

Approved: _____

Date

1-28-99

MINUTES OF THE HOUSE COMMITTEE ON ENVIRONMENT

The meeting was called to order by Chairperson Joann Freeborn at 3:30 p.m. on January 14, 1999 in Room 423-S of the Capitol.

All members were present except: Rep. Henry Helgerson - excused
Rep. Clay Aurand - excused

Committee staff present: Raney Gilliland, Legislative Research Department
Mary Torrence, Revisor of Statutes
Mary Ann Graham, Committee Secretary

Conferees appearing before the committee: Dr. James Triplett, College of Arts & Science, 223A
Heckert-Wells, Pittsburg State University, Pittsburg, KS
66767

Others attending: See attached list

Chairperson Joann Freeborn called the meeting to order at 3:30 p.m. She welcomed guests to the first House Environment committee meeting of the 1999 Legislative Session and asked the committee members to introduce themselves and give a little of their legislative background. She asked staff members to introduce themselves and mentioned the committee members, Rep. Henry Helgerson and Rep. Clay Aurand, and staff member, Emalene Correll, not in attendance. The Vice-Chairperson, Rep. Gerry Ray and the Ranking Minority Leader, Rep. Vaughn Flora were introduced and each spoke briefly to the committee.

Chairperson Freeborn announced there would be committee bill requests in next week's meetings, Tuesday, January 19 and Thursday, January 21. Also on Thursday there will be Agency bill requests.

The Chairperson introduced Dr. James Triplett, professor at Pittsburg State University, to the committee. Dr. Triplett reviewed the Final Report of the Kansas Special Commission on Water Quality Standards, (See attachment 1). This report is in fulfillment of the requirement of K.S.A. Sup. 65-1, 1777. The Commission, of which Dr. Triplett chaired, held sixteen meetings across the State, gathering information to address the work designated for the Commission by the Legislature. At each meeting, the Commission heard from an average of six invited experts. The Commission also took comments from stakeholders at every meeting. The Commission deliberated on the content of this report during ten hours of conference calls and two face-to-face meetings. Dr. Triplett gave recognition to the other members of the Kansas Special Commission listed in the final report and answered questions raised by committee members.

Karl Mueldener, Bureau of Water, Kansas Department of Health and Environment, was in attendance and introduced by Chairperson Freeborn. He answered questions by committee members concerning state water issues and problems.

Chairperson Freeborn thanked Dr. Triplett for his presentation and Mr. Mueldener for his participation. Also, she introduced Rep. Joann Flower, Chairperson of the House Agriculture Committee, in attendance today. She discussed two news bills received by the committee and announced that Al LeDoux, Kansas Water Office and Kent Lamb, Chairman of Kansas Water Authority will brief the committee on Tuesday, January 19, on the State Water Plan. Also committee bill requests will be heard.

The meeting adjourned at 4:45 p.m.

The next meeting is scheduled for Tuesday, January 19, 1999.

Surface Water Quality Commission

Marynell Hollenbeck, V. Chair, Kansas City
Dr. John Doull, Kansas City
Jon Ferguson, Kensington
Clifton E. Meloan, Manhattan
P. Martin Nohe, Leawood
Arthur F. Pope, Wichita

State of Kansas



James R. Triplett
Chair, Pittsburg

FINAL REPORT OF THE KANSAS SPECIAL COMMISSION ON WATER QUALITY STANDARDS

Transmitted on June 30, 1998

to

Governor Bill Graves
Kansas House of Representatives
Kansas State Senate

*House Environment
1-14-99
Attachment 1*

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Summary of Recommendations

1. *Establish Permanent Water Quality Commission.* The Commission recommends a permanent commission be established to advise the Governor and the Legislature on water quality issues. The Commission believes a permanent body will provide a system of checks and balances the current process lacks and shift some of the resources currently spent on litigation to those activities that improve water quality.

2. *Stakeholder Participation.* The Commission recommends a provision be added to Kansas statute requiring and outlining enhanced stakeholder participation in all aspects of the water quality standards setting process to reinforce the requirements of the Federal Clean Water Act. The implementing regulations should establish a procedure to involve all stakeholders early in the standards setting process creating a method for buy-in for specific or additional levels of protection. This includes all facets of designated uses, criteria and total maximum daily loads. The Commission recommends use of "Stream Teams" as one mechanism for stakeholder participation. A "stream team" is a citizen participation program that will increase familiarity and knowledge about a stream system. It should focus on collaborative learning, problem solving and program implementation, not monitoring for enforcement.

3. *Process for Establishing and Reviewing Designated Uses.* The Commission recommends a provision be added to Kansas statute outlining policy considerations that must be addressed by the Kansas Department of Health and Environment when establishing designated uses. The Commission also recommends a provision be added to Kansas statute requiring Health and Environment to review current use designations in a systematic manner based on priorities established through the stakeholder participation process.

4. *Components of Use Attainability Analysis.* The Commission recommends the Kansas Department of Health and Environment develop a scientifically based, objective process to conduct use attainability analysis. The Commission also recommends Health and Environment consider employing use attainability analyses from independent entities so long as each entity has followed the process for use attainability analysis developed by the agency and the entity was selected in the stakeholder process. Use attainability analysis should include a thorough and rigorous analysis to identify characteristics necessary to support uses, as well as field observations. The Commission believes the meaningful involvement of stakeholders in the process is very important. This program should be based on the principles of collaborative learning and would oversee the organization and operation of a use attainability analysis task force made up of stakeholders who will be involved in the design, application, interpretation and recommendations for the relevant stream segment.

5. *Monitoring.* The Commission strongly recommends the Kansas Legislature and the Governor establish a dedicated funding base to support water quality monitoring, both chemical and biological. Rigorous monitoring is the foundation for defensible use attainability analysis and appropriate designated use decisions. In fact, Kansas has a long tradition of recognizing the value of water quality monitoring. As the State moves into the next phase of water quality improvements, more thorough and targeted monitoring will be necessary.

6. *Ammonia Criteria.* The Commission recommends Health and Environment regulations provide for alternative winter ammonia limits on a site-specific basis where justified through scientific data and evaluation. Site-specific criteria developed with stakeholder participation can serve to educate communities about the condition of their local water resource. Communities which receive NPDES permits with site-specific criteria should be encouraged to undertake ongoing monitoring and evaluation of the effects of the criteria on the aquatic community prior to the renewal of the permit.

7. *Atrazine Criteria.* The Commission recommends the atrazine criteria for chronic aquatic life remain at 3 ppb until more research on the range from 1 ppb to 20 ppb is reviewed or conducted.

8. *Chlorides Criteria.* The Commission recommends the Kansas Department of Health and Environment recognize the impact of natural mineral intrusion on Kansas stream quality and subsequent permits. The agency should establish regional or segment specific criteria working with the Kansas Geological Survey to determine what numeric criteria is appropriate on a watershed or segment basis. Given 20 years of work done by the KGS which shows there are areas of the state that naturally exceed the criteria and have alkaline habitats, adjusting this criteria to consider natural conditions will make the standard more accurately reflect naturally occurring stream conditions.

9. *Fecal Coliform Criteria.* The Commission recommends a reexamination of the EPA criterion to determine if it is an adequate indicator of public health risks and further recommends the exploration of the impacts of seasonal disinfection and the public health risk associated with fecal coliform spikes caused by runoff events. The criteria used by Health and Environment was established by EPA in 1986. The Commission believes more research is available that did not exist a decade ago and it should be evaluated. This could reduce the public health risks from bacteria contamination.

10. *Seasonal Criteria.* The Commission recommends that the Kansas Department of Health and Environment utilize seasonal variations where appropriate. Information brought before the Commission indicates seasonal variations are accepted by EPA and used in several other states. This should result in criteria more accurately reflecting conditions in the field.

11. *General Pollutant Criteria.* The Commission recommends that if water quality criteria are to be established and are more stringent than EPA requirements, they must be justified with a risk assessment analysis, and where appropriate, a cost/benefit analysis.

12. *Stream Impairment Determination.* The Commission recommends the Kansas Department of Health and Environment add a provision to its regulations to clarify that narrative criteria alone should not determine stream impairment for listing purposes. This policy will ensure both subjective and objective criteria determine the attainment of a designated use for listing purposes and clarify the true condition of Kansas waters.

13. *Mixing Zones.* The Commission recommends the Kansas Department of Health and Environment modify its regulations to ensure that when data is available, actual effects take precedence over models or mathematical calculations.

14. *Implementation Procedures.* The Commission recommends the Kansas Department of Health and Environment fully incorporate implementation procedures into regulation. This will assure adequate peer review, stakeholder participation and consistent application of water quality standards.

15. *Funding.* The Commission recommends the Legislature and the Governor place a high priority on funding the necessary components for an effective and efficient water quality standards setting process. The Commission suggest dedicated funding for water quality monitoring and use attainability analysis.

INTRODUCTION

In fulfillment of the requirement of K.S.A. Sup. 65-1,177, the Kansas Special Commission on Water Quality Standards submits its final report. The Commission held sixteen meetings across the State, gathering information to address the work designated for the Commission by the Legislature. At each meeting, the Commission heard from an average of six invited experts. The Commission also took comments from stakeholders¹ at every meeting. The Commission deliberated on the content of this report during ten hours of conference calls and two face-to-face meetings.

Background

Many people believe all that is needed to get the “right” answer is “good science.” They tend to view science as black or white and very concrete. However, “good science” is more subjective than most believe. In fact, the answers are no better than the questions. The more society knows and understands about an issue, the better the questions that can be asked. The only good questions for the scientific method are those that can be proven false. Science can prove things are false, but cannot necessarily prove things to be true. At one time, the collective wisdom said the world was flat. The questions one might ask then would be markedly different from those based on what is now known. Knowledge based on science builds on itself, and changes based on the best available knowledge. So, from technology, we use the Best Management Practice, and from science, we use the Best Available Knowledge.

The waters of the State are one of the State’s most important natural resources. The Commission recognizes that by law, these waters are a public trust, belonging to all but owned by none. The Commission also recognizes the historic precedence of water use in Kansas that encourages a dual role -- protecting natural uses as well as uses for the development and growth of the community. All approved uses for legal purposes, ranging from public water supply to

¹ Within the context of this document, “stakeholder” means groups or individuals, including state, tribal and local governments, industry and small business, environmental groups, academia, and others who are affected by or have an interest in the Kansas surface water quality standards.

the discharge and dilution of wastes, are a privilege granted by the trust holders to the applicant. No one has the right to violate the public trust or deprive another of their privilege without permission. At the same time, the Commission acknowledges the critical importance of water to support agriculture, municipalities, industries, domestic uses, fish and wildlife, and recreation. The State is given the responsibility to ensure adequate protection and management of this resource. Concerns for human health, ecosystem balance, economic development and aesthetics require the State to develop policies, programs, laws and regulations that adequately protect water resources, yet permit, as much as possible, their full use.

Kansas implemented water quality standards even before the passage of the Federal Clean Water Act in 1972. Like the federal law, Kansas law and regulations have evolved over the past 25 years. Kansas derives its authority to issue National Pollutant Discharge Elimination System (NPDES) permits for wastewater dischargers from federal law and implementing regulations written by the Environmental Protection Agency (EPA). Permits are written so that dischargers meet pollutant criteria that in turn protect the designated uses for Kansas streams.

Kansas regulations received a major overhaul in 1994. For the first time, the Kansas Department of Health and Environment used the EPA river reach file 2 (RF2) and river reach file 3 (RF3) for identification and delineation of designated uses, tripling the number of streams assigned designated uses. At a minimum, all classified surface waters were designated for the noncontact recreational use² and one of the three categories to support aquatic life. Health and Environment performed 219 use attainability analyses resulting in 29 percent of all streams being designated for contact recreation. The food procurement use was assigned to newly listed streams which were known to support panfish and/or significant angling resources based on a 1981 stream and river fishery resource evaluation. The special aquatic life support designation was assigned based on the presence of state or federally listed threatened or endangered species or "species in need of conservation." In all, 17 percent of all streams listed were assigned the special aquatic life support use. Thirty-four streams, constituting four percent of the state's

² "Noncontact recreational use" means recreation where ingestion of surface water is not probable. This could include wading, boating, fishing, trapping, mussel harvesting, and hunting.

classified stream miles, were added to the list of outstanding natural resource waters. Numeric criteria were established for an additional 176 pollutant parameters and numeric restrictions on whole-effluent toxicity were adopted. A graduated mixing zone system was established and approximately 60 technical terms and phrases were defined.

Early in the 1997 triennial review process -- a review of water quality standards required by federal law -- the debate shifted from Health and Environment to the Kansas Legislature. House Bill 2368 was introduced by Representative Andrew Howell (R-Fort Scott) in response to the tone of the review and the difficulty the City of Fort Scott felt it was experiencing with Health and Environment. After much debate in both the House and Senate committees of jurisdiction, H.B. 2368 passed both chambers by an overwhelming margin. The bill set both the ammonia and chloride criteria based on 1987 regulations and established the atrazine chronic aquatic life criteria at 3 parts per billion (ppb) for all classified streams. The bill established the Kansas Special Commission on Water Quality Standards to examine a wide variety of issues and report back to the Legislature and Governor with a preliminary report due January 1, 1998 and a final report due six months later.

Summary of Concerns

The Legislature established the Kansas Special Commission on Water Quality Standards during the 25th anniversary of the Clean Water Act. It expressed interest in reassessing the current "way of doing business" given that current water quality problems are not as visible as they were 25 years ago. In 1972, people saw streams black from discharges, colored with industrial wastes and lined with sludge from cities and industry. The condition of Kansas streams has improved substantially -- the amount of pollution has decreased at the same time population and industry has increased. Generally, both fecal coliform and ammonia are found to be about 90 percent less than 1976 levels. Significant progress can be found in every stream community in Kansas including the Arkansas River, Big Creek, Johnson County Mill Creek, Sedgwick County Four Mile Creek and Shawnee County Half Day Creek, to name a few. Work still remains, but it is less visible and will require much more public education and stakeholder involvement.

The Commission acknowledges that some stakeholders disagree with that Kansas has made progress. These critics cite that the state is often ranked at the bottom of state comparisons for water quality. However, Kansas has one of the most comprehensive stream monitoring programs in the nation, as well as far-reaching designated uses compared to other states. For example, Drywood Creek is a creek Kansas shares with and which flows into Missouri. It is designated for aquatic life and noncontact recreation in Kansas. Missouri has designated Drywood Creek for livestock watering, warm water aquatic life, human health, and fish consumption. Due to Kansas' more rigorous designations, Drywood Creek is designated as impaired by bacteria in Kansas, but not in Missouri. In fact, Drywood Creek will never be designated impaired for bacteria in Missouri because the only designation tied to bacteria is recreation, which Missouri has not assigned to Drywood Creek. Therefore, the public would be led to believe that Drywood Creek is dirty in Kansas, but clean in Missouri. The irony of this situation was recently highlighted in an Environmental Protection Agency Inspector General audit of Missouri's water quality program. The audit stated that Missouri had not adopted the national "swimmable" use classification for all of its waters. It also pointed out that Missouri did not have a strategy to comprehensively evaluate all its waters, did not know the quality of its waters and did not have a plan to find out.

Water quality standards consist of two components: designated uses and criteria. Kansas regulations define uses for the surface waters of the state to include recreation, aquatic life, food procurement, irrigation, livestock watering, domestic water supply, industrial water supply, and groundwater recharge. Criteria are then set to protect the established uses. Finally, wastewater discharge permit limitations encompass the criteria to ensure that designated uses are protected.

Designated Uses. The Commission spent two full meeting days hearing from a variety of experts from both inside and outside government. Comments also were solicited from stakeholders during the public comment period. Concerns were raised about the appropriateness of many of the use designations assigned by Health and Environment as not representing either existing or potential uses. Concerns were raised about the attainability of many of the contact recreation use designations because of access limitations, both legal and physical. Others,

however, believed these designations were appropriate and in fact should be expanded to cover all waters of the state.

The economic impact of use designations was also discussed. Some groups recommended that economic impact be assessed prior to the establishment of use designations. Others were concerned about the practical difficulties of valuing benefits, and the possibility that a cost/benefit analysis would be skewed toward costs without accurately reflecting benefits. The Commission received a suggestion that Outstanding Natural Resource Water (ONRW) designations be systematically reviewed, including a detailed economic impact assessment. A recommendation to establish a procedure to nominate streams as ONRWs was also expressed. The Commission was informed that 98% of the high chloride occurrences in the state were caused by natural mineral intrusion (NMI). A recommendation was received to reassess stream designations where NMI impacts were experienced and to establish a saline aquatic life designation.

Criteria. The Commission concentrated its fact finding and deliberations on four criteria -- ammonia, atrazine, chlorides and fecal coliform. Municipalities expressed concern that the current winter ammonia limits were more restrictive than necessary to protect aquatic life. They suggested Kansas give due consideration to seasonal limits used by other states and accepted by EPA. Others suggested, however, that these recommendations reflect some cities interest in avoiding plant upgrades. A wide range of views were expressed regarding the atrazine criteria. Testimony was presented supporting a 1 ppb chronic aquatic life standard, while an EPA draft document supported 12 ppb as the aquatic animal criteria. Others suggested using a probabilistic ecological risk assessment technique to establish the numeric standard. There was general agreement regarding the chloride criteria. A strategy employing regional or segment-specific criteria based on historical stream monitoring data was suggested. Finally, the Commission determined that the basis for the fecal coliform criteria needed to be reevaluated. Source identification was suggested by several groups.

Stakeholder Participation. The Commission spent much of its time after issuance of the preliminary report focusing on stakeholder participation in the water quality standards process. Commissioners expressed concern about the lack of external involvement in the entire process.

Public perception of the value of the resource is an important underpinning to obtaining public buy-in for the protection of surface waters and setting appropriate uses, criteria and total maximum daily loads. The recommendations that follow emphasize the need for an open, collaborative process to improve and protect the State's valuable water resources.

Implementation. Throughout the Commission deliberations, concerns were raised about the use of models and mathematical calculations versus actual data, when it was available. Concerns were also raised about flexibility used by other states and accepted by EPA that were not used by Kansas. Others raised concerns that implementation procedures received no public input and suggested putting them into the formal rules and regulation process.

RESPONSE TO LEGISLATIVE QUESTIONS

The 1997 Kansas Legislature enumerated a number of items for the Commission to investigate in K.S.A. Sup. 65-1,177. Some required a review of the process followed by the Kansas Department of Health and Environment. Others required the gathering of information and the formulation of recommendations which are fully described in the portion of this report entitled Recommendations and Policy Considerations.

Questions of Process. In five of the eleven items listed in H.B. 2368, the Legislature asked the Commission to review past actions of KDHE and comment on their adequacy. The following is discussion of those five items.

K.S.A. Sup. 65-1,177(a)(5) states, "evaluate whether the 1994 surface water quality standards were adopted in full compliance with the requirements of Kansas law in effect at the time of adoption of the standards and whether the estimates of economic impact completed at the time accurately predicted the fiscal impact of the standards on communities facing compliance with the standards in 1997 and 1998."

The Commission determines the 1994 Kansas water quality standards were adopted in full compliance with the requirements of Kansas law (Faith Loretto, February 9, 1998, docket number 239). The Commission also concludes that the cost estimates developed by KDHE for municipality compliance with the standards were reasonable (Theresa Hodges, February 9, 1998,

docket number 240). However, the Department did not consider the costs to nonpoint sources nor were benefits quantified or discussed (Kansas Department of Agriculture, April 27, 1998, docket number 285). The Commission maintains that the establishment of a standard implies the standard will be met and therefore concludes that an estimate for all costs and benefits should have been developed. However, the Commission recognizes that while the economic impact statement requirements in effect at the time required Health and Environment not only to describe the costs but also who would be affected, Health and Environment would naturally consider those falling under its permit authority and overlook those not coming under the regulatory approach [K.S.A. 77-416 (1990) (repealed July 1, 1995)]. The Commission recommends the Department work with other entities, both public and private to fully explore and compile estimates for all impacted parties and examine the environmental benefits as outlined in K.S.A. 77-416 (1997) when the 1994 standards are revised. The Commission recognizes quantifying non-economic costs are more difficult than straightforward economic costs but encourages Health and Environment to make the attempt. Such a comprehensive analysis may reveal significant policy issues for consideration by the permanent commission recommended later in this report (recommendation 1).

K.S.A. Sup. 65-1,177(a)(7) states, "advise the governor, legislature and secretary whether the department's process of revising the 1994 surface water quality standards is in full compliance with federal and state law."

As stated above, the 1994 Kansas water quality standards were adopted in full compliance with the requirements of state and federal law (EPA, Region VII staff, May 15, 1998). However, while EPA acknowledges that the Kansas submission of its 1994 water quality standards was in compliance with the process outlined in federal regulation, there were some portions that were not accepted by EPA. More than three years after Health and Environment submitted the 1994 standards to EPA, a lengthy partial approval letter was received. Health and Environment is currently working with Region VII EPA to resolve outstanding issues which include consideration of the contents of this report.

K.S.A. Sup. 65-1,177(a)(8) states, "advise the governor, legislature and secretary regarding the extent of the department's compliance with the provisions of 1996 House Resolution No. 6013, concerning consultation with community officials on the impacts of the 1994 surface water quality standards on the communities of the state."

1996 House Resolution No. 6013 asked Health and Environment to meet with municipalities regarding water quality based effluent limits, defer setting new effluent limits, and report to the Legislature regarding designated uses of waters of the State. The Resolution was adopted by the Kansas House of Representatives on March 21, 1996 (docket number 236). The emphasis of H.R. 6013 was for administration-level staff to conduct public meetings and the Department to present the technical and scientific basis for the designated uses, the expenditure by the municipality, and the extent the effluent limitations would result in attainment of the designated uses. In testimony before the Commission, the League of Kansas Municipalities stated H.R. 6013 represented the first chapter of the process that was formalized when the 1997 legislature passed K.S.A. Sup. 65-1,177 establishing the Commission and setting forth its study process. It was their opinion that both measures were an expression of a desire for a closer working relationship with Health and Environment as it develops and implements water quality standards.

Health and Environment received nine written requests from the cities of Great Bend, Fort Scott, Emporia, Pratt, Independence, Topeka, El Dorado, Medicine Lodge, and Holton for a H.R. 6013 public meeting (docket number 237). During the five public meetings held to date, Health and Environment officials discussed the impacts of the 1994 standards on each of the community's wastewater treatment efforts. The remaining municipalities, after discussion with Health and Environment chose to defer their meetings until the work of the Commission is complete.

K.S.A. Sup. 65-1,177(b)(1) & (2) states, "(b) In completing its study, the commission shall evaluate and advise the governor, legislature and secretary whether: (1) There is reliable scientific documentation of the actual existence of the species that are designed to be protected by the special aquatic use designation contained in the 1994 surface water quality standards; and (2) the special aquatic use designation and reduced mixing zone requirements contained in the 1994 surface water quality standards are

based on any recognized scientific data and models and whether there is an established and clear relationship between the presence of the regulated pollutants and the protection or restoration of the targeted aquatic species.”

As with the most of the water quality issues reviewed by the Commission, both factual evidence and professional judgement varied substantially between specific sites and reviewers for the evaluation of the special aquatic use designation and the associated reduced mixing zone requirements. Wichita was provided clear and convincing evidence that their effluent was causing downstream impairments. Following the upgrade of the treatment plant, which provided disinfection and nitrification, sampling revealed improved water quality and the return of some sensitive fish species, including one Kansas threatened species. In the case of Fort Scott, there was a mix of factual evidence and extended professional judgement, which made the expected outcome somewhat less clear. Direct effects were even less clear when dealing with larger stream systems with significant impacts from mainstem impoundments. It is not always clear if the species needing protection or restoration are absent because of the existing impairment or other factors not addressed by the regulations.

Health and Environment that reported waters were designated as special aquatic life use (SALU) for three reasons: (1) they were SALU prior to 1994; (2) they were designated by the Kansas Department of Wildlife and Parks (KDWP) as critical habitat for threatened and endangered species; or (3) they were one of ten water bodies known to support SINC. Because of the importance of the SALU designation to the protection of aquatic species of concern and the potential impact on the regulated community, the Commission is concerned that these designations may be strictly an armchair activity with reliance on previous studies conducted for other purposes without additional field work to support the designations. For example, Health and Environment examined Kansas Biological Survey data and computer listings of habitats supporting rare aquatic and semiaquatic taxa in Kansas when establishing ten segments as SALU because they were also known to support SINC. The Commission recommends more in-field research be conducted or supplemental data used to augment KDWP designations.

The Commission encourages state agencies with water quality responsibilities to give these areas high priority: (1) establish stream teams; (2) develop stakeholder interest groups;

and, apply a use attainability analysis program (recommendations 2, 3 and 4). The Department utilized a portion of this approach in Wichita which enabled the City to gain the necessary public support to make a substantial investment in wastewater treatment upgrades. Wichita continues to maintain this support through a biological monitoring program partially supported by state dollars. The Commission also believes stakeholder involvement in the establishment of designated uses and conducting use attainability analysis will assist in building public support for and commitment to improved water quality (recommendations 2, 3 and 4).

Advice and Recommendations. The remaining six items required the Commission to advise and make recommendations to the Governor and Legislature. The following is a summary of those items. Full discussion of the concepts are contained in the Recommendations and Policy Considerations section of this report.

K.S.A. Sup. 65-1,177(a)(1) states, "Investigate and evaluate the technical and scientific basis of the 1994 surface water quality standards, including: (A) Stream designations use attainability analysis as required when compiling the 1996 Kansas Water Quality Assessment 305(b) report pursuant to 33 U.S.C. 1315(b)(1)(D) or 33 U.S.C. 1313(c)(2)(A); (B) low, high and yearly average flow impact criteria; and (C) scientific appropriateness of the criteria guidance of the United States Environmental Protection Agency and the department."

Discussion of these items are contained in recommendation numbers 3, 4, 10 and 11 in this report under the section entitled, Recommendations and Policy Considerations.

K.S.A. Sup. 65-1,177(a)(2) states, "evaluate whether the 1994 surface water quality standards, including the use designations, surface water chemical and microbial criteria and the "Kansas Surface Water Register," as published by the department on June 20, 1994, are based on sound scientific and technical data and information, whether such standards are more stringent than are required by federal law and those of other Midwestern and plains states, whether generally accepted criteria exist for evaluating the appropriateness and cost-effectiveness of the standard and whether the department should be directed to make any changes in the standards."

Discussion of these items are contained in recommendation numbers 6, 7, 8, 9, 10, 11 and 12 in this report under the section entitled, Recommendations and Policy Considerations.

K.S.A. Sup. 65-1,177(a)(3) states, "develop and recommend cost-benefit or risk assessment models for the evaluation of the impact of surface water quality standards on the various elements of the environment, health and economy of Kansas, including but not limited to human health, animal and plant species actually found or likely to be reintroduced in Kansas waters, industry, agriculture and wastewater treatment."

After much review, it was the consensus of the Commission that Health and Environment did a credible job quantifying the financial costs to municipalities of the 1994 water quality standards. However, the Commission believes the analysis did not go far enough to examine the environmental benefits of the standards and the all costs to other sectors of the Kansas economy. Much more work needs to be done by the Department in this area for future revisions of Kansas water quality standards. The Commission views benefit cost analysis as a framework for organizing thoughts or considerations with regard to water quality standards. There will always be some considerations that cannot easily be enumerated or valued. However, because the role of benefit cost analysis is to aid in decision making, but not be the only consideration, it should be pursued.

Developing a benefit cost model is beyond the scope of this Commission. However, the Commission recommends Health and Environment consult with other government entities and the private sector to find models and methods to use in evaluating future water quality standards. The Commission cautions policy makers that benefit cost analysis is just one tool in the decision making process.

The three independent but overlapping elements of risk -- assessment, management and communication -- should also be used by Health and Environment in the water quality standards setting process. Risk is defined as the probability that a substance or situation will produce harm under specified conditions. However, risk also includes the consequences as well as the probability of the adverse events and these result from exposure to the agent and its inherent hazard. When there is no exposure, there is no risk. Risk assessment is an integrated process used to describe and estimate the likelihood of adverse effects from environmental exposure to chemicals. The scientific disciplines most directly involved in human health risk assessment are epidemiology and toxicology. Risk management is the process of analyzing, selecting,

implementing and evaluating actions to reduce risk. It is dependent on social, political, economic, esthetic and other factors. Risk communication is the process of organizing, evaluating and communicating information about the nature, strength of evidence and likelihood of adverse health or ecological effects from particular exposure.

K.S.A. Sup. 65-1,177(a)(4) states, "assess the probability that designated uses contained in the surface water quality standards can be attained in a cost-effective and reasonable manner when requirements are met."

Discussion of this item is contained in recommendation numbers 1, 2, 3 and 4 in this report under the section entitled, Recommendations and Policy Considerations.

K.S.A. Sup. 65-1,177(a)(6) states, "advise the governor, legislature and secretary of any revisions to the 1994 surface water quality standards that are justified based on additional scientific and technical information and data."

Discussion of this item is contained in recommendation numbers 6, 7, 8, 9, 10 and 13 in this report under the section entitled, Recommendations and Policy Considerations.

K.S.A. Sup. 65-1,177(a)(9) states, "recommend the adoption of any procedures that the commission deems advisable to ensure the collection and evaluation of scientific and technical information necessary for the revision of the 1994 surface water quality standards in future years."

Discussion of this item is contained throughout the recommendations in this report under the section entitled, Recommendations and Policy Considerations.

RECOMMENDATIONS AND POLICY CONSIDERATIONS

1. Establish Permanent Water Quality Commission. *The Commission recommends a permanent commission be established to advise the Governor and the Legislature on water quality issues.* During the year-long deliberations of the current Commission, the symptoms of the inherent conflict the Kansas Department of Health and Environment finds itself in as the scientist, rulemaker and enforcer of water quality standards appeared frequently. It causes the distrust of stakeholders to fester and many times stands in the way of progress toward improved

water quality. Stakeholders spend a plethora of time and resources challenging Health and Environment science and policy judgements either in administrative arenas or in the courts. The Commission believes a permanent body to advise the Governor and Legislature on water quality issues will provide a system of checks and balances the current process lacks and shift some of the resources currently spent on these types of activities to those activities that improve water quality in the field.

The permanent Commission would advise the Governor and Legislature on water quality policy choices and peer review Health and Environment science. It would also serve as a forum for public education and buy-in for steps to improve water quality in the state. It would provide a forum for mediating disputes before they become entrenched and facilitate the use of common sense in water quality standard decisions.

The current Commission recommends a seven-member commission appointed by the Governor. Members should represent the diverse interests that span the State with regard to water quality. At a minimum, the members of the commission shall have experience in one or more of the following areas and disciplines -- environmental sciences, civil engineering, business and industry, public finance, municipal wastewater treatment, agriculture or agribusiness, environmental law, public health sciences, aquatic biology, risk assessment or cost benefit analysis. Terms should be staggered and at least three years in duration. Further, the Commission recommends that reasonable compensation be established to enable the Governor to choose from the widest possible pool of qualified individuals.

2. Stakeholder Participation. *The Commission recommends a provision be added to Kansas statute requiring and outlining enhanced stakeholder participation in all aspects of the water quality standards setting process to reinforce the requirements of the Federal Clean Water Act.* The implementing regulations should establish a procedure to involve all stakeholders early in the standards setting process creating a method for buy-in for specific or additional levels of protection. This includes all facets of designated uses, criteria and total maximum daily loads (TMDLs). Stakeholders should review the fiscal impact and assessment analysis, as well as the risk assessment analysis and be assisted in understanding the ramifications of water quality standard proposals on their communities.

As a first step in this process, the Commission recommends creation of a citizen participation program called "stream teams" that surrounding states are using successfully. Public perception of the value of the resource is an important underpinning to obtaining public buy-in for the protection of surface waters and setting appropriate uses, criteria and TMDLs. Increased familiarity and knowledge about a stream system is critical in establishing a perception of worth. The most successful "stream team" programs in other states focus on collaborative learning, problem solving and program implementation, not monitoring for enforcement. While leadership and support come from a broad spectrum of local, state, federal and private organizations, primary coordination is through a full-time position in the agency responsible for protection and management of fisheries and wildlife resources. The Commission is aware that a proposal to establish such a "stream team" program is currently under consideration in the state water planning process. The Commission encourages the Water Authority, the Legislature and the Governor to put the necessary commitment and resources in place to establish a fully funded "stream team" program.

The recommended stakeholder participation process, including a "stream team" program will provide necessary local discussion of the ramifications of designated uses and the protective criteria on environmental quality and the local community. The stakeholder discussion will help build the public support necessary to meet the water quality standards. This process may require a redirection of and/or more state resources -- both financial and personnel -- than the current process; however, the Commission believes stakeholder participation is extremely important to ensure improved water quality.

3. Process for Establishing and Reviewing Designated Uses. *The Commission recommends a provision be added to Kansas statute outlining policy considerations that must be addressed by the Kansas Department of Health and Environment when establishing designated uses.* The basic requirements include: (1) stakeholder participation and education; (2) a formal use attainability analysis; (3) an economic impact assessment -- both benefits and costs -- with a report to stakeholders; (4) a consequence analysis when proposed designations are more restrictive than federal requirements; (5) use designations set on a segment by segment basis; and (6) if a dispute over the appropriateness of a designated use arises, the Commission established

pursuant to recommendation 1 shall review the matter and make a recommendation. All policy considerations must recognize the parameters of the Federal Clean Water Act. The Commission recommends Health and Environment develop a methodology to perform each economic impact assessment and consequence analysis, making the methodology available for public review. The Commission also suggests that Health and Environment consider the existence of a relationship between habitat impacts, restoration of a target species, the pollutants regulated and the designated use assigned.

The Commission also recommends a provision be added to Kansas statute requiring Health and Environment to review current use designations in a systematic manner based on priorities established through the stakeholder participation process. Health and Environment should then prioritize stream segments for review giving first priority to those segments where current use designations are contentious. The components of use attainability analysis set out in recommendation 4 should be used by Health and Environment to complete this review.

These policy considerations and the ensuing review of designated uses would change the current water quality standards paradigm in Kansas. The Commission recommendations require Health and Environment to review current designated uses using new and expanded criteria. The Department would also be required to defend its actions before the permanent commission in disputed cases. However, heightened stakeholder involvement in the process will encourage acceptance of the designation and actions that lead to achieving designated uses more quickly. Fewer resources may be required to defend Health and Environment decisions and more would be used to achieve compliance. This method may require more State resources -- both human and financial -- or a redirection of resources across state agencies. Review of current use designations without additional resources would require Health and Environment to shift resources from current activities. However, the Commission believes a review is extremely important to ensure a sound foundation for Kansas water quality standards.

In testimony before the Commission there was consensus that stakeholder input in the process of establishing designated uses is appropriate. The majority of those appearing before the Commission believe that a process encouraging involvement must be a high priority (KS Farm Bureau, City of Ft. Scott, KS Dept. of Agriculture). Some likened an ideal process to

the recently revised process for listing threatened and endangered species, which provides for public meetings at the beginning of the process and the use of local advisory committees to develop and implement species protection plans (KS Farm Bureau, KS Dept. of Wildlife and Parks). Economic impact assessments were supported by those in the regulated community, but viewed with skepticism by others because of the application difficulties. All supported employing a use attainability analysis. Opinions diverged regarding when the use attainability analyses should be applied. A summary of the divergent opinions is outlined in the recommendation on use attainability analysis below (page 18). Differences of opinion existed over what level of water quality was attainable and what cost was reasonable to achieve attainment. There was also a distrust of the current method of setting designated uses. All believed their point of view met the basic requirements of the Federal Clean Water Act. Several conferees believed Health and Environment did not appropriately consider attainability when assigning uses given the physical characteristics of streams, the impacts of forces other than dischargers on streams, as well as the economic consequences to surrounding communities (City of Topeka, City of Fort Scott, KS Aggregate Producers). Others advocated setting all uses for all waters unless a use attainability analysis demonstrates that the use cannot be attained (Sierra Club, KS Natural Resources Council). Wildlife enthusiasts emphasized the importance of water quality to wildlife habitat (KS Audubon Society, KS Dept. of Wildlife and Parks). This wide difference of opinion suggests a need to elevate the review to a statutory requirement and include stakeholders in the deliberations.

4. Components of Use Attainability Analysis. *The Commission recommends the Kansas Department of Health and Environment develop a scientifically based, objective process to conduct use attainability analysis. The Commission also recommends Health and Environment consider employing use attainability analyses from independent entities so long as each entity has followed the process for use attainability analysis developed by the agency and the entity was selected in the stakeholder process. Use attainability analysis should include a thorough and rigorous analysis to identify characteristics necessary to support uses, as well as field observations. The formal use attainability analysis will be performed by individuals with*

appropriate professional credentials that are acceptable to all stakeholders no matter who is the sponsor.

The Commission realizes a systematic review of designated uses (recommendation 3) will markedly increase the need to conduct use attainability analyses. In addition, the need for stakeholder involvement will likely make the process more involved and costly. However, the Commission believes the meaningful involvement of stakeholders in the process is very important. In an effort to minimize the added costs and workload to Health and Environment, ensure stakeholder participation and ownership, promote orderly progress, and enhance integration into existing water protection and management programs, the Commission recommends a three step approach: (1) establish a prioritized list of streams for use attainability analysis in each of the 12 basins identified in the State Water Plan. The existing Basin Advisory Committees (BACs) would work with Health and Environment to help identify the priority streams within their basin; (2) after a high priority area is identified, the BAC and Health and Environment would recommend appropriate stakeholder participation projects to the Kansas Water Authority for funding through the State Water Plan; and, (3) a specific state program should be developed to implement stakeholder participation (a stakeholder task force) in use attainability analysis. This program will be based on the principles of collaborative learning and would oversee the organization and operation of a use attainability analysis task force made up of stakeholders who will be involved in the design, application, interpretation and recommendations of an use attainability analysis for the relevant stream segment. This program as previously outlined, will be funded through the State Water Plan and housed in the Kansas Water Office.

Establishing such a use attainability analysis process lets all stakeholders know how use designations will be set. Because stakeholders play an active role in selecting the entity to perform the use attainability analysis, everyone will then have a reasonable expectation that this analysis will be given serious consideration. The process may reduce conflict between Health and Environment and stakeholders, as well as increase public support for use designations that are established.

Testimony before the Commission indicated support for formal use attainability analysis. The disagreement surfaces over the question of when it should apply. Representatives for point and nonpoint sources agree that use attainability analysis should be performed prior to the establishment of designated uses. Other parties believe that all uses should be designated for all waters unless a use attainability analysis demonstrates that the use cannot be attained (Sierra Club, KS Natural Resources Council). Federal regulations³ set out a very rigorous format that states must follow if a designated use is to be changed. The Commission also heard testimony from a communications expert on collaborative learning which allows communities to turn controversy into constructive action (Dr. Gregg Walker, Oregon State University). He focused on processes that encourage constructive discussion of complex ideas to help initiate citizen deliberation. The process stresses learning, understanding, and the development of improvements in the situation -- a way for diverse groups of people to make progress on improving the situation as they work through issues, values, and concerns.⁴

5. Monitoring. *The Commission strongly recommends the Kansas Legislature and the Governor establish a dedicated funding base to support water quality monitoring, both chemical and biological.* Rigorous monitoring is the foundation for defensible use attainability analysis and appropriate designated use decisions. In fact, Kansas has a long tradition of recognizing the value of water quality monitoring. As the State moves into the next phase of water quality improvements, more thorough and targeted monitoring will be necessary. This information can then be used to focus state government resources on identified problems.

Establishing a dedicated funding base for water quality monitoring should ensure adequate resources are provided to characterize accurately the quality of Kansas waters. Further, information will allow policy makers, the regulated community and other stakeholders to identify problems and prioritize resources to improve water quality. While this may require an increase in the State's monetary commitment to water quality monitoring, it will also save private sector resources by focusing on documented problems rather than perceived ones.

³ 40 C.F.R. 131.10(g)

⁴ See "Ever-Widening Circles", Wingspread Journal, Spring 1997

Testimony and discussion before the Commission indicated broad-based support for this recommendation.

6. Ammonia Criteria. *The Commission recommends Health and Environment regulations provide for alternative winter ammonia limits on a site-specific basis where justified through scientific data and evaluation.* The Commission recognizes the difficulties involved in implementing this recommendation and is aware information is limited. Nevertheless, Health and Environment should use available data to provide winter ammonia limits. The Commission further suggests a review of the acute/chronic ratio and the methodology for establishing the ammonia criteria and that histopathological data not be given priority over other factors when examining the weight of evidence for criteria establishment.

The Commission also recommends that Health and Environment invite communities to propose the development of site specific criteria if the leaders of the community or Health and Environment believe the criteria may be either underprotective or overprotective for a given water segment. Further, Health and Environment should establish cost-effective procedures for the development of site specific studies and public participation in criteria development which can be completed by communities in no more than one year. Communities which receive NPDES permits with site specific criteria should be encouraged to undertake ongoing monitoring and evaluation of the effects of the criteria on the aquatic community prior to the renewal of the permit. Within the limits of available resources, Health and Environment should assist communities in undertaking the necessary studies required to develop such criteria.

Winter ammonia limits could allow local communities to target limited resources at significant water quality problems. Site specific criteria developed with public participation and evaluation of the aquatic community can serve to validate the continued use of the site specific criteria and to educate communities about the condition of their local water resource. Additional resources may be required for Health and Environment and from the local community to conduct the necessary evaluations.

The Commission believes the recommendations outlined above are consistent with the intent of the 1997 EPA proposed guidance on ammonia. Municipalities expressed concern that the current winter ammonia limits were more restrictive than necessary to protect aquatic life.

Concern was also expressed that Kansas had not given due consideration to seasonal limits used by other states and accepted by EPA as protective of aquatic life (League of Kansas Municipalities). Support was expressed for the evaluation of the aquatic community after seasonal nitrification to examine actual impacts on aquatic life, use of a 30-day chronic averaging method and removal of histopathological data from the criteria establishment process. The Commission was urged to continue to ask questions about cost effectiveness -- "cities are concerned about aquatic life, but are also concerned about taxpayers, especially those in small cities who do not have the opportunity to raise questions." The Commission was presented with a plan for the establishment of site specific ammonia discharge criteria for the City of Topeka's discharge to the Kansas River rather than the continued technical debate and media battle that has not resulted in environmental progress over the past four years (City of Topeka). The City of Topeka is utilizing a collaborative process to shift the debate away from theoretical discussions and model assumptions, and instead look at the local stream so the debate might be put into terms that all parties including the public can understand. Concerns were raised by others about the lack of funding for water quality research that could impact water quality in this area and in general (KS Audubon Society). Another testified that the changes sought were just an attempt to get some cities off the hook from making plant upgrades (Sierra Club).

7. Atrazine Criteria. *The Commission recommends the atrazine criteria for chronic aquatic life remain at 3 ppb until more research on the range from 1 ppb to 20 ppb is reviewed or conducted.* The Commission understands EPA expects to finalize its research later this year and therefore recommends Health and Environment adjust its regulations accordingly. The Commission was presented with evidence advocating a range of criteria. There was evidence presented that showed some aquatic impacts when atrazine levels were at 1 ppb, and other studies indicated that upwards of 12 ppb could be assimilated without impacts on aquatic life.

The Legislature established the chronic aquatic life criteria at 3 ppb in K.S.A. Sup. 65-1, 177. The current drinking water standard is 3 ppb. Setting the chronic aquatic life criteria at anything greater than 3 ppb will have no impact in streams that are designated for domestic water supply since the most protective criteria apply where dual designations exist. Funding

may be needed for a portion of the research to determine the impact of atrazine on aquatic life in the range of 1 ppb to 20 ppb.

Scientific studies were presented representing a wide array of views. Testimony and studies were presented supporting 1 ppb and advocating some evidence that a lower criterion would be appropriate (Sierra Club). Including atrazine metabolites in the measurement of atrazine in water was also advocated. An EPA draft criteria document was discussed that recommended 12 ppb as the aquatic animal criteria and 49 ppb as the aquatic plant criteria. Others advocated directing Health and Environment to use the probabilistic ecological risk assessment technique to establish the numerical standard presented to the Commission by Dr. Keith Solomon⁵ (KS Corn Growers Assn, KS Sorghum Producers Assn., KS Fertilizer and Chemical Assn.). Information was also presented predicting the economic impact of an atrazine ban on Kansas agriculture of more than \$200 million annually (Dr. Dick Faucet⁶, KS Corn Growers Assn, KS Sorghum Producers Assn.).

8. Chlorides Criteria. *The Commission recommends the Kansas Department of Health and Environment recognize the impact of natural mineral intrusion on Kansas stream quality and subsequent permits.* The agency should establish regional or segment specific criteria working with the Kansas Geological Survey (KGS) to determine what numeric criteria is appropriate on a watershed or segment basis. Health and Environment should review the appropriateness of the acute and chronic criteria for Kansas utilizing all existing information, not just that provided by EPA. Health and Environment should also consider use of variances or exemptions when chlorides are elevated due to natural causes. Finally, Health and Environment should move existing language [K.A.R. 28-16-28e(c)(3)(B)] that references natural mineral intrusion to the administrative section of the standards (K.A.R. 28-16-28f) and modify the language by striking domestic water supply and replacing it with designated use.

The Commission learned that a blanket chloride criteria was adopted by Health and Environment as a matter of expediency to meet EPA deadlines. Given 20 years of work done by

⁵ Dr. Keith Solomon, Center for Toxicology, University of Guelph, Ontario, Canada

⁶Dr. Dick Faucet, Faucet Consulting, Huxley, Iowa

the KGS which shows there are areas of the state that naturally exceed the criteria and have alkaline habitats, adjusting this criteria to consider natural conditions will make the standard more accurately reflect naturally occurring stream conditions. Because information and data are readily available, this work could be done at limited expense to the State.

In testimony before the Commission, the KGS reported that more than 98 percent of the elevated chlorides in state waters are caused by natural mineral intrusion. The Commission also learned that unique saline ecosystems have formed because of this natural intrusion (KBS). Point source dischargers encouraged the Commission to recommend a strategy employed by other States where there is also a prevalence of natural mineral intrusion. This includes establishing regional or segment-specific criteria based on long-term average flows and actual chloride concentrations from historical stream station monitoring data (City of Lyons, North American Salt Co., Morton Salt Co., City of South Hutchinson, City of Hutchinson, Cargill Salt Co.). Administrative changes were also recommended to give Health and Environment maximum flexibility when addressing natural mineral intrusion. An internal memorandum from Health and Environment was provided. It stated that the agency was well aware that less stringent, site-specific criteria could potentially be applied to some stream segments based on mineral intrusion considerations. The memorandum went on to say that it was equally evident that natural phenomena were not consistently or solely responsible for the elevated levels of chlorides documented in several streams in central Kansas (Sierra Club, KS Natural Resources Council, KS Dept. of Health and Environment).

9. Fecal Coliform Criteria. *The Commission recommends a reexamination of the EPA criterion to determine if it is an adequate indicator of public health risks and further recommends the exploration of the impacts of seasonal disinfection -- both aquatic and monetary -- and the public health risk associated with fecal coliform spikes caused by runoff events.*

Source identification is an important component to reducing public health risks and should be included as part of the assessment.

The criteria used by the Kansas Department of Health and Environment was established by EPA in 1986. The Commission believes more research is available that did not exist a decade ago and it should be evaluated. This could reduce the public health risks from bacteria

contamination. Further, more recent research using D.N.A. techniques has been developed to determine the source of contamination. This should be utilized to reduce public health risks. This reexamination may increase costs to the State.

The Commission heard testimony from a wide variety of stakeholders on the indicator nature of fecal coliform and the public health concerns this type of pollutant can cause. Some suggested requiring disinfection only during the recreation season for those streams designated for noncontact recreation (Johnson County Wastewater). Others argued that recreational uses of waters occur throughout the year and include waterfowl hunting, furharvesting and fishing which continues through the winter months (KS Dept. of Wildlife and Parks). Still others believed disinfection should be required for all classified streams, not just those known to be used for recreation (Sierra Club, KS Natural Resources Council). Testimony was also heard advocating reexamination of the current high flow exclusion to include an exemption from the contact and noncontact use designation during the first 24 hours of a storm and establishing a partial recreation use designation to temporarily remove fecal coliform limits during wet weather (KS Livestock Association, League of Kansas Municipalities).

10. Seasonal Criteria. *The Commission recommends the Kansas Department of Health and Environment utilize seasonal variations where appropriate.* Parameters for review should include, but are not limited to dissolved oxygen, fecal coliform and wet weather versus dry weather flows.

Information brought before the Commission indicates seasonal variations are accepted by EPA and used in several other states. This should result in criteria more accurately reflecting conditions in the field. It may also require more agency resources.

More than a dozen conferees came before the Commission to discuss the complex issues surrounding criteria establishment. It appeared seasonal variations offered a possible solution to several implementation issues brought forward. For example, one suggestion was to amend the contact recreation standard so it only applied from Memorial Day to Labor Day (KS Livestock Assn.). Others felt the contact recreation standard should apply to more waters throughout the year (Sierra Club, KS Natural Resources Council, KS Dept. of Wildlife and Parks). The impact

of wet weather events on pollutant loadings and the ability of cities and agriculture to control the loadings was a concern (Black & Veatch, KS Livestock Association).

11. General Pollutant Criteria. *The Commission recommends that if water quality criteria are to be established which are more stringent than EPA requirements, they must be justified with a risk assessment analysis, and where appropriate, a cost/benefit analysis. A process should be developed to communicate the results effectively to stakeholders.*

EPA provides states with criteria guidance on a variety of parameters. States can use this criteria, refine it to fit localized conditions or develop their own, so long as it protects the designated use. Requiring Health and Environment to justify more stringent standards is sound public policy. The analysis will either serve as a tool to justify increased expenditures to protect water quality or it will illustrate why the more stringent requirement is not appropriate.

Health and Environment is already required to submit an environmental benefit and economic impact statement on new regulations under K.S.A. 77-416. The Commission emphasizes the importance of this review, and suggests adding this requirement to the environmental protection statutes specifically.

12. Stream Impairment Determination. *The Commission recommends the Kansas Department of Health and Environment add a provision to its regulations to clarify that narrative criteria alone should not determine stream impairment for listing purposes.*

This policy will ensure both subjective and objective criteria determine the attainment of a designated use for listing purposes and clarify the true condition of Kansas waters. The Governor and the Legislature are very aware the State is often ranked at the bottom of state comparisons for water quality. The Commission notes Kansas has one of the best stream monitoring programs in the nation, as well as a comprehensive system for the assignment of designated uses. Differences in monitoring, use designations and criteria between states produce variable assessments of improvements. For example, Beaver Creek flows into Nebraska from Kansas. In Kansas, it is designated for every use including expected aquatic life and noncontact recreation. In Nebraska, it is designated for primary contact recreation (a seasonal designation applying from May to September with no recreation designation for the remainder of the year), warm water fisheries, agriculture and aesthetics. Beaver Creek is designated as impaired in

Kansas for fluoride, dissolved oxygen (DO) and total dissolved solids. In Nebraska, Beaver Creek is not designated as impaired for fluoride because it is not designated for drinking water -- the only designation tied to the fluoride criteria by Nebraska. Further, Nebraska has a seasonal criteria for dissolved oxygen while Kansas has one set number, 5.0 mg/L. If October readings for Beaver Creek are 4.0 mg/L in Kansas, the Creek is designated as impaired for DO. However, in Nebraska Beaver Creek is not designated as impaired because Nebraska's seasonal criteria for DO is 3.0 mg/L. Again, the public is led to believe the Creek is dirty in Kansas, but clean in Nebraska.

In testimony before the Commission, there was concern that because narrative criteria cannot be evaluated with monitoring, it should not be the sole indicator of impairment (Johnson County Wastewater).

13. Mixing Zones. *The Commission recommends the Kansas Department of Health and Environment modify its regulations to ensure that when scientific data is available, actual effects take precedence over models or mathematical calculations.* The Commission also recommends Health and Environment expand its variance procedure to include mixing zones and other items within the guidelines of the federal Clean Water Act. This will provide an opportunity for stakeholder participation processes to be designed and implemented. Mixing zones should relate to the toxic potential of the discharge, established dose/response relationships, actual plume character and time of exposure, rather than geometric sizes and models when this information is available. Health and Environment should also consider modifying implementation regulations so the best available science on the toxicological kinetics of pollutants is utilized.

As outlined in recommendation 6, the Commission recommends that Health and Environment invite communities to propose the development of site specific mixing zones if the leaders of the community or the Department believe the mixing zone may be either underprotective or overprotective for a given water segment. Further, Health and Environment should establish cost-effective procedures for the development of site specific studies and public participation in the mixing zone development which can be completed by communities in no more than one year. Communities which receive NPDES permits with site specific mixing

zones should be encouraged to undertake ongoing monitoring and evaluation of its effects on the aquatic community prior to the renewal of the permit. Within the limits of available resources, Health and Environment should assist communities in undertaking the necessary studies required to develop such criteria.

The implication for local units of government and industry is simple: the more stream available to dilute the effluent, the cheaper the treatment costs. It is in their economic best interest to provide Health and Environment with the necessary data to move away from the use of geometric means and models toward actual stream data. This should not substantially increase the cost to the State as the Commission is not recommending that the State gather the data for the permit holder. Health and Environment would, however, need to expend resources to develop procedures for the site specific studies and to properly evaluate information submitted by the permit holder.

Mixing zone implementation is another instance where points of view diverge. Municipalities consider the use of actual data as appropriate for establishing mixing zones, and if the data warrant, use of the full stream for mixing. As outlined in the discussion of recommendation 6 concerning ammonia, the Commission was presented with a plan for the establishment of site specific ammonia discharge criteria which will include a mixing zone for the City of Topeka's discharge to the Kansas River rather than the continued technical debate and media battle that has not resulted in environmental progress over the past four years (City of Topeka). The City of Topeka announced it is utilizing a collaborative process to shift the debate away from theoretical discussions and model assumptions, and instead look at the local stream so the debate might be put into terms that all parties including the public can understand. Others may support the use of data, but other positions, such as support of a prohibition on mixing zones in lakes, prohibition of mixing zones crossing tributary mouths, and support of restricting the mixing zone to 25 percent of the 7Q10 flow (Sierra Club, KS Natural Resources Council) seem to indicate that actual data would be irrelevant in these situations. However, these stakeholders have also suggested that they support the allowance of overlapping mixing zones so long as the Department finds the overlapping will not result in a violation of any of the general water quality criteria.

14. Implementation Procedures. *The Commission recommends the Kansas Department of Health and Environment fully incorporate implementation procedures into regulation.* This will assure adequate peer review, stakeholder participation and consistent application of water quality standards.

Health and Environment is given great latitude regarding implementation procedures by EPA. Formalizing these procedures could reduce the agency's flexibility while clarifying a complicated process.

In testimony before the Commission, this concept was supported because of concerns the procedures could be changed by Health and Environment staff without review (Sierra Club, KS Natural Resources Council). They felt there were too many important issues left to interpretation in the implementation procedures for this document not to receive public review when it is revised.

15. Funding. *The Commission recommends the Legislature and the Governor place a high priority on funding the necessary components for an effective and efficient water quality standards setting process.* The Commission suggests dedicated funding for water quality monitoring and use attainability analysis. The Commission also suggests Health and Environment ensure its policies are established in relation to available resources, both public and private. Finally, the relevant agencies should actively manage the wealth of information they currently have and capture it in a cost-effective manner.

Placing a higher priority on funding water quality infrastructure may require taking money from other sources. However, in the long-term, all resources -- both public and private -- are more wisely spent when information is available to target problems. This information will also assist stakeholders in evaluating conditions and coming to rational solutions which will improve the overall water quality of the State.

In order to adequately provide for public input into the water quality standard setting process, as envisioned by the Federal Clean Water Act, the Commission recognizes that additional information, resources and a concentrated effort at public education are required. The current system of limited public involvement and an unstandardized approach has polarized the current stakeholders in the debate. Involvement of stakeholders **early** in the process with

information to make informed decisions will encourage support necessary to ensure protection of the State's water resources.

Conclusion

The Commission believes the recommendations outlined above can guide any action the Legislature or Governor may decide to pursue. The recommendations recognize the efforts of the past and build on the success of the past 25 years. When taken as a package, the recommendations establish a process that allow improvements in water quality through public education and cooperation rather than the current adversarial system. The permanent Commission can serve as a public forum to assess science and policy questions, educate stakeholders and build consensus in an open fashion. A formal process involving all stakeholders will also enhance the state's ability to move forward with water quality improvements. Recent experience shows that in communities where Health and Environment and the cities have cooperated to inform stakeholders of the benefits of enhanced treatment for the water resource, stakeholders are then willing to make the necessary investments. Flexibility, as outlined in nearly every recommendation is another key component to a successful process. Gone are the days of rigid command and control. Balance and common sense are necessary to obtain public support.

CHRONOLOGICAL SUMMARY OF COMMISSION MEETINGS*

July 28, 1997

At the initial meeting, held in Topeka, the Commission heard testimony from: an attorney who spoke on Kansas Governmental Standards and Conduct; an attorney from Stinson, Mag & Fizzell; the Director of the Division of Environment (DDE) at Kansas Department of Health and Environment (KDHE); a Kansas State Representative; a representative from the American Crop Protection Association; and the director of the Environmental Protection Agency (EPA), Region VII. The conferees provided the Commission with information on the following: Kansas Ethics Statutes and Conflict of Interest Laws; Kansas Open Meetings Act; The Clean Water Act (CWA); Kansas Water Supply and Sewerage laws; Water Quality Criteria (WQC); the National Pollutant Discharge System Permitting Process (NPDES); Kansas Water Quality Standards (WQS); Surface Water Quality Register; administration of WQS; designated use (DU); mixing zone (MZ); outstanding natural resource water (ONRW); 7 day 10 year low flow (7QIO); antidegradation; use attainability analysis (UAA); municipal wastewater (WW) treatment plants; total maximum daily load (TMDL); history of HB 2368 which formed the Commission; atrazine; The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); The Federal Food, Drug and Cosmetic Act (FFDCA); WQS in Region VII; and The Governor's Water Quality Initiative.

August 20, 1997

At the 2nd meeting, held in Fort Scott, the Commission heard testimony from: the environmental services chief at the Kansas Department of Wildlife and Parks (KDWP), the DDE at KDHE; the director of Science & Support (DSS) at KDHE along with another KDHE representative; and a representative of GBMC and Associates, Bryant, Arkansas. The following information was provided-. KDWP biological testing on Kansas streams; KDWP's Current Guidelines for Designating Critical Habitat for Threatened and Endangered Species (T/E); T/E species at the Marmaton River; mandatory and non-mandatory EPA regulations regarding establishing DU's; reach file stream numbering; 1974, 1977, 1987 and 1994 WQS relating to DU; classification of Kansas waters; background on and process of UAA'S; and Contact Recreation UAA of the Marmaton River. Issues regarding the Marmaton's DU were discussed. The Commission was requested to consider recommending the development of third party rule making procedures in the UAA process. The Commission toured several areas at the Marmaton River.

August 27, 1997

At the 3rd meeting, held in Manhattan, the Commission heard testimony from: the DEE and DSS at KDHE; the director at the Bureau of Water (DBW); the chief of municipal program section (CMPS) at KDHE; the director of public works for the City of Topeka; the managing director of the Kansas Aggregate Producers' Association (KAPA); and an attorney with the Kansas Department of Agriculture (DOA). Information on the following was provided: ONRW of Kansas; 1994 Surface Water Quality Implementation Procedures; site specific criteria and variances; antidegradation; regulation of water and WW in Kansas; NPDES and WW treatment for Topeka; an overview of Topeka's WW treatment system; DU for the Kansas River; the impact of DU on aggregate producers; legal matters effecting analysis of water quality; stream chemistry monitoring in Kansas; and the calculation of TMDLS.

September 3, 1997

At the 4th meeting, held in Hutchinson, the Commission heard testimony from: an environmental geo-chemist with the Kansas Geological Survey (KGS); the DSS at KDHE; a representative from GBMC and Associates, Bryant Arkansas-, the director of the KGS; the DBW and CMPS at KDHE; and the chief engineer at Johnson County WW. Information on the following was provided: natural mineral intrusion (NMI) [which is endogenous to the Hutchinson area]; EPA requirements for Kansas to develop toxicity, temperature, and numeric criteria; areas of chloride concentration in Kansas and chloride criteria implementation; saline habitats and stream ecosystem; flow issues; MZ; WW treatment plants; permit effluent limitations and whole effluent toxicity at selected WW treatment plants; and the impact of flow and mixing zones on permits.

September 30, 1997

At the 5th meeting, held in Olathe, the Commission heard testimony from: an environmental quality specialist from Wichita; an aquatic/ecological toxicologist with Camp Dresser & McKee; EPA's Deputy Director (DDO) at the Office of Science & Technology (OST), Washington, D.C., representative from the Mid-Continent Ecology Division, Duluth, Minnesota, a senior scientist, Washington, D.C. and DD of the Water, Wetlands & Pesticides Division, Region VII; an environmental scientist at KDHE and a representative of Hall & Associates, Washington, D.C. Information was provided on the following: impact of ammonia on aquatic life in the Arkansas River at Wichita with chemical and biological monitoring performed at sites along the Arkansas River; Wichita's WW treatment system; ammonia toxicity and ammonia criteria; EPA's Aquatic Life Criteria related to Ammonia; evaluation of Kansas SWO Criteria for Total Ammonia; and an historical analysis of ammonia criteria.

October 14, 1997

At the 6th meeting, held in Topeka, the Commission heard testimony from: a professor from the University of Kansas (KU); a professor from the University of Guelph, Ontario, Canada; a doctor from Bowman Gray School of Medicine, Wakeforest, Illinois; a consultant from Sielken consulting, Bryan, Texas; the DDE at KDHE; an environmental scientist at KDHE; a consultant with Faucet consulting, Huxley, Iowa; an extension & research weed scientist, an agricultural engineer, and an employee with the Kansas State University (KSU) Extension; the director of the Clean Water Farms Project at Foster Farms, Rossville, Kansas; and the director of the Kansas Organic Producers Association. Information was provided on the following: the ecological effects of atrazine on aquatic ecosystems; human health and cancer science of atrazine; atrazine exposure risk assessment; Kansas Chronic Aquatic Life Criteria; weed science and the economic impact of atrazine; the history and development of the Foster Farms project, organic farming; and best management practices (BMPs). The Commission toured Foster Farms, Rossville, Kansas.

November 18, 1997

At the 7th meeting, held in Wichita, the Commission heard testimony from: a representative at the U.S. Fish and Wildlife Service, Washington, D.C., the DBW and an engineer at KDHE; a director from The Weinberg Group, Washington, D.C.; a graduate student from Strom Thurmond Institute of Government and Policy, Clemson University, Clemson, South Carolina; a dairy producer from Hutchinson, Kansas; and a representative from the City of Wichita. Information was provided on the following: the economic impact results of the 1996 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation; KDHE's Economic Analysis Behind Adoption of State Water Quality Regulations; the process and procedures used to identify costs of the proposed 1994 changes to ammonia WQS for municipal dischargers; Risk Assessment and Risk Management in Regulatory Decision-Making; economic and cost effective measures to achieve goals in the CWA; and the Cheney Lake Project.

November 25, 1997

At the 8th meeting, held in Great Bend, the Commission heard testimony from: a professor from KSU; a representative from EPA's Region VII; the DSS at KDHE; the DBW and a representative from the B of W at KDHE; a representative from Black & Veatch, Kansas City, Missouri; a professor from the University of Washington, Seattle, Washington; and an agronomist from KSU Extension Agronomy. Information was provided on the following: Fecal coliform (FC) Bacteria; water contamination indicators and the microbes used to set EPA standards; Kansas standards for FC and the science used to develop the standards; municipal perspectives in addressing FC; confined animal feeding industry permitting process; microbial source tracking; and BMPs used to reduce fecal contamination of surface waters.

October 14, December 2 and 12, 1997 Conference Calls

The Commission discussed the issues covered at Commission meetings. These issues are outlined on a matrix which will be used as guidance in the preliminary report to the governor and legislature due January 1, 1998. The calls initiated in the State Capitol. Listening posts were set-up at Kansas Department of Health and Environment District offices in Lawrence, Wichita and Hays.

December 18, 1997

At the 9th meeting, held in Topeka, the Commission continued to discuss and revise draft documents for the Commission Preliminary Report.

January 23, 1998 Conference Call

The Commission continued discussion of the guidance matrix. The call initiated in the State Capitol. Listening posts were set-up at Kansas Department of Health and Environment District offices in Lawrence, Wichita and Hays.

February 9, 1998

At the 10th meeting, held in Topeka, the Commission heard testimony from: the Executive Director, League of Kansas Municipalities; a policy/program analyst with Kansas Department of Administration; a representative of Kansas Department of Wildlife and Parks (KDWP); and three representatives of Kansas Department of Health and Environment. Information was provided on the following: 1996 House Resolution 6013; implementation of 1996 HR 6013; KDHE's process to promulgate the 1994 water quality standards; documentation of the occurrence of threatened or endangered species and stream monitoring by KDWP; KDWP permit program; and Special Aquatic Life Use designation criteria.

February 23, 1998

At the 11th meeting, held in Topeka, the Commission heard testimony from: Director, Environmental Field Services, Kansas Department of Health and Environment (KDHE); staff member, Bureau of Water, KDHE; Principal, Hall & Associates, Washington, D.C. Information was provided on the following: mixing zones, 305b report. The Commission toured the City of Topeka wastewater treatment plants.

March 11, 1998

At the 12th meeting, held in Hays, the Commission heard testimony from: the Director of the Water Bureau, Kansas Department of Health and Environment; two representatives of the Water Bureau; and an Assistant Attorney General for the State of Kansas. Information was provided on the following: current and past regulations for Effluent Created Flow; the application of recreational use designation; variance process; cooling waters; and the legal history of public access to waterways. The Commission discussed examination items outlined in HB 2368. The Commission toured the Hays Wastewater Treatment Plant and viewed a slide show pertaining to a stream stabilization project.

March 30, 1998

At the 13th meeting, held in Olathe, the Commission heard testimony from: a communications professor, Oregon State University, Chief of the Water Quality Division, Oklahoma Water Resources Board and the Administrator of the Colorado Water Quality Control Commission. Information was provided on the following: collaborative learning, organization and processes used to implement water quality standards in Oklahoma and Colorado. The Commission toured the Nelson Regional Facility and the Mill Creek Regional Facility, both wastewater treatment plants in Johnson County.

April 13, 1998 Conference Call

The Commission discussed those items that should be revisited from the preliminary report. The presentations by Oklahoma and Colorado from the March 30, 1998 meeting were discussed. Specific responses to legislative questions were discussed. The call initiated in the State Capitol. Listening posts were set-up at Kansas Department of Health and Environment District offices in Lawrence, Wichita and Hays.

April 27, 1998

At the 14th meeting, held in Pittsburg, the Commission heard testimony from: the Missouri Stream Team Coordinator, Missouri Department of Conservation; the Assistant Director of the Kansas Water Office (KWO); and the Water Resource Planner, KWO. Information was provided on the following: Missouri Stream Team overview, history and stakeholders role in water quality improvement; the structure and function of the KWO; the role of the Kansas Water Authority (KWA); the Kansas Water Plan (KWP); the role and responsibilities of the Basin Advisory Committee; and the Annual Implementation Planning Process and KWA Annual Recommendations in the KWP. The Commission toured the regional area to view surface water problems from mining and reclamation efforts.

May 15, 1998

At the 15th meeting, held in Topeka, the Commission heard testimony from: the Secretary of the KDHE; the public works director, City of Topeka; two representatives of Camp, Dresser & McKee Consultants; and the Coordinator of the Arkansas Stream Team, Arkansas Game and Fish Commission. Information provided included: an update on the EPA's response to KDHE's 1994 Water Quality Standards; an outline of a proposed process for a site specific ammonia study; details of the project approach to developing site specific discharge limits for the City of Topeka; and an overview of the Arkansas Stream Team.

June 8 and 16, 1998 Conference Calls

The Commission discussed the following items for the final report: new section entitled Response to Legislative Questions; response to section 3(b) of K.S.A. Sup. 65-1,177; permanent commission; chlorides; stakeholder participation; ammonia; mixing zones; suspended solids. The calls initiated in the State Capitol. Listening posts were set-up at Kansas Department of Health and Environment District offices in Lawrence, Wichita and Hays.

June 26, 1998

At the 16th and final meeting, held in Topeka, the Commission finished discussion and revised draft documents for the Commission Final Report due June 30, 1998.

** There was active discussion by Commission members on testimony given at each meeting. Public comments were welcomed and received at each meeting. All information pertaining to the Commission meetings is available from the Kansas Department of Health and Environment.*

SURFACE WATER QUALITY COMMISSION

James R. Triplett, Pittsburg - Chair

- Chair and Professor in the Department of Biology at Pittsburg State University. Chair of the Crawford County Solid Waste Planning Committee and Chair of the Statewide Council of River Basin Advisory Committee Chairs. A member of a number of scientific and professional organizations including the Water Quality Section of the American Fisheries Society and the Kansas Academy of Science.

Marynell Hollenbeck, Kansas City, Kansas - Vice-Chair

- Director of Environmental Services for the Kansas City, Kansas Board of Public Utilities. Originator of the environmental department at BPU and has overseen the carrying out of objectives for environmental compliance for the electric and water utility. A member of Sigma Xi, an international scientific research society, and author of dozens of research articles and presentations.

Dr. John Doull, Kansas City, Kansas

- Professor Emeritus of Pharmacology and Toxicology in the Department of Pharmacology, Toxicology and Therapeutics at the University of Kansas Medical Center. Chair of the Threshold Limit Value Committee of the American Conference of Governmental Industrial Hygienists. Chaired the Committee on Toxicology of the National Research Council of the National Academy of Sciences and has served on a number of other scientific advisory panels.

Jon Ferguson, Kensington

- Manager and owner of Ferguson Brothers, Inc., a commercial cow-calf herd and backgrounding operation, complemented by feed grain production. Serves on the National Cattleman's Beef Association Executive Committee. Member of the Science and Technology Committee, studying and working closely with Canada on the grading of beef and instrument grading process. Doctorate degree work in Nuclear Engineering at Massachusetts Institute of Technology.

Clifton E. Meloan, Manhattan

- Professor Emeritus of Analytical Chemistry at Kansas State University. Served for 28 years as a science advisor for the U.S. Food and Drug Administration, and on a variety of honorary and professional societies including the American Chemical Society and the American Academy of Forensic Sciences. Recipient of dozens of awards and honors, most recently the FDA Distinguished Service Award.

P. Martin Nohe, Leawood

- Investment banker with Kirkpatrick Pettis. During his career of over 20 years, his client base has included units of government such as school districts, cities and counties. He serves on the Board of Trustees of the National Recreation and Park Association, is a member of the Governor's Commission on Housing, the Johnson County Economic Research Institute and the Johnson County Airport Commission.

Arthur F. Pope, Wichita

- Corporate Director of Strategic Environmental Excellence with Koch Industries, Inc. Responsible for providing proactive, market-based internal technical expertise, permitting and acquisition and divestiture environmental risk discovery, pricing and hedging services to all Koch business groups worldwide. Participated on numerous industry and public advisory boards.



Introduction to Water Quality Standards



Section I: Introduction

Part A: Definition and Purpose of Water Quality Standards

Water quality standards are laws or regulations that States and Indian Tribes authorized to administer the program adopt to enhance water quality and to protect public health and welfare. Water quality standards provide the foundation for accomplishing two of the principal goals of the Federal Water Pollution Control Act Amendments of 1972 [commonly referred to as the Clean Water Act (CWA) of 1972]. That is to:

- restore and maintain the chemical, physical, and *biological integrity* of the Nation's waters; and
- where *attainable*, to achieve water quality that promotes protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water. This goal is commonly known by the expression "fishable/swimmable".

States report to the U.S. Environmental Agency (EPA) and Congress under a specific part of the CWA, known as Section 305(b), on whether these goals are being achieved. (Under Section 305(b), States report to EPA once every two years on the condition of their waters. EPA compiles the data and submits a report to Congress on the status and condition of the Nation's waters.)

A water quality standard consists of three elements: (1) the *designated beneficial use* or uses of a waterbody or segment of a waterbody; (2) the water quality criteria necessary to protect the use or uses of that particular waterbody; and (3) an antidegradation policy. (Each of these elements is discussed in this publication.) Examples of designated uses are recreation and protection of aquatic life. Water quality criteria describe the quality of water that will support a designated use. Water quality criteria may be expressed as either numeric limits or a narrative statement. An

antidegradation policy ensures that water quality improvements are conserved, maintained, and protected.

Water quality standards apply to *surface waters of the United States*, including *wetlands*. Surface waters include rivers, streams, lakes, oceans, estuaries, and wetlands; they do not include ground water.

Part B: Statutory Authority for the Water Quality Standards Program

The water quality standards program is authorized under Section 303(c) of the CWA (33 U.S.C. 1313(c)). The current regulations implementing this section of the CWA were published initially in the *Federal Register* (FR) on November 8, 1983 (48 FR 51400). The specific language of the regulations can be found in the *Code of Federal Regulations* (CFR) in Chapter 40, Part 131.

(The Federal Register is a periodical published by the U.S. Government. It includes all proposed and final regulations issued by EPA and other federal agencies. The number preceding the letters "FR" in the citation refers to the volume of the Federal Register, and the numbers after FR indicate the page number. The Code of Federal Regulations contains all EPA and other regulations that have received final approval. This document is abbreviated as CFR. The numbers in CFR citations refer to chapters and parts: each chapter customarily includes all the regulations in a given policy area such as water quality standards, while each part within a chapter is a specific subject within that policy area.)

The water quality standards program was strengthened in two significant ways with passage of the 1987 Water Quality Act amendments to the CWA. First, Section 303(c)(2)(B) of the CWA requires States to adopt numeric criteria for specific toxic pollutants that appear on a *priority pollutant* list [Section 307(a) of the CWA]. (Priority pollutants are compounds and families that are among the most persistent, prevalent, and toxic chemicals. A list of priority

pollutants appears as Appendix B.) These *toxic substances* are those for which EPA published Section 304(a) criteria recommendations. These toxics, if discharged to a waterbody or are present in sufficient concentrations in a waterbody, could compromise or interfere with the waterbody's designated use. On December 22, 1992, EPA imposed Federal chemical-specific, numeric criteria for priority toxic pollutants on 14 States that failed to adopt their own criteria, as required by Section 303(c)(2)(B) of the CWA. This action brought all States into compliance.

Second, Section 518 of the 1987 CWA gives EPA the authority to approve Indian Tribes to administer the water quality standards program on Reservation Lands. Section 518 also required EPA to develop a mechanism for resolving disputes when an Indian Tribe and a State adopt different water quality standards on a common body of water. On December 12, 1991, EPA issued Amendments to the Water Quality Standards Regulation that Pertain to Standards on *Indian Reservations* (40 CFR 131.6 and 131.7). The Amendments establish qualification criteria for Indian Tribe administration and describe a conflict resolution mechanism.

Part C: Establishing Water Quality Standards

The 50 States, the District of Columbia, U.S. Territories (Commonwealth of Puerto Rico, American Samoa, Palau, the Virgin Islands, Guam, and the Commonwealth of the Northern Mariana Islands), and Indian Tribes authorized to administer the program adopt water quality standards for each waterbody within the State, territory, or tribal boundary. (Throughout this document, the term *State* is used to mean any of the above jurisdictions.) EPA may also establish water quality standards where a State fails to do so. A single water quality standard need not be applied to the entire waterbody (for example, for the entire length of a stream); different water quality standards may be set on different segments of the same waterbody.

EPA reviews new or revised water quality standards that States adopt to determine whether the standards meet CWA requirements. EPA also reviews the standards of each State to ensure that they do not interfere with attainment of standards in waters shared with another State or waters located in another State downstream. If EPA disapproves a State's water quality standards, or determines that a new or revised water quality standard is necessary to meet the requirements of the Act, EPA may issue water quality standards to which the State is bound. EPA provides technical guidance, program grants, and assistance to the States to help them carry out the requirements of the program.

65-1,175. Surface water quality standards; definitions. As used in this act, unless the context otherwise requires:

(a) "Department" means the department of health and environment.

(b) "Secretary" means the secretary of health and environment.

(c) "1994 Surface water quality standards" means the Kansas surface water quality standards found at K.A.R. 28-16-28b *et seq.*, as in effect August 29, 1994.

History: L. 1997, ch. 148, § 1; May 1.

Revisor's Note:

For statement of legislative intent, see preamble to act, 1997 Session Laws, chapter 148.

65-1,176. Same; mixing zone to be used; standards for ammonia, chlorides and atrazine; permit conditions; assistance in meeting standards. On and after the effective date of this act and before July 1, 1999:

(a) The department shall use a mixing zone of 50% of the average cross-sectional area of the stream based on either a low flow provision of one cubic foot per second or the 7Q10 flow, whichever is the greater existing condition in the receiving stream, in determining NPDES permit limits for total ammonia and chlorides under subsections (b) and (d) for permits issued by the department.

(b) Unless an applicant for a new or renewal NPDES permit agrees to meet all 1994 surface water quality standards, notwithstanding the provisions of subsection (a), the department shall not require the applicant to comply with the numeric aquatic life criteria for total ammonia and chlorides that are contained in the 1994 surface water quality standards and shall instead require an applicant to comply with the applicant's existing permit requirements, including mixing zone provisions applicable to the permit, for numeric criteria for total ammonia and chlorides or with the criteria for total ammonia and chlorides that took effect May 1, 1987, whichever is more protective. Nothing herein shall be construed to require compliance with mixing zone provisions and numeric aquatic life criteria for total ammonia and chlorides that are more restrictive than the 1994 surface water quality standards.

(c) The department shall not use the numeric chronic aquatic life criteria for atrazine in Table 1a of subsection (d) of K.A.R. 1995 Supp. 28-16-28e and shall rely instead on the greater of either a standard of 3 parts per billion for atrazine or any revised numeric chronic aquatic life criteria for atrazine adopted by the department after consideration of any new criteria recommended by the United States environmental protection agency after the effective date of this act. Conformance with the atrazine standard shall be determined by application of the methodology used in the 1996 Kansas water quality assessment report (305(b) report) published by the department.

(d) Permits issued for expansion, upgrade or new construction of wastewater treatment facilities and modifications and renewals of existing permits shall include the following statement of

conditions, which shall be legally binding and enforceable upon the permittee:

"The permittee who does not agree to meet effluent limitations as necessary to attain the aquatic life criteria for ammonia and chlorides within the 1994 surface water quality standards incurs and acknowledges the legal duty and obligation to bring the facilities and operations authorized by this permit into compliance with the permit effluent limitations based on the 1994 surface water quality standards within 24 months after July 1, 1999, unless before July 1, 1999, revised numeric criteria for ammonia and chlorides are adopted pursuant to subsection (g) of K.S.A. 1997 Supp. 65-1,177, in which case the permittee incurs and acknowledges the legal duty and obligation to bring such facilities and operations into compliance with the permit effluent limitations based on the revised criteria within 24 months following the date of adoption of the rules and regulations containing the revised criteria."

(e) The department shall develop a plan and permit conditions that will assist entities that, on the effective date of this act, hold a permit or are applicants for a permit in meeting the requirements of this section relating to total ammonia and chlorides.

History: L. 1997, ch. 148, § 2; May 1.

65-1,177. Same; commission on surface water quality standards; duties; report; revision or reinstatement of 1994 standards. (a) There is hereby created the Kansas special commission on surface water quality standards. Within the limits of appropriations therefor, the commission shall undertake the following activities:

(1) Investigate and evaluate the technical and scientific basis of the 1994 surface water quality standards, including: (A) Stream designations use attainability analysis as required when compiling the 1996 *Kansas Water Quality Assessment* 305(b) report pursuant to 33 U.S.C. 1315(b)(1)(D) or 33 U.S.C. 1313(c)(2)(A); (B) low, high and yearly average flow impact criteria; and (C) scientific appropriateness of the criteria guidance of the United States Environmental Protection Agency and the department;

(2) evaluate whether the 1994 surface water quality standards, including the use designations, surface water chemical and microbial criteria and the "Kansas Surface Water Register," as published by the department on June 20, 1994, are based on sound scientific and technical data and information, whether such standards are more stringent than are required by federal law and those of other midwestern and plains states, whether generally accepted criteria exist for evaluating the appropriateness and cost-effectiveness of the standard and whether the department should be directed to make any changes in the standards;

(3) develop and recommend cost-benefit or risk assessment models for the evaluation of the impact of surface water quality standards on the various elements of the environment, health and economy of Kansas, including but not limited to human health, animal and plant species actually found or likely to be reintroduced in Kansas waters, industry, agriculture and wastewater treatment;

(4) assess the probability that designated uses contained in the surface water quality standards can be attained in a cost-effective and reasonable manner when requirements are met;

(5) evaluate whether the 1994 surface water quality standards were adopted in full compliance with the requirements of Kansas law in effect at the time of adoption of the standards and whether the estimates of economic impact completed at the time accurately predicted the fiscal impact of the standards on communities facing compliance with the standards in 1997 and 1998;

(6) advise the governor, legislature and secretary of any revisions to the 1994 surface water quality standards that are justified based on additional scientific and technical information and data;

(7) advise the governor, legislature and secretary whether the department's process of revising the 1994 surface water quality standards is in full compliance with federal and state law;

(8) advise the governor, legislature and secretary regarding the extent of the department's compliance with the provisions of 1996 House Resolution No. 6013, concerning consultation with community officials on the impacts of the 1994 surface water quality standards on the communities of the state; and

(9) recommend the adoption of any procedures that the commission deems advisable to ensure the collection and evaluation of scientific and technical information necessary for the revision of the 1994 surface water quality standards in future years.

(b) In completing its study, the commission shall evaluate and advise the governor, legislature and secretary whether:

(1) There is reliable scientific documentation of the actual existence of the species that are designed to be protected by the special aquatic use designation contained in the 1994 surface water quality standards; and

(2) the special aquatic use designation and reduced mixing zone requirements contained in the 1994 surface water quality standards are based on any recognized scientific data and models and whether there is an established and clear relationship between the presence of the regulated pollutants and the protection or restoration of the targeted aquatic species.

(c) The commission shall consist of seven members appointed by the governor. All members shall serve at the pleasure of the governor. The term of office of such members shall commence at the time of appointment until July 1, 1998, or unless the commission or the appointment is terminated by action of the governor on an earlier date. The chairperson of the commis-

sion shall be appointed by the governor from among the members of the commission. The staff of the department of health and environment, the department of agriculture, the Kansas biological survey and the department of wildlife and parks shall cooperate with and assist the deliberations of the commission.

(d) Members of the commission shall have experience in one or more of the following areas and disciplines: Environmental sciences; civil engineering; business and industry; public finance; municipal wastewater treatment; agriculture or agribusiness; environmental law; public health sciences; aquatic biology; risk assessment; and cost benefit analysis. At least one member shall represent the general public. Except for faculty members of universities under the supervision of the Kansas board of regents, no state officer or employee shall serve on the commission.

(e) Before assuming office as a member of the commission, each person appointed as a member shall complete and file with the office of the secretary of state:

(1) A statement containing the information required in a statement of substantial interests pursuant to K.S.A. 46-247 and amendments thereto; and

(2) a list of citations of any publications written by the person.

(f) Within the limits of appropriations provided therefor, the commission may retain such consultants and temporary staff as the commission deems necessary to complete the commission's investigations and final report. The secretary of administration shall provide appropriate space for the meetings of the commission. Each member of the commission shall receive compensation, subsistence, mileage and expenses as provided by K.S.A. 75-3223 and amendments thereto.

(g) On or before January 1, 1998, the commission shall submit a preliminary report to the governor and the legislature. The commission shall submit a final report to the governor and the legislature on or before June 30, 1998. The department shall hold public hearings and accept public comment on the commission's final report. After completion of the hearings and receipt of the comments, the department shall develop and publish proposed rules and regulations on or before December 31, 1998, and shall adopt rules and regulations in accordance with the rules and regulations filing act. On and after July 1, 1999, all stream designations and criteria contained in the 1994 surface water quality standards shall be in full force and effect unless otherwise revised by rules and regulations adopted by the secretary.

History: L. 1997, ch. 148, § 3; May 1.

KANSAS WATER QUALITY COMMISSION DOCKET

Document Number	Document Title	Author	Other Information
1	Portions of the Federal Clean Water Act Section 101; Section 303; Section 304		
2	Federal Regulations 40 C.F.R. Part 130 & Part 131		
3	Kansas State Statute. 65-165; 65-171a-d		
4	Kansas Administrative Regulations; 28-16-28b-f		1994
5	Water Quality Standards Handbook: Second Ed. August 1994, Contains Update #1	EPA	EPA-823-B-94-005a
6	Water Pollution Control under the National Pollutant Discharge Elimination System	Parthenia B. Evans, ed.	The Clean Water Act Handbook, 1994
7	1996 Kansas Water Quality Assessment 305(b) Report, December 1996	KDHE	
8	1996 Kansas Water-Quality Limited Segments 303(d) List, November 1996	KDHE	
9	Kansas Surface Water Register Maps June 20, 1994	KDHE	
10	Kansas Surface Water Register June 20, 1994	KDHE	
11	Memorandum of Understanding between EPA, Region 7 & KDHE regarding Implementation of Sections 303(d) & 303 (e) of the Clean Water Act		TMDL MOU Feb. 13, 1997
12	Summary of TMDL Settlements; June 9, 1997	EPA	
13	Overview of TMDL Cases; June 6, 1997	EPA	
14	Guidance for Water Quality-based Decisions: The TMDL Process; April 1991	EPA	440/4-91-001
15	Historical Overview of Kansas Surface Water Quality Standards; January 16, 1997	KDHE	
16	KDHE Memorandum Regarding 1994 Standards May 5, 1994	Charles Jones Director of Environment	
17	1987 Kansas Regulations; 28-16-28b-e		
18	H.B. 2368 as enrolled		
19	EPA Statement on H.B. 2368	Gale Hutton, Director Water, Wetlands & Pesticides; EPA	May 6, 1997

KANSAS WATER QUALITY COMMISSION DOCKET

Document Number	Document Title	Author	Other Information
20	KDHE/EPA MOU on Implementing H.B. 2368		April 1997
21	Summary Kansas Water Plan	Kansas Water Office	January 1997
22	Overheads from John Houlihan Presentation at July 28 1997 Meeting	John Houlihan, EPA	
23	Overheads from Parthenia Evans at July 28, 1997 Meeting	Parthenia Evans Stinson, Mag & Fizzell	
24	Overheads from Ron Hammerschmidt presentation at July 28, 1997 meeting	Ron Hammerschmidt KDHE	
25	Overheads from Dr. George Rolofson presentation at July 28, 1997 meeting	George Rolofson American Crop Protection Assn.	
26	Water Quality and Your Lawn	Professional Lawn Care Assn. of Mid-America	Provided by Don Tannahill
27	Fate of Turfgrass Pesticides	Professional Lawn Care Assn. of Mid-America	Provided by Don Tannahill
28	Introduction to Water Quality Standards	EPA September 1994	EPA-823-B-95-004
29	Reviewing the Dept. of Health and Environment's system for assessing the impact of rules and regulations mandated by the federal government	Legislative Post Audit June 1995	K-Goal Audit
30	Letter to KDHE from EPA regarding Kansas' 1994 Water Quality Regulations proposal	Ronald Ritter May 24, 1994	Came from Region 7
31	Economic Analyses Behind Adoption of State Water Quality Regulations	Karl Mueldener KDHE	August 1, 1997
32	Letter to Triplett from Kansas Contractors Assn. July 31, 1997	Bob Totten	
33	Letter to Triplett from John Metzler, Johnson Co. Wastewater; August 4, 1997	John Metzler	
34	Revised Kansas Water Quality Standards: A realistic approach protects the environment and yields cost savings	John Metzler Howard Andrews Terry McKanna Edie Snethen	1993
35	Contact Recreation Use Attainability Analysis: Marmaton River near Fort Scott, Kansas	Shon Simpson, FTN Associates, Little Rock	December 16, 1996
36	EPA Draft Ammonia Criteria Document June 5, 1997	EPA Special Review Panel	

KANSAS WATER QUALITY COMMISSION DOCKET

Document Number	Document Title	Author	Other Information
37	Risk Assessment & Risk Management in Regulatory Decision-Making - 1997	Presidential/Cong. Commission	Order from GPO 202-512-1800; Doc. 0550000568-1
38	Statement of the Kansas Grain & Feed Association and the KS Fertilizer and Chemical Association	Doug Wareham	July 28, 1997
39	The Value of Turf to Water Quality & The Environment	PLCAA Education & Research Foundation	Video
40	Letter from Public Works Supervisor City of Phillipsburg	Scott Robertson	August 7, 1997
41	Water Pollution Policy Allows States Up to 13 Years to Implement TMDLs for Polluted Waters	Daily Environment Report	August 13, 1997
42	Water Pollution Water Temperature Standard For Bull Trout in Idaho; State Disagrees	Daily Environment Report	August 1, 1997
43	Overheads from Chris Mammoliti, KDWP presentation at August 20, 1997 meeting	Chris Mammoliti Environmental Services Chief	
44	Overheads from Ron Hammerschmidt, KDHE presentation at August 20, 1997 meeting	Ron Hammerschmidt Director, Division of Environment	
45	Overheads from Theresa Hodges, KDHE presentation at August 20, 1997 meeting	Theresa Hodges Director, Science & Support	
46	Overheads from Steve Cringan, KDHE presentation at August 20, 1997 meeting	Steve Cringan Science & Support	
47	Overheads from Shon Simpson, GBMc & Associates presentation at August 20, 1997 meeting	Shon Simpson GBMc & Associates	
48	Overheads from John Metzler presentation during public comment period, August 20, 1997 meeting	John Metzler Johnson Co. Wastewater	
49	Comments from Dr. Frank Cross regarding special aquatic use designation of the Marmaton	Dr. Frank Cross, Retired	August 20, 1997
50	Letter from Secretary Gary Mitchell to Bruce Malfatt regarding use attainability analysis on unnamed tributary of North Wea Creek	Secretary Gary Mitchell KDHE	August 19, 1997
51	Photographs from Marmaton River Tour during Ft. Scott Meeting on August 20, 1997		
52	Minutes of the July 28, 1997 Meeting held in Topeka	Approved on Aug. 27, 1997	
53	Letter to Jim Triplett clarifying statements made during public comment at Aug. 20, 1997 meeting	Cynthia Abbott KS Audubon Council	August 22, 1997

KANSAS WATER QUALITY COMMISSION DOCKET

Document Number	Document Title	Author	Other Information
54	Overheads from Theresa Hodges, KDHE presentation at August 27, 1997 meeting	Theresa Hodges Director, Science & Support	
55	Overheads from Karl Mueldener, KDHE presentation at August 27, 1997 meeting	Karl Mueldener Director, Bureau of Water	
56	Overheads from Rod Geisler, KDHE presentation at August 27, 1997 meeting	Rod Geisler Municipal Programs Section Chief	
57	Presentation by Edie Snethen, City of Topeka, Aug. 27, 1997 meeting	Edie Snethen Director of Public Works	
58	Overheads from Edward Moses, KS Aggregate Producers Assn. presentation at Aug. 27, 1997 mtg	Edward Moses Director	
59	Overheads from Derenda Mitchell, KS Dept. of Ag presentation at August 27, 1997 meeting	Derenda Mitchell Legal Counsel	
60	Overheads from Ron Hammerschmidt, KDHE presentation at August 27, 1997 meeting	Ron Hammerschmidt Director of Environment	
61	Memo written by Dr. Bob Angelo, KDHE titled Marmaton River Special Aquatic Life Use Designation provided during public comment by Terry Shistar, Kansas Sierra Club, Aug. 27, 1997	Terry Shistar Pesticides & Toxics Chair	Memo dated March 5, 1997
62	Written Statement of the Kansas Farm Bureau presented during public comment, Aug. 27, 1997	Bill Fuller Associate Director, Public Affairs	
63	Written Statement of the KS Natural Resources Council & the KS Sierra Club presented during public comment, Aug. 27, 1997	Charles Benjamin Legislative Coordinator	
64	Written Statement of the KS Fertilizer & Chemical Assn. & the KS Grain & Feed Assn. presented during public comment, Aug. 27, 1997	Doug Wareham Vice President	
65	Letter from Terry Shistar with Overheads used during public comment at Aug. 27, 1997 meeting	Terry Shistar KS Sierra Club	
66	Portion of Report prepared for the League of KS Municipalities by Hall & Associates regarding mixing zones	Hall & Associates June 5, 1997	
67	Water Quality Advisory: Atrazine	U.S. EPA Criteria & Standards Div.	March 1986
68	Ambient Water Quality Criteria for Chloride - 1988	U.S. EPA Office of Water	EPA 440/5-88-001 February 1988

KANSAS WATER QUALITY COMMISSION DOCKET

Document Number	Document Title	Author	Other Information
69	Natural Mineral Intrusion in Kansas: Focus on Sources & Distribution of Chloride in Surface Waters	Donald Whittemore KS Geological Survey	Sept. 1, 1997
70	Presentation by Theresa Hodges on Chloride Criteria at Sept. 3, 1997 Meeting	Theresa Hodges Director, Science & Support	
71	Overheads from Vince Blubaugh, GBMc and Associates presentation at Sept. 3, 1997 meeting	Vince Blubaugh GBMc & Associates	
72	Written Statement of the City of Hutchinson presented during public comment, Sept. 3, 1997	Reg Jones Director of Utilities	
73	Written Statement of the Municipal/Industrial NPDES Chloride Steering Team presented during public comment, Sept. 3, 1997	Variety of Members of the Steering Team presented material	
74	Overheads from Tom Stiles, KS Water Office presentation at Sept. 3, 1997 meeting	Tom Stiles Assistant Director	
75	Overheads from Karl Mueldener, KDHE presentation at Sept. 3, 1997 meeting	Karl Mueldener Director, Bureau of Water	
76	Information regarding Chloride criteria impacts on NPDES permits provided by KDHE	Rod Geisler Municipal Programs Section Chief	
77	Overheads from John Metzler, Johnson County Wastewater presentation at Sept. 3, 1997 meeting	John Metzler Chief Engineer	
78	Written Statement of Glenn Gill presented during public comment, Sept. 3, 1997	Glenn Gill, Environmental Compliance Superintendent City of Kansas City	
79	Written Statement of the KS Natural Resources Council & the KS Sierra Club presented during public comment, Sept. 3, 1997	Charles Benjamin Legislative Coordinator	
80	Memo written by Dr. Bob Angelo, KDHE titled North American Salt Company NPDES Permit provided during public comment	Charles Benjamin Legislative Coordinator KNRC & KS Sierra Club	Memo dated Nov. 7, 1996
81	Written Statement of Ronald Ritter presented during public comment, Sept. 3, 1997	Ronald Ritter Consulting Engineer	
82	Overheads from Don Huggins, KBS presentation on Saline Habitat at Sept. 3, 1997 meeting	Don Huggins KS Biological Survey	
83	Overheads from Don Huggins, KBS presentation on mixing zones at Sept. 3, 1997 meeting	Don Huggins KS Biological Survey	
84	Workplan: Alternative Ammonia Implementation Prepared for the City of Fort Scott	FTN Associates Little Rock, AR	December 17, 1996

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Document Number	Document Title	Author	Other Information
85	Quality Criteria for Water 1986: Ammonia Section and Appendix on methodology procedures	U.S. EPA	EPA 440/5-86-001
86	Evaluation of the Kansas Surface Water Quality Standards: Final Report	Hall & Associates	June 5, 1997
87	Ambient Water Quality Criteria for Ammonia - 1984	U.S. EPA	EPA 440/5-85-001
88	Historical Overview & Comparison of Kansas and National Ambient Water Quality Criteria for Ammonia	Dr. Robert Angelo KDHE	
89	Minutes of the August 20, 1997 Meeting held in Ft. Scott, Kansas	Approved on Sept. 3, 1997	
90	Response to Comments Concerning Proposed K.A.R.'s 28-16-28 b through f	KDHE Division of Environment	June 23, 1994
91	Comparisons of single-species, microcosm & experimental pond responses to atrazine, Larsen, deNoyelles et al	Environmental Toxicology and Chemistry Vol 5, p179-190	1986
92	Structural Equation Modeling & Ecosystems Analysis Johnson, Huggins & deNoyelles	Aquatic Mesocosm Studies in Ecological Assessment, Ch 32	1994
93	Aquatic mesocosms in ecological effects testing Detecting direct & indirect effects of pesticides, deNoyelles, Dewey, Huggins & Kettle	Aquatic Mesocosm Studies in Ecological Assessment, Ch 30	1994
94	Ecological Consequences of the control & Elimination of Macrophytes in small ponds by atrazine & grass carp, Huggins & Johnson	Regional Lake Mgt conference	June 1991
95	Effects of atrazine on community level responses in taub microcosms, Stay, Larsen et al	Contaminants in Aquatic Ecosystems	1985
96	Diet & Reproductive Success of Bluegill Recovered from Experimental Ponds treated w/ Atrazine, Kettle deNoyelles et al	Bulletin of Environmental Contamination & Toxicology	1987
97	The responses of plankton communities in experimental ponds to atrazine, the most heavily used pesticide in the US, deNoyelles, Kettle & Sinn	Ecological Society of America	1982
98	Grass Carp as a potential Control Agent for Cattails Carney & deNoyelles	Transactions of the KS Academy of Science	1986
99	Use of experimental Ponds to assess the effects of a pesticide on an aquatic Environment, deNoyelles, Kettle et al	Using Mesocosms to assess the Aquatic Ecological risk of Pesticides	1989

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Document Number	Document Title	Author	Other Information
100	Experimental Ponds for evaluating bioassay predictions, deNoyelles & Kettle	Special Technical testing Publication 865	1985
101	Beyond the probabilistic approach: Risk assessment of atrazine in North American Surface Waters,	Ecorisk, Inc. Ferndale, Washington	1996
102	Characterization of Selenastrum Capricornutum response to episodic Atrazine Exposure	Institute of Wildlife & Environmental Toxicology Clemson University	1996
103	Simazine Aquatic Exposure & Risk Assessment	Gregory T. Peters	1995
104	Ecological Risk Assessment of Atrazine in North American Surface Waters: Additional Considerations of Exposure & Ecological Effects	Ecorisk, Inc. Ferndale, Washington	1995
105	Ecological Risk Assessment of Atrazine in North American Surface Waters, Solomon, Baker, et al	Environmental Toxicology and Chemistry	1996
106	On the use of Ecosystem stability measurements in ecological effects testing, Dewey & deNoyelles	Aquatic Mesocosm Studies in Ecological Risk Assessment, Ch 31	1994
107	Turning back the clock on ecological effects testing, deNoyelles & Howick	SETAC News	1993
108	The Ecotoxic effects of atrazine on aquatic ecosystem An assessment of direct & indirect effects using structural equation modeling, Huggins, deNoyelles & Johnson	Aquatic Mesocosm Studies in Ecological Risk Assessment, Ch 33	1994
109	Ecosystem modeling w/ Lisrel: A new approach for measuring direct & indirect effects, Johnson, Huggins deNoyelles	Ecological Society of America	1991
110	Effects of the herbicide atrazine on aquatic insect community structure & emergence, Sharon Dewey	Ecological Society of America	1984
111	Overheads from Vaughn Weaver, City of Wichita presentation at Sept. 30, 1997 meeting	City of Wichita	
112	Ambient Aquatic Life Water Quality Criteria of Atrazine -- Draft	U.S. EPA, Office of Water Office of Science & Tech.	April 1997
113	Stream Biological Monitoring Program Quality Assurance Management Plan, Part 3	KDHE Office of Science & Support	July 1, 1995
114	Summary of water quality criteria in other states within Region 7	Larry Shepard Region 7 EPA	March 5, 1997

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Document Number	Document Title	Author	Other Information
115	Presentation by Jerry deNoyelles on the Ecological Effects of atrazine on aquatic ecosystems at October 14 Meeting	Dr. Jerry deNoyelles Associate Director KS Biological Survey	
116	Overheads from Darrel Sumner Presentation at the October 14, 1997 Meeting	Dr. Darrell Sumner Bowman Gray School of Medicine, Wake Forest	
117	Presentation by Robert Sielken on the Assessment of Atrazine Exposure and Risk at October 14 Meeting	Robert Sielken, Sielken Consulting, Bryan, TX	
118	Presentation by KDHE on KS Surface Water Quality Criteria for Atrazine at the October 14, 1997 Meeting	Edward Carney, Bureau of Environmental Field Services	
119	Presentation by Dick Fawcet on the economic impacts of atrazine at the October 14, 1997 Meeting	Dr. Dick Fawcet, Fawcet Consulting, Huxley, Iowa	
120	Written Statement of the Kansas Chapter of the Sierra Club during public comment, Oct. 14, 1997	Terry Shistar Pesticides & Toxics Chair	
121	Presentation by Mary Fund, Clean Water Farms Project and Ed Reznicek, KS Organic Producers Assn. at the October 14, 1997 Meeting	Mary Fund, KS Rural Center Ed Reznicek, KS Organic Producers Assn.	
122	Written Summary of Remarks made at the Foster Site during the October 14, 1997 Meeting	David L. Regehr Extension & Research Weed Scientist, KSU	
123	Presentation by Charles Delos, U.S. EPA September 30, 1997 Meeting	Charles Delos, U.S. EPA Headquarters	
124	Addendum to Ambient Water Quality Criteria for Ammonia - 1984	U.S. EPA Criteria Review Committee	
125	Evaluation of KS Surface Water Quality Criteria for Total Ammonia presented at Sept. 30, 1997 Meeting	Robert Angelo KDHE	
126	Analysis of Ammonia Criteria presented at Sept. 30, 1997 Meeting	John C. Hall, Hall & Associates Washington, D.C.	
127	Impact of League of Municipalities Recommendations for Chronic Ammonia Criteria presented during public comment period, Sept. 30, 1997 meeting	John Metzler Chief Engineer Johnson Co. Wastewater	
128	Comments by the KS Chapter of the Sierra Club during public comment period, Sept. 30, 1997 Mtg.	Craig Volland, President Spectrum Technologists	
129	Ammonia Toxicity and Site-specific Water Quality Standards presented at Sept. 30, 1997 Meeting	Tony C. Gendusa, ph..D. Camp Dresser & McKee	
130	Maps relating to chloride impairments and concentrations presented by during Sept. 3, 1997 meeting	Theresa Hodges KDHE	

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Document Number	Document Title	Author	Other Information
131	Reducing Atrazine Runoff from Crop Fields presented during October 14, 1997 meeting	Cooperative Extension KS State University	April 1996
132	Letters supporting the League of Kansas Municipalities' Recommendations concerning Ammonia		
133	KDHE Response to the City of Phillipsburg see docket number 40	Rodney Geisler KDHE	Sept. 26, 1997
134	Pesticides in Surface Waters: Current Understanding of Distribution and Major Influences	U.S. Geological Survey Fact Sheet FS-039-97	1997
135	The Development of Water Quality Criteria for Ammonia and Total Residual Chlorine for the Protection of Aquatic Life in Two Johnson County Kansas Streams	KS Water Resources Research Institute	Dec. 1979
136	Minutes of the August 27, 1997 Meeting held in Manhattan	Approved November 14, 1997	
137	Minutes of the September 3, 1997 Meeting held in Hutchinson	Approved November 14, 1997	
138	Minutes of the September 30, 1997 Meeting held in Olathe	Approved November 14, 1997	
139	Herbicide Transport in a Managed Riparian Forest Buffer System, R. Lawrence, G. Vellidis, et. al.	American Society of Agricultural Engineers	Vol: 40, 4; 1047-1057
140	Presentation by Sylvia Cabrera, U.S. Fish & Wildlife November 18, 1997 Meeting	Sylvia Cabrera, U.S. Fish & Wildlife, Washington, D.C.	
141	Presentation by KDHE November 18, 1997 Meeting	Karl Mueldener & Joe Mester KDHE	
142	Presentation by Dr. Gail Charnley November 18, 1997 Meeting	Dr. Gail Charnley The Weinberg Group, Washington, D.C.	
143	Presentation by Sean Blacklocke November 18, 1997 Meeting	Sean Blacklocke Strom Thurmond Institute of Gov't & Policy Clemson University, South Carolina	
144	Comments by DeEtte Huffman, Arkansas River Coalition during public comment period, Nov. 18, 1997 Mtg.		
145	Comments by KS League of Municipalities during public comment period, Nov. 18, 1997 Mtg.	Chris McKenzie Executive Director	
146	The Effects of Single and Joint Toxicity of Atrazine and Alachlor on Three Non-Target Aquatic Organisms	Robyn A. Blackburn ph. D. Thesis, Univ. of KS	December 1987
147	Overview of the Results of Mesocosm Studies on Atrazine Conducted at the University of Kansas	Dr. Keith Solomon University of Guelph, Ontario	November 14, 1997

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Document Number	Document Title	Author	Other Information
148	Comments by the KS Corn Growers Assn & KS Grain Sorghum Producers Assn during public comment period, October 14, 1997 meeting	Jere White Executive Director	
149	Little Soos Microbial Source Tracking: A Survey	Dr. Mansour Samadpour University of Washington	August 1995
150	DNA locates polluters: DNA tracks parentage -- why not fecal coliform	Runoff Report	May/June 1997
151	Multiplication and Growth of Selected Enteric Bacteria in Clear Mountain Stream Water by Charles W. Hendricks and S.M. Morrison	Water Research, Vol. 1, pp. 567-576	June 1967
152	Effect of Summer Use of a Mountain Watershed on Bacterial Water Quality by Quentin D. Skinner, John C. Adams, Paul A. Rechard & Alan A. Bettle	J. Environ. Quality Vol. 3, no. 4	1974
153	Chemical and bacteriological quality of pasture runoff by J.W. Doran, J.S. Schepers & N.P. Swanson	Journal of Soil & Water Conservation	May-June 1981
154	The Effect of Cattle Grazing on Indicator Bacteria in Runoff From a Pacific Northwest Watershed by M.D. Jawson, L.F. Elliott, K.E. Saxton & D.H. Fortier	J. Environ. Quality Vol. 11, no. 4	1982
155	Water Quality in a Stream Receiving Dairy Feedlot Effluent by B.F. Hollon, J.R. Owen & J.I. Sewell	J. Environ. Quality Vol. 11, no. 1	1982
156	Cattle grazing impact on surface water quality in a Colorado Front Range stream by Howard L. Gary, Steven R. Johnson & Stanley L. Ponce	Journal of Soil & Water Conservation	March-April 1983
157	Coliform as an Indicator of water quality in wildland streams by Carolyn C. Bohn & John Buckhouse	Journal of Soil & Water Conservation	January/February 1985
158	Bacterial Water Quality Responses to Four Grazing Strategies-Comparisons with Oregon Standards by A.R. Tiedemann, D.A. Higgins, et. al.	J. Environ Quality Vol. 17, no. 3	1988
159	Fecal Coliform Release From Cattle Fecal Deposits by Michael Kress & Gerald Gifford	Water Resource Bulletin Vol. 20, no. 1	February 1984
160	Fecal Coliform Release Patterns from Fecal Material of Cattle by Richard Thelin & Gerald Gifford	J. Environ. Quality Vol. 12, no. 1	1983
161	Bacterial Pollution in Runoff from Agricultural Lands by Wanada Baxter-Potter & Martha Gilliland	J. Environ. Quality Vol. 17, no. 1	1988
162	Bacterial Pollution of Waters in Pristine & Agricultural Lands by R.M. Niemi & J.S. Niemi	J. Environ. Quality Vol. 20, pp. 620-627	1991
163	Indicator Bacterial Survival in Stream Sediments by Brett Sherer, J. Ronald Miner, et. al.	J. Environ. Quality Vol. 21, pp. 591-595	1992

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Document Number	Document Title	Author	Other Information
164	Fecal Bacteria in Agricultural Waters of the Bluegrass Region of Kentucky by J.M. Howell, M.S. Coyne et. al.	J. Environ. Quality Vol. 24, pp. 411-419	1995
165	Indicator Bacteria Concentrations of Two Northwest Arkansas Streams in Relation to Flow & Season by D.R. Edwards, M.S. Coyne, et. al.	Transactions of the ASAE Vol. 40, no. 1 pp. 103-109	1997
166	Shellfish Habitat Restoration thru Remediation of Nonpoint Fecal Coliform Sources by George Simmons and Sue Herbein	Virginia Polytechnic Institute & State University	February 1997
167	Managing Nonpoint Fecal Coliform Sources to Tidal Inlets by George Simmons, Sue Herbein & Carey Jam	Water Resources No. 100, pp. 64-74	Summer 1995
168	Fecal Coliform and Streptococcus Concentrations in Runoff from Grazed Pastures in Northwest Arkansas D.R. Edwards, M.S. Coyne, et. al.	Journal of the American Water Resources Assn. Vol. 33, no. 2	April 1997
169	Vegetated Filter Strip Length Effects of Quality of Runoff from Grazed Pastures by T.T. Lim, D.R. Edwards, S.R. Workman, B.T. Larson	American Water Resource Assn., Meeting Paper No. 972060	August 1997
170	A Simple Membrane Filter Method to Concentrate and Enumerate Male-Specific RNA Coliphages by Mark Sobsey, Kellogg Schwab, Thomas Handzel	Journal of the American Water Resources Assn. Vol. 82, No. 9	September 1990
171	Bacteria in Agricultural Drainage as Affected by Manure Management by M.J. Cook, J.L. Baker, et. al.	American Water Resource Assn., Meeting Paper No. 972148	August 1997
172	Genotyping Male-Specific RNA Coliphages by Hybridization with Oligonucleotide Probes by Fu-Chih Hsu, Y.S. Carol Shieh, et. al.	Applied & Environ. Microbiology Vol. 61, no. 11	November 1995
173	Recent Developments in Bacteriophages as Virus Indicators of Drinking Water Quality by Mark Sobsey, David Battigelli, et. al.	1994 Water Quality Technology Conference Proceedings Am. Water Works Assn.	November 1994
174	Detection and Occurrence of Coliphage Indicator Viruses in Water by Mark Sobsey, Adam Amanti, et.al	1995 Water Quality Technology Conference Proceedings Am. Water Works Assn.	November 1995
175	Detection and Characterization of Male-specific RNA Coliphages in a New York City Reservoir to Distinguish Between Human and Non-Human Sources of Contamination by Kerri Alderisio, Douglas Wait, et. al.	New York City Water Supply Studies Am. Water Works Assn.	July 1996
176	Distinguishing Human from Animal Fecal Contamination in Water by Typing Male-specific RNA Coliphages by Fu-Chih Hsu, Hyenmi Chung, et. al.	1996 Water Quality Technology Conference Proceedings Am. Water Works Assn.	November 1996

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177	Presentation by Dr. George Marchin November 25, 1997 Meeting	Dr. George Marchin KSU - Biology Dept.	
178	Presentation by Dr. Jake Joyce November 25, 1997 Meeting	Dr. Jake Joyce Region 7, EPA	
179	Presentation by Rance Walker November 25, 1997 Meeting	Rance Walker KDHE	
180	Presentation by Karl Mueldener November 25, 1997 Meeting	Karl Mueldener, Director Bureau of Water, KDHE	
181	Presentation by Andy Andrews November 25, 1997 Meeting	Andy Andrews Black & Veatch	
182	Presentation by Dr. Charles Rice November 25, 1997 Meeting	Dr. Charles Rice KSU - Dept. of Agronomy	
183	Comments by Charles A. Stryker, KS Contractors Assn. during public comment period, Nov. 25, 1997 Mt	Charles A. Stryker CAS Construction	
184	Comments by WestPlains Energy, a Division of UtiliCorp United during public comment period Nov. 25, 1997 Meeting	WestPlains Energy UtiliCorp United	
185	Comments by John Metzler during public comment period, Nov. 25, 1997 Meeting	John Metzler, Chief Engineer Johnson County Wastewater	
186	Comments by Charles Benjamin, KS Natural Resourc Council & Sierra Club during public comment period Nov. 25, 1997 Meeting	Charles Benjamin Legislative Coordinator	
187	Comments submitted by League of Kansas Municipalities during public comment period Nov. 25, 1997 Meeting	Chris McKenzie Executive Director	
188	Comments by LewJene Schneider, KS Livestock Assn during public comment period, Nov. 25, 1997 Meeting	LewJene Schneider Director of Research & Legal Affairs	
189	Letters supporting the probabilistic risk assessment technique to establish an aquatic standard for atrazine presented by Dr. Keith Solomon		
190	Comments from the KS Grain Sorghum Producers As and the KS Corn Growers Assn. regarding atrazine	Jere White Executive Director	December 4, 1997
191	Comments from Secretary Steve Williams KS Dept. of Wildlife and Parks		December 10, 1997
192	Comments from Jim Wolf, North American Salt Co. regarding the activities of the Wisconsin Chloride Advisory Committee	Jim Wolf Sr. Environmental Engineer	December 4, 1997

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193	Letter from the City of McPherson Wastewater Treatment Dept.	Steve Gorszczyk Superintendent	December 4, 1997
194	Letter from City of McPherson Board of Public Utilities	R.N. Anderson General Manager	December 4, 1997
195	Bacterial pollution from agricultural sources: a review S.R. Crane, J.A. Moore, M.E. Grismer & J.R. Miner	Trans. ASAE Vol. 26, pgs. 858-866	1983
196	Standard methods for the examination of water and wastewater by A.E. Greenberg, L.S. Clesceri, eds.	Am. Public Health Assn. Washington, D.C.	1992
197	Reducing Great Lakes Toxics: Can We Do More for Less Through Wastewater Effluent Trading? by Robert I Fassbender	Wisconsin Environmental Law Journal; Vol. 1, No.1	
198	TMDL Case Study: Tar-Pamlico Basin, North Carolina	U.S. EPA, Office of Water EPA841-F-93-010; No. 10	September 1993
199	Implementing Market-Based Instruments for Clean Water in America by Zach Willey from Clean Water & the American Economy Proceedings: Vol. 1	U.S. EPA, Office of Water EPA800-R-93-001a Session 7	March 1993
200	Water Pollution: Pollutant Trading Could Reduce Compliance Costs if Uncertainties Are Resolved	General Accounting Office GAO/RCED-92-153	June 1992
201	Point-Nonpoint Source Trading for Managing Agricultural Pollutant Loadings: Prospects for Coastal Watersheds by David Letson, et. al	USDA, Economic Research Service; Ag Economic Report No. 674	September 1993
202	Point-Nonpoint Source Trading: Looking Beyond Potential Cost Savings by Ester Bartfeld	Northwestern School of Law of Lewis & Clark College Environmental Law Vol. 23:43	1993
203	Optimizing Nonpoint Source Controls in Water Quality Regulation by J. Walter Milon	Water Resources Bulletin Vol. 23, No. 3	June 1987
204	Feasibility of point-nonpoint source trading for managing agricultural pollutant loadings to coastal waters by S. Crutchfield, D. Letson & A. Malik	Water Resources Research Vol. 30, No. 10 pp. 2825-2836	October 1994
205	Point/Nonpoint Source Trading: A New Approach to Reducing Nutrient Pollution by S. Levitas & D. Rader	Environmental Permitting	Winter 1992/93
206	Point/Nonpoint Source Pollution Reduction Trading: An Interpretive Survey by D. Letson	Natural Resources Journal Vol. 32, pp. 219-232	Spring 1992
207	Investment Decisions and Transferable Discharge Permits: An Empirical Study of Water Quality Management under Policy Uncertainty by D. Letson	Environmental and Resource Economics Vol. 2, pp. 441-458	1992

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Document Number	Document Title	Author	Other Information
208	Market Incentives: Effluent Trading in Watersheds by M. Podar, R. Kashmanian, et. al	Watershed '96: A National Conference Proceedings	June 1996
209	The Use and Impact of Intraplant Trading in the Iron and Steel Industry to Reduce Water Pollution by R. Kashmanian, M. Podar, et. al.	The Environmental Professional Vol. 17, pp. 309-315	1995
210	Using Market Incentives to Protect Water Quality in America by Zach Willey	Water Resources Update pp. 43-51	Spring 1992
211	Increasing Regulators Confidence in Point-Nonpoint Pollutant Trading Schemes by S. Taff & N. Senjem	Water Resources Bulletin Vol. 32, No. 6	December 1996
212	Evaluation of Opportunities for Effluent Trading in the Steam-Electric, Petroleum-Refining, and Coal Mining Industries by Michael Davis	Argonne National Lab ANL/EES-TM-272	October 1983
213	Reforming Water Pollution Regulation by Paul Tramontozzi	Center for the Study of American Business Publication No. 69	August 1985
214	TMDL Case Study: Boulder Creek, Colorado	U.S. EPA, Office of Water EPA841-F-93-006, No.8	June 1993
215	Assessing the Viability of Marketable Permit Systems: An Application in Hazardous Waste Management by J. Opaluch & R. Kashmanian	Land Economics Vol. 61, No. 3	August 1985
216	Compatibility of Stream Habitat Reclamation with Point and Nonpoint Source Controls	Water Environment & Technology, Vol.3, No. 1	January 1991
217	Albemarle-Pamlico: Case Study in Pollutant Trading by John Hall & Ciannat Howett	EPA Journal pp. 27-29	Summer 1994
218	Nutrient Trading -- in the Wings by Bruce Zander	EPA Journal pp. 47-49	Nov./Dec. 1991
219	Pollution Trading Permits as a Form of Market Socialism and the Search for a Real Market Solution to Environmental Pollution by R. McGee & W. Block	Fordham Environmental Law Journal Vol. 6, No.1	Fall 1994
220	Market Incentives for Water Quality: A Case Study of the Tar-Pamlico River Basin, North Carolina by David W. Riggs	Center for Policy Studies Clemson University	December 1993
221	Water Quality Management in South Carolina: Attaining Future Goals with a Market Approach by Sean Blacklocke	Center for Policy & Legal Studies Clemson University	October 1997
222	Effluent Trading in South Carolina: Pee Dee River Case Study by Sean Blacklocke	Center for Policy & Legal Studies Clemson University	October 1997

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223	Draft Framework for Watershed-Based Trading	U.S. EPA, Office of Water EPA800-R-96-001	May 1996
224	Minutes of the October 14, 1997 Meeting held in Topeka	Approved on Dec. 18, 1997	
225	Minutes of the Nov. 14, 1997 Conference Call	Approved on Dec. 18, 1997	
226	Minutes of the Dec. 12, 1997 Conference Call	Approved on Dec. 18, 1997	
227	Minutes of the November 18, 1997 Meeting held in Wichita	Approved on Dec. 12, 1997	
228	Minutes of the November 25, 1997 Meeting held in Great Bend	Approved on Dec. 12, 1997	
229	Minutes of the Dec. 2, 1997 Conference Call	Approved on Dec. 12, 1997	
230	Letter from John Hall regarding League of Municipalities' Recommendations on Mixing Zones	John Hall Washington, D.C.	December 15, 1997
231	Preliminary Report of the Kansas Special Commission on Water Quality Standards		January 1, 1998
232	Record of Transmittal of Preliminary Report to the Kansas Legislature as required by statute	Journal of the House Journal of the Senate	January 12, 1998
233	Response to issues raised by EPA & KDHE at the Sept. 30, 1997 meeting	John Hall for the League of Kansas Municipalities	January 13, 1998
234	1996 Clean Water Needs Survey: Report to Congress	EPA 832-R-97-003	September 1997
235	Chronology of Public Participation During Reviews of Water Quality Standards	KDHE	Jan. 1989 - present
236	House Resolution No. 6013	Kansas Legislature	1996 Session
237	Report to the Legislature on HR 6013	KDHE	December 1997
238	Origins and Requirements of 1996 H.R. 6013 Presentation at Feb. 9, 1998 meeting	League of Kansas Municipalities	February 9, 1998
239	Handouts from Faith Loretto, KS Dept. of Administration presentation at Feb. 9, 1998 meeting	Faith Loretto KS Dept. of Adm.	
240	Overheads from Theresa Hodges, KDHE presentation at Feb. 9, 1998 meeting	Theresa Hodges KDHE	

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241	Handouts from Chris Mammoliti, KS Dept. of Wildlife and Parks presentation at Feb. 9, 1998 meeting	Chris Mammoliti, KS Dept. of Wildlife & Parks	
242	EPA Requirements for the Promulgation of Water Quality Rules & Regulations by States	Ann Lavaty Region 7, EPA	February 6, 1998
243	Minutes of the Dec. 18, 1997 Meeting held in Topeka	Approved on Feb. 9, 1998	
244	Letter to the Commission from the Arkansas River Coalition	E. DeEtte Huffman President	February 6, 1998
245	Public Comment from the Kansas Audubon Council Handed out at Feb. 9, 1998 meeting		February 9, 1998
246	Overheads from Mike Tate, KDHE presentation at Feb. 23, 1998 meeting	Mike Tate, P.E. KDHE	
247	Overheads from John Hall, Hall & Associates discussion at Feb. 23, 1998 meeting	John C. Hall Washington, D.C.	
248	The Updated 305b Guidelines: Advantages and Expectations	EPA 841-S-97-002	September 1997
249	Letter to the Commission from Hall & Associates regarding Analysis of Mixing Zone Issues	John C.Hall Washington, D.C.	March 6, 1998
250	Letter to Secretary Gary Mitchell regarding 1994 Water Quality Standards	U. Gale Hutton, Director Water, Wetlands & Pesticides Division Region 7 EPA	February 19, 1998
251	Response from KDHE regarding the Chemical Reactions of Sulfer Dioxide Dechlorination	Rod Geisler KDHE	March 19, 1998
252	Memo authored by Bob Angelo regarding Hall & Associates Report. Provided by Kansas Chapter of the Sierra Club	Bob Angelo, Chief Technical Services Section KDHE	February 18, 1998
253	Collaborative Learning: Improving Public Deliberation in Ecosystem-Based Management by Steven Daniels & Gregg B. Walker	Environmental Impact Assessment Review 1996; 16:71-102	1996
254	Communication Competence and Public Participation in Natural Resource Policy Decisions by Gregg Walker and Steven Daniels	Paper presented at Nat'l Communication Assn. Mtg, Chicago	November 22, 1997
255	Using Collaborative Learning in Fire Recovery Planning by Daniels, Walker, Matthew Carroll	Journal of Forestry Vol. 94, Number 8	August 1996
256	Letter to Dennis Grams, Region 7 EPA Regional Administrator from Secretary Gary Mitchell regarding 1994 Water Quality Standards	Gary R. Mitchell Secretary, KDHE	March 9, 1998

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Document Number	Document Title	Author	Other Information
257	Wastewater Discharges may be most Hazardous to Fish During Winter by A. Dennis Lemly	Environmental Pollution Vol. 93, No. 2	1996
258	Presentation by Mike Tate, KDHE at March 11, 1998 meeting	Mike Tate, P.E. KDHE	
259	Presentation by Rod Geisler, KDHE at March 11, 1998 meeting	Rod Geisler, P.E. KDHE	
260	Interim Economic Guidance for Water Quality Standards: Workbook	EPA-823-B-95-002	March 1995
261	Presentation by Don Pitts, Attorney General's Office at March 11, 1998 meeting	Don Pitts, Assistant Attorney General	
262	Technical Support Document for Water Quality-based Toxics Control	EPA/505/2-90-001 PB91-127415	March 1991
263	Comments by John Metzler during public comment period March 11, 1998 meeting	John Metzler Johnson Co. Wastewater	
264	Comments by Ed Sramek, City of Independence during public comment period March 11, 1998 mtg	Ed Sramek Utility Supervisor	
265	Comments by Tom Brown, Western Resources during public comment period March 11, 1998 mtg	Tom Brown, Environmental Service Dept.	
266	Materials provided during March 30, 1998 tour of Nelson Complex & Mill Creek Regional, Johnson Co.		
267	Materials provided by Johnson County Water District No. 1 during March 30, 1998 tour		
268	Time Allowed for States to Do TMDLs Too Little for Adequate Job, Group Told	BNA Daily Environment No. 46	March 10, 1998
269	Several TMDL Issues Remain Unsettled As Final Meeting of Advisory Panel Nears	BNA Daily Environment No. 57	March 25, 1998
270	Presentation by Dr. Gregg Walker, Oregon State University to the March 30, 1998 meeting	Dr. Gregg Walker Oregon State University	
271	Collaborative Learning Takes Sustainability from Theory to Practice by Walker & Daniels	Wingspread Journal Spring, 1997	
272	Presentation by Derek Smithee, Oklahoma Water Resources Board during March 30, 1998 meeting	Derek Smithee, Water Quality Programs Division chief OK Water Resources Board	

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Document Number	Document Title	Author	Other Information
273	Clean Water Action Plan: Restoring and Protecting America's Waters	Vice President Al Gore	February 1998
274	Seeking Solutions: Alternative Dispute Resolution and Western Water Issues. Report to the Western Water Policy Review Advisory Commission	Gail Bingham Resolve Inc. Washington, D.C.	October 1997
275	Letter to Commission from City of Fort Scott	Richard Nienstedt City Manager	March 27, 1998
276	Information regarding the Colorado Water Quality Commission provided by Paul Frohardt	Paul Frohardt, Exec. Director, CO Water Quality Commission	
277	Minutes of the March 11, 1998 meeting in Hays		
278	Minutes of the February 9, 1998 meeting in Topeka		
279	Kansas Water Plan Overview prepared by the Kansas Water Office		April 1998
280	Kansas Water Authority Report for Implementation of the Kansas Water Plan in FY 1999: A Report to the Governor and the 1998 Legislature by the Kansas Water Office		December 1997
281	FY 1999 Annual Implementation Plan : Kansas Water Plan		July 15, 1997
283	Water Quality Section of the Kansas Water Plan		July 1995
284	List of Kansas Water Authority Basin Advisory Committee Chairs		November 1997
285	Letter from Kansas Department of Agriculture regarding the 1994 Surface Water Quality Standards Atrazine Criterion	Secretary Allie Devine	April 27, 1998
286	Letter from League of Kansas Municipalities recommending clarification of the Commission's Draft Recommendations	Glen E. Welden, City Manager, Parsons	May 7, 1998
287	Statement from the Municipal/Industrial NPDES Chloride Steering Team during public comment period at April 27, 1998 meeting	Jim Wolf, Regulatory Liaison	
288	Letter from Conferee Joe Bachant -- April 27 mtg	Joe Bachant, Missouri Stream Team Coordinator	April 30, 1998
289	Presentation by Steve Filipek, Arkansas Game and Fish Commission at May 15, 1998 meeting	Steve Filipek, Arkansas Stream Team Coordinator AR Game & Fish Commission	

KANSAS WATER QUALITY COMMISSION DOCKET

Document Number	Document Title	Author	Other Information
290	Handouts from Commission Tour of Southeast KS April 27, 1998 meeting		
291	Minutes of the April 27, 1998 meeting in Pittsburg	Approved May 15, 1998	
292	Letter to Dennis Gram, Administrator Region VII EPA regarding 1994 Water Quality Standards	Gary M. Mitchell Secretary, KDHE	March 9, 1998
293	Presentation by City of Topeka and Camp Dresser and McKee at May 15, 1998 meeting	Edie Snethen, City of Topeka Tony C. Gendusa, ph.D. Camp Dresser & McKee	
294	Comments by the KS Natural Resources Council & the KS Sierra Club presented during public comment May 15, 1998	Charles Benjamin Legislative Coordinator	
295	Letter to the Commission from League of Kansas Municipalities and Hall and Associates	Chris McKenzie Executive Director	May 15, 1998
296	Letter from Region VII EPA regarding ecoregions	Ann Lavaty, Water Quality Standards Coordinator	
297	Minutes of the May 15, 1998 meeting in Topeka	Approved June 8, 1998	
298	Public Comment from the City of Topeka Handed out at May 15, 1998 meeting		
299	Our Changing Role in Environmental Protection	Kansas Gov't Journal Vol. 84, No. 6	June 1998
300	Minutes of Jan. 23, 1998 Conference Call	Approved June 26, 1998	
301	Minutes of Feb. 23, 1998 meeting in Topeka	Approved June 26, 1998	
302	Minutes of March 30, 1998 meeting in Olathe	Approved June 26, 1998	
303	Minutes of April 13, 1998 Conference Call	Approved June 26, 1998	
304	Minutes of June 8, 1998 Conference Call	Approved June 26, 1998	
305	Minutes of June 16, 1998 Conference Call	Approved June 26, 1998	
306	Minutes of June 26, 1998 meeting	Mailed to Commission	
307	Mailing list of all parties notified of each Commission meeting and conference call		
308	Agendas from each Commission meeting		
309	Record of Transmittal of Final Report to the Kansas Legislature as required by K.S.A. Sup. 65-1,177		
310	Final Report of the Kansas Special Commission on Water Quality Standards		