

1 INTRODUCTION

1.1 Minnesota Environmental Quality Board

1.1.1 Authorization

The Minnesota Environmental Quality Board (EQB) was established by the Minnesota Legislature in 1973 to serve as an interdepartmental forum for addressing and resolving environmental problems and issues.

1.1.2 Responsibilities

Legislated responsibilities of the EQB are to: (1) initiate interdepartmental investigations into state environmental problems; (2) review and coordinate the environmental programs of state agencies to ensure compliance with state environmental policy; (3) review the rules and criteria of state agencies for granting and denying environmental permits; and (4) coordinate the development of legislative proposals submitted by state agencies (MS 116C.04, Subd. 2, 1990).

In practice, the EQB accomplishes these responsibilities through the administration of specific programs and activities such as the state's Environmental Review Program, Power Plant Siting and Pipeline Routing, and Water Resource Planning. Staff support for EQB activities are provided by the Minnesota Planning Office, although member agencies may also assign their own staff to work on specific projects.

1.1.3 Membership

The EQB is a 15-member executive branch board, consisting of both state agency administrators and citizens. The chair of the EQB is appointed by the governor and is considered a representative of the governor's office. The nine agency administrators represented on the EQB include the commissioners of Natural Resources, Pollution Control, Public Service, Agriculture, Health, and Transportation; the directors of the Office of Waste Management and Strategic and Long-Range Planning; and the chair of the Board of Water and Soil Resources. The five citizen members are appointed by the governor at staggered, four-year terms. Current membership of the EQB is as follows:

- Robert Dunn, chair (governor's representative)
- Rod Sando, Department of Natural Resources
- Charles Williams, Pollution Control Agency
- Kris Sanda, Department of Public Service
- Elton Redalen, Department of Agriculture
- Mary Jo O'Brien, Department of Health
- James Denn, Department of Transportation
- John Chell, Office of Waste Management
- Linda Kohl, Minnesota Planning Office
- D. James Nielson, Board of Water and Soil Resources
- Bruce Bomier, citizen member
- Carolyn Engebretson, citizen member
- Deanna Fairbanks, citizen member
- Douglas Magnus, citizen member
- Paul Toren, citizen member

1.2

Generic Environmental Impact Statements

1.2.1

Authorization

A Generic Environmental Impact Statement (GEIS) is a specific form of environmental review that can be used to study certain types of projects not adequately reviewed on a case-by-case basis. The authorization for conducting alternative forms of environmental review, such as a GEIS, is found in Minnesota's Environmental Policy Act, MS 116D.04, Subd. 4a. Specific criteria for determining the need for a GEIS and the unit of government most appropriate to oversee its preparation, and the general process and content of a GEIS are identified in Minnesota Rules, part 4410.3800. Although only the EQB is authorized to order a GEIS, any person or government body may request the EQB to consider the preparation of a GEIS.

1.2.2

Unique Attributes

A GEIS differs from project-specific environmental impact statements (EIS) in the following four major ways:

1. **Cumulative Impacts Focus.** While a project-specific EIS typically examines environmental impacts within a limited geographic area, a GEIS analyzes the cumulative impacts associated with a number of separate, yet related activities. In the case of the GEIS on timber harvesting and forest management, cumulative impacts are those resulting from the hundreds of individual logging activities occurring in the state each year—in effect, the collective impacts of these individual operations on the state's overall

environmental quality.

2. **Discretionary Nature.** The administrative rules governing the state's Environmental Review Program establish general criteria for determining when it would be in the state's best interest to prepare a GEIS. However, these criteria do not specify explicit thresholds which, if exceeded, mandate the EQB to order such a study. The decision by the EQB to prepare a GEIS is voluntary. Additionally, because a GEIS is considered an alternative form of environmental review, projects under consideration by a GEIS are still subject to normal environmental review procedures and requirements, as well as environmental permit procurement procedures. In essence, a GEIS is considered a long-range planning document that can provide useful information regarding geographically broad and long-term consequences that are unlikely to be identified in project-specific environmental review processes. Therefore, a GEIS provides the context within which future project-specific EISs can be assessed.
3. **Recommendation Development.** A third distinction between project-specific EISs and GEISs is the focus of the GEIS on developing recommendations. Traditional environmental review documents assess the likely consequences of feasible and prudent alternatives to a proposed action (e.g., changes in process technology, proposal size or site location), but do not state which of the analyzed alternatives is preferred. These decisions are left to the government agencies responsible for issuing the necessary development and/or environmental permits. However, a GEIS is not limited to strictly the analysis of impacts, but can advocate strategic policy and program direction through the development of recommendations to address the identified impacts.
4. **Funding Mechanism.** Unlike project-specific development proposals where the costs associated with preparing environmental review documents are borne by the project proposer, no mechanism exists for assessing the costs of preparing a GEIS. Funding for a GEIS is typically via special legislative appropriations, contributions of EQB member agencies, or outside funding sources. The EQB does not have the authority to establish rules relating to assessing the costs of preparing a GEIS.

1.2.3 GEIS Need Criteria

Although Minnesota's Environmental Review Program does not recognize circumstances in which preparation of a GEIS is mandatory, certain factors

are considered by the EQB in determining the need for a GEIS. These factors are:

- whether reviewing the proposed action can be better accomplished by a GEIS than by project-specific review;
- whether the possible effects on the human environment are highly uncertain and involve unique or unknown risks;
- whether a GEIS can be used in a subsequent project-specific EIS to provide a context in which the individual project can be assessed;
- the amount of basic research needed to understand the impacts of such projects;
- the degree to which decisionmakers or the public have a need to be informed of the potential impacts of such projects;
- the degree to which information to be presented in the GEIS is needed for governmental or public planning;
- the potential for significant environmental effects as a result of the cumulative impacts of such projects;
- the regional and statewide significance of the impacts and the degree to which they can be addressed on a project-by-project basis; and
- the degree to which governmental policies affect the number or location of such projects or the potential for significant environmental effects.

1.3

EQB Decision: GEIS on Timber Harvesting and Forest Management

In July 1989, a citizen petition was brought before the Minnesota EQB. This petition cited a number of environmental and economic issues that could be directly impacted as a result of accelerated timber harvesting in Minnesota, and requested that the EQB prepare a GEIS to examine the cumulative impacts resulting from timber harvesting and forest management activities. The major concern of the petitioners was that no formal environmental review process currently existed to provide an analysis of the collective impacts that expanded timber harvesting activities might have on Minnesota's environment.

Support for the study was given by several individuals and groups involved in the management and use of the state's forests. After lengthy deliberation, the EQB unanimously passed a resolution to authorize the preparation of a GEIS on timber harvesting and forest management activities in December 1989. The EQB designated itself as the governmental unit responsible for the study's preparation.

1.3.1 Advisory Committee

A central component of the EQB's resolution ordering preparation of the GEIS on timber harvesting and forest management was the establishment of an advisory committee. This ten-person committee was created to provide direction and oversight of the GEIS study process through their recommendations to the EQB. Committee membership includes economic development, environmental, conservation, tourism, and public land management interests, reflecting a broad cross-section of stakeholders in the management and use of Minnesota's forest resources.

Membership. Members of the GEIS Advisory Committee are as follows:

- Don Arnosti
- Janet Green
- Dennis Kmit
- Roy Linder
- Tom Sawle
- Wayne Brandt
- Butch Eggen
- Darrell Lauber
- Gerald Rose
- Jim Woehrle

Doug Jackson and Bob Raufs also served on this committee.

Charge. The EQB asked the Advisory Committee to assist in the preparation of the GEIS by assuming the following major responsibilities:

- to advise the EQB on the scope of the GEIS, including the issues to be examined, the type and level of detail of studies to gather and analyze information, and the schedule for preparation of the GEIS;
- to advise the EQB on the selection of a consultant to assist in preparation of the GEIS;
- to review and provide comment to the EQB on reports prepared by the consultants, and on the proposed draft and final GEIS documents; and
- to make recommendations on the alternatives presented for the mitigation of impacts where analysis has indicated the potential for significant impacts.

To enhance the Advisory Committee's ability to develop consensus advice on these four areas, the EQB secured the services of Howard S. Bellman, Madison, Wisconsin, to serve as facilitator to this committee.

1.4 GEIS Funding Sources

Funding for the GEIS, which totals \$875,000, comes from the following public and private sources: Minnesota Environment and Natural Resources Trust Fund (\$400,000), state legislative appropriations (\$300,000), Crow Wing

County via the Iron Range Resources and Rehabilitation Board (\$100,000), and the Cuyuna Range Economic Development Corporation (\$75,000). In addition, the Northwest Area Foundation provided a grant of \$47,000 to the EQB for facilitation services associated with operation of the GEIS Advisory Committee.

1.5 GEIS Process

This section of the document sets out the key aspects of the study process from the initial scoping process to the completion of the draft and final GEIS documents.

1.5.1 Scoping Process

The first step in conducting a GEIS is to identify and define the issues to be addressed in the study. This is accomplished through a scoping process. The main purpose of scoping is to focus the study by clearly defining the critical issues in need of examination. In addition, the scoping process establishes other important GEIS study parameters such as study objectives, assumptions, and alternatives to be analyzed.

The scoping process for the GEIS was initiated by the EQB in early 1990. Over the course of four meetings, the GEIS Advisory Committee worked to develop a draft scoping document that would specify the study's general format and issue content. Upon receiving this document from the Advisory Committee, along with the recommendation that it be used as the basis for public review, the EQB issued the committee's report as the draft scoping document in July 1990. Shortly after the draft scoping document was released, the EQB established a 40-day comment period in which the public could comment and suggest modifications to the draft document. During that public comment period, the EQB held three public meetings (Rochester, Twin Cities, Grand Rapids) to discuss the proposed format and content of the GEIS, and to solicit public input on that draft.

In total, 94 individuals or organizations submitted written comments during the scoping period, and 84 individuals or organizations provided testimony at the three public meetings. Upon completion of the scoping period, the Advisory Committee reviewed the public comments. After three meetings, the committee reached consensus on the recommended content of the final scoping document. In December 1990, the EQB approved the Final Scoping Decision (FSD) for the GEIS as recommended by the Advisory Committee. The final scoped issues are repeated from the FSD in section 1.5.5.

1.5.2 Study Objectives

The FSD calls for a GEIS study to be based on three overarching objectives:

1. to develop a basic understanding of the status of timber harvesting and related forest management activities in Minnesota, and how this level of statewide activity relates to long-term sustainable levels of timber removals;
2. to identify and assess the environmental and related (i.e., economic and social) impacts associated with current and potential elevated levels of statewide timber harvesting and forest management activity; and
3. to develop strategies to mitigate the existing or potential significant adverse impacts that are identified.

1.5.3 Major Assumptions

The following are major assumptions used in defining the scope of the GEIS on timber harvesting and forest management in Minnesota:

Geographic Coverage

The GEIS examines the impacts of timber harvesting and forest management on Minnesota's environment and on relevant sectors of the state and regional economies. To the extent possible, all forest lands and resources within the state's boundaries have been considered in this study. Issues and data have been gathered and analyzed at appropriate levels of resolution in order to determine the statewide cumulative impacts.

Forest Lands Under Consideration

The GEIS examines the cumulative impacts of timber harvesting and forest management activities occurring on all forest lands in Minnesota. This includes, to the extent possible, all public forest lands owned and/or managed by federal, state, county, or municipal governments as well as forest land owned by industrial and nonindustrial private interests. Both commercial and noncommercial forest lands are the subject of this study.

Relationship to Timber Harvesting and Forest Management

The GEIS analyzes only those impacts associated with timber harvesting and associated forest management activities in Minnesota. Timber harvesting and forest management is defined to include a broad range of human-induced activities related or incidental to altering forest environments. Although not inclusive, typical activities include logging, site preparation, reforestation (through both artificial and natural means), forest road design, density and construction, chemical applications, and thinning operations.

1.5.4

Alternative Statewide Timber Harvesting Scenarios Analyzed

The purpose of discussing alternatives in an EIS is to compare the environmental impacts of the proposed project with other reasonable alternatives to the project, including the alternative of no action. In the case of this GEIS, the proposed project was defined in terms of the state's cumulative timber harvesting and related forest management activities. Therefore, alternatives addressed in the GEIS are defined as different levels of statewide timber harvesting activity. In addition to examining the existing levels of harvesting, potential future timber harvesting levels are also analyzed to identify impacts that would result if such levels of statewide activity were actually achieved.

The FSD specifies that, to the extent possible, all issues are to be reviewed from the following three levels of statewide timber harvesting and associated forest management activity:

4.0 million cords. This was the level of statewide timber harvesting activity that occurred in 1990, the most recent year for which data was available at the time the document was drafted.

4.9 million cords. This is the level of statewide timber harvesting activity estimated to occur by 1995 if all announced or considered forest products industry expansions fully materialize. (This also approximates a 50 percent increase in timber harvesting and associated forest management activity over 1988 statewide harvest levels.)

7 million cords. This is the estimated maximum annual volume of timber available for harvest statewide for all tree species in the year 2000. (This also approximates a 100 percent increase in timber harvesting and associated forest management activity over 1988 statewide harvest levels.)

These alternatives provide for analysis under three different perspectives:

1. the current level of timber harvesting and forest management activity;
2. a level of statewide timber harvesting activity that is estimated to occur within the next five years if proposed expansions occur; and
3. estimated long-term maximum sustainable annual statewide timber harvest levels.

As is discussed more fully in section 2.3, the first alternative (4.0 million cords) was adjusted upward from the 3.2 million cord level specified in the FSD to reflect up-to-date information on existing statewide timber harvesting activity.

1.5.5 Scoped Issues

The following are the *issues of concern* identified in the FSD as those needing investigation in the GEIS. Under each major issue is a series of questions intended to more clearly define the significant aspects of each issue.

Maintaining Productivity of Forests for Timber Production. *Making sure that forests are able to sustain (over long periods of time) the production of ample supplies of timber in an environmentally sensitive manner is of major importance to society. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:*

- 1. Based on most recent statewide forest inventory information, what allowable timber harvest rates are sustainable for major Minnesota forest types? What rates are possible for sustaining economic activity based on pulp, fuelwood and quality sawtimber products? What methods are used (or could be used) to estimate allowable harvest rates (considering structural and taxonomic diversity, specific geographic areas, and various landowner classes)?*
- 2. What is the relationship between current and future estimates of sustainable timber supplies and the demands expected for the supply of such timber? Are there seasonal differences in timber demand and supply?*
- 3. Are there classes of landowners, geographic regions or forest types where timber harvest rates may be expected to exceed allowable timber harvest rates or biological growth? If needed, what strategies can be implemented to assure the perpetuation of a renewable forest resource? What are the impacts of these strategies and what forest conditions will result from their implementation.*

Forest Resource Base. *Forests are dynamic ecosystems which change naturally and in response to human intervention (e.g., timber harvesting). Understanding the nature and extent of such change is important to the making of wise management and land use decisions. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:*

- 1. To what extent have changes occurred in the size and composition of Minnesota's forest land base (using reliable statewide information)? What were the major factors contributing to this change?*
- 2. To what extent do timber harvesting and management activities impact the abundance, composition, spatial distribution, age class structure, genetic variability and tree species mixture (for example, in creating forest monocultures) of Minnesota's forests (based on reliable information)? To what extent are changes in these characteristics specifically attributable to timber harvesting and management of certain forest landowner*

categories?

Forest Health. *The management of forests should be undertaken so as to ensure that they are sustained in a healthy condition over long periods of time, recognizing that endemic pest conditions will be present. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:*

- 1. What impact does timber harvesting and management have on the change in risk of disease and insect infestations to Minnesota's forests?*
- 2. To what extent are changes in the risks of insect and disease infestations specific to a particular forest landowner class, geographic region, tree species or forest type?*

Plant and Animal Diversity in Forest Ecosystems. *A diverse range of plants and animals are associated with forest ecosystems. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:*

- 1. What impact does timber harvesting and management have on the biological diversity of forests at the genetic, species and ecosystem levels? What spatial patterns of forest cover does timber harvesting create, and how do these patterns impact wildlife and native plant communities (for example, fragmentation of forests)?*
- 2. To what extent are federal and state-listed species of special concern, threatened, or endangered species or their habitats impacted by timber harvesting and management?*
- 3. Based on the DNR's final definition of "old growth" forests and "old" forests, to what extent do these forests exist in Minnesota; how are they identified and managed; and how are they impacted by timber harvesting and management?*

Forest Wildlife and Fish. *Forest wildlife and fish are an integral part of forest ecosystems. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:*

- 1. What are the forest dependent wildlife and fish species, their specific habitat requirements, and their current status and distribution?*
- 2. To what extent does timber harvesting and management impact populations and habitats of each of the ten groups of wildlife as defined in Appendix B to the FSD.*

Water Quality. *Forests are capable of influencing the flow of significant quantities of water of various qualities. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:*

1. *To what extent does timber harvesting and management result in changes in the level of sedimentation, nutrient loading and runoff in lakes, rivers, streams and wetlands?*
2. *To what extent are fertilizers, compost, sludge and pesticides used in timber management, and what are their impacts on the quality of surface and groundwater?*
3. *To what extent does timber harvesting and management impact aquatic ecosystems, wetlands and peatlands?*

Forest Soils. *Forest soils are a fundamental resource on which rests the ability of forests to provide a wide variety of benefits. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:*

1. *To what extent does soil erosion occur as a result of timber harvesting, and how does this rate of erosion compare with forest soil erosion rates in undisturbed forests? What specific timber harvesting and management activities are major contributors to the erosion of forest soils?*
2. *To what extent do timber harvesting and management (e.g., short cycle rotations) activities impact nutrient cycling and the productivity of forest soils? To what extent do specific management and timber harvesting practices impact the productivity of forest soils?*
3. *To what extent do timber harvesting and management activities impact the compaction of forest soils? To what extent does soil compaction impact forest productivity and the growth of forest plants?*
4. *To what extent does the time of year in which timber harvesting occurs impact forest soil productivity and the success of forest regeneration?*

Forest Recreation. *Forests provide significant opportunity for a wide variety of outdoor recreational experiences. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:*

1. *To what extent are forest recreation opportunities, both quantitatively and qualitatively, impacted by timber harvesting and management? Do such impacts vary by type of recreation (e.g., day use, overnight use, dispersed, nondispersed, on-site, off-site, consumptive, nonconsumptive)?*

Economics and Management. *Forests provide a variety of benefits which are critical to the economic and social health of regional and statewide*

economies. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:

1. a) *To what extent does timber harvesting and management impact regional and state economies?*
 - b) *Which and to what extent do specific economic sectors benefit from timber harvesting and management?*
 - c) *Which and to what extent are specific economic sectors adversely impacted by timber harvesting and management?*
2. a) *To what extent is the state's recreation and tourism industry impacted by timber harvesting and management?*
 - b) *Which and to what extent do specific segments of the recreation and tourism industry benefit from timber harvesting and management?*
 - c) *Which and to what extent are specific segments of the recreation and tourism industry adversely affected by timber harvesting and management?*
 - d) *To what extent will an increase or decrease in timber harvest affect the habitats of deer and ruffed grouse, other game species and other recreational use of wildlife; and how will these changes affect state and regional economies?*
3. *What is the current distribution of timber stumpage among various users? What laws, policies and procedures influence this distribution?*

Aesthetics and Unique Cultural Resources. Forests provide a variety of scenic vistas and often are the setting for important cultural and historic resources. Considering previously specified timber harvesting levels and looking at timber harvesting and management activities statewide:

1. *To what extent are unique historical and cultural resources (e.g., Native American cultural, religious and spiritual resources) in forested areas impacted by timber harvesting and management.*
2. *To what extent does timber harvesting and management impact the visual quality of Minnesota's forests?*

As discussed in subsequent sections of the document, data availability limited the extent to which impacts could be quantitatively assessed for certain issues. The GEIS study does identify areas where future research is needed to collect data that are currently unavailable but needed to more completely address all GEIS-scoped issues. The primary vehicle for addressing these FSD-scoped issues is the collection of nine technical papers, *Maintaining Productivity and the Forest Resource Base, Forest Soils, Forest Health, Water Quality and Fisheries, Biodiversity, Wildlife, Unique Historical and Cultural Resources, Economics and Management Issues, and Recreation and Aesthetics* (Jaakko Pöyry Consulting, Inc. 1992a,b,c,d,e,f,g,h; 1993), outlined in section 2.3.

1.5.6

Other Analyses

In addition to the previously mentioned scoped issues, two other issues were identified for analysis. These issues were related to, but not dependent on, levels of timber harvesting and forest management being examined. The first issue was the assessment of opportunities for using recycled fiber to meet additional wood fiber demand, including an assessment of any consequent impacts on the environment and the economy. The second issue required the identification and description of studies that address global warming and its possible effects on Minnesota's forests.

1.5.7 Study Timeframe

The FSD specified a schedule for study preparation that envisioned the preparation of the feasibility assessment and study workplan by June 1991. The GEIS study was to be started in June, and a draft GEIS, including input from the Advisory Committee, was to be completed in January 1992 and released for public comment in February or March 1992. The final document was to be completed in June 1992.

This schedule constrained the time available for the study and was a fundamental and critical factor shaping the study methodology. The proposed methodology was unconstrained by cost but constrained by a final reporting date of July 1992 (Jaakko Pöyry Consulting, Inc. 1991a).

The manner in which the GEIS process ultimately evolved extended the study timeframe to the middle of 1993. The major factors responsible for this extension included: (1) initial delays in securing funding for the approved GEIS Workplan (Jaakko Pöyry Consulting, Inc. 1991b); (2) difficulties associated with critical data sets required to conduct the analysis; (3) a more extensive oversight role for the GEIS Advisory Committee than originally envisioned; and (4) additions to the EQB-approved study process as set out in the Workplan, such as conducting a consultant-initiated external review of all technical papers prior to their submission to the EQB.