

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7

In the matter of:)	
)	
Moran Beef, Inc.)	DOCKET NO. CWA-07-2010-0080
)	
Pottawattamie County, Iowa,)	
)	COMPLAINANT'S REBUTTAL
)	PREHEARING EXCHANGE
Respondent.)	and
)	PENALTY PROPOSAL
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Pursuant to 40 C.F.R. § 22.19 of the "Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties," 40 C.F.R. Part 22 (CROP) and the Presiding Officer's Order of August 26, 2010, Complainant United States Environmental Protection Agency (EPA) submits this Rebuttal Prehearing Exchange and Penalty Proposal.

I. WITNESSES.

1. Donald G. Huggins, PhD. Dr. Huggins is a Senior Scientist, Professor and the Directors of the Central Plains Center for BioAssessment and the Ecotoxicology Program at the University of Kansas. For over thirty years, Professor Huggins has studied the impacts of pollutants on watersheds and is a national expert in agriculture-related runoff and its impacts on receiving water bodies. Professor Huggins is expected to testify regarding EPA's and Respondent's sample results, as well as the potential impacts of pollutants on aquatic life that were identified by the sample results. He is also likely to testify regarding conclusions made in Respondent's expert witness report. Dr. Huggins' CV is attached as Exhibit C18.

II. EXHIBITS.

For purposes of the list of documents below, "Complainant's Exhibit" is abbreviated as "C___." The documents themselves are labeled "Complainant's Ex. No. XX"

C18 Donald G. Huggins Curriculum Vitae

C19 Iowa Department of Natural Resources. (March 2010). *Iowa's Water - Ambient Monitoring Program: Water Quality Summary 2000 - 2009* [Fact Sheet]

C20 Iowa Department of Natural Resources. (2006). *Summary of Water Quality Analytical Results: 2002 - 2006 Random Stream Sampling* [Fact Sheet]

- C21 Addendum to EPA Inspection Report dated September 23, 2010
- C22 Iowa Department of Natural Resources. (December 4, 2008). *Livestock Producers Who House Animals Both Inside and Out May Need to Apply for a Permit* [Press Release]
- C23 Iowa Department of Natural Resources. (October 2008). *NPDES Permits: Determining if a Combination Open Feedlot and Animal Confinement Must Apply for an NPDES Permit in 2008* [Factsheet]

III. Proposed Penalty

In Complainant's October 1, 2010 Prehearing Exchange, Complainant submitted a detailed discussion of the Clean Water Act statutory factors used in determining Respondent's penalty, including the nature, circumstances, extent and gravity of the violations, the economic benefit or savings resulting from the violation, and the violator's ability to pay, prior history of such violations, the degree of culpability, and other matters as justice may require.

Section B of Complainant's Prehearing Exchange discussed the actual and potential harm to human health and the environment, also known as the "gravity" factors. In that section, Complainant included as penalty factors the discharges from Respondent's open pens observed and sampled by EPA personnel, as well as discharges occurring during rainfall events of one inch or greater. To these previously considered discharges, Complainant now adds the observed and sampled continuous and uncontrolled discharges from Respondent's tile drain adjacent to its confinement building and the water basin inside Respondent's confinement building. Statements made by Frank Moran and Respondent's expert witness, Gerald Hentges, acknowledged that both the tile drain and the water basin discharge directly into the unnamed tributary of Mosquito Creek. Therefore, Complainant also includes these discharges to the gravity portion of the proposed penalty.

In its October 29, 2010 Prehearing Exchange, Respondent provided no issues of fact or law that warrants a reduction in EPA's proposed penalty, nor did Respondent assert an inability to pay a penalty. Applying the factors detailed in its Prehearing Exchange and the above paragraph, EPA believes a penalty of \$79,000 is appropriate for these violations.

In the Matter of Moran Beef, Inc.
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Complainant's Rebuttal Prehearing Exchange
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RESPECTFULLY SUBMITTED this 12th day of November, 2010.

A handwritten signature in black ink, appearing to read "Chris Muehlberger". The signature is fluid and cursive, with a long horizontal stroke at the end.

Chris Muehlberger
Assistant Regional Counsel
Region 7

CERTIFICATE OF SERVICE

I hereby certify that copies of the Prehearing Exchange in the Matter of Moran Beef, Inc., Docket No. CWA-07-2010-0080, were sent to the following persons in the manner indicated:

A true and correct copy hand delivered to:

Sybil Anderson (original plus one copy)
Headquarters Hearing Clerk
EPA Office of Administrative Law Judges
1099 14th Street NW
Suite 350, Franklin Court
Washington, DC 20005

A true and correct copy by United Parcel Service to:

Eldon McAfee
Beving, Swanson & Forrest, P.C.
321 E. Walnut St., Suite 200
Des Moines, IA 50309

Dated: November 10, 2010



COMPLAINANT'S
EX. NO. 18

DONALD G. HUGGINS
Curriculum Vitae

Revised Oct 2009

Director of Central Plains Center for BioAssessment, Univ. of Kansas, Lawrence, KS 66047
Director of Ecotoxicology Program, KS Biological Survey, Univ. of KS
Senior Scientist, KS Biological Survey, Univ. of KS
Courtesy Professor, Dept. of Civil Engineering, Univ. of KS.
Courtesy Professor, Dept. Evolutionary Biology and Ecology, Univ. of KS

PERSONAL:

Born - April 11, 1944, Des Moines, Iowa
President of the board of directors for the Lawrence Community Shelter
(a community program for the homeless and under-privileged)
Vietnam Combat Veteran (US Marine Corps)

EDUCATION:

BA, Westmar College, Lemars, IA. 1966. Double major in Chemistry and Biology
MS, Iowa State University, Ames, IA. 1968. Fisheries Biology (Major), Water Resources
(Minor)
PhD, (with Honors), University of Kansas, Lawrence, KS. 1990. Environmental Health Science,
School of Engineering

PROFESSIONAL TRAINING PROGRAMS:

1977 - Current Biological Methodology & Quality Assurance Practices. US EPA, Region VII,
KS
1977 - Bioassay Procedures Workshop. Columbia National Fisheries Research Laboratory,
Columbia, MO
1978 - Basics of Surface-Water Discharge Measurements. US Geological Survey, KS
1986 - Hazard Ranking System of NCP. US EPA, Region VII, KS
1988 - Geographic Information Systems and Digital Data Processing Workshop. CALMIT, Univ.
of Nebraska, Lincoln, NE
2000 - Applied Fluvial Geomorphology. Kansas Water Office and Wildland Hydrology, Salina,
KS
2003 - National Wadeable Streams Assessment, USEPA sponsored field methodologies and
quality assurance training, Lawrence, KS
2007 - National Lakes Assessment Training, USEPA sponsored field methodologies and
quality assurance training, Lawrence, KS
2008 - National Rivers and Streams Assessment (NRSA) Training, USEPA sponsored field
methodologies and quality assurance training, May 27-30, 2008, Kansas City, KS

PROFESSIONAL EXPERIENCE:

- 1965-66 - Student Advisor, Westmar College
- 1966-68 - Research Assistant, Coop. Fisheries Unit, Iowa State University
- 1967 - Biological Technician, Wildlife (GS-5), U.S. Fish and Wildlife Service
- 1969-70 - Agricultural Advisor for MAC-V, U.S. Marine Corps
- 1973-74 - Limnologist, Center for Northern Studies, Wollcott, VT
- 1970-77 - Fisheries Biologist, University of Kansas, Lawrence
- 1977-87 - Tech. Consultant, Kansas Nongame, Threatened and Endangered Species Program, KS. Dept. Wildl. & Parks
- 1978-87 - "Fish Kill" Investigation Group, Kansas Dept. Health and Environment, KS Wildl. & Parks and Kansas Biological Survey, Lawrence
- 1979 - Graduate Faculty (Ad hoc), Civil Engineering, University of Kansas
- 1987-88 - President, Central States Entomological Society
- 1993 - Development of Coop. Research Agreement with Iowa State Univ., Univ. of Kansas, The Ukrainian Res. Inst. of Agriculture & Luiv Univ. (Luiv, Ukraine)
- 1994 - Kansas Conservation Partnership Forum, University Panel, Salina, KS
- 1994 - Sharing Water: Cities, Farms and Ecosystems, National Video Conference, Discussion Panel, University of Kansas, Lawrence

PROFESSIONAL AFFILIATIONS:

- North American Benthological Society
- Central States Entomological Society
- Water Environment Federation
- Society of Environmental Toxicology and Chemistry
- North American Lake Management Society

COMMITTEE ASSIGNMENTS (since 1975):

- 1975 - Chairman, Chironomid Studies and Ecology of Stream Invertebrates Session, North American Benthological Society, Annual Mtg.
- 1975-76 - Committee on Threatened and Endangered Species in Kansas, Invertebrate Work Group, Kansas Dept. Wildl. & Parks
- 1976-79 - Planning and Policy Advisory Committee - Kansas Water Quality Plan. Kansas Dept. of Health & Environment
- 1976-79 - Technical Planning Committee (Assessment of streams and lake biosupport capabilities and development of stream and lake fisheries classifications for Water Quality Assessment workplan). Kansas Water Quality Plan. Kansas Dept. of Health & Environment
- 1977 - Chairman, Search Committee for aquatic invertebrate position, Kansas Biological Survey
- 1977-78 - Technical Advisor, Development of Invertebrate Strategic Plan for the Kansas Endangered Species Program. Kansas Dept. Wildl. & Parks

- 1977-82 - Federal-State Coordinating Committee, Kansas River and Tributaries Bank Stabilization Study, Army Corps of Engineers
- 1978 - Chairman, Search Committee for phycologist position, Kansas Biological Survey
- 1978 - Review Committee on the Directorship of the Museum of Invertebrate Paleontology, University of Kansas
- 1978-79 - Chairman, Kansas Academy of Science Natural History Handbooks Committee, Invertebrate Section, Kansas Acad. Sci.
- 1979 - Chairman, Search Committee for aquatic invertebrate biologist position, Kansas Biological Survey
- 1978-87 - Planning Committee, Nongame, Endangered or Threatened Wildlife. Kansas Dept. Wildl. & Parks
- 1983 - Ecological community advisor, Environmental Defense Fund, Washington, D. C.
- 1984-85 - Surface Water Quality Standards Task Force. Kansas Dept. Health & Environment
- 1985-to-date - Joint Task Group 10500 (Benthic Macroinvertebrates) for prep of *Standard Methods for the Examination of Water and Wastewater*. American Water Works Assn.
- 1985-to-date - Joint Task Group 10900 (Identification of Aquatic Organisms) for prep of *Standard Methods for the Examination of Water and Wastewater*. American Water Works Assn.
- 1986 - Member, Search Committee for Stream Ecologist position with Kansas Biological Survey
- 1986 - Chairman, Aquatic Toxicity Session, North American Benthological Society, Annual Meeting
- 1986-92 - Aquatic Insect Common Names Committee, North American Benthological Society
- 1987 - Planning Committee, Stream Program. Kansas Dept. Wildl. & Parks
- 1990 - Livestock Pollution Control Task Force (tech. subcommittee.), Bureau of Environ. Quality, Kansas Dept. Health & Environment.
- 1990-91 - University Committee on Promotion and Tenure (UCPT). University of Kansas
- 1991-92 - Pesticide/Nitrate Risk Reduction Opportunity Team, U.S. EPA, Region VII
- 1991-93 - General Research Fund Committee, University of Kansas
- 1991-93 - Faculty Senate Research Committee, University of Kansas
- 1992-to-date - Chairman, Joint Task Group 8750 (Toxicity Test Procedures for Aquatic Insect) for prep of *Standard Methods for the Examination of Water and Wastewater*. American Water Works Assn.
- 1995-99 - Project Advisory Team, Clean Water Farms Project, Kansas Rural Center and Kansas Dept. of Health & Environment

GRANTS AND CONTRACTS (since 1975):

Funded

- 1979-81 - Soldier Creek Water Quality and Conservation Project. Kansas Dept. Health & Environment. (\$15,000)
- 1977-79 - The determination of water quality criteria for the support of aquatic life in two small Kansas streams (C. Burkhead and D. Huggins). Kansas Water Resources Institute.

- (\$27,607)
- 1981 - Guide to the Freshwater Invertebrates of the Midwest. Office of Surface Mining, Dept. of Interior. (\$1800)
- 1985 - Biological assessment of selected water quality parameters of Prairie Creek and associated contact springs. Stinson, Mag & Frizzell for Waste Management Inc. (\$30,333)
- 1985-86 - Development and maintenance of the Kansas Biotic Index. Kansas Dept. Health & Environment. (\$10,000)
- 1985-86 - Cheyenne Bottoms: An Environmental Assessment, (Project Manager). Kansas Dept. Wildl. & Parks. (\$180,000)
- 1985 - Effects of atrazine concentrations recorded in a large Kansas reservoir on phytoplankton from atrazine-free water (D. Huggins, G. Howick and F. deNoyelles). US Geological Survey. (\$4,993)
- 1985 - Potential for the development of atrazine-resistant phytoplankton communities in contaminated zones of a large Kansas reservoir (D. Huggins, G. Howick and F. deNoyelles). US Geological Survey. (\$4,993)
- 1985 - A preliminary evaluation of the impact of atrazine on the plant community of a large Kansas reservoir (D. Huggins, G. Howick and F. deNoyelles). Kansas Dept. Health & Environment. (\$4,935)
- 1986-87 - Seasonal Stream Water Quality Inventory (D. Huggins and G. Howick). Kansas Dept. Wildl. & Parks. (\$24,212)
- 1986-87 - Milford Hatchery Site Water Quality and Water Management Assessment. (D. Huggins, G. Howick and F. deNoyelles, Jr.). Kansas Dept. Wildl. & Parks. (\$32,743)
- 1986-87 - The Plecoptera Nymphs of Kansas: Their identification, distribution and use in water quality studies. Kansas Dept. Health & Environment. (\$10,000)
- 1986-87 - Proposed Biotic and Habitat indices for use in Kansas Streams. Kansas Dept. Health & Environment. (\$5,000)
- 1987-88 - Biological & engineering contributions to RI/FS at the Arkansas City "superfund" site in SE Kansas (D. Huggins, D. Lane and F. deNoyelles). US Geological Survey. (\$50,000)
- 1985 - Development of experiment lake facility (with others) Res. Improvement Award, University of Kansas. (\$98,199)
- 1987-88 - Field evaluations of the assessment value of a Kansas biotic index on nonpoint source agricultural pollution (D. Huggins, F. deNoyelles, D. Kettle and P. Liechti). Kansas Dept. Health & Environment. \$10,000)
- 1989-90 - Relationships between land use/land cover and nonpoint pollution stream effects within an ecosystem (Project Manager). US EPA, Region VII. (\$173,000)
- 1985 - Data validation for EPA modeling (D. Huggins and M. Johnson). US EPA, Duluth-ORD. (\$7,500)
- 1991-92 - A regionalized assessment of the influences of rural nonpoint source pollution on the ecological integrity of stream ecosystems and evaluation of associated pollution control management. (E. Martinko, D. Huggins and M. Johnson). US EPA. (\$1,250,000)
- 1992-93 - A regionalized assessment of the influences of rural nonpoint source pollution on the

- ecological integrity of stream ecosystems and evaluation of associated pollution control management (F. deNoyelles, D. Huggins and M. Johnson). US EPA. (\$1,450,000)
- 1993-94 - A regionalized assessment of the influences of rural nonpoint source pollution on the ecological integrity of stream ecosystems and evaluation of associated pollution control management (F. deNoyelles, D. Huggins and M. Johnson). US EPA. (\$1,500,000)
- 1992-95 - An assessment of the effects on nonpoint source pollution on the biotic integrity of Walnut Creek and the role of riparian vegetation in mitigating nonpoint source (D. Huggins, M. Johnson and B. Menzel). US EPA, ERL-Duluth. (\$358,720)
- 1992-93 - Riparian Studies in the Delaware River basin, Kansas. US EPA, ERL-Duluth and US EPA, Region VII co-op grant. (\$25,000)
- 1993-94 - Effects of the structure and function of periodically-flooded wetlands on the degradation of herbicides and their metabolites. Regional Applied Research Effort proposal, US EPA, Region VII and US EPA-ERL, Duluth co-op grant. (\$30,000)
- 1994-95 - Research and Development Fund Grant (F. deNoyelles, D. Huggins, D. Lane and S. Randtke). University of Kansas. (\$35,761)
- 1995-99 - Validation of clean water farms management techniques. Kansas Dept. Health & Environment and US EPA Region VII, 319 grant funding. (\$442,642)
- 1995-96 - Predicting impacts of the conservation reserve program on aquatic ecosystems (D. Huggins and L. Bain). National Biological Service, Ft. Collins, CO. (\$28,000)
- 1995-96 - Macroinvertebrate identifications and verifications for NAWQA Program, US Geological Survey, Arvada, CO. (\$69,600+\$45,240)
- 1995 - Water quality impacts of agricultural activities on small watersheds. Kansas Dept. Health & Environment. (\$30,000)
- 1996-97 - Assessment of the ecological integrity of Soldier Creek drainage basin, Prairie Band of Potawatomi Nation, Mayetta, KS. (\$10,000+\$20,706)
- 1996 - Development of a watershed analysis and management framework, Prairie Band of Potawatomi Nation, Mayetta, KS. (\$16,990)
- 1997-99 - Assessment of Clinton Reservoir and its watershed, Kansas Dept. Health & Environment, Kansas Water Office and US EPA Region VII. (\$220,049)
- 1997-99 - Development of biocriteria metrics for streams of the Western Corn Belt Plains Ecoregion Kansas and adjacent states, (L. Ferrington and D. Huggins). US EPA. (\$30,000)
- 1998 - Baldwin Creek water quality assessment project. Kansas Water Office. (\$15,000)
- 1998 - Small stream crossing impact study. Subcontract with Univ. of California-Davis. (\$6,500)
- 1998-99 - Small stream crossing impact study. Subcontract with Univ. of California-Davis. (\$14,500)
- 1998-99 - Enhancement of research with experimental aquatic ecosystems at the Kansas Ecological Reserves, (C. Annett, S. Dewey, L. Ferrington, D. Graham, D. Huggins, D. Kettle, V. Smith and F. deNoyelles). National Sci. Foundation. (\$13,381)
- 1999 - Macroinvertebrate identifications. Missouri Dept. of Conservation. (\$1,752)
- 1999 - Big Soldier Creek Watershed Management Plan, Prairie Band of Potawatomi Nation, Mayetta, KS. (\$7,805)

- 1999-00 - TMDL supplement data assessment project, (D. Huggins and F. deNoyelles). Kansas Dept. Health & Environment. (\$120,000)
- 1998-01 - Development of a regional center of bioassessment. US EPA. (\$160,000)
- 1998-01 - Acquisition and assessment of nutrient data: an ecoregion approach with an emphasis on streams. US EPA. (\$188,729)
- 2001 - TMDL supplement data assessment project, (D. Huggins). Kansas Dept. Health & Environment. (\$60,000)
- 2001-03 - Spatial and temporal variability of nutrient limitation on phytoplankton growth in Kansas reservoirs. Kansas Department of Health and Environment. (Co-PI, \$108,308)
- 2001-03 - Water quality and biological criteria and recommended monitoring approaches relevant to Heartland Network Parks. U.S. National Park Service cooperative grant. (\$169,000)
- 2001-04 - An Integrated Modeling Approach to Predict the Effects of Watershed Management on the Eutrophication of Reservoirs in the Central Plains. USEPA Region 7. (Co-PI, \$540,000)
- 2003-05 - Developing Regional Nutrient Benchmark Values for Streams, Rivers, and Wetlands Occurring in USEPA Region 7. USEPA Region 7. (Co-PI, \$80,000)
- 2004-05 - Assessment of floodplain wetlands of the lower Missouri River using an EMAP study approach. USEPA Region 7. (Co-PI, \$209,481)
- 2004-05 - Assessment of wadeable streams within the South Central Semi-arid Prairies Ecoregion using an EMAP randomized study design. USEPA, WOWO. (Co-PI, \$401,972)
- 2004-05 - Defining relationships among indicators of sediment, erosion and ecosystem health in low gradient stream. USEPA Region 7. (Co-PI, \$59,000)
- 2006-07 - Procurement of Field and Analytical Support for the EMAP-Great Rivers Reference Condition Research on the Missouri River in Kansas. USEPA Region 7. (Co-PI, \$98,000)
- 2005-07 - Developing Regional Nutrient Criteria for Wetlands of the Central Plains Region. USEPA Region 7. (Co-PI, \$40,000)
- 2005-07 - Reference Conditions for Wadeable Streams of the Central Plains: Characterizing Minimally Versus Least Disturbed Conditions. USEPA Region 7. (Co-PI, \$30,000)
- 2005-07 - Identification and Characterization of Reference Conditions within USEPA Region 7 using EMAP methodology. USEPA Region 7. (Co-PI, \$374,000)
- 2005-07 - Determination of Regional Reference Conditions, Tiered Aquatic Life Applications and Inter-Regional Calibration of Community Assessment Methods. USEPA Region 7. (Co-PI, \$30,000)
- 2006 - Procurement of Field and Analytical Support for the EMAP-Great Rivers Reference Condition Research on the Missouri River in Kansas, USEPA (Co-PI, \$98,000)
- 2007-09 - Assessing the condition of USEPA Region 7's large tributaries of the Missouri River: A probabilistic design approach, USEPA (Co-PI, \$383,000)
- 2007-09 - National River and Stream Assessment Survey – 2008 and 2009, TetraTech as contractee of USEPA. (Co-PI, \$208,418)
- 2008 - Developing Regional Nutrient Benchmarks for Streams and Wetlands of the Central Plains Region, Great Lakes Environmental Center as a contractee of USEPA. (Co-PI,

\$16,000)

2008 - Database development for definition and assessment of nutrient levels and their biological effects in the Missouri River, Great Lakes Environmental Center as a contractee of USEPA. (Co-PI, \$15,000)

2008-09 - Assessment of Westar Energy Jeffrey Energy Center discharge on Lost Creek: A long-term monitoring/assessment strategy, Westar Energy. (Co-PI, \$153,000)

PROFESSIONAL CONSULTING (Since 1975):

B. A. Vittor & Associates, Environ. Research & Consulting

Black and Veatch, Consulting Engineers

Chadwick & Associates, Consulting Engineers

Natural Resources Consultants

Illinois Natural History Survey

Midwest Aquatic Enterprises

Waste Management of North America, Inc.

B. F. Goodrich, Chemical Division

Blazer, Zeni and Company (Environ. Management Consultants)

Jacobs Engineering Group, Inc.

RESEARCH INTERESTS:

Population Studies

Ecological and taxonomic studies of Odonata, Plecoptera and aquatic Lepidoptera are primary study groups with emphases on larval taxonomy, systematics of Argyractini, new species descriptions, and rheobiotic macroinvertebrate responses to "hydraulic stress". Population responses to perturbations are also of interest.

Community and Ecosystem Level Research

Major research interests are in ecotoxicology and community and/or ecosystem assessment of anthropogenic perturbations. Current research efforts are being directed toward assessment of the effects of watershed-level influences on stream ecosystems. Research on the joint toxicity of pesticide mixtures is ongoing. Current research efforts include: (1) nonpoint pollution and its relationship with land form and use, (2) development of assessment methods for use in stream pollution studies, and (3) interactions of riparian or near stream land use and stream ecosystems, and effects of landuse in instream habitats and geomorphology of streams, (4) surface and groundwater quality associated with differing farm management practices, (5) development of simple watershed models to rank nonpoint source contaminant risk to stream ecosystems, (6) Development of Use Attainability Assessment procedures, and (7) use of Structural Equation Modeling (SEM) in ecosystem studies.

SEMINARS AND PRESENTATIONS (Since 1975):

- 1974-84 - Various class presentations on aquatic biology, Lawrence, Topeka, St. Francis, Bonner Springs, Ottawa, Melvern and Shawnee Mission School Districts
- 1976 - Invertebrate Stream Biology, Kansas Assoc. Biological Teachers
- 1978 - Surface Mining Stream Investigation Workshop, Office of Surface Mining, US Dept. Interior, Kansas City, KS
- 1986 - Cheyenne Bottoms - Environmental Assessment Study presentation at public meeting, Great Bend, KS
 Cheyenne Bottoms: Environmental Assessment, Kansas Governor Mike Hayden, and Select legislative representatives, Topeka
 Cheyenne Bottoms, Kansas Advisory Council Environ. Education, Topeka
 Cheyenne Bottoms: An Environmental Assessment, KS Dept. Wildlife & Parks Commission, Topeka
 Cheyenne Bottoms, Fish and Wildlife Committee of Kansas Water Office, Topeka
 Cheyenne Bottoms, KS Audubon Council, Kansas City
 Cheyenne Bottoms, Jayhawk Kiwanis Club, Lawrence
- 1986 - New insights into the ecology and systematics of aquatic Lepidoptera, KU Entomol. Seminar, Lawrence
- 1986 - Biological assessment of nonpoint source agricultural pollution, KS Department of Health and Environment, Topeka
- 1985 - Remote Sensing and GIS-based assessment of agricultural nonpoint source pollution (Huggins, D. and P. Liechti). Geography seminar, University of Kansas, Lawrence, October 26.
- 1985 - Use of a GIS approach in assessing the ecological effects of nonpoint source pollution on stream ecosystems, Animal Ecology Seminar, ISU, Ames, IA
- 1990 - Impact of livestock confinements on stream water quality, Livestock Pollution Control Task Force, Kansas Dept. Health & Environment, Topeka
- 1990 - Ecological disturbance: interactions between aquatic ecosystems and landscapes, Animal Ecology Seminar, ISU, Ames, IA. (April 29)
- 1990 - The development, utilization and future of biological indicators in ecological risk assessment, Comparative Risk Seminar Series, US EPA, Region VII, Kansas City, KS
- 1985 - Ecological disturbance: Interaction between aquatic ecosystems and landscapes, Systematics and Ecology Seminar, University of Kansas, Lawrence, KS (September 18)
- 1985 - Special Aquatic Sites. Wetland Protection Workshop (Enforcement Training program), Corps of Eng./US EPA, Region VII, Kansas City, MO
- 1985 - Identifying technical criteria for riparian wetland restoration and protection, a 2-day workshop presentation (Huggins, D., D. Bandi and K. Higgins), Kansas Biological Survey, University of Kansas, Lawrence, KS.
- 1985 - Tri-State nonpoint source pollution assessment project, US EPA - Region VII, 2nd Annual NPS Workshop, US EPA Region VII, Overland Park, KS
- 1985 - Landscape risk-based assessment of nonpoint source pollution and riparian restoration potential, poster presentation, 3rd Ann. Regional Wetland Mtg., US EPA Region VII, Kansas City, MO (D. Huggins and D. Bandi)
- 1994 - Delaware Riparian Study, Wetland Riparian Areas Project Mtg., Manhattan, KS

- 1990 - Identifying riparian buffers to control nonpoint source pollution impacts, managing ecological risks through riparian protection and restoration, a 2-day workshop, U.S.EPA Wetlands Res. Program & US EPA, Region VIII, Denver, CO.
- 1990 - Nonpoint Source Pollution Effects on Aquatic Ecosystems and Whole System Management (D. Huggins & F. deNoyelles), a workshop for Nebraska extension educators, Coop. Extension, Univ. of Nebraska, July 18, Lawrence, KS.
- 1994 - Upper Delaware riparian study, Soil Conservation Service, AC - State Staff Conference, Topeka, KS.
- 1990 - Nonpoint source pollution and riparian buffers, a wetlands workshop, Kansas Biol. Survey, Lawrence, KS. (April 11- 12)
- 1994 - Identifying riparian buffers that function to control nonpoint source pollution impacts, *In* The geographic prioritization of ecosystem restoration and protection activities, US EPA sponsored workshop, Lincoln, NE. (Aug 22-23)
- 1990 - Aquatic organisms as indicators of stream quality. Kansas Water Environ. Assn., 50th Ann. Conf., Manhattan, KS. (April)
- 1998 - Temporal and spatial variations in water quality of Clinton Reservoir: preliminary data. Kansas Academy of Science, 130th Ann. Meeting, Kansas Newman College, Wichita, KS. (April 19-20)
- 1998 - Examining the potential enhanced toxicity of atrazine in aquatic ecosystems, Symposium on Kansas Water Resources: Past, Present and Future. Kansas Academy of Science, 130th Ann. Meeting, Kansas Newman College, Wichita, KS. (April 19-20)
- 1999 - Biological assessment of Soldier Creek watershed, Soldier Creek Watershed Partnership Meeting, Prairie Band of Potawatomi Nation. (Sept 29)
- 1999 - Nutrient levels in Midwestern streams and lakes. Breakout session #2, Nutrients, EPA Region 7, 7th Ann. Nonpoint Source Conference and Iowa St. University Conference on global water issues. ISU, Ames, IA. (March 24-26)
- 2000 - Functions and values of intermittent streams. Regional Wetlands and Water Resources meeting, Kansas City, MO, (Feb 29 – March 2)
- 2000 - Panelist and presenter, Professional Seminar Series, Environmental Science. Federal Agency Advisory Board and Haskell Indian Nations University, March 30.

TEACHING:

- 1980, Fall - Aquatic insects, Laboratory and Aquatic Biology (Biol. 418), University of Kansas
- 1981, Fall - Aquatic biology, Biol. Principles Environ. Eng. Proc. (CE 773), University of Kansas
- 1981, Spring - Aquatic macroinvertebrate, Stream Ecology (Biol. 661), University of Kansas
- 1984-92, Spring - Biological monitoring and toxicity testing, Environ. Monitoring (CE 873), University of Kansas
- 1987, Fall - Biological Assessment of Streams, Stream Ecology (Biol. 661), University of Kansas
- 1988, 1992, 1994, Spring - Odonata evolution and biology, Aquatic Entomology (Biol. 525), University of Kansas

PRESENTATIONS (since 1975):

- 1975 - Odonates of Kansas, Part II. Kansas Academy of Science, Ann. Mtg.*
- 1977 - Stoneflies of Kansas. Kansas Academy of Science, Ann. Mtg.*
- 1979 - Aquatic Biology Studies in Kansas (invited paper), Kansas Assoc. Biological Teachers, Ann. Mtg.
- 1980 - Effects of a 24 hour ammonia injection on stream drift and benthic standing crop, Kansas Academy of Science, 112th Ann. Mtg.* (D. Huggins and P. Liechti)
- 1980 - Odonates of southeastern United States (invited paper), special symposia, North Am. Benthological Soc., Ann. Mtg., Savannah, GA *
- 1984 - Emergence Biology of *Anax longipes*, North Am. Benthological Soc., Ann. Mtg., Raleigh, NC (D. Huggins and B. Coler) *
- 1986 - Effects of VOC contamination on the stream fish *Pimephales promelas* (Rafinesque), North Am. Benthological Soc., Ann. Mtg., Lawrence, KS. (D. Huggins and G. Welker)*
- 1986 - Aquatic toxicity studies on VOC contamination, Soc. Environ. Toxicol. and Chem, Ozark- Prairie Chapter, Ann. Mtg., Columbia, MO
- 1986 - Reproduction in *Petrophila* (invited paper) (Huggins, D. and A. Brigham). Entomol. Soc. Am., Natl. Conf., Reno, NV *
- 1986 - The Cheyenne Bottoms feasibility study (Hoffman, W. and D. Huggins). Midwest Fish and Wildlife, Natl. Conf. Omaha, NE *
- 1987 - Hydrologic assessment of Cheyenne Bottoms (McClain, T. and D. Huggins). American Geophysical Union, Ann. Mtg., Baltimore, MD *
- 1987 - Evolution of Odonata, Formal Conference on the Aquatic Insects, Entomol. Soc. America, Natl. Conf., Boston, MA*
- 1988 - Cheyenne Bottoms Study (invited paper), 5th Ann. Water and Future of Kansas Conf., Manhattan, KS
- 1988 - Aquatic Lepidoptera (Pyrilidae: Nymphulinae) in the Neotropics (invited paper (Huggins, D. and A. Brigham)), Special Symposia, North Am. Benthological Soc., Ann. Mtg., Tuscaloosa, AL *
- 1990 - Application of the Habitat Development Index in evaluating insect composition in small streams (Huggins, D., T. Anderson and P. Liechti), North Am. Benthological Soc., Ann. Mtg., Blacksburg, VA *
- 1990 - Invertebrate biomonitoring and habitat assessment (invited paper), Nonpoint Source Pollution Workshop, Center for Field Biology and Tennessee Dept. Health and Environ., Austin Peay St. Univ., Clarksville, TN
- 1990 - Influence of near-stream conditions on NPS pollution (invited paper), Nonpoint Source Pollution Workshop, Center for Field Biology and Tennessee Dept. Health and Environ., Austin Peay St. Univ., Clarksville, TN
- 1990 - Use of remote sensing and GIS in evaluating NPS pollution (invited paper), Nonpoint Source Pollution Workshop, Center for Field Biology and Tennessee Dept. Health and Environ., Austin Peay St. Univ., Clarksville, TN
- 1990 - Direct and indirect effects of atrazine on aquatic fauna. Fish and Wildlife Conf.: "Environmental Health of Kansas", Pittsburg St. Univ., Pittsburg, KS

- 1990 - The effects of atrazine on aquatic ecosystems: an assessment of direct and indirect effects using structural equation modeling (Huggins, D., M. Johnson and F. deNoyelles, Jr.) Soc. Environ. Tox. and Chem. (SETAC), 11th Ann. Mtg. Arlington VA *
- 1990 - Structural equation modeling and ecosystem analysis. (Johnson, M., D. Huggins and F. deNoyelles, Jr.). Soc. Environ. Tox. and Chem. (SETAC), 11th Ann. Mtg. Arlington VA *
- 1990 - Freshwater simulated field studies: A review of surrogate ecosystems designed to simulate the natural environment (deNoyelles, F., S. Dewey, D. Huggins and D. Kettle). Soc. Environ. Tox. and Chem. (SETAC), 11th Ann. Mtg. Arlington VA *
- 1991 - Temporal variation in the response of stream insect composition to extensive basin cultivation in small agricultural streams (D. Huggins and T. Anderson). North Am. Benthological Soc., Ann. Mtg. Santa Fe, NM *
- 1991 - Ecological impacts of NPS pollution/agricultural chemicals. KS. Water Pollut. Control Assoc., 46th Ann. Conf., Manhattan, KS *
- 1991 - Ecological consequences of the control and elimination of macrophytes in small ponds by atrazine and Grass Carp (Huggins, D. and M. Johnson). North Am. Lake Mgmt. Soc., Region Lake Mgmt. Conf., Des Moines, IA *
- 1991 - Impacts of row crop pollutants on aquatic life (overview paper). Conference on the Status of Row Crop Pollution Control Practices, KSU, Manhattan, KS. (June 20)
- 1992 - The Kansas River system and its biota in transition, 122nd Ann. Mtg., Am. Fish Soc., Rapid City, SD (R. Sanders, D. Huggins and F. Cross)*
- 1993 - Monitoring freshwater communities to integrate environmental stresses, Water and Future of Kansas Conf., 10th Ann. Mtg., Manhattan, KS*
- 1993 - Ecotoxic effects of atrazine and its potential impact on aquatic ecosystem structure, (keynote address). Ozark-Prairie Chapter, SETAC, 8th Ann. Mtg., Ames, IA
- 1993 - Ecological impacts of herbicides - a review. Symposium on agricultural nonpoint sources of contaminants: a focus on herbicides, U.S. EPA and U.S.G.S., Lawrence, KS
- 1993 - The impacts of agricultural non-point source pollution on benthic macroinvertebrates in sixteen Western Corn Belt Plains Ecoregion streams (Lary, M. and D. Huggins). North Am. Benthological Soc. 42nd Ann. Mtg., Orlando, FL
- 1994 - The role of macroinvertebrates data in a watershed approach in evaluating nonpoint-source agricultural pollution (Anderson, T. and D. Huggins). Oregon Chapter, Am. Fish. Soc. Ann. Mtg., Sunriver, OR
- 1994 - Differentiation of major periphyton taxonomic groups based on spectral reflectance using close-range remote sensing (Clements, A., Dewey, S. Bergin and D. Huggins). Kansas Academy of Science, 126th Ann. Mtg. *
- 1994 - Differentiation of major periphyton taxonomic groups based on spectral reflectance using close-range remote sensing (Clements, A., S. Dewey, S. Bergin and D. Huggins). North Am. Benthological Soc, Ann. Mgt. *
- 1993- Evaluating biological integrity in watershed monitoring studies in the Midwest (Invited speaker). Ozark-Prairie Chapter, SETAC, 9th Ann. Mtg. Lawrence, KS
- 1994 - Riparian forest impacts on aquatic wildlife (Invited speaker), Great Plains Ag. Council, 46th Ann. Mtg., Forestry Com., Manhattan, KS
- 1995 - Non-point source evaluation of sixteen watersheds. Kansas Water Environ. Assn., 50th Ann. Conf., Manhattan, KS (April)

- 1995 - Northeast Kansas environmental assessment. 12th Ann. Water and Future of Kansas Conf., Manhattan, KS
- 1995 - The impacts of agricultural non-point source pollution on benthic macroinvertebrate trophic structure in the western corn belt plains ecoregion (M. Lary and D. Huggins). 43rd Ann. Mtg., North Am. Benthological Soc., Keystone, CO *
- 1995 - The dragonflies and damselflies (Odonata) and aquatic moths (Lepidoptera: Pyralidae:Nymphilinae) of Colorado (Invited speaker). 43rd Ann. Mtg., North Am. Benthological Soc., Keystone, CO*
- 1995 - Spatial and land use characteristics of small livestock confinements affecting stream water quality (D. Huggins, D. VanSchmus, S. Meador and D. Bandi). Animal Waste and Land-Water Interface, An Interdisciplinary Conference, Fayetteville, AR *
- 1995 - Effects of hydrophyte community structure on atrazine and alachlor degradation in Wetlands (Lee, K., D. Huggins and M. Thurman). *In* Versatility of wetlands in the agricultural landscape. Am. Water Res. Assoc. Conference, Orlando, FL
- 1999 - Nutrient criteria: National and regional perspectives (D. Huggins, B. Hayford and G. Welker, invited speakers). 49th Ann. Environ. Engineering Conference, Lawrence, KS *
- 1999 - Management and restoration of Midwestern riparian systems*. USDA workshop, 61st Midwest Fish and Wildlife Conference, Chicago, IL
- 2004 - Nutrient limitation of primary production in eastern and central Kansas reservoirs (Dzialowski, A., S. Wang, W. Spotts, N.C. Lim, and D. Huggins). North American Lake Management Society Annual Meeting, Victoria, British Columbia, November 2004.
- 2006 - Examining biological integrity and stressor gradients in wadeable streams in the Central Plains (Baker, D., A. Dzialowski, and D. Huggins). Midwest Fish and Wildlife Conference Annual Meeting, Omaha, NE. December 2006.
- 2007 - Predicting taste and odor events in Kansas reservoirs (Dzialowski, A., D. Huggins, F. deNoyelles, Jr., N.C. Lim and J. Beury). Future and Water in the State of Kansas Ann. Mgt., Topeka, KS. March 2007.
- 2008 - Biological Responses to Nutrient Enrichment in Streams of the Central Plains and Adjacent Regions (Huggins, D. and D. Baker). Iowa Water Conference, 8th Annual "Linking land management and water quality". ISU, Ames, IA. February 2008.
- 2008 - Predicting Taste and Odor Events: Is it Possible? (Huggins, D. and A. Dzialowski). Kansas Rural Water Assoc., 2008 Conference. Wichita, KS. March 2008.
- 2008 - Impact of Sedimentation on Biological Resources (Huggins, D., B. Everhart [presenter], A. Dzialowski, J. Kriz and D. Baker). *In* Sedimentation in our Reservoirs: Causes and Solutions, A research strategy workshop. Sponsored by KS Water Resources Inst. and KS Water Office, Topeka, KS. March 2008.*
- 2009 - Biological Impacts of Sediment and Sedimentation in Aquatic Ecosystems (Huggins, D. [session moderator and speaker], B. Everhart, A. Dzialowski, J. Kriz and D. Baker), in Session 6, Sediment Loading in Streams and Lakes. Assessing Impacts, 26th Annual Water and the Future of Kansas Conference, Capital Plaza Hotel, Topeka, KS. March 26, 2009.
- 2009 - Using Digital Elevation Data for River Valley Identification and Floodplain Mapping (J. Kastens, K. Dobbs, S. Egbert, D. Huggins, B. Williams, and J. Thorp). A poster presented at the 1st Biennial Symposium of the International Soc. River Science. St. Pete Beach, FL,

July 12-17, 2009.

* denotes abstracted papers

TECHNICAL REPORTS:

- 1976 - Invertebrates of Woodson County State Fishing Lake and Game Management Area (Huggins, D., P. Liechti, T. Oldham and S. Hamilton). *In* Preliminary Inventory of Woodson County State Lake and Game Management Area. Rpt. State Biol. Surv. Kansas 5: 40-61.
- 1979 - The development of water quality criteria for ammonia and total residual chlorine for the protection of aquatic life in two Johnson County, Kansas streams (Burkhead, C., D. Huggins and R. Hazel). Office of Water Res. and Tech., U. S. Dept. Interior, Dec. 1979. Kansas Water Resources Res. Inst., Cont. No. 209
- 1986 - Biological assessment of selected water quality parameters of Prairie Creek and associated contact springs (Huggins, D., P. Liechti, G. Welker, and T. Fraizer). Rpt. No. 30. Kansas Biol. Surv., Lawrence, KS. 92 pp. + Append.
- 1996 - The effects of atrazine on phytoplankton in Tuttle Creek Reservoir (Huggins, D., G. Howick, M. Moffett, F. deNoyelles, Jr.). Rpt. No. 31. Kansas Biol. Surv., Lawrence, KS. 38 pp.
- 1987 - Assessment of the quality of water sources at the Milford Fish Hatchery (Huggins, D., G. Howick, F. deNoyelles, Jr., and M. Moffett). Rpt. No. 33. Kansas Biol. Surv., Lawrence, KS. 49 pp.
- 1986 - Cheyenne Bottoms: An Environmental Assessment. (Project Manager & Author). Rpt. No. 32. Kansas Biol. Surv., Lawrence, KS. 719 pp.
- 1987 - Seasonal stream water quality inventory: Summer 1986 (Huggins, D. and G. Howick). Rpt. No. 34 Kansas Biol. Surv., Lawrence, KS. 30 pp.
- 1988 - An economic impact study of petition for regulatory relief from phosphorus effluent limits, City of Pana. (State of Illinois). R84-44, Dec. 1987, Blazer, Zeni & Co. 63 pp. + Apex.
- 1986 - Cheyenne Bottoms: An Environmental Assessment (Executive Summary). (Project Manager & Author). Report of Kansas Biological Survey and Kansas Geological Survey for Kansas Dept. Wildl. & Parks. 20 Jan. 1987. 29 pp.
- 1987 - Proposed biotic and habitat indices for use in Kansas streams. (Huggins, D. and M. Moffett) Rpt. No. 35. Kansas Biol. Surv., Lawrence, KS. 128 pp.
- 1988 - An economic analysis of proposed amendments to water pollution regulations, phosphorus discharges (State of Illinois). R87-6, March 1988, Blazer, Zeni & Co. 82 pp + Appex.
- 1988 - An ecological and air quality assessment of the Arkansas City, Kansas Superfund Site, Center for Research, Inc. Final report for U.S. Geological Survey (Contract #14-08-0001-A-0335). 13 Jun 1988. Part I, 38 pp; Part 2, 11 pp. + Appex.
- 1989 - Ecological assessment (M. Griffith, D. Huggins and R. Blackburn), pp. 65-101. *In* Remedial Investigation of the Arkansas City Dump Site, Cowley County, South-Central

- Kansas, Phase IIB. T. Spruill, et al., eds. U.S. Geological Survey Administrative Report, Lawrence, KS.
- 1988 - Field evaluations of the assessment value of a Kansas biotic index on nonpoint source agricultural pollution (D. Huggins, P. Liechti and T. Anderson). Rpt. No. 37. Kansas Biological Survey.
- 1990 - Establishment of empirical relationships between land use/land cover and nonpoint source pollution stream effects within an ecosystem (D. Huggins, M. Johnson, P. Liechti, T. Anderson, S. Meador and J. Whistler). U.S. EPA, Region VII, Office Integrated Environ. Analysis, NPS Analysis Project Rpt. 3. 66 pp.
- 1994 - Identifying riparian buffers that function to control nonpoint source pollution impacts to instream communities: Feasibility study in the Delaware River Basin, Kansas (D. Huggins, D. Bandi, and K. Higgins). Rpt. No. 60. Kansas Biol. Surv., Lawrence, KS. 118 pp.
- 2004 - Variability in nutrient limitation of Kansas reservoirs (Wang, S.W., A. Dzialowski, W. Spotts, N.C. Lim, and D. Huggins). Rpt No. 201, Kansas Biol. Surv., Lawrence, KS. 45 pp.
- 2005 - Identification and quantification of reference conditions associated with lotic ecosystems of the central plains and surrounding regions: A summary of approaches and factors (Huggins, D. and A. Dzialowski). Final report submitted to the United States Environmental Protection Agency, Region 7, Kansas City, KS. 34 pp.
- 2005 - Predicting the effects of watershed management on the eutrophication of reservoirs in the central plains: an integrated modeling approach (Wang, S., D. Huggins, N.C. Lim, W. Spotts, and A. Dzialowski). Rpt. No. 223. 103 pp.
- 2006 - Characterization of reference conditions in wadeable streams of the central plains. (Dzialowski, A., D. Baker and D. Huggins). Final report submitted to the United State Environmental Protection Agency, Region 7, Kansas City, KS. 28 pp.
- 2007 - An integrated assessment of the effects of internal phosphorus cycling on sediment resuspension on the eutrophication of lakes and reservoirs in the Central Plains (Dzialowski, A., S. Wang, N.C. Lim, J. Beury and D. Huggins). Final Report submitted to the United States Environmental Protection Agency, Region 7, Kansas City, KS. 36 pp.
- 2009 - Solomon River Basin Selenium Assessment Project (Koontz, J., D.G. Huggins, and N.C. Lim). Final Report. Open-file Report No. 155. Kansas Biological Survey, Lawrence, KS. 31 pp.
- 2009 - Trophic State Analysis of Pottawattamie State Fishing Lake No. 1 (Beury, J.H. and D.G. Huggins). Open-file Report No. 154. Kansas Biological Survey, Lawrence, KS. 8 pp.

PUBLICATIONS:

- 1969 - Mark-and-recapture methods for studying domestic cockroach populations (Huggins D., and F. Bulow). Proc. Iowa Acad. Sci. 75: 447-456
- 1971 - Toad or frog? Iowa Conservationist, Jan 1971. p.7
- 1971 - *Scaphiopus bombifrons* Cope, a species new to Iowa. Jour. Herpetology 5(3-40): 216

- 1974 - The limnology of the Noatak Drainage Area (J. O'Brien and D. Huggins). *In the Environment of the Noatak River Basin, Alaska*, S. B. Young, ed. Center for Northern Studies, Wolcott, Vermont, 1: 158-223
- 1975 - Primary productive and nutrient limiting factors in lakes and ponds in the Noatak River Valley, Alaska (J. O'Brien and F. deNoyelles, Jr. and D. Huggins). *Arch. Hydrobiol.* 75: 263-275
- 1975 - Skipjack herring, *Alosa chrysochloris*, in the Missouri River Basin (Cross, F. and D. Huggins). *Copeia* 2:382-385
- 1975 - Fish population structure in altered and unaltered areas of a small Kansas stream (Huggins, D. and R. Moss). *Trans. Kansas Academy Sci.* 77: 18-33
- 1976 - The sympatric occurrence of three species of Eubranchipoda in Douglas County, Kansas. *The Southwestern Nat.*, 20: 577-578
- 1976 - Biological notes on *Eupera cubensis* (Bivalvia: Sphaeriidae) from Kansas (Mackie, G. and D. Huggins). *Jour. Fish. Res. Bd. Canada* 33: 1652-1656
- 1976 - Species accounts of certain aquatic macroinvertebrates from Kansas (Huggins, D., P. Liechti and D. Roubik). *In New Records of the Fauna and Flora of Kansas for 1975*. J. Caldwell, ed. Tech. Publ. State Biol. Surv. Kansas 1:13-77
- 1977 - Unionacean mussels of Kansas (Liechti, P. and D. Huggins). *In New Records of the Fauna and Flora of Kansas for 1976*. J. Caldwell, ed. Tech. Publ. State Biol. Surv. Kansas 4: 17-30
- 1977 - Kansas Plecoptera (Stoneflies) (Stewart, K. and D. Huggins). *In New Records of the Fauna and Flora of Kansas for 1976*. J. Caldwell, ed. Tech. Publ. State Biol. Surv. Kansas 4: 31-40
- 1977 - Additions and corrections to the list of aquatic beetles of the families Dryopidae and Elmidae from Kansas (Brown, H. and D. Huggins). *In New Records of the Fauna and Flora of Kansas for 1976*. J. Caldwell (ed.). Tech. Publ. State Biol. Surv. Kansas 4: 41-44
- 1977 - Records of Megaloptera in Kansas (P. Liechti and D. Huggins). *In New Records of the Fauna and Flora of Kansas for 1976*. J. Caldwell, ed. Tech. Publ. State Biol. Surv. Kansas 4: 45-50.
- 1978 - Additional Records of Kansas Odonata. *In New Records of the Fauna and Flora of Kansas for 1977*. R. Brooks & R. McGregor, eds. Tech. Publ. State Biol. Surv. Kansas 6: 1-35
- 1978 - Description of the nymph of *Enallagma divagans* Selys (Odonata: Coenagrionidae). *Jour. Kansas Entomol. Soc.* 51(1): 140-143
- 1979 - Kansas leeches (Annelidae; Hirudinea) with notes on distribution and ecology (Klemm, K., D. Huggins and M. Wetzel). *In New Records of the Fauna and Flora of Kansas for 1978*. R. Brooks, ed. Tech. Publ. State Biol. Surv. Kansas 8: 38-46
- 1979 - Fleas in Kansas: Their habits and effects on man (Huggins, D. and T. W. Oldham). *Bull. State Biol. Surv. Kansas* 6: 1-20
- 1980 - The occurrence of the glass shrimp, *Palaemonetes kadiokensis* Rathbum in Kansas. *In New Records of the Fauna and Flora of Kansas for 1979*. R. Brooks, ed. Tech. Publ. State Biol. Surv. Kansas 9: 12-14
- 1980 - The Spongillafly (Neuroptera: Sisyridae) of Kansas. *In New Records of the Fauna and Flora of Kansas for 1979*. R. Brooks, ed. Tech. Publ. State Biol. Surv. Kansas 9: 67-70

- 1980 - Kansas black flies (Diptera: Simuliidae) with notes on distribution and ecology (Snyder, T. and D. Huggins). *In* New Records of the Fauna and Flora of Kansas for 1979. R. Brooks, ed. Tech. Publ. State Biol. Surv. Kansas 9: 30-34
- 1981 - New state and distributional records for Kansas Plecoptera. *In* New Records of the Fauna and Flora of Kansas for 1980. R. Brooks, ed. Tech. Publ. State Biol. Surv. Kansas 10:65-70
- 1981 - Guide to the freshwater invertebrates of the Midwest (Huggins, D., P. Liechti and L. Ferrington). Tech. Publ. State Biol. Surv. Kansas 11:221 pp.
- 1982 - Odonata (Huggins, D. and W. Brigham), pp. 4.1-4.100. *In* Aquatic Insects and Oligochaetes of North and South Carolina, A. R. Brigham, W. U. Brigham and A. Gnilka, eds. Midwest Aquatic Enterprises, Mahomet, Illinois.
- 1982 - Factors affecting microdistribution of two species of burrowing dragonfly nymphs (Odonata: Gomphidae) with notes on their biology (Huggins, D. and M. DuBois). *Odonatologica* 11(1): 1-14.
- 1982 - Development of water quality criteria for ammonia and total residual chlorine for the protection of aquatic life in two Johnson County, Kansas streams (Hazel, R., C. Burkhead and D. Huggins), pp. 381-388. *In* Aquatic Toxicology and Hazard Assessment, J. Pearson, R. Foster and W. Bishop, eds. ASTM STP 766, Am. Soc. Test Materials, Philadelphia, PA
- 1982 - Notes on the Amphipoda of Kansas (Moffett, M. and D. Huggins). Tech. Publ. State Biol. Surv. Kansas 12:9-12
- 1983 - Sphaeriacean clams of Kansas (Mackie, G. and D. Huggins). Tech. Publ. State Biol. Survey Kansas 14: 92 pp.
- 1983 - Description of the nymph of *Somatochlora ensigera* (Scudder). *Jour. Kansas Entomol. Soc.* 56(3):415-419
- 1983 - New Kansas records of Odonata. Tech. Publ. State Biol. Survey Kansas 13: 24-25
- 1984 - Description of the nymph of *Enallagma daeckii* (Calvert). *Jour. Kansas Entomol. Soc.* 57(2):190-196
- 1985 - The nymph of *Gomphus (Gomphurus) ozarkensis* Westfall (Odonata: Gomphidae). *Jour. Kansas Entomol. Soc.* 58 (4): 656-661.
- 1985 - Insects and their relatives, pp. 115-128. *In* *Natural Kansas*, J. T. Collins, ed. Univ. Press Kansas, Lawrence.
- 1986 - A recovery and pinning technique for microlepidoptera preserved in alcohol. *Jour. Kansas Entomol. Soc.* 59(2): 387-388
- 1991 - Ecosystem modeling with LISREL: an approach for measuring direct and indirect effects in ecosystem level ecotoxicological testing. (Johnson, M., D. Huggins and F. deNoyelles, Jr.) *Ecol. Appl.* 1:383-398.
- 1991 - Ecological consequences of the control and elimination of macrophytes in small ponds by atrazine and Grass Carp (Huggins, D. and M. Johnson). *Proc. Regional Lake Mgmt. Conference, N.A. Lake Mgmt. Soc., Des Moines, IA. (June)*
- 1993 - Kansas River System and its biota (Sanders, R., D. Huggins and F. Cross), pp. 295-326. *In* Restoration planning for the rivers of the Mississippi River ecosystem, L. Hesse, C. Stalnaker, N. Benson and J. Zuboy, eds. U.S. Fish. Wildl. Serv., Biol. Rept. 19.

- 1984- The ecotoxic effects of atrazine on aquatic ecosystems: an assessment of direct and indirect effects using structural equation modeling (Huggins, D., M. Johnson and F. deNoyelles, Jr.), pp. 653-692. *In Simulated Field Studies in Aquatic Ecological Risk Assessment*, R. Graney, J. Kennedy and J. Rodgers, eds. Lewis Publ., Ann Arbor, MI
- 1994 - Structural equation modeling and ecosystem analysis. (Johnson, M., D. Huggins and F. deNoyelles, Jr.), pp. 627-652. *In Simulated Field Studies in Aquatic Ecological Risk Assessment*, R. Graney, J. Kennedy and J. Rodgers, eds. Lewis Publ., Ann Arbor, MI
- 1994 - Aquatic mesocosms in ecological effects testing: Detecting direct and indirect effects on pesticides (deNoyelles, F., Jr., S. Dewey, D. Huggins and W. Kettle), pp.605-626. *In Simulated Field Studies in Aquatic Ecological Risk Assessment*, R. Graney, J. Kennedy and J. Rodgers, eds. Lewis Publ., Ann Arbor, MI
- 1994 - Converting Public Land Survey information into digital maps of improved accuracy and usefulness (Bandi, D. and D. Huggins). ASPRS Proceedings of "International Symposium on Spatial Accuracy of Natural Resource Data Bases", May 1994, 280 pp.
- 1995 - Effects of hydrophyte community structure on atrazine and alachlor degradation in wetlands (Lee, K., D. Huggins and E. Thurman), pp. 525-538. *In Versatility of wetlands in the agricultural landscape*. Am. Water Res. Assoc. Conference, Orlando, FL
- 1997 - Checklist of Kansas dragonflies (Beckemyer, R. and D. Huggins). *The Kansas School Naturalist*, 43(2): 3-15
- 1998 - Checklist of Kansas damselflies (Beckemyer, R. and D. Huggins). *The Kansas School Naturalist*, 44(1): 3-15
- 1998 - Effects of a large reservoir on downstream groundwater quality (Huggins, D. and G. Howick). *J. Lake and Res. Management* 14(1): 86-91
- 1999 - An analysis of the trophic state of Clinton Lake (Wang, S., D. Huggins, F. deNoyelles, Jr. and W. Kolln). *Lake and Reserv. Manage.* 15(3): 239-250
- 2001 - Ecoregions of Nebraska and Kansas (Chapman, S., J. Omernik, J. Freeouf, D. Huggins, J. McCauley, C. Freeman, G. Steinauer, R. Angelo and C. Mammoliti). Color poster with map, descriptive text, summary tables, and photographs. USGS, Reston, VA (paper copy and at ftp://ftp.epa.gov/wed/ecoregions/ks_ne)
- 2003 - Watershed-lake water quality modeling: Verification and application (Makin, K., S. Wang, J. Koelliker, D. Huggins, and F. deNoyelles, Jr.). *J. Soil and Water Conservation* 58(4): 188-197
- 2005 - Nutrient limitation of phytoplankton growth in central plains reservoirs, USA (Dzialowski, A., S. Wang, N.C. Lim, W. Spotts and D. Huggins). *J. Plankton Research* 27(6): 587-595
- 2005 - An integrated modeling approach to total watershed management: Water quality and watershed assessment of Cheney Reservoir, Kansas, USA (Wang, S., D. Huggins, L. Frees, C. Volkman, N.C. Lim, D. Baker, V. Smith and F. deNoyelles, Jr.). *Water, Air and Soil Pollution* 164:1-19
- 2005 - Relationships between cyanobacteria production and the physical and chemical properties of a Midwestern Reservoir, USA (Wang, S., A. Dzialowski, Meyer, J., F. deNoyelles, Jr., N.C. Lim, W. Spotts, and D. Huggins). *Hydrobiologia* 541:29-43
- 2005 - Nutrient limitation of phytoplankton growth in Central Plains reservoirs, USA (Dzialowski, A., S. Wang, W. Spotts, N.C. Lim and D. Huggins). *J. Plankton Research*

- 27: 587-595.
- 2008 – Effects of sedimentation on biological resources (D.G. Huggins, R.C. Everhart, A. Dzialowski, J. Kriz and D.S. Baker), pp35-46. *In* Sediment in Our Reservoirs: Causes and Solutions, Contribution No. 08-250-S, KS Ag. Experiment Station, KSU. 142pp
- 2008 - Effects of sediment resuspension on algal biomass and nutrient concentrations in reservoirs of the Central Plains (Dzialowski, A.R., S.H. Wang, N.C. Lim, J.H. Beury and D.G. Huggins). *Lake and Reserv. Manage.* 24:313-320.
- 2009 - Development of predictive models for geosmin-related taste and odor in Kansas, USA, drinking water reservoirs. (A. Dzialowski, V. Smith, F. deNoyelles, Niang-Choo Lim, D. Baker, J. Buery). *Water Research* 43: 2829-2840
- 2009 - Threshold patterns in aquatic biodiversity across water quality gradients in Central Plains streams and rivers. (Evans-White, M.A., W.K. Dodds, D.G. Huggins, and D.S. Baker). *J. North Am. Benthol. Soc.* 28: 855-868.
- (in press) - Patterns in algal biomass across stream size and ecoregions: examining widespread assumptions (D. Huggins, J. Thorp, and D. Baker). *Ecosystems*.
- (submitted) - Evaluating sediment toxicity of residential streams in metropolitan Kansas City area, USA, with the amphipod *Hyaella azteca* (Tao, J., C. Ingersoll, N. Kemble, J. Dias, J. Murowchick, G. Welker and D.Huggins). *Arch. Environ. Contamin. Toxic.*
- (submitted) - Distribution of polycyclic aromatic hydrocarbon and pesticide contamination of sediment in residential streams in metropolitan Kansas City area, USA (Tao, J., D. Huggins, G. Welker, J. Dias, C. Ingersoll and J. Murowchick). *Arch. Environ. Contamin. Toxic.*
- (submitted) - Congruence between nutrient water quality parameters and Chironomidae (Diptera) scales (Hayford, B. L., D. Huggins, D. B. Baker and M. Johnson). *Environ. Management*, June 2008

SERVICE:

State and National

Since 1974, I have been directing my service related activities toward providing advisory and support services to the Kansas citizenry; local and regional planners; government officials, judiciary, legislature and regulatory agencies; scientists and engineers and special interest groups who are concerned or interested in our aquatic resources and environment with regards to its biota. Many members and groups in our society are fast recognizing the importance of understanding our aquatic biota and their relationship with water quality. I have listed below a selected group of agencies and organizations that have asked for professional assistance in the area of aquatic biota and water quality related subjects.

Kansas Department of Health and Environment
 US Geological Survey
 Kansas Geological Survey
 Kansas Dept. Wildlife and Parks

Kansas Fish Farmers Association
Dept. Health & Welfare (State of Idaho)
Kansas Department of Transportation
U. S. Department of Army - Ecological Research Unit
Wichita State University
Emporia State University
Kansas State University
Department of Environment Control (State of Nebraska)
Illinois Natural History Survey
University of Missouri
Missouri Conservation Commission
US Army Corps of Engineers (Kansas City District)
Museum of Natural History (KU)
US Fish and Wildlife Service
US EPA, Region VII
US EPA, ERL-Duluth
US EPA, ERL-Corvallis
University of California, Berkley & Davis
Integrated Laboratory systems, Duluth, MN
Nebraska Extension Educators
The Academy of Natural Sciences, Philadelphia
Haskell Indian Nations University
National Biological Service
Dept. of Entomology, Univ. of Wisconsin

International

1993:

Visit of KU and KBS facilities by Iowa State University and Ukraine representatives was conducted to develop a cooperative research and study agreement (KU, ISU and Ukraine). Efforts were made to facilitate discussions and presentations of capabilities of joint environmental interest between KU, ISU and Ukraine. University of Kansas units represented included International Studies, REES, Center of Environmental Education and Training, KBS and university administration officials. In addition, on behalf of the KBS I hosted agricultural and environmental leaders (i.e. government and university official) from Brazil interested in international "partnerships" and studies.

1994-95:

The aquatic ecotoxicology program facilitated collaborative research between Professor Zhaohui Jin, a visiting scholar from Nankai University, Tianjin, China and myself. Professor Jin was provided salary and laboratory facilities during his one and a half year stay at KU and a long-term research effort was established between KBS and Nankai University. This relationship continues with planned visits by other scholars and staff, as well as, collaborative publications of research done at the University of Kansas.

Current:

Since 1994 I have served and continue to serve as an external thesis examiner (i.e. adjudicator) for a number of educational institutes from India including the University of Kalyani, University of Calcutta and the University of Ankhra. I have established and maintained strong and productive relationships with a number of international higher education institutions due to my long history of research and academic mentoring of foreign students.

University

I have provided direct professional assistance and guidance to eight Masters degree candidates and one Ph.D. candidate within the Environmental Health program in Civil Engineering (KU). I have chaired or co-chaired seven MS committees (S. Meador & K. Higgins both CE honors graduates, K. Segelquist, S. Donley, A. Clements, M. Lary, N. Giron, J. Yelton, N. Lim, W. Spotts, W. Bouchard) and four Ph.D. committees (H. Wang, G. Welker, M. Blackwood, B. Chapin). I have sponsored three post-doctoral students (S. Wang, B. Hayford, D. Bandi, A. Dzialowski) and several national and international visiting scholars. Additionally I have set on five Ph.D. and five MS committees at KU and served as an ad hoc member of both a Master (Univ. Humboldt, CA) and PhD (UMKC) committee from other U.S. universities during the last 5 years. In addition, I have served as a mentor and provided research assistance to over 31 graduate students in numerous departments (e.g. Ecology and Evolutional Biology, Geography, Civil Engineering, Entomology, Architecture & Urban Design, Chemistry and Botany) during my tenure with the University. I have also assisted in the development of numerous MS thesis projects for students at Emporia, Pittsburg and Wichita State Universities, Illinois University, Iowa State University, UC-Davis and other universities.

I currently chair or co-chair three MS (Jason Buery, Geoff Warlick, Jason Koontz) and one Ph.D. (Bob Everhart) committee in either EEB or Civil Engineering.

I am the director of the Central Plains Center for BioAssessment that currently employs four scientists on a full-time basis (M. Blackwood, A. Blackwood, L. Bennett, D. Baker). In addition we normally employ about 2-4 graduate students, 4-6 undergraduate students and provide summer salary for 1-3 KU faculty members. During 2006 we have provided full or partial appointments for 5 graduate and 6 undergraduate students and 3 KU faculty members.

Reviewer (1987-to-date)

- Journal Kansas Entomol. Society
- Universities Council on Water Resources
- Nongame, Endangered or Threatened Wildlife Program, KDWP
- *Standard Methods* reviewer, American Water Works Assoc.
- Chapter 9: Lepidoptera *In* Freshwater Macroinvertebrates of Northeastern North America, Cornell Univ. Press.
- Entomological News
- Hydrobiologia

- Special Publication of Soc. Environ. Toxicol. and Chem. (1993)
- KU, New Faculty Proposals (11)
- Journal of North American Benthological Society
- Journal of American Society of Photogrammetry and Remote Sensing (1993)
- University Press of Kansas (book review, 1995)
- Journal of Insect Behavior (1995)
- Environ. Tox. and Chemistry (1994)
- External thesis examiner, University of Kalyani and Ankhra University, India (1994-95)
- Journal of Environ., Toxicol. and Chem. (1994)
- EPA's Eco-related Life Science Peer Review Panel (Apr 21-23, 1997)

COMPLAINANT'S
EX. NO. 19

IOWA'S WATER

Ambient Monitoring Program

Water Quality Summary 2000-2009*

Water Quality Parameter	Units	Number of Samples	Min Value	Percentiles					Max Value
				10th	25th	50th	75th	90th	
Acetochlor ^{††}	µg/L	7,126	<0.1	<0.1	<0.1	<0.1	<0.1	0.16	21
Alachlor ^{††}	µg/L	7,126	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.6
Ammonia (as N)	mg/L	9,568	<0.1	<0.1	<0.1	<0.1	<0.1	0.20	5.7
Afrazine ^{††}	µg/L	7,135	<0.1	<0.1	<0.1	<0.1	0.24	0.75	53
Butylate ^{††}	µg/L	7,045	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carbonaceous BOD (5 day)	mg/L	8,806	<2	<2	<2	<2	2	5	35
Chloride	mg/L	8,497	<1	12	16	22	29	39	170
Chlorophyll a [†]	µg/L	5,056	<1	2	5	13	45	120	640
Chlorophyll b [†]	µg/L	5,049	<1	<1	<1	<1	<1	2	70
Chlorophyll c [†]	µg/L	5,049	<1	<1	<1	<1	2	8	66
Chlorophyll fies or pheophytin	µg/L	4,042	<1	2	4	10	28	80	370
Corrected Chlorophyll a [†]	µg/L	5,053	<1	<1	3	10	36	110	920
Cyanazine ^{††}	µg/L	7,045	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.3
Deethylatrazine ^{††}	µg/L	7,045	<0.1	<0.1	<0.1	<0.1	<0.1	0.17	2.6
Desopropylatrazine ^{††}	µg/L	7,045	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.57
Dimethenamid ^{††}	µg/L	6,326	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	4.4
Diss. Orthophosphate (as P)	mg/L	9,398	<0.1	<0.1	<0.1	<0.1	0.15	0.27	5.1
Dissolved Oxygen	mg/L	9,639	0.7	7.7	8.7	10.5	12.9	14.4	21
E. coli Bacteria	CFU/100 ml	9,614	<10	<10	30	120	440	2,300	980,000
Field pH	pH units	9,274	5.0	7.8	8.0	8.2	8.4	8.6	10.9
Field Temperature	Celsius	9,881	0.0	0.1	2.3	12.7	20.5	24.3	34.3
Flow	CFS	7,963	<1	20	90	340	1,280	3,500	78,500
Metolachlor ^{††}	µg/L	7,126	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	56
Metribuzin ^{††}	µg/L	7,045	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.6
Nitrate+Nitrite (as N)	mg/L	9,561	<0.1	0.9	3	5.6	8.5	12	35
Pheophytin [†]	µg/L	5,049	<1	<1	3	3	3	19	201
Silica ^{††}	mg/L	8,424	<1	5.0	9.0	13	17	21	190
Simazine ^{††}	µg/L	6,767	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	20
Specific Conductance	µmhos/cm	6,758	120	420	510	610	720	830	1,700
Sulfate	mg/L	7,996	<1	20	26	36	59	98	400
Total Dissolved Solids	mg/L	9,198	10	250	300	360	430	500	1,840
Total Hardness (as CaCO ₃)	mg/L	8,769	55	200	240	300	360	410	820
Total Kjeldahl Nitrogen	mg/L	9,197	<0.1	0.3	0.5	0.8	1.3	2.0	28
Total Phosphorus	mg/L	9,556	<0.1	<0.1	0.11	0.20	0.34	0.60	26
Total Suspended Solids	mg/L	9,192	<1	4	10	34	87	220	17,000
Trifluralin ^{††}	µg/L	7,045	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
Turbidity	NTU	9,450	<1.0	2.8	6.0	18	44	110	8,500

*Due to budget constraints, the network of 75 stream sites were not fully monitored September 2008 – March 2009. Full monitoring resumed in April 2009.

- µg/L – micrograms per liter (parts per billion)
- mg/L – milligrams per liter (parts per million)
- CFU/100 ml – Colony Forming Units per 100 milliliters of water
- CFS – Cubic Feet per Second (ft³/sec)
- µmhos/cm – micromhos per centimeter
- NTU – Nephelometric Turbidity Units; Diss. – Dissolved
- < – less than detection limit shown; BOD – Biological Oxygen Demand

Raw data are available through STORET at www.igsb.uiowa.edu/wqm

Note: This summary only includes stream sites monitored as part of the fixed monthly network. Additional stream sites throughout Iowa are also monitored, but are not included in this summary, since their sampling frequency and parameters vary from the fixed network.

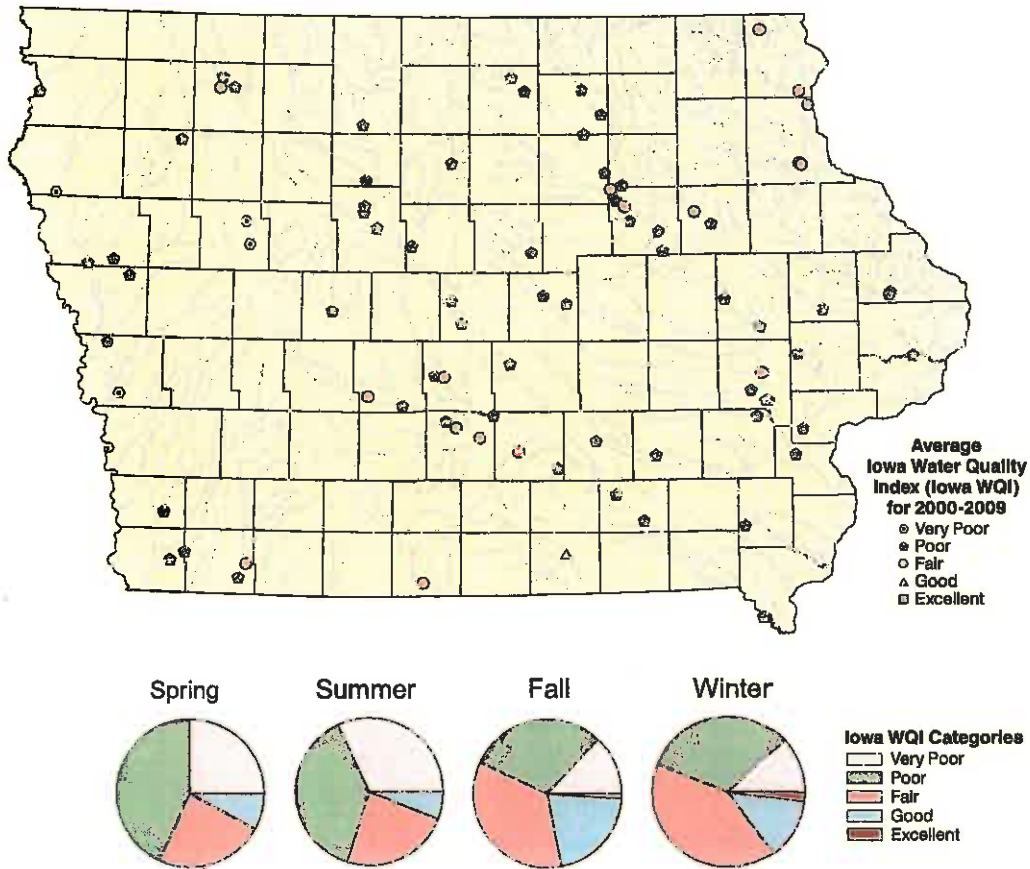
- * Includes monthly and event samples for all stream sites
- ** Provisional data from the U.S. Geological Survey and University of Iowa Hygienic Laboratory
- † Sampling discontinued in 2005
- †† Sampling discontinued in 2008

Less than values have been standardized to account for decreases in detection limits through time.

A total of 80 stream sites were sampled monthly from 2000-2002. A total of 84 stream sites were sampled monthly from 2003-2006. Number of sites sampled from Aug-Dec 2006 varied from 75 to 83. A total of 75 stream sites were sampled monthly since Dec 2006.

Iowa Water Quality Index for 2000-2009

In 2005, the Iowa Department of Natural Resources developed the Iowa Water Quality Index (WQI), a standardized method for comparing the water quality of various water bodies across the state. The Iowa WQI rates water quality using the following nine parameters: biological oxygen demand, dissolved oxygen, *E.coli* bacteria, nitrate+nitrite as nitrogen, total detected pesticides, pH, total phosphorus, total dissolved solids, and total suspended solids. If a result is missing for any of these parameters, the Iowa WQI assigns a default value for the missing parameters. Iowa WQI ranks range from 0 – 100 and streams are classified as **very poor** (0 – 25), **poor** (25.1 – 50), **fair** (50.1 – 70), **good** (70.1 – 90), and **excellent** (90.1 – 100). For 2000-2009, 1% of the monthly stream WQI values were in the **excellent** category, 11% were **good**, 31% were **fair**, 36% were **poor**, and 21% were **very poor**. (See map below for average WQI rank for each site.)



Streams in Iowa show seasonal Iowa WQI patterns. For the majority of streams, water quality is **poor** during the spring, followed by a decline in water quality during the summer months when the number of streams in the **very poor** category increases, while the number of streams in the **poor** category remains relatively the same. Water quality is at its best during the fall and winter months, with nearly 57% of the streams classified in the **fair**, **good**, and **excellent** categories during the fall and 56% of the streams classified in the **fair**, **good**, and **excellent** categories during the winter. (See pie charts above.)



Prepared by
Iowa Department of Natural Resources, Geological and Water Survey
109 Trowbridge Hall, Iowa City, IA 52242-1319

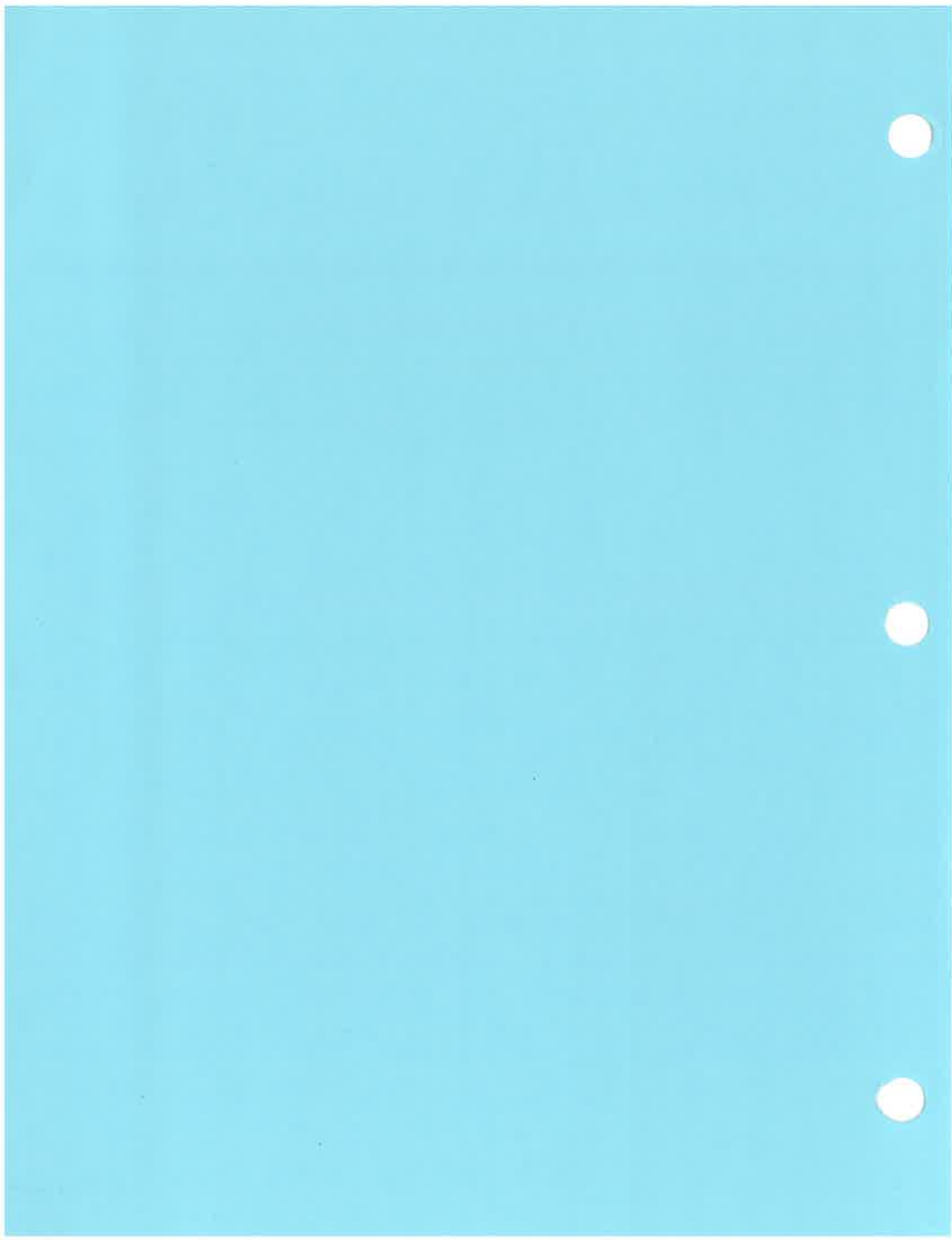
COMPLAINANT'S
EX. NO. 20



SiteID	Stream_Location	Site No	Ecoregic	County	Strahler Stream Order	ammonia mg/L as N	chl A ug/L	chl B ug/L	D O (field) mg/L	(field) Std Units	temper ature (field) C	flow cfs	nitrate N mg/L as N	
						ONG_DILAT_DD	chl A ug/L	chl B ug/L	mg/L	Units	(field) C			
128	West Nishnabotna River - Manning # 12	128	47e	Carroll	3	-95.02	1.5	20.5	11.15	8.2	17.85	6	16	
8	East Nishnabotna River - Griswold - 8	8	47e	Cass	5	-95.15	67.667	21	13.833	8.8667	26.667	69.333	0.8	
259	Sevenmile Creek	259	47e	Cass	4	-95.02	9.5	6.65	8.25	7.5	23.15	15.1	2.85	
227	Sevenmile Creek	227	47e	Cass	4	-94.85	4.5	12	8.7	8.1	20.7	4.85	13	
190	Troublesome Creek	190	47e	Cass	4	-94.86	11	8.9	7.6	8.1	26.55	14.85	6.85	
138	Unn. Trib. Buck Creek - Atlantic # 138	138	47e	Cass	2	-95.01	3	20.75	9.6	7.8	16.025	3.5	14	
30	Boyer River - Deloit - 30	30	47e	Crawford	4	-95.28	7	16.667	7.9	8.2667	25.933	79.333	8.3333	
43	Nishnabotna River - Hamburg - 43	43	47m	Fremont	6	-95.64	340	13	14.8	9	26	326	1.6	
182	Plum Creek - Thurman # 182	182	47m	Fremont	3	-95.72	23	12.5	7.6	8.1	24.55	3.2	1.85	
172	Potato Creek - Persia # 172	172	47e	Harrison	2	-95.7	2	15.75	8.65	7.95	17.85	4.075	14.75	
15	Battle Creek - Battle Creek - 15	15	47e	Ida	3	-95.59	5.6667	19	10	8.2667	22.567	15.133	7.7667	
158	Mud Creek - Hastings # 158	158	47e	Mills	3	-95.51	4	11.95	9.65	8.25	21.3	12.9	8.5	
191	Silver Creek	191	47e	Mills	4	-95.59	8	18	9.9333	8.5	13.5	79.433	6.4667	
217	Jordan Creek	217	47m	Monona	2	-95.82	5.75	12.5	7.75	8.05	21.275	0.875	0.7325	
226	Little Sioux River	226	47d	Monona	6	-95.95	50.5	23.5	8.55	8.35	26.05	538.2	5.05	
110	Maple River - Castana # 110	110	47m	Monona	5	-95.92	116	17.5	9.7	8.35	22.85	185.25	6.5	
21	Maple River - Turin - 21	21	47d	Monona	5	-95.94	140	16	9.6	8.3	25.3	161	6	
208	Monona-Harrison Ditch	208	47d	Monona	6	-96.01	28	14.5	7.9	8.2	25.15	99.25	6.6	
119	Soldier River - Moorhead # 119	119	47m	Monona	5	-95.84	7	14	8.45	8.4	24.7	45.65	4.5	
247	Unn. Trib. Norway Creek - Soldier - REM	247	47m	Monona	2	-95.73	10	10.767	8.5	8.3333	20.133	0.8	2.1	
17	Unn. Trib. E. Nishnabotna - Essex - 17	17	47e	Page	2	-95.27	4.3333	9.9333	8.2	8	15.1	2.5	1.7333	
123	West Tarkio Creek - Coin # 123	123	47e	Page	3	-95.31	4	8.65	8.5	8.15	22.15	21.35	6.75	
106	West Tarkio Creek - Essex # 106	106	47e	Page	3	-95.2	10	10	9.65	8.05	17.45	21.7	14.5	
24	Broken Kettle Creek - Westfield - 24	24	47e	Plymouth	4	-96.47	7	14	10.333	8.0333	16.867	8.1333	6.1	
130	Perry Creek - Hinton # 130	130	47e	Plymouth	3	-96.37	1.5	13.5	8.95	8.05	17.9	10.7	10.5	
74	Boyer River - Missouri Valley - REMAP #	74	47d	Pottawattamie	5	-95.92	46.667	19.667	9.1667	8.5667	27.6	180.13	6.2667	
52	Keg Creek - McClelland - 52	52	47e	Pottawattamie	3	-95.64	16	16	13.333	8.4333	24.3	6.3667	5.2667	
294	Lapworth Creek - Crescent - 294	294	47d	Pottawattamie	2	-95.87	46	46	3.1	8	18.5	0.05	0.1	
105	Mosquito Creek - Underwood # 105	105	47e	Pottawattamie	4	-95.69	23	23	9.3333	9.6667	16.767	49.633	6.4333	
150	Pony Creek - Council Bluffs # 150	150	47d	Pottawattamie	4	-95.83	12	17.5	7.3	7.65	17.35	1.35	1.1	
97	West Nishnabotna River - Oakland # 97	97	47e	Pottawattamie	5	-95.4	7	16.5	8.6	8.35	22.4	159.1	4.45	
251	Odebolt Creek - Odebolt - REMAP # 251	251	47e	Sac	3	-95.27	83	293.33	10.3	7.9	12.6	0.3333	3.7333	
146	East Branch West Nishnabotna River -	146	47e	Shelby	4	-95.23	2	11	8.5	8.3	19.6	54.3	7.65	
16	Mosquito Creek - Panama - 16	16	47e	Shelby	3	-95.47	6	24.5	9.6	8	17.25	5	2.55	
230	Unn. Trib. Indian Creek - Elk Horn 230	230	47e	Shelby	2	-95.15	7.6667	11.9	10.1	7.9	13.25	1.8333	8.1667	
149	Unn. Trib. West Nishnabotna R. - Irwin #	149	47e	Shelby	2	-95.27	1.875	14.75	9	7.975	19.4	1.9	8.825	
60	West Nishnabotna River - Irwin - REMA	60	47e	Shelby	4	-95.18	10.667	22.333	10.467	8.2667	13.217	22.883	8.5333	
173	W.Frk.Little Sioux R. - Bronson # 173	173	47m	Woodbury	5	-96.08	4.5	18	7.55	8.3	28.45	84.75	8.4	
						Min	0.025	6.650	3.100	7.500	12.600	0.050	0.100	
						10Pct	0.025	9.980	1.763	7.600	14.620	1.208	1.450	
						25Pct	0.025	12.125	4.083	8.300	17.375	3.644	3.071	
						50Pct	0.025	15.875	7.000	8.975	20.988	14.975	6.450	
						75Pct	0.071	19.500	13.000	9.692	24.663	76.833	8.383	
						90Pct	0.181	23.150	72.267	10.373	26.200	166.740	13.300	
						Max	1.537	293.333	340.000	14.800	9.000	28.450	538.200	16.000
						Mean	0.112	23.579	28.071	9.119	20.743	60.441	6.455	
						Std.Dev	0.261	45.432	60.981	1.826	4.485	106.506	4.145	

ortho phosph	silica mg/L	nitrogen mg/L as	dissolve solids mg/L	phosphorus mg/L as	suspended solids	volatile suspended solids	turbidity ntu
0.305	21.5	1.8	430	0.43	16	5	12.9
0.0833	9.5	1.2233	250	0.2033	28.333	6	14.1
0.09	16.5	0.45	230	0.13	29.5	4	15.75
0.065	15.5	0.75	280	0.19	88.5	12.5	73
0.14	15.5	0.75	265	0.295	83.5	13	45.5
0.065	17.5	0.6375	342.5	0.205	72	9	33
0.08	15.333	0.6767	380	0.16	80	7.6667	24.333
0.03	5.7	2.4	240	0.46	190	27	61
0.1	21.5	1.25	345	0.325	87	12.5	45.5
0.085	22.25	0.57	460	0.225	87	9.25	40
0.0833	17	0.61	543.33	0.0967	27.667	9	8.6667
0.235	22	1.3	380	0.44	73.5	11	37
0.1833	20	1	373.33	0.5267	229.67	24.667	127
0.0925	21.25	0.925	420	0.1925	36.75	6.25	20.25
0.06	19	0.95	490	0.225	113.5	16	63.5
0.04	13.5	1.015	430	0.225	97	12	36.5
0.01	14	1.1	380	0.18	120	14	44
0.085	18.5	0.65	485	0.22	77	9.5	36.5
0.095	16.5	0.51	425	0.225	59	6.5	22
0.0467	18.667	0.9833	436.67	0.1467	61.667	7.3333	30
0.3767	13.633	1.1467	313.33	0.2367	28.667	2.6667	34
0.225	21	0.765	270	0.365	88	11	61.5
0.085	17.5	0.57	285	0.215	103.5	10.5	54.5
0.1433	21.333	0.61	636.67	0.2333	57.333	5.8333	13
0.08	23	0.59	520	0.19	87	11.5	39
0.31	15.667	1.4667	460	0.6267	89.667	11.333	44.667
0.11	12.667	1.1967	360	0.2367	59.667	6	30.2
0.08	16	1.9	500	0.19	48	5	28
0.0767	15.333	0.5767	420	0.1967	80	8.3333	29.667
0.04	20	0.65	450	0.165	27.5	6.5	19.5
0.15	16	0.62	410	0.21	51.5	5	19.55
0.9967	15.667	3.2667	1166.7	1.3667	21.667	10	13
0.095	19	0.515	362	0.255	123.5	12.5	53
0.0425	18.5	1.035	405	0.15	35.5	2.75	20.5
0.09	15.667	0.96	310	0.22	94.333	9	34.333
0.075	20.5	0.6125	360	0.2375	118.5	13.75	56
0.0983	11.883	0.765	403.33	0.2217	83	7.8333	27.833
0.095	20.5	0.55	525	0.27	135	16.5	64
0.010	5.700	0.450	230.000	0.087	16.000	2.667	8.667
0.042	13.250	0.594	268.500	0.157	28.133	5.000	13.770
0.075	15.500	0.611	343.125	0.191	48.875	6.313	20.875
0.088	17.250	0.765	404.167	0.223	80.000	9.125	34.167
0.133	20.375	1.135	457.500	0.286	93.167	12.375	45.500
0.256	21.500	1.567	521.500	0.446	121.050	14.600	62.100
0.997	23.000	3.267	#####	1.367	229.667	27.000	127.000
0.135	17.238	0.983	414.285	0.281	78.882	9.952	37.704
0.164	3.739	0.571	155.492	0.213	44.526	5.145	22.409

COMPLAINANT'S
EX. NO. 21





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

NOV 8 2010

MEMORANDUM

SUBJECT: Addendum to Inspection Report dated September 23, 2010

FROM: Joe Heafner *SAH* 11/8/10
EFCB/ENSV

TO: Facility File

This is an addendum to the report of inspection for Moran Beef Feedlot that EPA conducted on September 23, 2010. The addendum presents all sample results including those that were not available at the time that the September 23, 2010 report was completed.

Table 1 represents the analytical data from the samples collected on September 23, 2010 (see attachments 1 and 2 for complete data transmittal packets).

Table 1: Analytical Results for Samples Collected During Inspection.

Parameter ¹	Site #1 5120-1	Site #2 5120-2	Site #3 5120-6	Site #4 5120-5
NH ₃ -N	0.570	3.88	0.1U ²	0.394
TKN	10.5	17.9	0.841	1.24
Total P	2.54	7.26	0.189	0.327
NFS	87.2	2740	4.0U ²	67.8
NO ₂ +NO ₃ -N	0.251	25.5	13.0	13.8
BOD	18	68	5	2
E. coli	>2500	>2500	>2500	>2500
pH	8.43	7.02	7.4	7.52
Temperature	23.0	18.6	19.5	19.3

¹Parameters are reported in milligrams per liter (mg/L)

²The analyte was not detected at or above the reporting limit.

Attachments

1. Data Transmittal Packet for Activity JAH1012 (11 pages)
2. Transmittal from Midwest Laboratories (3 pages)

**United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101**

Date: OCT 26 2010

Subject: Transmittal of Sample Analysis Results for ASR #: 5120

Project ID: JHMBFLCAFO

Project Description: Moran Beff- CAFO sampling

From: Michael F. Davis, Chief  10/27/10
Chemical Analysis and Response Branch, Environmental Services Division

To: Joe Heafner
ENSV/EFCB

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

ATTACHMENT 1 Page 1 of 11

Project Manager: Joe Heafner

Org: ENSV/EFCB

Phone: 913-551-7091

Project ID: JHMBFLCAFO

Project Desc: Moran Beff - CAFO sampling

Location: Underwood

State: Iowa

Program: Water Enforcement

Purpose: Enforcement

GPRA PRC: 501E49C

Moran Beef Feedlot CAFO sampling in Ireton, Iowa.

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

Units: Specific units in which results are reported.

___ = Field Sample

Deg C = Degrees Celsius

SU = Standard Units (pH)

mg/L = Milligrams per Liter

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.

U = The analyte was not detected at or above the reporting limit.

ASR Number: 5120

Sample Information Summary

10/26/2010

Project ID: JHMBFLCAFO Project Desc: Moran Beff - CAFO sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	___	Water	Effluent near NE corner of confinement barn		09/23/2010	13:45	09/23/2010	13:45	09/24/2010
2 -	___	Water	Outfall from confinement barn, collection basin		09/23/2010	14:05	09/23/2010	14:05	09/24/2010
5 -	___	Water	Upstream sample of unnamed Trib. to Mosquitto Creek		09/23/2010	14:15	09/23/2010	14:15	09/24/2010
6 -	___	Water	Downstream sample of unnamed Trib. to Mosquitto Creek		09/23/2010	14:10	09/23/2010	14:10	09/24/2010

ATTACHMENT 1 Page 3 of 11

Analysis Comments About Results For This Analysis

1 Ammonia in Water by Automated Distillation

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3133.1G

Samples: 1-__ 2-__ 5-__ 6-__

Comments:

1 NFS or Nonfilterable Solids

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.3E

Samples: 1-__ 2-__ 5-__ 6-__

Comments:

1 Nitrogen, Nitrate+Nitrite in Water

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3133.2H for acidified samples (for total NO3+NO2 analysis).

Samples: 1-__ 2-__ 5-__ 6-__

Comments:

1 pH of Water by Field Measurement

Lab: (Field Measurement)

Method: Measurement of field parameter

Samples: 1-__ 2-__ 5-__ 6-__

Comments:
(N/A)

1 Temperature of Water by Field Measurement

Lab: (Field Measurement)

Method: Measurement of field parameter

Samples: 1-__ 2-__ 5-__ 6-__

Comments:
(N/A)

ATTACHMENT 1 Page 4 of 11

1 Total Kjeldahl Nitrogen in Water Colorimetric

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

ASR Number: 5120

RLAB Approved Sample Analysis Results

10/26/2010

Project ID: JHMBFLCAFO

Project Desc: Moran Beff - CAFO sampling

Analysis/ Analyte	Units	1-__	2-__	5-__	6-__
1 Ammonia in Water by Automated Distillation Ammonia as Nitrogen	mg/L	0.570	3.88	0.1 U	0.394
1 NFS or Nonfilterable Solids Solids, nonfilterable	mg/L	87.2	2740	4.00 U	67.8
1 Nitrogen, Nitrate+Nitrite in Water Nitrate + Nitrite as Nitrogen	mg/L	0.251	25.5	13.0	13.8
1 pH of Water by Field Measurement pH	SU	8.43	7.02	7.52	7.4
1 Temperature of Water by Field Measurement Temperature	Deg C	23.0	18.6	19.3	19.5
1 Total Kjeldahl Nitrogen in Water Colorimetric Total Kjeldahl Nitrogen	mg/L	10.5	17.9	0.841	1.24
1 Total Phosphorus in Water, Colorimetric Phosphorus	mg/L	2.54	7.26	0.189	0.327

ATTACHMENT 1 Page 5 of 11

ASR Number: 5120

RLAB Approved Analysis Comments

10/26/2010

Project ID: JHMBFLCAFO Project Desc Moran Beff - CAFO sampling

Analysis	Comments About Results For This Analysis
----------	--

Method: EPA Region 7 RLAB Method 3133.3F

Samples: 1-__ 2-__ 5-__ 6-__

Comments:

(N/A)

1 Total Phosphorus in Water, Colorimetric

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3133.4E

Samples: 1-__ 2-__ 5-__ 6-__

Comments:

(N/A)

ATTACHMENT 1 Page 6 of 11

**CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII**

ACTIVITY LEADER (Print) Joe Heatner	NAME OF SURVEY OR ACTIVITY ASR 5120	DATE OF COLLECTION 23 / 7 / 10 <small>DAY MONTH YEAR</small>	SHEET 1 of 1
---	---	---	-------------------------------

SAMPLE NUMBER	TYPE OF CONTAINERS				VOA SET (2 VIALS EA)	SAMPLED MEDIA					RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	CUBITAINER	BOTTLE	BOTTLE	BOTTLE		water	soil	sediment	dust	other	
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
5120-1	2					X					
5120-2	2					X					
5120-5	2					X					
5120-6	2					X					
<div style="border: 2px solid black; border-radius: 50%; padding: 20px; display: inline-block;"> <p style="font-size: 2em; margin: 0;">Actual Complete</p> </div>											
						ATTACHMENT 1 Page 7 of 11					
Total 8						ATTACHMENT Page 8 of 11					
Ch. Temp. Recd. bet. 3.3. - 4.7°C											

DESCRIPTION OF SHIPMENT 8 PIECE(S) CONSISTING OF <u>X</u> BOX(ES) 1 ICE CHEST(S); OTHER _____	MODE OF SHIPMENT _____ COMMERCIAL CARRIER: _____ _____ COURIER <input checked="" type="checkbox"/> SAMPLER CONVEYED (SHIPPING DOCUMENT NUMBER) _____
---	--

PERSONNEL CUSTODY RECORD			
RELINQUISHED BY (SAMPLER) Joe Heatner <input checked="" type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	DATE 7/23/10	TIME 1930	RECEIVED BY Michael Balle <input checked="" type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED
9/24/10			
RELINQUISHED BY	DATE	TIME	RECEIVED BY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED
RELINQUISHED BY	DATE	TIME	RECEIVED BY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED

... ..

... ..

Sample Collection Field Sheet
 US EPA Region 7
 Kansas City, KS

ASR Number: 5120 Sample Number: 1 QC Code: ___ Matrix: Water Tag ID: 5120-1-___

Project ID: JHNWIACAFO SHMBFLCAFO **Project Manager:** Joe Heafner
Project Desc: CAFO sampling in Northwest Iowa Moran Beef
City: Various Underwood **State:** Iowa
Program: Water Enforcement

Location Desc: ~~Discharge of Effluent~~ near Effluent near NE corner of Confinement Barn
Storet ID: _____ **External Sample Number:** _____

Expected Conc (or Circle One: Low Medium High) **Date** **Time(24 hr)**
Latitude: _____ **Sample Collection: Start:** 09/23/2010 13:45
Longitude: _____ **End:** 09/23/2010 13:45

Field Measurement

Parameter	Value	Units
Temperature :	23.0	Deg C
pH :	8.43	SU

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	2 mL H2SO4/L	28 Days	1 Nitrogen, Nitrate+Nitrite in Water
1 - 1 Liter Cubitainer	4 Deg (2)	7 Days	1 NFS or Nonfilterable Solids
1 - 1 Liter Cubitainer	5 mL H2SO4/L	28 Days	1 Ammonia in Water by Automated Distillation
1 - 1 Liter Cubitainer	5mL H2SO4 to pH<2.5, 4 Deg C	28 Days	1 Total Kjeldahl Nitrogen in Water Colorimetric
1 - 1 Liter Cubitainer	5mL H2SO4 to pH<2.5, 4 Deg C	28 Days	1 Total Phosphorus in Water, Colorimetric

Sample Comments

(N/A)

BOD and E. coli samples conveyed to Midwest Labs in Omaha NE

ATTACHMENT 1 Page 8 of 11

Sample Collected By: Joe Heafner



...to ... spe? ... 2000/01/01

Sample Collection Field Sheet
 US EPA Region 7
 Kansas City, KS

ASR Number: 5120 Sample Number: 2 QC Code: ___ Matrix: Water Tag ID: 5120-2-___

Project ID: ~~JHNWIACAFO~~ ~~SHMBFLCAFO~~ **Project Manager:** Joe Heafner
Project Desc: ~~GAFO sampling in Northwest Iowa~~ Moran Beff
City: Various Underwood **State:** Iowa
Program: Water Enforcement

Location Desc: Outfall from Confinement Barn Collection Basin

Storet ID: _____ **External Sample Number:** _____

Expected Conc (or Circle One: Low Medium High) **Date** **Time(24 hr)**
Latitude: _____ **Sample Collection: Start:** 09/23/2010 14:05
Longitude: _____ **End:** 09/23/2010 14:05

Field Measurement

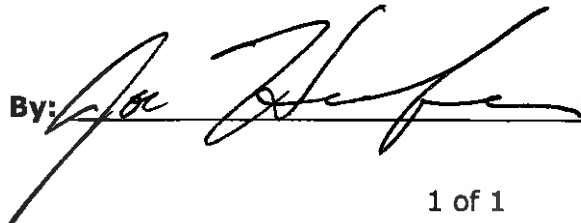
Parameter	Value	Units
Temperature :	<u>18.6</u>	Deg C
pH :	<u>7.02</u>	SU

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	2 mL H2SO4/L	28 Days	1 Nitrogen, Nitrate+Nitrite in Water
1 - 1 Liter Cubitainer	4 Deg (2)	7 Days	1 NFS or Nonfilterable Solids
1 - 1 Liter Cubitainer	5 mL H2SO4/L	28 Days	1 Ammonia in Water by Automated Distillation
1 - 1 Liter Cubitainer	5mL H2SO4 to pH<2.5, 4 Deg C	28 Days	1 Total Kjeldahl Nitrogen in Water Colorimetric
1 - 1 Liter Cubitainer	5mL H2SO4 to pH<2.5, 4 Deg C	28 Days	1 Total Phosphorus in Water, Colorimetric

Sample Comments

(N/A) BOD and E. coli samples conveyed to Midwest Labs in Omaha NE

Sample Collected By: 

...to ... are ...

Sample Collection Field Sheet
 US EPA Region 7
 Kansas City, KS

ASR Number: 5120 Sample Number: 5 QC Code: ___ Matrix: Water Tag ID: 5120-5-___

Project ID: ~~JHNWIACAFO~~ ~~JHMBFLCAFO~~ **Project Manager:** Joe Heafner
Project Desc: ~~GAFO~~ sampling in Northwest Iowa ~~Moran~~ ~~Beff~~
City: ~~Various~~ Underwood **State:** Iowa
Program: Water Enforcement

Location Desc: Upstream sample of Unnamed Trib. to Mosquito Creek
Storet ID: _____ **External Sample Number:** _____

Expected Conc (or Circle One: Low Medium High) **Date** **Time(24 hr)**
Latitude: _____ **Sample Collection: Start:** 09/23/2010 14:15
Longitude: _____ **End:** 09/23/2010 14:15

Field Measurement

Parameter	Value	Units
Temperature :	<u>17.3</u>	Deg C
pH :	<u>7.52</u>	SU

Laboratory Analyses:

2

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	2 mL H2SO4/L	28 Days	1 Nitrogen, Nitrate+Nitrite in Water
1 - 1 Liter Cubitainer	4 Deg <u>(2)</u>	7 Days	1 NFS or Nonfilterable Solids
1 - 1 Liter Cubitainer	5 mL H2SO4/L	28 Days	1 Ammonia in Water by Automated Distillation
1 - 1 Liter Cubitainer	5mL H2SO4 to pH<2.5, 4 Deg C	28 Days	1 Total Kjeldahl Nitrogen in Water Colorimetric
1 - 1 Liter Cubitainer	5mL H2SO4 to pH<2.5, 4 Deg C	28 Days	1 Total Phosphorus in Water, Colorimetric

Sample Comments

(N/A) BOD and E. coli samples conveyed to Midwest Labs in Omaha NE

ATTACHMENT 1 Page 10 of 11

Sample Collected By: Joe Heafner

Sample Collection Field Sheet
 US EPA Region 7
 Kansas City, KS

ASR Number: 5120 Sample Number: 6 QC Code: ___ Matrix: Water Tag ID: 5120-6-___

Project ID: ~~JHNWIACAFO~~ ~~JHMBFLCAFO~~ Project Manager: Joe Heafner
 Project Desc: ~~CAFO sampling in Northwest Iowa~~ Moran Belf
 City: ~~Various~~ Underwood State: Iowa
 Program: Water Enforcement

Location Desc: Down stream Sample of Unnamed Trib to Mosquito Creek

Storet ID: _____ External Sample Number: _____

Expected Conc _____ (or Circle One: Low Medium High) Date _____ Time(24 hr) _____

Latitude: _____ Sample Collection: Start: 09/23/2010 14:10

Longitude: _____ End: 09/23/2010 14:10

Field Measurement

Parameter

Value Units
 Temperature : 19.5 Deg C
 pH : 7.4 SU

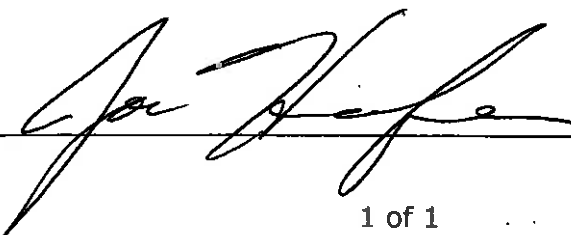
Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	2 mL H2SO4/L	28 Days	1 Nitrogen, Nitrate+Nitrite in Water
1 - 1 Liter Cubitainer	4 Deg <u>2</u>	7 Days	1 NFS or Nonfilterable Solids
1 - 1 Liter Cubitainer	5 mL H2SO4/L	28 Days	1 Ammonia in Water by Automated Distillation
1 - 1 Liter Cubitainer	5mL H2SO4 to pH<2.5, 4 Deg C	28 Days	1 Total Kjeldahl Nitrogen in Water Colorimetric
1 - 1 Liter Cubitainer	5mL H2SO4 to pH<2.5, 4 Deg C	28 Days	1 Total Phosphorus in Water, Colorimetric

Sample Comments

(N/A) BOD and E. coli samples conveyed to Midwest Labs in Omaha NE

ATTACHMENT 1 Page 11 of 11

Sample Collected By: 

10-11-1971

Report Number
10-272-2125

Page 1 of 2



13611 "B" Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121

www.midwestlabs.com

REPORT OF ANALYSIS

For: (25910) SAIC

(703)375-2287

Mail to:

SAIC
KATIE MERRIMAN/DAVID LARIT
12100 SUNSET HILLS ROAD MS 4-3
RESTON VA 20190

ASR 5021

Date Reported: 09/29/10
Date Received: 09/23/10

Lab number: 1762148

ATTACHMENT 2 Page 1 of 3

Analysis	Level Found	Units	Detection Limit	Method	Analyst-Date	Verified-Date
Sample ID: 5021-1 E coli Biochemical oxygen demand	> 2500	MPN/100 mL	1	IDEXX SM 9223B	clh-09/24	kej-09/28
Sample ID: 5021-2 E coli Biochemical oxygen demand	18	mg/L	2	SM 5210B	kkr-09/24	cmw-09/29
Sample ID: 5021-5 E coli Biochemical oxygen demand	> 2500	MPN/100 mL	1	IDEXX SM 9223B	clh-09/24	kej-09/28
Sample ID: 5021-6 E coli Biochemical oxygen demand	68	mg/L	2	SM 5210B	kkr-09/24	cmw-09/29
Sample ID: 5021-5 E coli Biochemical oxygen demand	1,200	MPN/100 mL	1	IDEXX SM 9223B	clh-09/24	kej-09/28
Sample ID: 5021-6 E coli Biochemical oxygen demand	2	mg/L	2	SM 5210B	kkr-09/24	cmw-09/29
Sample ID: 5021-6 E coli Biochemical oxygen demand	> 2500	MPN/100 mL	1	IDEXX SM 9223B	clh-09/24	kej-09/28
Sample ID: 5021-6 E coli Biochemical oxygen demand	5	mg/L	2	SM 5210B	kkr-09/24	cmw-09/29

Notes:

- *Sample was setup with 100 mL used in E coli determination. All the wells were positive for 3 of 4 samples. If high amounts were expected, we could have done dilutions to determine the exact #

For questions contact

Prem Arora
Environmental Project Manager
prema@midwestlabs.com (402)829-9878


The result(s) issued on this report only reflect the analysis of the sample(s) submitted. For applicable test parameters, Midwest Laboratories is in compliance with NELAP requirements. Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced in whole or in part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.

REASON FOR CHANGE OF CUSTODY	RECEIVED BY	TIME	DATE	RELINQUISHED BY	SEALING
					UNSEALED
					UNSEALED
	<i>Heathner</i>	1527	7/27/02	<i>Joe Heathner</i>	UNSEALED

PERSONNEL CUSTODY RECORD

DESCRIPTION OF SHIPMENT: PIECE(S) CONSISTING OF 1 BOX(ES)
 ICE CHEST(S); OTHER
 COMMERCIAL CARRIER: COURIER SAMPLER CONVEYED
 CONVEYED BY: *Midwest Logistics*
 (SHIPPING DOCUMENT NUMBER) *NR*

MODE OF SHIPMENT

1762148 - 1762151


HAND DELIVERED ON ICE



ENSV/RFCB
 901 North 5th Street
 Kansas City, Kansas 66101
 Phone: 913-551-7091
 Fax: 913-551-8699
 E-mail: heathner.joseph@epa.gov

U.S. Environmental Protection Agency
 Region 7, Kansas, Missouri, Iowa, Nebraska
Joe Heathner
 Life Scientist
 Environmental Services Division



SAMPLE NUMBER	TYPE OF CONTAINERS			NUMBERS OF CONTAINERS PER SAMPLE NUMBER				RECEIVING LABORATORY
	1L	2L	5L	VIA SET (2 VIALS EA)	BOTTLE	BOTTLE	OTHER	
5821-1	1			1				BDD C.C.I.
5821-2	1			1				
5821-5	1			1				
5821-6	1			1				

CONTENTS OF SHIPMENT

ACTIVITY LEADER (P/N): *Joe Heathner*
 NAME OF SURVEY OR ACTIVITY: *USE 0221*
 DATE OF COLLECTION: DAY *23* MONTH *02* YEAR *02*
 SHEET *1* of *1*

CHAIN OF CUSTODY RECORD ENVIRONMENTAL PROTECTION AGENCY REGION VII

09-23-10P04:02 RCVD

95910

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(s): See Header

NAME OF SURVEY OR ACTIVITY: ASR 5221 5122

DATE OF COLLECTION: 12/12/92

SHEET 1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	CUBITAINER	BOTTLE	BOTTLE	BOTTLE	NUMBERS OF CONTAINERS PER SAMPLE NUMBER				
					VOA SET (2 VIALS EA)	SOIL	sediment	dust	other
5120 52H	1L				1				
5120 51	1L				1				
5120 50	1L				1				
5120 49	1L				1				
5120 48	1L				1				
5120 47	1L				1				

RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
BAD 6021

↑

Project Managers #5 on
Transposed SAM
Samples 7/23/92

1-6/1 4/11

ATTACHMENT 2 Page 3 of 3

DESCRIPTION OF SHIPMENT

MODE OF SHIPMENT

PIECE(S) CONSISTING OF 1 BOX(ES)

ICE CHEST(S); OTHER _____

COMMERCIAL CARRIER: _____

COURIER _____

SAMPLER CONVEYED _____

(SHIPPING DOCUMENT NUMBER) 5122

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	SEALING	REASON FOR CHANGE OF CUSTODY
<u>[Signature]</u>	<u>12/12/92</u>	<u>15:37</u>	<u>[Signature]</u>	SEALING	
				UNSEALING	
				SEALING	
				UNSEALING	

COMPLAINANT'S
EX. NO. 22



IOWA DEPARTMENT OF NATURAL RESOURCES

**December 4, 2008
For immediate release**

- 1. Livestock producers who house animals both inside and out may need to apply for a permit**

LIVESTOCK PRODUCERS WHO HOUSE ANIMALS BOTH INSIDE AND OUT MAY NEED TO APPLY FOR A PERMIT

MEDIA CONTACT: Gene Tinker at (563) 927-2640 or gene.tinker@dnr.iowa.gov or Ken Hessenius at (712) 262-4177 or kenneth.hessenius@dnr.iowa.gov

DES MOINES – Animal producers, primarily beef and dairy producers, may need to act soon if they raise large numbers of the same kind of animals in both indoor and outdoor housing.

Based on industry input, the DNR estimates that there are less than 200 or 250 livestock operations that will need the permit. But, those who do, must act quickly. Producers who are affected must apply for a permit by Dec. 31, 2008.

The permit is called a national pollutant discharge elimination system permit (NPDES). Affected producers must apply for an NPDES permit to the DNR, develop and submit a nutrient management plan and determine how they will comply with any needed construction requirements – all by the end of the year.

Three tests can help producers decide if they need a permit:

1. Does their operation have any of the following:
 - a. 700 or more mature dairy cows, milked or dry?
 - b. 1,000 or more veal calves?

- c. 1,000 or more of all other cattle types? (For example, dairy producers raising replacement heifers and feeding out dairy steers would add both of these together to determine if they have 1,000 head.)
2. Does their operation discharge? Most Iowa producers who house animals outside have periodic runoff allowing manure components or process wastewater to reach a stream. In contrast, since Iowa confinement operations are not allowed to discharge, any discharges that occur are likely due to an accident or pipe failure and are in violation of state law.
3. How close are the different parts of their operation? Animals housed within 1,250 feet of each other would be added together.

Producers can call their DNR field office for more information and technical assistance. More information is available on the DNR Web site at www.iowadnr.com/afo/index.html under Current News.

The requirement comes about because of a state law that was passed to help Iowa producers comply with federal regulations.

The requirement to obtain an NPDES permit for combined open feedlot and confinement facilities is the result of State law passed in 2008 to help producers comply with federal regulations.

Writer: Karen Grimes

COMPLAINANT'S
EX. NO. 23





NPDES Permits

Determining if a Combination Open Feedlot and Animal Confinement Must Apply for an NPDES Permit in 2008

Act Now! — What to Do if You Need a Permit

Producers who need an NPDES permit must apply by Dec. 31, 2008. Producers who are affected must:

- submit a complete NPDES permit application,
- develop a nutrient management plan that involves soil sampling and public notice,
- decide on any needed construction and find an engineer

— all before the end of 2008

A new Iowa law requires a national permit for producers who house animals of the same type in both an open feedlot¹ (unroofed or partially roofed) and a confinement² (totally roofed). The permits are called national pollutant discharge elimination system or NPDES permits. Producers may also need a construction permit to make changes to their operation.

Open Feedlot, including cow yards

Unroofed or partially roofed area where livestock or poultry are confined for more than 45 days out of any 12-month period.

Confinement Totally roofed area where livestock or poultry are confined for more than 45 days out of any 12-month period.

Animal Feeding Operation: A lot or facility where (1) animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and (2) crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility. 40 Code of Federal Regulations (CFR) 122.23 (b)(1)

In the past, Iowa law required producers to count animals that were housed in the same type of housing to determine if a permit was needed. Now producers must count animals together if the same types of animals are in different housing types. The change occurred when the state legislature passed a law in the spring of 2008 to bring state law into agreement with existing federal law. If affected, producers

must develop and submit the permit applications to the Department of Natural Resources by Dec. 31, 2008. Producers who need a permit will also need to modify their operations in most cases.

Who is Affected

The new law applies to animal feeding operations² and large livestock markets, not to cow-calf operations on pasture. It applies to producers who own or manage the

animals, not to two entirely separate owners with facilities located close to each other.

Answering three questions should tell you if you need a permit. Those questions are: 1) How far apart are the different components of my operation? 2) How many animals do I have of the same type? 3) Does my operation allow manure, manure-laden runoff or process wastewater (such as bedding or feedstuffs runoff) to reach Iowa waters?

1) The Department of Natural Resources is proposing that producers who own or manage two or more facilities with the same animal type within 1,250 feet of each other would combine the number of animals in each facility to determine if they need a permit.¹

2) Until that distance is finalized, check the table below to determine if you have enough animals of one type (regardless of housing) to require a permit. For example, if you have mature dairy cows with 400 cows housed in a barn and 350 that are in an open lot (cow yard), you would add the animals together in both housing types to get a total of 750 mature dairy cows. Because 750 mature dairy cows are equal to or more than the 700 listed in the table,

Minimum Number and Type of Animals that Require a Permit

Type of Animal	Number of Head
Mature Dairy Cows, milked or dry	700
Veal Calves	1,000
All Other Cattle (beef or dairy steers, heifers or bulls; cow/calf pairs)	1,000
Swine (55 lbs or more)	2,500
Swine (less than 55 lbs.)	10,000
Horses	500
Sheep or Lambs	10,000
Turkeys	55,000
Laying hens or broilers (liquid manure handling system)	30,000
Laying hens (other manure handling system)	82,000
Chickens (other than laying hens) (other manure handling system)	125,000

1. It's important to note that the distance between facilities has not been finalized until the DNR passes rules. Consequently, the distance between two facilities that would need to be counted as one could change before the rules are finalized.
2. Definitions given here are paraphrased. For complete definitions, see Chapter 65 in the Iowa Administrative Code. Also see the state and federal definitions for "animal feeding operations." Federal definitions can be found in EPA's Producer's Guide to Compliance (website listed on back).

you could potentially be affected, depending upon how far apart the barn and the partially roofed area are from each other. Generally a mature dairy cow is any cow that has been milked or had her first calf.

For producers with other cattle types, virtually any combination of 1,000 cattle (other than mature dairy cows or veal calves which are separate types) would require a permit. For example, 750 beef steers outside plus 300 dairy heifers inside, would equal 1,050 cattle and need a permit. For producers with swine, 2,500 finishers weighing 55 pounds or more split between outside and inside housing would require an NPDES permit.

Producers who have less animals, but whose operations meet one of the following may also be required to apply for an NPDES permit:

1. A man-made ditch, pipe or similar device carries manure or process wastewater from the operation to surface water, or
2. The animals come into contact with surface water that runs through the area where they're confined.

3) Finally, if your operation discharges manure or runoff, including process wastewater, from the open feedlot area that reaches Iowa waters, you will need to apply for an NPDES permit. Process wastewater includes bedding, feedstuff runoff and silage piles. Almost all feedlots in Iowa discharge, but if you're not certain about yours, ask yourself if it discharged or had runoff that reached a creek this year, especially during the spring thaw. Or, next time it rains, check below the open lot or cow yard area to see if the runoff will potentially reach a stream.

Timeline for NPDES Permits

1. Decide if it applies to your operation.
2. Evaluate your operation and make needed management decisions. For example, if you have 650 mature dairy cows inside and 50 dry cows outside, you may want to consider bringing the 50 dry cows into a hoop building or other confinement. Since confinements are not allowed to discharge, an NPDES permit would not be needed unless a discharge occurred. However, you still need to submit a preliminary plan (Step 5) and a construction permit for the confinement would be needed.)
3. Collect soil samples this fall on fields that will receive manure applications, and have soils tested for use in a Nutrient Management Plan.
4. Develop and submit a Nutrient Management Plan to the Iowa Department of Natural Resources or combine an existing Manure Management Plan with a new Nutrient Management Plan. Plans can be developed by producers or hired consultants.
5. Provide an engineer's name and develop a preliminary plan indicating how you will comply with state and federal requirements. The plan should include a proposed schedule for completing the project.
6. Provide proof of public notice for the Nutrient Management Plan.
7. Submit a complete NPDES application by Dec. 31, 2008, including the application fee and items 4, 5 and 6 listed above, to the DNR at 502 East Ninth St., Des Moines, IA 50319.

More information:

If you decide that your operation will need an NPDES permit, more information is available on the DNR Web site at www.iowadnr.gov under Animal Feeding Operations.

Most Iowa open feedlots will need some construction to bring them into compliance with federal laws. Producers can find forms, too, at www.iowadnr.gov/af/. Choose the following forms to apply for an NPDES permit (form number 542-4001), to write a Nutrient Management Plan (542-2021) or to apply for a construction permit (542-1427).

A list of engineers and nutrient planners can be found on the Iowa Manure Management Action Group's website at <http://www.agronext.iastate.edu/immag/sp.html>.

See the National Cattlemen's Beef Association or the EPA's Web sites for more information about discharges and the federal rules: <http://www.beefusa.org/goveCAFORule.aspx> or http://cfpub.epa.gov/npdes/home.cfm?program_id=7.

More information about federal regulations can be found in Chapter 3 of the U.S. Environmental Protection Agency's Producer Compliance Guide for CAFOs at <http://cfpub.epa.gov/npdes/af/compliance.cfm>.

Recent state law requirements can be found in House File 2700, Division 8, Animal Feeding, Section 143 to 148; or on p. 19, line 6, etc., of the Senate Amendment 5464; or at <http://coolice.legis.state.ia.us/Cool-ICE/default.asp?Category=BillInfo&Service=BillBook&hbill=S5464&ga=82>. Existing rules and definitions can be found in Chapter 65 of the Iowa Administrative Code http://search.legis.state.ia.us/IXT/gateway.dll/IowaState/iac_5/a567/iac_a567_c65v20.pdf.

Additional Help

Help is available at regional DNR Environmental Services field offices, located in the following areas:

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|---|----------------|
| • Northeast Iowa, Manchester | (563) 927-2640 |
| • North Central Iowa, Mason City | (641) 424-4073 |
| • Northwest Iowa, Spencer | (712) 262-4177 |
| • Southwest Iowa, Atlantic | (712) 243-1934 |
| • South Central Iowa, Des Moines | (515) 725-0268 |
| • Southeast Iowa, Washington | (319) 653-2135 |
| • Ken Hassenius, DNR field office supervisor, Spencer | (712) 262-4177 |