MISSOURI HOUSE OF REPRESENTATIVES

REPORT OF THE INTERIM COMMITTEE ON

WATER QUALITY ISSUES

Representative Dennis Wood, Chair
District 62
Representative Lanie Black
District 161
Representative Bob Dixon
District 140
Representative Roy Holand
District 135
Representative Gary Kelly
District 36
Representative J. C. Kuessner
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Representative Albert Liese
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Representative Brian Munzlinger
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Representative John Quinn
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Representative Marilyn Ruestman
District 131
Representative Harold Selby
District 105
Representative Dan Ward
District 107
Representative Jay Wasson
District 141
Representative Patricia Yaeger
District 96

December, 2003

The Honorable Catherine Hanaway, Speaker
Missouri House of Representatives
State Capitol, Room 308
Jefferson City, Missouri 65101

Dear Madame Speaker:

Pursuant to your charge, your Interim Committee on Water Quality Issues gathered information from a variety of sources during the fall. The committee held an organizational meeting in Jefferson City on September 11, 2003, and heard public testimony at hearings conducted in Jefferson City on October 7, 2003, in Springfield on October 23, 2003, in Branson on October 24, 2003, and in the St. Louis area on November 6 and 7, 2003. The committee also visited agricultural demonstration sites near Anabel and the water treatment plant of the Clarence Cannon Wholesale Water Commission on October 8, 2003, toured sites related to water quality issues in southwestern Missouri on October 23, 2003, was briefed on the operations and storm water management plan of Fred Weber, Inc., in St. Louis County on November 6, 2003, and toured the Lemay Sewage Treatment Facility of the Metropolitan St. Louis Sewer District on November 7, 2003.

There was widespread interest and concern about several water quality issues, including the effects of on-site sewage treatment systems, the impacts of phosphorus and other nutrients, storm water runoff, stream gravel mining, groundwater depletion, and watershed-based planning and cooperation. The committee expresses its gratitude to all of the citizens, organizations, businesses, and state and federal agencies who provided vital information and assistance. The committee is also grateful to the Missouri Corn Growers Association, the Clarence Cannon Wholesale Water Commission, Southwest Missouri State University, the City of Branson, Fred Weber, Inc., and the Metropolitan St. Louis Sewer District, who graciously provided meeting facilities and tours of their facilities. The committee has formulated several recommendations. Enclosed herein is our report.

Sincerely,

Dennis Wood, Chair

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District 1

INTRODUCTION

The citizens of Missouri have demonstrated long-term interest in the quality of the waters of the state. Surface and ground waters are used as sources of drinking water, and recreation associated with lakes and streams is an essential part of the state's tourism industry. Concern has developed over the impacts of urban and rural growth, agriculture, stream gravel mining, and other activities on water quality, and over the adequacy of current regulations, water quality monitoring, and planning efforts.

In response to widespread interest in these topics, in September, 2003, the Honorable Catherine Hanaway, Speaker of the Missouri House of Representatives, appointed an interim committee to examine water quality issues. Members of the committee were Representative Dennis Wood, Chair (R-62, Kimberling City), Representative Lanie Black (R-161, Charleston), Representative Bob Dixon (R-140, Springfield), Representative Roy Holand (R-135, Springfield), Representative Gary Kelly (D-36, Richmond), Representative J. C. Kuessner (D-152, Eminence), Representative Albert Liese (D-79, Maryland Heights), Representative Brian Munzlinger (R-1, Williamstown), Representative John Quinn (R-7, Chillicothe), Representative Marilyn Ruestman (R-131, Joplin), Representative Harold Selby (D-105, Cedar Hill), Representative Dan Ward (D-107, Bonne Terre), Representative Jay Wasson (R-141, Nixa), and Representative Patricia Yaeger (D-96, St. Louis). This report includes an analysis based on information received from citizens, organizations, businesses, and state and federal agencies, and the committee's findings and recommendations.

TESTIMONY AND MAJOR ISSUES

The committee heard public testimony at an organizational meeting in Jefferson City on September 11, 2003, and at hearings conducted in Jefferson City on October 7, 2003, in Springfield on October 23, 2003, in Branson on October 24, 2003, and in the St. Louis area on November 6 and 7, 2003. Testimony was received from state agencies, utilities, citizens, and other groups (see Appendix A).

The committee also visited agricultural demonstration sites near Anabel and the water treatment plant of the Clarence Cannon Wholesale Water Commission on October 8, 2003, toured sites related to water quality issues in southwestern Missouri on October 23, 2003, was briefed on the operations and storm water management plan of Fred Weber, Inc., in St. Louis County on November 6, 2003, and toured the Lemay Sewage Treatment Facility of the Metropolitan St. Louis Sewer District on November 7, 2003 (see Appendix B).

The following major issues emerged from the testimony and site visits:

Water Quality Regulation in Missouri

Witnesses from the Missouri Department of Natural Resources, the Missouri Office of the Attorney General, and the U.S. Environmental Protection Agency provided general information on water quality regulation in the state. They noted that the U.S. Environmental Protection Agency has delegated authority to Missouri to enforce provisions of the federal Clean Water Act, and that Missouri must maintain certain standards to maintain this primacy of enforcement. Delegation also brings the state benefits related to federal grants.

Certain specific aspects of regulation are mandated by the federal government and others are at the discretion of the states. Key elements of successful water quality management programs include setting standards, monitoring, permitting, and establishing total maximum daily loads (TMDLs). The federal government must approve these aspects of the state's program, and problems have arisen in several areas, including designation of waters for uses involving whole body contact and as trout habitat, permit backlogs, and water quality standards for bacteria, dissolved oxygen, and certain metals. Missouri is currently meeting the federal schedule for completion of TMDLs.

There are currently lawsuits in 26 states, including Missouri, to require the U.S. EPA to enforce the requirements of the Clean Water Act. This has forced the states to push rapidly ahead when budgets are tight. Missouri is fourth among states in the number of permits issued and has numerous citizen commissions and formal rulemaking requirements for developing its impaired streams list. There are also new challenges that will include implementation of new federal standards for concentrated animal feeding operations (CAFOs), mercury, endocrine disrupters, antibiotics, and other drugs,

addressing non-point source pollution, protecting groundwater and other drinking water sources, funding for the development of effective and innovative on-site sewage disposal systems, funding for water quality monitoring, and taking a watershed approach to water quality issues.

The Missouri Office of the Attorney General stated that the goal of state enforcement actions, including the Attorney General's zero tolerance policy, is compliance, not penalties. Actions are implemented to avoid inconsistencies that would provide competitive advantages to some businesses over others. There are frequent delays in the normal legal process of enforcement, but providing alternatives to current case referral pathways could improve the timeliness of some enforcement actions.

Effects of Phosphorus and Other Nutrients

Several witnesses noted that excessive inputs of phosphorus, nitrogen, and other nutrients have caused water quality problems in many of the state's lakes and streams. In the Ozark region, phosphorus is the most important limiting nutrient, and increases in phosphorus will enhance algal growth. Excessive algae in lakes and reservoirs can decrease aesthetics, cause taste, odor, and toxicity problems in drinking water, and, when decaying, consume dissolved oxygen. Removal of phosphorus sources can decrease concentrations of algae, but overall improvements in water quality will take time and may be confused with short-term natural variations caused by food-chain dynamics.

Nutrients can enter streams and lakes from urban and agricultural point and non-point sources. Inputs from non-point sources can be particularly pronounced during storm water runoff events. The largest point sources are usually municipal sewage treatment plants. In the southwest region of the state, where waters are particularly sensitive to phosphorus inputs, several municipalities are upgrading their treatment facilities to improve phosphorus removal. Funding sources include Special Infrastructure and Rural Sewer Hardship Grants, matching grants and loans from the Missouri Department of Natural Resources, and the State Revolving Loan Fund. To attain phosphorus removal goals within watersheds in a cost-effective manner, communities within some watersheds are exploring the use of effluent trading. Trading would allow small communities to purchase nutrient reduction credits from larger communities, where reductions can be more easily attained because of the economies of scale.

Other witnesses noted that corn growers and poultry producers are involved in many local cooperative efforts to reduce nutrient inputs and improve water quality. These efforts must include farmers to be effective and could be improved if more cost-share and other funding was available for research and implementation.

Innovative approaches to managing nutrient inputs are being developed. Land application has been the traditional way to dispose of biosolids from wastewater treatment plants, but alternative methods are being explored, including the production of fertilizer. There are also emerging technologies to develop alternative uses for agricultural wastes. Other issues that are being explored

are reductions in phosphate use and the development or preservation of natural nutrient filtering processes provided by wetlands.

Effects of On-site Sewage Disposal Systems

A few witnesses stated that proper regulation of on-site sewage disposal systems is critical to maintaining water quality. In many rural areas, large centralized sewage treatment systems are financially impractical, even where there has been rapid residential growth, and on-site systems are prolific. Phosphorus and other nutrients from these systems can infiltrate into streams and lakes and promote algal blooms, especially in the parts of the state with thin, rocky soils.

Witnesses from the Missouri Department of Health and Senior Services provided a history of regulation of on-site sewage disposal systems. A 1986 statute allowed counties to pass health ordinances, and a statewide law regulating systems was passed in 1995. Counties may adopt their own standards stricter than statewide requirements. Although the Department of Natural Resources regulates larger sewage treatment facilities, the Department of Health and Senior Services is responsible for state-wide regulation of individual on-site systems. These regulations are intended to protect groundwater and public health, and do not deal specifically with the issue of nutrient enrichment of surface waters. The regulations prescribe systems designs, are not performance-based, and do not include maintenance requirements. The state does operate a training center for installers and inspectors, but counties may also have their own registration and training requirements, and this has resulted in some inconsistencies across the state.

Several witnesses discussed the need for innovative approaches to the design of on-site systems, especially in areas where soils are not suitable for traditional drain fields. These witnesses stated that regulations are important, but should be flexible to allow and encourage innovative solutions. New system designs involving peat moss and constructed wetlands are emerging. At the Shell Knob Senior Center, the housing complex has an innovative on-site wastewater treatment system that uses constructed wetlands for nutrient removal. The system has been very efficient in reducing phosphorus discharge levels and is serving as a model demonstration site for wastewater treatment in southwestern Missouri. Other areas are developing locally consolidated decentralized systems. Proper maintenance is critical to the effective operation of on-site systems, and several companies are beginning to provide maintenance services for owners of clustered on-site wastewater treatment systems.

Financial assistance for system owners is critical to the development of improved on-site sewage disposal system designs and maintenance programs. Several witnesses noted that legislation to allow the formation of sewer districts in areas with on-site sewage disposal systems would provide access to funding from the State Revolving Fund that is only available to government entities. If the districts are formed on watershed boundaries, design and maintenance standards could developed

specifically for each watershed and consistent regulation and enforcement could be applied throughout the watershed.

Effects of Storm Water Runoff

Several witnesses stated that proper management of storm water runoff is of central importance in maintaining water quality. In urban areas, runoff from impervious surfaces and from construction sites can cause stream bank erosion and increase sedimentation in streams, particularly in areas with rapid population growth and where riparian buffer zones have been removed. Erosion and other water quality problems can have substantial public costs. Home builders are required by federal regulations to obtain a storm water permit if more than one acre of ground is disturbed. Many local jurisdictions also have permit requirements. Runoff can also carry pollutants from excessive urban fertilizer and pesticide use, and many urban areas have problems with overflows from combined sewers and storm water drains. Addressing these problems will require significant capital expenditures.

In agricultural areas, runoff can also impair water quality by carrying sediment, fertilizers, and pesticides into streams and lakes. These problems have resulted in violations of safe drinking water standards in parts of northern Missouri where surface waters are the only practical source for drinking water. In this region, producers, private companies, and state and federal agencies have formed a unique partnership to develop agricultural practices that maximize efficiency for producers and minimize impacts to water quality. These cooperative efforts have already resulted in significant improvements in water quality. In other areas, farmers have used state and federal outreach programs and cost-share funding to improve grazing and watering practices, reduce stream bank erosion, and restore native stream bank vegetation.

Stream Gravel Mining

A few witnesses noted that the stream gravel mining issue is important to many citizens throughout the state. They stated that improper stream gravel mining could lead to stream channel instability, bank erosion, sedimentation, reductions in fish populations, and damage to bridges, pipelines, and other public infrastructure. They also noted that there are times when stream gravel mining could be beneficial. These witnesses called for regulations to be developed and enforced to ensure that stream gravel miners use best management practices.

Water Quality Monitoring

Several witnesses described the importance of water quality monitoring efforts by agencies and by Stream Teams and other volunteers. Lake monitoring by volunteers is coordinated through the

Lakes of Missouri Volunteer Program. In many cases, local volunteers are able to sample more frequently and more thoroughly than researchers or agency personnel. These efforts are critical in documenting both impairment and improvement in the state's water quality.

Groundwater Depletion

The Missouri Department of Natural Resources provided detailed information on trends in groundwater levels, well construction standards, and the permitting process for well drillers. The installation of wells is regulated by the state and some counties, but there is no regulation or monitoring of the amount of groundwater removed. Several witnesses noted that groundwater depletion is becoming a problem in some localized areas, especially in the southwestern part of the state. Drawdown by large water users may have a significant impact on owners of small wells. These witnesses stated that local governments should have the authority to meter groundwater withdrawal, especially for large users.

Educational Efforts

Several witnesses discussed the importance of educating citizens and businesses on water quality issues. The Missouri Department of Natural Resources Outreach and Assistance Center provides educational programs for home builders, operators of wastewater treatment facilities, teachers, and others. The center is also involved in ongoing market feasibility studies for the development of beneficial uses of poultry litter, including use as fertilizer and fuel. Outreach and education has also been the focus of several citizen organizations like the James River Basin Partnership. They have developed effective relationships with local television stations and newspapers, sponsored youth education events and teacher training, and conducted legislative briefings.

Stream Team members from Reeds Spring High School noted the importance of water quality issues in their education and the availability of college credits for certain coursework related to stream team activities. By teaching study skills and providing hands-on experience, stream team projects have had a major impact on the educational and professional development of many students. Southwest Missouri State University's Bull Shoals Field Station, a cooperative arrangement between the university, the Missouri Department of Conservation, and the U.S. Army Corps of Engineers, also provides educational activities, including university classes, teacher workshops, and open houses for the general public.

Watershed-Based Planning and Cooperation

Many witnesses described the efforts of local governments and other organizations in establishing cooperative watershed-based planning. These witnesses noted that proper planning and cooperation are required to gain access to state and federal matching funds to study issues and implement solutions. Intergovernmental cooperation is critical to achieve results, as are the actions of dedicated volunteers. One witness noted that the state was divided into numerous solid waste management districts in 1990, and suggested that a similar approach could be used for watershed-based management across the state.

Most counties have a complex mix of different water and wastewater utilities. Several counties are working with individual municipalities and large and small wastewater districts on watershed approaches to planning. Many counties have established ordinances related to water quality issues, including requirements for the design, installation, inspection, and maintenance of on-site sewage treatment systems and package sewage treatment plants, and requirements related to storm water management, including specifications for riparian setbacks and tree canopy protection.

In southwestern Missouri, four water quality groups have been very active and have been successful in bringing people together to address water quality issues in Table Rock Lake watersheds without the involvement of government funding or agencies. In the St. Louis area, the East-West Gateway Coordinating Council established a Water Resources Advisory Committee to coordinate planning activities in watersheds that involve many local jurisdictions. Associations of Stream Teams have been established in some watersheds.

FINDINGS AND RECOMMENDATIONS

The committee recognizes the complexity of many water quality issues discussed during our hearings and site tours and expresses its gratitude to all the citizens, organizations, businesses, and state and federal agencies who provided vital information and assistance. The committee applauds all the efforts now being directed toward improving and maintaining water quality in Missouri's streams and lakes. The committee recognizes, however, that more work needs to be done and recommends the following actions to enhance ongoing efforts:

1. Formation of On-site Sewage Disposal System Districts

The committee recognizes that on-site sewage disposal systems can have significant impacts on water quality, especially in areas of the state where soils are not suitable for traditional drain fields. The development of innovative system designs, installation of system improvements, and effective maintenance are all important in minimizing negative effects on water quality. Access to low-interest loans and other assistance for system owners is critical, but individuals that reside outside of municipalities and sewer districts do not have access to low-interest loans that are available to centralized facilities. The committee recommends legislation to allow and facilitate the formation of sewer districts in areas with on-site sewage disposal systems to provide access to funding from the State Revolving Fund that is only available to government entities. The legislation could be applicable state-wide or be implemented on a trial basis in watersheds in southwestern Missouri where needs are most critical.

2. Inspection and Maintenance of On-site Sewage Disposal Systems

The committee recognizes that proper design, installation, inspection, and maintenance of on-site sewage disposal systems is critical to their effective operation, especially for systems that incorporate new, emerging technologies. The committee recommends that the state study several potential additions to existing state requirements, including disclosure of system maintenance history during real estate transactions, implementation of system maintenance requirements at the state or local level, and, to better encourage the development and use of innovate system designs, movement toward performance-based rather than design-based system standards. The committee also recommends that the state explore ways to improve consistency across the state in training and licensing requirements for system installers, inspectors and maintenance companies.

3. Watershed-based Planning and Regulation

The committee applauds the ongoing efforts in both urban and rural areas that are using watershed-based approaches to address water quality issues. The development of best management practices by agricultural, home-building, and other groups should be encouraged and continued. Cooperation by counties, municipalities, sewer districts, and private organizations should be supported, expanded, and focused on a watershed-based approach to address water quality issues. The state should also develop water quality standards and discharge permit requirements on a watershed basis to most effectively impose water quality regulations.

4. Water Quality Monitoring

The committee was very favorably impressed with the efforts of volunteers in monitoring the water quality of Missouri's streams and lakes, and recognizes that the state should also play a role in water quality monitoring. The committee encourages the state to continue financial and logistic support of volunteer monitoring efforts and to expand monitoring where possible, especially with regard to nutrient concentrations in waters that cross state boundaries in the southwestern part of the state.

5. Nutrient trading Within Watersheds

The committee recognizes the critical importance of reducing nutrient concentrations in the effluents of point sources, especially with regard to phosphorus concentrations. The committee also recognizes that requirements for phosphorus removal may place an extreme financial hardship on small communities. Large communities, with more financial resources and the economies of scale, appear to be able to undertake nutrient reduction programs more economically than small communities. The committee recommends that the state seriously explore the concept of nutrient trading within watersheds, where small communities could purchase credits for nutrient removal from large communities, to most effectively accomplish nutrient reduction goals for entire watersheds.

6. Regulation of Concentrated Animal Feeding Operations (CAFOs)

The committee recognizes that CAFOs and their associated sites used for land application of wastes have the potential to cause significant negative impacts on water quality. The committee also recognizes that these facilities provide significant employment opportunities in several areas of the state. Significant unresolved issues related to CAFOs include the criteria used for land application of wastes, the question of owner versus operator liability for violations at satellite sites, and the implementation of new federal requirements. The committee encourages the state to work with the regulated community to ensure that federal regulations and additional state-specific requirements are effectively implemented and enforced to protect the waters of the state.

7. Timely Enforcement Actions

While the committee encourages full use of cooperation and conference, conciliation, and persuasion in addressing potential violations of water quality laws and regulations, there will always be situations that require enforcement actions. Timeliness of enforcement actions is critical in protecting the state's water quality. There are frequent delays in the normal legal process of enforcement, but the committee recognizes that providing alternatives to current case referral pathways could improve the prompt implementation of some enforcement actions. The committee recommends legislation that would provide more alternatives than those currently available in referring cases to the Office of the Attorney General for enforcement actions.

8. Monitoring of Withdrawal of Groundwater

Missouri currently does not regulate or monitor groundwater withdrawal. The committee recognizes that groundwater depletion is an important emerging issue in several regions of the state. Water law on both the state and national level remains unclear on the authority to regulate groundwater

withdrawals. The committee recommends that as this issue emerges, local governments or the state be provided with the legal authority to monitor groundwater use by large users.

APPENDIX A

SUMMARY OF INDIVIDUAL TESTIMONY

I. JEFFERSON CITY, SEPTEMBER 11, 2003

The committee held a brief organizational meeting in Jefferson City to elucidate the interests of committee members and to establish an agenda. The committee also heard brief interest statements from the following individuals:

1. Jerry Birch; Southwest Missouri State University
2. Leslie Holloway; Missouri Farm Bureau
3. Carla Klein; Sierra Club
4. Scott Totten, Bryan Fawks; Missouri Department of Natural Resources
5. John Parris; St. Louis County Government; St. Louis Homebuilders Association
6. Brett Berri; Missouri Attorney General's Office

II. JEFFERSON CITY, OCTOBER 7, 2003

The committee held a public hearing in Jefferson City and heard testimony from the following individuals:

1. Scott Totten; Bryan Fawks; Michael Wells; Mimi Garstang -- Missouri Department of Natural Resources

Personnel from the Department of Natural Resources provided a basic overview of federal and state regulations relating to water quality. They noted that the U.S. Environmental Protection Agency has delegated authority to Missouri to enforce provisions of the federal Clean Water Act, and that Missouri must maintain certain standards to maintain this primacy of enforcement. Delegation also brings the state benefits related to federal grants. They also explained which aspects of regulation are mandated by the federal government and which are at the discretion of the states. Department personnel provided a summary of the state's water resource planning efforts and issues related to management of the Missouri River.

2. Susan Jenkins; Daryel Brock -- Missouri Department of Health and Senior Services

Personnel from the Department of Health and Senior Services provided a basic overview of state regulations relating to on-site sewage disposal systems. They explained the jurisdictions of the Department of Natural Resources and the Department of Health and Senior Services with regard to on-site systems, and clarified the role of county ordinances and health departments.

3. Peter Herschend -- Upper White River Basin Foundation

Mr. Hershend noted the importance of regulating on-site sewage disposal systems, especially in the southwestern part of the state where soils are thin and water quality is important for tourism.

4. Floyd Gilzow -- Upper White River Basin Foundation; Poultry Industry Advisory Council

Mr. Gilzow noted the importance of regulating on-site sewage disposal systems and stated that financial assistance for developing efficient systems would have a significant impact on water quality. By being able to form districts, local users of on-site systems would be eligible for federal revolving loan funds that are only available to government entities. There are also emerging technologies to deal efficiently with agricultural wastes.

5. David Casaletto -- Table Rock Lake Water Quality, Inc.

Mr. Casaletto noted that improved management and innovative design of on-site sewage disposal systems would greatly enhance water quality, especially in the southwestern portion of the state. Standards could vary from region to region and regulation could be efficiently applied at different levels, from individuals to districts to local and state governments.

6. Rod Taylor -- Table Rock Lake - Kimberling City Chamber of Commerce

Mr. Taylor stressed the importance of water quality to tourism in the southwestern portion of the state.

III. SPRINGFIELD, OCTOBER 23, 2003

The committee held a public hearing on the campus of Southwest Missouri State University in Springfield and heard testimony from the following individuals:

1. John Havel -- Southwest Missouri State University

Dr. Havel discussed the relations between water quality, algal concentrations, and nutrient loading in lakes and provided an overview of his research in southwestern Missouri. In the Ozark region, phosphorus is the most important limiting nutrient, and increases in phosphorus will enhance algal growth. Excessive algae in lakes and reservoirs can decrease aesthetics, cause taste, odor, and toxicity problems, and, when decaying, consume dissolved oxygen. Removal of phosphorus sources can decrease concentrations of algae, but overall improvements in water quality will take time and may be confused with short-term variations caused by food-chain dynamics.

2. Daniel Beckman -- Southwest Missouri State University

Dr. Beckman described his research on impaired water quality in Ozark streams and the use of an Index of Biotic Integrity to assess changes in the fish community related to impairment. Streams in the Bull and Swan Creek basins showed variable levels of impairment from human activities. Agriculture, gravel removal, sewage inputs, and siltation from development are all possible causes.

3. David Coonrod -- Greene County Commission

Mr. Coonrod discussed the issue of groundwater depletion in southwestern Missouri. Drawdown by large water users may have a significant impact on owners of small wells. The installation of wells is regulated by the Missouri Department of Natural Resources and some counties, but there is no regulation or monitoring of the amount of groundwater removed. Local governments should have the authority to meter groundwater withdrawal, especially for large users.

4. Robert Pavlowsky -- Southwest Missouri State University

Dr. Pavlowsky discussed his research on sources of contaminants in the watersheds of southwestern Missouri. Inputs of phosphorus, nitrogen, suspended sediments, and bacteria have caused water quality problems in the region's lakes and streams. Removal of point phosphorus sources in the James River has improved water quality in Table Rock Lake. The impacts of urban and agricultural non-point sources of all contaminants, especially during storm runoff events, require further assessment.

5. Janice Schnake Greene -- Southwest Missouri State University

Dr. Greene described the mission of the university's Bull Shoals Field Station for environmental research and education. The station is the result of a cooperative agreement between the university, the Missouri Department of Conservation, and the U.S. Army Corps of Engineers. Educational activities include university classes, teacher workshops, and open houses for the general public. Research activities include long-term monitoring of water quality in southwestern Missouri.

6. Alvin Layne; Rosiland Layne; Leslie Holloway -- Missouri Farm Bureau

Mr. Layne, Ms. Layne, and Ms. Holloway noted that local poultry producers are involved in many local cooperative efforts to improve water quality. These efforts must include farmers to be effective and could be improved if more cost-share and other funding was available for research and implementation. Money for development of rural sewer systems is particularly important.

7. Ruth Bamberger -- Springfield-Greene County League of Women Voters

Ms. Bamberger noted that the league is participating in local efforts to improve water quality and considers control of runoff from land disturbances, overuse of fertilizers and pesticides, reduction in phosphate use, and development/preservation of non-mechanical filtering processes like wetlands to be of central importance. The league also opposes legislation that would prevent Missouri from adopting water quality standards that are stricter than federal requirements and that would remove several requirements for concentrated animal feeding operations (CAFOs).

8. Anthony Ciston

Mr. Ciston, a resident of Christian County, described bank erosion and increasing sedimentation on the James River, with much caused by runoff from the east side of Springfield. Some local planning decisions have been detrimental to efforts to improve water quality.

9. Mimi Garstang; James Vandike -- Missouri Department of Natural Resources

Ms. Garstang and Mr. Vandike provided detailed information on permits for well drillers, well construction standards, trends in groundwater levels, and presence of the contaminant MTBE (methyl tertiary butyl ether) in groundwater.

IV. BRANSON, OCTOBER 24, 2003

The committee held a public hearing at the city hall in Branson and heard testimony from the following individuals:

1. Mike Collins; Tonya Lewis; Allison Watkins; Trisha Morgan; Rebecca Short -- Reeds Spring High School Stream Team #432.

Stream team members discussed the importance of water quality issues in their education and described their activities, including monthly water quality monitoring, a lobbying day in the state capitol, a cultural exchange with an inner-city school in Kansas City, and the availability of college credits for certain coursework related to stream team activities. By teaching study skills and providing hands-on experience, stream team activities have had a major impact on the educational and professional development of many students.

2. Gregory Maycock -- Indian Point Wastewater Advisory Committee

Mr. Maycock described the efforts of the Village of Indian Point in developing cost-effective wastewater treatment for residents. Large, centralized systems were financially impractical for the residential and resort community on a peninsula surrounded by Table Rock Lake. An engineering study indicated that the most efficient solution would be a consolidation approach for development of decentralized systems. The village is currently developing engineering and management plans, enacting codes and ordinances, and identifying funding sources.

3. Leo Alderman -- U.S. Environmental Protection Agency, Region 7

Mr. Alderman discussed the requirements of the federal Clean Water Act, and interactions between the U.S. EPA, the Missouri Department of Natural Resources, and the Clean Water Commission. Key elements of successful water quality management programs include setting standards, monitoring, permitting, and establishing total maximum daily loads (TMDLs). EPA must approve these aspects of the state's program, and problems have arisen in several areas, including designation of waters for uses involving whole body contact, new bacterial indicators of water quality, and permit backlogs. Missouri is currently meeting the federal schedule for completion of TMDLs. New challenges will include implementation of new standards for concentrated animal feeding operations (CAFOs), addressing non-point source pollution, protecting drinking water sources, and taking a watershed approach to water quality issues.

4. Steve Mahfood -- Missouri Department of Natural Resources

Mr. Mahfood noted that there are currently lawsuits in 26 states for the U.S. EPA to enforce the requirements of the Clean Water Act. This has forced many states to push rapidly ahead when budgets are tight. Missouri is fourth among states in the number of permits issued and has the added complicating factors of numerous citizen commissions and formal rulemaking requirements for developing its impaired streams list. Budget cuts have affected regional offices and the outreach and assistance, dam safety, and drinking water programs. Emerging water quality issues include new federal requirements for concentrated animal feeding operations (CAFOs), groundwater protection, funding for the development of effective and innovative on-site sewage disposal systems, funding for water quality monitoring, new mercury water quality standards, and the effects of endocrine disrupters, antibiotics, and other drugs in wastewater.

5. Harry Bozoian -- Missouri Office of the Attorney General

Mr. Bozoian stated that the goal of state enforcement actions, including the Attorney General's zero tolerance policy, is compliance, not penalties, and noted that actions should be implemented to avoid inconsistencies that would provide competitive advantages to some over others. He explained that there are frequent delays in the normal legal process, but providing alternatives to current referral pathways could improve the timeliness of some actions. He also stated that legislation that prevents state rules from being stricter than federal requirements is detrimental to state water quality efforts and prevents implementation of regional solutions to regional problems.

6. Floyd Gilzow -- Upper White River Basin Foundation

Mr. Gilzow explained the roles and activities of the four water quality groups that are active in southwestern Missouri. The groups have been very successful in bringing people together to find solutions without the involvement of government funding or agencies. Needs for the region include the ability to form watershed-based on-site sewer districts and additional funding for water quality monitoring. District formation would allow access to funding from the State Revolving Fund. Other issues that should be explored are effluent trading within watersheds, alternative uses for wastes from animal agriculture, and requirements for inspection and maintenance of on-site sewage disposal systems.

7. Loring Bullard -- Watershed Committee of the Ozarks

Mr. Bullard noted that the major issue in southwestern Missouri is growth, with most occurring outside of urban service areas, and the impacts of this development on water quality. Problems are caused by runoff from impervious surfaces, soil disturbance from construction, removal of riparian buffer zones, and excessive urban fertilizer and pesticide use. Agricultural cost-share funding is not available for urban areas. Best management practices should be developed and progress should be evaluated with additional water quality monitoring. Groundwater depletion is also becoming an issue in some localized areas.

8. David Casaletto -- Table Rock Lake Water Quality, Inc.

Mr. Casaletto stressed the importance of basin-wide approaches to improving water quality. Many areas in southwestern Missouri are too rural for centralized wastewater treatment systems and have soils that are not suitable for traditional on-site sewage disposal systems. Legislation that would allow the formation of sewer districts in areas with on-site sewage disposal systems would provide consistent regulation and enforcement and could enable funding for the development and implementation of new technologies for efficient wastewater treatment.

9. Diana Sheridan -- James River Basin Partnership

Ms. Sheridan noted that outreach and education has been the focus of the James River Basin Partnership. They have developed effective relationships with local television stations and newspapers, sponsored youth education events and teacher training, and conducted legislative briefings.

10. Larry Van Gilder -- City of Branson

Mr. Van Gilder described Branson's efforts to improve wastewater treatment, especially with regard to the removal of phosphorus. Land application has been the traditional way to dispose of biosolids from the wastewater treatment plant, but alternative treatment methods are being explored.

11. Daryel Brock -- Missouri Department of Health and Senior Services

Mr. Brock provided a history of regulation of on-site sewage disposal systems. A 1986 statute allowed counties to pass health ordinances, and a statewide law regulating systems was passed in 1995. These regulations were intended to protect groundwater and public health, and do not deal specifically with the issue of nutrient enrichment of surface waters. They prescribe systems designs, are not performance-based, and do not include maintenance requirements. The state does operate a training center for installers and inspectors, but counties may also have their own registration and training requirements, and this has resulted in some inconsistencies across the state.

12. Rick Helms -- White River Valley Environmental Services

Mr. Helms noted that White River Valley Environmental Services is a subsidiary of the local electric cooperative. The company provides management services for owners of cluster on-site wastewater treatment systems, and is working to determine which types of systems are most suitable for the region. The company is also working with the local watershed groups.

13. Angel Kruzen -- Scenic River Stream Team Association

Ms. Kruzen described the formation of an association of stream teams and a watershed management group for the Ozark Scenic Riverways region. There is considerable poverty in the area and residents need funding to improve their on-site sewage disposal systems. She also noted that many residents who are not able to attend hearings on weekdays are concerned about water quality and funding cuts imposed on the Missouri Department of Natural Resources.

14. Mike Sowders -- Tracets Foundation

Mr. Sowders noted that fishing was the original impetus for growth of tourism in southwestern Missouri. Local efforts are resulting in improvements in the water quality of Table Rock Lake. The Tracets Foundation is involved in local shoreline cleanup efforts and is raising money to increase the stocking of bass in Table Rock Lake.

15. Anthony Thorpe -- Lakes of Missouri Volunteer Program

Mr. Thorpe described the activities of the Lakes of Missouri Volunteer Program for water quality monitoring. The program, centered at the University of Missouri, coordinates sampling by volunteers on lakes throughout the state. Local volunteers are able to sample more frequently and more thoroughly than researchers or agency personnel. General results have shown that lake water clarity is usually directly related to phosphorus concentration, although occasionally nitrates play a role. Specific data have shown that reductions in phosphorus discharges from the Springfield municipal sewage treatment plant have resulted in reduced nutrient concentrations in parts of Table Rock Lake.

V. ST. LOUIS, NOVEMBER 6, 2003

The committee held a public hearing at the Fred Weber, Inc., Media Center in St. Louis County, and heard testimony from the following individuals:

1. Terry Spence

Mr. Spence, a farmer from Unionville, discussed the impacts of corporate agriculture and concentrated animal feeding operations (CAFOs) on water quality in northern Missouri and elsewhere. Effluent from these facilities has been repeatedly spilled into the state's waters and, despite numerous fines and lawsuits, mishaps continue on an average of about two per month. Corporate agriculture has caused significant impairment of water quality in several regions of the state and Missouri does not have adequate regulations in place to address this issue.

2. Melody Torrey -- Stream Team # 714

Ms. Torrey described her water quality monitoring activities and the impacts of phosphorus discharges from concentrated animal feeding operations (CAFOs) on water quality. Run off from CAFOs and their sites used for land application of effluent contains large quantities of phosphorus, a nutrient that can cause algal blooms. Standards for land application rates, however, are based on concentrations of nitrogen, not phosphorus. To significantly lessen impacts on water quality, the state should base land application rate criteria on phosphorus as well as nitrogen.

3. Scott Harding -- Greater St. Louis Home Builders' Association

Mr. Harding noted that home builders have a strong impact on the local economy. Builders are aware of potential impacts on water quality from sedimentation and are required by federal regulations to obtain a permit if more than one acre of ground is disturbed. Many local jurisdictions also have

permit requirements. Each site must have a sedimentation prevention plan, and the association is developing an educational seminar on these issues for builders.

4. Sara Parker; Scott Totten -- Missouri Department of Natural Resources

Ms. Parker and Mr. Totten discussed the formation of the department's Outreach and Assistance Center. Once sufficient regulations are in place, education on water quality issues becomes critical, and the center has educational programs for home builders, operators of wastewater treatment facilities, teachers, and others. The center also has ongoing market feasibility studies for the development of beneficial uses of poultry litter, including use as fertilizer and fuel.

5. Michael Duvall -- St. Louis/Jefferson County Solid Waste Management District; St. Charles County Government

Mr. Duvall described efforts in St. Charles County to protect water quality. As a charter county, St. Charles County can impose regulations, and has developed requirements for package sewage treatment plants, riparian setbacks, and tree canopy protection. The county works with individual municipalities on watershed approaches and may eventually have a county-wide operation similar to the Metropolitan St. Louis Sewer District (MSD). They have also participated a watershed awareness education program in cooperation with the East-West Gateway Coordinating Council Water Resources Advisory Committee and MSD. In 1990 the state was divided into numerous solid waste management districts; a similar approach could be used for watershed-based management across the state.

6. Paula Haskin

Ms. Haskin, a plumbing contractor from Jefferson County, noted that water is a natural resource, and its management should not be driven solely by economic decisions. Residents pay the costs of poor storm water management and other negative impacts on water quality. Like many counties, Jefferson County has a complex mix of different water and wastewater utilities and inadequate financial resources to meet the needs of citizens. More funding should be available from the state for research and to assist counties and poor residents to improve water and wastewater systems. Regulations are important, but should be more flexible to allow innovative solutions to water problems.

7. Josh Campbell -- Missouri Votes Conservation

Mr. Campbell noted that the stream gravel mining issue is important to many citizens throughout the state. Improper stream gravel mining leads to stream channel instability, bank erosion, sedimentation, reductions in fish populations, and damage to bridges, pipelines, and other public infrastructure. The resulting decline in water quality can also have a significant negative impact on tourism. Regulations must be developed and enforced to ensure that stream gravel miners use best management practices.

8. Ted Heisel -- Missouri Coalition for the Environment

Mr. Heisel described the importance of the state's water quality standards in maintaining environmental and human health. In 2000, the U.S. Environmental Protection Agency noted that Missouri needed to upgrade its water quality standards to meet federal requirements. Missouri is one of only a few states to not have a bacteria standard in place, and there are also problems with state standards for dissolved oxygen, certain metals, trout waters, and others. To date, the standards have not been improved, and the coalition has sued to require the state to take action.

VI. ST. LOUIS, NOVEMBER 7, 2003

The committee held a public hearing at the Lemay Sewage Treatment Facility of the Metropolitan St. Louis Sewer District and heard testimony from the following individuals:

1. Janet Wilding -- Great Rivers Greenway

Ms. Wilding noted that in 2000 voters in St. Charles County and St. Louis City and County approved a local one-tenth cent sales tax for parks. Revenue is equally divided between local jurisdictions and a park district. The district plans to develop a system of parks connected by trails. All development plans include best management practices for water quality. The first park to be developed is Canary Island at the former National Lead Industrial site. In addition to being funded through the local sales tax revenue and federal development funds, the site is eligible for brownfield tax credits. This and other parks may also be tied into other economic development projects.

2. David Wilson -- East-West Gateway Coordinating Council

Mr. Wilson described the activities of the Water Resources Advisory Committee of the East-West Gateway Coordinating Council, which issued its final report in October, 2003. The committee was funded through the Missouri Department of Natural Resources and provided a forum to coordinate planning activities in watersheds that involve many local jurisdictions. Watershed groups are being formed, especially in areas of St. Charles County that have been subject to rapid growth. Regulation of storm water is particularly important because improper development can lead to erosion and other water quality problems that have substantial public costs. In part because of the approaching Lewis and Clark bicentennial, there is also increasing attention being directed toward recreational and tourism-related activities on the Missouri and Mississippi Rivers.

3. Ron Coleman -- Open Space Council for the St. Louis Region

Mr. Coleman noted that the Open Space Council was formed 38 years ago as a private effort to address open space issues in the St. Louis area. The council has aided in the acquisition of thousands of acres of parklands, especially along the lower Meramec River. These efforts are emerging as a national model greenway project. The council has also been involved with Operation Clean Stream. Volunteer stream cleanup efforts remove numerous waste tires from stream beds, and

the state waste tire fee provided critical funds to reimburse organizations for some of the costs of these activities. Renewal of the waste tire fee is very important for continuing stream cleanup efforts.

4. Martin Toma -- Jefferson County Government

Mr. Toma noted that Jefferson County is actively addressing critical land-use planning issues. Ordinances are in place for the design, installation, and inspection of on-site sewage treatment systems, and new ordinances are being developed for on-site system maintenance requirements and storm water issues. Municipalities, large and small wastewater districts, and county government formed a Clean Water Committee to develop a 15-year action plan. Proper planning and cooperation are required to gain access to state and federal matching funds to study issues and implement solutions. Intergovernmental cooperation is critical to achieve results, as are the actions of dedicated volunteers.

APPENDIX B

SUMMARY OF SITE VISITS

I. AGRICULTURAL SITE TOUR - OCTOBER 8, 2003

The committee toured agricultural demonstration sites near Anabel related to the Watershed Research Assessment and Stewardship Program and the Stewardship Implementation Project of the Missouri Corn Growers Association. Producers, private companies, and state and federal agencies have formed a unique partnership to develop agricultural practices that maximize efficiency for producers and minimize impacts to water quality. The initial impetus for the project was impairment of water quality by atrazine, a common, inexpensive, and effective herbicide, and the resulting violations of drinking water standards. Surface waters are the only practical source for drinking water in this region, and these cooperative efforts have already resulted in significant improvements in water quality. The committee also toured the water treatment plant of the Clarence Cannon Wholesale Water Commission. The commission provides water from Mark Twain Lake to 20 communities in the region.

Throughout the tour, the committee heard brief presentations in the field by individuals representing the partners in these cooperative efforts:

1. Brent Rockhold, Jane Glosemeyer, Steve Taylor, Troy Huntley, Mark White; Missouri Corn Growers Association
2. Steve Taylor; Environmental Resources Coalition
3. Rex Martin; Syngenta
4. John Sadler, Robert Lerch; U.S. Department of Agriculture Agricultural Research Service
5. Scott Totten; Missouri Department of Natural Resources
6. Judy Grundler; Missouri Department of Agriculture
7. Robert Broz; University of Missouri Extension
8. Trent Stober; Midwest Environmental Consultants
9. Elizabeth Grove; Clarence Cannon Wholesale Water Commission

II. SOUTHWESTERN SITE TOUR - OCTOBER 23, 2003

The committee toured the following sites related to water quality issues in southwestern Missouri:

1. Nixa Wastewater Treatment Plant

The City of Nixa is upgrading its wastewater treatment plant on the James River to increase treatment capacity by 2 million gallons per day and to install equipment to limit phosphorus concentrations in the plant effluent to 0.50 mg/l. Most of the costs of the nearly $10 million project

have been paid by Special Infrastructure and Rural Sewer Hardship Grants, matching grants and loans from the Missouri Department of Natural Resources and the State Revolving Loan Fund.

2. Curbow Farm, Stone County

Mr. and Mrs. Elmer Curbow raise approximately 150 cattle on their farm located on the James River. Through a partnership with the U.S. Department of Agriculture Natural Resource Conservation Service, the Missouri Department of Conservation, and the Missouri Department of Natural Resources, and with state and federal cost-share funding, they have developed an innovative program to improve grazing and watering practices, reduce stream bank erosion, and restore native stream bank vegetation.

3. Shell Knob Senior Center and Wetlands

The non-profit Shell Knob Senior Center Corporation is developing a senior center complex with housing units. As part of the project, the corporation has developed an innovative on-site wastewater treatment system that uses constructed wetlands for nutrient removal. The system has been very efficient in reducing phosphorus discharge levels and is serving as a model demonstration site for wastewater treatment in southwestern Missouri.

III. FRED WEBER SITE BRIEFING - NOVEMBER 6, 2003

The committee was briefed on the quarry operations, landfill, and other activities of Fred Weber, Inc., in the St. Louis area, including the company's storm water management plan.

IV. LEMAY SEWAGE TREATMENT FACILITY SITE TOUR - NOVEMBER 7, 2003

The committee toured the Lemay Sewage Treatment Facility of the Metropolitan St. Louis Sewer District (MSD) and was briefed by MSD personnel on facility operations and infrastructure and funding issues in the St. Louis area. The district has developed a capital improvement and replacement program to deal with sewer overflows, storm water, deteriorating old infrastructure, compliance issues, and treatment plant capacity. Plans for funding the program include a bond issue and a rate increase. Current rates are well below the average for the nation's fifty largest cities.