



Scoping Document

GENERIC ENVIRONMENTAL IMPACT
STATEMENT ON ANIMAL AGRICULTURE



ENVIRONMENTAL
QUALITY BOARD

DECEMBER 1998

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DECEMBER 1998

Background

The Generic Environmental Impact Statement or “GEIS” on Animal Agriculture is a statewide study authorized and funded by the 1998 Minnesota Legislature and ordered by the Environmental Quality Board or “EQB.” The Legislation directs the EQB to “...examine the long-term effects of the livestock industry, as it exists and as it is changing, on the economy, environment and way of life of Minnesota and its citizens.”

The need for the study grows out of the recent controversy surrounding feedlots in Minnesota. This statewide study is intended to provide Minnesotans with objective information and give them the opportunity to express their opinions and weigh future policy options. The GEIS is intended to provide a full public examination of environmental, economic, health and social factors surrounding animal agriculture.

The GEIS project consists of three main phases during the proposed project period, Summer 1998 through the Year 2000:

- **Project Scope (June – December 1998):** The first phase of work was aimed at determining specific topics to include in the statewide study on animal agriculture.
- **Draft Study (1999):** The second phase of work is the study and analysis of the identified topics and the different paths or alternatives that animal agriculture could take in Minnesota.
- **Final Report (2000):** The third phase is preparation of the final GEIS document including recommendations for future policymakers.

“The success of the final GEIS on Animal Agriculture will be measured by how well it educates and informs government officials, project proposers and the public on animal agriculture and by the extent to which the information is reflected in future decisions and policy initiatives made or enacted by Minnesota state and local governments.”

The actual GEIS project time schedule will depend on how long it takes to research the identified topics and to build consensus on the meaning of

the research results and the GEIS recommendations for future policymakers.

All GEIS study phases will involve input from a Citizen Advisory Committee or “CAC” and the general public. The 1998 legislation directed the EQB to establish a committee consisting of the livestock industry, environmental interests, and other stakeholder groups for the GEIS study. The EQB appointed a 25-member CAC to provide advice on the scope and content of the GEIS.

The success of the final GEIS on Animal Agriculture will be measured by how well it educates and informs government officials, project proposers and the public on animal agriculture and by the extent to which the information is reflected in future decisions and policy initiatives made or enacted by Minnesota state and local governments.

Explanation of this scoping document

This scoping document outlines what topics will be addressed in the GEIS on Animal Agriculture as well as proposed study goals and objectives and an overall study framework.

The scoping document is based on extensive public input during the period June 1998 – December 1998. The EQB sponsored a series of six public pre-scoping meetings in July 1998 to get initial public input on the question “What topics should be included in this statewide study on animal agriculture?” Approximately 800 people attended the public meetings in Rochester, St. Cloud, Marshall, North Mankato, Thief River Falls, and Fergus Falls. Approximately 250 people provided oral comment. Another 150 people submitted written comments to the EQB.

The CAC, using these initial public comments as a foundation, developed draft recommendations in August – September on what topics of concern to include in a draft GEIS scoping document. The EQB adopted the CAC’s recommendations on the draft scoping document on September 30, 1998. The draft scoping document was made available for public review and comment during the period October 5 – November 9, 1998.

CITIZEN ADVISORY COMMITTEE

A 25-member advisory committee provides advice to the EQB on the statewide study on animal agriculture in Minnesota.

Ken Albrecht, retired farmer, North Mankato

Gary Allen, Gar-Lin Dairy Farms, Inc., Eyota

Brian Buhr, University of Minnesota,
Department of Applied Economics

Paul Christ, Minnesota Agri-Growth Council,
Arden Hills

Robert Ferguson, Jackson County
commissioner, Heron Lake

Amy Fredregill, Izaak Walton League, St. Paul

Troy Gilchrist, Minnesota Association of
Townships, St. Michael

Roger Gilland, Cattleman's Association, Morgan

Fraser Hart, University of Minnesota,
Geography Department

Ed Hegland, Minnesota Soybean Growers
Association, Appleton

Patricia Henderson, University of Minnesota,
Endowed Chair Agricultural Systems

John Holck, Minnesota Pollution Control
Agency, St. Paul

Galen Lisell, farmer, Roseau

Suzanne McIntosh, Clean Water Action
Alliance, Minneapolis

Helen Palmer, League of Women Voters,
Rochester

Donna Peterson, Minnesota Lakes Association,
Richville

Dave Preisler, Minnesota Pork Producers
Association, North Mankato

George Raab, The Turkey Store Company,
Faribault

Chris Radatz, Minnesota Farm Bureau, St. Paul

Tina Rosenstein, Environmental Services
Department, Nicollet County

Mark Schultz, Land Stewardship Project,
Minneapolis

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Environmental Advocacy, St. Paul

Harold Stanislawski, Minnesota Department of
Agriculture, Fergus Falls

Andy Steensma, Minnesota Farmers Union,
St. Paul

Tim Tracy, Farm Credit Services of Southern
Minnesota, Mankato

Facilitator: **Sue Laxdal**, Management Analysis
Division, State of Minnesota

Minnesotans were invited to comment on the adequacy of the draft scoping document at a series of six public meetings in Thief River Falls, Morris, Cold Spring, Marshall, North Mankato and Rochester. Approximately 300 individuals attended these meetings. Approximately 70 of the attendees provided oral comment. Another 60 people submitted written comments on the draft scoping document to the EQB.

EQB staff, working with the CAC, reviewed the public input and state agency input on the draft scoping document along with rough budget estimates developed by EQB staff with help from technical experts. The CAC, at its meeting on December 4, 1998, agreed to forward its recommendations for the final GEIS scoping document to the EQB. The EQB adopted this final scoping document on December 17, 1998.

Study goals and objectives

The overall goal of the GEIS is to help the State of Minnesota understand the issues and controversy surrounding animal agriculture. Toward this overall study goal, the statewide study on animal agriculture has the following broad study objectives:

- Develop a basic understanding of animal agriculture in Minnesota.
- Identify and assess the environmental, economic, health and social impacts — both positive and negative — associated with animal agriculture as it exists and as it may change, with particular emphasis given to any cumulative effects in the state.
- Identify alternative paths for animal agriculture (including the current path) that can optimize the benefits of animal agriculture in relation to the environment, economy, health and way of life in the state with particular emphasis on sustainability.
- Seek consensus on the path(s) that Minnesota should strive for related to animal agriculture and, as appropriate, develop the recommendations needed to move the state in these desired direction(s).

“The overall goal of the GEIS is to help the State of Minnesota understand the issues and controversy surrounding animal agriculture.”

Study framework

The EQB will use a five-step study approach for the GEIS on Animal Agriculture. The five steps are interrelated and some will likely occur concurrently rather than sequentially.

Step 1: Understand what animal agriculture is in Minnesota as well as how and why it has developed in the way it has developed over time. This step will involve the initial literature review, some limited data analysis and an inventory of animal agriculture production facilities.

Step 2: Identify the current and potential alternative paths for animal agriculture. Alternatives might incorporate different sizes and types of farming operations, different types of farm ownership, different animal types, different degrees of access to buyers, different degree of access to money and different facility densities. This step is expected to take place after the initial literature review is underway but before full data analysis begins on the hypothesized economic, environmental, health and social impacts of the alternatives.

Step 3: Analyze the environmental, economic, health and social impacts of the identified alternatives. This step will follow the initial literature review and at least part of the inventory work. Particular emphasis will be given to any cumulative impacts of animal agriculture in the state and on the sustainability of different alternatives. Analysis might involve more in-depth literature review, analysis of existing data or, in some cases, new data collection and analysis.

Step 4: Compare the different alternatives. This step will follow the literature review and the development of alternatives. Additional literature review and data analysis may be needed to complete this step.

Step 5: Develop recommendations.

Beginning in January 1999, the EQB will conduct an initial literature review on the 12 topics identified in this scoping document. The EQB will, at the same time, initiate and conduct an inventory of animal agriculture production facilities that is appropriate for the GEIS study. The exact purpose and nature of the feedlot inventory will be determined by the EQB with CAC input. The EQB will coordinate the feedlot inventory with existing data sources and with any planned and related data collection efforts.

The launch of a literature review and inventory launch will enable the EQB to develop an initial workplan for the GEIS study and analysis phase. The initial workplan will clarify study topics that require further analysis and related budget estimates.

“The EQB will prepare a draft GEIS that will be available for public comment in the Year 2000.”

The EQB will, with guidance from the CAC, retain the resources required to conduct the study and analysis required to complete the GEIS. Further, the EQB will seek the views of the CAC regarding the acceptability of the results of any study and analysis work.

The EQB will prepare a draft GEIS that will be available for public comment in the Year 2000. EQB staff will work with the CAC to review the public input and to conduct further study and analysis as appropriate for consideration in the final document. An EQB decision to issue a final GEIS on Animal Agriculture is expected in the Year 2000.

Topics of concern

The EQB recommends that 12 topics of concern be studied as part of the GEIS on Animal Agriculture.

Specific study questions are included under each topic for clarification purposes. Topics are clearly interrelated and will be treated as such during the GEIS study and analysis phase. The chart at the end of this section summarizes the topics and study questions.

Inclusion of a topic in this scoping document is a commitment by the EQB to conduct an initial literature review on the topic. These questions are worded to reflect EQB's understanding of the issues at this point in time. Questions may be clarified as the study progresses through the study and analysis phase. Research will focus on Minnesota and may, with EQB and CAC input, include a focus on other states and countries. Whether an issue will receive attention beyond the initial literature review will be dependent on the results of the initial literature review, the adequacy of the information available, cost, time, the subsequent EQB decisions regarding the study topic, and, ultimately, continued legislative support and project funding. The citizen advisory committee will provide advice and guidance to the EQB on these ongoing study decisions.

“Whether an issue will receive attention beyond the initial literature review will be dependent on the results of the initial literature review, the adequacy of the information available, cost, time, the subsequent EQB decisions regarding the study topic, and, ultimately, continued legislative support and project funding.”

The EQB will develop an initial workplan for the study and analysis phase once the initial literature review is underway and the EQB, working with the CAC, has determined what additional analysis is needed on study topics. Topics that have been identified for further examination by the EQB will be described in the initial workplan. The initial workplan is expected to be available in the first quarter of 1999.

The final GEIS document will include discussion of the literature review and/or analysis on all of these 12 topics. Where it is determined that a particular issue cannot be sufficiently analyzed within the proposed study timeline, the GEIS will identify future research necessary to obtain this information.

I. Social topics

A. SOCIAL / COMMUNITY

This topic addresses the relationships between animal agriculture and the way in which people live, work, relate to one another, organize to meet their needs, and generally cope as members of society.

1. What is the relation between different types of animal agriculture production systems and the following social elements:
 - a. demographics (racial and ethnic distribution, residential stability, residency);
 - b. community and institutional factors (size and structure of local government, linkages between levels of government, voluntary and other local associations, employment and income characteristics, and opportunities for new wealth);
 - c. political and social resources (distribution of power and authority, leadership, channels of complaint response and redress, changes in the way stakeholder groups are identified, and ownership patterns);
 - d. individual and family changes (perceptions of personal risk to health and safety, trust in institutions, friendships and family relations, attitudes about social well-being, job satisfaction, neighborhood identity and neighborliness, community involvement, enjoyment of property, and attitudes toward cultural diversity);
 - e. community resources (housing, public services, natural resources and land use, historical and cultural resources);
 - f. social capital (the ability of people to respond to difficulty, the ability of people to work together to find solutions to problems, and trust between community members);
 - g. quality of life?

2. What is the relation between changes in the ownership, control and legal structure in the animal agriculture industry and how do these changes affect the way that stakeholders are identified, the way the affected public is responded to, or the benefits that accrue to the local community?

3. What is the relation between animal agriculture production systems and consumer and citizen attitudes with respect to:

- a. quality of animal products and food safety;
- b. treatment of animals and ethics;
- c. consumer need to know about their food supply; and
- d. consumer demand and willingness to pay for food as well as externalities that may result from production of animal products?

4. What mechanisms are available for producers and their neighbors to resolve perceived problems related to animal agriculture in their communities and how effective are these mechanisms?

B. LAND USE

This topic addresses potential conflicts caused by the proximity of livestock raising and non-farm uses of land such as housing development and the recreational use of resources. It also addresses how these conflicts can be potentially addressed with land use planning and zoning.

1. What are the current land use conflicts associated with animal agriculture in Minnesota including conflicts with the use of resources for recreation and tourism and land for housing and urban development?

2. What zoning and land use planning strategies exist, to what extent are they in place in Minnesota, and are they effective in:

- a. addressing the identified land use conflicts (see #1);
- b. promoting citizen participation;
- c. identifying and promoting the best uses of the land;
- d. addressing development pressures in agricultural areas;
- e. reducing negative environmental, economic, health and social impacts of animal agriculture; and
- f. balancing property rights?

3. What are the costs and benefits of these different land use strategies?

C. ROLE OF GOVERNMENT

This topic is aimed at understanding the role of all levels of government — federal, state, county, township — related to animal agriculture and the specific government regulations, policies and programs that are currently in place and effective in achieving desired goals.

1. What are the government policies and programs directed at animal agriculture and human health as it is impacted by animal agriculture in Minnesota and other places including regulation, financial assistance, technical assistance and education or other incentives, and how effective are these actions in mitigating problems or encouraging desired outcomes?

2. How, and to what extent, do the government actions and policies of the past, present and future affect animal agriculture relating to economics, profitability, size, and location?

3. How are public funds for animal agriculture research, education and training currently allocated in Minnesota and how does the allocation of these funds impact the development of animal agriculture and Minnesota citizens as a whole?

4. What are the implications of regulating animal agriculture at the township, county, state and federal levels?

II. *Economic topics*

D. INDUSTRY STRUCTURE AND COMPETITIVENESS

This topic covers the dimensions of the Minnesota livestock industry, including the numbers, locations, and nature of feedlots; the business structures used by livestock operations; the ownership and control of livestock operations; the present market situation; and the competitiveness of Minnesota livestock producers in national and international markets.

1. What choices of business organization are available to livestock producers in Minnesota and in other states? To what degree are livestock producers allowed to operate agricultural systems interdependently as opposed to independently in Minnesota and in other states and what is the significance?

2. With respect to the following factors, what is the current situation in the Minnesota livestock industry, what are the changes taking place, why are the changes occurring, and what are their implications:
 - a. geographic distribution;
 - b. size of enterprise;
 - c. type of business organization and degree of vertical integration or coordination; and
 - d. competitiveness in national and international markets?

3. How are livestock businesses different from and similar to non-agricultural businesses with respect to the following factors, and what are the implications of these differences:
 - a. location;
 - b. technology employed;
 - c. business concentration;
 - d. use of land as a resource;
 - e. patterns of ownership and control;
 - f. government regulation and assistance, including financial and technical assistance and exemptions from legal requirements; and
 - g. public perceptions?

4. What is the current market situation, how is the market changing and what are the implications for livestock producers with respect to the following factors:
 - a. consumer demand (including brand loyalty);
 - b. concentration of buyers;
 - c. contractual buying and selling arrangements;
 - d. access to markets;
 - e. terms of trade;
 - f. price discovery and market fairness;
 - g. access to inputs, such as credit and genetics; and
 - h. lending practices?

5. What is the current situation and what are the changes taking place in the ownership and control of livestock in Minnesota:
 - a. who owns the livestock and livestock facilities and what is the significance;
 - b. what are the current trends in type of ownership by animal species, facility size and regional location;
 - c. what legal and business structures are used; and
 - d. who makes the decisions over the practices of livestock operations of different kinds in Minnesota (owners vs. renters)?

6. What motivates livestock producers and processors to start, continue, expand, and quit business? What are the characteristics of those starting, continuing, expanding, and quitting?

E. PROFITABILITY AND ECONOMIC VIABILITY

This topic covers the profitability and overall economic viability of both livestock farms and livestock processing firms including how they are affected by such factors as economies of scale, production methods, marketing arrangements, and government policies and programs.

1. What are the economies of scale (including diseconomies) related to livestock raising, and what are the implications for size and type of production system?

2. How is the profitability and economic viability of farms and firms affected by different production and marketing arrangements? What are the comparative internal economic costs and benefits of various livestock production systems?

3. How do government policies, regulations and programs affect the profitability and viability of livestock farms and firms in Minnesota? How do governmental policies in other states and countries differ from those in Minnesota with respect to their impacts on farm/firm profitability and viability in those places, and what can we learn from their experiences?

F. EXTERNAL BENEFITS AND COSTS

This area focuses on the positive and negative economic effects of animal agriculture on other industries and businesses, communities and on the state as a whole.

1. What are the overall economic benefits of animal agriculture (from all sources, including spin-off economic activity)? How do the benefits vary by type of production method, size, and location of operation and the animal population and density in the area? Factors to be considered include:
 - a. wages;
 - b. value added to crop prices;
 - c. purchases of supplies;
 - d. property values;
 - e. tax base; and
 - f. other relevant factors?

2. How are the economic benefits (from #1) distributed locally (between owners, operators, employees, neighbors, and others) and in the state economy?

3. What are the overall economic costs due to the effects of animal agriculture on other segments of the economy, the environment, health, and the community? How do those costs vary by the type of production method, size, and location of operation, and the animal population and density?

Factors to be considered include:

- a. tourism and recreational businesses;
- b. public roads and other costs to government;
- c. pollution of air, water, and soil;
- d. wages;
- e. property values;
- f. tax base; and
- g. other relevant factors?

4. How are the economic costs (from #3) distributed locally (between owners, operators, employees, neighbors, and others) and throughout the state?

III. *Environmental topics*

G. WATER

This topic addresses pollution impacts and risks to ground and surface waters, how use is affected, how effects vary by system and location, what mitigation is available, and how animal agriculture compares as a water pollution source to other major sources of water pollution. It also addresses water quantity issues associated with the use of water for livestock.

1. To what extent are groundwater and surface water affected by or at risk from animal manure storage, handling, and application?
2. How do the effects or risks (from #1) affect the use of water by humans for drinking, recreation and other purposes?
3. How do the effects or risks (from #1) affect fish and wildlife (such as fish kills due to pollution)?
4. What are the health risks to humans from contamination of ground and surface waters from animal manure storage, handling, and application?
5. To what extent are surface waters affected by or at risk from allowing pastured animals (primarily cattle) access to surface waters?
6. How do the various impacts in #1 to #5 vary by species, operation, system type, management, geography, geology, watershed characteristics, and concentration of livestock facilities?

7. What are the current and potentially available best management practices and mitigation technologies to prevent against ground and surface water pollution from manure storage, handling, and application and to what extent are they effective?

8. To what extent does Minnesota animal agriculture contribute to the hypoxia problem in the Gulf of Mexico?

9. What is the impact of animal agriculture on water quantity and availability (sustainability of water supply)? How does the use of water by animal agriculture compare with that of other industries in Minnesota?

10. How does animal manure compare to other types of wastes produced in Minnesota as a source of water pollution?

H. AIR QUALITY & ODOR

This topic addresses all types of air emissions from animal agriculture, their effects on the environment and health, how the emissions vary by system type, what mitigation is available, and what monitoring and modeling techniques and standards are available.

1. What are the types, quantities, and concentrations of air emissions, including airborne microbial contaminants, from different types of livestock facilities and what are the resulting impacts on the environment?
2. What are the health risks from animal agricultural emissions on neighbors, facility workers, and the animals?
3. How do the various impacts in #1 and #2 vary by species, operation, system type, management, geography, and concentration of livestock facilities?
4. What are the current and potentially available mitigation measures and technologies for dealing with livestock-related gases, odors, and other airborne emissions, and to what extent are they effective?
5. What monitoring techniques, modeling approaches, and standards are available to detect, measure, and regulate all types of airborne emissions from livestock operations and facilities? How can we judge the validity of each?

I. SOILS

This topic deals with the effects of manure application and livestock production on properties of the soil.

1. How are the following properties of soil affected by manure application and livestock production systems:

- a. moisture holding capacity;
- b. soil tilth;
- c. air incorporation;
- d. erosion potential;
- e. biological activity;
- f. structure and density;
- g. weed content; and
- h. productivity?

J. MANURE AND CROP NUTRIENTS

This topic covers current manure storage and application practices, the benefits and risks of manure in comparison to other sources of crop nutrients, the carrying capacity of soils to absorb nutrients and toxic substances and the current levels of such substances in soils, and comparison of management practices.

1. What manure storage and application practices are in current use in Minnesota and how do they compare to the practices in use in the past? To what extent do the current practices adhere to existing requirements?
2. To what extent is manure an asset or liability to the environment, community, and the economy? What are the comparative benefits and risks of manure compared to commercial fertilizer and other sources of fertility (such as legumes and sewage sludge) including comparative energy use, and how does the comparison vary according to geography and geology and by manure management method?
3. What is the carrying capacity of the soils in the agricultural areas of Minnesota for the nutrients and toxic substances contained in manures? What are the current levels of those substances in the soils in agricultural areas of Minnesota (including phosphorus and trace metals)?
4. What is the total amount and proportion of plant nutrients applied to soils in Minnesota from:
 - a. animal manures;

- b. commercial fertilizers;
- c. legumes;
- d. plant decomposition;
- e. sewage sludge; and
- f. atmospheric deposition?

5. Which management, construction, storage, and application techniques in Minnesota and other places maximize the positive and minimize the negative impacts of manure?

IV. Health topics

K. HUMAN HEALTH

This topic area addresses the health and well being of people exposed through various paths to toxins and pathogens from livestock production.

1. What are the current regulations and routine practices in place in Minnesota and other places related to animal agriculture production that are aimed at the protection of human health? What is known about the use of these practices, or in the case of regulation, what is known about compliance? What is known about the effectiveness of the regulations and practices?
2. What are the human health effects and associated risks of different types of animal agriculture giving consideration to:
 - a. use of antibiotics, heavy metals, and other chemicals in livestock production;
 - b. transmission of gases, dust, odors, pathogens and nutrients through the air, water and soil;
 - c. transmission of disease and sickness via manure, flies, dead animal carcasses and other animal waste bi-products;
 - d. transmission of disease and sickness through consumption of animal products;
 - e. safety and wholesomeness of the food supply?
3. How do these human health effects and associated risks vary by segment of the population including: workers, neighbors, animal product consumers, the elderly, the ill, pregnant women and young children?
4. How do the human health effects vary by species, operation, system type, management, geography, and concentration of livestock facilities?

TOPICS OF CONCERN

I. SOCIAL			II. ECONOMIC			III. ENVIRONMENTAL				IV. HEALTH	
A. Social/ community	B. Land use	C. Role of government	D. Industry structure & competitive- ness	E. Profitability & economic viability	F. External benefits & costs	G. Water	H. Air quality and odor	I. Soils	J. Manure and crop nutrients	K. Human health	L. Animal health
Relation of operation type & social elements	Land use conflicts	Existing government programs	Business organization	Economies of size & scale	Economic benefits	Surface and ground water quality impacts	Air emissions & impacts	Impacts on soil quality	Manure practices	Current regulations and practices	Current regulations and practices
Ownership & control	Land use strategies	Effects of government policies	Livestock industry changes	Profitability of different production & marketing methods	Distribution of benefits	Effects on use for drinking, recreation & other purposes	Health risks		Manure benefits and impacts	Health & nutrition effects	Effects on animal health and well-being
Consumer and citizen attitudes	Costs & benefits	Role of public funds	Differences/ similarities to other businesses	Effect of government policies	Economic costs	Effects on fish & wildlife	Variation by operation type and location		Carrying capacity of soils	Risks to population segments	Variation by operation type
Problem solving mechanisms		Role of different levels of government	Livestock market situation		Distribution of costs	Health risks	Mitigation		Comparison to other nutrient sources	Variation by operation type and location	Measurement and standards
			Ownership, business structure & control of operations			Impacts of pasturing	Monitoring, modeling & standards		Assessment of practices	Measurement and standards	Prevention & mitigation
			Motivations of producers and processors			Variations by operation type & location				Prevention & mitigation	
						Mitigation					
						Hypoxia					
						Quantity and withdrawal					
						Comparison to other waste sources					

5. What monitoring techniques, modeling approaches, and standards are available and in use in Minnesota as well as other places to detect and measure for the existence of these human health effects and how can we judge the validity of each?

6. What are the current and potentially available prevention and mitigation measures that are available to producers, workers and neighbors for addressing these effects and to what extent are these effective?

L. ANIMAL HEALTH

This topic area addresses the health and well being of animals in the livestock production system.

1. What are the current regulations and routine practices in Minnesota and other places relating to animal agriculture that are aimed at the health and well being of animals? What is known about the use of these practices, or in the case of regulation, what is known about compliance?

2. What are the effects of the animal agriculture system on animal health and well-being and how are these effects being measured and addressed, including consideration of:

- a. antibiotic use;
- b. disease and sickness;
- c. indoor confinement and animal density;
- d. air quality in confinement facilities;
- e. use of manure as feed?

3. How do the effects (in #2) vary by species, operation, system type and management practice?

4. What monitoring techniques and standards are available to determine and address the effects on animals in Minnesota and other places?

5. What are the current and potentially available prevention and mitigation measures for addressing any negative effects on animal health and well-being in Minnesota and other places and to what extent are these measures effective?

Glossary

Definitions are included for clarification purposes only. This glossary is not a listing of official definitions.

Animal feedlot A lot or building or combination of lots and buildings intended for the confined feeding, breeding, raising, or holding of animals and specifically designed as a confinement area in which manure may accumulate or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. For purposes of these parts, open lots used for the feeding and rearing of poultry shall be considered to be animal feedlots. Pastures shall not be considered animal feedlots.

Animal unit A unit of measure used to compare differences in production of animal manures that employs as a standard the amount of manure produced on a regular basis by a slaughter steer or heifer. The following equivalents shall apply: one mature dairy cow, 1.4 animal unit; one slaughter steer or heifer, 1.0 animal unit; one horse, 1.0 animal unit; one swine over 55 pounds, 0.4 animal unit; one sheep, 0.1 animal unit; one swine under 55 pounds, 0.05 animal unit; one turkey, 0.018 animal unit; one chicken, 0.01 animal unit. For animals not listed, the number of animal units shall be defined as the average weight of the animal divided by 1,000 pounds.

Aquifer A natural geologic formation that yields useful amounts of water.

Atmospheric deposition The process by which materials held in the atmosphere move to the earth's surface, including precipitation, particles, aerosols and gases.

BMP Best management practice is a conservation practice determined to be the most effective, practical means of preventing or reducing pollution from nonpoint sources.

CAC Citizen Advisory Committee for the Generic Environmental Impact Statement on Animal Agriculture.

Confinement Facility A type of feedlot where the animals are confined and fed under a roof or in a building.

Connected actions Two or more projects that are related, interdependent parts of a larger whole.

Economies of scale Reductions in the average cost of a product in the long run, resulting from an expanded level of output. Related to the technical input/output relationship rather than price changes as in economies of size.

Economies of size Pecuniary (i.e., money compensated) gains from increasing the volume of outputs. For example, buying a 6 oz. box of detergent from a vending machine at a laundromat will cost more per ounce than buying the 120 oz. jumbo box at a discount store on a per ounce basis.

Effluent The discharge of a pollutant, or pollutants, in a liquid form from a containing space.

Environment The complex of physical, social, chemical, and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival.

EIS Environmental Impact Statement is a thorough study of a project with potential for significant environmental impacts, including evaluation of alternatives and mitigation.

EQB Environmental Quality Board is the state agency that among other responsibilities adopts environmental review rules, monitors their effectiveness and revises as appropriate; provides technical assistance to interpret and apply rules.

EPA The United States Environmental Protection Agency.

Externality Cost or benefit incurred by others without just compensation.

Family farm Any farm owned by a natural person, or one or more natural persons all of whom are related within the third degree of kindred according to the civil law, at least one of whose owners resides on or actively operates said farm.

GEIS Generic Environmental Impact Statement.

Global climate change Changes in the earth's climate caused by human-induced increases in atmospheric gases which trap heat. These "greenhouse gases" include carbon dioxide, methane, and nitrogen oxides.

Ground water The supply of water under the earth's surface and below the water table.

Hydrogen sulfide (H_2S) A toxic gas formed during anaerobic decomposition of manure. It smells like rotten eggs and causes headaches, dizziness, nausea, unconsciousness and death. It quickly deadens the sense of smell.

Hypoxia A zone of ocean with a depleted level of oxygen caused by the decay of excessive plant life stimulated by delivery of large amounts of nitrogen and phosphorus by a river. Such a zone occurs in the Gulf of Mexico due to the discharge of the Mississippi River.

Lagoon A manure treatment structure, typically earthen. Lagoons can be aerobic, anaerobic, or facultative depending on their design. An anaerobic lagoon is different from an earthen storage basin in that the lagoon is managed for manure treatment. Anaerobic lagoons are only partially emptied each year whereas earthen storage basins are emptied once or twice a year.

Manure The fecal and urinary excretions of livestock and poultry. Manure can include bedding material and water used for livestock. Types of manure have descriptive names such as liquid, slurry, and solid.

Manure storage area An area associated with an animal feedlot where animal manure or runoff containing animal manure is stored until it can be utilized as domestic fertilizer or removed to a permitted animal manure disposal site. Animal manure packs or mounding within the animal feedlot shall not be considered to be manure storage for these parts.

Methane (CH_4) An odorless, explosive gas formed during manure's anaerobic decomposition. Methane can cause headaches and asphyxiation in unventilated areas.

MPCA Minnesota Pollution Control Agency.

Nonpoint source Entry of effluent into a water body in a diffuse manner with no definite point of entry and where the source is not readily discernible.

Nutrient Elements or compounds essential to growth and development of living things (e.g., nitrogen, phosphorus, potassium).

Pastures Areas where grass or other growing plants are used for grazing and where the concentration of animals is such that a vegetation cover is maintained during the growing seasons, except in the immediate vicinity of temporary supplemental feeding or watering systems.

Pathogens Disease-causing organisms.

Permit A document issued by the Pollution Control Agency, at no charge to the applicant, which contains requirements, conditions, and compliance schedules relating to the discharge of animal manure pollutants.

Phased actions Two or more projects by the same proposer that will have environmental effects on the same geographic area and will occur sequentially over a limited time period.

Phosphorus A nonmetallic element that occurs widely and is essential to the growth of aquatic organisms as well as all forms of life. In aquatic environments, phosphorus is often the nutrient that limits the growth that a body of water can support.

Point source The release of an effluent from a pipe or discrete conveyance into a water body or a water-course leading to a body of water.

Pollutant Any substance of such character and in such quantities that when it reaches a body of water, soil, or air, it is degrading in effect so as to impair its usefulness or render it offensive.

Risk The possibility of injury or loss. When used in environmental situations, 'risk' usually conveys the idea that the likelihood of an event is small but it's consequences would be significant if it did occur.

Rotational grazing The practice of subdividing pasture and forage fields into small sections, or paddocks, and allowing the high quality forage to be grazed quickly.

Rural Of or relating to the country, country people or life, or agriculture.

Scoping Process to identify what potential environmental impacts, alternative and other issues will be addressed in the EIS.

Social Of or relating to human society, the interaction of the individual and the group, or the welfare of human beings as members of society. Tending to form cooperative and interdependent relationships with others of one's kind.

Surface water Water present above the substrate or soil surface.

Sustainable agriculture Represents the best aspects of traditional and modern agriculture by using a fundamental understanding of nature as well as the latest scientific advances to create integrated, self-reliant, resource conserving practices that enhance the enrichment of the environment and provide short- and long-term productive and economical agriculture.

Sustainable development Or 'sustainability' is development that maintains or enhances economic opportunity and community wellbeing while protecting and restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.

Value added The value of the firm's output minus the value of the inputs it purchases from other firms or enterprises. In common usage it refers to the portion of firm profits that accrue to owners who supply agricultural products as inputs to the firm.

Vertical coordination When two or more firms whose activities extend over more than one successive stage of production form an agreement or alliance to coordinate their vertically related production processes.

Vertical integration A single firm whose activities extend over more than one successive stage of the production process transforming raw materials into final goods.

Water quality The biological, chemical, and physical conditions of a waterbody.

Watershed The surrounding land area that drains into a lake, river or river system.

Tentative outline for the GEIS

1. Background

2. Description of animal agriculture in Minnesota

Information in this section will be based on the literature review, data gathered from a feedlot inventory and some limited data analysis on relevant topics such as economics, role of government, etc.

3. Development and identification of alternatives (including the current system)

Alternatives might include different sizes and types of farming operations, different types of farm ownership, different animal types, different degrees of access to buyers, different degree of access to money and different facility densities.

4. Analysis of issues

Analysis of the economic, social, environmental and health effects of the different alternatives with particular emphasis on cumulative effects.

5. Recommendations

Seek consensus on the path(s) that animal agriculture could take in Minnesota and, as appropriate, develop recommendations needed to optimize the benefits of animal agriculture in relation to the environment, economy, health and way of life in the state.

6. Future research needs

7. Appendices

MINNESOTA ENVIRONMENTAL QUALITY BOARD MEMBERS

Established by the Minnesota Legislature in 1973, the Environmental Quality Board consists of 10 state agency commissioners or directors and five citizen members.

Chair: Rod Sando

Commissioner of the Department of Natural Resources

Ann Schluter

Director of Minnesota Planning

Gene Hugoson

Commissioner of the Department of Agriculture

Anne Barry

Commissioner of the Department of Health

Peder Larson

Commissioner of the Pollution Control Agency

Kris Sanda

Commissioner of the Department of Public Service

James Denn

Commissioner of the Department of Transportation

Kathleen Roer

Chair of the Board of Water and Soil Resources

Art Dunn

Director of the Office of Environmental Assistance

Jay Novak

Commissioner of Department of Trade and Economic Development

Bruce Bomier, citizen member, Anoka

Carolyn Engebretson, citizen member, Rochert

Deanna Fairbanks, citizen member, Cass Lake

Douglas Magnus, citizen member, Slayton

Paul Toren, citizen member, Mahtomedi