



**American Water Works  
Association**

The Authoritative Resource on Safe Water <sup>SM</sup>

**Testimony of Wiley Stem**

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**On Behalf of the American Water Works Association**

**April 19, 2007**

**Before the House Subcommittee on  
Water Resources**

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## **Summary**

Lake Waco is the only viable public drinking water supply for approximately 150,000 central Texas citizens who live in the City of Waco and surrounding communities. In recent decades, Lake Waco has been severely damaged by pollution running off agricultural lands in the watershed. Segments of the North Bosque River upstream from Lake Waco have been determined by both the Texas Commission on Environmental Quality (“TCEQ”) and by the United States Environmental Protection Agency (“EPA”) to be so impaired due to high concentrations of nutrients, principally phosphorus, that they have been placed on the national list of impaired waters.

Numerous studies and peer reviewed publications have concluded that the high concentrations of phosphorus in Lake Waco are caused by runoff from agricultural operations in the North Bosque River watershed. More specifically, this runoff occurs as a result of dairies over-applying cow manure to their waste application fields. The dairies in question – which, by the way, are industrial-scale operations and not traditional “family farms” - are applying manure to their fields as a means of waste disposal rather than for agronomic purposes.

Although technically speaking, parts of a Concentrated Animal Feeding Operation (CAFO) may be a point source under the Clean Water Act, the type of pollution I am describing – runoff from waste application fields – is considered “non point source” pollution, because it does not come from a pipe or discrete

conveyance (a point source) as defined in the Clean Water Act. Non point source pollution is subject to few if any effective controls by EPA or most states.

The excessive phosphorus in our watershed has caused algal growth in Lake Waco, which in turn causes serious taste and odor problems with the water. The end result is that Waco has to spend tens of millions of dollars that it would not have to spend if there were adequate controls on these nonpoint sources of pollution.

In addition to phosphorus, of course, animal wastes are also a significant source of pathogens. Although Waco takes great care to treat its water to safe levels, in other cities there have been several well-documented cases where a chain of events including breakdowns in water treatment have resulted in people being killed or seriously sickened by pathogens associated with animal wastes. The City of Waco has both an obligation under the Safe Drinking Water Act and a moral responsibility, which we take very seriously, to ensure that the water we deliver to our residents is safe, odor free, and pleasant to drink. In order to meet this obligation, Waco has been forced to spend millions of dollars in recent years for additional water treatment costs as the direct result of the pollution in our watershed. The cost of upgrades in equipment and facilities which we must employ to deal specifically with this problem is projected to nearly double the cost of a project we are undertaking to ensure we have adequate water supplies to meet our needs now and in the future. The cost of that project is estimated at approximately \$90 million, of which about \$40 million is attributable to the poor water quality caused by animal operations in our watershed.

As described in more detail in my statement, the City of Waco was forced to sue a number of the dairies in our watershed, using the authorities of the Clean Water Act and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, better known as Superfund). These suits were not for the purpose of enriching the City, but to force the dairies to adopt better practices that reduce the levels of polluted run off from their fields. I would note that there are efforts underway in Congress to relax the provisions of Superfund by excluding animal manure and its constituents such as phosphorus from coverage under the law. I urge you to strongly oppose such a relaxation of Superfund.

I would also note that the types of programs that Waco had to sue to get agricultural operators to adopt in our watershed are the same types of programs that could be adopted voluntarily with support under our nation's comprehensive Farm Bill. Congress is expected to pass a new comprehensive Farm Bill this summer. I urge you to expand the conservation programs in it to at least \$7 billion annually, as proposed by several members of Congress, and to make protection of drinking water supplies a top priority for those funds. Of particular importance is the "Partnership and Cooperation" program. The US Department of Agriculture should be required to spend at least twenty percent of its "working lands" conservation monies in this program, and water utilities like Waco's should be specifically eligible to coordinate a cooperative effort with agricultural producers in the watershed.

Finally, I would be remiss if I did not thank Representative Chet Edwards for his tireless efforts to procure funds for the City of Waco to help us deal with these problems. I hope that you will strongly support the Water Resources Development Act and the funds Rep. Edwards is seeking to assist Waco in the important work of securing adequate and safe supplies of water for our citizens.

### **I. Introduction**

My name is Wiley Stem. I have been an employee of the City of Waco for the past 29 years. Over that time I have worked as a management analyst, assistant director of public works, water/wastewater supervisor, and director of water distribution and wastewater divisions. In 1999 I assumed a position as Assistant City Manager, which is the position I currently hold. As Assistant City Manager my responsibilities and duties include overseeing several different departments within our local government, including water utilities, environmental services, general services, public works, human resources and parks and recreation.

I received a Bachelor of Business Administration degree from Baylor University in 1976. Among other professional associations, I am a member of the American Water Works Association (AWWA). AWWA was founded in 1881 and is the oldest and largest organization of water professionals in the world. AWWA member utilities serve safe water to about 80 percent of the American people.

I currently serve on the Brazos Regional Water Planning Group and am chair of the Waco Metropolitan Area Regional Sewerage System. I have also served on the United Way board. On a personal note, my family has had a farm in Falls County, Texas, since 1961, and we continue to have a cow/calf operation there. For more than twenty years I have been a member of the Texas Farm Bureau.

I want to thank the Subcommittee on Water Resources for allowing me to testify regarding the effect that runoff pollution often has on city water suppliers.

## **II. Lake Waco**

Lake Waco, part of the Brazos River Basin, is located in the southeastern portion of the Bosque River Watershed, entirely within McLennan County, Texas, and on the northwestern edge of the Waco city limits. In or about 1928, construction of a dam to impound Lake Waco began, and the dam was completed around 1930.

Lake Waco is fed by the North Bosque, the Middle Bosque, and the South Bosque rivers, and by Hog Creek. The contributing watershed to Lake Waco is approximately 1,652 square miles. The great majority of that (about 1,260 square miles) is in the North Bosque River watershed. The North Bosque River and its tributaries flow downstream and terminate in Lake Waco, which means that pollutants dissolved and entrained in the waters of the North Bosque are carried into, and ultimately deposited in, Lake Waco.

In or about 1958, the City of Waco, with the assistance and support of the

U.S. Army Corp of Engineers, began construction of a second larger dam on Lake Waco to provide additional flood control and drinking water. That project was completed in or about 1965.

Lake Waco constitutes the public drinking water supply for the City of Waco and is a significant source of drinking water for many surrounding communities and approximately 150,000 citizens.

Additionally, Lake Waco is used for a wide variety of recreational activities, including fishing, boating, swimming, and water skiing. The shores of Lake Waco provide recreational activities and amenities in the form of parks, picnic areas, boat docks and camping facilities. Lake Waco is also put to a variety of other municipal purposes, including irrigation.

In any city, a clean and reliable source of drinking water is indispensable to the health and welfare of the citizens and is also essential to the existence and growth of business and industry. A substantial supply of clean water is critical to any city's ability to maintain and attract industrial enterprises.

Lake Waco is the regional water supply. There is no viable alternative to the Lake as the regional water supply, and that will continue to be the case into the foreseeable future.

### **III. Nonpoint Source Problems**

In the later half of the 1980's, large industrial dairy operators began moving into counties in the North Bosque River watershed. This influx of dairy operators into the watershed coincided with a massive increase in the amount of

nutrients, and specifically phosphorus, which were being released into the North Bosque River and ultimately deposited into Lake Waco. The waste from these dairies is the single most important cause of the environmental problems that are occurring in the North Bosque River watershed and Lake Waco.

A dairy cow generates up to 115 pounds of manure per day or more. Considering that there are over 70 dairies in the North Bosque River watershed with over 50,000 permitted head of dairy cattle, more than 2,875 tons of animal manure is produced every day in our watershed. In addition to this solid waste, these dairies produce large amounts of liquid waste.

Best management practices indicate that to properly dispose of waste, a dairy operator should maintain 1.5 to 3 acres of land per dairy cow. For example, a 2,000 cow dairy ought to have 3,000 to 6,000 acres of land to properly dispose of waste produced by their cows. In many instances, dairies in the North Bosque River watershed have less than 1/4 to 1/5 an acre per cow. In short, in our watershed there are too many cows producing too much waste on too little land.

Solid and liquid cow waste contains many pathogens and bacteria. Significantly, the huge amounts of solid and liquid waste generated by dairy cows contain very high concentrations of phosphorus. A single dairy cow may produce as much as 40 pounds of phosphorus per year or more, which means permitted cows in our watershed would produce as much as 2,000,000 pounds of phosphorus each year.

Because of the enormous amounts of waste generated on a daily basis by Concentrated Animal Feeding Operations, it is critical that they dispose of such

waste properly, that is, in a way which ensures that the waste does not reach the water supply. CAFOs often rely on several methods to manage their animal wastes. Liquid waste from cows and slurry resulting from wash water being combined with solid waste from cows is collected in “lagoons” located on the property. Such lagoons are supposed to be specially and properly lined to ensure that the liquid waste is contained and does not leach into the ground and into the groundwater and water supplies. Many of the dairies in this region have failed to construct and maintain their lagoons in a way which prevents leaching or even overflow.

Another waste management practice often used by Concentrated Animal Feeding Operations involves spreading waste on their fields. Several times a year, heavy rain turns this waste into liquid manure that runs off the waste application fields and into our watershed. Moreover, because the land they possess is small relative to the number of cows they have confined in their pens, many of the dairies in our watershed long ago exceeded the natural capacity of the soils and vegetation on their facilities to absorb or otherwise assimilate the phosphorus in the waste.

Any application of manure and waste products containing phosphorus to a waste application field in excess of 80 ppm is a waste management practice, not an agricultural one. That is because at levels of 80 ppm and higher there is far more phosphorus than can be used by plants. At those levels, there is a very high risk that the phosphorus will simply run off of the fields as nonpoint source pollution. Samples taken by the Texas Commission on Environmental Quality

("TCEQ") over a five year period showed over 200 individual waste application fields on dairies in our watershed, where soil levels exceeded 200 ppm. Once soil phosphorus reaches those levels, the time required for the phosphorus to decline to agronomic levels is measured in years or even decades.

The large industrial dairies in our watershed have permits issued to them by the State of Texas which require them to conduct their operations in accordance with various laws, rules and regulations. Many of those dairies have operated their dairies and maintained their land in such a way as to have consistently and egregiously violated the applicable laws and regulations, and they continue to do so.

Finally, it must be noted that the phosphorus being released by these dairies is a pollutant and is poisonous. Both CERCLA and the Clean Water Act recognize phosphorus as a hazardous substance.

#### **IV. Impacts on the City of Waco**

Prior to the late 1980's the City of Waco experienced taste and odor problems with the water from Lake Waco only on a sporadic and episodic basis. Those sporadic and episodic taste and odor problems in the water were resolved without the City of Waco having to resort to special water treatment methods.

In or about the late 1980's, large industrial dairy operators began moving into Erath County and into the North Bosque River watershed.

In about 1988 there were very notable increases in the levels of algae in Lake Waco. The mass and volume of algae increased to levels which had never before occurred in the lake. There is a direct correlation between the increased

levels of phosphorus in Lake Waco resulting from dairy waste runoff, increased levels of algae in the Lake, and the taste and odor problems with the water in Lake Waco. As the algae level in the lake increased, so did the taste and odor problems with the water. The problems became so bad and so greatly affected the quality of the water that the City began using a different and additional treatment process in order to make the water acceptable for human consumption.

Since 1996, Waco has had to continually employ water treatment methods it would not otherwise use, to ensure our water is palatable. Those treatment methods involve adding treatment chemicals to the water whose sole purpose is to reduce the substantial taste and odor problems of the water from Lake Waco. Despite the high levels at which the additives are being put into the water, they are becoming less effective at improving the taste and odor of water out of Lake Waco. At the same time, the City is reaching the upper limit of the level at which these chemicals can be added to the water, because, at very high levels, they cause adverse side effects by producing undesirable chemical byproducts and by adversely affecting other aspects of the drinking water treatment process.

Needless to say, these chemicals are also expensive. Since 1995, the City has spent close to \$4.5 million to address taste and odor problems in Lake Waco. Those expenditures are in excess of those which would have otherwise been made for water treatment. Ongoing remedies for treatment of taste and odor problems directly attributable to excessive phosphorus from dairies currently consume more than half of the City of Waco's budget for chemical water

treatment. Prior to 1996, that figure was about 10 percent.

Even though the City has been and continues to be very aggressive and diligent in its efforts to ensure that the water our citizens drink is microbiologically safe and palatable, doing so is a challenge. Because the City is currently unable to sufficiently reduce such taste and odor problems, out of concerns for the microbiological safety of the water, and because of concerns that the pollution in our watershed may continue or even increase in the future, the City has found it necessary to add additional, advanced water treatment equipment and facilities to its two existing water treatment plants.

It should be noted that the equipment and facilities necessary to ensure our drinking water is safe and palatable will do nothing to improve the quality of water in Lake Waco itself. It continues to be impaired by runoff pollution. The pathogens which are borne in cow manure and which enter Lake Waco have created concern about the health and safety of the citizens who fish, swim, ski and engage in other activities in the lake. If this pollution is allowed to continue unabated, there is the potential for substantial risk to the health and welfare of the users and consumers of Lake Waco water.

Segments of the North Bosque River upstream from Lake Waco were placed on the national list of impaired waters after it was determined by both the TCEQ and the Environmental Protection Agency (“EPA”) that these waters were severely impaired due to high concentrations of nutrients, principally phosphorus. This data has been confirmed through many scientific and peer-reviewed studies.

Two Total Maximum Daily Loads (TMDLs) for soluble reactive phosphorus in the North Bosque River were adopted by TCEQ and approved by EPA in 2001. TCEQ subsequently approved a plan to implement these TMDLs, which are designed to reduce the amount of phosphorus in the North Bosque River. It remains to be seen whether or not the TMDLs will be effective in reducing the phosphorus entering the North Bosque River. If the underlying problem is not effectively addressed and the polluting conduct not abated, the current water supply may be irreparably damaged.

## **V. Recommendations**

Although this hearing does not focus on specific remedies to the kinds of problems I have described, I would like to make a couple of general recommendations.

### **A. The Importance of Enforcement**

First, I want to stress the importance of properly enforcing the provisions of the Clean Water Act and other environmental statutes. The type of runoff I have described is associated with both point source and nonpoint source pollution. To the extent that some of the pollution I have described could be said to have come from a point source, I would have to say that enforcement was lax in the case of Waco. It does not seem fair to hold the municipal sector to strict accountability in matters of water pollution but essentially to look the other way when there are persistent and serious problems from others in our watershed. With respect to the nonpoint source runoff from fields, there is essentially no

federal program at all. And most states will not venture into an environmental area where the federal government does not tread.

Of course, the question of enforcement goes well beyond the Clean Water Act, to encompass the Superfund statute. As I noted in the summary, the City of Waco had to bring legal action against fourteen large industrial dairies in the watershed, using the authorities of both the Clean Water Act and Superfund. Our goal was to bring about improvements in the waste management practices of these dairies. I am pleased to say that the City's efforts were highly effective, and the City has settled with the original defendant dairies. Under these settlements, the dairies have agreed to certain changes in their management of animal wastes that will significantly reduce their polluted runoff, yet allow them to continue in business. None of the dairies that have settled have paid money to settle the lawsuit. In one case, an insurance company for a dairy paid a cash settlement to the City, which Waco then returned to the dairy operator in exchange for a conservation easement prohibiting certain land from being used for confined animals, though it may be used for other agricultural purposes.

These results show the importance of Superfund in addressing pollution problems of this kind. That is why AWWA and others oppose proposals to remove phosphorus and other constituents of animal waste from coverage under Superfund. The normal agricultural application of manure as a fertilizer is already exempt from Superfund. If adopted, the amendment would make it impossible for Waco and other cities to use Superfund authorities to force

cleanup where there has been mismanagement and non-agronomic application of animal wastes with consequent damage to our water supplies.

### **B. The Need for More Effective Nonpoint Source Programs**

My second recommendation goes to the need as a nation to develop meaningful programs to reduce and manage nonpoint sources of pollution. Obviously these need to be reasonable, cost-effective, and balanced. The kinds of things that could be done to address this problem include Best Management Practices (BMPs), where those are economically viable. This needn't be a permit-based program, but it needs to be real and effective, and it needs to involve major contributors to water quality problems who up to now have not had to be "at the table" in dealing with problems in a watershed.

### **C. The Opportunity to Protect Water Under the Farm Bill**

Third, we have an opportunity this year to make a real difference in this kind of problem by redirecting resources under the comprehensive Farm Bill towards the protection of sources of drinking water. The Conservation Title of the 2002 Farm Bill authorized record levels of funding for a suite of conservation programs. AWWA was active in the development of this title throughout the legislative process, along with many partner organizations, and we are grateful to the many members of Congress who worked so hard to ensure the enactment of the Conservation Title of the 2002 Farm Bill.

The conservation programs of the U.S. Department of Agriculture (USDA) can do much to enhance the quality of America's waters. Promoting practices such as buffer strips, terracing, temporary or permanent land retirement, and no-

till cultivation are great ways to protect sources of drinking water from agricultural runoff. These programs also provide revenue security for agricultural producers – particularly important when international trade requirements may affect price-support programs. Overall, conservation programs protect our vital water supplies, benefit public health, and assist agricultural producers.

The 2002 Farm Bill created a very forward-thinking program, the Partnerships and Cooperation program, which was to be used to encourage local or regional partnerships to solve natural resource challenges related to agricultural production. This program allows regional cooperation projects to compete for conservation funds with single-farm projects, and USDA may use up to five percent of conservation grant funds for Partnerships and Cooperation projects. Water utilities have both a critical interest in water quality and much needed technical expertise, and so utilities would be logical facilitators for such local or regional partnerships.

Unfortunately this program in the 2002 Farm Bill has been little used in practice. AWWA proposes that the 2007 bill require USDA to use up to twenty percent of “working lands incentives” (buffer strips, land retirement, etc.) for local or regional partnerships, as provided in legislation introduced by Rep. Ron Kind, unless the number of partnership applications is less. In addition, water utilities should be specifically listed as being eligible to receive grants to lead local or regional partnerships under this program.

In implementing the conservation programs under the 2002 Farm Bill, the USDA developed factors for scoring project applications. Under these factors,

improvement or protection of water quality has received less consideration than, for example, protection of wildlife habitat. The 2007 Farm Bill should be written to explicitly give protection of drinking water supplies at least equal ranking with habitat protection in scoring and ranking proposed conservation projects.

The 2002 Farm Bill authorized mandatory funding at high levels of support for conservation programs. Mandatory funding means the amount of money authorized for a program is available in future years unless Congress acts to limit it. The major conservation programs actually received most of their approved funding for FY2003, but since then Congress has been reducing the funds going to conservation programs. In the budget reconciliation process for FY2006, one-fourth of the cuts in USDA's budget came out of the conservation programs. We urge Congress to protect these funds in the future.

A boost in conservation assistance to agricultural producers could provide them with greater income security in the near future. This is particularly timely as the current U.S. system of subsidies and price supports comes under increasing pressure from international trade organizations, which may conclude that our system constitutes an unfair practice. Conservation programs are not considered to constitute an unfair trade practice under international trade rules. In light of the environmental and public health benefits from conservation programs, as well as the benefits to agricultural producers, AWWA recommends that overall USDA conservation funding increase to at least \$7 billion annually, starting in FY 2008.

Finally, I would like to note that Congressman Chet Edwards has worked to include \$10 million for a North Bosque River clean-up plan designed to

improve water quality at Lake Waco. This was included during the 109<sup>th</sup> version of WRDA. We would appreciate the same inclusion for the 110<sup>th</sup> Congress. The plan would authorize federal funding for Army Corps of Engineers clean-up efforts in the watershed for the first time.

This authorization will clear the way for a wide range of clean-up efforts in the North Bosque Watershed, and that means improved water quality for Lake Waco and 200,000 Waco citizens. This plan will include input from local stakeholders and set in motion a balanced plan that takes into consideration the needs of all parties involved.

Short term objectives of the plan include development of a comprehensive implementation plan that spells out specific improvements throughout the watershed. Potential projects could include wetlands, or even water treatment facilities upgrades to help remove phosphorus from Lake Waco. Long term goals include maintaining environmental improvements, and implementation of four demonstration projects involving dairy producers, rural landowners near dairies, and municipalities.

The plan will pair the Army Corps of Engineers with the USDA's National Resource Conservation Service (NRCS) and the Texas Water Resources Institute (TWRI) at Texas A&M to implement the plan.

## **VI. Conclusion**

Thank you for the opportunity to testify before you today concerning the problems facing Waco and public water utilities all across the country from runoff pollution. This is a serious problem affecting most bodies of water in America and causing thousands of cities to spend significant additional resources to ensure their residents' drinking water is safe and palatable. AWWA, and I personally, look forward to working with the Committee as you consider specific programs to more effectively deal with this important problem.