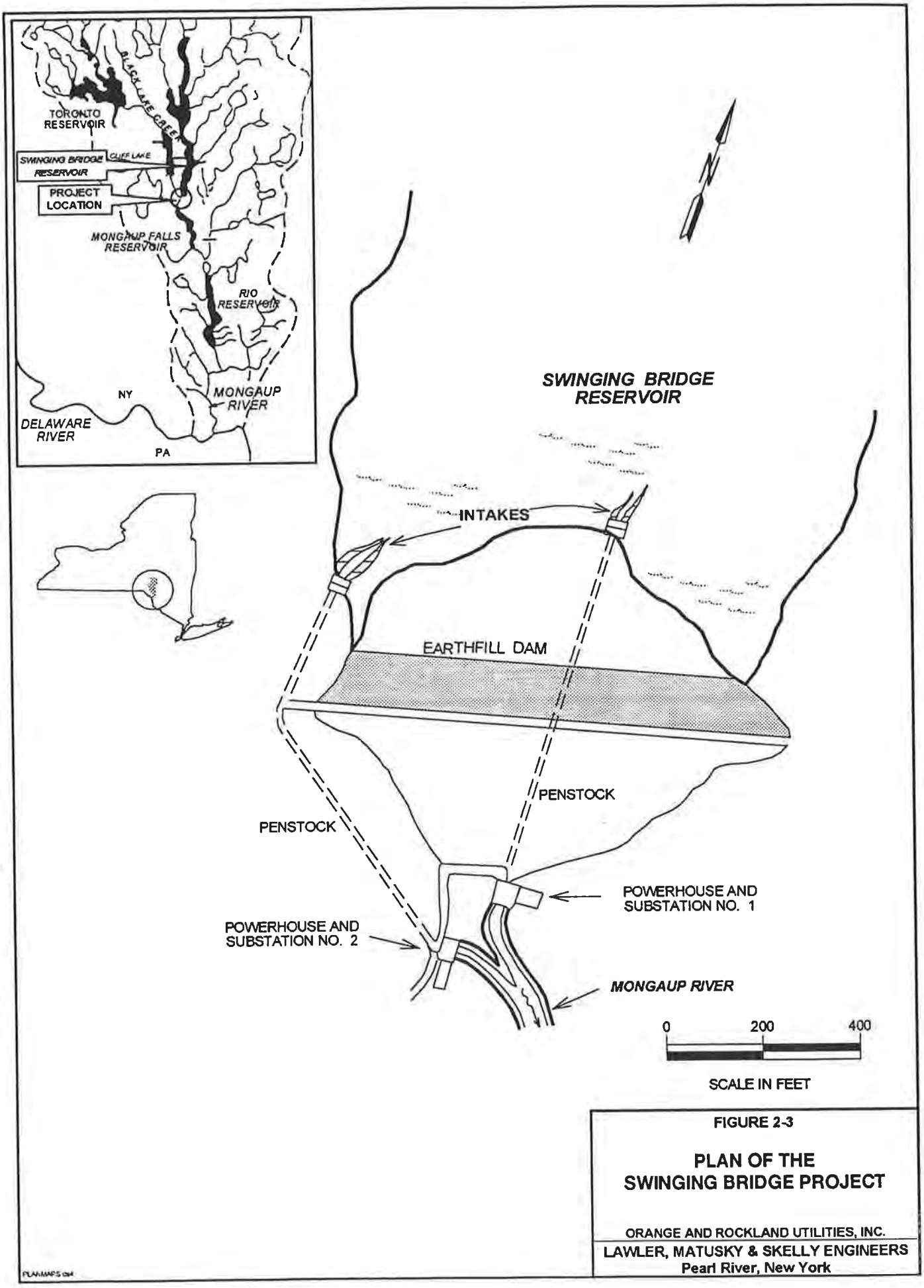


FIGURE 2-3

PLAN OF THE SWINGING BRIDGE PROJECT

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downstream of the confluence. Table 2-1 lists the specific design characteristics and turbine specifications of each unit.

2.1.3 Rio

The Rio project comprises the Rio Reservoir and its associated dam and hydroelectric station. Two vertical Francis turbine units are installed at the Rio powerhouse, each with a nameplate generation rating of 5000 kW. The units are supplied by a common penstock approximately 7000 ft long and 11 ft in diameter. The penstock is connected to a 40-ft-diameter 65-ft-high surge tank and splits approximately 100 ft above the turbine units (Figure 2-4). Separate discharge bays contain steel conical draft tubes that discharge into a common 45-ft-wide tailrace. Design characteristics and turbine specifications at the Rio project are listed in Table 2-1.

2.2 MONGAUP RIVER BASIN PROJECT OPERATION

The three Mongaup River basin projects are hydraulically connected and must be operated in conjunction with one another to achieve the most economical use of available flows. The Mongaup Falls and Rio stations operate according to the release pattern of the upstream Swinging Bridge station. Releases at Rio and Mongaup Falls are typically made prior to releases at Swinging Bridge to accommodate increased flow. Hydro operators attempt to maximize operating efficiency at each station by monitoring load demands, reservoir levels, and available storage and runoff data, and provide release information to the Delaware River Master's Office. During adverse conditions (low flow) in the Delaware River, ORU has agreed to maintain a minimum daily average discharge of 100-150 cfs for the period June through November and 20-30 cfs for December through May.

The operating schedule at each station uses seasonal runoff during the winter and spring to fill storage reservoirs and yield economic generation. Seasonal runoff and stored capacity from controlled releases from the storage reservoirs is used in the summer and fall to yield economic generation.

2.2.1 Mongaup Falls Station Operation

The operating schedule at the Mongaup Falls hydroelectric station for November 1992 through October 1993 followed a seasonal pattern, reflecting typical increases in winter and spring runoff and drier conditions during summer and early fall. The operating schedule for this station is shown in Figure 2-5. Operating hours were determined from ORU's integrated system load daily log. A unit was considered operating if it operated during any part of an

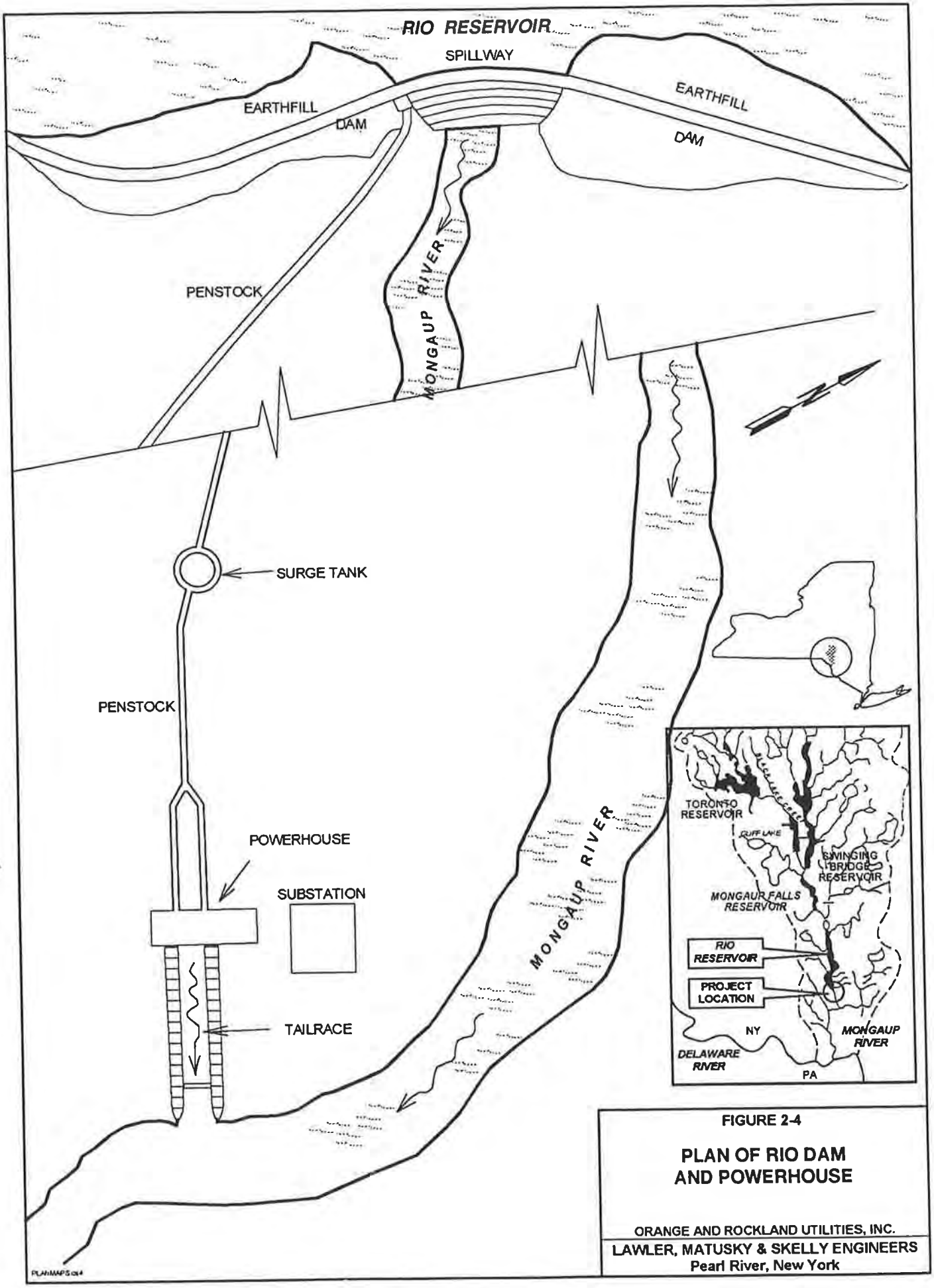


FIGURE 2-4

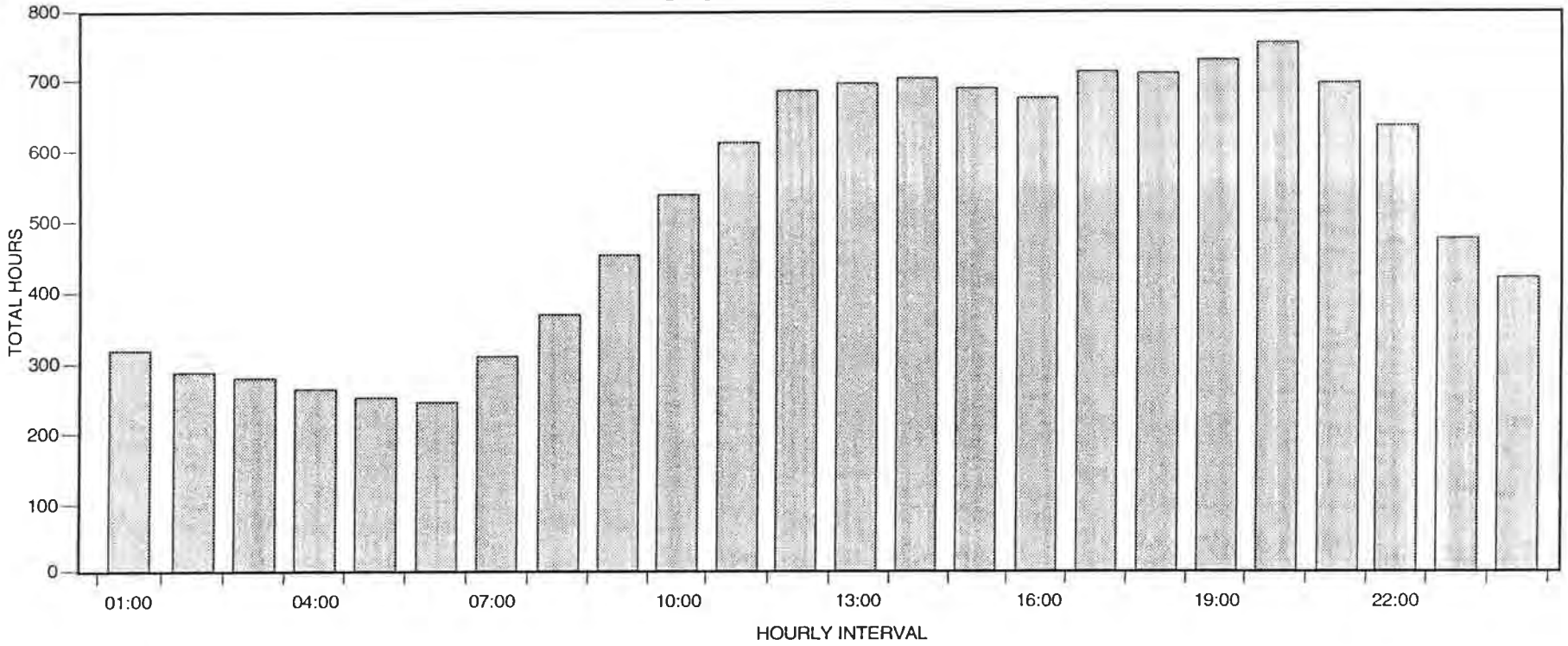
PLAN OF RIO DAM AND POWERHOUSE

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hour. The four turbine units located at the Mongaup station operated for a combined total 12,487 hrs during the sampling period (Figure 2-5). Operating hours were greatest in January and April, accounting for approximately 40% of total operation. Figure 2-5 also displays the monthly operating schedule by hour for all units combined at the station. Total operating hours were greatest between 1200 and 2200 hrs, reflecting the increase in load demand during daylight and evening hours.

FIGURE 2-5
UNIT HOURS OF OPERATION NOVEMBER 1992 - OCTOBER 1993
Mongaup Falls Hydroelectric Station



MONTH	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	SUM
NOV 1992	18	18	17	19	18	13	16	23	38	49	49	60	69	59	62	58	61	60	68	70	63	44	44	35	1031
DEC	24	24	26	24	21	19	25	36	41	56	71	81	80	87	92	94	95	102	109	104	94	82	62	47	1496
JAN 1993	76	69	63	64	60	57	76	87	100	99	100	99	102	97	98	104	112	106	101	106	107	108	104	106	2201
FEB	7	4	4	1	5	3	10	20	18	24	28	34	35	33	30	33	36	47	41	48	48	44	29	18	600
MAR	30	26	28	18	16	15	23	26	44	51	54	57	58	54	44	47	54	57	62	65	56	57	51	39	1032
APR	114	108	113	108	106	110	110	108	112	102	109	116	105	112	108	110	110	103	114	112	104	106	106	115	2621
MAY	36	33	28	30	23	26	35	39	57	72	76	82	67	72	74	68	66	70	76	84	73	71	45	36	1339
JUN	0	0	0	0	0	0	2	5	9	22	35	38	49	45	50	42	47	44	42	43	45	37	1	0	556
JUL	9	5	1	0	0	0	8	17	22	28	32	43	56	62	63	58	67	58	53	62	53	45	20	17	779
AUG	3	0	0	0	0	0	2	3	6	14	22	25	23	26	30	30	30	31	23	18	14	24	11	9	344
SEP	0	0	0	0	0	0	0	0	0	0	4	13	12	15	8	11	12	11	3	7	7	3	0	0	106
OCT	0	0	0	0	0	0	1	3	5	20	30	38	39	38	29	19	22	20	37	36	31	14	0	0	382
TOTAL	317	287	280	264	249	243	308	367	452	537	610	686	695	700	688	674	712	709	729	755	695	635	473	422	12487

Note: Shaded areas ( ) indicate nighttime hours Average monthly sunrise and sunset time at Binghamton, NY, used to calculate daylight and darkness generating hours (Gale Research Company 1977).

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CHAPTER 3

MATERIALS AND METHODS

3.1 DISSOLVED OXYGEN AND TEMPERATURE PROFILING

A one-year DO and temperature profile study was conducted by Stetson-Harza between August 1992 and August 1993 to provide documentation of conditions in the vicinity of the intakes for the Mongaup Falls, Swinging Bridge, and Rio projects. This study was undertaken because existing data on DO in the impoundments suggested that conditions would be limiting to fishes during substantial portions of each year at some of the intakes. Stetson-Harza used the findings of the study to evaluate fish distribution in the vicinity of the intakes and the potential for entrainment for various species. Details and results of the study are included in their report, reproduced as Appendix A.

3.2 ENTRAINMENT SAMPLING

3.2.1 Mongaup Falls

Entrainment sampling occurred at the Mongaup Falls station between November 1992 and October 1993. Surveys were scheduled randomly on selected weekdays every two weeks for the one-year period. Sampling dates were adjusted to accommodate actual unit operating schedules and periods of low water availability. During particularly dry months in late spring and summer, LMS coordinated its sampling schedule with the ORU's hydro operations staff.

Entrainment samples were collected with a full-coverage draft tube net installed in the stoplog slots of Unit 4, the unit farthest upstream. A steel frame designed to cover the full width of the discharge bay extended above the surface of the tailrace at the highest expected water level (Figure 3-1). The frame and net were lifted and set using davits and winches attached to the building wall and located on either side of the discharge. The draft tube net was constructed of 0.375-in. heavy-duty knotless nylon mesh, 14.5 ft wide by 11.6 ft high at the mouth and approximately 45 ft long. On 2 February a 0.25-in. knotless nylon mesh net was added to the outside of the net at the cod end to retain the smaller of the alewife entrained. Prior to sampling, the net and steel frame were inspected for rips, tears, or structural damage.

Samples were collected for approximately 8 hrs on each day of sampling. Initial surveys were scheduled only during daytime hours (approximately 0800-1700). Both day and night samples

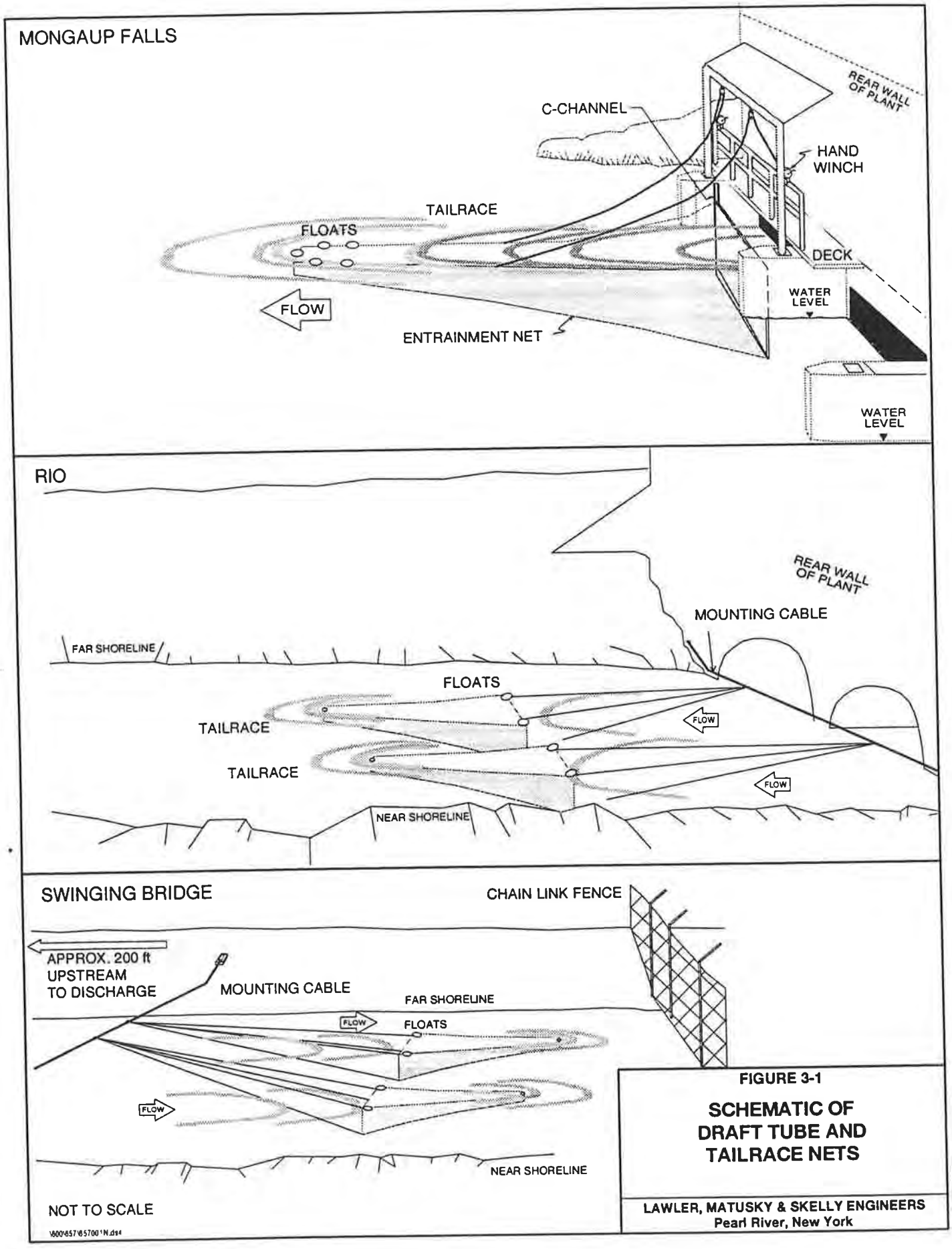


FIGURE 3-1

SCHEMATIC OF DRAFT TUBE AND TAILRACE NETS

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(approximately 1200-1800 and 1800-2400) were initiated after 13 January at NYSDEC's request, with each sample collected for approximately 4 hrs.

Prior to sampling, the nets and frames were inspected for rips, tears, or structural damage. Sample time, number of units operating, weather conditions, and flowmeter readings were recorded on field data sheets. At the beginning of each sample water quality measurements were taken from the shoreline area adjacent to the collection nets. DO was determined using the modified Winkler method to the nearest 0.1 mg/l and water temperature was measured using calibrated thermometers to the nearest 0.1°C. At the end of each sample the nets were removed from the stream channel.

Fish collected in each net were sorted and counted by species. Total length measurements were made on all fish or up to 30 individuals per species if a species was abundant. Entrainment samples were processed in the field, then returned to the water. Some samples were returned to the laboratory for processing due to the numbers of fish caught and/or severe weather conditions.

3.2.2 Swinging Bridge and Rio

Entrainment sampling was conducted at the Swinging Bridge and Rio projects between November 1992 and March 1993. Surveys were scheduled every two weeks concurrent with Mongaup Falls entrainment sampling. Sampling dates were adjusted when severe weather limited sampling and to accommodate actual unit operating schedules.

Entrainment samples were collected with two 1-m square net frames equipped with 6-mm mesh nets approximately 3 m long. Net frames were suspended across the stream channel just downstream of the confluence of the two tailraces at Swinging Bridge and in the Rio tailrace. A flowmeter was attached to each net to measure the volume sampled (Figure 3-1).

Samples were collected for approximately 8 hrs on each day of sampling. Initial surveys were scheduled only during daytime hours (approximately 0800-1700). Both day and night samples (approximately 1200-1800 and 1800-2400) were initiated on 19 January at NYSDEC's request, with each sample collected for approximately 4 hrs.

Water quality measurements, data recording, and sample processing were the same as at Mongaup Falls.

3.3 COLLECTION EFFICIENCY

Collections made in the tailraces of the Mongaup River basin projects provide an estimate of entrainment patterns, but they do not account for 100% of fish entrained. Entrainment studies employing draft tube nets in tailraces at other sites show that some fish are able to swim in the tailrace and/or draft tube net for an extended period of time and may not be collected. In addition, entrained fish may enter the surge tanks or other areas where they can avoid turbine passage or net collection. Recovery of entrained fish may also be affected by deterioration of entrained fish in the collection net, collection procedures, or scavenging by other fish and/or birds. Collection efficiency tests were conducted at the request of NYSDEC to account for unsampled fish.

3.3.1 Mongaup Falls

Collection efficiency tests were conducted at the Mongaup Falls station during February, March, June, August, September, and October 1993. All tests were conducted concurrent with scheduled entrainment sampling.

Efficiency releases were conducted at the beginning of the scheduled sample. Releases of marked fish were made into the pipeline directly behind the bar racks in the gatehouse, using a pipe injection system consisting of a 4-in.-diameter plastic pipe, a 5-gal plastic bucket with funnel and plug, and a plunger to ensure passage of test fish from the pipe. The number and species of fish released varied with each test. When available, both live and dead fish were released. Number of fish released, number recovered, and recovery condition (live or dead) were recorded at the end of the scheduled sample.

3.3.2 Swinging Bridge

Collection efficiency tests were conducted at the Swinging Bridge station during January, February, March, and October 1993. Except for October, all tests were conducted concurrent with scheduled entrainment sampling.

Efficiency releases were made at the beginning of a scheduled entrainment sample. The marked (fin clip) test fish were released in the tailrace immediately below the operating unit. Releases were made using 5-gal plastic buckets, with fish distributed evenly from both sides of the tailrace. Actual numbers and species released varied with each test. When available, both live and dead fish were released. Number of fish released and number recovered were recorded.

3.4 DATA ANALYSIS

3.4.1 Collection Efficiency

Collection efficiencies for individual tests conducted at the Swinging Bridge and Mongaup Falls hydroelectric stations were calculated by dividing the number of fish recovered by the number released and multiplying by 100.

Results of the sampling efficiency tests performed at the Mongaup Falls Station were evaluated to determine the influence of various factors on collection efficiency. A mean collection efficiency was used in entrainment estimate calculations to adjust for unsampled fish. A detailed description and summary of the sampling efficiency analysis is included in Appendix B.

3.4.2 Entrainment Estimates

Entrainment rates at all three plants were calculated by dividing the number of fish collected by the flow sampled (in thousand cubic feet [cf]) for each sample. Densities for each taxon collected were weighted by sample volume and used to obtain an average monthly rate. Monthly rates were multiplied by the plant flow and adjusted for collection efficiency to calculate entrainment abundance estimates. The mean collection efficiency at Swinging Bridge was applied to the Rio collections.

The variance (S^2)of the mean density was calculated as:

$$S^2 = \frac{\sum_{i+1}^{n} W_i d_i^2 - \frac{\sum_{i=1}^{n} W_i d_i \sum_{i+1}^{n} W_i d_i}{n}}{n - 1}$$

where:

n = number of samples taken during period

d_i = catch/Vol_i = density in ith sample

Vol_i = volume filtered in ith sample

W_i = weighting coefficient

$$n \cdot Vol_i / \sum_{i=1}^{n} Vol_i$$

Station operation and monthly plant flow were determined from ORU's integrated system load daily log and the rated hydraulic capacity of each unit. The daily log provides unit operation for each hour. A unit was considered operating during an hour if it operated during any part of an hour. This would slightly overestimate total entrainment because a portion of an hour would be considered a full hour of operation.

3.5 TURBINE MORTALITY LITERATURE REVIEW

Studies that provided turbine passage survival information for hydro sites with physical configurations, head, turbine type, and fish species similar to those at the Mongaup River projects were reviewed (Chapter 5). Appropriate turbine survival estimates were used to estimate entrainment losses and provide a qualitative assessment of entrainment on resident fish populations.

CHAPTER 4

RESULTS

4.1 ENTRAINMENT WATER QUALITY

4.1.1 Mongaup Falls

Temperature values recorded during entrainment sampling at the Mongaup Falls station described a seasonal pattern throughout the sampling period. Figure 4-1 presents the average temperature and DO concentration for each sample day. Temperatures reached a minimum of 1.4°C on 19 January 1993 and a maximum of 19.4°C on 4 August 1993. DO concentrations, which ranged from 9 to 14 mg/l between December 1992 and April 1993, began to fall during May and June 1993. The lowest DO concentration recorded during entrainment sampling was 4.6 mg/l on 3 September 1993.

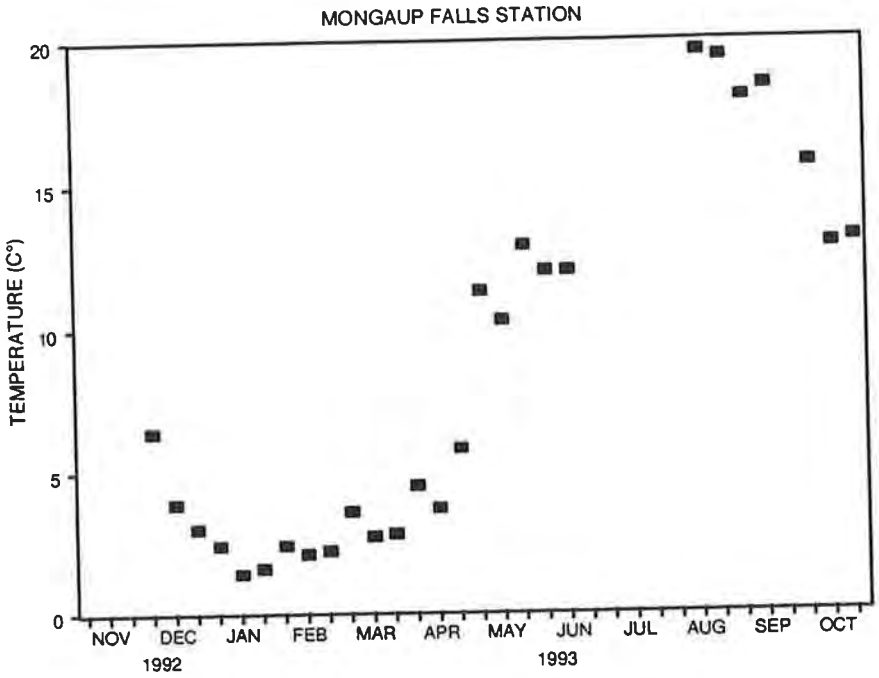
4.1.2 Swinging Bridge and Rio

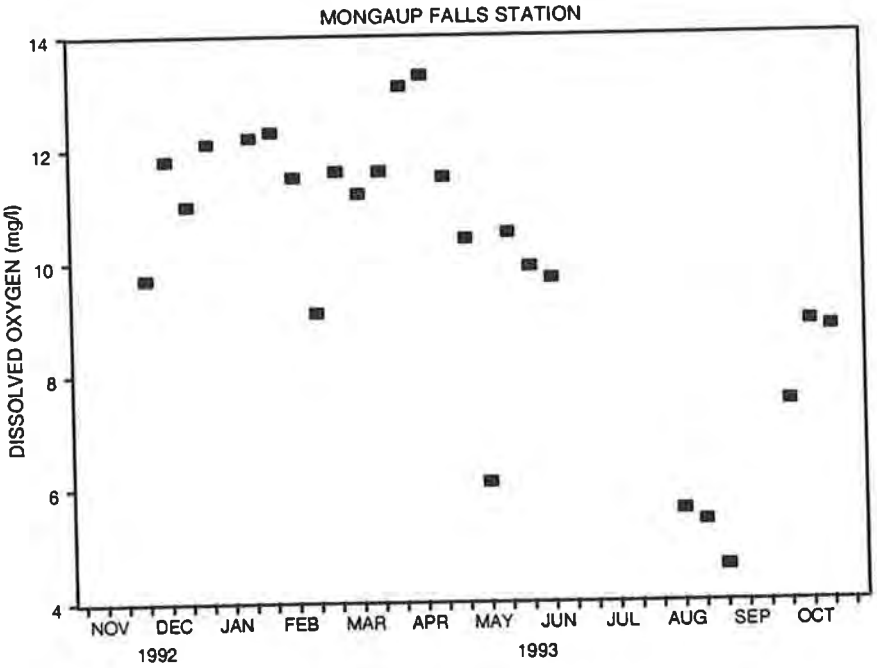
Water quality measurements were taken in the tailrace area of an operating unit at the start of each entrainment sample. Temperature values followed an expected seasonal pattern at both stations, with a decline in temperature during late fall and winter followed by a slow rise in spring. Average temperatures for each sample day are presented in Figure 4-2 and listed in Appendix C. The maximum temperature recorded during entrainment sampling at the Rio Station was 6.4°C (2 December 1992) and the minimum was 1.85°C (19 January 1993). Temperature values recorded at the Swinging Bridge Station were similar. The maximum water temperature was 6.6°C on 2 December. The minimum, 1.9°C, was recorded on 19 January. As expected, DO concentrations were inversely related to temperature (Figure 4-2). DO concentrations measured at both stations were also similar, ranging from a high of 12.8 mg/l to a low of 9.6 mg/l.

4.2 COLLECTION EFFICIENCY

4.2.1 Mongaup Falls

Collection efficiency tests were conducted at the Monagaup Falls station during February, March, June, August, September, and October 1993. Thirteen releases were made using golden shiner or alewife. Test date, number released, number recaptured, and the condition of fish are summarized in Table 4-1. Collection efficiency data collected at Mongaup Falls was evaluated





NOTE: Samples taken in the tailrace area of each station.

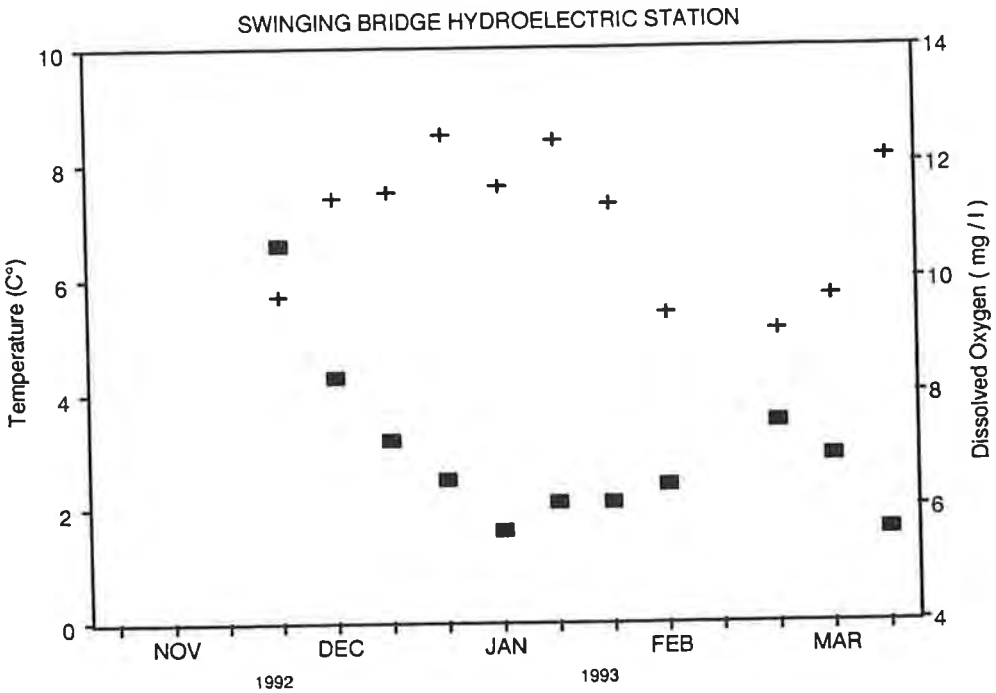
FIGURE 4-1

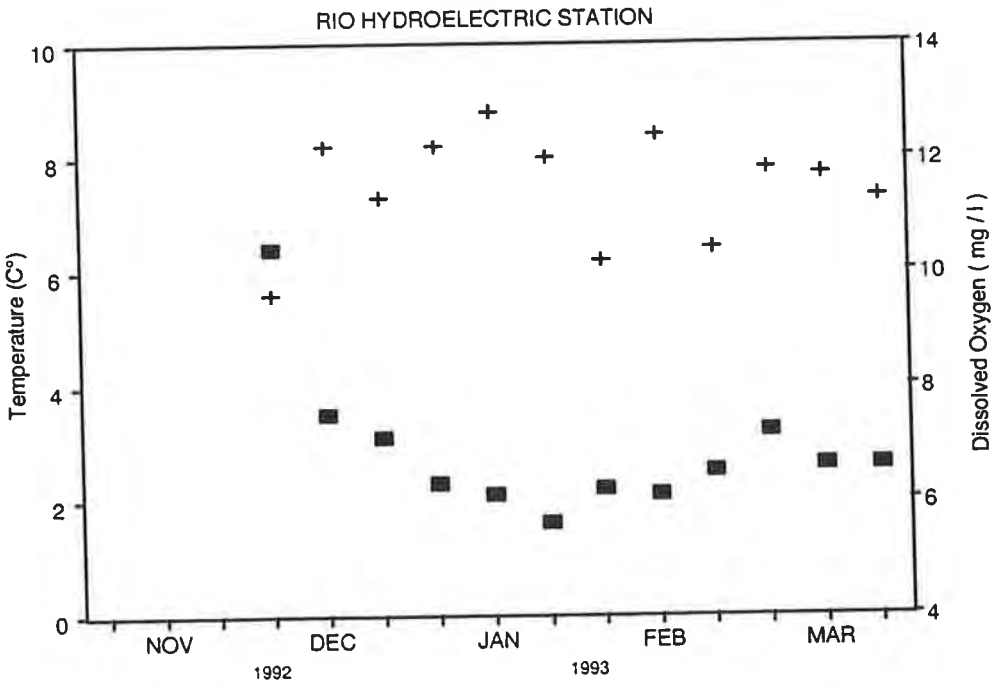
ENTRAINMENT SAMPLING
WATER QUALITY
November 1992 - October 1993

ORANGE AND ROCKLAND UTILITIES, INC.

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Pearl River, New York

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Temperature — Dissolved Oxygen

NOTE: Samples taken in the tailrace area of each station.

FIGURE 4-2

ENTRAINMENT SAMPLING
WATER QUALITY
November 1992 - March 1993

ORANGE AND ROCKLAND UTILITIES, INC.

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Pearl River, New York

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TABLE 4-1

COLLECTION EFFICIENCY TEST RESULTS

Mongaup Falls Hydroelectric Station - 1993

RELEASE INFORMATION					RECAPTURE INFORMATION		
RELEASE DATE	UNIT(S)[a]	SPECIES	NUMBER	CONDITION	NUMBER	OBSERVED %	EXPECTED %[b]
17 Feb	4	Golden shiner	210	Live	191	91.0	100.0
17 Feb	4	Alewife	200	Dead	186	93.0	100.0
3 Mar	1,4	Golden shiner	260	Live	130	50.0	50.0
3 Mar	1,4	Alewife	200	Dead	85	42.5	50.0
9 Jun	1,2,3,4	Alewife	240	Live	47	19.6	25.0
4 Aug	1,2,3,4	Alewife	300	Live	38	12.7	25.0
3 Sep	2,3,4	Alewife	142	Live	21	14.8	33.0
3 Sep	2,3,4	Alewife	132	Dead	25	18.9	33.0
16 Sep	4	Alewife	200	Dead	172	86.0	100.0
1 Oct	1,2,4	Alewife	200	Live	57	28.5	33.0
1 Oct	1,2,4	Alewife	150	Dead	40	26.7	33.0
14 Oct	3,4	Alewife	140	Live	59	42.1	50.0
14 Oct	3,4	Alewife	150	Dead	70	46.7	50.0

[a]Unit(s) operating at time of release.
[b]Expected % - 100/No. of units operating.

4-1A

to determine how various factors such as species released, condition, and unit operation (number of units operating) may have influenced collection efficiency. Collection efficiency was significantly influenced by unit operation ($p < 0.05$) but not by other factors tested. Data were then pooled among remaining factors to calculate unit operation efficiencies and a mean collection efficiency. Collection efficiency at Unit 4 was 90.0, 95.9, 89.6, and 90.7 for one-unit (Unit 4 alone), two-unit, three-unit, and four-unit operation, respectively. The mean collection efficiency was 91.6 ± 4.7. Because the difference in collection efficiency was small for the different operating conditions, an average collection efficiency was used to estimate total entrainment. A detailed description of the efficiency analysis is contained in Appendix C.

4.2.2 Swinging Bridge

Collection efficiency tests were conducted at the Swinging Bridge station during January, February, March, and October 1993. Collection efficiency was tested on five dates using live or dead releases. Depending on availability, golden shiner and alewife were used for the tests. All efficiency tests were conducted with one unit operating. Testing with two units operating was not conducted because one unit was unavailable during the winter and there was not enough water to run two units during the summer. Number released, number recaptured, and the condition (live or dead) in each release are summarized in Table 4-2.

4.3 ENTRAINMENT

4.3.1 Mongaup Falls

Thirty-one entrainment samples were collected on 21 dates (including 10 day/night paired samples) at the Mongaup Falls station between November 1992 and October 1993. Sampling was scheduled to be conducted twice a month during the one-year period. An unusually dry summer, however, severely reduced hydroelectric operations at the station and limited sampling to once during August. Precipitation for New York State was well below normal for three consecutive months prior to August, with the Eastern Plateau receiving only 51% of the normal rainfall during July (NOAA 1993). The small amount of generation that did occur in August could not be coordinated with an entrainment sample. No sampling was conducted in late June and during July due to unscheduled maintenance of Unit 4. Sample dates, times, and volumes are listed in Table 4-3. Beginning on 19 January, entrainment samples were split between daylight and nighttime hours. Twenty-one entrainment samples were collected during daylight hours; 10 samples were collected at night. Night samples were not collected on 26 May, 3 and 16 September, or 1 October due to the station's operating schedule.

TABLE 4-2

COLLECTION EFFICIENCY TEST RESULTS

Swinging Bridge Hydroelectric Station - 1993

RELEASE INFORMATION					RECAPTURE INFORMATION	
RELEASE DATE	UNIT(S)[a]	SPECIES	NUMBER	CONDITION	NUMBER	%
13 Jan	2	Alewife	300	Dead	9	3.0
17 Feb	1	Golden shiner	210	Live	13	6.2
17 Feb	1	Alewife	200	Dead	17	8.5
3 Mar	1	Golden shiner	260	Live	8	3.1
24 Mar	2	Golden shiner	250	Live	6	2.4
24 Mar	2	Alewife	400	Dead	25	6.3
1 Oct	1	Alewife	150	Dead	11	7.3
1 Oct	1	Alewife	300	Live	15	5.0

[a]Unit(s) operating at time of release.

4-2A

TABLE 4-3

ENTRAINMENT SAMPLING DATES, TIME, AND UNIT OPERATION
Mongaup Falls Hydroelectric Station Unit 4
November 1992 - October 1993

YEAR	SAMPLE DATE	START TIME	END TIME	DURATION (min)	VOLUME (1000 cf)[a]	NO. OF UNITS[b]
1992	3 Nov	09:47	15:45	358	3329.4	4
	17 Nov	12:30	18:10	340	3162.0	4
	2 Dec	09:30	18:50	560	5208.0	4
	16 Dec	10:30	18:25	475	4417.5	4
	30 Dec	10:00	16:10	370	3441.0	4
1993	13 Jan	11:05	20:00	535	4975.5	4
	19 Jan	12:56	17:50	294	2734.2	4
	19 Jan	18:05	21:50	225	2092.5	4
	9 Feb	13:00	16:30	210	1953.0	4
	9 Feb	16:45	21:40	295	2743.5	4
	17 Feb	09:28	13:30	242	2250.6	3
	3 Mar	11:20	13:32	132	1227.6	2
	3 Mar	18:56	20:51	115	1069.5	2
	24 Mar	10:40	17:15	395	3673.5	4
	24 Mar	17:25	21:00	215	1999.5	4
	7 Apr	13:00	18:00	300	2790.0	4
	7 Apr	19:00	21:00	120	1116.0	4
	21 Apr	14:00	18:00	240	2232.0	4
	21 Apr	19:00	23:00	240	2232.0	4
	12 May	14:30	18:30	240	2232.0	4
	12 May	19:00	23:00	240	2232.0	4
	26 May	11:50	19:50	480	4464.0	4
	9 Jun	13:14	19:15	361	3357.3	4
	9 Jun	19:40	21:30	110	1023.0	4
	4 Aug	13:00	17:00	240	2232.0	4
	4 Aug	20:50	00:30	220	2046.0	4
	3 Sep	10:50	15:00	250	2325.0	3
	16 Sep	10:30	14:30	240	2232.0	1
	1 Oct	10:40	16:00	320	2976.0	3
	14 Oct	11:35	16:00	265	2464.5	3
	14 Oct	16:45	20:00	195	1813.5	4

Note: Shaded areas indicate night surveys.

[a] Rated capacity (155 cfs) used to calculate volume sampled.
[b] Number of units operating at start of sampling.

A total of 14,657 fish were collected in entrainment samples between November 1992 and October 1993 (Appendix D). Nineteen species of fish were present, including a group of juvenile sunfish which could not be readily identified due to their small size (Table 4-4). Entrainment collections in September and October had the greatest number of species, with 14 different species collected in each month.

Alewife dominated entrainment samples at Mongaup Falls, making up 98.7% of the estimated total. The total estimated entrainment at the Mongaup Falls station was 1,752,302 fish (Table 4-5). Alewife abundance was greatest during the winter season, with an estimated 1,562,047 (99.9 of all fish) entrained between December and February. Alewife entrainment estimates rose slightly from the February level during March and April, then fell sharply in May and June. The length-frequency distribution of alewife collected in entrainment samples was bimodal at all three stations (Appendix F, Table F-1; Figure 4-3). Lengths ranged from 50 to 200 mm, with peaks at 60-80 mm and 110 to 140 mm.

Yellow perch was the second most abundant species collected in entrainment samples, with a total estimated 13,385 entrained (Table 4-5). Yellow perch entrainment was highest during September and October, with smaller numbers collected in December, January, April through June, and August. Yellow perch entrained from December through June ranged from 100 to 160 mm (Appendix F, Table F-3; Figure 4-4). Perch entrained from August through October encompassed a broad range of sizes, with peaks in the length-frequency distribution from 60 to 90 mm and 110 to 130 min.

Eight paired samples (day and night surveys) were collected at the Mongaup Falls station. Alewife entrainment rates were highest during night surveys from January to the beginning of April (Figure 4-5). The day/night sample for August showed substantially more alewife entrained during day than at night. The pattern of day/night entrainment rates for species other than alewife was variable over the study program (Figure 4-5). During February, March, April, and May, when the entrainment rate of non-alewife species was very low, entrainment was greater at night than during the day, except for the samples in late March. During June, August, and October, when the entrainment was relatively high compared to earlier months, the day entrainment rate was substantially greater than at night during June; day and night rates were approximately equal in August and the night rate was much greater than the day rate in October.

TABLE 4-4

FISH SPECIES COLLECTED IN ENTRAINMENT SAMPLES

Mongaup River Hydroelectric Projects

STATION	COMMON NAME	SCIENTIFIC NAME
Mongaup Falls	Alewife	*Alosa pseudoharengus*
	Pumpkinseed	*Lepomis gibbosus*
	Black crappie	*Pomoxis nigromaculatus*
	Golden shiner	*Notemigonus crysoleucas*
	Tessellated darter	*Etheostoma olmstedi*
	Largemouth bass	*Micropterus salmoides*
	Chain pickerel	*Esox niger*
	White sucker	*Catostomus commersoni*
	Spottail shiner	*Notropis hudsonius*
	White catfish	*Ameiurus catus*
	Yellow perch	*Perca flavescens*
	Rock bass	*Ambloplites rupestris*
	Redbreast sunfish	*Lepomis auritus*
	Brown trout	*Salmo trutta*
	Brook trout	*Salvelinus fontinalis*
	Unidentified sunfish	*Centrarchidae*
	White bass	*Morone chrysops*
	Longear sunfish	*Lepomis megalotis*
	Yellow bullhead	*Ameiurus natalis*
	Rainbow trout	*Oncorhynchus mykiss*
Swinging Bridge	Alewife	*Alosa pseudoharengus*
	Brown bullhead	*Ameiurus nebulosus*
	Spottail shiner	*Notropis hudsonius*
	White catfish	*Ictalurus catus*
	Yellow perch	*Perca flavescens*
Rio	Alewife	*Alosa pseudoharengus*
	Gizzard shad	*Dorosoma cepedianum*

TABLE 4-5

ESTIMATED NUMBER OF FISH ENTRAINED AT ALL UNITS COMBINED

Mongaup Falls Hydroelectric Station - November 1992 - October 1993

TAXON	1992		1993										Total	%
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT		
Alewife	4,063	5,301	1,531,428	25,318	31,314	75,921	183	0	--	56,675	71	33	1,730,307	98.7
Pumpkinseed	0	0	0	0	0	0	0	154	--	147	99	513	913	0.1
Black crappie	0	0	0	0	0	0	0	0	--	0	28	386	414	<0.1
Golden shiner	0	0	0	0	0	0	92	0	--	0	14	160	266	<0.1
Tessellated darter	0	0	0	0	0	0	0	0	--	0	28	0	28	<0.1
Largemouth bass	0	0	0	0	0	0	183	0	--	98	1,006	224	1,511	0.1
Chain pickerel	0	0	0	0	0	0	92	0	--	0	0	0	92	<0.1
White sucker	0	0	0	0	0	0	0	0	--	98	14	33	145	<0.1
Spottail shiner	96	0	0	0	0	0	183	0	--	98	0	64	441	<0.1
White catfish	0	0	0	0	0	0	275	0	--	0	14	33	322	<0.1
Yellow perch	0	279	273	0	0	573	183	541	--	392	6,589	4,555	13,385	0.8
Rock bass	0	0	0	0	0	190	0	0	--	0	14	0	204	<0.1
Redbreast sunfish	0	0	0	0	0	0	0	0	--	0	14	64	78	<0.1
Brown trout	290	0	0	105	0	0	366	77	--	0	0	97	935	0.1
Brook trout	0	0	0	0	0	0	0	0	--	0	0	33	33	<0.1
Unidentified sunfish	0	0	0	0	0	0	0	0	--	147	56	2,824	3,027	0.2
White bass	0	0	0	0	0	0	0	77	--	0	0	0	77	<0.1
Longear sunfish	0	0	0	0	0	0	0	0	--	49	0	0	49	<0.1
Yellow bullhead	0	0	0	0	0	0	0	0	--	0	14	33	47	<0.1
Rainbow trout	0	0	0	0	0	0	0	0	--	0	28	0	28	<0.1
Total	4,449	5,580	1,531,701	25,423	31,314	76,684	1,557	849	--	57,704	7,989	9,052	1,752,302	

4-3B

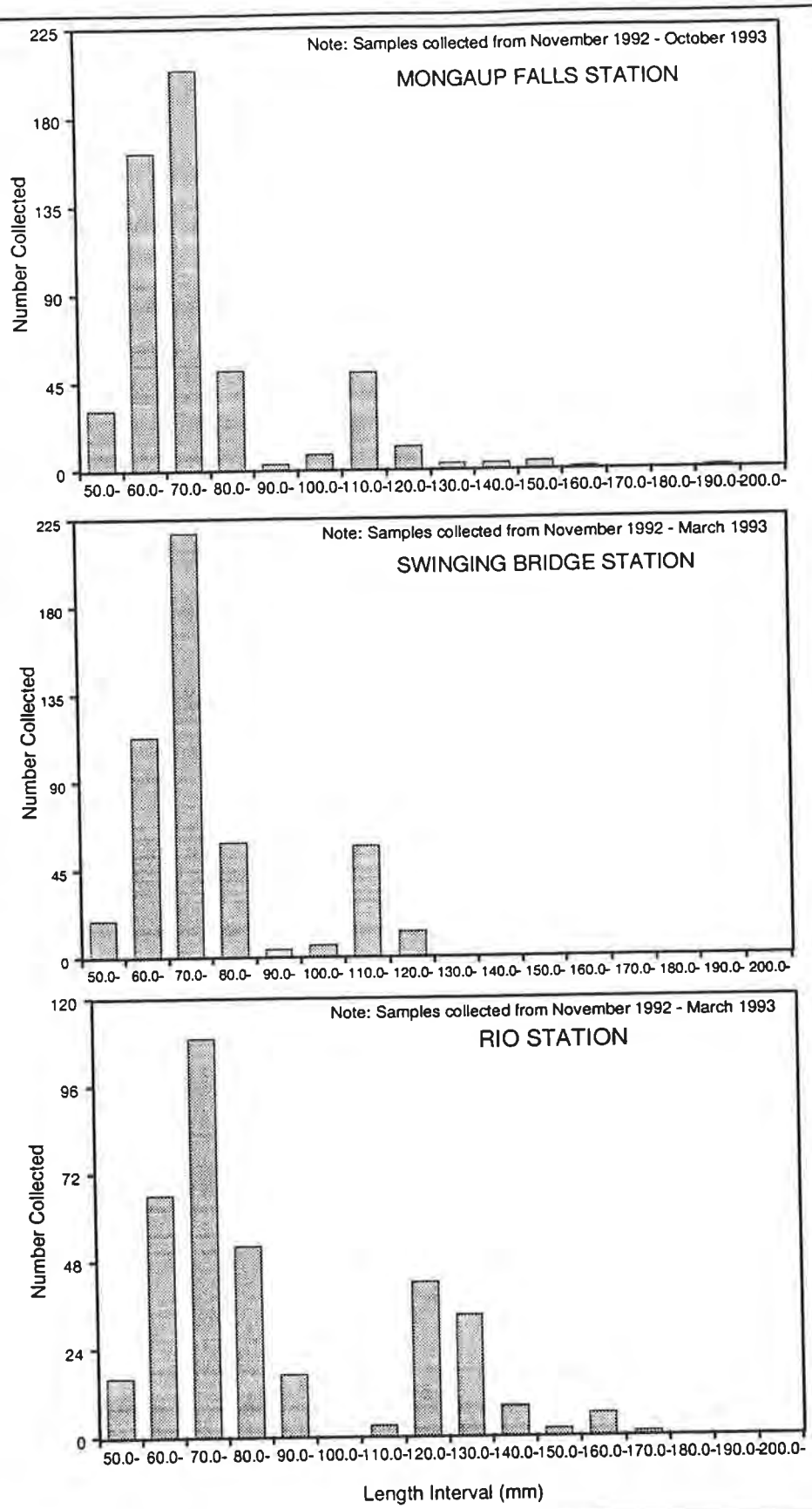


FIGURE 4-3

Length-Frequency Distribution of Alewife Collected in Entrainment Samples

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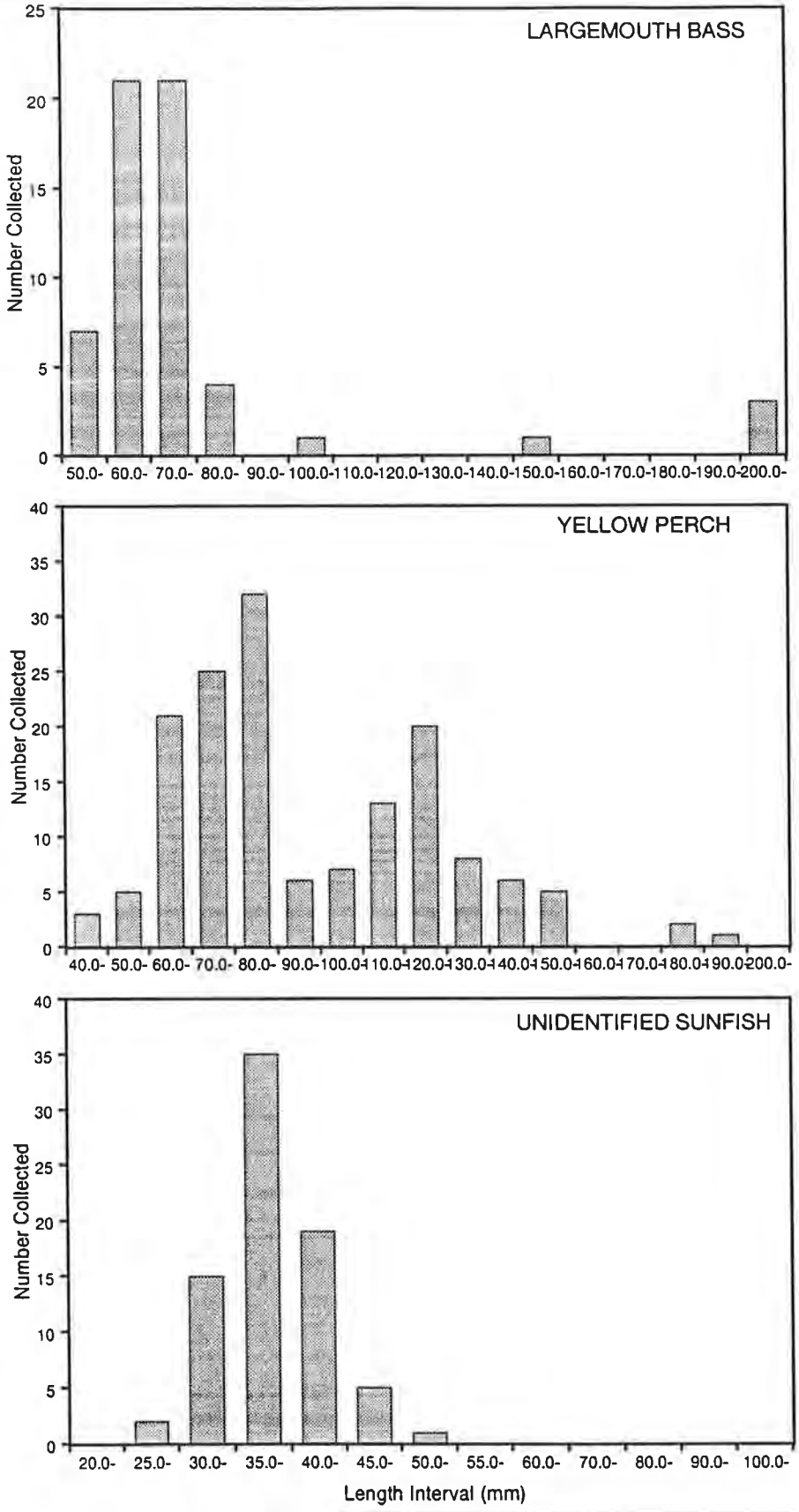


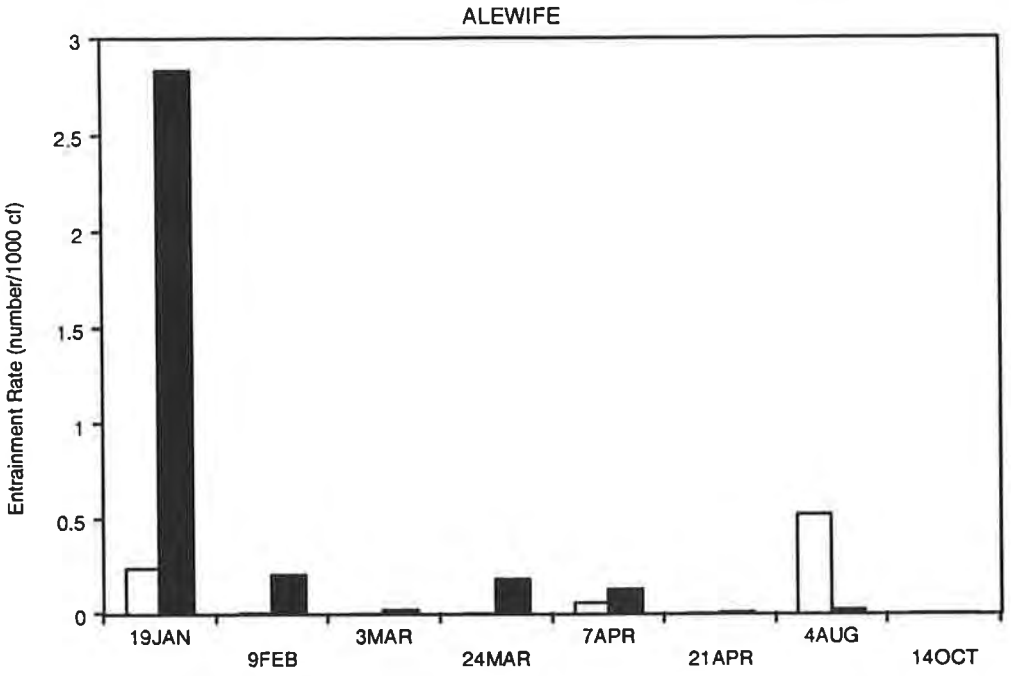
FIGURE 4-4

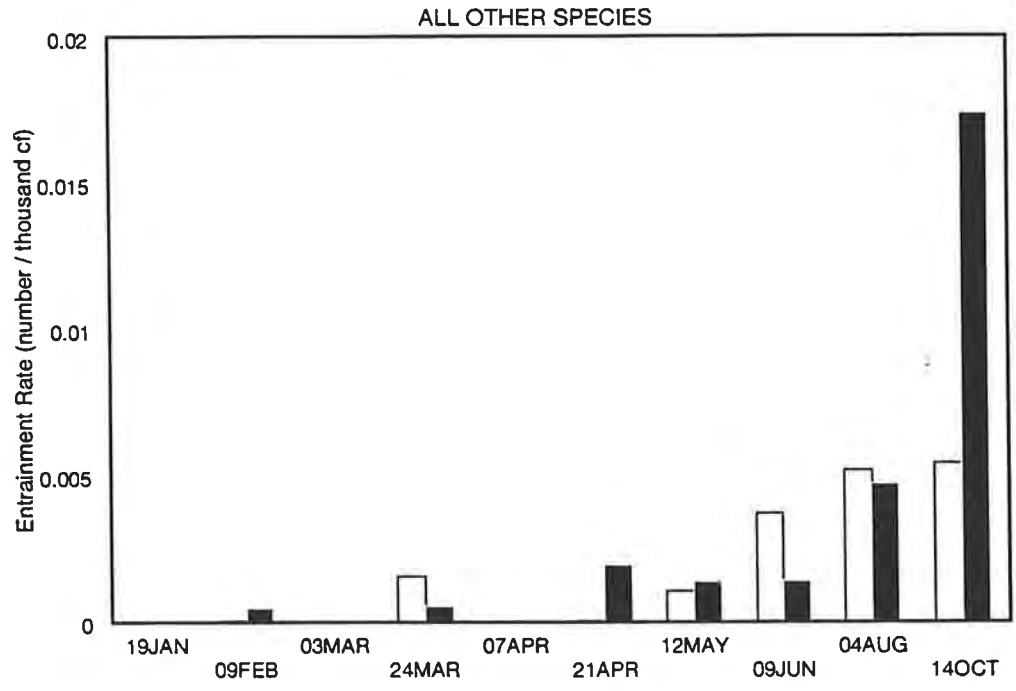
Length-Frequency Distribution of Selected Species Collected in Entrainment Samples at the Mongaup Falls Station

November 1992 - October 1993

ORANGE AND ROCKLAND UTILITIES, INC.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York







NOTE: Only paired (both a day and night survey conducted) sample dates shown.

FIGURE 4-5

MONGAUP FALLS
DAY AND NIGHT ENTRAINMENT RATES
January - October 1993

ORANGE AND ROCKLAND UTILITIES, INC.

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Pearl River, New York

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4.3.2 Swinging Bridge

Thirteen entrainment samples were collected at the Swinging Bridge station between November 1992 and March 1993. Sample dates, times, and unit(s) sampled are listed in Table 4-6. Beginning on 19 January 1993 samples were split between daylight and nighttime hours. Nine samples were collected during daylight hours; four samples were collected at night. There was no night sampling conducted on 17 February. No daylight sample was collected on 9 February because neither unit was operating.

A total of 8352 fish were collected at Swinging Bridge (Table 4-7). Alewife constituted the majority of entrainment samples, with 99.9% (8338) of all fish collected. Alewife were most abundant in entrainment samples during January, with 7375 fish collected, approximately 88% of all alewife collected. Samples taken during November and December contained relatively fewer fish. Alewife abundance declined substantially in February (110 collected), but increased slightly in March (750 collected). Brown bullhead, spottail shiner, white catfish, and yellow perch made up the remainder of fish collected.

Total numbers entrained from November through March were estimated using the average recovery efficiency factor and the relationship between volume sampled and total monthly flow. The estimated entrainment total for the five species collected were: alewife, 86,233,947; brown bullhead, 11,517; spottail shiner, 12,618; white catfish, 12,765; and yellow perch, 38,294 (Table 4-8). The estimates for species other than alewife were based on very low collection rates, which casts doubt on the precision of these estimates. For bullhead, shiner and catfish only a single specimen was collected and in the case of yellow perch two individuals were collected. In each case, these fish were collected on a single date during the winter sampling period, which means there was no entrainment during the other months of sampling, and based on the D.O. and temperature preference data little or no entrainment during other seasons.

4.3.3 Rio

Fourteen entrainment samples were collected at the Rio station between November 1992 and March 1993. Sample dates, times, and unit sampled are listed in Table 4-8. Beginning on 19 January, samples were split between daylight and nighttime hours. Ten entrainment samples were collected during the day; four samples were collected at night.

A total of 1099 fish were collected at the Rio station (Table 4-7). One gizzard shad collected in December was the only species present other than alewife. December was the most abundant period for alewife, with 609 collected on three sample dates. Alewife were also relatively

abundant during January (381 collected), while collections diminished through February and March. Total winter entrainment of alewife and [gizzard shad] was estimated to be 18,211,403, and 10,460, respectively (Table 4-8). The gizzard estimate is based on the collection of a single individual during December, which may be a fish which originated in the tailrace. This species is not known to occur in the Mongaup River upstream of Rio Dam.

TABLE 4-6

ENTRAINMENT SAMPLING DATES AND TIMES
Swinging Bridge Hydroelectric Station
November 1992 - March 1993

YEAR	SAMPLE DATE[a]	START TIME	END TIME	DURATION (min)	UNIT(S) SAMPLED
1992	17 Nov	12:00	16:30	270	1
	02 Dec	10:05	17:52	467	1
	16 Dec	11:25	19:20	475	1
	30 Dec	09:20	16:50	450	2
1993	13 Jan	11:50	21:00	550	2
	19 Jan	15:00	18:45	225	2
	19 Jan	19:00	22:50	230	2
	09 Feb	16:00	20:00	240	2
	17 Feb	12:25	16:40	255	1
	03 Mar	10:24	12:42	138	1
	03 Mar	18:30	21:30	180	1
	24 Mar	09:50	18:05	495	1
	24 Mar	09:50	18:05		2
	24 Mar	18:20	21:00	160	1

Note: Shaded areas indicate night surveys.

[a]Includes sample date and time information for both sample nets.

TABLE 4-7

TOTAL NUMBER OF FISH COLLECTED IN ENTRAINMENT SAMPLES
Swinging Bridge and Rio Hydroelectric Stations
November 1992 - March 1993

TAXON		1992				1993						TOTAL	%
		17 NOV	2 DEC	16 DEC	30 DEC	13 JAN	19 JAN	9 FEB	17 FEB	3 MAR	24 MAR		
SWINGING BRIDGE													
Alewife	Day	1	15	74	7	5001	263	NS	73	12	40	5486	65.8
	Night	NS	NS	NS	NS	NS	2111	37	NS	424	274	2846	34.1
Brown bullhead	Day	1	--	--	--	--	--	NS	--	--	--	1	<0.1
	Night	NS	NS	NS	NS	NS	--	--	NS	--	--	0	0.0
Spottail shiner	Day	--	1	--	--	--	--	NS	--	--	--	1	<0.1
	Night	NS	NS	NS	NS	NS	--	--	NS	--	--	0	0.0
White catfish	Day	--	--	--	--	1	--	NS	--	--	--	1	<0.1
	Night	NS	NS	NS	NS	NS	--	--	NS	--	--	0	0.0
Yellow perch	Day	--	--	--	--	1	--	NS	--	--	--	1	<0.1
	Night	NS	NS	NS	NS	NS	2	--	NS	--	--	2	<0.1
Total		2	16	74	7	5003	2376	37	73	436	314	8338	
RIO													
Alewife	Day	59	165	437	7	151	1	NS	4	--	2	826	75.2
	Night	NS	NS	NS	NS	NS	229	16	NS	12	15	272	24.7
Gizzard shad	Day	--	1	--	--	--	--	NS	--	--	--	1	0.1
	Night	NS	NS	NS	NS	NS	--	--	NS	--	--	0	0.0
Total		59	166	437	7	151	230	16	4	12	17	1099	

NS - No sample collected.

TABLE 4-8

SWINGING BRIDGE AND RIO HYDROELECTRIC STATIONS
ESTIMATED TOTAL NUMBER ENTRAINED - NOVEMBER 1992-MARCH 1993

Taxon	1992		1993			
	Nov	Dec	Jan	Feb	Mar	Total
Swinging Bridge						
Alewife	11,517	1,152,815	8,275,2238	58,224	2,266,153	86,240,947
Brown bullhead	11,517	0	0	0	0	11,517
Spottail shiner	0	12,618	0	0	0	12,618
White catfish	0	0	12,765	0	0	12,765
Yellow perch	0	0	38,294	0	0	38,294
Rio						
Alewife	2,385,453	6,844,235	8,684,402	16,901	280,412	18,211,403
Gizzard shad	0	10,460	0	0	0	10,460

TABLE 4-9

ENTRAINMENT SAMPLING DATES AND TIMES
Rio Hydroelectric Station
November 1992 - March 1993

YEAR	SAMPLE DATE[a]	START TIME	END TIME	DURATION (min)	UNIT(S) SAMPLED
1992	17 Nov	14:15	19:20	305	1
	17 Nov	14:15	19:20		2
	2 Dec	08:25	17:55	545	1
	2 Dec	09:10	17:50		2
	16 Dec	10:00	18:00	413	1
	16 Dec	12:15	18:00		2
	30 Dec	10:50	14:00	190	1
	30 Dec	10:50	14:00		2
1993	13 Jan	10:29	18:30	481	1
	13 Jan	10:29	18:30		2
	19 Jan	13:45	17:00	195	1
	19 Jan	13:45	17:00		2
	19 Jan	17:15	21:00	225	1
	19 Jan	17:15	21:00		2
	9 Feb	14:00	17:20	200	1
	9 Feb	17:30	20:50	200	1
	9 Feb	17:30	20:50		2
	17 Feb	11:40	18:50	430	1
	3 Mar	12:01	14:13	132	1
	3 Mar	18:29	20:15	106	1
	24 Mar	11:15	16:35	320	1
	24 Mar	11:15	16:35		2
	24 Mar	16:40	20:20	220	1
	24 Mar	16:40	20:20		2

Note: Shaded areas indicate night surveys.

[a]Includes sample date and time information for both sample nets.

CHAPTER 5

TURBINE SURVIVAL LITERATURE REVIEW

Recent studies related to relicensing of hydro projects provide a large database of studies on turbine passage survival for many of the species found in the Mongaup River and its impoundments. The Electric Power Research Institute (EPRI 1992) has prepared a summary of recent turbine survival testing that includes data through September 1992. LMS is aware of several ongoing survival studies in New York State, but study results are not yet available. EPRI provides the most comprehensive summary of turbine survival data available. The following summary first presents EPRI's general findings from all of the studies reviewed, then the specific survival rates from the studies most relevant to the Mongaup River project plants.

EPRI reported that for Kaplan and Francis turbine units survival averaged approximately 94% for naturally entrained fish and ranged from 70 to 80% for tests involving controlled releases of selected species. They attributed the higher mortality in controlled tests to the generally larger size of the fish and the additional stress of handling and marking associated with the test.

The EPRI report also summarized turbine survival for species groups for all studies combined, which includes a wide range of plant characteristics. For Francis turbines centarchid (bass and bluegills) survival averaged 88.3%, percid (walleye and yellow perch) survival averaged 76.4%, catostomid (suckers) survival averaged 76%, and cyprinid (minnows) survival averaged 80%. The generalized results for American shad and blueback herring, species very similar to alewife, were for Francis turbines. Tests using a balloon recovery technique had an average survival of 84%.

The EPRI database was reviewed for studies with turbine types and species similar to those on the Mongaup River. The Mongaup plants have heads of 110-170 ft and RPM's of 240-300. Among the plants included in the EPRI review, two with relatively high heads and RPM's were found. Another Francis unit site tested survival of juvenile American shad, a species similar to alewife in body shape and swimming ability.

The Hardy plant on the Muskegon River in Michigan, which has a 100-ft head and a 164-RPM Francis turbine, produced survival rates of 90.5 and 91.5% for bluegill, 88.7 and 85.5% for golden shiner, 76.2% for largemouth bass, 76.9 and 64.5% for white sucker, and 95.5 and 83.1% for yellow perch. The two values represent a small and large size of test fish, respectively. At the Prickett plant on the Sturgeon River in Michigan, which has a 54-ft head and a 257-RPM Francis turbine, survival rates were 85.7 to 97.7% for bluegill, 35.7 and 70.8%

for white sucker, and 93.9% for golden shiner. At the Holtwood plant on the Susquehanna River, which has a head of 62 ft and a 95-RPM Francis turbine, juvenile American shad had a survival rate of 88%.

These data suggest that relatively high survival can be expected for fish passing through the turbines at the Mongaup River hydro projects. The RPM at the Mongaup plants is somewhat higher than the RPM of the units reported above. Because RPM may be a factor in survival, with lower survival related to high RPM's, it would be appropriately conservative to use survival values at the lower end of the range of values reported by EPRI for the various species groups.

Literature survival data specific to alewife were not available. Other clupeids provide a potentially useful database, but there were no test data for winter conditions. Alewife move into deep water in lakes to find suitable temperatures (approximately 4°C) for overwintering. Winter conditions may be stressful for alewife as well as for other species. Direct observation of alewife discharged at the Mongaup hydro plants indicates that many are stressed or dead. While the mortality rate is not known, it is reasonable to assume that substantial mortality occurs during the winter months from a combination of naturally stressful conditions and turbine entrainment. During the summer months the literature survival values for American shad juveniles are believed to be representative of alewife survival at that time of year.

CHAPTER 6

DISCUSSION

The entrainment of alewife at Mongaup Falls followed the expected pattern, that is, relatively high entrainment during winter and lower entrainment during other seasons. Mongaup Falls had moderately high (compared to winter) alewife entrainment in August 1993, but little or no entrainment during other months, except for yellow perch and sunfish species in September and October.

The collection efficiency of test fish released into the tailrace area at Swinging Bridge was low, but sufficient numbers of fish were recovered during sampling to achieve the study objective, which was to document the occurrence and relative abundance of alewife entrainment during the winter months. Collection efficiency testing at Mongaup Falls showed that the recovery rate of test fish in the draft tube net at Unit 4 was similar with different combinations of units operating at this plant. This finding permitted the use of an average recovery rate to estimate total plant entrainment.

Alewife entrainment was episodic at all three plants in that the collections showed large differences between adjacent samples and between day and night samples. When paired day/night samples were available, the entrainment rate of alewife was higher at night than during the day except during August 1993 at Mongaup Falls, when day samples were higher.

At Rio alewife entrainment was relatively high from early December to mid-January except for the 30 December 1992 sample. With the exception of the period from mid-February to early March 1993, two units were in operation at Rio during entrainment sampling.

Throughout the winter sampling period only one of the two units operated at Swinging Bridge. During January 1993, when the entrainment of alewife was greatest, Unit 2, which has an intake depth range of 38 to 57 ft, was in operation. The rates of entrainment were relatively low at the end of December and in early February when Unit 2 was operating. At the beginning and end of the winter sampling period, when alewife entrainment was low to moderate, Unit 1 was in operation. The Unit 1 intake has a depth range of 92 to 111 ft.

Total winter entrainment estimates (November through December) at Swinging Bridge and Rio were based on relatively low recovery rates, or in the case of species other than alewife, very small numbers of fish. Because of the episodic nature of alewife entrainment and the low

numbers collected for other species, the actual number entrained could vary substantially from the estimated totals.

The collection efficiency values used to adjust the entrainment estimates were based on releases of live and dead marked fish into the tailrace upstream of the collection nets at Swinging Bridge. These fish were released in a manner to attempt to simulate the discharge of fish from the turbines. The collection efficiency rates based on test fish may not reflect actual collection efficiency because they may not adequately simulate the conditions encountered by the entrained fish. Collection efficiencies based on releases of test fish into the penstock intakes could not be made because of the ice cover in the reservoir.

The size distribution of alewife at all three plants was similar. The majority of fish ranged from 50 to 80 mm, with smaller numbers in the 110- to 130-mm range. The smaller fish are believed to be young-of-the-year; the larger group probably includes adults. If young-of-the-year dominate entrainment in every year, the total amount of forage available for wintering eagles could vary substantially from year to year, depending on the success of reproduction during the preceding spring. Large differences in year-class strength are common for many fish species, including alewife. There are no data on the population dynamics of alewife in the Mongaup River impoundments, but relatively large populations have persisted for many years.

Other than alewife, the majority of entrainment at Mongaup Falls occurred from May through October, the period of greatest activity for many pond species. The annual peak in entrainment during September and October corresponds to the time when entrainable young-of-the-year are most abundant. The size distribution data for yellow perch, largemouth bass, and sunfish (species grouped) showed an overwhelming predominance of young-of-the-year in the fall entrainment samples.

First-year juveniles of the game species is the age group with the highest natural mortality among the various ages in these populations. Losses due to entrainment at this age would have the highest potential to be compensated for by increased survival of the remaining individuals in this age group. In addition, turbine survival has been shown to be higher for the smaller individuals among the species tested (EPRI 1992).

The total number of juvenile game and panfish for the species entrained at Mongaup Falls is believed to represent a relatively small portion of the total populations of these species present in this impoundment. If one assumes turbine survival on the order of 70% (the low end of the range reported in the literature), then actual annual losses are on the order of 4000 yellow perch, 500 largemouth bass, and 900 sunfish. Assuming similar survival rates, losses of all

other species would be no more than hundreds of fish annually. For fish entrained at Swinging Bridge and Mongaup Falls, survivors could find usable habitat in the downstream impoundment. Most species entrained at Rio would not find usable habitat because there are several miles of high-gradient, boulder pocket water downstream of this project. Some species may find usable habitat in the large pools of the Delaware River at the mouth of the Mongaup.

Trout, particularly brown trout, were collected in the draft tube net at Mongaup Falls. Trout occur both in the impoundment and the tailrace at this project. The tailrace velocities at Mongaup Falls are relatively low and trout are known to live in the draft tube and tailrace area. A number of the trout collected are believed to have originated in the tailrace (non-entrained fish), but the total number originating in the tailrace cannot be estimated.

The surveys of temperature and DO profiles in the impoundments just upstream of the intakes confirm that from June into October water quality conditions are marginal or unsuitable for fish in the intake depth zone at Swinging Bridge and Rio (see Appendix A). The intake at Rio and the Unit 2 intake at Swinging Bridge have conditions that are marginal or suitable for fish later into June and earlier in the fall than the deeper Unit 1 intake at Swinging Bridge, where conditions are unsuitable for fish from early June through mid-October. The extent and duration of reduced DO levels will vary from year to year depending on a variety of factors, but it is reasonable to expect marginal or unsuitable conditions for fish at these intakes for the duration of the summer and early fall in each year.

The DO conditions at Rio and Swinging Bridge should result in reduced or minimal entrainment at these hydro intakes during the periods of low DO. The year-round entrainment data from Mongaup Falls show that the typical pond fishes are entrained in greatest numbers from May through October, which includes much of the time that DO is marginal or unsuitable at the Rio and Swinging Bridge intakes. In addition, when temperature and habitat preferences are taken into consideration, it is reasonable to expect that the typical pond fishes will prefer the nearshore and relatively shallow depths of these impoundments. For example, many of the species are shoreline spawners in June and July and the young-of-the-year generally find juvenile habitat in shallow water. The intakes at Rio and Swinging Bridge are in deep water along the steep face of the dikes and/or spillways, which would tend to isolate them from the preferred habitat of many species during much of the year.

Yellow perch, an abundant species in the Mongaup impoundments, spawn in early spring when DO conditions are suitable for fish throughout the impoundments. Their preference for shallow spawning areas will isolate them from deep-water areas of the Rio and Swinging Bridge intakes during spawning.

During the winter months, warmwater fishes are generally inactive, which limits their potential exposure to the intakes. The winter sampling at Rio and Swinging Bridge showed that relatively few species other than alewife are active or occur in the deep water near these intakes.

DO conditions in the vicinity of the Mongaup Falls intake were at least marginal for fishes at all times, except for a brief period in August. The low DO in August was probably a temporary condition related to an extended period in which there was no generation at this project. The top of the intake at Mongaup Falls is submerged 18 ft at normal pond elevation, but some water is drawn from the surface, based on direct observations. This would result in some portion of the intake flow having suitable DO conditions at all times. This intake is also close to the shallow, natural shoreline on the east side of the impoundment, which would bring typical pond fish close to the intake. Despite conditions that are conducive to entrainment, the total number of fish entrained at Mongaup Falls (other than alewife) is low.

Based on the relatively low entrainment of fishes at Mongaup Falls, the low potential for entrainment of species other than alewife at Rio and Swinging Bridge, and the expected substantial survival of entrained fish, the existing level of entrainment at the Mongaup River hydro projects is believed to have a minimal adverse impact on the fish populations. The rates of entrainment during spring, summer and fall were low and involved primarily juvenile fish at Mongaup Falls, while winter entrainment at all three plants was almost exclusively alewife, as expected. The fish populations in the Mongaup River hydro project reservoirs have maintained themselves for many years with the current level of entrainment losses.

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Stone & Webster Environmental Services. 1992. Fish entrainment and turbine mortality review and guidelines. Final report, Sept. 1992. TR-101231, Res. Proj. 2694-01. Prepared for Electric Power Research Institute.

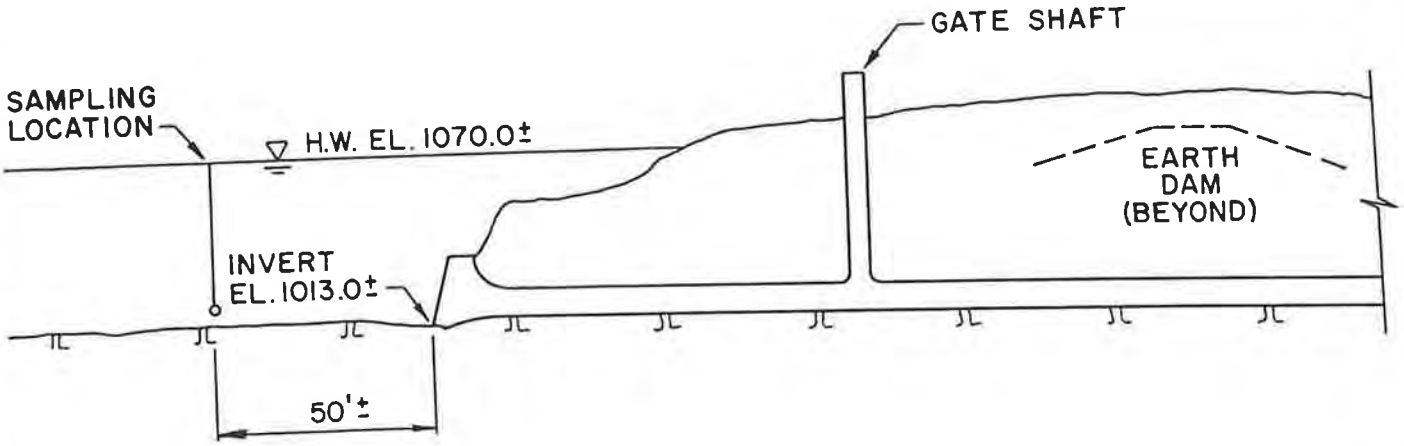
any changes in D.O. distribution near the intakes that may result from station operation. Relative to seasonal coverage, ORU incorporated sampling during the ice cover period into the study.

Relative to the need for, and location of, additional D.O. profiles to assess the effects of operation on D.O. distribution in the intakes' zones of influence, NYSDEC described sampling both prior to unit start-up and at points distant from the intakes as being desirable. In designing the sampling program, S-H considered the possibility that project operation would result in withdrawal of some oxygenated water from the surface layers. At a meeting held with NYSDEC on December 2, 1992 at Mongaup Falls, S-H and ORU reviewed the sampling design elements and preliminary sampling results related to determining project operation effects. ORU formally responded to NYSDEC's comments by letter dated January 7, 1993 (Attachment 1) and reviewed the study design elements that addressed NYSDEC concerns relative to operational effects on D.O. distribution. NYSDEC provided no further comment on specifics of the D.O. study design or requests for study design changes in their letter of July 7, 1993 (Attachment 1).

Methods

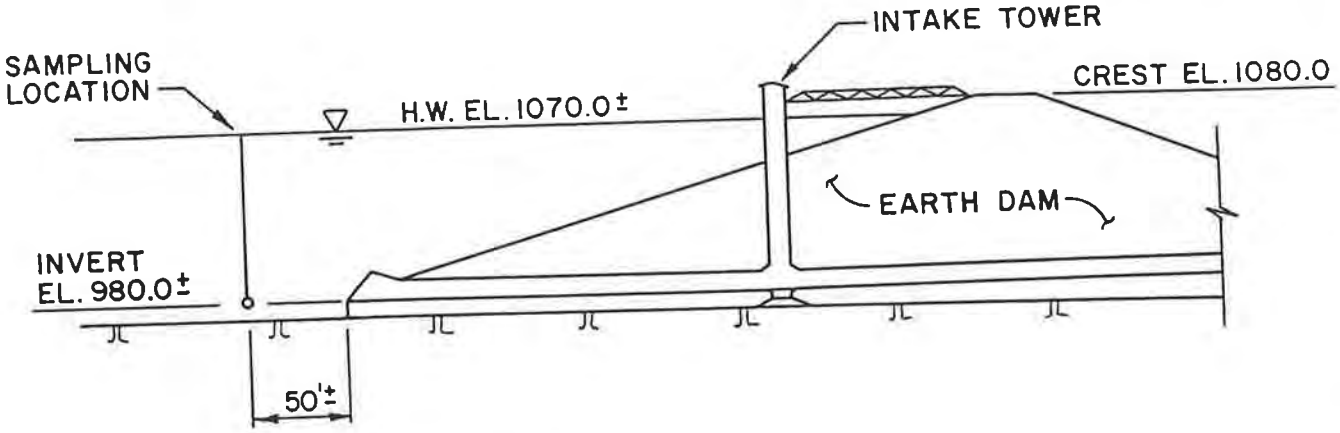
Dissolved oxygen profile sampling commenced on August 19, 1992 and continued at approximately bi-weekly intervals until November 17, 1992. Sampling during the period of ice cover was conducted on January 19, and February 9, 1993. Biweekly sampling resumed on March 24, 1993 and continued through August 4, 1993. Profile measurements were obtained from surface to bottom at one meter (3.3 ft) depth intervals using a YSI Model 57 D.O. and temperature meter. During ice-free periods, profiles were conducted from a boat stationed immediately upstream (50-100 ft; 15-30 m) from the intake (Figures 2 and 3).

During periods of ice cover, profiles were taken from the intake gatehouse structures, immediately in front of the trash racks at Mongaup Falls and Rio and from the bridge to the intake gate tower at Swinging Bridge Unit No. 1. Through-the-ice sampling during the ice cover period could not be accomplished due to unsafe conditions (areas of open water and thin ice) in the general area of the intakes. Measurements made during the ice cover period did not include the intake level at Swinging



PROFILE - SWINGING BRIDGE UNIT 2

SCALE: 1" = 50'

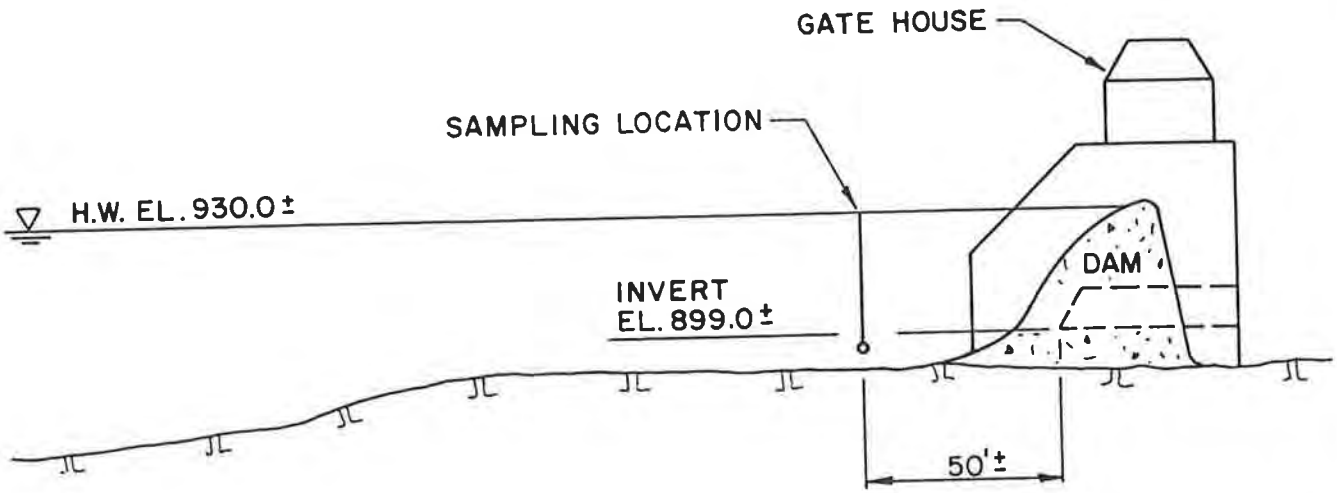


PROFILE - SWINGING BRIDGE UNIT 1

SCALE: 1" = 100'

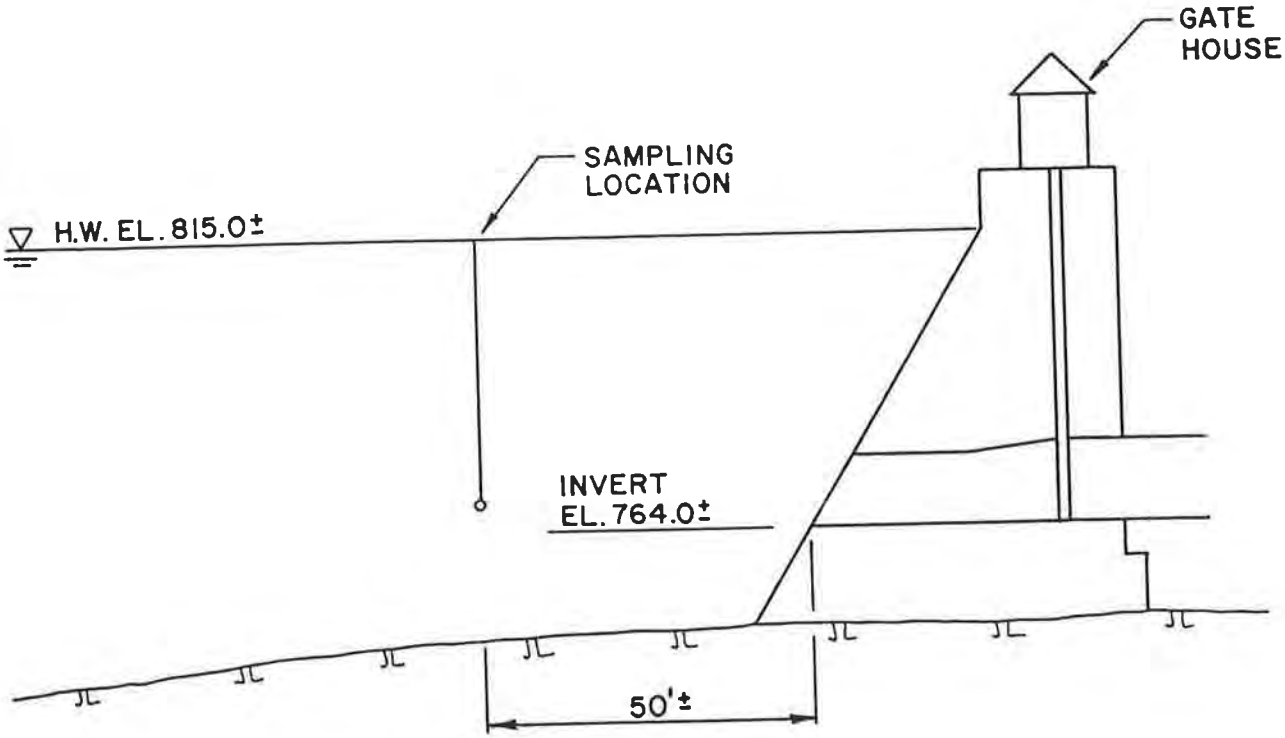
Stetson-Harza, A HARZA COMPANY, 181 Genesee Street, Utica, NY 13501 (315) 797-5800; Rensselaer Technology Park, 250 Jordan Rd., Troy, NY 12180 (518) 283-8080	DATE 2/28/94 DRAWN EJL NO. 6588	ORANGE & ROCKLAND UTILITIES DISSOLVED OXYGEN SAMPLING LOCATIONS	FIG. 2

BRUNING 73817 FORM # 3726



PROFILE - MONGAUP INTAKE

SCALE: 1" = 50'



PROFILE - RIO INTAKE

SCALE: 1" = 30'

Stetson-Harza A HARZA COMPANY 181 Genesee Street, Utica, NY 13501 (315) 797-5800 Rensselaer Technology Park 250 Jordan Rd., Troy, NY 12180 (518) 283-8080	DATE 2/28/94 DRAWN EJL NO. 6588	ORANGE & ROCKLAND UTILITIES **DISSOLVED OXYGEN SAMPLING LOCATIONS**	FIG. 3

BRUNING 7381 / FORM # 3725-

Bridge. Measurements during the ice cover period at Rio and Mongaup Falls provided at least partial coverage of the intake zone of influence.

Surface D.O. and temperature measurements were also made in the tailrace at each project following completion of profiling in the reservoir. Measurements were made at a depth of one foot (30 cm) approximately three feet (90 cm) from the bank.

The profiles included the depths influenced by the intakes (except those for Swinging Bridge during the ice cover period). The depth ranges that are primarily influenced by the intakes (referenced to each reservoir's Normal Water Surface Elevation) are given in Table 1. The zone of primary influence for each intake was considered to be represented by the depths between the top of the intake orifice and the intake structure invert.

To assess the effects of operation on D.O. stratification at Swinging Bridge, a variable number of sampling locations was used. If one of the units was operating, profiles were taken at both units (the unit intakes are approximately 600 ft, 180 m, apart). If neither intake was operating, a profile was taken at the Unit No. 1 intake. Sampling at a third site, which was approximately 1,500 feet (450 m) north of both intakes, would have been conducted if both intakes had been operating; however, sampling did not occur during operation of both intakes. One profile was obtained at the third site on November 17, 1993 to confirm that measurements at the intakes were representative of undisturbed conditions.

Results

When sampling began in August, 1992, D.O. levels at all sites were above 5 ppm only in water shallower than 5 m (16 ft). Temperature and D.O. stratification was observed in all reservoirs during the late summer and early fall (Figures 4 - 7). During thermal stratification, temperatures began to decline rapidly below depths of 3-6 m (10-20 ft). Temperatures below the thermocline were usually more than 8°C cooler than surface temperatures. During stratification, D.O. at depths between 5 and 15 m (16 and 50 ft) typically decreased from around 5 ppm to less than 3 ppm. Below the thermocline temperatures were low (< 10°C) and D.O. levels were on the order of 2 ppm or less.

In mid-September to mid-October the water column became isothermal at all sites. D.O. levels at depth increased slowly following the onset of fall turnover while D.O. levels near the surface were temporarily depressed in Swinging Bridge Reservoir. Depression of surface D.O. was not observed at Mongaup Falls and Rio during fall turnover. D.O. throughout the intakes' zones of influence did not reach levels greater than 5 ppm until the November 3 sampling at all projects.

By mid-November, D.O. throughout much of the water column was at or above saturation. Supersaturation of D.O. was observed in Swinging Bridge reservoir below 15 m. At Rio there was a "pocket" of nearly anoxic water at depths greater than 23 m (>75 ft), which is below the intake zone of influence.

Nearly complete to partial ice cover was present at all sites during the January, February and March samples and partial ice cover was present at the Swinging Bridge and Rio reservoirs during the April 7 sample. During the ice cover period, D.O. levels at all sites were above 5 ppm (generally above 6 ppm) at all depths from which measurements were obtained.

Sampling on April 21, 1993, immediately following ice-out, indicated isothermal conditions in all three reservoirs. D.O. levels at depth were somewhat depressed on this date. D.O. levels were above 4 ppm at the intake level in Swinging Bridge and Mongaup Falls reservoirs. D.O. levels in the Rio intake zone declined from approximately 4 ppm to less than 3 ppm.

Thermal stratification was first observed in Rio reservoir during the May 4, 1993 sample. Swinging Bridge reservoir showed thermal stratification on May 19. Weak stratification was observed at Mongaup Falls on May 19 and June 2. A distinct thermal gradient was not observed at Mongaup Falls until the June 23, 1993 sampling.

The timing of development of D.O. gradients generally followed the pattern of thermal stratification, but was delayed by about one month. D.O. at the intake level in Rio reservoir rose to near saturation (>8 ppm) by the May 4 sample; then dropped to between 4.5 and 5.2 ppm for the samples on May 19 and June 2. D.O. remained below 3 ppm at the Rio intake level during the remainder of the study. D.O. at the intake levels of Swinging Bridge Reservoir remained above 4.5 ppm from May 4

through June 2 but had dropped to below 2.6 ppm by June 23 and remained at low levels through the termination of the study. At Mongaup Falls, where thermal stratification was not fully established until the June 23 sample, D.O. levels at the intake depths remained above 4.5 ppm until the July 7 sample when depressed D.O. levels (2.8-4.2 ppm) were observed. D.O. at the Mongaup Falls intake level declined to less than 3.3 ppm on July 21 and was less than 1.4 ppm on August 4, 1993 at the termination of the study.

D.O. conditions at the intake level(s) are summarized in Table 2. Profile data for temperature and D.O. at each site are presented in Figures 1 through 4.

Discussion

This study was conducted to determine the timing of occurrence of conditions potentially lethal or stressful to fish at the intake depths in the Mongaup Projects' reservoirs. Stressful conditions are difficult to define precisely. Such conditions need to be defined relative to the species present in the fish community and with regard to the the definition of "stressful" that meets the needs of the study.

The reservoirs in this study have a mixed fish community that includes both trout and warmwater species such as bass and sunfish. Laboratory studies of quiescent fish have indicated that lethal D.O. levels for salmonids (e.g., brown and brook trout) are on the order of 1.4-2.9 ppm (depending on temperature, season, fish size and prior acclimation) while other species such as bass, sunfish and perch may tolerate D.O. levels of 0.5-2.3 ppm (Wheaton 1977). However, D.O. levels appreciably higher than the lethal level can limit swimming ability, feeding and growth (Davis 1975). Salmonids, largemouth bass and bluegill showed some adverse responses (e.g., reduced growth, reduced maximum swimming speed, avoidance) to any appreciable reduction in D.O. from saturation (Warren, et al. 1973). Data presented in Davis (1975) indicate that full oxygen metabolism for many species (i.e. full oxygen saturation in the blood) appears to require about 50 percent oxygen saturation in water (which would correspond to 4.2 ppm at 25°C and 5.1 ppm at 10°C). Warren, et al. (1973) reported that D.O. levels of 3 ppm or less produced an avoidance response in bluegill and D.O. levels of 4.5 or below produced avoidance in juvenile pacific salmon and largemouth bass. Davis (1975) suggested that a D.O. level of 5.3 ppm would result in the onset symptoms of oxygen distress in an average member of a mixed freshwater fish community, while most members of the mixed freshwater

community would be adversely affected by low oxygen at 3.3 ppm, particularly if the oxygen minimum were prolonged beyond a few hours.

In this discussion criteria were adapted from the information provided in Davis (1975). A D.O. level of 3 ppm or below is considered to be very stressful (unsuitable) for the fish communities of the Mongaup Projects' reservoirs and would be likely to be avoided by individuals of all species. Fish presence in areas with D.O. levels below 3 ppm is considered unlikely. D.O. levels of between 3 and 5 ppm are considered stressful (particularly for trout) but might not be avoided by some species. Fish presence in such "marginal" areas, with D.O. between 3 and 5 ppm, is considered possible but avoidance of such areas by most species appears likely, especially at the lower end of the D.O. range. D.O. levels above 5 ppm are considered to be generally acceptable to the fish community (not avoided) for the purposes of this discussion.

Based on the results of the study, the seasonal occurrence of D.O. and temperature stratification in the reservoirs at the Mongaup Projects can be summarized in the following manner:

1. Temperature stratification in the reservoirs first occured in early to late May and preceded D.O. depression below the thermocline by up to one month.

2. By late June, strong thermal stratification was evident at all sites and D.O. levels in the Rio and Swinging Bridge reservoirs had been reduced to 3 ppm or less at the intake levels at those sites. Maximum D.O.'s in the intake zone at Mongaup Falls generally remained between 3.2 and 6.2 ppm through the summer, except for August 4, 1993, when maximum D.O. in the intake zone was 1.3 ppm (see Table 2).

3. Thermal stratification began to break down by mid-September and the reservoirs were essentially isothermal by mid-October to early November.

4. D.O. levels at intake depth rose relatively rapidly following the breakdown of thermal stratification (i.e., turnover) in the Mongaup Falls reservoir in September and were generally above 5 ppm by mid-October. D.O. levels at intake depth at the Rio and

Swinging Bridge reservoirs rose slowly following turnover and did not exceed 5 ppm until late October to early November.

5. During the period when the reservoirs were affected by ice cover, D.O. levels in the upper portion of the water column (shallower than 10 m; 33 ft) were generally well above 5 ppm (range: 5.5-9.6 ppm).

6. During late April, within two weeks after ice-out, low D.O. levels (< 3 ppm) were observed at intake depths in the Rio reservoir. Marginal D.O. levels in the 4-5 ppm range occured at Mongaup Falls and Swinging Bridge. Such depressed D.O. levels during early spring were apparently short-lived, since D.O. levels two weeks later were well above 5 ppm (range: 6.8-9.6 ppm) at intake depths in all reservoirs.

The duration of seasonal thermal stratification and depressed D.O. levels appears to be shorter in the vicinity of the Mongaup Falls intake than at the Swinging Bridge or Rio intakes. At Mongaup Falls conditions stressful for, or potentially lethal to, fish appear to occur sporadically from July through September. The location of the Mongaup Falls intake at a nominal depth of between 5 and 10 m (16-33 ft) places it in the transition zone between the surface layer where D.O. remains relatively high and temperatures are warm and the colder, nearly anoxic water below the thermocline. Fish presence within the zone of influence of this intake may not be completely precluded by temperature and D.O. conditions occurring during the summer. At Rio and Swinging Bridge, the period of strong thermal stratification and relatively low D.O. levels at the intakes begins in June and continues through October. The Swinging Bridge Unit No. 2 and Rio intakes are located in a D.O. and temperature transition zone, while the Swinging Bridge Unit No. 1 intake is below the thermocline. However, unlike the Mongaup Falls intake, the Swinging Bridge Unit No. 2 and Rio intakes are at depths where D.O. is more frequently marginal or unsuitable for fish until after the onset of isothermal conditions in the fall.

At Swinging Bridge Unit 1, D.O. in the intake zone of influence remains within a range that would be likely to exclude fish from the area (i.e., ≤ 3.0 ppm) from late June through mid-October. Similar conditions are found at the shallower Unit 2 intake from late June through mid-September.

D.O. at the Swinging Bridge Unit 2 intake level from late September through mid-October is generally better than at the level of the Unit 1 intake, but remains less than 5 ppm while D.O. near the surface is in the 5-7 ppm range. The results to date at Swinging Bridge indicate that fish would likely be prevented from moving into the intake areas during the summer and early fall months because of low D.O.

Due to the relatively shallow intake location at Mongaup Falls, the distribution of D.O. with depth in the vicinity of the intake structure at that project varied more among samplings during the summer months (mid-June through September) than at the other projects. Maximum D.O. levels in the intake zone exceeded 5 ppm on three of eight summer sampling dates (August 19 and September 29, 1992; June 23,1993). On four summer sampling dates, the D.O. levels were marginal (maximum D.O.'s ranged from 3.2-4.3 ppm). On August 4, 1993, following a prolonged station outage, D.O. at Mongaup Falls was unsuitable, with a maximum D.O. in the intake zone of 1.3 ppm. These results indicate that, occasionally during the summer, D.O. concentrations would not, by themselves, be low enough to deter fish from entering the intake's area of influence. Stratification of D.O. and temperature occurred at 3-6 m depth (10-20 ft), immediately above the intake zone. Temperatures in the intake zone were variable but, on a number of occasions, were usually greater than 4°C lower than surface temperature. Preferred summer temperatures (Coutant 1977, Spotila, et al. 1979) for the warmwater fish species that inhabit the reservoir are in the mid- to upper 20°C range, which is typical of summer surface temperatures. Fish would be likely to respond to this stratification by avoiding the cooler temperatures and decreasing oxygen levels below the surface layer. Thus although D.O. and temperatures conditions would not completely preclude entrainment, it is considered likely that fish would avoid the depth range of the intake.

Rio Reservoir appeared to have a compound stratification during the summer months. A surface layer, in the upper 3-5 m (10-16 ft) of the epilimnion, had water temperatures above 20°C and D.O. concentrations greater than 6 ppm. A weak thermocline, where temperature declined 2°C or more and D.O. dropped 3-6 ppm, occurred over a 2-3 m (7-10 ft) depth interval below the surface layer, just above the intake zone. Temperatures then declined gradually to the 13-15 m (43-49 ft) level where there was a marked thermocline with temperatures dropping up to 10°C to 7-8°C in a 5 m (16 ft) interval. D.O.'s at and below the thermocline were consistently low (< 3 ppm) during stratified

conditions. At Rio the lower portion of the intake zone is located at the upper boundary of the thermocline. Maximum D.O. concentrations at the intake level were variable among samplings but generally below 5 ppm (Table 2). Thermal stratification of the epilimnion was absent in late September and October but the thermocline at 15 m (49 ft) persisted through early November. D.O. concentrations slowly increased above the thermocline during this late September and early October.

Maximum summer D.O. concentrations at the intake level at Rio were within a range (4.8-6.1 ppm; Table 2) that would not preclude fish presence in the intake zone during three of eight sampling dates (August 19; September 17 and 29, 1993). On the other five summer sampling dates, maximum D.O. concentrations were unsuitable for fish (range: 1.2-3.0 ppm; Table 2). Despite the occurrence, at times, of tolerable D.O. conditions at the intake level, the presence of temperature and D.O. gradients above the intake location would, however, be likely to deter fish from moving into the intake zone. Temperatures in the surface layer were in the low 20's (°C) while the preferred summer temperatures for the warmwater species that comprise most of the fish community in Rio reservoir are in the mid- to upper 20's. The warmwater species, including alewife, would be expected to occupy the upper 5 m (16 ft) of the water column in order to remain in the most preferable temperature conditions available. Brown trout, which occur in Rio Reservoir, prefer cooler temperatures (12.4-17.6°C; Spotila, et al. 1979) than those found in the surface layer and could possibly move into the intake zone on occasions when summer D.O. levels are tolerable. Brown trout would be expected to reside in or near the surface layer during the summer, however, because of more suitable D.O. conditions, temperatures that are well within their summer tolerance range, and the availability of alewife and other forage species in the surface layer. Thus, during the summer, entrainment of fish species found in Rio Reservoir is unlikely.

In summary, the D.O. data collected in 1992-1993 indicate that D.O. conditions were unsuitable for fish in the vicinity of the Swinging Bridge Units 1 and 2 intakes between mid- to late June and mid-September (Unit 2) or early November (Unit 1). Marginal conditions occurred at the Swinging Bridge Unit 2 intake through mid-October. Conditions at the Rio intake zone were unsuitable for fish from mid- to late June through early August, and marginal or unsuitable for fish in mid-August to mid-September. At the Mongaup Falls intake, conditions were unsuitable for fish in late July and early August of 1993; however, good conditions occurred through mid-June and marginal to good

D.O. conditions were present in the intake zone at other times during the summer. Among the sites studied, Mongaup Falls appears to have the highest potential for fish presence in the intake area during the summer and early fall. At Rio, fish may be present at times during the late summer, on the basis of the D.O. data alone. However, when temperature preferences of the species of the fish communities at both Rio and Mongaup Falls are considered in addition to D.O., it appears more likely that most fish, including salmonids, will occupy areas shallower than the intake zones throughout the summer.

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TABLES

Table 1. Depths from Normal Water Surface Elevation for Intake Zone of Influence at ORU's Mongaup River Projects.

	Swinging Bridge Unit 1	Swinging Bridge Unit 2	Mongaup Falls	Rio
Normal Water Surface Elevation (ft)	1070.0	1070.0	930.0	815.0
Top of Intake Orifice Elevation (ft)	978.0	1032.0	912.0	782.0
Intake Invert Elevation (ft)	959.5	1013.0	898.5	764.0
Intake Zone of Influence Depth				
Feet	92.0 - 110.5	38.0 - 57.0	18.0 - 31.5	33.0 - 51.0
Meters	28.0 - 33.7	11.6 - 17.4	5.5 - 9.6	10.1 - 15.5

Table 2. Range of D.O. Concentrations in the Intake Zone of Influence at ORU's Mongaup River Projects.

	Swinging Bridge No. 1			Swinging Bridge No. 2			Mongaup Falls			Rio		
Date	min		max	min		max	min		max	min		max
19-Aug-92	1.9	-	2.0	0.3	-	1.2	4.3	-	6.0	1.3	-	4.8
01-Sep-19	1.6	-	2.2	0.2	-	0.5	2.8	-	4.3	1.6	-	2.5
17-Sep-92	0.4	-	0.4	0.4	-	2.6	2.8	-	4.0	3.4	-	4.8
29-Sep-92	0.4	-	0.4	3.3	-	5.0	3.1	-	6.2	2.4	-	6.1
12-Oct-92	1.9	-	2.0	3.4	-	4.8	4.1	-	6.7	3.3	-	5.5
03-Nov-92	3.2	-	3.4	5.6	-	6.1	6.6	-	8.4	6.0	-	6.5
17-Nov-92	16.5	-	16.5	16.7	-	17.1	11.0	-	11.5	7.7	-	8.2
19-Jan-93	*		9.6	*		9.6	7.8	-	9.0	9.6	-	9.6
09-Feb-93	*		6.5	*		6.5	6.2	-	7.4	6.6	-	6.6
24-Mar-93	*		7.2	*		7.2	7.0	-	7.0	*		5.5
07-Apr-93	*		6.8	*		6.8	6.8	-	8.2	6.0	-	6.0
21-Apr-93	*		4.5	4.6	-	5.4	3.6	-	6.2	2.7	-	4.0
04-May-93	7.8	-	7.8	6.8	-	8.8	8.6	-	9.6	8.0	-	8.6
19-May-93	*		7.0	5.8	-	7.9	7.8	-	8.4	4.6	-	5.2
02-Jun-93	4.6	-	4.6	6.0	-	7.0	6.8	-	7.6	5.0	-	5.2
23-Jun-93	0.2	-	0.4	2.4	-	2.6	4.6	-	7.8	2.2	-	3.0
07-Jul-93	*		2.2	2.6	-	2.6	2.8	-	4.2	1.4	-	2.2
21-Jul-93	*		1.1	0.7	-	1.6	0.6	-	3.2	1.1	-	1.4
04-Aug-93	*		0.7	0.6	-	1.4	0.8	-	1.3	0.8	-	1.2

* Maximum measurement depth was less than depth of intake zone of influence of intake. Value for deepest measurement used.

Table 3. Tailrace D.O. and Temperature Measurements at ORU's Mongaup River Projects

DATE	SWINGING BRIDGE D.O	SWINGING BRIDGE Temp.	MONGAUP D.O	MONGAUP Temp.	RIO D.O	RIO Temp.
19-Aug						
01-Sep	4.8		6.8		5.5	17.5
17-Sep	3.2		6.0	14.5	5.7	17.0
29-Sep	8.4	16.0	8.0	15.0	7.9	15.0
12-Oct	6.7	15.0	8.2	14.0	9.1	15.0
03-Nov	8.2	10.0	9.2	9.0	9.0	10.0
17-Nov	8.7	6.5	11.9	6.7	8.6	8.1
19-Jan	11.9	2.0	11.4	2.0	11.9	2.0
09-Feb	12.3	2.0	13.0	2.0	12.4	2.0
24-Mar	10.5	3.0	10.0	3.0	9.7	3.0
07-Apr	9.8	2.0	10.4	2.0	11.6	2.0
21-Apr	10.5	5.0	9.6	6.0	9.5	6.5
04-May	10.4	8.0	10.4	9.0	9.8	10.0
19-May	9.2	8.0	9.7	10.5	8.8	11.5
02-Jun	8.3	9.0	9.0	11.5	6.6	14.0
23-Jun	7.8	16.0	8.0	13.5	7.0	16.0
07-Jul	5.6	12.5	6.5	15.5	5.6	17.0
21-Jul			5.8	17.0	4.0	17.5
04-Aug	5.6	19.0	5.7	19.5	3.5	20.0

FIGURES

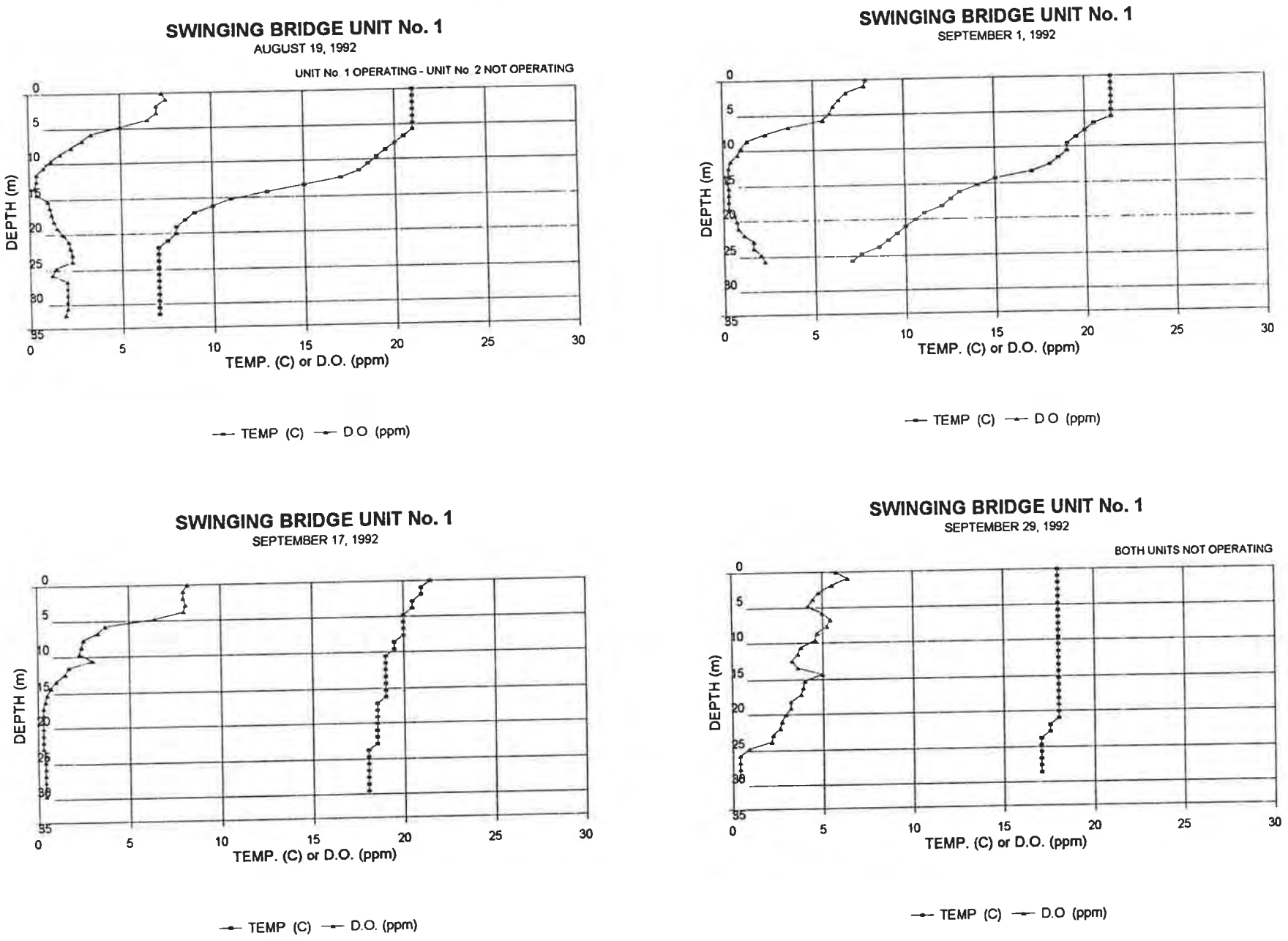
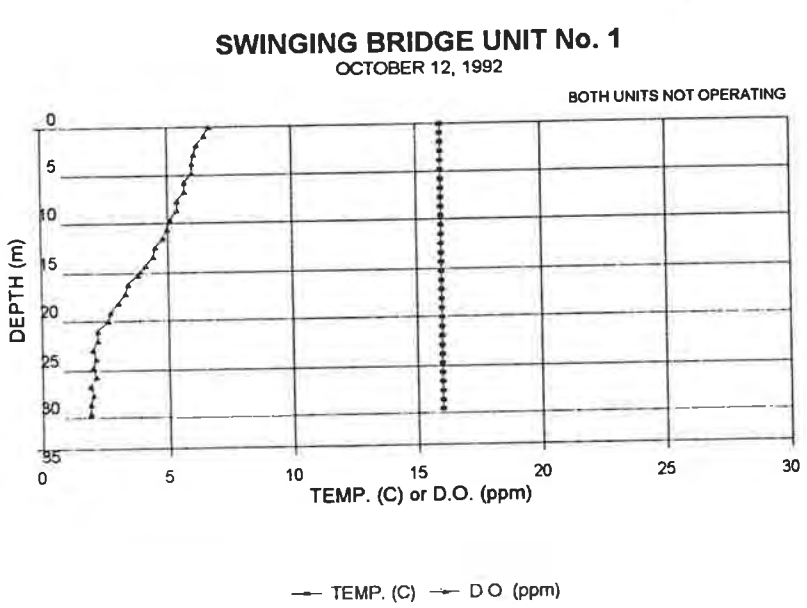
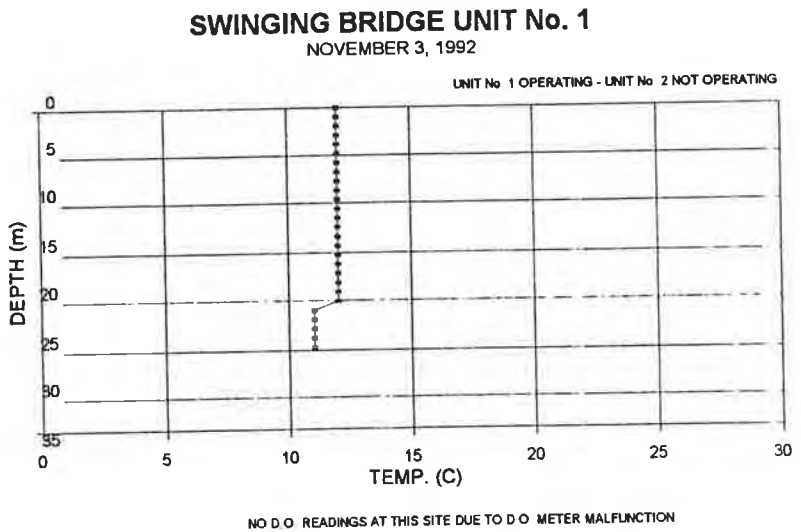
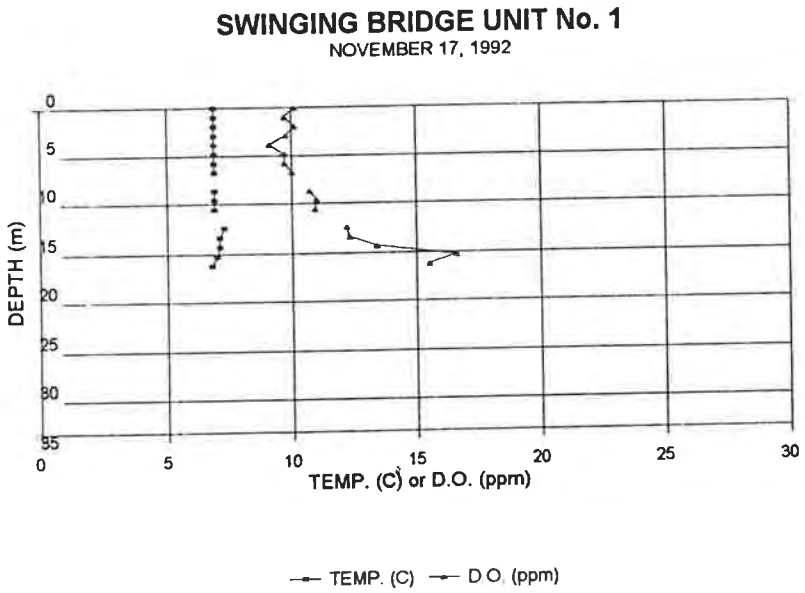


Figure 4a. Dissolved oxygen and temperature profiles collected at Swinging Bridge Unit No. 1 intake, August 19 - September 29, 1992.







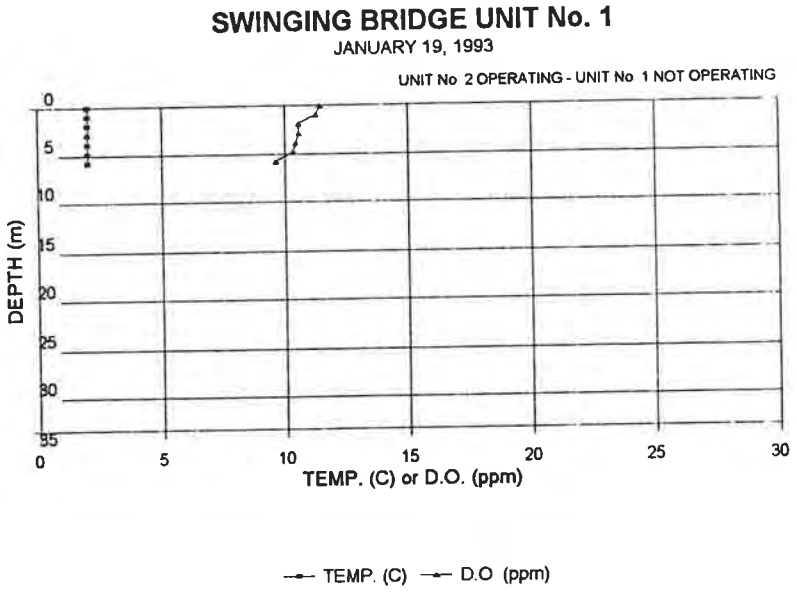
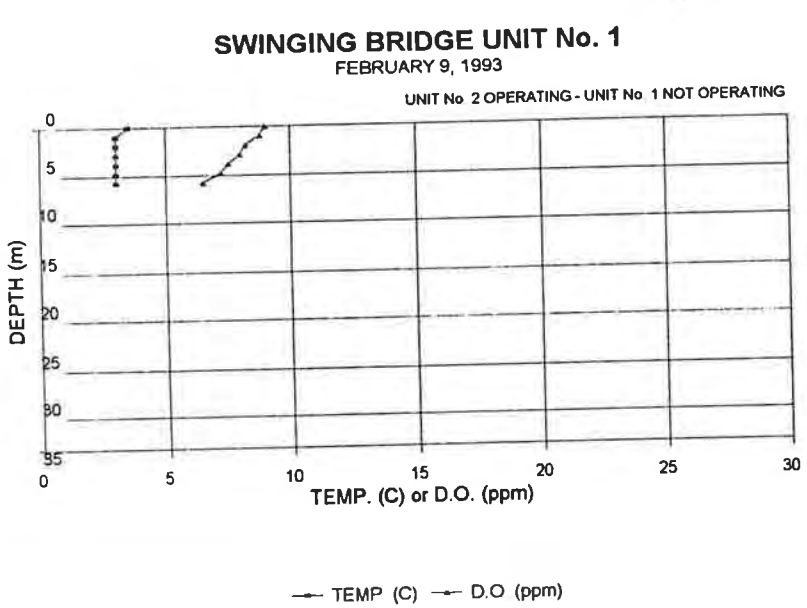
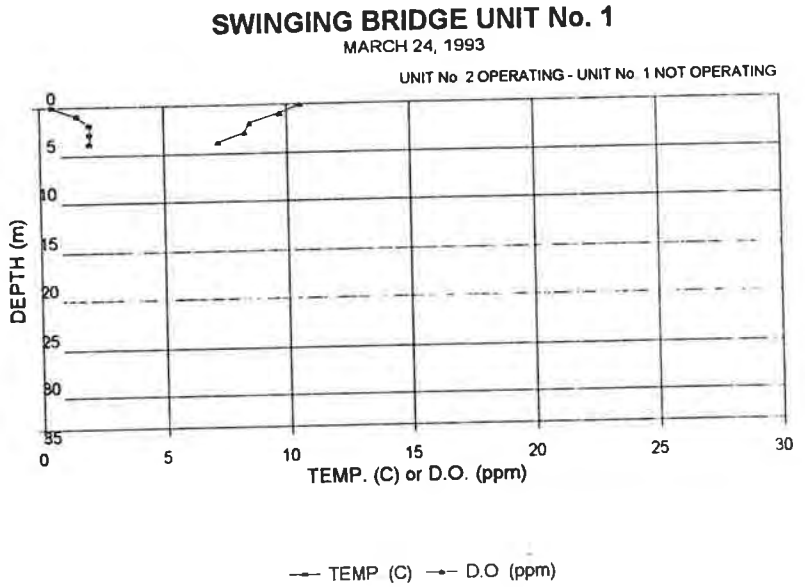
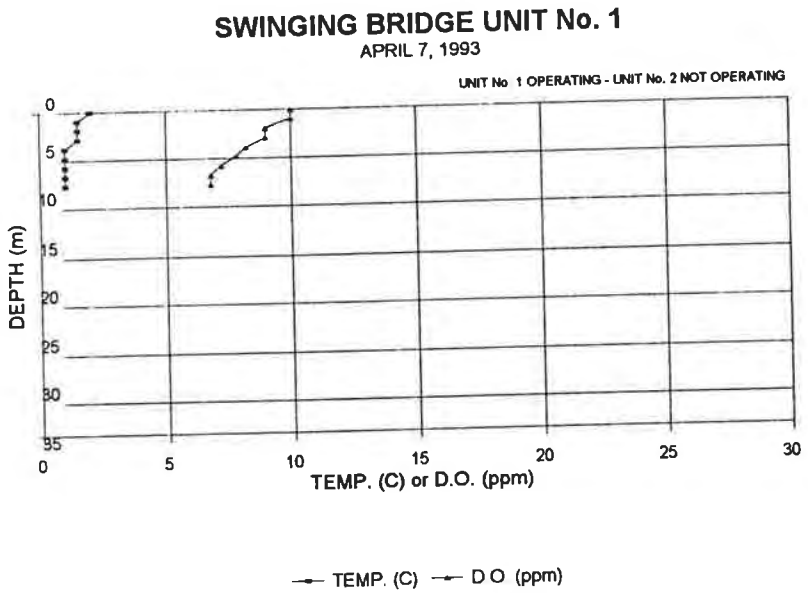


Figure 4b. Dissolved oxygen and temperature profiles collected at Swinging Bridge Unit No. 1 intake, October 12, 1992 - January 19, 1993.







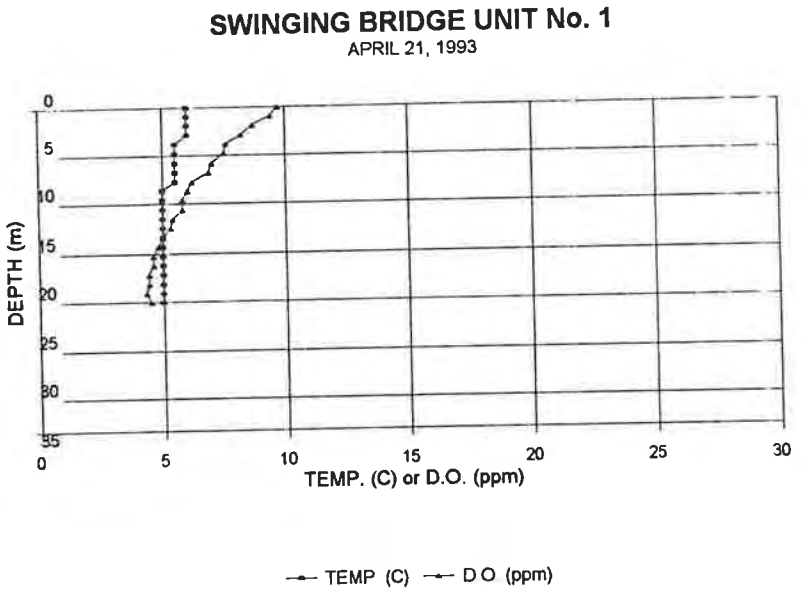
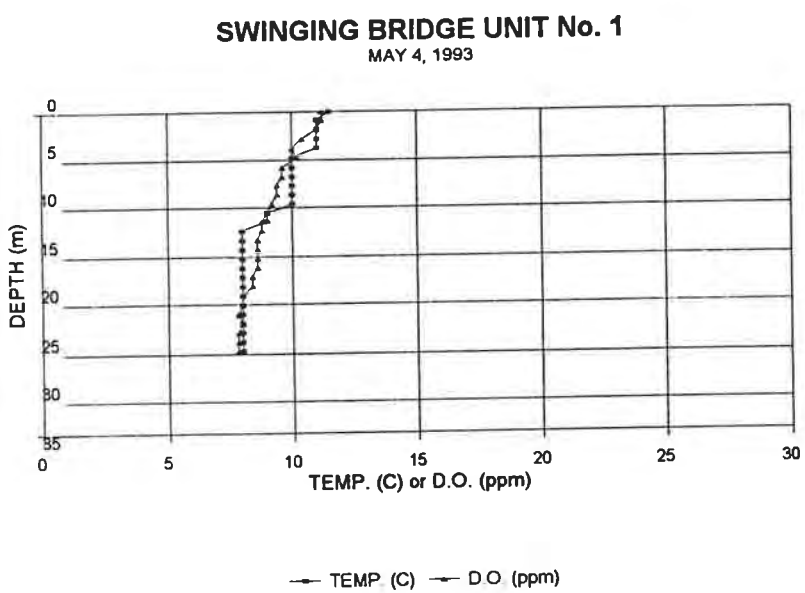
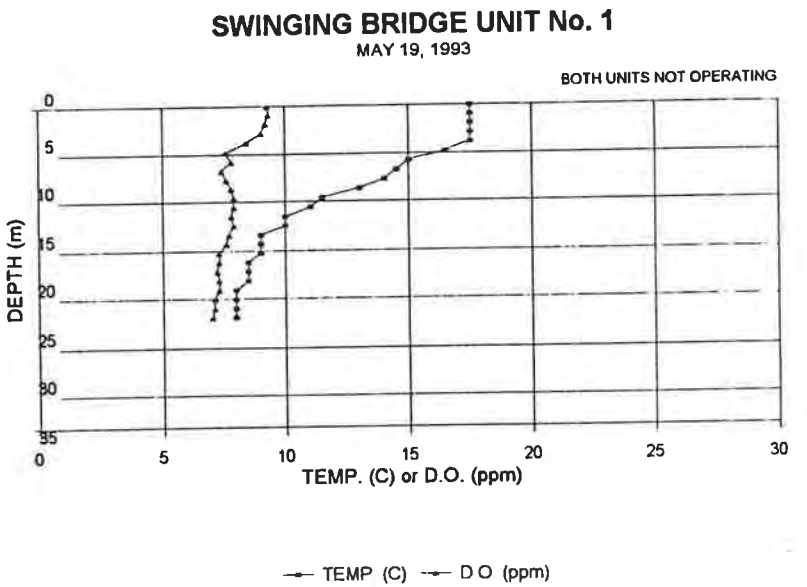
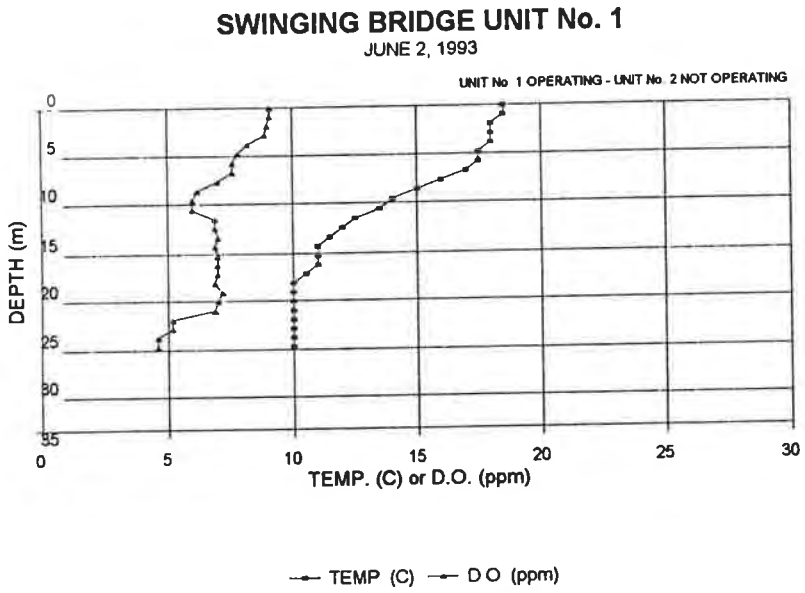


Figure 4c. Dissolved oxygen and temperature profiles collected at Swinging Bridge Unit No. 1 intake, February 9 - April 21, 1993.







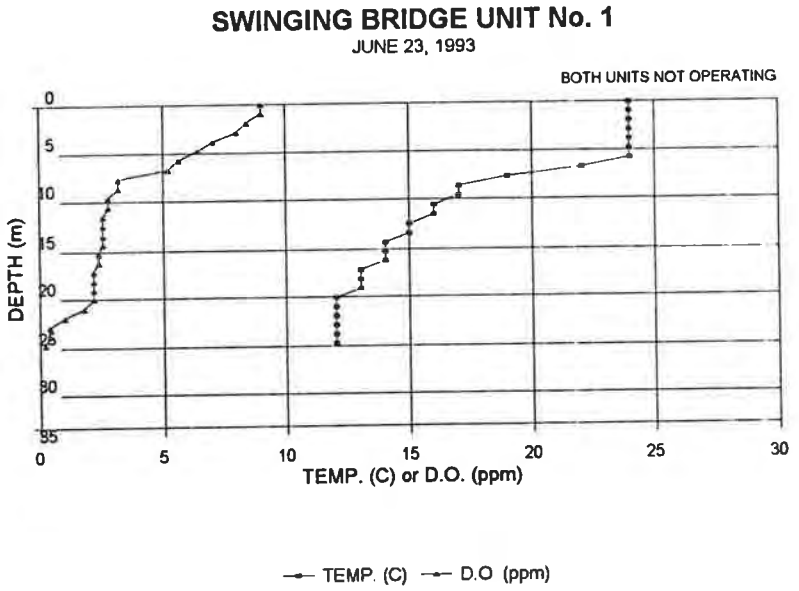
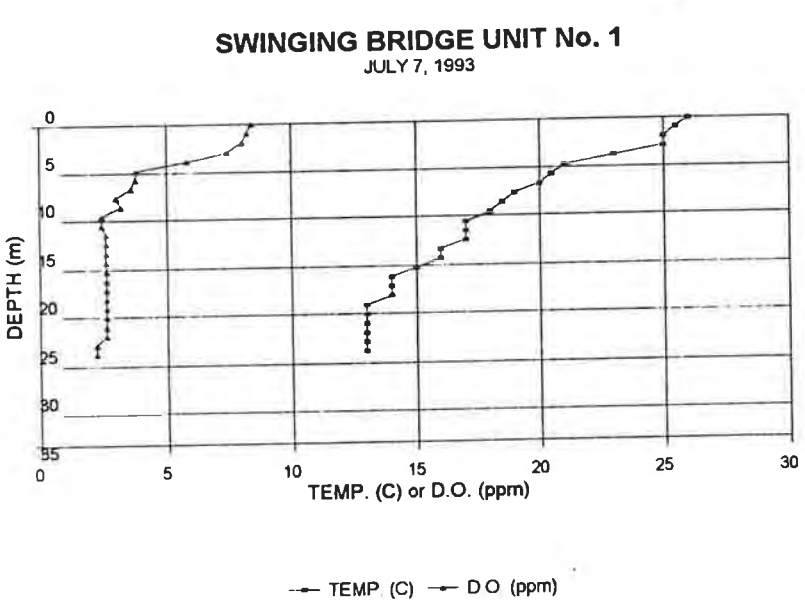
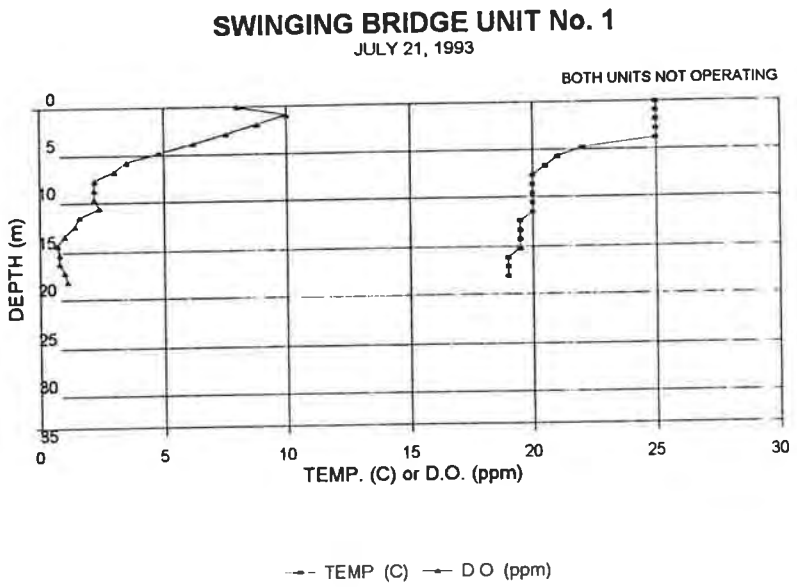


Figure 4d. Dissolved oxygen and temperature profiles collected at Swinging Bridge Unit No. 1 intake, May 4 - June 23, 1993.





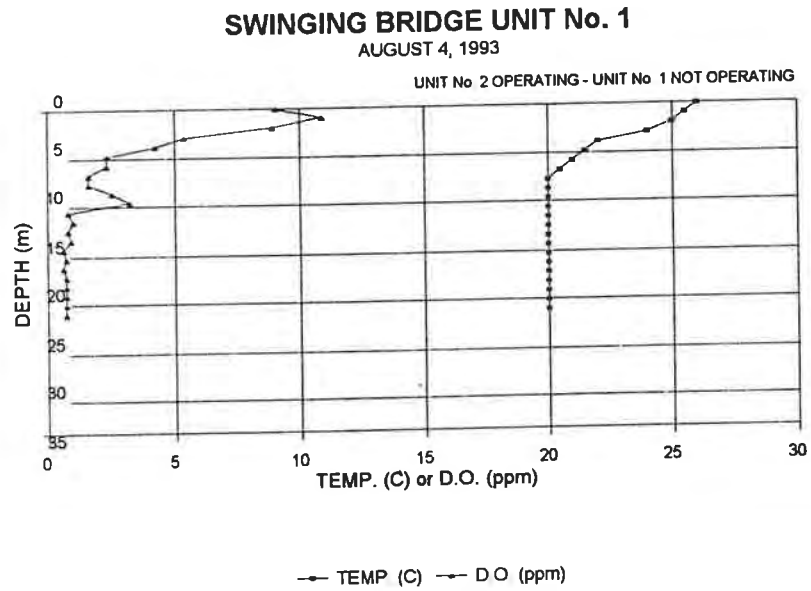


Figure 4e. Dissolved oxygen and temperature profiles collected at Swinging Bridge Unit No. 1 intake, July 7 - August 4, 1993.

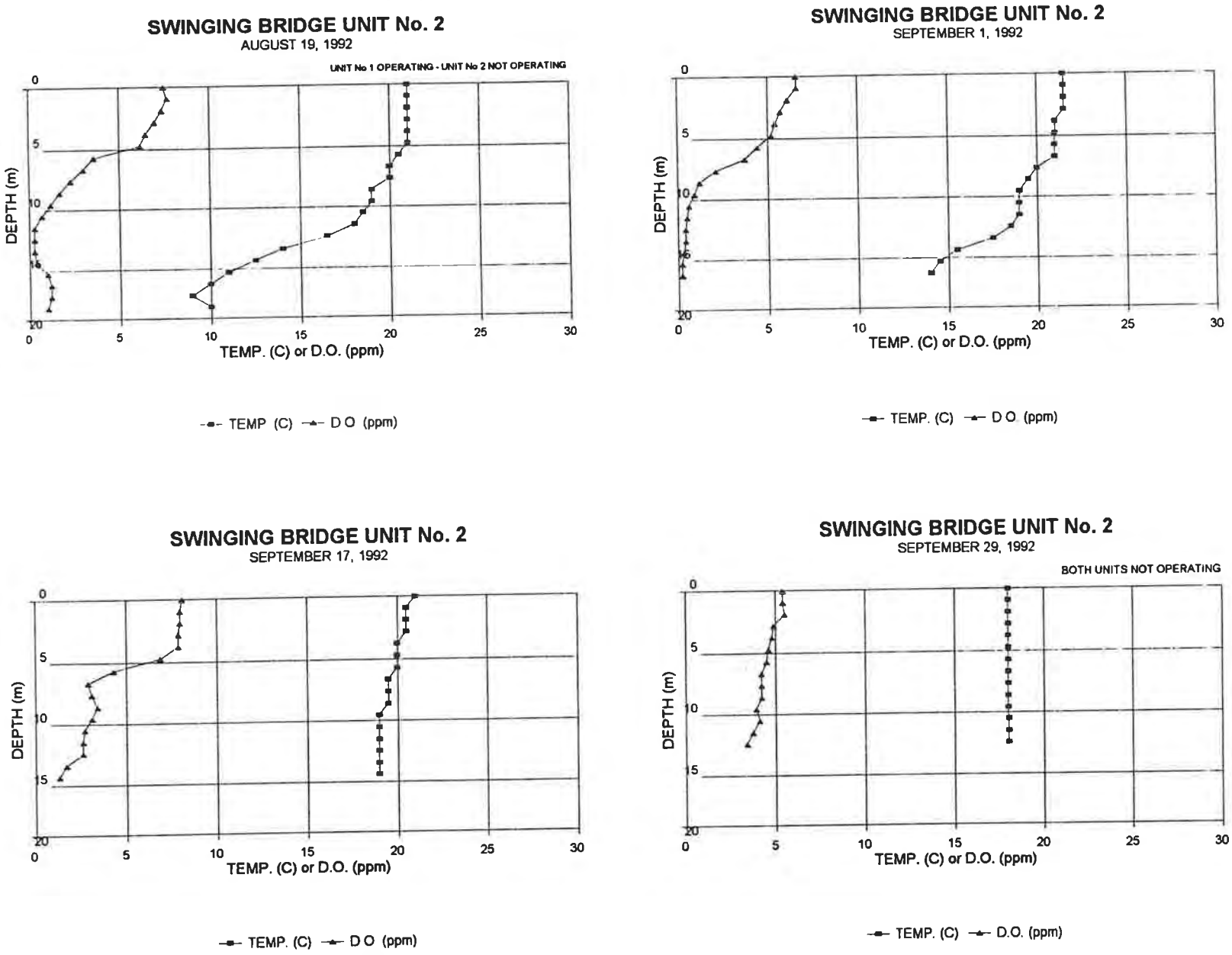
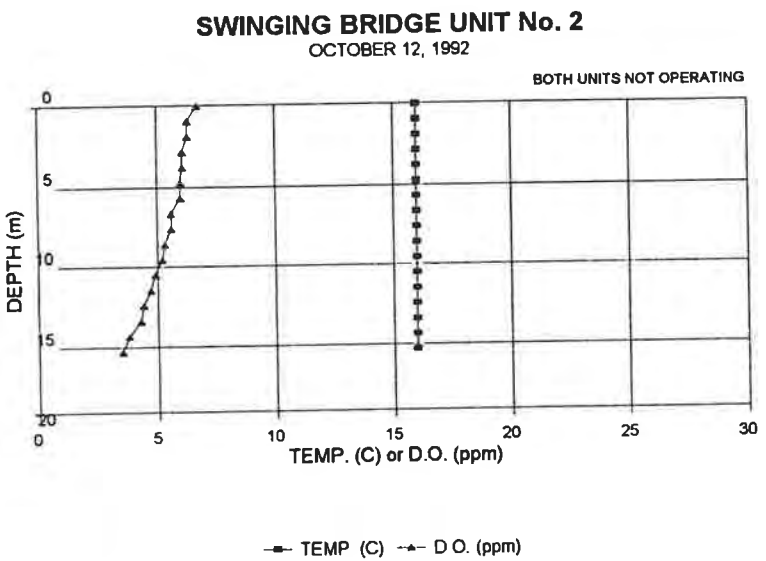
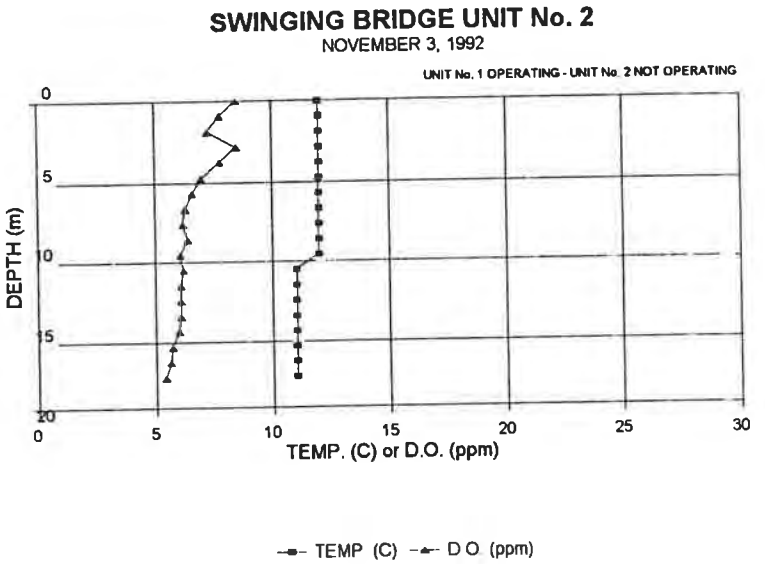
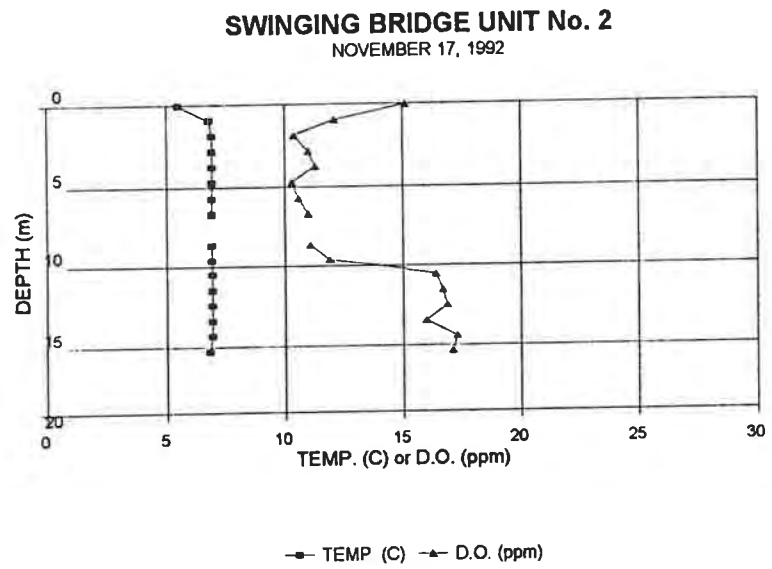


Figure 5a. Dissolved oxygen and temperature profiles collected at Swinging Bridge Unit No. 2 intake, August 19 - September 29, 199







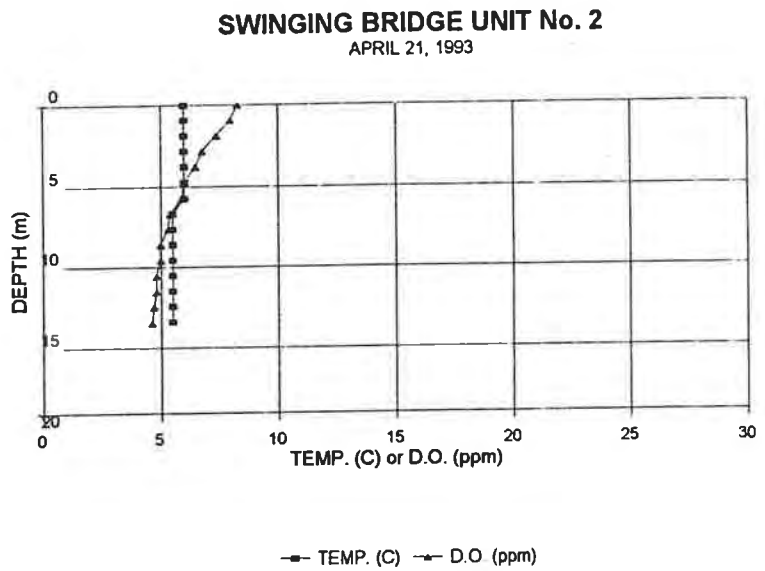


Figure 5b. Dissolved oxygen and temperature profiles collected at Swinging Bridge Unit No. 2 intake, October 12, 1992 - April 21, 1993.

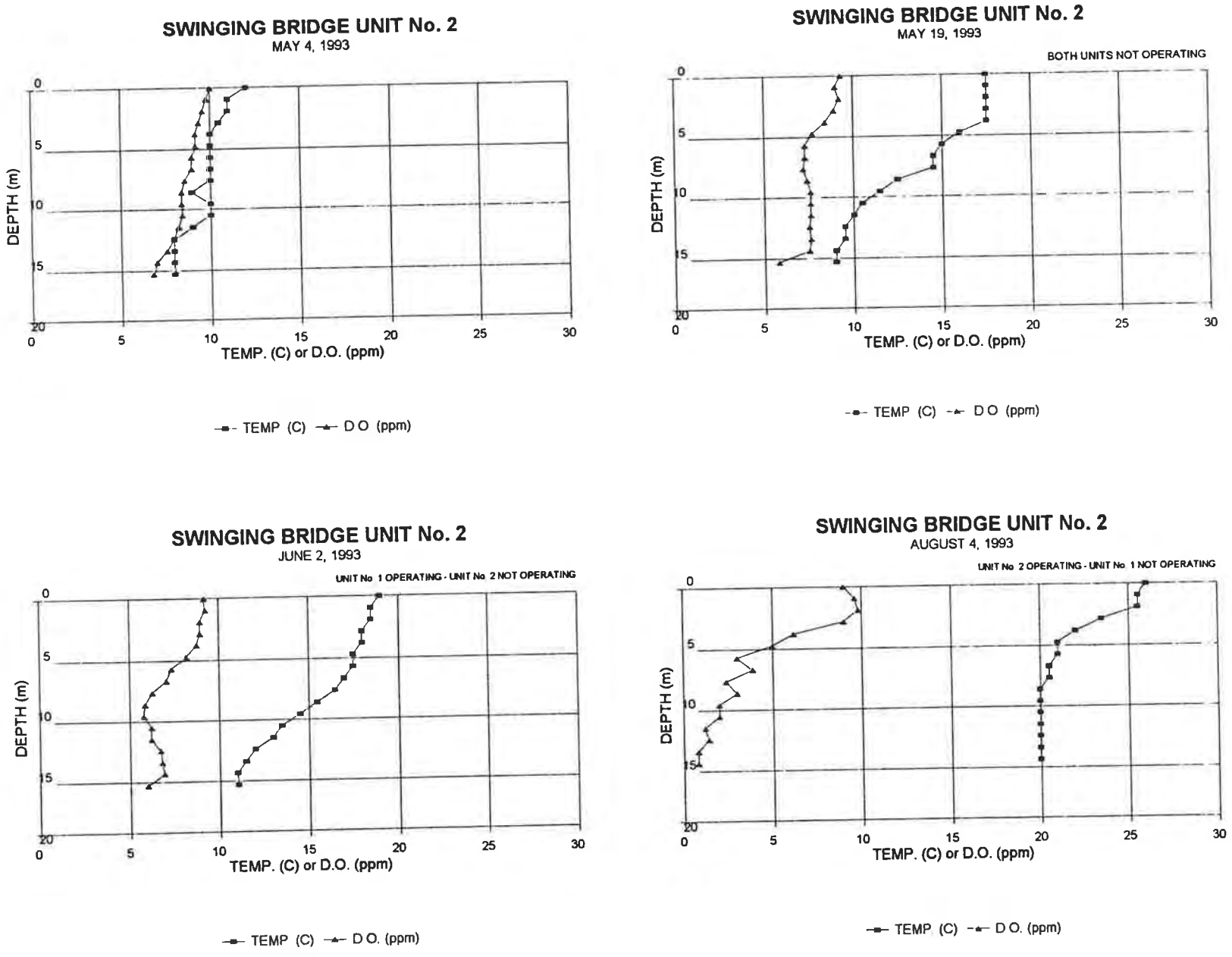
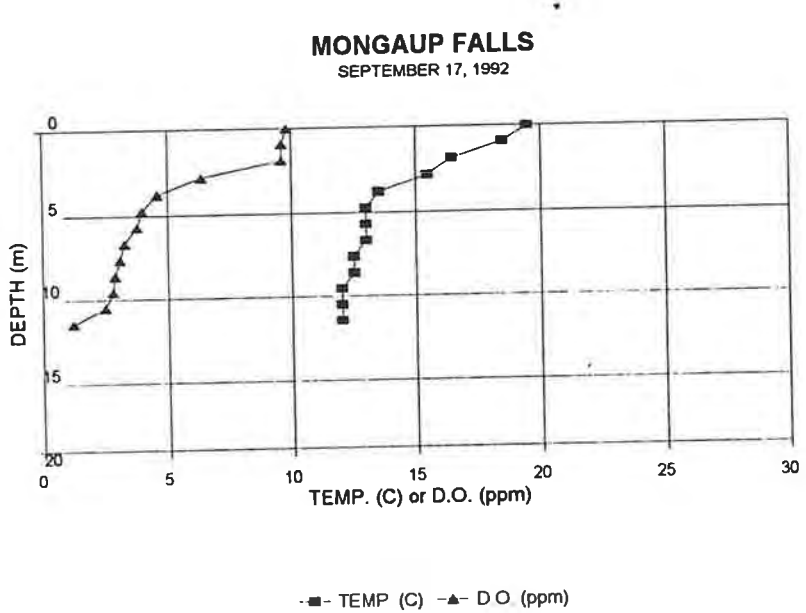
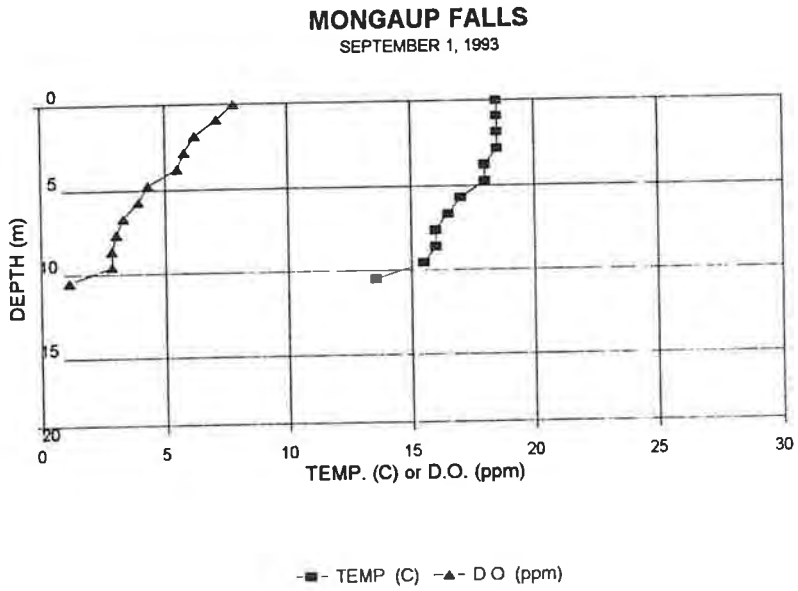
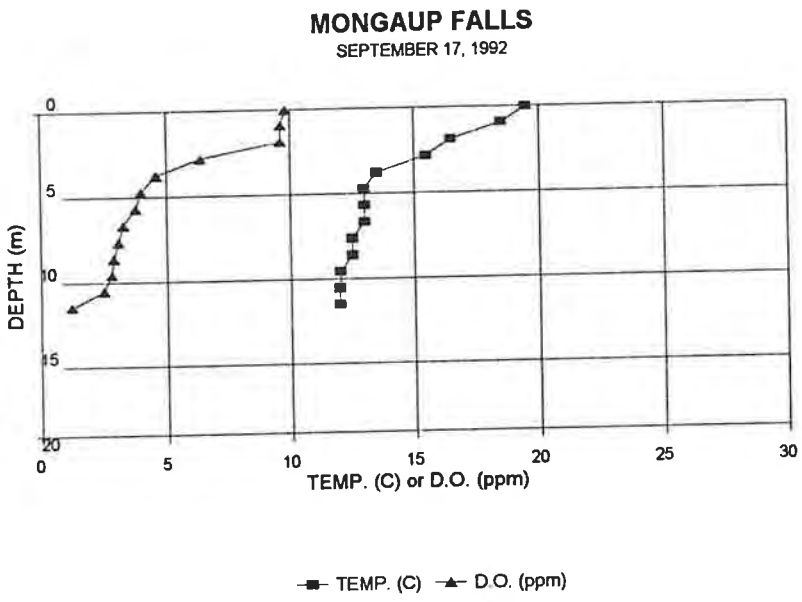


Figure 5c. Dissolved oxygen and temperature profiles collected at Swinging Bridge Unit No. 2 intake, May 4 - August 4, 1993.







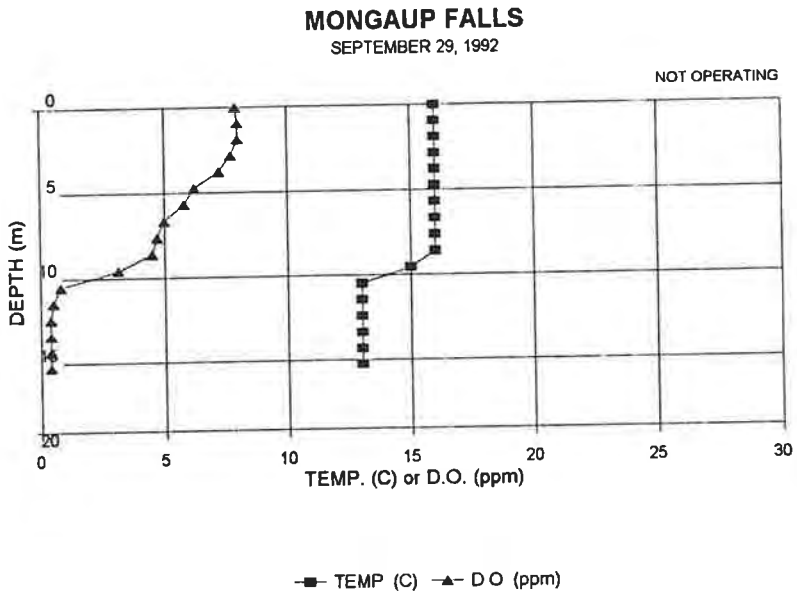
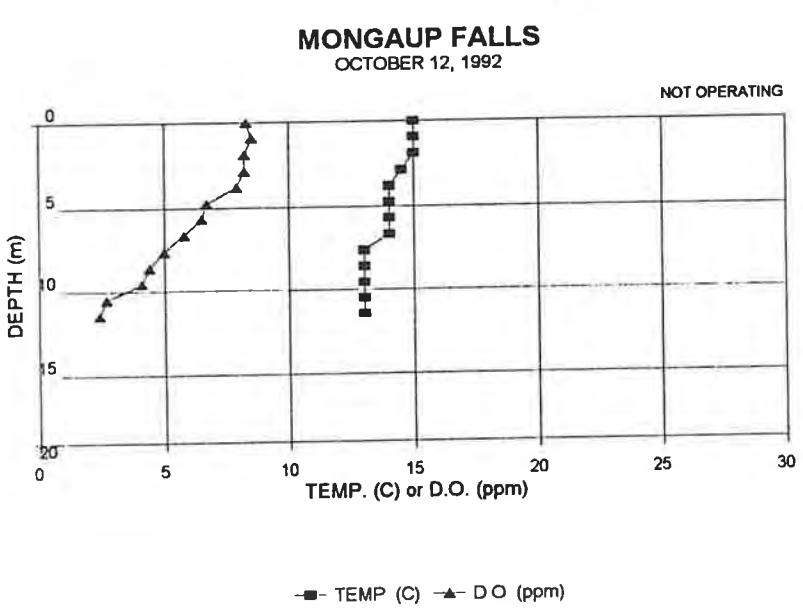
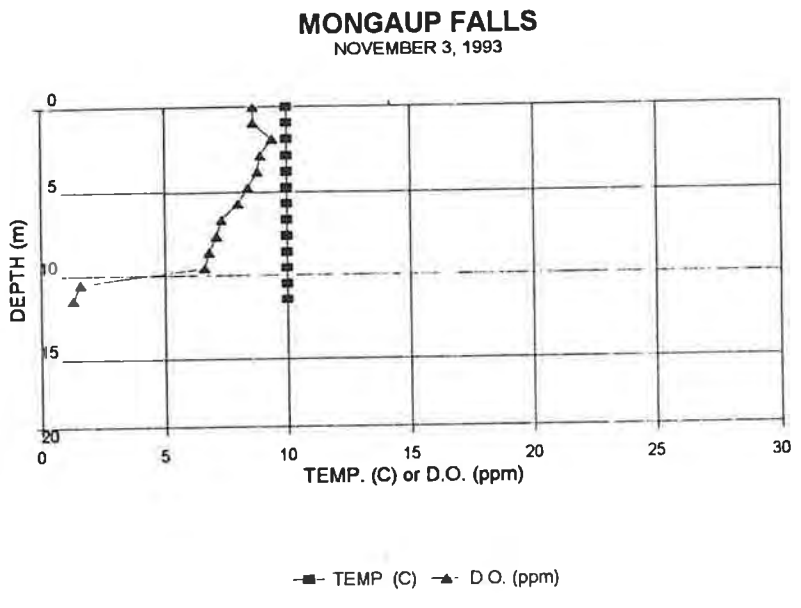
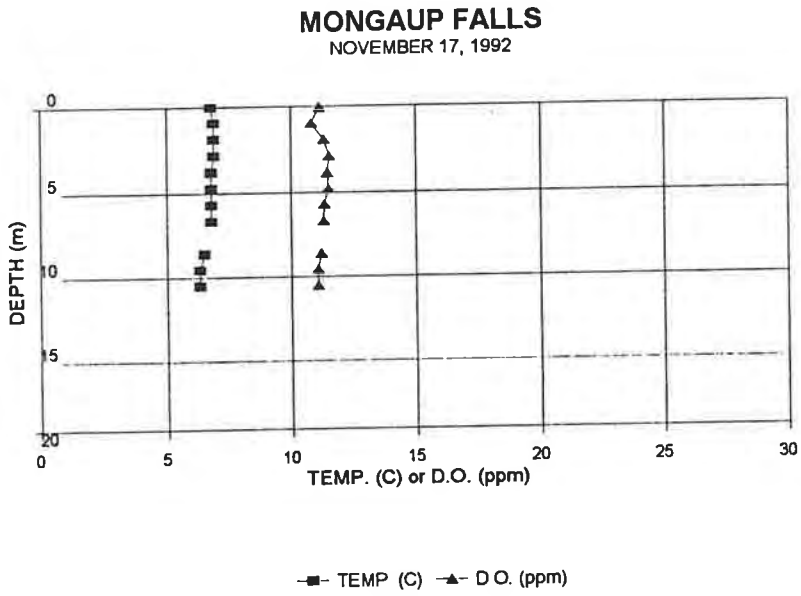


Figure 6a. Dissolved oxygen and temperature profiles collected at Mongaup Falls Project intake, August 19 - September 29, 1992.







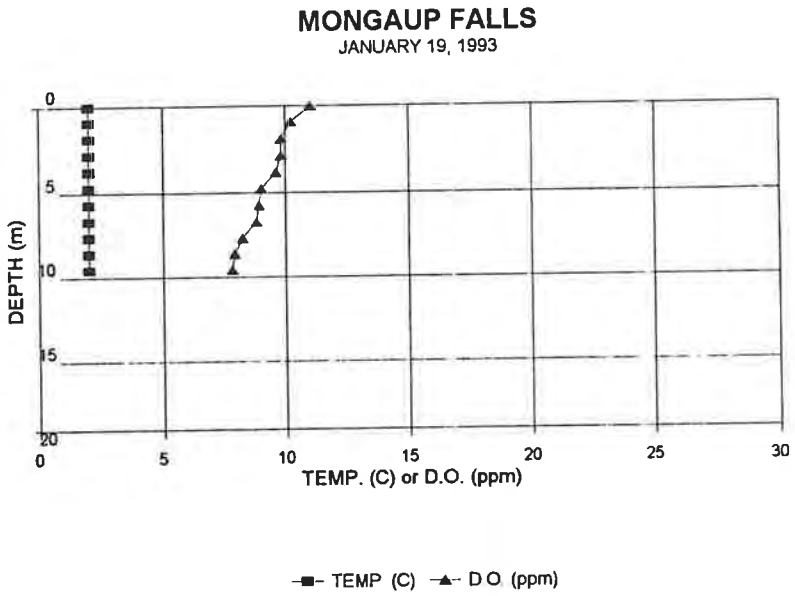
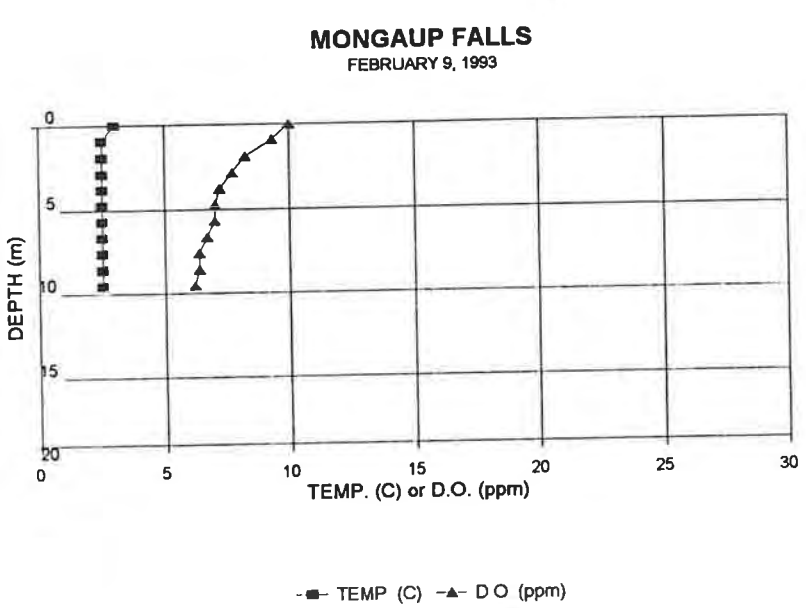
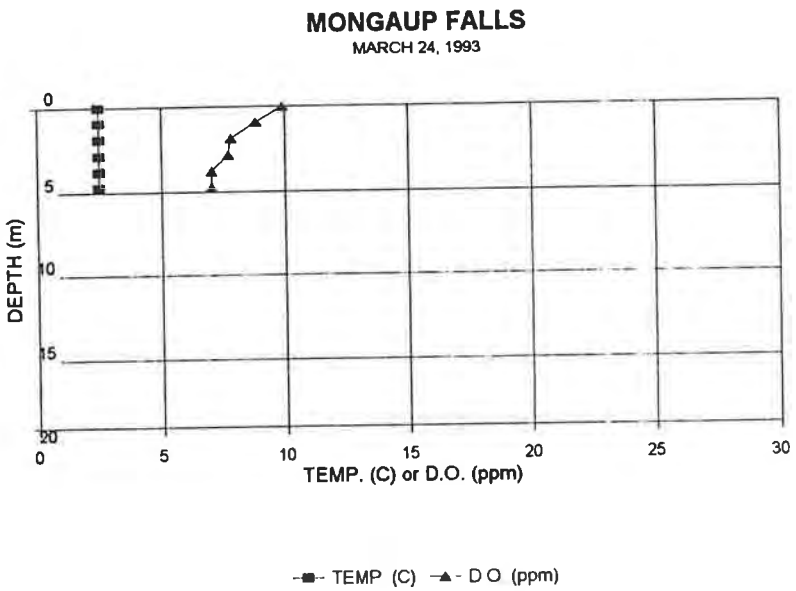
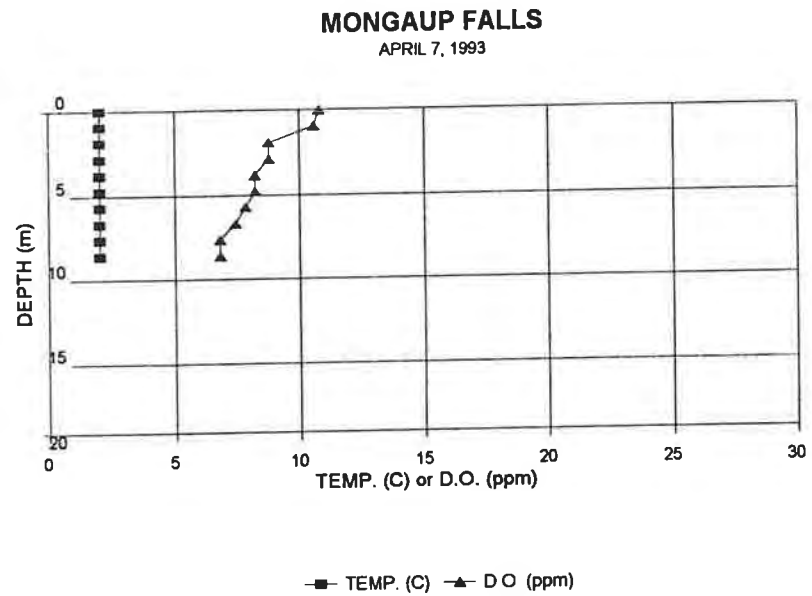


Figure 6b. Dissolved oxygen and temperature profiles collected at Mongaup Falls Project intake, October 12, 1992 - January 19, 1993.







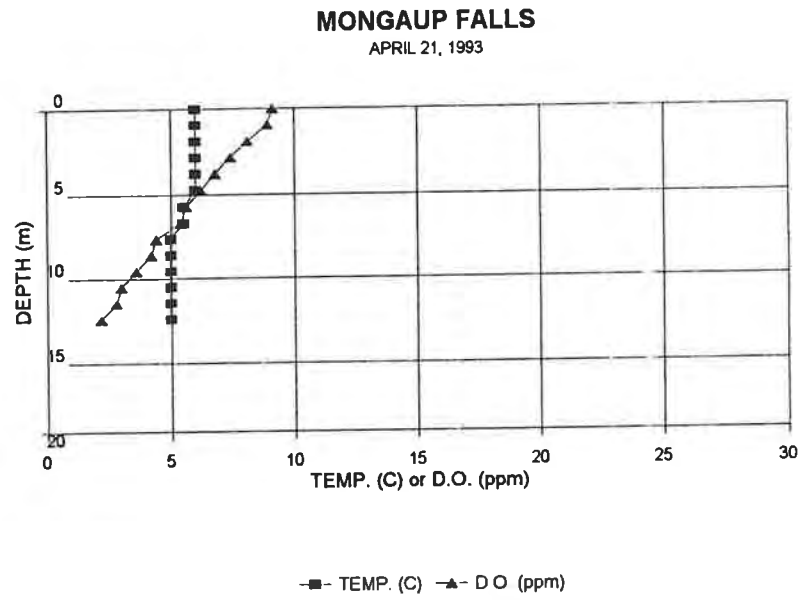


Figure 6c. Dissolved oxygen and temperature profiles collected at Mongaup Falls Project intake, February 9 - April 21, 1993.

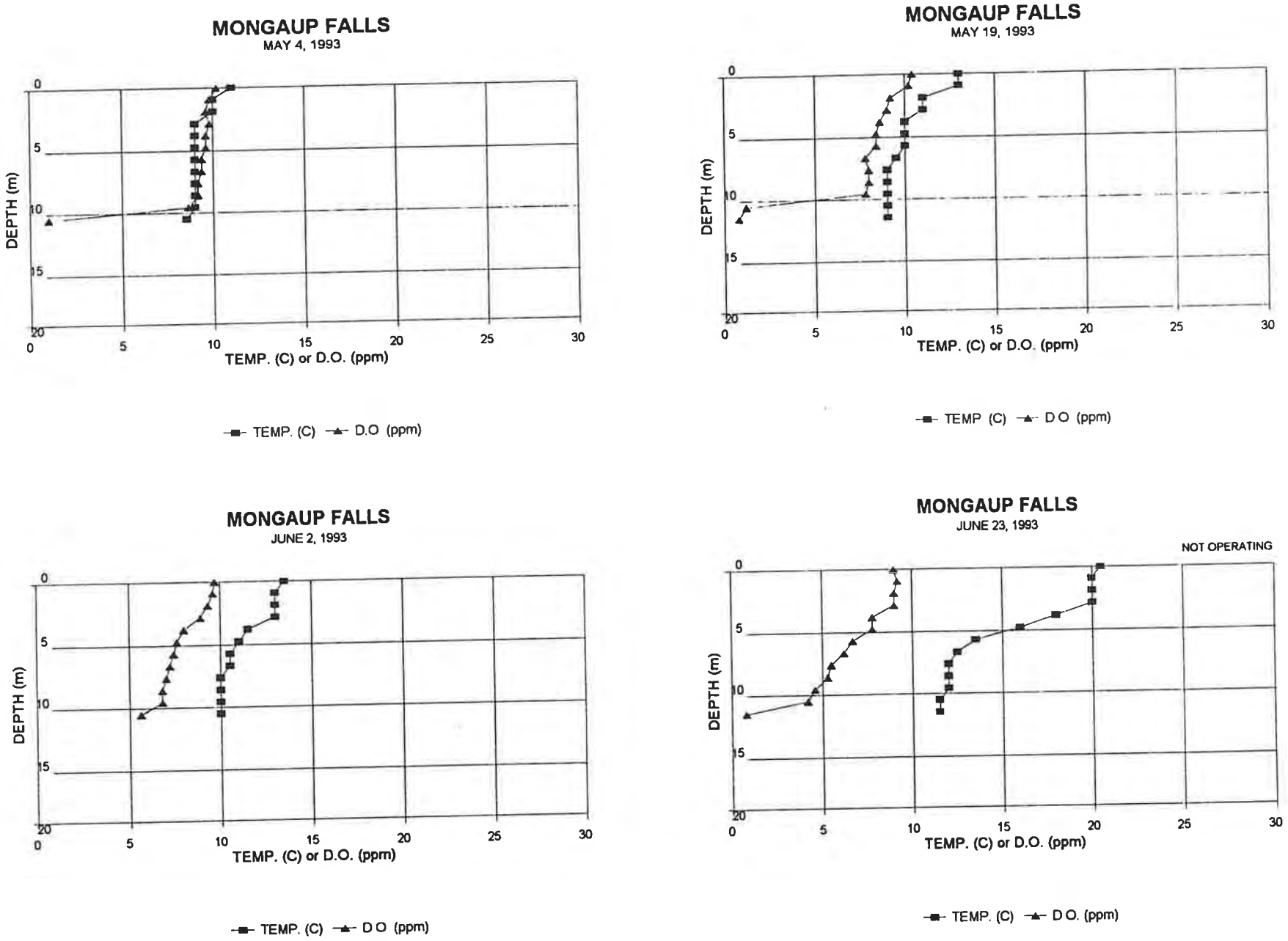
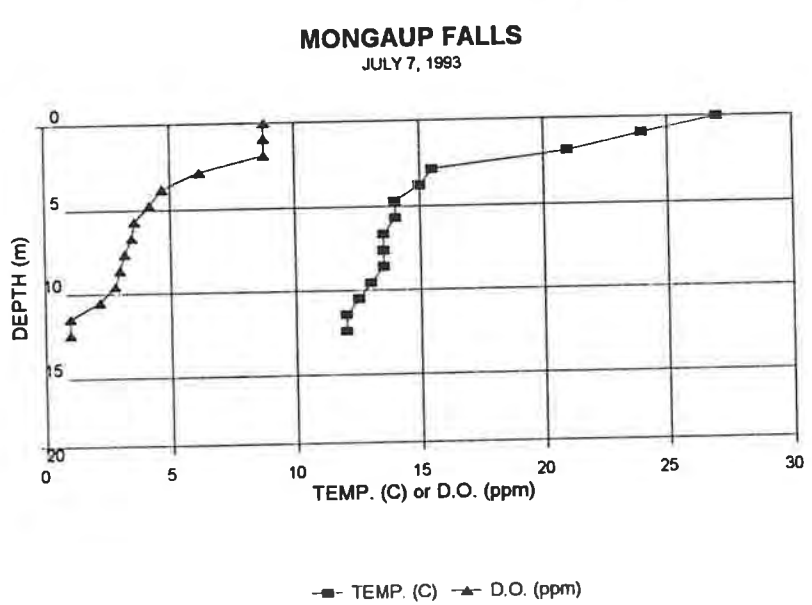
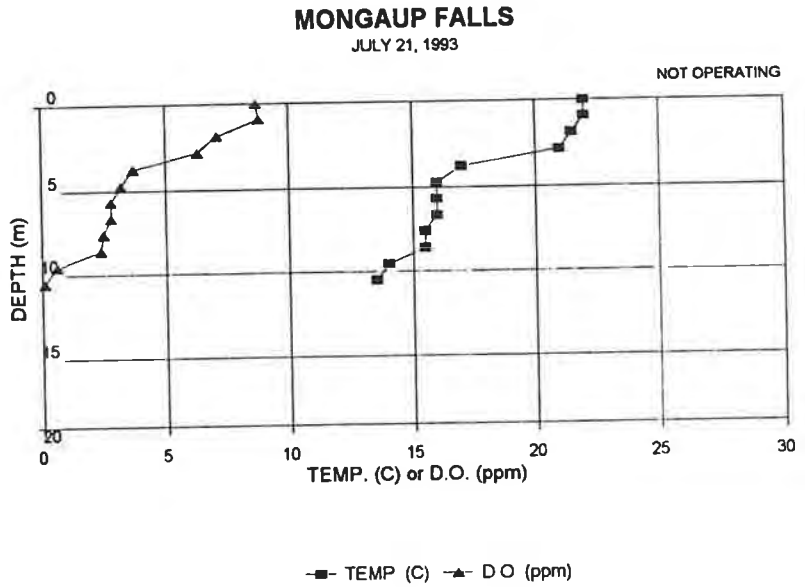


Figure 6d. Dissolved oxygen and temperature profiles collected at Mongaup Falls Project intake, May 4 - June 23, 1993.





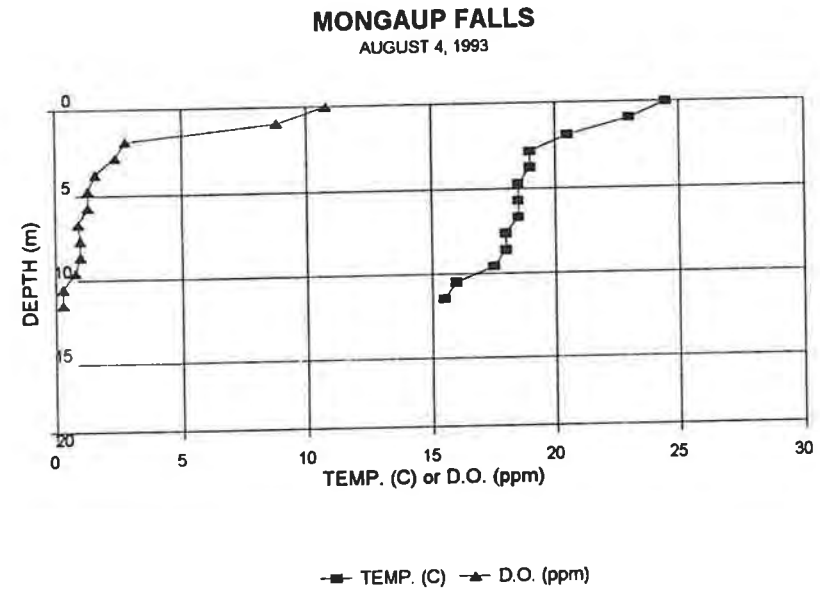


Figure 6e. Dissolved oxygen and temperature profiles collected at Mongaup Falls Project intake, July 7 - August 4, 1993.

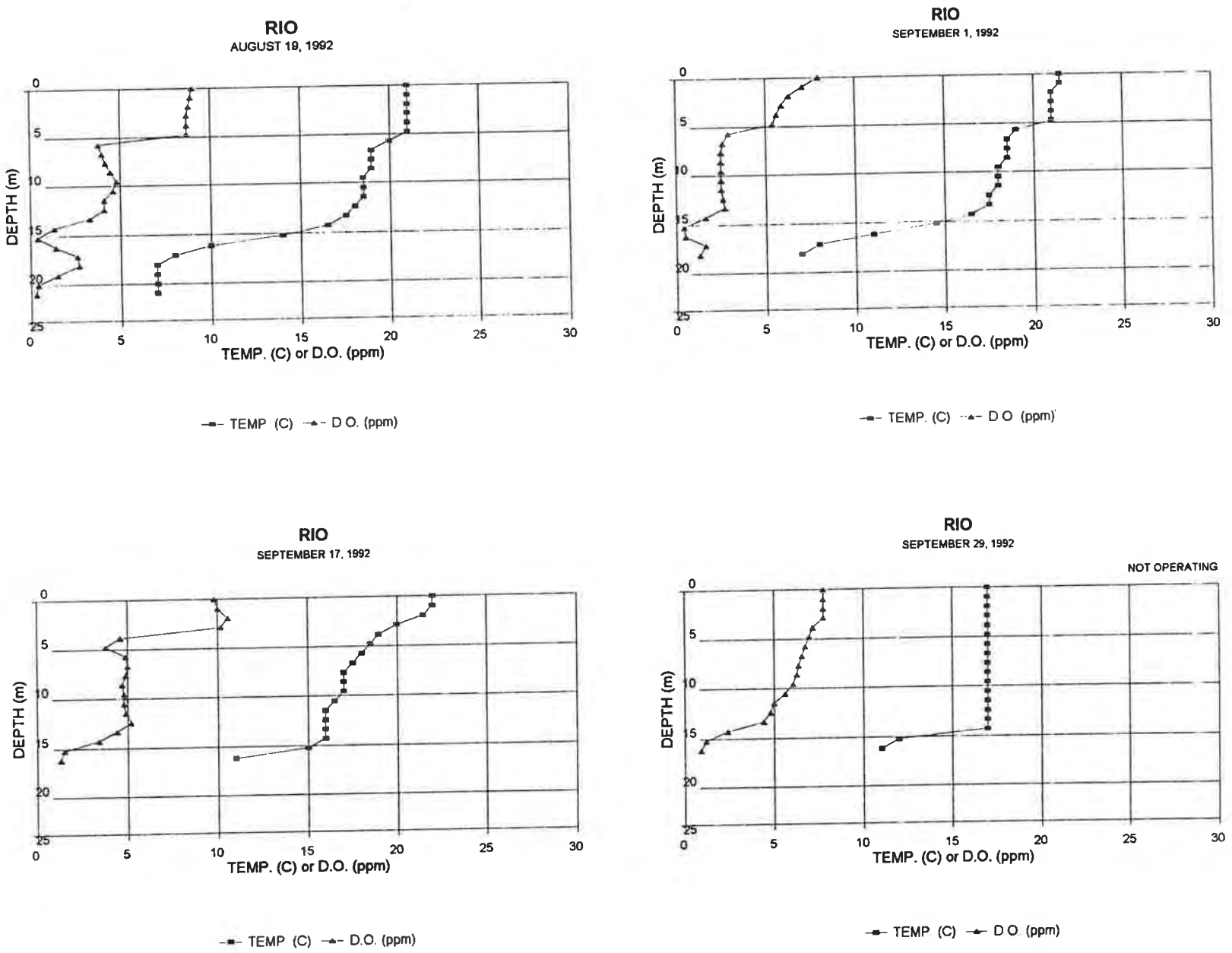


Figure 7a. Dissolved oxygen and temperature profiles collected at Rio Project intake, August 19 - September 29, 1992.

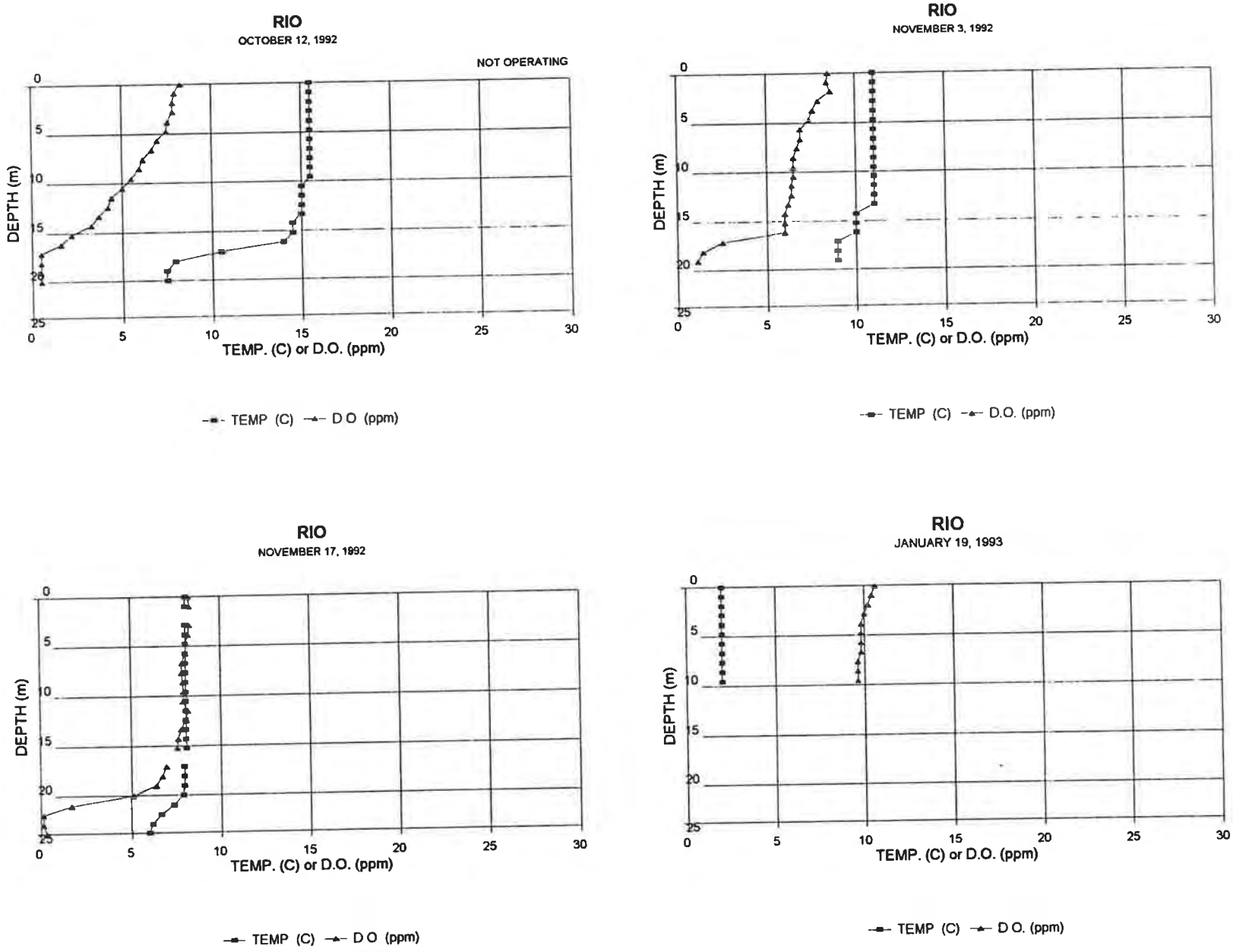


Figure 7b. Dissolved oxygen and temperature profiles collected at Rio Project intake, October 12, 1992 - January 19, 1993.

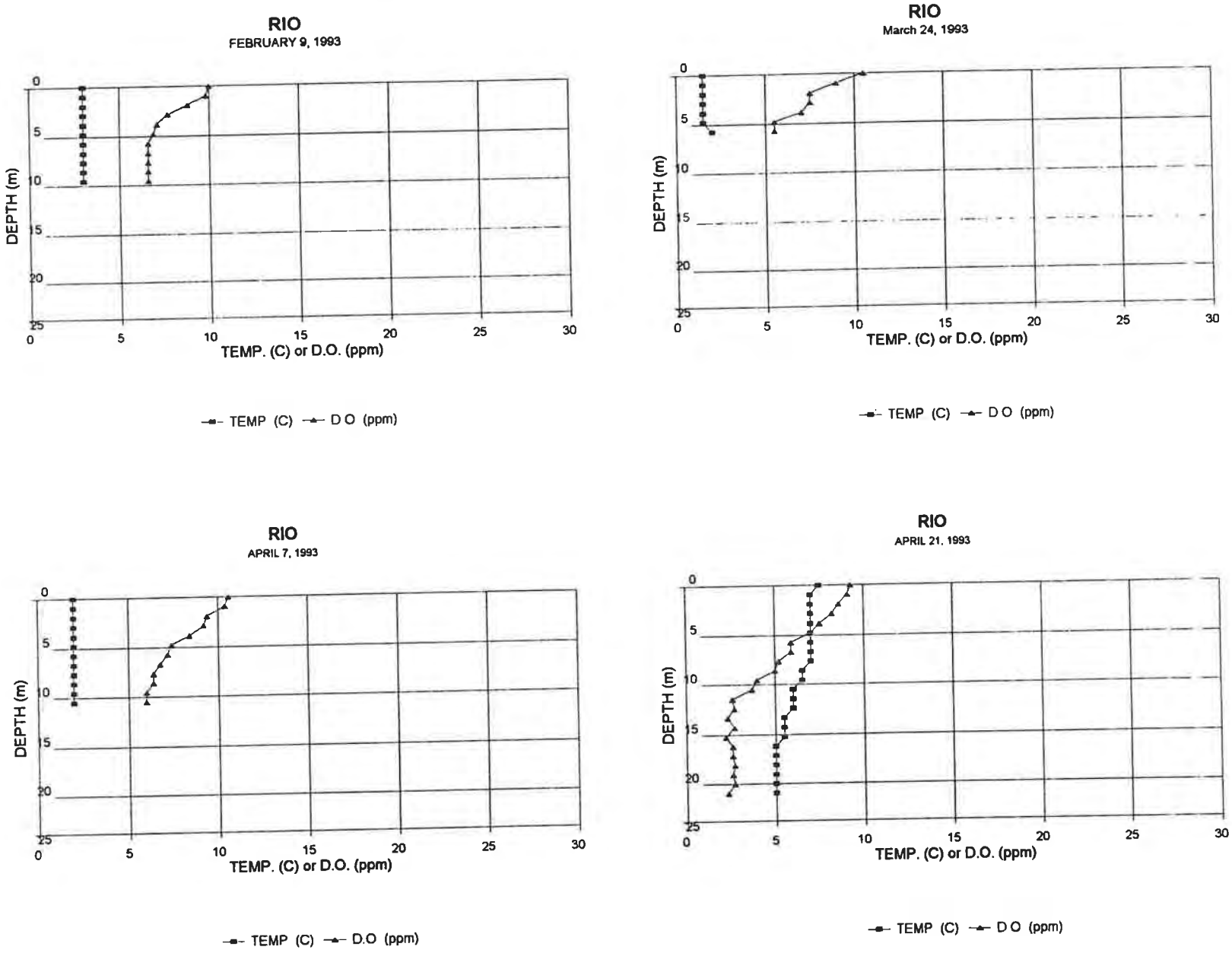


Figure 7c. Dissolved oxygen and temperature profiles collected at Rio Project intake, February 9 - April 21, 1993.

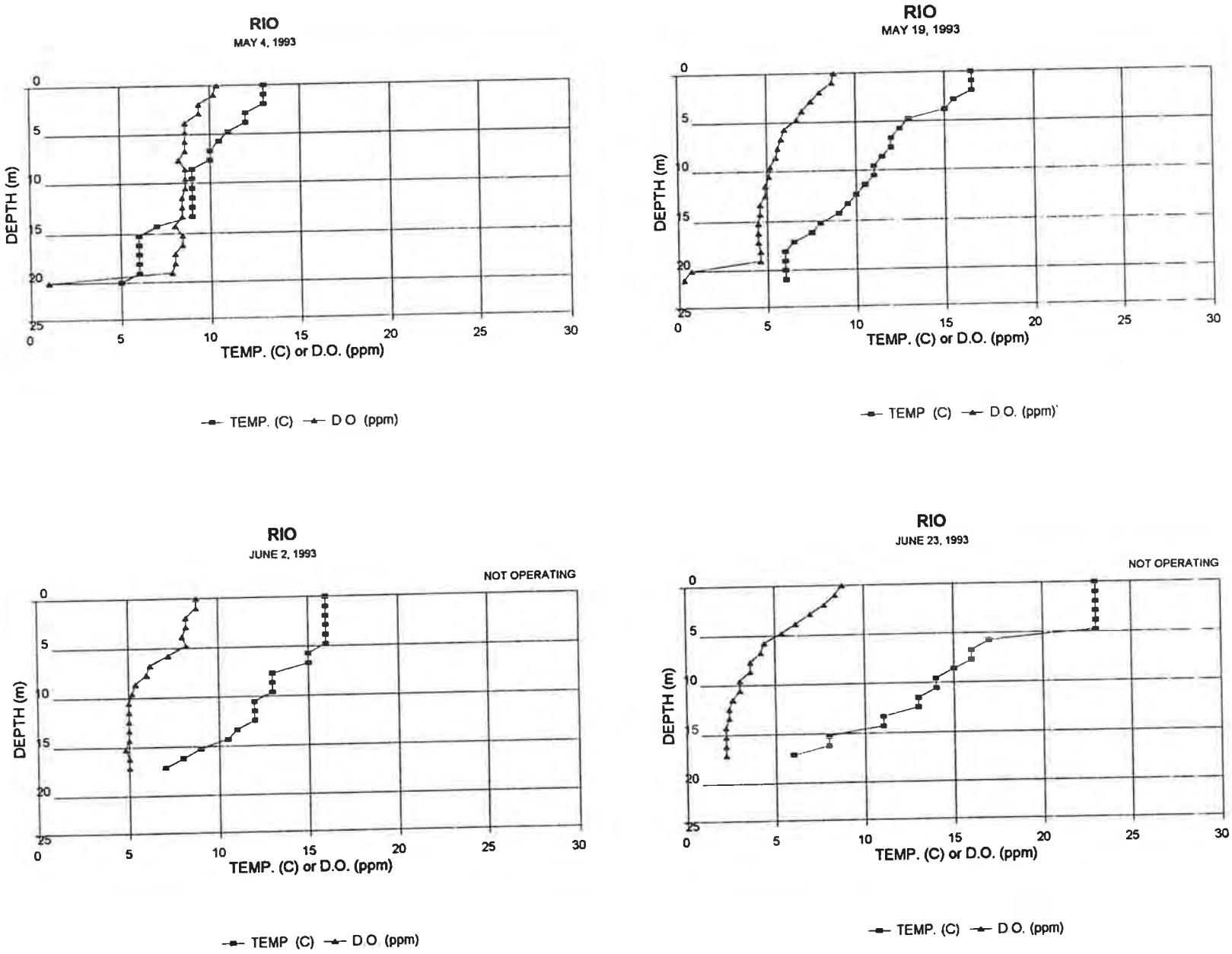


Figure 7d. Dissolved oxygen and temperature profiles collected at Rio Project intake, May 4 - June 23, 1993.

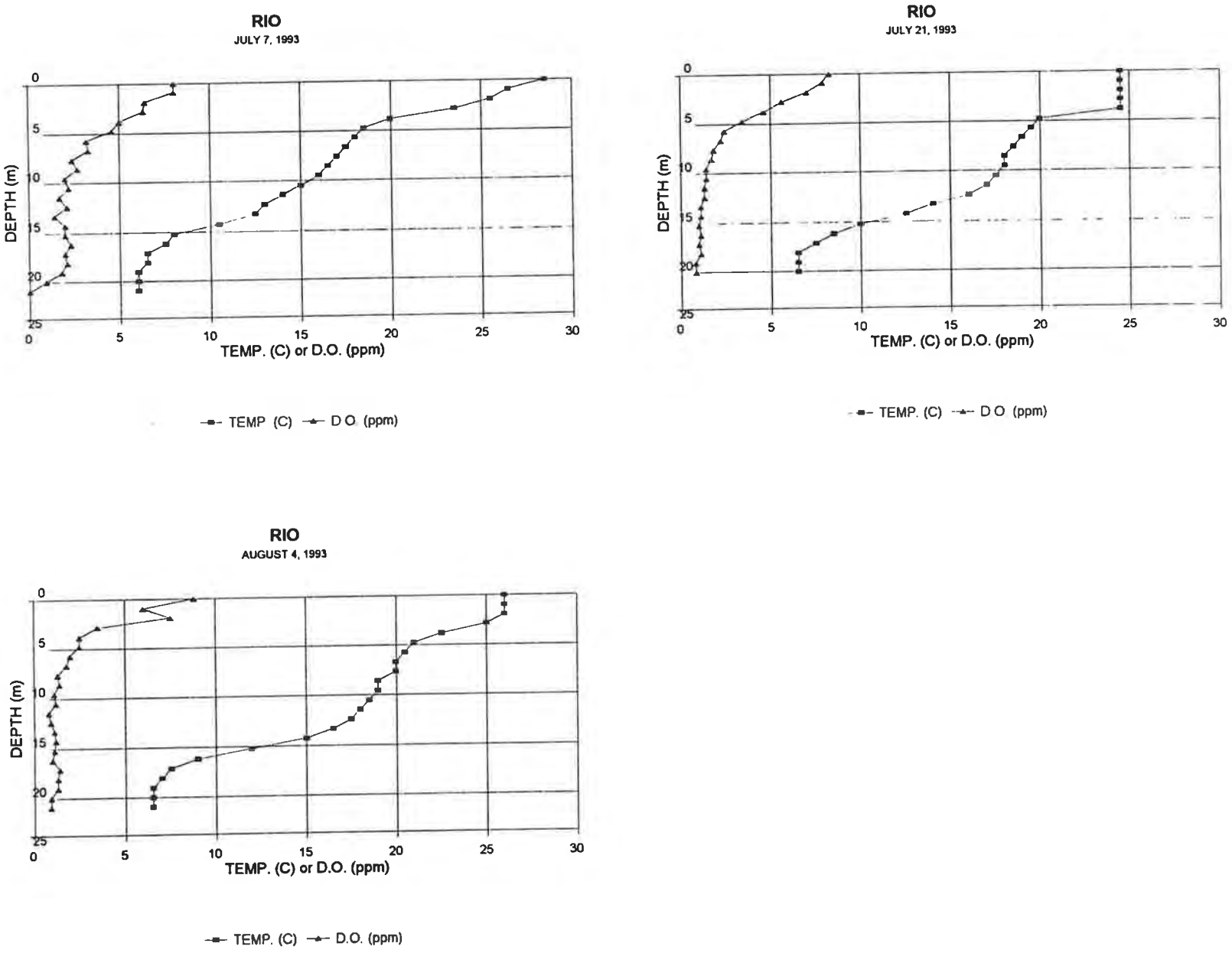


Figure 7e. Dissolved oxygen and temperature profiles collected at Rio Project intake, July 7 - August 4, 1993.

ATTACHMENT 1

Agency Correspondence

CONTENTS

Agency Correspondence

Letter from NYSDEC to ORU dated November 2, 1992

Letter from NYSDEC to ORU dated November 25, 1992

Letter from ORU to NYSDEC dated January 7, 1993

Letter from NYSDEC to ORU dated July 7, 1993

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

November 2, 1992

RECEIVED
NOV 06 1992
O.R.U., INC.
ENVIRONMENTAL SERVICES
DEPARTMENT

Mr. Robert T. Kosoir, P.E.
Manager - Environmental Services
Orange and Rockland
One Blue Hill Plaza
Pearl River, New York 10965

RE: Scope of Work
Entrainment Studies
Memorandum of Understanding
Between Orange and Rockland and the Department
of Environmental Conservation

Dear Mr. Kosoir:

The New York State Department of Environmental Conservation (DEC) has reviewed your proposed "Scope of Work, Entrainment Studies, Mongaup River Hydroelectric Projects". As required under the Memorandum of Understanding (MOU) Orange & Rockland (O&R) was to complete a study to determine the significance of entrainment within one year from the date of issuance of the Federal Energy Regulatory Commission (FERC) licenses. As we discussed earlier during our phone conversation, in order to meet the one year MOU time frame, you are presently gearing up at the Mongaup site.

Presently, we are not convinced that the September 8, 1992 monitoring plan, which limits monitoring to a single project (Mongaup Falls) will represent both the Rio and Swinging Bridge projects. Entrainment (according to the literature) at hydroelectric stations is very site specific. There are definite physical differences that makes the selection of Mongaup Falls as representative of both Rio and Swinging Bridge questionable. Specifically, Mongaup Falls has four (4) generating units with a plant capacity of approximately 620 cfs, a shallow intake with an intake velocity of 2.14 cfs, trashrack spacing of 1.7 inches and can operate for longer periods than the other two stations. Swinging Bridge has two separate powerhouses each with one generating unit for a total project capacity of 1,570 cfs, one deep and one shallow water intake with varying intake velocities of less than 1 foot per second and trashrack spacing of 2.6

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inches. Rio presents another very different situation. Each powerhouse has different characteristics, and therefore entrainment at each facility may be vastly different. Therefore, entrainment monitoring needs to be expanded to include all projects. We do have comments on your proposal that we would like to offer at this time.

Potential use of hydroacoustics is dismissed in a brief paragraph on Page 2. The reason given is that some studies indicate that, "...hydroacoustic information is inconsistent and does not correspond well with netting results..." Not all hydroacoustic studies have reached this conclusion. Further, many entrainment studies have demonstrated inconsistencies with net sampling (due to avoidance, extrusion, nonrandom distribution, etc.). Thus, entrainment conclusions based solely on net-obtained subsamples may be seriously flawed. Independent assessments obtained with other methods can help resolve questions of potential net bias.

Therefore, the use of hydroacoustic entrainment monitoring of the Mongaup River hydro facilities cannot be brushed aside as simply as the O and R document proposes. Specifically, we must request:

a. A synopsis of the literature and studies used to support their conclusion that hydroacoustics were not appropriate at the Mongaup River Projects.

b. A discussion of the logistics and cost associated with using hydroacoustic monitoring at one or more of the O & R stations.

c. A more complete discussion of the potential bias associated with the proposed net sampling (see #3 below).

Dissolved oxygen concentrations influence vertical distribution of live fish and thus are a major factor in entrainment vulnerability. Vertical temperature and oxygen profiles are proposed in the three reservoirs every two weeks except for the winter period (end of November through mid-March). Winter stratification of oxygen and organisms occurs as well, and fish are less active (and potentially more vulnerable to entrainment) at low winter water temperatures. Thus, the temperature and oxygen monitoring program should continue all year, with the caveat that some scheduled sampling may be precluded by ice conditions not suited to either boat or foot access to the sampling locations. Also, potential operational impacts to the existing population of over wintering bald eagles is a major concern to DEC, It is important to be able to compare

this winter data with winter netting as proposed in the alewife section.

Entrainment impacts at the three Mongaup River facilities will be largely estimated by net-obtained 8-hour subsamples obtained every two weeks at the Mongaup Falls tailrace over a one year period. The consultant or you must provide a complete assessment of how they plan to verify all potential sources of bias, including sampled vs. unsampled volumes, distribution of entrained organisms in the tailrace, net avoidance, net extrusion, and the influence of diel behavior and distribution patterns on entrainment.

It is also important that your consultants involved in this work are adequately apprised of eagle concerns/needs/sensitive areas within the study area, particularly to avoid disturbances during winter work activities.

In summary, we do not believe that the study as proposed is adequate. A revised study that addresses our concerns, must be submitted for review and comment before any entrainment study can be accepted (or rejected by DEC. Any sampling conducted prior to our approval may not qualify as part of the year of sampling as required under the MOU. A suitably modified program may require extension beyond 1993.

A site meeting at this time is appropriate. This would provide an opportunity to discuss fish entrainment, study alternatives and specifications. The 13th of November or any date after November 23rd would be satisfactory.

Please contact me at (518)457-2224 if you have any questions.

Sincerely,

Edward R. Miller

Edward R. Miller
Associate Environmental Analyst
Project Management Section

ERM:lk
cc: L. Cashell (FERC)
D. Shumway (FERC)
F. Springer (FERC)
M. Robinson (FERC)
A. Sidoti (FERC-NY)
L. Corin (USFWS)
R. Metsger (O&R)
File

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

November 25, 1992

Mr. Robert T. Kosoir, PE
Manager, Environmental Services
Orange and Rockland Utilities
One Blue Hill Plaza
Pearl River, New York 10965

RECEIVED
NOV 30 1992
O.R.U., INC.
ENVIRONMENTAL SERVICES
DEPARTMENT

RE: Mongaup River Hydroelectric Project
Scope of work for Entrainment Studies

Dear Mr. Kosoir:

The following supplemental comments are provided to assist you in the preparation of a systemwide entrainment study acceptable to the Department of Environmental Conservation (DEC).

-- As previously discussed, the differences in the physical configuration for these projects makes the proposal to select a single site as representative of all of the sites unacceptable. Entrainment has been shown to be very site specific and, considering the differences in the sites, all sites must be studied.

-- Second paragraph, page 1: As mentioned, we believe that studies have shown that entrainment is very site specific. While a literature review may provide some useful information, transferring that information to these sites is questionable. Specifications of the project including (but not limited to) head, intake configuration, turbine specifications, racks, intake velocities, turbine efficiency, species composition and tailrace configuration all affect entrainment and mortality.

-- Third paragraph, page 2: While published and unpublished reports many provide useful information, care must be taken to examine study design and ensure

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that all studies have undergone the appropriate peer and/or agency review. Peer and agency comments should be included in analyzing the usefulness of any studies.

4. Second paragraph, page 3: How the "point considered to be outside the immediate influence" is to be determined is not clear.

The additional profile suggested for Swinging Bridge to determine whether dissolved oxygen (D.O.) and temperature stratification are altered by project operations, should be performed at all sites where D.O. and temperature stratification may effect entrainment, not just a 1 site.

-- Third paragraph, page 3: D.O. and temperature profiles should be taken at all sites where stratification may affect entrainment. The sampling must be a year round program to look at seasonal difference, with the exception that sampling would be discontinued when ice conditions were unsafe.

profiles should also be taken just prior to start up of turbines to assess the potential that profiles (and therefore entrainment) would change during operation.

-- If, following discussions we accept tailrace netting as the method of study, then specifics on the net will be required, as such:

1. mesh size, interior and backing

2. configuration, i.e. live car

3. percent tailrace coverage.

-- Fifth paragraph, page 5: The specifics of when sampling will occur are needed. Diurnal versus nocturnal or crepuscular variations must be assessed. It would probably be necessary to sample for 24-48 hours continuously. Also, you will need to sample the full range of environmental conditions, such as flow variations.

-- For collections of more than 30 fish of one species, all fish measurements should include a range as well as a subsample.

-- If significant numbers of fish are collected during the winter, processing done at the lab should be minimized, and all fish possible returned to the tailrace.

-- Task 4 Availability of Alewives for Eagle Forage: Many

of the above comments also relate to this study. Placement of the nets in regards to surface may affect results. Specifics about the net positioning should be included.

Our meeting on December 2, will provide an opportunity to discuss these issues further. I apologize for not getting this information to you earlier.

Sincerely,

Bruce Ferral for

Edward R. Miller
Associate Environmental Analyst
Project Management Section

ERM:lk
cc: L. Cashell (FERC)
D. Shumway (FERC)
M. Robinson (FERC)
A. Sidoti (FERC-NY)
L. Corin (USFWS)
R. Metsger (ORU)
File

ORANGE AND ROCKLAND One Blue Hill Plaza, Pearl River, New York 10965

RECEIVED
JAN 11 1993

7 January 1993
File No. 657-001

Mr. Edward R. Miller
N.Y. State Dept. of Environmental Conservation
50 Wolf Rd
Albany, NY 12233

Dear Mr. Miller:

Orange and Rockland Utilities (O&R) and its consultants Stetson-Harza (S-H) and Lawler, Matusky and Skelly Engineers (LMS) have reviewed your letters of November 2 and 25, 1992 commenting on O&R's scope of work for entrainment studies at the Mongaup River hydroelectric projects. New York State Department of Environmental Conservation (DEC) comments cover four aspects of the scope of work:

A. DEC questions the representiveness of the entrainment sampling at Mongaup Falls for estimating entrainment at Rio and Swinging Bridge.

B. DEC requests more support for O&R's position that hydroacoustics is not an appropriate entrainment sampling methodology for the Mongaup hydro projects.

C. DEC requests an evaluation of all potential sources of bias in net sampling for entrainment.

D. DEC requests an extended DO sampling program through the winter months.

The following responses address these comments, as well as comments received at the December 2nd meeting and site visits to the dam and powerhouse at each facility.

A. Representativeness of Mongaup Falls Sampling

In developing the scope of work S-H and LMS reviewed the physical configurations of each hydro plant, particularly the intake and turbine designs, as well as the operating characteristics of each plant. They also reviewed available data on the fish communities and water quality in each impoundment. This review showed that Mongaup Falls would be a representative site for entrainment sampling for the following reasons:

- Depressed dissolved oxygen levels (DO) in Swinging Bridge, Rio and Mongaup Falls impoundments encompass the zone of withdrawal of these projects and restricts the distribution of fish to areas away from the intakes for much of the year. Recent data (see below) confirms earlier data which had been the basis for FERC's determination (Environmental Assessment for Hydropower License, September 17, 1991) that low DO, in particular, would limit entrainment much of the year at these units. FERC concluded that entrainment would continue to be insignificant and that there was no need to conduct entrainment studies at the projects.

- The fish communities in the three impoundments are similar, thus the factors influencing the distribution and movements of fish, which could bring them into the vicinity of the intakes, should affect entrainment in similar ways. Among the species in these impoundments, alewife is the only one expected to use the deep portions of the impoundments when DO is adequate to support fish life. The warmwater/ coolwater fish community common to these impoundments is expected to use the shallower depths throughout the year, thus Mongaup Falls, which has a shoreline intake is expected to have the highest potential for entrainment for species other than alewife.

- Water quality (DO) and fish distribution will have a much greater influence on entrainment rates than differences in the intake configurations. As DEC points out there are differences in the plant flow rates, trash rack spacing and intake velocities among the three plants, as tabulated below.

PLANT	MAXIMUM PLANT FLOW (cfs)	TRASHRACK SPACING (in)	INTAKE VELOCITY (ft/sec)
Swinging Bridge			
Unit 1	675	2.6	0.83
Unit 2	1,075	2.6	0.90
Mongaup Falls	620	1.7	2.14
Rio	870	2.9	2.64

Mongaup Falls plant flow is the lowest among the plants, but it is reasonably close to the others. Trashrack spacing varies among the plants, but the smallest spacing (at Mongaup Falls) is large enough to pass the full range of fish sizes which could be entrained. The variation in trashrack sizes will not be a selection mechanism which could bias the entrainment data. Intake velocity is relatively high at Mongaup Falls, thus to the extent that intake velocity influences entrainment, Mongaup Falls represents the best opportunity for entrainment among the plants.

In summary, Mongaup Falls has the greatest potential to entrain fish among the projects and should result in an overestimate of total entrainment when the Mongaup Falls data are applied to Swinging Bridge and Rio. In addition, the partial net sampling conducted at Swinging Bridge and Rio will provide an estimate of entrainment at these plants for the November to March period, when alewife

are expected to be entrained. While this sampling lacks the precision of the full draft tube net used at Mongaup Falls, and is intended to primarily evaluate the food resource for bald eagles, the data will provide a basis for comparing species composition, relative abundance and size distribution among the plants during the winter months.

B. Hydroacoustics

As part of the development of the scope of work, hydroacoustics was evaluated for estimating entrainment. In addition, LMS reviewed literature on the use of hydroacoustics at hydro facilities and drew upon its recent experience with hydroacoustics and netting to estimate entrainment at 11 hydro facilities in Michigan. As we discussed at the December 2, 1992, meeting, the capabilities and limitations of hydroacoustics to detect fish are well documented, but the problems of applying this technology to a hydro facility has received little attention to date. A recent paper by Downing et. al. (1991) and a review of entrainment sampling by Stone and Webster (1992) are the first technical papers to point out some of the problems of hydroacoustics for estimating entrainment.

With respect to the Mongaup hydros, the following factors represent major limitations for the practical application of hydroacoustics at these sites.

- Hydroacoustics is a subsampling technique, thus the representativeness of the samples is important if data are used to estimate total entrainment. The biases associated with hydroacoustics would be difficult to evaluate, and some probably cannot be quantified. Multiple counting of fish which do not pass immediately through the hydroacoustic signal has been observed and documented. This is a type of bias which cannot be quantified because it is a behavioral aspect of fish which will vary from species to species.

- Hydroacoustics cannot identify species, nor provide precise information on size distributions. Net sampling would be needed for these data. If net sampling can provide relatively unbiased estimates of entrainment (see Section C below), including species and size information, then hydroacoustics is at best redundant.

- Hydroacoustics is susceptible to false targets (debris and entrained air) which can result in overestimates of entrainment. As we observed at the Mongaup Falls intake on December 2nd, there was a vortex along the headwall entraining air into the intake flow. Electronic gating is generally used to reduce interference from background "noise". Gating imposes a fish detection limit of approximately 2 in., which could eliminate some potential fish targets from the sample. Initial net sampling at the Mongaup plants has collected entrained alewife in the 1 to 2 in. size range.

- Hydroacoustics is susceptible to power failures and relies on good quality phone lines. Frequent on-site system checks are needed to maintain the equipment, which is a significant cost to an hydroacoustic study.

- Hydroacoustics does not provide an independent estimate of entrainment, as suggested in the DEC letter, because netting is needed to evaluate the biases of hydroacoustics

and to provide species and size distribution data. Because netting and hydroacoustics have different biases, which, in the case of hydroacoustics cannot be quantified, they are not directly comparable. Experience at several sites (Downing et. al., 1991) has shown that hydroacoustics can overestimate as well as underestimate entrainment.

- The application of hydroacoustics to the Mongaup hydros, particularly Swinging Bridge and Rio, would be costly and difficult. The intakes at these plants are very deep, which would necessitate a major diving operation to install transducers. At Swinging Bridge, intake velocity is relatively low at the trash racks, which is the outermost accessible structure in the intake. There is no access port into the intake tunnels, which would be needed to install transducers in a relatively high velocity area. While hydroacoustics is generally described as a low cost methodology for estimating entrainment, application of this technology to the Mongaup hydros would be more costly than netting when all costs are considered.

O&R and its consultants believe that there are major limitations to the application of hydroacoustics to the Mongaup hydros which cannot be overcome. Hydroacoustics would produce a large volume of low precision entrainment data. Netting was selected for entrainment sampling because it is needed under any circumstances, and its biases can be eliminated or controlled in the development of an estimate of entrainment.

E. Biases Associated With Net Sampling

The DEC letters identify a number of potential sources of bias in net sampling, and the letters request that these sources of bias be quantified. The sources of bias identified by DEC were: avoidance, extrusion, non-random distribution, unsampled volumes, downstream entrainment and diel behavior patterns. The entrainment study program involves two types of net sampling which have different objectives, thus the response to this comment requires a distinction between the full draft tube net and the meter nets.

The draft tube net at Mongaup Falls is for the purpose of providing a reliable, quantitative estimate of entrainment by species. This net will also provide data on seasonal occurrence and size distribution by species. The data acquired with this net will be used to provide an estimate of entrainment at Swinging Bridge and Rio, taking into account the water quality conditions in these two impoundments. With respect to the draft tube net the potential biases identified above will have the following effects on the data base:

- Avoidance - Avoidance will not occur because the full flow is sampled; there is a tight seal on all sides of the net frame.

- Extrusion - Extrusion will not occur; the velocities in the net are too low to cause extrusion and the mesh has been sized to prevent fish from being squeezed through.

- Non-random distribution - The full flow is sampled, thus the distribution of fish within the flow will not influence the sampling efficiency.

- Unsampled volumes- The draft tube net samples at least 25% (100% volumes with one unit operating) of the total plant flow, which is carried in a common pipeline to the four units. There is no reason to believe that the unit equipped with the draft tube net is not representative because the four units are identical in design and flow rate. As requested by NYSDEC at the December 2, 1992 meeting, collection efficiency tests involving controlled releases of marked fish will be conducted at the Mongaup Falls plant to quantify the collection rate at the unit being sampled (see Attachment 1).

- Downstream entrainment - Entrainment of fish from the tailrace cannot occur because the net frame is sealed in the log slots; fish living under the powerhouse could be entrained, this will be minimized by running the unit for a short period of time before the net is installed.

- Diel behavior effects on entrainment - The peaking entrainment operation at Mongaup Falls can span the time during which there is a change from daylight to darkness. The sampling program will be modified so that separate samples representing these two lights conditions are obtained during the regularly scheduled surveys.

The meter nets at Swinging Bridge and Rio are for the purpose of obtaining baseline information on the major food source for bald eagles wintering in the area. These data will provide relative abundance and size distribution data for alewife, which are known to be entrained during the winter months. With the use of flow meters in the nets it will be possible to estimate the total number of fish entrained, but the objective is relative abundance data to compare among plants and to look at differences over the winter period. The potential biases would effect meter net data in the following ways:

- Avoidance - Fish could avoid the nets, but observations have shown that alewife exiting the plant are generally drifting passively; other species may be more mobile, but the nets were designed (large filtering area) to reduce back pressure which can result in net avoidance.

- Extrusion - Extrusion will not occur, because the velocities through the mesh are too low and the mesh size is too small to permit a fish to pass through.

- Non-random distribution - A non-random distribution could effect net efficiency, but as long as the nets are deployed in a consistent manner it will not limit the use of relative abundance and size data.

- Unsampled volumes - Collection efficiency tests involving the controlled release of marked fish will be conducted at the Swinging Bridge plant to quantify the collection rate as requested by NYSDEC at the December 2, 1992 meeting (see Attachment 1).

- Downstream entrainment - Entrainment of fishes from the tailrace area could occur, but fishes are generally inactive during the winter period.

- Diel behavior - These plants have deep intakes, thus daily changes in light pattern would have little effect on fish behavior in the vicinity of the intakes.

D. Dissolved Oxygen Sampling Program

The dissolved oxygen (DO) and temperature sampling program was developed to provide further documentation of DO conditions at intake level for the three projects. A sampling program conducted at the Swinging Bridge, Mongaup Falls and Rio Reservoirs during the summer of 1987 had indicated that DO levels near the intakes were stressful or potentially lethal for resident fish. As noted above, this was the basis for FERC's position that entrainment would continue to be insignificant.

In 1992, DO and temperature vertical profile sampling sites were situated near the intake structures. The depth ranges that are primarily influenced by the intakes (referenced to each reservoir's Normal Water Surface Elevation) are tabulated below. The zone of primary influence for each intake was considered to be represented by the depths between the top of the intake orifice and the elevation of the intake structure invert.

PLANT	NORMAL W.S.E. (ft)	INVERT ELEV. (ft)	TOP OF ORIFICE (ft)	DEPTH RANGE FOR ZONE OF INFLUENCE (ft)
Swinging Bridge				
Unit 1	1070	959.5	976	94.0 - 110.5 (28.7 - 33.7 m)
Unit 2	1070	1013	1030	40.0 - 57.0 (12.2 - 17.4)
Mongaup Falls	930	898.5	912	18.0 - 31.5 (5.5 - 9.6 m)
Rio	814	764	782	32.0 - 50.0 (9.8 - 15.2 m)

In their letters of November 2 and November 22, 1992, NYSDEC raised several concerns relative to the DO sampling program. The two areas of concern are the seasonal coverage of the sampling program and the need for identifying changes in DO distribution near the intakes that may result from station operation. Relative to seasonal coverage, the intent of the DO and temperature program was to document conditions during the period when it is expected that fish would be excluded from the vicinity of the intakes. During winter it is assumed that DO and temperature stratification, if they occur, would not prevent fish from moving into the vicinity of the intakes. As a result of NYSDEC's request at the December 2 meeting, O&R will address winter DO and temperature distributions at all sites (see Attachment 1) with sampling depending on access availability.

Relative to the need for and location of additional profiles to assess the effects of operation on DO distribution in the zone of influence of the intake, NYSDEC described sampling both prior to unit start-up and at points distant from the intakes as being desirable. In designing the sampling program, S-H considered the possibility that project operation would result in withdrawal of some oxygenated water from the surface layers. Such withdrawal could temporarily result in apparent presence of oxygen conditions at the intake depth that would not preclude fish presence while conditions at the intake depth elsewhere in the reservoir were unsuitable for fish. This could result in an over-estimation of the potential for fish presence in the vicinity of the intake. The program has accounted for this by establishing a sampling location at the Swinging Bridge site at a distance of approximately 1500-2000 ft from the nearest intake. Sampling will occur at that location when both Swinging Bridge units are operating during stratified conditions in the summer. Operation of both units would result in a relatively large volume withdrawal (1,750 cfs). Sampling at this distance would accomplish the same objective as sampling prior to daily operation because the influence of the intake diminishes rapidly with distance from the structure. In addition, there have been two occasions when sampling was conducted during a period when the stations were not operating. Comparison of operational and non-operational profiles indicated that station operation has little influence on D.O. distribution near the intakes at Swinging Bridge. At Mongaup Falls the intake is near the surface and DO distribution near the intakes was not expected to preclude fish presence. At Rio, no additional sampling location was specified. Sampling during periods when the station has not been operating indicates that the DO distribution is not affected by operation.

The DO data from 1987 and the data gathered during the late summer and fall of 1992 show that DO conditions in the vicinity of the intakes of the Mongaup hydros are below tolerance limits or would be stressful for fish in summer and early fall. DO conditions varied among the intakes with very poor conditions at both Swinging Bridge intakes, somewhat better but still limiting for fish life at Rio and best, but stressful at times at Mongaup Falls (see attached figures). All of the impound-ments contain DO and temperature conditions adequate for fish in the surface layer, thus the resident fishes have suitable habitat which is not in the intake withdrawal zone.

O&R's sampling program, conducted in response to its memorandum of agreement with NYSDEC, will provide a reliable basis for estimating the number, species, size distribution and seasonal occurrence of fishes entrained at the Mongaup River hydro projects. The program will continue with the addition of collection efficiency testing at Swinging Bridge and Mongaup Falls and winter DO and temperature profiling in response to NYSDEC comments on the study scope. O&R appreciates NYSDEC's comments and will continue to consult with NYSDEC during the study.

If you have any questions regarding these comments on the additions to the entrainment study program please contact me at (914) 577-2582.

Sincerely,

Robert T. Kosior

Robert T. Kosior, P.E.
Manager, Environmental Services

cc: R. Alevras, LMS; W. Elliot, NYSDEC, P. Nye, NYSDEC; T. Post, NYSDEC; P. Saunders, S-H.

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

July 7, 1993

RECEIVED
JUL 12 1993
O.R.U., INC.
ENVIRONMENTAL SERVICES
DEPARTMENT

Mr. Robert T. Kosior, P.E.
Manager, Environmental Services
Orange and Rockland Utilities
One Blue Hill Plaza
Pearl River, New York 10965

RE: Entrainment Studies for the Mongaup River Projects
FERC-9690-Rio, FERC-10482-Swinging Bridge,
FERC-10481-Mongaup Falls

Dear Mr. Kosior:

The attached comments are provided by the New York State Department of Environmental Conservation (DEC) in response to your April 26, 1996 response to our April 7, 1993 letter on the Entrainment Studies currently underway within the Mongaup River System. The comments also reflect a re-review of your January 7, 1993 response on the subject.

I may be reached at (518)457-0788 if you have any questions.

Sincerely,

Edward R. Miller
Environmental Analyst 2
Project Review Section
Division of Regulatory Affairs

ERM:lk
cc: L. Cashell (FERC)
M. Robinson (FERC)
A. Sidoti (FERC-NY)
R. Metzger (ORU)
L. Corin (USFWS)
R. Alevras (LMS)
P. Saunders (S-H)

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COMMENTS ON THE MONGAUP RIVER ENTRAINMENT STUDY

1. At this stage of the current study, we recognize the fact that it is too late to make changes in the current study. Our position regarding the study approach has been stated for the record and will be further elaborated later in these comments.

We are not convinced that the current Orange and Rockland (O&R) study is adequate. However, we are willing to look at the results of the study at Mongaup Falls before recommending further studies. The current study may provide some insight into entrainment which would be useful in determining if further studies are needed, and how to best obtain the information needed. The entrainment studies must provide sufficient information to determine the need for fish passage and protection at these sites. If the current study and the other information available about the projects is not sufficient for DEC to make a recommendation on the need for fish passage and protection, then additional studies will be necessary.

A critical aspect of the process of developing a study, conducting a study and coming to agreement on the results of the study; is that all parties are involved in the process and agree to what is required. We do not accept study proposals without a thorough review by staff. Recommendations are provided on those issues needed in order to provide the information necessary to base a decision. We were not involved in developing the study proposal which is to determine the entrainment levels at these <u>three</u> sites. We are unconvinced that the study results to be obtained will be adequate to determine the level of entrainment and whether or not fish passage and/or protection will be needed at these sites.

2. Some of the recommendations made by DEC have been incorporated into the study. However, there are still areas of disagreement, and a lack of details regarding the efficiency tests and mortality estimates. Incorporating some of our recommendations "improves" the study but should not be construed that we believe the study is adequate.

3. Based on the studies reviewed by staff, conversations with resource agency staff in the midwest (which have recently conducted entrainment and mortality studies), and conversations with Mr. Alevras regarding studies conducted by LMS in the midwest; we can find no clear evidence to support the use of representative sites. Entrainment and mortality are episodic and highly variable. There is no clear biological factor, or engineering factor which can accurately predict entrainment or mortality at a given site. Mr. Alevras has stated that the recent studies conducted by

LMS in the midwest showed no clear correlation between entrainment and any biological or physical characteristic that one might assume would be important. Entrainment could not be directly linked to any single or multiple characteristics that might be used to predict entrainment.

The Mongaup sites are different from those in the midwest in one significant way. The depth of the intakes may be a factor which significantly influences entrainment. The depth of the intakes may be sufficient to place the zone of withdrawal within the anoxic zone of the impoundments. When the zone of influence of the intakes is within the anoxic water layer (i.e. all water entrained is anoxic) then entrainment is not an issue. However, during periods when water drawn into the intakes is sufficiently oxygenated to sustain fish, then entrainment becomes an issue. Water quality sampling shows that there are extended periods (fall through spring) when water drawn into the intakes is not anoxic. Therefore, entrainment at all three sites is an issue. LMS should provide documentation for the statement "Mongaup Falls data would overestimate entrainment at Swinging Bridge and Rio because fish are more susceptible to entrainment at Mongaup Falls". All three sites have oxygenated water at the depth of the intakes for long periods. Since no study of fish distribution or entrainment has been completed at all 3 sites, assuming Mongaup Falls will "overestimate" is an assumption that needs to be supported by facts. The purpose of studies is to minimize the assumptions and maximize the facts.

A brief review of the Characteristics of these sites indicates that there are significant differences which further preclude the use of "representative" sites. These factors include:

1. depth of intake
2. shoreline vs. deepwater intake
3. flow through turbines
4. rack spacing
5. intake velocities
6. habitat characteristics of the impoundments

ORU's January 7, 1993 letter states, ".... fish distribution will have a much greater influence on entrainment rates rather than differences in intake configurations." The difference in intake configurations (depth, orientation to shoreline, habitat conditions) means that it is very possible that different fish distributions will be occurring at the different intake sites. The location of the intakes (part of the configuration) may therefore directly impact entrainment.

The lack of oxygenated water in front of the intakes would be a sound biological basis for not sampling any of the sites if it was documented that water quality in front of all of the intakes was sufficiently poor so as to exclude fish from entering the intakes. However, sampling would have to be conducted before the entrainment study to document that D.O. levels were limiting year round. The entrainment study plan was based on an assumption (inadequate D.O. at the levels of the intakes to support fish on a year round basis) that now appears to have been incorrect. The water in front of the intakes is not anoxic for significant parts of the year. Therefore, the basis for the "representative site" approach is not supported by the information available to DEC.

4. We consider the data from partial net sampling to be of limited usefulness. Unless the efficiency test includes high numbers and multiple replicates of all species found in the impoundment or watershed above the impoundment, it is not possible to determine the efficiency of the net at catching all species. Just because alewife are the predominant or only species captured in a meter net does not mean other species are not being entrained. If other species exhibit net avoidance, and alewifes do not, then net efficiency for species other than alewife is unknown unless all species are sampled. The fact that only alewife are captured does not mean that other species are not avoiding the partial nets. The small percentage of fish expected to be captured by the net in relation to overall entrainment further compounds the problem of poor precision.

The results of partial net sampling have many biases, including:

1. different species will have different capture rates
2. net avoidance due to backpressure and/or visual aversion.
3. as placed in this study, fish can easily avoid nets by swimming around it. The nets are placed a substantial distance below the powerhouse in water with relatively low velocities.
4. Fish entering the net are not committed and can swim back out.

We do not support the use of partial netting of the type employed in this study. The results may provide some useful information, but are not a substitute for a complete entrainment study.

5. Any study which does not adequately address the biases associated with it will be questioned and the results will

either be unacceptable, or will have to be very conservatively evaluated. Any source of bias which can be addressed, must be. We recognize that there are sometimes biases which can not be completely addressed. However, the biases associated with sampling only one unit of a multiple unit site can be addressed by full tailrace netting of the turbines. If the project has a combined penstock, it may be possible to perform an "efficiency" test that will determine the ratio of the fish captured to non-captured and, therefore, determine what percentage of fish enter the sampled unit as opposed to unsampled units. It can not be assumed that all species and sizes of fish will enter and proceed through a project in a similar manner. If the testing reveals a very poor return, then the rate of entrainment between units varies, and potentially all units will need to be sampled.

Properly conducted, complete efficancy testing will address many of the biases associated with the sampling. As discussed above, testing of the "metered" nets may not determine the efficiency (bias) unless a large number and variety of species are tested.

Details of the procedures to be used during the efficiency tests are still lacking. The numbers of species, sizes of fish per release are not clear. How fish will be introduced is not clear. We have recommended that all speciescommonly entrained in the full draft tube net at Mongaup Falls be used in the efficiency test at that site. A range of sizes for those species should also be tested.

If all combinations of turbine operations and all species commonly entrained are not tested during the efficiency test, then there will be no basis for extrapolating the results from one turbine to the other turbine. The combined penstock at Mongaup Falls may equally divide flows and fish entrained to each unit. However, it is possible that there may be differences in entrainment to certain units due to the hydraulics of the bifurcation. Sampling, under various combinations of turbines, a number of sizes and species of fish (commonly entrained), and various flow conditions is needed to determine if there is a difference in the percent entrained into one unit as opposed to other units, under various turbine combinations.

6. We do not recommend basing mortality rates for these projects on literature derived estimates. We do not support the assertion that "the range of turbine survival values....is small....".

The use of literature derived mortality estimates would be acceptable if:

1. The studies to be referenced include the species entrained at this project.
2. Mortality estimates must be calculated seperately for each project and different turbine type and configuration. Turbine specifications to be evaluated would include, but not be limited to:

    1. head
    2. number of runners and blades per runner
    3. rpm
    4. peripheral runner velocity
    5. flow
    6. gate opening sizes
    7. velocity through gates
    8. velocity as enter tailrace
    9. turbine efficiencies
    10. size of blades
    11. clear opening between blades
    12. turbine shaft orientation
    13. number of gates per runner

If sites from the literature can be found which match the specifications of the turbines at these projects, then literature values would be acceptable if:

1. the entire study is submitted to DEC for review; including methods, procedures, results.
2. comments of the resource agencies responsible for review of the documents are included.
3. turbine specifications and operating conditions match.

We would then confirm that the studies in question are not biased, and that the results provided are accurate and supportable.

Without this type of documentation, we cannot accept literature values for mortality. As noted earlier, conversations with resource agency staff in the mid-west have indicated that mortality between sites, among turbines at a site, and even through a single turbine on different days are variable. Evaluation of the information provided in the 1987 and 1992 EPRI reports indicates that there is no one variable in site characteristics which can reliably predict mortality. It appears that a number of factors act together to determine survival through a turbine during a particular test. We cannot accept reported mortality estimates based on summary reports from other sites at face value due to the following concerns:

1. Comments of the resource agencies responsible for

reviewing the report are not included.

2. Only a summary of the report is included, not sufficient details to review the adequacy of the study or results.

3. Resource Agency staff from the mid-west did not recommend that the results of their studies be used at other sites, and some of the studies published have not been thoroughly reviewed.

4. Of the reports included in the EPRI report which DEC staff have reviewed (Finch-Pruyn, Sewalls, Crescent) none of these studies are adequate to address mortality at the Mongaup sites. Two of the studies and reports were seriously flawed and the results as presented are biased and unacceptable. The other study underestimates due to inappropriate manipulation of the data.

If O&R or LMS cannot document that their proposed approach is supportable DEC may recommend that a complete and thorough mortality study be conducted.

7. The D.O. sampling has found that anoxic conditions are not present under ice cover. Sampling has also shown that turnover occurs in October to November. Therefore, low oxygen levels which would limit or prevent entrainment at all three sites are not occurring for extended periods.

8. DEC concurs with the explanation of hydroacourstics being a subsampling technique, just as is netting.

In summary, O&R's "representative site" approach to conducting the required entrainment sampling, and "literature review" approach to mortality estimates are not recommended by the DEC. However, we will wait until the current study has been completed before deciding on a future course of action on the need for and the scope of additional studies.

ERM:lk
Comments.7-6

bcc: J. Cianci
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File (2)

APPENDIX B

MONGAUP FALLS HYDROELECTRIC STATION
COLLECTION EFFICIENCY ANALYSIS

APPENDIX B

Results of the sampling efficiency tests conducted at the Mongaup Falls Hydroelectric Station were evaluated to determine the influence variious factors may have on collection efficiency. Previous studies at other hydro projects showed that species tested, water temperature, and unit operation may all be factors which influence recovery rates. Initial scoping of the entrainment studies at Mongaup Falls identified the unit operating schedule (number of units operating during sampling) and the manifold design of the common penstock as possibly effecting sampling efficiency.

Initial investigation was performed using Formal Inference-based Recursive Modeling (FIRM) (Hawkins 1982, 1990). This technique is useful for evaluating the structure within large data sets of mixed data types. Given a data set of a single dependent variable, in this study recapture, and two or more independent variables measured on a nominal (categorical), ordinal (ranked), or interval (continuous) scale, the procedure successively examines the dependent variable with respect to the various factors, while preserving the nature of the scale.

The computational algorithm can be described as follows (after Kass 1980):

Let the dependent variable (recapture) have $d \geq 2$ categories and the factor under analysis $c \geq 2$ categories.

(1) For each predictor, cross tabulate the categories of predictor with categories of dependent variable and do steps (2) and (3).

(2) Find the pair of categories of the independent variable (only allowing pairs as determined by measurement scale) whose $2 \times d$ sub-table is least significantly different. If this significance does not reach a critical value, merge the two categories and repeat this step.

(3) For each merged category of 3 or more original categories, find the most significant binary split (constrained by measurement scale) into which the merger may be resolved. If the significance is beyond a critical value, implement the split and return to step (2)

(4) Calculate significance (as below) of each optimally merged factor and isolate the most significant one. If this significance is greater than the criterion value, subdivide the data according to the (merged) categories of the chosen independent variable.

(5) For each partition of the data not analyzed, return to step (1).

Steps (2) and (3) rely on the asymptotic partition of total χ^2 for the 2 $\times$ d sub-table considered for collapsing and for the resulting table after merger. Step (4) requires a test of significance of the reduced contingency table. FIRM uses the raw χ^2 probability, the Bonferroni multiplier, and the multiple comparison significance for this purpose.

Bonferroni multipliers are computed differently for each type of variable:

$$B_{monotonic} = \binom{c-1}{r-1}$$

$$B_{free} = \sum_{i=0}^{r-1} (-1)^i \frac{(r-1)^c}{i!(r-i)!}$$

$$B_{float} = \binom{c-2}{r-2} + r\binom{c-2}{r-1}$$

where:

r =number of rows and
c =number of columns in table.

In FIRM literature, ordinal predictors are termed "monotonic" and nominal scaled predictors are called "free." A third data type, called "float," is a monotonic variable that includes missing data. FIRM requires that interval scale data be converted to a monotonic or floating variable.

Potential influences included in the recapture analysis were season (date), species released, condition (live or dead), and number of units operating. The dependent variable, recapture, was a nominal measure, coded as "1" for recaptured and "2" for not recaptured. All four

independent variables used were nominal and considered free variables in the analysis. Species released during efficiency studies included both alewife and golden shiner and their condition coded as live or dead. Each of the eight separate test dates were coded individually, 1-8 while unit operation was coded 1-4, corresponding to the number of units operating during the efficiency test.

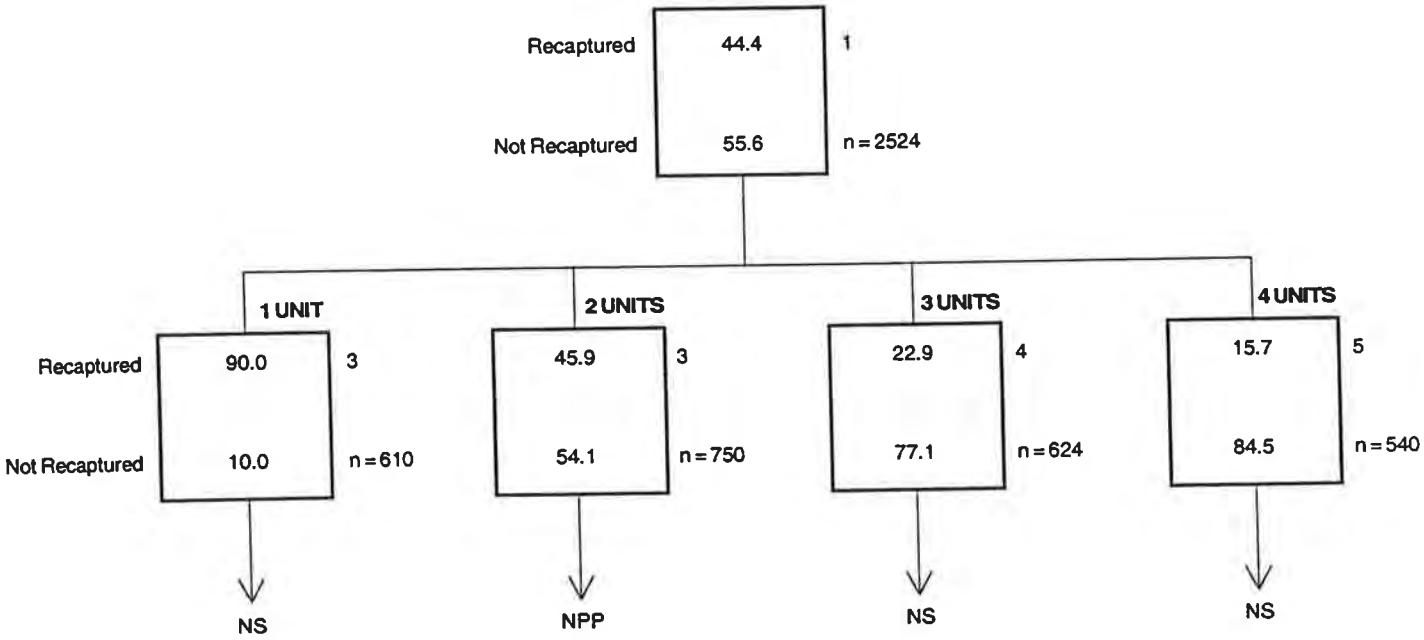
As expected, the unit operating schedule was found to be the primary variable influencing recapture. Distribution of fish in the common penstock was expected to be split evenly amongst the number of units operating, resulting in expected efficiency estimates of 50% with two unit operation, 33% with three unit operation, and 25% with all units operating. Season (date), condition, and species tested were either not significant ($p \leq 0.05$) or sample sizes too small for possible prediction. Results of the analysis are presented in Figure B-1.

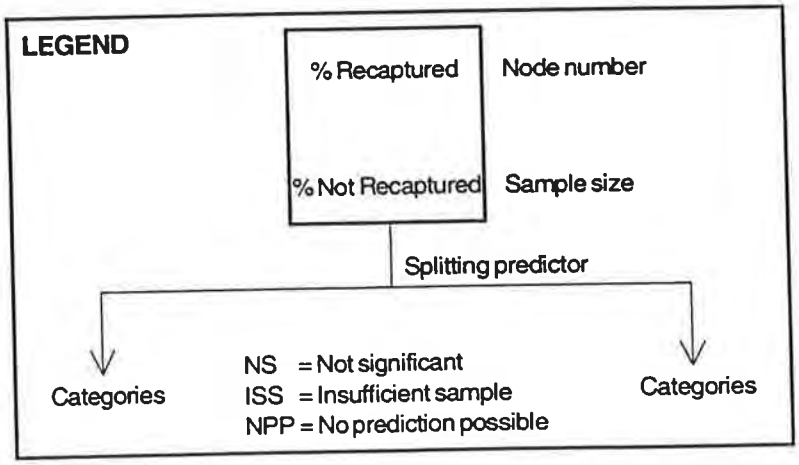
Recapture data were then pooled among the three remaining independent variables (season, condition, and species) to further examine any differences due to unit operation and to calculate collection efficiency. Recapture data for different unit operating schedules was compared using a chi-square test. Test results, collection efficiencies and recapture data are summarized in Table B-1.

The mean efficiency estimate amongst all unit operating schedules was 91.6 percent. Collection efficiency results differed by less than 6.5% between tests conducted during different operating schedules; however, evaluation of the efficiency estimates using the chi-square statistic indicated that the efficiencies between unit operation were significantly different ($p < 0.05$). When two unit operating data was excluded from the chi-square test, efficiencies among the remaining tests were not significantly different ($p \leq 0.05$) (Table B-1). As two unit operation was significantly different from all other operations, it was removed and a pooled efficiency of 90.1% based on the remaining samples, was computed. This value is considered the most appropriate measure for collection efficiency. Its use in adjusting entrainment estimates is conservative as inclusion of the higher two unit efficiency would yield an even higher overall efficiency.

Figure B-1

Mongaup Falls Hydroelectric Station
Collection Efficiency Evaluation





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TABLE B-1

MONGAUP FALLS HYDROELECTRIC STATION
COLLECTION EFFICIENCY EVALUATION

Unit Operation Comparison

CONTINGENCY TABLE

EFFICIENCY RECOVERIES	UNIT OPERATING SCHEDULE				Total
	1 Unit	2 Units	3 Units	4 Units	
Not Recaptured[a]	61	31	65	50	207
Recaptured[a]	549	719	559	490	2317
Total (n)	610	750	624	540	

	df	Value	Prob.
Chi-Square Statistic	3	23.977	0.000
	2[b]	0.110	0.802

EFFICIENCIES

OPERATING SCHEDULE	1 Unit	2 Units	3 Units	4 Units	Mean
Efficiency (%)[c]	90.0	95.9	89.6	90.7	91.6±4.7

[a]Number of individuals.
[b]Excludes two unit operation data.
[c]Efficiency = (No. Recaptured/Total) x 100.

APPENDIX C

ENTRAINMENT SAMPLING WATER QUALITY DATA

MONGAUP FALLS HYDROELECTRIC STATION NOVEMBER 1992 - OCTOBER 1993
TEMPERATURE AND DO DATA COLLECTED DURING ENTRAINMENT SAMPLING

OBS	S_DATE	N	TEMP	D_O
1	02DEC92	1	6.40	9.70
2	16DEC92	1	3.90	11.80
3	30DEC92	1	3.00	11.00
4	13JAN93	1	2.40	12.10
5	19JAN93	2	1.50	12.20
6	09FEB93	2	2.25	11.90
7	17FEB93	2	2.20	10.65
8	03MAR93	2	3.15	11.40
9	24MAR93	2	2.75	11.50
10	07APR93	2	4.10	13.20
11	21APR93	3	6.00	11.60
12	12MAY93	2	10.80	8.25
13	26MAY93	1	12.90	10.50
14	09JUN93	2	12.00	9.80
15	04AUG93	2	19.50	5.50
16	03SEP93	1	18.00	4.60
17	16SEP93	1	18.40	.
18	01OCT93	1	15.70	7.50
19	14OCT93	2	13.00	8.85

RIO HYDROELECTRIC STATION NOVEMBER 1992 - MARCH 1993
TEMPERATURE AND DO DATA COLLECTED DURING ENTRAINMENT SAMPLING

OBS	S_DATE	N	TEMP	D_O
1	17NOV92	0	.	.
2	02DEC92	2	6.40	9.60
3	16DEC92	2	3.50	12.20
4	30DEC92	2	3.10	11.30
5	13JAN93	2	2.30	12.20
6	19JAN93	4	1.85	12.40
7	09FEB93	4	2.15	11.30
8	17FEB93	2	2.50	10.40
9	03MAR93	4	2.90	11.75
10	24MAR93	4	2.25	7.15

SWINGING BRIDGE HYDROELECTRIC STATION NOVEMBER 1992 - MARCH 1993
TEMPERATURE AND DO DATA COLLECTED DURING ENTRAINMENT SAMPLING

OBS	S_DATE	N	TEMP	D_O
1	02DEC92	2	6.60	9.7
2	16DEC92	2	4.30	11.4
3	30DEC92	2	3.20	11.5
4	13JAN93	2	2.50	12.5
5	19JAN93	4	1.85	12.0
6	09FEB93	2	2.10	11.3
7	17FEB93	2	2.40	9.4
8	03MAR93	4	3.20	9.4
9	24MAR93	4	2.25	11.4

NOTE: Values are averaged when more than one measurement was taken during an entrainment sample.

APPENDIX D

TOTAL NUMBERS COLLECTED DURING DAY AND NIGHT SURVEYS AT THE MONGAUP FALLS STATION

TOTAL NUMBER COLLECTED DURING DAY SURVEYS BY TAXON AND MONTH AT MONGAUP FALLS HYDROELECTRIC STATION NOVEMBER 1992 - OCTOBER 1993

	YEAR											
	1992		1993									
	MONTH		MONTH									
TAXON	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	AUG	SEP	OCT	TOTAL
Alewife	42	76	1934	31	4	121	2	--	1115	5	--	3330
Pumpkinseed	--	--	--	--	--	--	--	1	2	7	9	19
Black crappie	--	--	--	--	--	--	--	--	--	2	6	8
Golden shiner	--	--	--	--	--	--	--	--	--	1	5	6
Tesselated darter	--	--	--	--	--	--	--	--	--	2	--	2
Largemouth bass	--	--	--	--	--	--	2	--	2	71	7	82
Chain pickerel	--	--	--	--	--	--	1	--	--	--	--	1
White sucker	--	--	--	--	--	--	--	--	--	1	1	2
Spottail shiner	1	--	--	--	--	--	1	--	--	--	2	4
White catfish	--	--	--	--	--	--	1	--	--	1	--	2
Yellow perch	--	4	2	--	--	--	2	6	7	465	139	625
Rock bass	--	--	--	--	--	--	--	--	--	1	--	1
Redbreast sunfish	--	--	--	--	--	--	--	--	--	1	2	3
Brown trout	3	--	--	1	--	--	4	1	--	--	3	12
Unidentified sunfish	--	--	--	--	--	--	--	--	--	4	65	69
Yellow bullhead	--	--	--	--	--	--	--	--	--	1	--	1
Rainbow trout	--	--	--	--	--	--	--	--	--	2	--	2
TOTAL	46	80	1936	32	4	121	13	8	1126	564	239	4169

TOTAL NUMBER COLLECTED DURING NIGHT SURVEYS BY TAXON AND MONTH AT MONGAUP FALLS HYDROELECTRIC STATION NOVEMBER 1992 - OCTOBER 1993

YEAR

1993

MONTH

TAXON	JAN	FEB	MAR	APR	MAY	JUN	AUG	OCT	TOTAL
Alewife	9262	450	392	277	--	--	42	1	10424
Pumpkinseed	--	--	--	--	--	1	1	7	9
Black crappie	--	--	--	--	--	--	--	6	6
Golden shiner	--	--	--	--	1	--	--	--	1
White sucker	--	--	--	--	--	--	2	--	2
Spottail shiner	--	--	--	--	1	--	2	--	3
White catfish	--	--	--	--	2	--	--	1	3
Yellow perch	--	--	--	3	--	1	1	3	8
Rock bass	--	--	--	1	--	--	--	--	1
Brown trout	--	1	--	--	--	--	--	--	1
Brook trout	--	--	--	--	--	--	--	1	1
Unidentified sunfish	--	--	--	--	--	--	3	23	26
White bass	--	--	--	--	--	1	--	--	1
Longear sunfish	--	--	--	--	--	--	1	--	1
Yellow bullhead	--	--	--	--	--	--	--	1	1
TOTAL	9262	451	392	281	4	3	52	43	10488

APPENDIX E

DAY AND NIGHT ENTRAINMENT RATES AT MONGAUP FALLS STATION

MONGAUP FALLS HYDROELECTRIC STATION JANUARY - OCTOBER 1993

ENTRAINMENT RATE OF ALEWIFE (NUMBER/THOUSAND CF) DURING DAY AND NIGHT SURVEYS

OBS	S_DATE	YEAR	TOT_CT	DAY_RATE	NITE_RATE
1	19JAN	1993	9262	0.23811	2.83467
2	09FEB	1993	449	0.00270	0.20180
7	03MAR	1993	32	0.00050	0.01606
10	24MAR	1993	361	0.00000	0.18117
11	07APR	1993	269	0.05735	0.12855
12	21APR	1993	8	0.00048	0.00382
24	04AUG	1993	42	0.52127	0.01964
32	14OCT	1993	1	0.00041	0.00041

MONGAUP FALLS HYDROELECTRIC STATION JANUARY - OCTOBER 1993

ENTRAINMENT RATE OF ALL SPECIES (NUMBER/THOUSAND CF) DURING DAY AND NIGHT SURVEYS

OBS	S_DATE	YEAR	N	DAY_RATE	NITE_RATE
1	19JAN	1993	1	0.23811	2.83467
2	09FEB	1993	2	0.00270	0.20224
4	03MAR	1993	2	0.06574	0.01606
5	24MAR	1993	2	0.00151	0.18167
6	07APR	1993	1	0.05735	0.12855
7	21APR	1993	3	0.00048	0.00573
8	12MAY	1993	5	0.00101	0.00134
9	09JUN	1993	4	0.00365	0.00137
10	04AUG	1993	8	0.52641	0.02431
11	14OCT	1993	12	0.00579	0.01778

APPENDIX E

DAY AND NIGHT ENTRAINMENT RATES AT MONGAUP FALLS STATION

APPENDIX F

LENGTH FREQUENCY DISTRIBUTIONS OF SELECTED SPECIES

TABLE F-2 LENGTH FREQUENCY DISTRIBUTION OF LARGEMOUTH BASS COLLECTED FROM MONGAUP FALLS ENTRAINMENT SAMPLES
JANUARY 1993 TO DECEMBER 1993

YEAR	MONTH	50.0-59.9	60.0-69.9	70.0-79.9	80.0-89.9	90.0-99.9	100.0-109.9	110.0-119.9	120.0-129.9	130.0-139.9	140.0-149.9	150.0-159.9	160.0-169.9	170.0-179.9	180.0-189.9	190.0-199.9	200.0-209.9
1993	MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1993	AUG	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1993	SEP	5	21	17	2	0	1	0	0	0	0	0	0	0	0	0	1
1993	OCT	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0
		7	21	21	4	0	1	0	0	0	0	1	0	0	0	0	2

YEAR	MONTH	210.0-219.9	220.0-229.9	230.0-239.9	240.0-249.9	250.0-259.9	260.0-269.9	270.0-279.9	280.0-289.9	290.0-299.9	300.0-309.9	310.0-319.9	320.0-329.9	330.0-339.9	340.0-349.9	350.0-359.9	360.0-369.9
1993	MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	OCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

YEAR	MONTH	370.0-379.9	380.0-389.9	390.0-399.9	400.0-409.9	410.0-419.9	420.0-429.9	430.0-439.9	440.0-449.9	450.0-459.9+	N	MEAN	MIN	MED	MAX	SD
1993	MAY	0	0	0	0	0	1	0	0	0	2	315.5	206.0	315.5	425.0	154.9
1993	AUG	0	0	0	0	0	0	0	0	0	2	54.0	53.0	54.0	55.0	1.4
1993	SEP	0	0	0	0	0	0	0	0	0	48	69.9	51.0	67.0	152.0	14.9
1993	OCT	0	0	0	0	0	0	0	0	0	7	95.1	71.0	77.0	200.0	46.6
		0	0	0	0	0	1	0	0	0	59					

NOTE: Lengths recorded to the nearest millimeter.
NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE F-3 LENGTH FREQUENCY DISTRIBUTION OF YELLOW PERCH COLLECTED FROM MONGAUP FALLS ENTRAINMENT SAMPLES
JANUARY 1993 TO DECEMBER 1993

YEAR	MONTH	40.0-49.9	50.0-59.9	60.0-69.9	70.0-79.9	80.0-89.9	90.0-99.9	100.0-109.9	110.0-119.9	120.0-129.9	130.0-139.9	140.0-149.9	150.0-159.9
1992	DEC	0	0	0	0	0	0	1	2	1	0	0	0
1993	JAN	0	0	0	0	0	0	0	1	1	0	0	0
1993	APR	0	0	0	0	0	0	1	0	0	0	0	0
1993	MAY	0	0	0	0	0	0	0	2	0	0	0	0
1993	JUN	0	0	0	0	0	0	0	2	4	1	0	0
1993	AUG	3	2	1	0	0	0	0	0	0	2	0	0
1993	SEP	0	2	20	19	5	1	5	6	14	5	5	5
1993	OCT	0	1	0	6	27	5	0	0	0	0	1	0
		3	5	21	25	32	6	7	13	20	8	6	5

YEAR	MONTH	160.0-169.9	170.0-179.9	180.0-189.9	190.0-199.9	200.0-209.9+	N	MEAN	MIN	MED	MAX	SD
1992	DEC	0	0	0	0	0	4	116.5	107.0	116.5	126.0	8.0
1993	JAN	0	0	0	0	0	2	118.5	112.0	118.5	125.0	9.2
1993	APR	0	0	1	0	0	2	148.5	109.0	148.5	188.0	55.9
1993	MAY	0	0	0	0	0	2	113.5	111.0	113.5	116.0	3.5
1993	JUN	0	0	0	0	0	7	121.6	113.0	122.0	130.0	6.1
1993	AUG	0	0	0	0	0	8	72.5	42.0	56.5	139.0	39.4
1993	SEP	0	0	1	1	0	91	98.0	52.0	82.0	190.0	33.7
1993	OCT	0	0	0	0	0	40	84.5	56.0	83.0	144.0	11.9
		0	0	2	1	0	156					

NOTE: Lengths recorded to the nearest millimeter.
NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE F-4 LENGTH FREQUENCY DISTRIBUTION OF ALEWIFE COLLECTED FROM RIO ENTRAINMENT SAMPLES
NOVEMBER 1992 TO MARCH 1993

YEAR	MONTH	50.0-59.9	60.0-69.9	70.0-79.9	80.0-89.9	90.0-99.9	100.0-109.9	110.0-119.9	120.0-129.9	130.0-139.9	140.0-149.9	150.0-159.9
1992	NOV	0	6	17	13	4	0	1	7	5	4	0
1992	DEC	15	42	45	16	4	0	0	0	1	0	0
1993	JAN	1	11	25	20	8	0	2	29	21	4	1
1993	FEB	0	6	10	1	1	0	0	1	0	0	0
1993	MAR	0	1	12	2	0	0	0	5	6	0	1
		16	66	109	52	17	0	3	42	33	8	2

YEAR	MONTH	160.0-169.9	170.0-179.9	180.0-189.9	190.0-199.9	200.0-209.9+	N	MEAN	MIN	MED	MAX	SD
1992	NOV	0	0	0	0	0	57	93.9	64.0	82.0	145.0	25.9
1992	DEC	0	0	0	0	0	127	70.9	51.0	70.0	130.0	10.7
1993	JAN	4	1	0	0	0	127	104.6	56.0	97.0	171.0	29.4
1993	FEB	0	0	0	0	0	20	73.7	27.0	71.5	120.0	16.6
1993	MAR	2	0	0	0	0	29	103.2	65.0	80.0	164.0	33.0
		6	1	0	0	0	360					

NOTE: Lengths recorded to the nearest millimeter.
NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE F-5 LENGTH FREQUENCY DISTRIBUTION OF ALEWIFE COLLECTED FROM SWINGING BRIDGE ENTRAINMENT SAMPLES
NOVEMBER 1992 TO MARCH 1993

YEAR	MONTH	50.0-59.9	60.0-69.9	70.0-79.9	80.0-89.9	90.0-99.9	100.0-109.9	110.0-119.9	120.0-129.9	130.0-139.9	140.0-149.9	150.0-159.9
1992	NOV	0	0	1	0	0	0	0	0	0	0	0
1992	DEC	4	17	27	3	0	0	0	0	0	0	0
1993	JAN	3	27	82	30	3	1	23	10	0	0	0
1993	FEB	8	27	42	5	1	2	7	0	0	0	0
1993	MAR	2	39	66	20	0	3	27	3	0	0	0
1993	DEC	2	3	0	1	0	0	0	0	0	0	0
		19	113	218	59	4	6	57	13	0	0	0

YEAR	MONTH	160.0-169.9	170.0-179.9	180.0-189.9	190.0-199.9	200.0-209.9+	N	MEAN	MIN	MED	MAX	SD
1992	NOV	0	0	0	0	0	1	71.0	71.0	71.0	71.0	.
1992	DEC	0	0	0	0	0	55	68.5	40.0	70.0	82.0	7.9
1993	JAN	0	0	0	0	0	180	82.2	57.0	76.0	123.0	17.6
1993	FEB	0	0	0	0	0	95	73.4	27.0	71.0	117.0	15.0
1993	MAR	0	0	0	0	0	162	80.8	51.0	74.0	123.0	17.9
1993	DEC	0	0	0	0	0	7	61.0	45.0	61.0	83.0	11.8
		0	0	0	0	0	500					

NOTE: Lengths recorded to the nearest millimeter.
NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation

TABLE F-6 LENGTH FREQUENCY DISTRIBUTION OF UNIDENTIFIED SUNFISH COLLECTED FROM MONGAUP FALLS ENTRAINMENT SAMPLES
JANUARY 1993 TO DECEMBER 1993

YEAR	MONTH	20.0-24.9	25.0-29.9	30.0-34.9	35.0-39.9	40.0-44.9	45.0-49.9	50.0-54.9	55.0-59.9	60.0-64.9+	N	MEAN	MIN	MED	MAX	SD
1993	AUG	0	2	1	0	0	0	0	0	0	3	29.0	26.0	29.0	32.0	3.0
1993	SEP	0	0	1	1	0	0	0	0	0	2	35.0	31.0	35.0	39.0	5.7
1993	OCT	0	0	13	34	19	5	1	0	0	72	38.1	31.0	37.0	51.0	4.2
		0	2	15	35	19	5	1	0	0	77					

NOTE: Lengths recorded to the nearest millimeter.
NOTE: N = Number of lengths, MEAN = Mean length, MIN = Minimum length, MED = Median length, MAX = Maximum length, SD = Standard deviation