LAST GASP

Caney Fork River

HOW THE ARMY CORPS OF ENGINEERS IS CHOKING TROUT IN THE CANEY FORK RIVER AT THE CENTER HILL DAM

A Report by:
Tennessee Clean Water Network
Tennessee Public Employees for Environmental Responsibility

August 2005

Photos by Barry Sulkin unless otherwise noted

PURPOSE

Tennessee Clean Water Network (TCWN) and Tennessee Public Employees for Environmental Responsibility (PEER) are conducting case studies in the three main regions of Tennessee – East, Middle, and West – to examine and expose examples of surface water pollution not being adequately addressed by regulatory programs under the Clean Water Act (CWA) and related laws.

The Middle Tennessee case study focuses on a stretch of the Caney Fork River downstream of Center Hill Dam. The dam has caused low dissolved oxygen (DO) in the tailwater (section of river below a dam), violating Tennessee's water quality criteria and degrading significant trout habitat. The Caney Fork has been included in Tennessee's 303(d) list of "water quality limited" waters for many years. However, neither the Army Corps of Engineers (COE) nor the State of Tennessee Department of Environment and Conservation (TDEC) has taken acceptable action to address the continuing violation of water quality regulations and improve dissolved oxygen levels in the river.

THE CENTER HILL DAM

Center Hill Dam

Center Hill Dam is located on the Caney Fork River in DeKalb County, about 70 miles east of Nashville. The U.S. Army Corps of Engineers constructed Center Hill Dam in 1948 for the purpose of flood control and hydroelectric power generation. The tailwater section of the Caney Fork flows in a northwest direction for about 26 miles before joining the Cumberland River near Carthage, TN.

Center Hill Dam is a concrete and earthfill dam that impounds a reservoir 64 miles long with a total storage capacity of 2,092,000 acre-feet (1 acre-foot = 325,850 gallons of water). The dam is 250 feet high at its maximum point with an estimated yearly average energy output of 351,000,000 kilowatt hours.[1]

Daily generation schedule fluctuates throughout the year and follows peak demand for power. Power demand rises in the morning and evening in the winter and in the afternoon in the summer. The dam has three turbines that, when all are in operation, increase the water level below the dam by as much as 10 feet. Average loading of the turbines creates 3,500 cubic feet per second (cfs) of water flow. During periods of no power generation the average flow from the dam is in the range of 60 - 90 cfs, which occurs through seepage of water around the dam.[2] Thus seepage is providing some oxygen to the tailwater. However, the COE has plans to fix this, perhaps further reducing DO to the tailwater.

[1] ACOE Brochure, Center Hill Lake, ACOE Nashville District

[2] Fiss, C. Frank and Young, David W., Management Plan for the Center Hill Tailwater Trout Fishery. December 2003. Tennessee Wildlife Resource Agency.

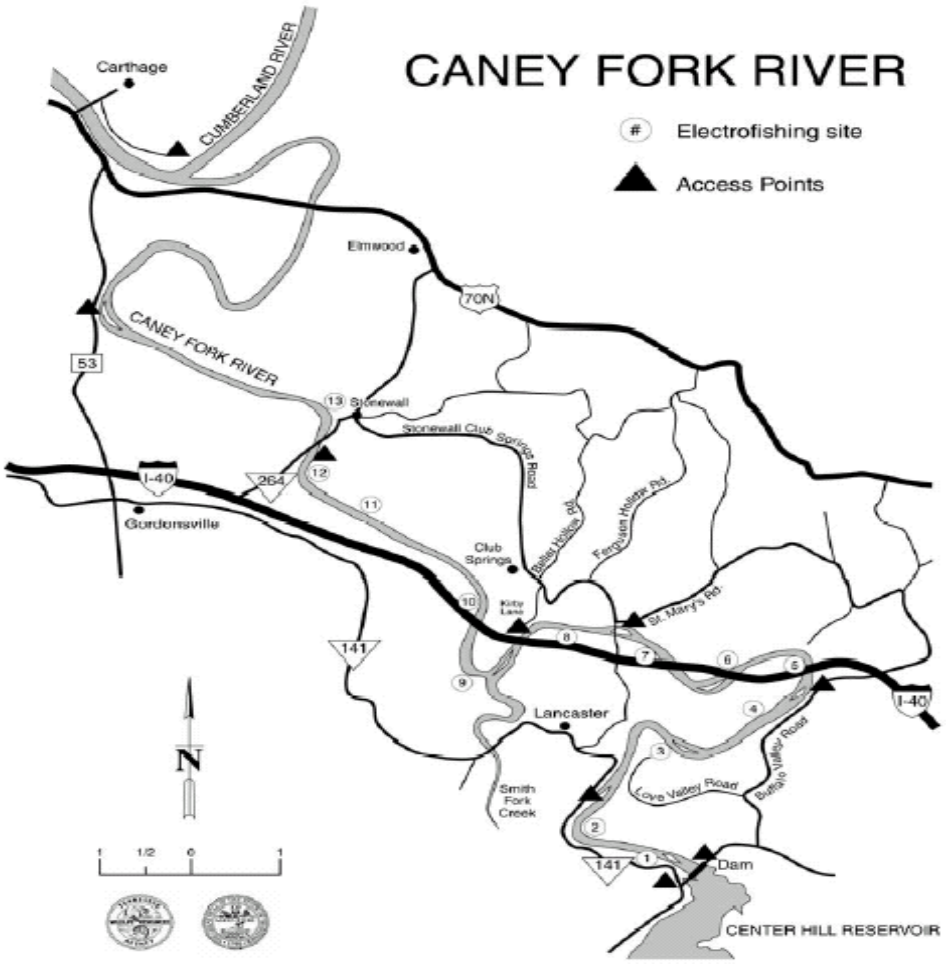
Seepage around Center Hill Dam

CANEY FORK WATERSHED

The Caney Fork watershed is predominately undeveloped, except for homes around Center Hill Reservoir – but none directly on the shoreline. The largest town in the watershed is Sparta with a population of ~5,000 residents. With numerous parks and protected lands, this area hosts a number of recreational opportunities, including fishing, paddling, hiking, and camping. The Caney Fork River watershed is home to 59 rare plant and animal species and 13 rare aquatic species (4 rare fish, 7 rare mussels, 1 rare snail and 1 rare crustacean).[3] The Caney Fork is the most popular trout fishing destination in Middle Tennessee, accommodating thousands of anglers each year[4].

[3] Caney Fork River Watershed, Chapter 2, US EPA

[4] Fiss, C. Frank and Young, David W., Management Plan for the Center Hill Tailwater Trout Fishery. December 2003. Tennessee Wildlife Resource Agency.



Map 1: Caney Fork River below Center Hill Dam

TROUT

The construction and operation of the dam has eliminated habitat for many of the native aquatic species in the tailwater reach of the river. To mitigate for the loss of recreational opportunities in this reach of river, the Tennessee Wildlife Resources Agency (TWRA) and the U.S. Fish and Wildlife Service (USFWS) have been stocking trout since the 1950s.[5]

Photo courtesy of TWRA

The Caney Fork River now has an artificial fish community mostly comprised of trout, shad, and carp. TWRA annually stocks about 106,000 catchable (>200 mm) rainbow trout and 17,500 catchable brown trout.[6] Fishing pressure over an eight month period in 1997 was calculated at 66,000

[5] Ibid.

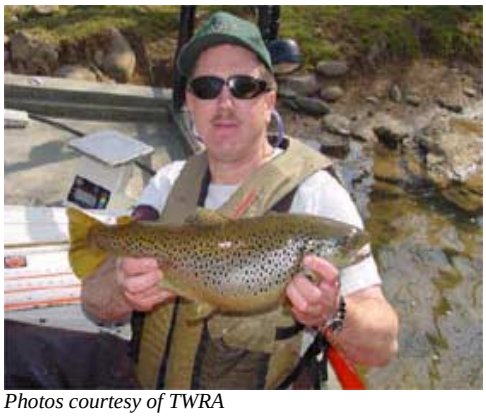
[6] Devlin, George J. III, and Bettoli, Phillip W., Seasonal Fluctuations in Growth and Condition of Trout in a Southeastern Tailwater. Proc. Annu. Conf. Southeast Assoc. Fish & Wildlife Agencies, 1999.

hours representing 21,300 trips to the area with anglers spending approximately $65.00 per day.[7] The fishery is described as "put-and-take," meaning that fish are stocked at a large enough size to be immediately harvested by anglers. Natural reproduction of trout in the Caney Fork River is now extremely rare.

WHAT IS DISSOLVED OXYGEN AND WHY IS IT IMPORTANT?

Oxygen is a colorless, odorless and tasteless gas that can dissolve in water and there be used by aquatic plants and animals to maintain life. Without adequate amounts of dissolved oxygen in water, fish and many aquatic organisms cannot survive. There are many natural factors that affect oxygen levels: water temperature, atmospheric pressure, light penetration and turbulence. Water temperature and atmospheric pressure work together to hold dissolved oxygen in the water. Temperature has an inverse relationship to the amount of DO that can be maintained in water, with colder water generally having more DO than warmer water. The ability of light to penetrate the water and ultimately affect temperature varies with turbidity, color and depth of the water. Also, turbulence or wave action can affect the amount of oxygen that is dissolved into a waterbody. Dissolved oxygen can range from zero to about 15 mg/L at saturation, depending on temperature and other characteristics of the water. Higher levels, or supersaturation can exist under certain conditions, which can also pose a problem to fish survival. For healthy streams and lakes in Tennessee, the normal range is about 6 to 10 mg/L, with higher levels for trout waters.[8]

Dissolved oxygen requirements vary by species. Trout and various aquatic insects generally require DO at a levels of greater than 6 mg/L. Warmer water fish such as bass require at least 5 mg/L DO and rough fish like carp can survive on less. As temperatures increase, fish need more DO to survive. Even at rest, a trout uses 5 times more DO at 80 degrees F, than at 40 degrees F[9]. Trout can die at DO levels less than about 2.5 mg/L, especially when exposure lasts more than 24 hours.



Photos courtesy of TWRA

THE PROBLEM

At times of the year with low flows and high temperatures (summer and fall), operations of Center Hill Dam on the Caney Fork River have decreased DO levels of tailwaters to fatal conditions for trout survival, health, growth and catchability. These operations violate water quality standards and

[7] Williams, Jeffrey S. and Bettoli, Phillip W., Net Value of Trout Fishing Opportunities in Tennessee Tailwaters; a final report submitted to the TWRA. August 2003.

[8] Sulkin, Barry, Harpeth River Below Franklin Dissolved Oxygen Study, Vanderbilt University Masters Thesis, 1987

[9] "Dissolved Oxygen: aquatic life depends on it" 2003. University of Wisconsin. This publication is part of a sever-series set, "Water Action Volunteers-Volunteer Stream Monitoring Fact sheet Series" and is available from the Water Action Volunteers Coordinator at 608.264.8949.

prevent TWRA from stocking the Caney Fork River below the dam during certain times of the year, thus also adversely impacting the public's use of the river.

LOW DO AS A RESULT OF GENERATION OF ELECTRICITY

Regional power demands and rainfall determine the level of discharge. Dam operations result in severe fluctuations in tailwater flows, water temperatures, and DO concentrations. Water released from the dam with the generation of electricity has low DO from about July through December. During September through November there are releases of water with DO concentrations that can be less than 2.0 mg/L downstream of the dam. Depending on initial DO levels, it can take up to 16 miles to fully recover DO to an acceptable level.

DEPLETION OF DO DUE TO THERMAL STRATIFICATION

During the summer months, a process called thermal stratification occurs in many reservoirs throughout Tennessee, including Center Hill Reservoir. This causes the water in the reservoir to separate into two layers: a surface layer that, though warmer, is relatively rich in dissolved oxygen due to mixing with the atmosphere, and a colder bottom layer. The oxygen in the lower layer is gradually used up as organic material – which enters the reservoir from natural and human sources – settles to the bottom and decays, using up DO through the respiration of microorganisms that consume and decompose the organic matter. In the reservoir, the two layers of water do not mix because of lack of turbulence and the temperature difference, so the oxygen in the lower layer is not replaced. By the end of the summer, oxygen content near the bottom can be entirely depleted. Thus, despite the general relationship between DO and temperature, though the lower water is colder, it contains less DO than the upper, warmer water.

Hydroturbine intakes typically draw water from these deeper levels, creating low-oxygen conditions downstream of the dam. This can cause problems for fish and other types of aquatic life, which depend on oxygen as much as do creatures living on land.

Center Hill Dam power generation facility

VIOLATION OF WATER QUALITY STANDARDS

Tennessee water quality standards require a minimum dissolved oxygen concentration of 6 mg/L at all times for non-reproducing trout waters, including artificial tailwaters (Tennessee Rules 1200-4-3). For many years, the Caney Fork River below Center Hill Dam has violated this standard, with DO concentrations often ranging from 2 to 4 mg/L throughout the tailwater. This river segment has been included in Tennessee's 303(d) list since the 1980s due to this problem. According to the latest 2004 list, 6.4 miles of the Caney Fork River are again included with the explanation that one or more designated uses are impaired due to low dissolved oxygen, flow alteration, and thermal modification caused by the upstream impoundment. However, despite this listing and the consistent violation of

water quality standards, which is illegal under the Tennessee Water Quality Control Act, TDEC has so far not taken action against the operator of the dam – the U.S. Army Corps of Engineers.

Waterbody Id	Impacted Waterbody	County	Parital	Not	Cause (pollutant)	Pollutant Source	COMMENTS
TN05120108 012-1000	Caney Fork River	Smith DeKalb	6.4		Low DO Flow Alteration Thermal modification	Upstream impoundment (Center Hill Reservoir)	This section is habitat for the following federally listed mussels:Oyster mussel (*E. capsaeformis*), Cumberland combshell *(E. brevidens)*,Pink mucket pearly mussel (*Lampsillis abrupta*), Dromedary pearly mussel (*Dromus dromus*),Fanshell (*Cyprogenia stegarias*), Clubshell (*Pleurobema clava*), Cumberland bean (*villosa trabalis*)

Table 1: 2004 303(d) List (Caney Fork River Basin)

FISH STOCKING

During the low DO periods on the Caney Fork River (typically August through November), stocking immediately downstream of the dam is not possible. TWRA monitors DO during these critical months to determine when and where stocking is possible so as to avoid fish mortality. Although DO may be acceptable during periods when power generation is off, managers cannot stock if they suspect that DO will drop that evening during peak power production. During extremely low DO periods, the stocking events must be postponed or cancelled. In 1997 trout were stocked during a low DO episode and caused a fish kill. Since then stocking has been done to better avoid such times.

Fish Stocking by TWRA Photo courtesy of TWRA

The Center Hill tailwater is stocked by the USFWS Dale Hollow National Fish Hatchery (DHNFH) in cooperation with TWRA. TWRA decides the schedule and the numbers of each species. Annually Center Hill tailwater receives 112,000 9-inch rainbow trout from DHNFH, and about 2,500 12-inch rainbow trout from TWRA's Flintville Hatchery. DHNFH also stocks roughly 20,000 8-inch brown trout each spring and about 20-40,000 4-inch brown trout in the fall, depending on availability.

The rainbow trout are stocked regularly between March and December. The rate varies from 5,000 to 16,000 per month, and is scheduled to match peak usage by anglers. In light stocking months the river is stocked every two to three weeks, in heavy months it is stocked almost weekly.[10]

[10] Fiss, Frank TWRA - Fisheries Management Division, July 28, 2005. Personal Communication

HOW CAN THIS PROBLEM BE ADDRESSED?

Low dissolved oxygen below dams is a common problem in rivers throughout the country. However, technological innovations have been applied to many hydropower operations, resulting in significant improvements to water quality and stream health. A good example is the Tennessee Valley Authority, which has taken significant steps over the past decade to improve DOS levels below its dams throughout the region. Several methods have been implemented, including maintaining minimum overflows, turbine venting, surface water pumps, oxygen injection systems, aerating weirs, and air compressor and blowers. Studies show that TVA's tailwater improvement program has improved conditions for aquatic life in more than 300 miles of river and has resulted in a dramatic increase in tailwater fishing, which contributes to local economies.

For more information on TVA's tailwater improvements see
http://www.tva.gov/environment/water/rri_results.htm

DATA/SCIENTIFIC STUDIES

The following data, collected by the COE between 1994-2002, demonstrate a recurring pattern. Each year DO levels drop significantly between August and November, violating state water quality standards.

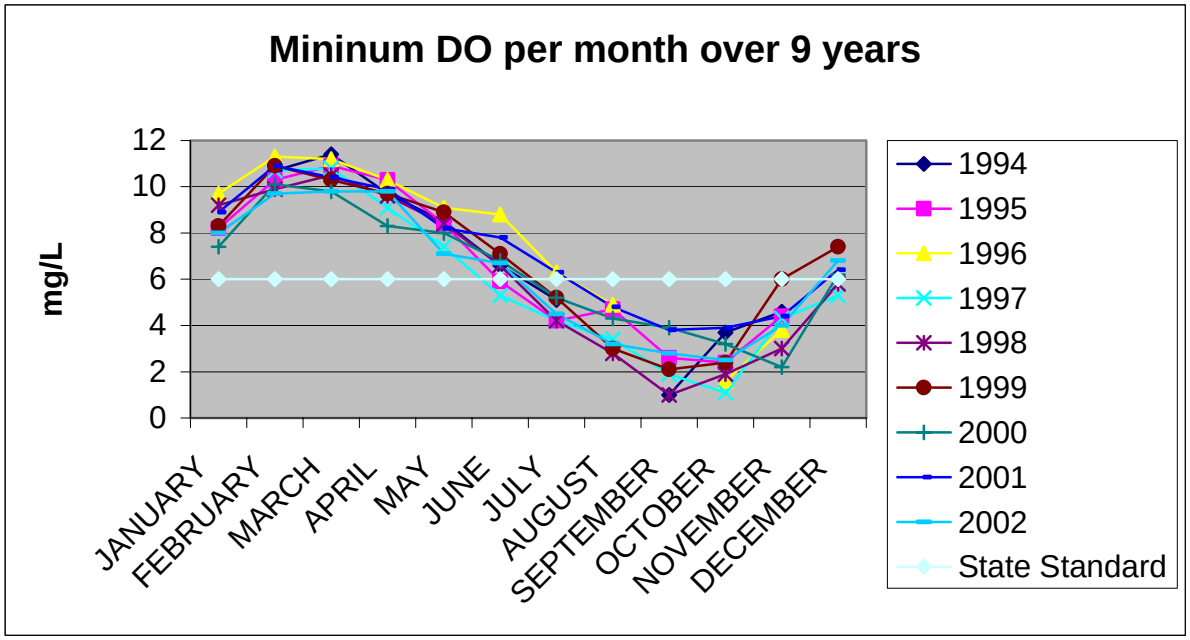


Chart 1: Data provided by COE
Data sampling location - Center Hill Dam Tailwater, Caney Fork River mile 26.5 at boat ramp

EFFORTS TO ADDRESS THIS PROBLEM

For many years, natural resource agencies, environmental groups, and recreation interests have sought to bring attention to the water quality problems caused by Center Hill Dam. The low DO problem has resulted in fish kills, loss of productivity in the river, and adversely impacted the public's right to use the river.

According to TWRA, the existing fishery is only about fifty percent of what the Caney Fork is capable of supporting with restored water quality. On February 26, 1998 the TWRA Commission adopted a resolution to "petition the US ACOE to design and implement a comprehensive tailwater

restoration project for the Caney Fork River and that such design draw upon technology and expertise as successfully demonstration elsewhere in the Tennessee River System" (i.e. TVA). This resolution stated that the Caney Fork River tailwater is a premier water recreation and fishery resource absolutely essential to the well being of the State of Tennessee and that in 1992 the COE recognized this distinction.

Unfortunately, both TDEC and the COE have been unwilling to remedy this situation. Repeated contacts with TDEC by PEER regarding this issue have been largely misunderstood and then ignored TDEC argued that since the dam is not considered a point source, it does not need a permit. We are not questioning whether the dam should be permitted. We have asked TDEC to take enforcement action against the COE for violations of water quality standards for DO. We recently learned that TDEC under new leadership has now taken the position that the problem can be addressed and has issued a Notice of Violation to the COE. At this point, it is unclear what if any enforcement action may be taken (see Appendix A – Correspondence).

TWRA and Trout Unlimited have tried numerous times to encourage the COE to modify the Center Hill Dam to meet water quality standards. TWRA has requested through resolution that the COE work with TWRA to actively pursue opportunities to improve water quality (1992); support the design and implementation of a tailwater restoration plan (1998) and to work with TVA to rehabilitate the dam to restore water quality (2004) (see Appendix B – Resolutions).

The COE's response has been to consider autoventing turbines (AVT) and to do a Major Rehabilitation Evaluation Report for Center Hill Dam. Though the COE has admitted that the DO problems at Center Hill Dam are continuing, citing budgetary restraints, they have been reluctant to act.

This all sounds eerily similar to a situation on the Snake River in Washington, except in that case DO was too high. When DO is very high, it can also be lethal for fish. The COE operates 4 dams on the Snake River in Washington State as part of the Columbia River Power System. A number of environmental groups in the northwest sued the COE for violations of water quality. The court ruled in favor of the plaintiffs and held that the COE must comply with the CWA, and thus state water quality standards, when operating its dams. [(National Wildlife Federation v. U. S. Army Corps of Engineers, 92F. Supp. 2d 1072, 1082)(D. Or. 2000)] and [(NWF v. COE, 132 F. Supp.2d 876, 896,) (D. Or. 2001)].

NEEDED ACTION

- **TDEC should take action against the COE by issuing an order to comply with state standards for DO on a schedule not to exceed three years as per the CWA. This order should involve public participation and be entered as a court order so that it is enforceable by citizens.**

- **The COE should make this a priority budget item and ask for congressional support for funding if necessary. Enforcement action by the state will likely adjust the priority of this project.**

CONCLUSION

The Caney Fork River has the potential to be a premiere trout stream in Tennessee. Currently, without the fish stocking efforts of the USFWS and the TWRA, this stream would have little catchable trout. COE's management of tailwaters at the Center Hill Dam have a detrimental effect on

the survivability of trout and water quality in the Caney Fork River. They are also proceeding to fix the dam leakage that ironically provides some DO to the tailwater. TWRA, TVA and non-profit groups such as Trout Unlimited have tried for years to get the COE to improve DO the tailwater at the dam with limited results. Successful lawsuits in other states have required the COE to comply with state water quality standards. Due to the violations in water quality standards, TDEC has a role to play in improving this fishery.

For more information about this report contact:

Renée Victoria Hoyos – Executive Director, Tennessee Clean Water Network
renee@tcwn.org - 865.522.7007

Rick Parrish – Attorney – Southern Environmental Law Center
rparrish@selcva.org - 434.977.4090

Barry Sulkin – Director - Tennessee Public Employees for Environmental Responsibility
tnpeer@peer.org - 615.313.7066

APPENDIX A
CORRESPONDENCE

Tennessee

PEER

Public Employees for Environmental Responsibility

4443 Pecan Valley Road · Nashville, TN 37218
tel: (615) 313-7066 · fax: (615) 251-0111
e-mail: tnpeer@peer.org web site: www.tnpeer.org

March 15, 2001

Commissioner Milton Hamilton
TN Department of Environment and Conservation
21st Floor L & C Tower
401 Church Street
Nashville, TN 37243

Re: Caney Fork and Stones Rivers - Low DO
Formal Complaint - WQCA Section 118(a)

Dear Commissioner:

As noted in the recently released year 2000 305(b) report from the Division of Water Pollution Control, both the Caney Fork River below Center Hill Dam and the Stones River below Percy Priest Dam are list as not meeting state standards for Dissolved Oxygen (DO). This is consistent with the 1998 listing as per requirements of section 303(d) of the federal Clean Water Act. It appears that the problem of low DO downstream of these dams is continuing in apparent violation of the state's Water Quality Control Act. In accordance with section 118(a) of that act, we are filing a formal complaint regarding this situation.

To our knowledge, the problem of low DO below these dams operated by the Corps of Engineers has persisted for some time. We ask that you investigate the problem and see that corrective action is taken. Please provide us with information and data regarding the extent of the problem, most recent data showing low DO, and a description of what action will be taken in the near term to see that these waters are maintained in accordance with the state DO criterion of at least 5 mg/L at all times.

Thank you for your efforts in this matter, and we await your response. If you or your staff would like to discuss this problem in person, please contact us.

Sincerely,

Barry Sulkin
Director
TN PEER

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

DON SUNDQUIST
GOVERNOR

MILTON H. HAMILTON, JR
COMMISSIONER

June 13, 2001

Mr. Barry Sulkin
4443 Pecan Valley Road
Nashville, TN 37218

Subject: Formal Complaint Determination pursuant to the T.C.A. §69-3-118(a) regarding U.S. Corps of Engineers allegedly being responsible for low Dissolved Oxygen below Center Hill and Percy Priest Dams in DeKalb and Davidson County, Tennessee.

Dear Mr. Sulkin:

This letter responds to your formal complaint, which I received March 16, 2001, against the U.S. Corps of Engineers (the "Corps"). In your complaint you state that the Corps is responsible for low dissolved oxygen (DO) downstream from the Percy Priest and Center Hill dams, which you believe is a violation of the Water Quality Control Act.

The issue you have raised in this complaint is similar to another complaint filed under T.C.A. §69-3-118(a), *In the Matter of: Leaf Myczack,* which is the subject of a pending Motion for Summary Judgment. In this and the Myczack complaint, the state is being asked to respond to changes in waters of the state resulting from the operation of a dam by a federal agency. The position of the Environmental Protection Agency that dams are not point sources of pollution has been consistently upheld in Federal court, including TVA vs. Tennessee Water Quality Control Board, 717 F. 2nd 992 (1983), which holds that the state cannot require a Federal agency to obtain a permit unless the agency is causing a discharge or runoff of pollution.

This Department is aware of the DO problem that exists in the tailwaters of dams. The Corps and TVA have tailwater and forebay improvement projects underway. Feel free to contact these agencies for further information. This Department believes that further regulatory action is not necessary or warranted at this time.

If you disagree with this determination, you may appeal to the Water Quality Control Board for a hearing that will be conducted pursuant to T.C.A. Section §69-3-110. Such an appeal must be made within thirty (30) days after receipt of this notification.

If you require additional information, please contact Mr. John Leonard, Assistant Commissioner for Environment, at (615) 532-0220.

Sincerely,

Milton H. Hamilton, Jr.

M.H.H.:CSM:lkm

Tennessee

PEER

Public Employees for Environmental Responsibility

4443 Pecan Valley Road · Nashville, TN 37218
tel: (615) 313-7066 · fax: (615) 251-0111
e-mail: tnpeer@peer.org web site: www.tnpeer.org

September 7, 2001

Commissioner Milton Hamilton
TN Department of Environment and Conservation
21st Floor L & C Tower
401 Church Street
Nashville, TN 37243

Re: Caney Fork and Stones Rivers - Low DO
Formal Complaint - WQCA Section 118(a)

Dear Commissioner:

We are in receipt of your response to our complaint and request that you reconsider your reply and respond again before we make a decision on appealing. This is based on several reasons. First, the complaint was dated March 15, 2001 and received the following day according to your letter. Section 118(a) of The Water Quality Control Act states that the commissioner "In all cases... shall notify the complainant of his action or determination within ninety (90) days from the date of his receipt of the written complaint". This means that a determination was due under the law by approximately June 16, 2001. Your response was dated June 13, 2001 but was postmarked July 17, 2001 and not received until July 18, 2001. A copy of the envelope showing the postmark date is attached.

Your letter also explains that our concern was not being pursued due to the fact that there was another pending case by the TN Riverkeepers, and reference to an EPA position, federal court holdings, and a 1983 Board decision that the state can't require a permit for a dam operation. I think you missed the point. We are not asking that a permit be required, only that water quality standards violations not be allowed, and it is irrelevant that there was the unresolved Riverkeepers case that may or may not involve similar issues.

While previous decision you mention may have ruled that permits are not required, they do not support a position that standards can be violated and not enforced. With very little searching among our colleagues across the country, we were quickly bombarded with replies and referred to several cases on point, the most significant and often cited involving dams on the Snake River - National Wildlife Federation v. U.S. Army Corps of Engineers, 92 F. Supp. 2d 1072, 1082 (D. Or. 2000) and NWF v. COE, 132 F. Supp.2d 876, 896 (D. Or. 2001). These cases involved violations of water quality standards for temperature and dissolved gasses and the court held that the Corps must comply with the Clean Water Act when operating its dams. A summary can be

found on the website of Earthjustice Legal Defense Fund - the legal organization that handled the case (copy attached) www.earthjustice.org/backgrounder/display.html?ID=19 . I spoke to an attorney there who was involved and she explained that the Corps argued that dams are non-point sources and not thus subject to the standards and that citizens can't enforce violations, only the state. The court ruled against the Corps on both of these points and held that standards must be met regardless of whether the dams/problems were point source or non-point (covered by Section 319 of the CWA).

As in our complaint, it's not a question of the need for a permit, but of meeting water quality standards. It is understood that the Corps and TVA have ongoing projects to improve the situation, but without a directive from the state, such voluntary efforts might not get fully supported, implemented, or funded as needed. We believe that there are responsible staff within these agencies that want to see this problem corrected, but need the required enforcement pressure from your department to make it happen. Besides, as point out by the above case we believe it is the state's duty to enforce compliance with the standards.

Based on this clarification and additional information that your agency was apparently not aware of, and since the reply deadline required by the law was not met, we are offering the opportunity for an additional thirty (30) days for another determination under the provisions of 118(a). This would make the additional response date approximately October 12, 2001. We will also presume that the appeal period following the determination has not begun.

If you or your staff would like to discuss this matter in person, please call and we would be glad to work with you. We look forward to your revised response.

Sincerely,

Barry Sulkin
Director
TN PEER

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

DON SUNDQUIST
GOVERNOR

MILTON H. HAMILTON, JR.
COMMISSIONER

October 5, 2001

Mr. Barry Sulkin
Tennessee PEER
4443 Pecan Valley Road
Nashville, Tennessee 37218

Subject: Formal Compliant Pursuant to T.C.A. §69-3-118(a)
Caney Fork River and Stones River

Dear Mr. Sulkin:

This letter serves to respond to your recent request to reconsider our initial determination. You also indicated that the response did not occur within the stated period. We realize that you did not receive notice of the original determination within the 90-day time period. It is the Department's goal to meet regulatory requirements.

In regard to the complaint of water quality impact we are aware of studies and projects undertaken by the Corps of Engineers to improve dissolved oxygen content of the water discharged through generating periods. We have been kept apprised of Corps of Engineers activities and its efforts to maximize support of designated uses below the Center Hill and J. Percy Priest dams. Included is a recent summary of progress. We do not believe enforcement measures against existing Corps of Engineers dams is warranted.

The Department recognizes your appeal rights to the Water Quality Control Board regarding this second determination. If you desire to appeal this determination, please notify us within thirty days of this correspondence. If you require additional information, please contact Mr. John Leonard, Assistant Commissioner for Environment at (615) 532-0220.

Sincerely,

Milton H. Hamilton, Jr.

Enclosure

Cc: David Day, COE, Acting Chief, Engineering – Construction Division

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

JAMES H. FYKE
COMMISSIONER

PHIL BREDESEN
GOVERNOR

June 13, 2005

LTC Byron G. Jorns
District Engineer, Nashville District
U. S. Army Corps of Engineers
P. O. Box 1070
Nashville, TN 37202-1070

Re: Caney Fork River / Center Hill Reservoir Tailwaters
Notice of Violation of Tennessee Water Quality Standards

Dear Colonel Jorns:

Your letter of April 19, 2005 presents the Corps' response to our request for a commitment to improved water quality below Center Hill dam. It discusses two proposed projects that hold promise for improved tailwater quality, but their funding and scheduling are uncertain. Also, it discusses measures undertaken in 2004 to boost tailwater oxygen and proposes to build on that experience with further sluice releases, perhaps automated, as continuing mitigation.

We appreciate that the Nashville District has taken positive steps both to propose major project upgrades and to manage existing facilities toward achieving water quality goals. Still, funding considerations beyond the district's control leave us with no real commitment for either the major project rehabilitation, for the long term, or readily available interim measures, which offer more immediate relief. We have an abatable violation of water quality standards that, aside from the welcome but only partially effective sluice release program, remains unabated, and moreover, unscheduled for abatement, on account of funding. Our position must remain, as stated in our earlier letter, that lack of funding is not a legitimate basis for continuing violations of water quality standards.

The oxygen problems in Center Hill tailwaters have a real economic cost to Tennessee. As we have said, a healthy fishery has substantial value to the local community, which is presently reduced because neither the budget process nor the power customers will come forward to meet the requirements of federal and state law. We continue to believe that the value of power production at Center Hill well justifies reasonable expenditures to sustain the fishery and meet Tennessee's clean water goals.

We must insist that the Corps make a firm commitment to timely installation of interim improvement measures, such as oxygen injection and improved blending of sluice waters, until the proposed major rehabilitation projects can sustain tailwater quality in accord with established standards. We restate our interest in meeting with Corps staff who are position to set agency funding priorities or with power customers who can deliver needed funding to the district's proposals, so that they can fully understand the importance of this matter to Tennessee. Ultimately, unless we can show the citizens of Tennessee that the Corps is doing everything reasonable to correct the violations of water quality standards as soon as possible, we will be compelled to take all available actions to attain compliance with this state's legally established clean water goals.

Sincerely,

James H. Fyke

Cc: - SEPA, EPA Region 4, TWRA, TN AG.

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202-1070

JUL 2 2 2005

#2423 - Please prepare a response for the Commissioner's Signature. Thank
Paul Davis 8/11/05

IN REPLY REFER TO

Engineering-Construction Division

Commissioner James H. Fyke
State of Tennessee
Department of Environment
and Conservation
401 Church Street
Nashville, Tennessee 37243-0435

Dear Commissioner Fyke:

Your letter of June 13, 2005, requests that the Corps of Engineers make a firm commitment to the timely installation of interim water quality improvement measures at Center Hill Dam. The purpose of this letter is to inform you that we are committed to meeting established clean water goals and will do so through operational modifications including limits on hydropower generation and a refined sluice release operation. In 2004, we instituted sluice releases in late September, after release dissolved oxygen levels had reached critically low levels. This year we will initiate sluice releases earlier in order to maintain a blended release above the Tennessee Water Quality Standard of 6 mg/l. In addition, we plan to make sluice releases coincidental with hydropower generation to minimize their impacts to hydropower generation, tailwater recreation, and downstream water treatment plants. Sluice gate operations will be preceded by restrictions on the number of turbines in use to maximize the benefits of previously installed turbine venting features and to minimize the period that sluice releases will be required.

The timely use of highly oxygenated sluice releases provides us with a highly effective mechanism to meet downstream water quality objectives. It should be noted that there are a number of factors that will challenge our ability to always meet the dissolved oxygen goal. The revised operating criteria will require daily sluice gate operations using equipment that was

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designed for infrequent use. To date, 2005 has been a dry year; however, should that change and flood control operations become necessary, we may have trouble meeting both flood control and water quality requirements. These proposed water management modifications are in close accord with the Chief of Engineers recently adopted Environmental Operating Principles. We are confident that these operational changes will make significant improvements to the health of the lower Caney Fork River ecosystem. I am forwarding a copy of this letter to Mr. Charles Borchardt, Southeastern Power Administration, 1166 Athens Tech Road, Elberton, Georgia 30635, and to Mr. Gary Myers, Tennessee Wildlife Resources Agency, Ellington Agricultural Center, P.O. Box 40747, Nashville, TN 37204.

Sincerely,

Byron G. Jorns
Lieutenant Colonel
Corps of Engineers
District Engineer

APPENDIX B
TWRA RESOLUTIONS

RESOLUTION

BY

THE TENNESSEE WILDLIFE RESOURCES COMMISSION

RELATIVE TO THE U. S. ARMY CORPS OF ENGINEERS

MANAGEMENT OF THE CUMBERLAND RIVER SYSTEM

WHEREAS, the Tennessee Wildlife Resources Commission has responsibility for the management and protection of wildlife, fish and aquatic life, and their respective habitat; and

WHEREAS, the U. S. Army Corps of Engineers has responsibility for the management of the Cumberland River and its tributaries; and

WHEREAS, the Cumberland River system is a premier aquatic resource absolutely essential to the well-being of the State of Tennessee; and

WHEREAS, the Chief of Engineers for the Corps has recently established that water quality, fish and wildlife, and recreation are authorized elements of project operations; and

WHEREAS, the Corps has further committed to operation of all projects in compliance within the confines of the Federal Clean Water Act, the National Environmental Policy Act, and all other applicable environmental law;

BE IT THEREFORE RESOLVED, the Tennessee Wildlife Resources Commission, on this the 30th day of September 1992, fully endorses the enhancement of water quality, fish and wildlife resources, and recreational opportunity in the Cumberland River system; and

BE IT FURTHER RESOLVED, the Tennessee Wildlife Resources Commission and the Tennessee Wildlife Resources Agency propose to work with the Nashville District of the U.S. Army Corps of Engineers to identify and pursue opportunities to improve water quality, fish and wildlife resources, and recreational opportunity in the Cumberland River System.

Chairman
Tennessee Wildlife Resources Commission

ATTEST:

Secretary
Tennessee Wildlife Resources Commission

RESOLUTION

by

The Tennessee Wildlife Resources Commission

Relative To

The Caney Fork River, Center Hill Reservoir Tailwater

As Managed by the U. S. Army Corps of Engineers

WHEREAS, the Tennessee Wildlife Resources Commission has responsibility for the management and protection of wildlife, fish and aquatic life, and their respective habitat; and

WHEREAS, the U.S. Army Corps of Engineers has responsibility of the Cumberland River system including that portion of the Caney Fork River constituting the tailwater of Center Hill Reservoir; and

WHEREAS, the Caney Fork River tailwater is a premier water recreation and fishery resource absolutely essential to the well being of the State of Tennessee; and

WHEREAS, in 1992 the Corps recognized water quality, fish and aquatic life, and water based recreation as authorized elements of the Center Hill Reservoir operation and further committed to operate this project in compliance with the Federal Clean Water Act, The National Environmental Policy Act, and the Tennessee Water Quality Control Act; and

WHEREAS, despite the availability of proven tailwater restoration technology as successfully demonstrated elsewhere in the Tennessee River Valley, the Caney Fork tailwater continues to suffer from low dissolved oxygen, erratic flow release, and significant fish kills; and

WHEREAS, the U.S. Army Corps of Engineers has yet to design and implement a comprehensive tailwater restoration and management project for the Caney Fork River;

BE IT THEREFORE RESOLVED, the Tennessee Wildlife Resources Commission and the Tennessee Wildlife Resources Agency, on this the 26th day of February, 1998, petition the U.S. Army Corps of Engineers to design and implement a comprehensive tailwater restoration project for the Caney Fork River and that such design draw upon technology and expertise as successfully demonstrated elsewhere in the Tennessee River system; and

BE IT FURTHER RESOLVED, the Tennessee Wildlife Resources Commission petitions the Tennessee General Assembly and Tennessee Congressional delegation to fully support the design and implementation of a comprehensive tailwater restoration project for the Caney Fork River by the U.S. Army Corps of Engineers; and

BE IT FURTHER RESOLVED, that copies of this Resolution be provided to the Office of the Governor, the Tennessee Water Quality Control Board, and other partners in conservation for their support.

Bob Sterchi, Chairman
Tennessee Wildlife Resources Commission

Gary T. Myers, Executive Director
Tennessee Wildlife Resources Agency

Exhibit No.

RESOLUTION

Regarding

RESTORATION OF THE CANEY FORK RIVER

WHEREAS, the Tennessee Wildlife Resources Commission has statutory responsibility for th protection, management, and conservation of wildlife, including fish and aquatic life; and

WHEREAS, the U.S. Army Corps of Engineers (COE), Center Hill Dam, violates state and federal environmental law, and causes pollution of the Caney Fork River resulting in fish kills and degraded water quality; and

WHEREAS, the Tennessee Valley Authority (TVA) is nationally recognized for restoring water quality, fish and aquatic life in tailwaters impacted by hydropower operations; and

WHEREAS, TVA has the expertise, experience, and technology to restore the Caney Fork River downstream of Center Hill Dam.

BE IT THEREFORE RESOLVED, The Tennessee Wildlife Resources Commission petitions TVA and COE to enter into negotiations to rehabilitate Center Hill Dam, restore water quality in the Caney Fork tailwaters, and recoup TVA investment costs through power generation.

This RESOLUTION to be provided to Tennessee's Congressional delegation and to the Tennessee Wildlife Resources Agency (TWRA) partners in conservation, requesting their support and action.

So RESOLVED, the 20th day of May 2004 in regular session in Nashville, Tennessee.

Hugh T. "Skip" Simonton, Jr.
Chairman, TWRC

Gary Myers
Executive Director, TWRA