MINNESOTA GROUND WATER PROTECTION STRATEGY

September, 1988

RUDY PERPICH
GOVERNOR

STATE OF MINNESOTA

OFFICE OF THE GOVERNOR

ST. PAUL 55155

August 18, 1988

To the People of Minnesota:

Minnesota is a state known for its abundant water resources, both ground and surface water. The current drought has dramatically underscored the dependence of human institutions on natural systems, and highlights the need for effective stewardship of the resources in our state.

This Ground Water Protection Strategy has as its central themes, the need for protection of our ground water resource from pollution and misuse and the need for strong efforts toward public information and education on the myriad of ways in which human activities impact ground water. Effective protection will not be possible without an informed public, able to make and support strong decisions aimed at protecting our ground water resource for generations of Minnesotans to come.

I urge you to read this document and to become involved in this state's ground water protection efforts.

Sincerely,

RUDY PERPICH
Governor

MINNESOTA ENVIRONMENTAL QUALITY BOARD
300 Centennial Building · 658 Cedar Street · St. Paul, Minnesota 55155
612-296-2603

RESOLUTION
MINNESOTA ENVIRONMENTAL QUALITY BOARD

ADOPTION OF THE
MINNESOTA GROUND WATER PROTECTION STRATEGY

WHEREAS, ground water is a resource vital to the public health and economic well-being of all Minnesotans, and its protection from contamination and misuse requires a timely, concerted effort by all State and federal agencies, local governments, private concerns and citizens; and

WHEREAS, the Minnesota Ground Water Protection Strategy was developed by the Minnesota Pollution Control Agency based upon the advice of an interagency work group with representatives from all State agencies with ground water related authorities along with federal and local government representation, and reflects the recommendations of the Environmental Quality Board's Advisory Committee on Ground Water and other comments received during the public review period and at fourteen public meetings, and is consistent with Environmental Quality Board policies and priorities, and

WHEREAS, the Strategy stresses the urgent need for prevention of ground water impacts and recommends programmatic change and legislative initiatives to improve the State's ground water protection policies and programs;

NOW THEREFORE BE IT RESOLVED that the Environmental Quality Board adopts the Minnesota Ground Water Protection Strategy as the blueprint for ground water protection in Minnesota. Implementation of the Strategy will be consistent with EQB policies and priorities, including those governing interpretation of inter-local and local-state ties established in the 1987-89 Water Resources Priority Recommendations report.

BE IT FURTHER RESOLVED that the chairman transmit this resolution and adopted Strategy to the governor for approval and signature.

Moved by Commissioner Leonard Levine, seconded by Dr. C. Edward Buchwald.

Passed unanimously with Kawamura, Levine, Dunn, Ashton, Hughes, Ditmore, Buchwald, Willet, Ogaard, and Pavelich voting aye.

ACKNOWLEDGEMENTS

The Minnesota Ground Water Protection Strategy (Strategy) was prepared by staff of the Minnesota Pollution Control Agency (MPCA), based upon the efforts of a work group composed of representatives from the following governmental agencies:

Minnesota Department of Health,
Minnesota Department of Agriculture,
Minnesota Department of Natural Resources,
State Planning Agency,
Minnesota Geological Survey,
Minnesota Board of Water and Soil Resources,
Minnesota Department of Transportation,
Minnesota Waste Management Board,
Attorney General's Office,
United States Geological Survey,
Metropolitan Council, and
United States Soil Conservation Service.

This document is based upon the March 10, 1988, Public Review Draft of the Strategy with modifications suggested from a number of commentors. These comments were received in a series of 14 public meetings which were held in April and in written comments received during the public review period which ended May 31. Staff involved would like to thank all who participated in the meetings and who provided written comments.

Special gratitude is extended to the Environmental Quality Board's (EQB) Advisory Committee on Ground Water Protection for their intensive review and comments. This committee was composed of representatives from a wide variety of Minnesota interests. Their unanimous report was accepted by the EQB on June 16, 1988, and their summary letter to the EQB is included at the end of this document. The members of the committee were:

Tom Anding, Committee Chair
Center for Urban and Regional Affairs, University of Minnesota

E. Calvin Alexander, Jr.
Department of Geology and Geophysics, University of Minnesota

Jack Anderson, Irrigators Association of Minnesota

Stephen Bloom, Martin County Coordinator

William Bryson, Freeborn Soil and Water Conservation District Supervisor

Marianne Curry, Minnesota Chamber of Commerce and Industry

Dick Eischens, New Prague Farmer

Terry Gips, International Alliance for Sustainable Agriculture

Verne Jacobsen, North Central Section, American Water Works Association

Diane Jensen, Clean Water Action Project

Linda Lehman, Minnesota Ground Water Association

Christine Olsenius, Freshwater Foundation

Richard Post, Kandiyohi County Commissioner, Member of the Association of Minnesota Counties Physical Development Committee

Newell Searle, Cargill, Minnesota Business Partnership

Lois Yellowthunder, Citizens League

Copies of the Report of the Environmental Quality Board Advisory Committee on Ground Water Protection (June 1988) are available from Marilyn Lundberg, State Planning Agency, Centennial Office Building, 658 Cedar Street, St. Paul, Minnesota 55155; phone 612/296-0676.

For more information on the Minnesota Ground Water Protection Strategy, contact:

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Partial funding for development of this Strategy was provided by the U.S. Environmental Protection Agency, Office of Ground Water, through their Region 5 offices in Chicago, Illinois.

PREAMBLE TO STRATEGY

Minnesota's ground water is a vital resource of immeasurable value. Three quarters of Minnesota's citizens depend on it to provide, with little or no treatment, their drinking water supply. Ground water is crucial for many other uses, notably irrigation, and it provides inflow to our streams and lakes. No other Minnesota resource is more important or more deserving of protection and wise management.

Prevention: Protecting and managing this resource poses unique challenges. Most of our ground water is of high natural quality, but it is threatened to varying degrees from a wide range of sources. Once contaminated, ground water can be very difficult and costly to clean up. Cleanup often requires long-term commitments of resources; even so, ground water normally cannot be cleaned up completely.

Prevention must be the main long-term focus for ground water protection programs. Preventing contamination is more cost-effective and likely to produce a greater level of success. For this reason, pollution sources must be identified and controlled with the consistent goal of preventing ground water impacts. Current cleanup and remediation efforts must be continued as well to correct the historical backlog of ground water contamination.

New emphases: Although some sources of ground water pollution have received publicity, such as hazardous waste sites, Minnesota's ground water quality is also being altered by many other far more commonplace and widespread activities, including unsealed abandoned wells, septic systems, animal confinement facilities, and application of pesticides and fertilizers by farmers and urban homeowners. The total area and quantity of ground water affected by these activities is vastly larger than the areas impacted by more localized sources. More program effort is needed to address each of these areas.

To be successful in minimizing pollution from these much more numerous and dispersed sources, a different approach will be needed than has worked for the smaller numbers of "point" sources currently being addressed through regulatory programs. Success will rest largely on bringing about voluntary action by individuals, increased awareness, and changes in individual habits and behaviors. Education, information, and incentives will be more powerful tools in this effort, although regulation must remain an important part of the overall approach. Much is not known about the severity and solutions to these problems, so it is also vital that the State increase its support for applied research, monitoring, and resource evaluation, and adopt a careful, well-founded approach to change.

Local government: Local governments are much closer to where the problems occur than State government, and could be much better positioned than the State to take the lead on some ground water management issues. This will not happen without substantially increased funding to local governments. Equally important are the availability of technical assistance from the State and a State regulatory framework to back up local programs. The Strategy strongly recommends these changes to create a substantial new local role in ground water management.

Stable additional funding: These initiatives depend upon substantially increased funding for ground water protection and management. Success also depends on stability in funding levels to maintain continuity. Funding is a complex and controversial issue; there is not one "right" way to fund ground water protection. Ground water benefits all Minnesotans, not just those who directly consume or use it, so part of the funding should be from a general revenue base. Some groups are more directly benefitted, however, so fees should be considered for a wide range of activities, such as waste disposal, use of products that impact ground water quality, well construction, and ground water use/withdrawal. Fee-based funding will ensure that those who affect ground water and benefit from it also help support the programs, and it will tend to provide a more secure long-term funding base.

PURPOSE OF THE STRATEGY

This Strategy will serve as the blueprint for future ground water management activities at the State level, and also help define the local role in ground water management and protection. The Strategy is built on the strong regulatory framework which the State has established. State agencies already have statutory authority to establish ground water standards and regulate pollution sources, to protect and monitor drinking water supplies, to regulate water appropriation, and to regulate the sale and use of agricultural chemicals which may impact ground water quality. These water related functions are coordinated through the Water Resources Committee of the EQB, a board composed of the top executive officers of the major environmental agencies together with citizen members.

The Strategy has been structured around four major initiatives:

I. To protect ground water quality now and for the future, to ensure safe drinking water supplies, and to prevent ground water contamination by effectively regulating sources of pollution.

II. To ensure adequate water supplies, to regulate water appropriation and use for protection of highest priority users, and to improve coordination of quality and quantity aspects of regulatory programs.

III. To enhance the current body of knowledge on Minnesota's ground water resource, delineating problem areas and providing information needed to effectively manage the resource.

IV. To provide the public, decision-makers, regulators, and the regulated community with the necessary information and education for making environmentally sound decisions in areas which may impact ground water.

MAJOR LEGISLATIVE CONCEPTS

The Strategy recommends the following major legislative initiatives.

*Prevention of contamination should be the top priority. This includes establishment of a goal of nondegradation for all ground water, development of numerical limits on ground water pollutants, and delineation of the especially sensitive areas of the State where special protective measures must be taken at the land surface to ensure protection of the resource below. Strong continued support is needed for cleanup of existing problems.

*Drinking water protection is crucial to the health and welfare of all Minnesotans. Components of this effort include the State developing a Wellhead Protection Program, promotion of better contingency planning and conservation measures, registration of all wells on property deeds and testing of wells at the time of property transfer, development of a prioritization scheme and incentive fund to address the problem of abandoned wells, and enforcement of the Water Well Construction Code.

*Ground water information and education are vital to the success of the prevention and cleanup efforts. Components of this effort are the development of educational opportunities for children and adults, the dissemination of information on our ground water resource and State programs to protect it, specialized training for target groups, and the furtherance of intergovernmental communication.

*Enhancement of local government participation in environmental protection is a critical need as well. The Strategy recommends development of a grant mechanism which would provide funds to local government for the development and implementation of local programs to address environmental concerns. State agencies should be authorized to develop rules for delegation of certain programs to local governments, and have staff in place for technical assistance to aid local governments in program development and implementation.

*Ground water resource evaluation, monitoring, and research are needed for effective management of the resource. The extent of existing contamination is not documented, minor aquifers are not mapped, and recharge areas of major aquifers are not fully and clearly delineated. Research is also needed in the development of alternative technologies to replace current practices which impact ground water. The Strategy recommends development of a fund which would help to foster stable, long-term resource evaluation, monitoring, and research.

*Control of pollution sources is a necessary component. Increased funding for staff in regulatory programs and for programs such as the Clean Water Partnership is needed to continue these efforts. Another important area is pollutant source reduction for both current and potential sources of pollution. Technical assistance in source control and reduction will be a necessary component.

More detail on these legislative initiatives follows in later sections of the Strategy.

TABLE OF CONTENTS

A separate volume entitled "Supporting Documentation for the Minnesota Ground Water Protection Strategy" will also be available. It will contain:

Full report of the Advisory Committee;
Reports on:
- The Ground Water Protection Public Meetings, and
- Written Comments Received on the Ground Water Strategy

Report of the Minnesota Department of Health Commissioner's Task Force on Drinking Water
Issue Papers prepared for the Minnesota Ground Water Protection Strategy; and other supporting documentation.

INTRODUCTION

Minnesota is blessed with abundant, high-quality ground water. With a growing awareness of threats to our ground water Minnesotans have enacted a variety of programs to preserve and protect the ground water resource. These efforts have been successful in many respects, but it is clear that there is substantial room for improvement.

The Strategy was developed by an interagency work group led by the MPCA, which has received federal funding to help support the effort. The public review draft of the Strategy presented issues relating to ground water management, then listed the recommendations of the work group for resolving those issues. Now in its final form, the Strategy reflects comments received on the public review draft. Considerable modification has been made, based upon views expressed in a series of 14 public meetings held in April 1988, and on the more detailed written comments received during the public comment period which was extended until May 31, 1988. This version of the Strategy also incorporates the recommendations of the EQB's Advisory Committee on Ground Water Protection.

It is intended that the Strategy will guide Minnesota's ground water protection priorities far into the future. Since it is impossible to foresee all future concerns regarding ground water, it is essential that the Strategy be regularly updated and reincorporated into the State's ground water protection programs. The Water Resources Committee of the EQB is the appropriate vehicle for this periodic review. It is recommended that the Strategy be reviewed and updated every two years, and that legislative and program changes be identified through this biennial update.

Related Efforts:

The Strategy builds upon a long series of previous efforts. No attempt will be made to list all of them or to describe their contents. Some of the more important previous documents include the following:

1. The Environmental Quality Board's "Protecting Minnesota's Waters, an Agenda for Action in the 1987-1989 Biennium";
2. The Legislative Auditor's 1987 Report "Water Quality Monitoring";
3. The Executive Branch Policy Development Program Issue Team Report, "Ground Water Management Strategy," February 27, 1985;
4. The MPCA's June 1983 "Ground Water Protection Strategy Framework for Minnesota";
5. The Minnesota Water Planning Board's 1979 "Toward Efficient Allocation and Management: A Strategy to Preserve and Protect Water and Related Land Resources"; and
6. The U.S. Environmental Protection Agency's "Ground-Water Protection Strategy" (1984) and "Guidelines for Ground Water Classification" (1986).

In the past year, other related strategies have also been developed by the State. Staff involved in these efforts have been working closely together to ensure consistency between the strategies. They include the "Water Resources Strategy for the Control of Pests and Management of Nutrients," developed by the Water Resources Committee of the EQB and the "Nonpoint Source Pollution

Management Program," which was developed in response to the passage of Minnesota's Clean Water Partnership and the federal reauthorization of the Clean Water Act. The ground water related portions of these strategies have been incorporated herein, in much less detail. The strategies themselves will be available under separate cover.

Minnesota's Ground Water:

Nature of the Resource. Minnesota's extensive surface waters are well-known, but the State also has substantial reserves of extremely high quality ground water. As with surface waters, the ground water resource is unevenly distributed. Some areas of Minnesota have several abundant aquifers; other areas have no major aquifers, and only very meager quantities of ground water are available to domestic wells. The most plentiful aquifers are the surficial and buried sands located throughout the State, especially in central and north central Minnesota, and the bedrock formations of southeast Minnesota. Many of these aquifers have little natural protection from contamination.

Several statistics dramatically underscore the importance of ground water to Minnesota. Statewide, 75 percent of all Minnesotans receive their drinking water from ground water sources. Ninety-three percent of the State's municipal water supply systems use ground water. Finally, ground water supplies 60 to 80 percent of the irrigation water used in the State. In addition to these critical uses, ground water is important in food and beverage processing and other industrial uses, air conditioning and heating, livestock production, and other purposes, and it plays a vital role in the hydrologic cycle, supplying high-quality replenishment of wetlands, streams, and lakes.

Minnesota's ground water generally is of much higher quality than drinking water quality standards, and the State has fewer occurrences of naturally brackish or saline ground water than almost any other state. Natural ground water quality rarely fails to meet any of the health-based primary drinking water standards, with the possible exception of radionuclides, which are only beginning to be tested. Secondary drinking water standards, nonenforceable guidelines which reflect the aesthetic quality (e.g., taste and odor) rather than health risk, are commonly exceeded. The secondary standards for iron and manganese are exceeded in up to half the samples tested statewide by the MPCA's Ground Water Quality monitoring program. In western Minnesota, there are frequent exceedances of the secondary standards for sulfate and total dissolved solids.

Human Impacts. Ground water is vulnerable to pollution, and it is threatened from a variety of sources in Minnesota. These include "point sources," such as uncontrolled hazardous waste disposal sites, leaking liquid storage tanks, and landfills, and "nonpoint sources" including agricultural chemicals, concentrations of septic tanks, and other widespread land use practices. Improperly constructed, multi-aquifer wells or abandoned wells and high capacity withdrawals also influence ground water movement and migration of contaminants. Porous soils and fractured bedrock do little to restrict contaminant movement to the ground water in many areas throughout the State. And, once polluted, ground water is difficult to clean up and may remain polluted for decades or longer. Ground water may also be threatened locally by overuse, if withdrawals exceed the rate of replenishment of an aquifer. Because of these characteristics--many and widespread contaminant sources and points of use, susceptible areas, and persistence of pollution--protecting ground water is a challenge that requires efforts at many different levels.

Ground water quality impacts from land use practices and nonpoint sources of pollution have been partially known for years, but have been the subject of much greater concern very recently. Nitrate contamination, from fertilizers and human and animal wastes, is common, particularly in southern Minnesota, where concentrations of nitrate in ground water frequently exceed the primary drinking water standard. Recent studies by the Minnesota Departments of Health and Agriculture concentrating on farming areas in more vulnerable hydrogeologic settings found pesticide concentrations at generally very low levels, normally well below drinking water standards, in up to 40 percent of the ground water sampled.

In urban and rural areas throughout the State, ground water contamination has also occurred from specific localized sources. The most significant of these render the ground water unuseable as a potential source of drinking water or other use. The highest priority sites, which are candidates for thorough investigation and possible corrective actions, are listed on the State's Permanent List of Priorities. A breakdown of this list into source categories gives some indication of the relative importance of Minnesota's various sources of localized ground water contamination. The listed sources, and the numbers of sites in each category, are as follows:

Contaminant Source	Contaminating Substances	Number of Listed Sites
Industrial/manufacturing (on-site spills, illegal or uncontrolled disposal, industrial impoundments)	Solvents, metals, wood preservatives, pesticides	75
Solid waste landfills and dumps	Leachate: organic chemicals, metals	55
Storage and transportation of petroleum and other products	Gasoline, fuel oil, and breakdown products, other materials	5
Agricultural chemical handling facilities	Pesticides, nitrates	4

The listed sites represent only the highest priority sites identified to date; many other sites have not yet been identified or have lesser impacts on ground water quality. Petroleum leaks and spills could overtake the others as the largest source of localized ground water contamination because of the widespread nature of petroleum storage and transportation. The State has provided for regulation and, through the State Superfund and Petrofund, for corrective action at these sites. However, certain other kinds of facilities, such as gravel pits, salt storage piles and land treatment and disposal of wastewater, have not been monitored as much as the above sites, and they may also result in localized impacts.

Existing Framework:

There are many parties involved in ground water management and protection, and coordination between these parties is essential for effective management of our ground water resource. The federal government has limited authority to regulate

ground water, but it affects ground water and State regulatory programs indirectly through the programs administered by the U.S. Environmental Protection Agency under the Safe Drinking Water Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation and Liability Act (Superfund); Federal Insecticide, Fungicide, and Rodenticide Act; and Clean Water Act.

The federal government is also active in ground water research, resource evaluation, development of practices and technologies to avoid ground water pollution, and technical assistance. The U.S. Geological Survey conducts aquifer, ground water quality, and geologic resource evaluations and research. The U.S. Environmental Protection Agency conducts and supports research on ground water contamination and monitoring. The U.S. Department of Agriculture, through several service branches, provides technical assistance to landowners and supports research on land management practices. In this Strategy, federal programs are described briefly under each initiative to set the framework in which State and local programs operate.

Local governments are becoming more active in ground water protection issues. They exercise control over some activities through their zoning, permitting, and licensing authorities; they have responsibilities for protecting public health; and they directly affect ground water quality through activities such as wastewater treatment and disposal and water supply systems. Through their authorities over land use, local governments are uniquely able to regulate some land use practices that may affect ground water. In addition, local knowledge of soils and geologic conditions is often better than State government's. The local government role in ground water protection is likely to increase further as a result of the local water planning efforts now under way in 54 counties under the Comprehensive Local Water Management Act.

Lack of funds for program development and implementation will severly hamper local governments in their efforts to initiate environmental programs. A consistent level of program guidance is also needed from the State to local government in many programs, to aid in establishment of environmental goals and criteria. In the Strategy, we will examine in more detail these local needs, and recommend ways to enhance the local role in ground water protection.

State government is the level of government most actively involved in ground water protection and regulation, since ground water, as one of the "waters of the State," is under the common ownership of the citizenry of the State. Several different agencies have authorities over ground water (see the table on the following three pages), particularly the Minnesota Department of Natural Resources (DNR), MPCA, and Minnesota Department of Health (MDH).

The division of authorities among these agencies places water quantity management in the DNR; ground water quality issues and pollution control requirements within the MPCA; and health-related and domestic supply matters in the MDH. Two other agencies have expanded authorities related to ground water. The Minnesota Department of Agriculture regulates the registration, sale, use, storage, and disposal of pesticides and has recently been given responsibilities for monitoring the impacts of pesticides on water resources. The Board of Water and Soil Resources, composed of local government representatives and private citizens, administers the local water planning effort, as well as the Soil and Water Conservation Districts, watershed districts and water management organizations.

In addition, State government is involved in research, education, and information, mainly through the University of Minnesota and the Minnesota Geological Survey. The Minnesota Geological Survey compiles hydrogeologic information, including well logs and mapping. The University of Minnesota is active in various lines of ground water research, and the Minnesota Extension Service provides information and education on water quality issues.

Recommended Changes:

The Strategy describes recommended modifications in State programs, and suggests ways to coordinate the programs. Some new organizational links are recommended to enhance research and educational efforts. In addition, the EQB's Ground Water Advisory Committee recommended the creation of a Joint Legislative Commission on Water, which would create a focus at the legislature for water issues and programs and complement the coordinating function of the EQB. The Ground Water Advisory Committee further recommended that the EQB should continue its strong role relating to water issues.

MINNESOTA STATE GROUND WATER AND RELATED MANAGEMENT PROGRAMS

ENVIRONMENTAL QUALITY BOARD

-Water Resources Committee-
Interagency Coordination and Policymaking

Statewide Framework Water and Related Land Resources Planning
Environmental Impact Assessment
Environmental Policy Planning

MINNESOTA POLLUTION CONTROL AGENCY

-Ground Water and Solid Waste Division-
Site Response (Superfund) Program
Solid Waste Facility Permits
Program Development
Statewide Ambient Ground Water Monitoring
Minnesota Ground Water Protection Strategy

-Water Quality Division-
Water Quality Management Planning
NPDES Permits Program
Nonpoint Source Pollution Control
State Disposal System Permits
Agricultural Waste
Municipal Sludge Disposal

-Hazardous Waste Division-
Hazardous Waste Generator Program
Hazardous Waste Facility and Transportation Permits
Storage Tank Regulation and Cleanup
Emergency Response (Spills)

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

-Division of Waters-
Water Appropriation
Ground Water Resource Investigations
Water Level Observation Wells Network
Ground Water Hydrologic Data
Underground Gas and Liquid Storage Permits
Water Use Informational Systems Development

MINNESOTA DEPARTMENT OF HEALTH

-Division of Environmental Health-
Safe Drinking Water Program
Wellhead Protection
Water Well Construction/Abandonment
Health Risk Assessment

-Division of Public Health Laboratories-

STATE PLANNING AGENCY

-Environmental Division-
Staff to the Environmental Quality Board

-Land Management Information Center-
Systems for Water Information Management

MINNESOTA DEPARTMENT OF AGRICULTURE

-Agronomy Services Division-
Pesticide Regulation — Fertilizer Regulation
Environmental Assessment of Pesticides and Fertilizers
Agricultural Chemical Emergency Response

-Planning Division-
Sustainable Agriculture Program

-Laboratory Services Division-

-Plant Industry Division-
Plant Pest Survey — Biological Pest Control Project
Implemenation and Enforcement of Plant and Animal Pest Control Statutes

UNIVERSITY OF MINNESOTA

-Minnesota Geological Survey-
Hydrogeologic Mapping (Statewide) — Water Well Logs Data Base
Hydrogeochemistry Mapping — High Capacity Well Data Base

-Institute of Technology-
Civil and Mineral Engineering — Geology and Geophysics

-College of Agriculture-

-College of Forestry-

-School of Public Health-

-Minnesota Extension Service-

-Water Resources Research Center-

-Center for Agricultural Impacts on Water Quality-

BOARD OF WATER AND SOIL RESOURCES

Local Water Management/Local Water Planning
Oversight of Soil and Water Conservation Districts
Watershed District Formation and Plan Review
Water Policy Conflict Resolution

WASTE MANAGEMENT BOARD

Hazardous Waste Management Plan — Solid Waste Management
Siting of Hazardous Waste Stabilization and Containment Facility

MINNESOTA DEPARTMENT OF TRANSPORTATION

-Technical Services Division-

BASIC TENETS OF THE STRATEGY

1. Ground water is a resource vital to to the economic and public health of Minnesota. It is necessary for the State to develop a comprehensive strategy to adequately manage the resource.

2. The State needs a strong, prevention based program when dealing with potential sources of ground water contamination. Cleanup of existing contamination must continue to be a priority as well. A balance must be struck between regulatory and nonregulatory approaches.

3. Clear goals for ground water protection should be incorporated into all programs which control potential sources of ground water contamination. These goals should include nondegradation where possible, and conformance to specific numeric standards where not possible or for existing problems. All ground water quality impacts should be met with action commensurate with the level of environmental and health risk posed by the impacts.

4. Even in a water-rich State like Minnesota, ground water is a finite resource, although it is to a certain extent a renewable resource. Fostering of water conservation measures, and their enforcement, must be a high priority with the State. Withdrawals should not be allowed which result in "mining" of water beyond the amount replenished by recharge.

5. More basic information on Minnesota's ground water resource is critical. A greater effort is needed to develop information on the State's geologic framework and the quality and flow of water within it, and to see that the information is maintained in a way useable by Minnesotans for varied purposes. Research must be coordinated, and the findings disseminated in a timely manner.

6. Ground water programs should be conducted at the most local level appropriate. Local governments have a crucial role to play in the management and protection of ground water and ground water users. Some problems can be addressed most effectively at the local level, but are limited by availability of resources and technological expertise. The State should support and enhance local efforts, and provide local governments with guidelines and regulations to aid in their program efforts.

7. Coordination between levels of government and governmental entities is vital to efficient ground water protection. Mechanisms such as interagency agreements, and work groups on various topics should be used to the greatest extent possible. The EQB should continue its strong role in coordination of the State agencies, and should extend its role to aid in communication of State programs to local governments.

8. People must understand the impacts that their various practices and activities have on the environment, and be educated in ways to minimize or alleviate those impacts. While education alone is not enough to cause changes in people's behavior, it is a necessary component of both regulatory and nonregulatory programs. Specialized training is also necessary for target groups.

Initiative I. To protect ground water quality now and for the future; to ensure safe drinking water supplies and to prevent ground water contamination by effectively regulating sources of pollution.

Topics Covered in This Initiative:

Initiative I. To protect ground water quality now and for the future; to ensure safe drinking water supplies and to prevent ground water contamination by effectively regulating sources of pollution.

Part One: Goals and Priorities for Ground Water Quality Protection.

Federal Government Role

There is no federal ground water nondegradation policy or statutory direction. However, the U.S. Environmental Protection Agency has been directed by Congress to develop numerical standards for pollutants which may be found in drinking water. The U.S. Environmental Protection Agency has also developed guidelines for a ground water classification system which sets up a differential protection scheme for aquifers based on current water quality and use.

Minnesota State and Local Role

Nondegradation Goal: Minn. Rules ch. 7060 sets forth a "nondegradation policy" for ground water, stating that ground water may not be contaminated in such a way that it can no longer be used as a safe source of drinking water. This policy was developed in 1973, citing the interconnected nature of ground water in the State, and states that economic benefits must be weighed when applying the policy.

Recommendations: Statement of Legislative Intent. Nondegradation (meaning prevention of further contamination and appropriate actions to improve ground water quality in areas already impacted) should be the policy goal of the State in the regulation of all potential sources of contamination. The nondegradation goal means that ground water impacts should be prevented to the maximum extent practicable regardless of whether the water is already impacted by human activities. While this goal is not currently achievable for many activities, the nondegradation goal will provide impetus for adopting improved technologies as they are developed. In areas already impacted, containment of pollutant sources should be the first priority, and should be followed up by a level of cleanup activity appropriate to the circumstances at each site. In some instances, active cleanup will be necessary, while in others passive cleanup (removing the contaminant source or implementing best management practices then allowing natural processes to flush contaminants from the system) may be appropriate. Time frame for implementation - 1989 Legislative Session.

Rule Revision. Minn. Rules ch. 7060 should be revised so that the nondegradation goal applies to all activities and all ground water. This would be implemented by requiring the use of "Best Available Technology" for permitted facilities and practices, and developing incentives for use of "Best Management Practices" for nonpoint sources of pollution. These "Best" technologies would be used, even if a lesser technology can be used and still meet the numerical limits for ground water contaminants discussed below. Time frame for implementation - rules proposed by December 1990.

Programmatic Change. Detection of manmade compounds in ground water, or levels of naturally occurring compounds beyond background levels, indicate

that impacts have occurred. Therefore, regulatory programs should develop a plan for response actions commensurate with the observed level of potential health or environmental hazard. Time frame for implementation - plans developed by December 1990.

Numerical Limits on Ground Water Pollutants: For some practices, it is likely that the nondegradation goal cannot currently be achieved, even if "Best" technologies are used (and especially where they are not). For this reason, numerical limits on ground water pollutants are also necessary for effective ground water protection. Minn. Rules ch. 7050.0220 sets ground water quality standards which are based on the mandatory and recommended provisions of the 1962 U.S. Public Health Service Drinking Water Standards or subsequent revisions. Because of the number of revisions which have been set forth for different purposes, a variety of different numbers has been applied, which leads to variable levels of ground water quality protection from program to program and sometimes from site to site.

Recommendations: Statement of Legislative Intent. The legislature should direct MPCA to establish criteria which would be used to develop numerical ground water limits. The purpose of the numerical limits would be twofold: 1) to serve as a consistent upper limit on the allowable impacts from those practices where ground water impacts cannot currently be avoided, and 2) to serve as a goal for cleanups and remedial activities if still cleaner conditions cannot be restored. Time frame for implementation - 1989 Legislative Session.

Rule Revision. The MPCA should establish a work group, with representatives from other State agencies and the University of Minnesota to begin to revise Minn. Rules ch. 7050.0220 to establish a mechanism for development of numerical ground water quality limits. The rules should specify the process to be used to develop interim limits for compounds detected in ground water. This work group will be responsible for recommending the programmatic steps to be followed, discussing and resolving the technical questions, and recommending staffing levels for the various agencies which would be needed to develop these standards. Existing goals and standards set by the federal government and other states should be considered, and existing information used, in development of the numerical limits. Time frame for implemenation - rules proposed by December 1989.

Rule Revision, Programmatic Change. All State and local agencies dealing with ground water should incorporate these limits in their programs, and strive toward adequate and consistent application of the "Best" technologies. Nondegradation should be a prescribed goal for prevention. Incorporation of limits throughout State ground water programs should be a priority of the EQB's Water Resources Committee. Time frame for implementation - programs guidance developed by July 1991.

Protection of Sensitive Areas: A scheme for ground water classification based on the vulnerability of the particular resource is also given in Minn. Rules ch. 7050.0220. This classification system allows for less stringent protection of areas sensitive to pollution, and so is no longer appropriate. The "writing off" of aquifers in this manner is antithetical to Minnesota's nondegradation goal for all waters, and should not be allowed.

Recommendations: Statement of Legislative Intent. The Strategy recommends enactment of a legislative statement of intent which acknowledges the need for applying special protective measures in areas where ground water is more sensitive to contamination. Time frame for implementation - 1989 Legislative Session.

Rule Revision. The revisions to Minn. Rules ch. 7050 should include a set of criteria for defining areas of the State where more stringent control measures must be taken on the land surface to assure the same level of protection to aquifers below. This revision would provide greater levels of protection to vulnerable ground water, by requiring more stringent controls on potentially polluting activities. Criteria would be established in the rule on geologic susceptibility to contamination from potentially polluting activities. The goal would be to protect all ground water from degradation which threatens its use as a source of drinking water. Time frame for implementation - rules proposed by July 1990.

Resource Evaluation and Mapping. Additional information and research is needed in the area of aquifer evaluation and mapping of sensitive areas. Time frame for implementation - initial development work funded in 1989 Legislative Session.

Local Government Role. Local governments have a role in helping to delineate sensitive areas, possibly as part of the development of water plans, and to use zoning and land use controls to protect sensitive areas. Time frame for implementation - to coincide with implementation of water plans, beginning in 1990.

Funding: Additional staff will be needed at MPCA to work on the rule revisions outlined. Although existing data on the toxicity of pollutants will be used in the setting of numerical ground water quality limits, additional staff will be needed at the MDH to work on this effort as well. The research needed to delineate sensitive areas will be costly; only a limited amount of this information has been gathered to date. It was the recommendation of the Citizen's Advisory Committee that funds for such basic regulatory work as this come from broad-based, general revenues, and that the rules should be structured to avoid a major commitment of resources to ongoing development and maintenance of numerical limits.

Initiative I. Part Two: Drinking Water Protection.

Drinking water protection differs from ground water quality protection in that these programs operate at the point of water use, not at the potential sources of contamination. This issue relates both to public water supplies and private water supplies.

Federal Government Role

The Safe Drinking Water Act defines the federal program and permits states with an equivalent program to be given primary enforcement reponsibility or "primacy."

Minnesota State and Local Role

Water Supply Planning: Public water utilities are responsible for the development of their water supplies, including locating sufficient amounts of suitable quality water to meet the needs of their citizens, and for obtaining the necessary approvals and permits from State agencies. Consultants take an active role in this effort, providing technical assistance to utilities during the planning process.

Recommendation: Legislative Change, Program Development. The legislature should direct the MDH and the Minnesota Department of Natural Resources to work more closely with the public water utilities during their planning process. This should include development of Wellhead Protection guidelines, under which utilities would delineate the recharge areas of wells and work with local government to enact special protective land use restrictions in those areas to prevent future problems with the wells. Additional staff will be needed by the agencies to conduct this effort. Time frame for implementation - 1989 Legislative Session; program development started in July 1989.

Enforcement of Water Well Construction Code: Private well owners have inadequate protection under the current programs. Although Minnesota currently has a water well construction regulatory program, the program has not been effective enough because of understaffing and lack of effective enforcement mechanisms. Minnesota needs adequate funding for the water well program at the State or county level to ensure ground water protection.

Recommendation: Legislative Change; Programmatic Change: The MDH well program should be funded at a level to increase staff to meet legislative obligations for the enforcement of the water well construction code. Also, additional legislation is necessary to implement new regulations to increase the effectiveness of the well program. Legislation should be introduced to cause abandoned wells to be sealed. Such legislation should include disclosure laws and the requirements that abandoned wells be sealed at the time of property transfer. Other legislative initiatives are needed to increase enforcement effectiveness, including a system of fines, impounding equipment, and a system of State well permits and bonding. The MDH should continue to encourage the delegation of the water well program to county governments through a delegation agreement and the adoption of the model well ordinance developed by the MDH and Southeast Minnesota community health programs. Time frame for implementation - 1989 Legislative Session.

Local Assumption of the Water Well Construction Program: Statewide, about 75 percent of all Minnesotans receive their drinking water from ground water sources. Much of this drinking water is supplied by an estimated 300,000-400,000 private wells throughout the State. These large numbers make it difficult to effectively regulate well construction and abandonment, and the testing of drinking water from these wells at the State level. Local governments are already directly involved and experienced in public health protection programs and are in a position to more effectively regulate and test drinking water wells. Current funding through the Community Health Services subsidies must support many other public health programs as well. As a result, most counties have not assumed the well program.

Recommendation: Legislative/Funding, Programmatic Change. Counties should be encouraged to adopt county water well programs including enforcement and well sealing, either through their Community Health Services subsidies, or through another source of funding. The State should provide financial and technical assistance to counties in developing and implementing well sealing programs and water testing services, including development of a model county well ordinance by MDH. Local testing services should be certified by the State. Time frame for implementation - 1989 Legislative Session; program development at county level beginning in July 1990.

Sealing of Unused and Other Problem Wells: Unsealed, abandoned wells may be a major source of ground water contamination. Estimates of the number of unsealed, abandoned wells range from 300,000 to 2 million. Multi-aquifer wells can allow the lower-quality, near surface water to move down into lower aquifers whether the wells are currently in use or not. Improperly cased wells, and wells with casings which have deteriorated over time, are also a significant cause for concern.

Recommendation: Legislative Change, Program Development. The legislature should develop an incentive fund to aid well owners in the sealing of multi-aquifer wells in current use. Pilot projects should also be developed to demonstrate how effective local government can be at dealing with the issue of unused wells, including conducting an inventory of unused wells and developing ways to assure that the most critical of these are sealed in accordance with the Water Well Construction Code. The MDH would be responsible for developing a prioritization scheme to determine the highest-priority wells for sealing. Research is also needed into development of more cost-effective well sealing techniques. Time frame for implementation - 1989 Legislative Session; rules for grant program and prioritization scheme developed by June 1990; initial research funded in 1989 Legislative Session.

Private Water Well Testing: Testing of private wells at the time of construction may be performed by the MDH laboratory or certified private laboratories. Most counties offer testing services to private well owners for coliform bacteria and nitrate to assure the sanitary quality of their water. If private well owners desire to test their water for a broader suite of parameters, such as pesticides or volatile organic compounds, they must contact private laboratories for these services. Because MDH is only beginning to certify laboratories for water chemistry analysis, there is little guidance for people in choosing reputable laboratories. The cost of these analyses is also quite high, and may be prohibitive.

> Recommendation: Program Development. MDH should continue rapidly to develop a laboratory certification program, with minimum requirements for quality assurance to aid consumers in selecting laboratories capable of performing the work accurately and precisely. In addition, counties should consider expanding their well testing programs to include more parameters and to use this data to aid in delineating problem areas and developing the baseline water quality information needed to more adequately manage the resource. Counties may choose to share the cost of this analysis with the homeowner, and at least may arrange the testing so that lower rates can be obtained by application of a quantity discount. Time frame for implementation - certification of laboratories will begin in January of 1989; counties should consider expanded water well testing as part of the water planning efforts now under way.

Wells and Property Transfer: There is currently no requirement in Minnesota for registration of wells on property deeds, which hinders governmental efforts in enforcing sealing of unused wells. Some lending institutions are requiring testing of private wells at the time of property transfer, but this too is not a State requirement.

> Recommendation Legislative Change. The legislature should require registration of all drilled wells, whether in current use or not, on the property deed at the time of transfer. In addition, it is recommended that the legislature require testing of all domestic water supply wells at the time of property transfer to ensure that the water is of sufficient sanitary quality for a drinking water source. This testing should be done by certified laboratories, and the results reported to the MDH or the county community health agency if they have been delegated authorities under the provisions of the Minnesota Water Well Construction Code. A portion of the well testing fee should be retained by the agency to whom the data is reported for data management. Time frame for implementation - 1989 Legislative Session.

Funding: The funding required under the Water Supply Planning for Drinking Water Protection would be for a staff person at the MDH, and should include sufficient amounts for development and publication of the guidelines on Wellhead Protection. Funds for this could come from an additional fee on public water supplies.

Enforcement of the Water Well Construction Code will require major staff additions at the State or local level. This could be funded by a permit fee for wells, either on a one-time basis when the well is constructed or an annual well-permit fee. The well sealing demonstration projects could be funded from

broad-based, general revenues. The cost of the laboratory certification program will be covered in large part by fees paid by the laboratories desiring certification, and the increased testing of private wells could be paid for by well owners.

The cost of registering wells on deeds and testing of wells at the time of property transfer would also be borne by the well owner. County well programs could be funded by a per annum tax on private wells, paid on property taxes for those homes not served by public or rural water supply systems.

Initiative I. Part Three: Programs to Control Pollution.

Federal Government Role

Programs administered by the U.S. Environmental Protection Agency including those under the Safe Drinking Water Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation and Liability Act (Superfund); Federal Insecticide, Fungicide, and Rodenticide Act; and Clean Water Act. The federal government is also active in ground water research, resource evaluation, development of practices and technologies to avoid ground water pollution, and technical assistance.

Minnesota State Government Role

Review of State Programs: Many of Minnesota's serious ground water contamination problems result from improper waste disposal and treatment. Approximately 136,000 facilities of various types are regulated by 15 programs operated by State government; most of the waste facilities are regulated by MPCA. The Minnesota Department of Agriculture is responsible for regulation of pesticides and fertilizers. Ground water protection is frequently not the major regulatory focus of the programs, which results in differential levels of protection for the resource. In addition, large differences in staffing and funding among regulatory programs result in varying abilities to address ground water issues.

Recommendations: Legislative Mandate for Program Review. The Strategy recommends the following set of criteria be used to review regulatory programs in a more objective and consistent manner. These criteria are:

1. goals for ground water protection;
2. enforceable regulations and facility standards for design, construction, operation and closure (also including minimum standards for monitoring and quality assurance);
3. sufficient staff and funds to match the scope of the problems;
4. adequate review of individual facilities and effective enforcement mechanisms; and
5. prioritization of facilities based on judgement of probable environmental risk.

Time frame for implementation - the programs will self-evaluate based on these criteria, then report back to the Water Resources Committee with their findings and recommendations by September 1989, with subsequent EQB report to the legislature for the 1990 session.

Source Control/Reduction: Reducing the amount of waste which must be disposed through reuse and recycling, as well as disincentives on purchase of potentially polluting substances, will result in less pollutants being discharged into the environment.

Recommendation: Legislative Change. The legislature should adopt reuse/recycling legislation with the goal of waste reduction of consumer goods. Pickup programs for household hazardous waste should be expanded and waste agricultural chemical collections should be continued beyond the current demonstration projects. Fees should be imposed on products which have been

shown to impact ground water as disincentives to use. Time frame for implementation - 1989 Legislative Session.

Expand and Enhance Irrigation Regulatory Programs: State law establishes authority for developing requirements for application of pesticides through irrigation systems, including the requirement of obtaining a permit from the Minnesota Department of Agriculture. Such a permitting program does not exist for controlling the application of fertilizers through irrigation systems, even though this practice is more widespread and requires similar precautionary measures. The DNR issues permits for the appropriation of water for irrigation and must consider in that process the impacts of the use of the water.

Recommendation: Legislative Change, Program Development. The Minnesota Department of Agriculture should be authorized to develop requirements to control fertilizer applications through irrigation systems. This should be undertaken in cooperation with farm chemical industry, commodity grower's groups, and irrigators association. Requirements should be distinct from those governing pesticide application through irrigation systems, and should be geared toward best management practices for protecting the environment. Time frame for implementation - 1989 Legislative Session.

Recommendation: Programmatic Change. DNR should develop agreements/ procedures with the Minnesota Department of Agriculture, MPCA, and MDH for reviewing, revoking, and denying appropriations permits and requiring monitoring for irrigation where ground water contamination is present or is a concern. Time frame for implementation - agreements in place by June 1989.

Development of Local Programs: Those contaminant sources which are more numerous and widely dispersed may be controlled more effectively at the local level. Local governments are in a unique position of knowing local conditions and having the available tools to regulate certain types of land use and protect public health. Options available to local governments include land use regulation through zoning and permitting, operation of water supply utilities, and planning and operation of waste treatment and disposal systems. Controlling sources of contamination will require resources which most local governments do not presently have available. In addition, Comprehensive Local Water Planning has been initiated by 54 of the 80 greater Minnesota counties and one metropolitan county has initiated a ground water plan. These plans are important in assessing local problems and needs.

Recommendation: Legislative/Funding; Programmatic Change. Grants to Local Governments. The Ground Water Protection Strategy recommends that the legislature establish a grant mechanism which would help local governments develop and implement environmental programs to address problem areas identified in the Comprehensive Local Water Planning process. This grant could be administered by the Board of Water and Soil Resources, with the local governments reportable to the State agencies which are responsible for the programs which they seek to administer. Examples of programs of this type are the feedlot regulation program, the on-site sewage treatment system program, gravel and other industrial mineral mines, and other pollution sources which are locally important but are not regulated by the State. Agencies should be authorized to develop rules for delegation of these programs. Highest priority for grants would be given to those with the most

comprehensive approach, and those in sensitive areas of the State. Time frame for implementation - 1989 Legislative Session; grant program in place by July 1990.

Technical Assistance and Program Review. The State must have staff in place for technical assistance to aid local governments in ground water information assessment as well as program development/implementation, not only to ease the process of program transfer but to enhance intergovernmental communication. It would be the responsibility of the State programs to oversee local efforts to ensure that minimum environmental protection goals are being met as a condition of continuance of the delegated authority. Time frame for implementation - 1989 Legislative Session.

Nonpoint Sources of Contamination: Nonpoint source impacts are a major cause of ground water contamination in rural and urban parts of the State. Accepted agricultural practices are coming under closer scrutiny as certain pesticides and nutrients are being detected in ground water in areas away from possible point sources of pollution. Many other nonpoint source land use activities also have the potential to adversely impact ground water quality. Pollution sources that do not have adequate prevention programs include: animal waste, urban infiltration ponds, construction sites, on-site sewage treatment systems, underground injection wells, junkyards, backyard dumps, and stockpile storage areas.

Recommendations: Legislative/Funding; Program Development. The State should follow recommendations made in the "Nonpoint Source Ground Water Strategy" and the "Water Resources Strategy for the Control of Pests and Management of Nutrients," which detail specific recommendations for addressing the concerns listed above, including pesticides and nutrients. Appropriate agencies and the University of Minnesota should monitor and research ground water impacts resulting from the various nonpoint pollution sources as recommended in the strategies. Expanded educational and informational opportunities should be provided for the public regarding nonpoint source pollution of ground water. Nonpoint source pollution issues should be addressed by a combination of voluntary best management practices and regulation. A need exists for funding of research, monitoring, and education regarding nonpoint source pollution in areas such as the fate and transport of chemicals in ground water. In addition, the legislature should increase funding for the Clean Water Partnership Program and other programs that address nonpoint source pollution of ground water (e.g., Wellhead Protection Program). State programs such as Reinvest in Minnesota and the State cost share program should be expanded to aid in implementing best management practices to alleviate pollution from pesticides and nutrients. Time frame for implementation - tie in with other recommendations of this Strategy for education and information. Funding for Clean Water Partnership, expanded Reinvest in Minnesota program, and expanded State cost share program - 1989 Legislative Session.

Program Development. Minnesota should develop a State Pesticide Management Plan with Minnesota Department of Agriculture as the lead agency, with strong interagency coordination through the EQB. It should stress problem prevention and nondegradation, should delineate what to do when problems or issues arise, and include: 1) designating special protection areas,

2) taking preventative actions, and 3) initiating specific management plans for a pesticide following detection. Time frame - plan developed by December 1989.

Local Government Role. Due to the widespread nature of nonpoint source pollution, local governments will have a vital role to play in source identification and control through the local water plans. Local governments do not have a large role in issues such as pesticide regulation, or cleanup of past ground water contamination. Time frame - in implementation of local water plans, beginning in 1988.

Underground Injection Control: In 1979 the State decided not to seek primacy from the U.S. Environmental Protection Agency on the Underground Injection Control program, based largely on the fact that there were no known injection wells in the State. Since that time, the federal program has begun to address wells which have been found to occur in the State to some extent, including agricultural drainage wells, stormwater drainage wells, heat-pump return wells, and cesspools and other nonconforming sewage systems.

Recommendation: Program Review. An inventory and assessment of these types of wells in Minnesota should be conducted. A work group should be established to discuss the need for the State to seek primacy in this program, and to determine the steps which need to be taken to receive federal authorization.

Data Management: Regulatory programs at all levels of government are hampered by the lack of adequate computerized data storage and retrieval systems to allow efficient evaluation of the ground water impacts of facilities and practices regulated.

Recommendation: Legislative/Funding. Develop an information management system (an interface, not a new, central system) to link ground water data collections from programs in all State agencies in a consistent and useable format, which would be coordinated among the various agencies and consistent with the State Water Information Management committee data standards. The Integrated Ground Water Information System currently under development by MPCA needs additional funding to become a viable system. The Integrated Ground Water Information System can serve as a template for programs being developed by other agencies. It also will have a PC-based version, which can be used by local units of government. Time frame for implementation - 1989 Legislative Session.

Funding: Additional staff for State programs traditionally comes from the General Fund, reimbursed by permit fees to the extent possible. Grants for local programs should come from the broad-based, general revenues, as should funds for data management. Nonpoint source pollution control efforts could be funded by a combination of General Fund revenues and fees on polluting substances. Source control/reduction should be financed by taxes on nonrecyclable materials, permit fees to stores which sell household materials which become hazardous waste.

Initiative II. To ensure adequate water supplies, to regulate water appropriation and use for protection of highest priority users, and to improve coordination of quality and quantity aspects of regulatory programs.

Topics Covered in This Initiative:

Initiative II. To ensure adequate water supplies, to regulate water appropriation and use for protection of highest priority users, and to improve coordination of quality and quantity aspects of regulatory programs.

The protection and management of the State's ground water resources are incomplete without taking into account ground water quantity concerns and the interrelationship between ground water quantity and quality. The policy which directs ground water programs administered by various State agencies in Minnesota is one of nondegradation of the resource for both quality and quantity.

Federal Government Role

The federal government has no authority to regulate water use in Minnesota. The U.S. Geological Survey is involved in aquifer evaluations which are used in decision-making on appropriation permits.

Minnesota State and Local Role

Water Use Priorities: Appropriation of water from the natural environment is regulated by the DNR through its water appropriation permit system. A water use priority system is laid out in statute, and is applied by DNR when making appropriation permit decisions. This system is called upon increasingly to address types of appropriations which involve both water quantity and quality concerns, such as pumpouts of contaminated water for cleanups.

Recommendation: Programmatic Review. The DNR should lead the EQB's Water Resource Committee in evaluating the State's current water allocation framework and priorities to determine whether they still meet the needs of the State, especially in the areas of contamination cleanups, conservation and efficient use of ground water, and the interactive relationship of ground water and surface water. Time frame for implementation - recommendations to Water Resources Committee in October 1988.

Conservation: Conservation of water in a water-rich State like Minnesota typically has not been a high priority, yet it is of critical importance, especially in time of drought. Enforcement of water conservation and efficient use of ground water has not been adequately implemented. There is a need for a policy which clearly states water conservation goals and provides more "muscle" for promoting conservation and efficient use of ground water. Ground water withdrawals in the Twin Cities during the summer cause large drawdowns. Much of this water is used for climate control in downtown office buildings. Current regulatory policy and programmatic restrictions make it difficult to encourage reuse of noncontact temperature control water, as well as treated water from contamination pumpouts. This tacet policy leads to wasting and inefficient use of ground water.

Recommendation: Programmatic Change. State programs should stress water conservation and efficient use of ground water. As a part of this effort, the DNR should revive the program to get unpermitted water appropriators under permit. Time frame for implementation - conservation should be a topic at the next conference in the "Minnesota Water '88" series. DNR program upgrade by July 1990.

Programmatic Change. Agencies should work together to recommend and encourage uses for contaminated ground water (pumpout water) and ground water used for noncontact temperature control. Time frame - immediate.

Rules Revision. The MPCA and MDH should consider changes in rules which would facilitate reinjection of ground water, under controlled circumstances, where water to be injected meets appropriate quality standards. The injection of waste, or contaminated water, should not be allowed under any circumstances. A work group should be established to discuss these issues, and to direct the State in the decision as to whether to seek primacy on the Underground Injection Control Program from the U.S. Environmental Protection Agency. Time frame for implementation - work group report due to Water Resources Committee by October 1989.

Contingency Planning: A coordinated approach which addresses both quality and quantity concerns is needed to deal with issues of water supply and ground water pollution remediation, both in developing public water supplies and in contingency planning.

Proposed Recommendation: Programmatic Change. Contingency planning for public water supplies should be expanded to better cover emergencies of water quality and availability, especially at the local level. Interagency agreements between DNR, MPCA, and MDH should be used to develop a coordinated approach to deal with problems of water supply and ground water pollution remediation. Federal agencies also have roles in contingency water supply planning. Time frame for implementation - as part of the Water Supply Planning recommendations, outlined herein on page 13.

Coordination of Quantity and Quality Concerns: A coordinated approach which addresses both quality and quantity concerns is needed to deal with issues of water supply and ground water pollution remediation. Remedial actions and alternative water supplies at ground water contamination sites may be designed without adequately considering water conservation and efficient use of ground water. In addition, little has been done to coordinate water supply needs for growing communities with water availability considerations.

Recommendation: Programmatic Change. Interagency agreements between DNR, MPCA, and MDH should be used to develop a coordinated approach to deal with problems of water supply and ground water pollution remediation. In addition, these agencies, along with the Minnesota Department of Agriculture, should develop agreements/procedures for reviewing, revoking, and denying appropriation permits and requiring monitoring for irrigation where ground water contamination is a concern. Staff should be educated about the goals, programs and rules of other agencies. The Minnesota Department of Agriculture should also be involved in issues where agricultural concerns are involved. Time frame for implementation - agreements developed by March 1989; education of staff beginning in January of 1989.

Programmatic Change. The MPCA needs to consider quantity issues when evaluating cleanup options. Uses of pumpout water should be planned as part of remedial measures. DNR may need additional staffing to deal with the increased number of appropriation permits requested as a result of these pumpouts. Time frame for implementation - interagency discussion beginning in October 1988.

Programmatic Change. The DNR should consider water quality impacts of ground water appropriations before approving permits, bearing in mind the State's policy of nondegradation. More research will be necessary in determining these possible impacts. Time frame - immediate.

Funding: The initial implementation of these recommendations is not anticipated to require major expense, but will require staff time to implement. The rules revision stage is more costly. Funding from this comes from the General Fund currently, which is reimbursed by permit fees which the water appropriators pay.

Initiative III. To enhance the current body of knowledge on Minnesota's ground water resource, delineating problem areas and providing information needed to effectively manage the resource.

Topics Covered in This Initiative:

Initiative III. To enhance the current body of knowledge on Minnesota's ground water resource, delineating problem areas and providing information needed to effectively manage the resource.

Federal Government Role

The U.S. Environmental Protection Agency has a ground water research program consisting of five functional areas: monitoring, fate and transport, aquifer reclamation, source control, and technology transfer and technical assistance. The U.S. Geological Survey is also involved in generating information on ground water through hydrogeological studies of specific aquifers and the National Water Use program. The U.S. Department of Agriculture Soil Conservation Service, through its soil survey program, has information available to help identify areas sensitive or susceptible to ground water contamination relative to soil properties.

Minnesota State and Local Role

Coordination: Resource evaluation, monitoring, and research information have been generated by a variety of sources including research institutions and units of government at all levels. Information needs and subsequent data generation are normally accomplished by individual researchers and governmental units with little or no interaction among them. More coordination is needed in these efforts to ensure information is collected in those areas with the greatest need and to avoid a duplication of effort.

> Recommendation: Legislative Change/Programmatic Change. All data generation activities at the State level should be coordinated through a Ground Water Technical Committee made up of technical staff from federal, State, and local agencies and research institutions. This committee would be responsible for recommending to EQB the dissemination of funds from a dedicated research fund and overseeing the development, implementation, and the evaluation of programs in monitoring, research, and resource evaluation. Dissemination of results and findings of the research would be done by the committee. This committee would also make recommendations to other bodies such as the Water Resources Research Center and the Legislative Commission on Minnesota Resources as to research and resource evaluation needs and priorities. The committee should be tied to or formed from existing committees within the State. Time frame for implementation - committee should be formed in July of 1989, and with the first awards for research projects in January of 1990.

Resource Evaluation: It is critical for the regulation and protection of ground water resources to be able to evaluate the resource to be protected. The data needed to define aquifer extent, ground water availability, and water use are often not available. With the exception of several sand plain aquifers and the Twin Cities area aquifer system, the yield potential of most ground water sources in the State has not been thoroughly explored. Except in limited areas that have been the subject of special studies, the data currently available are inadequate to sufficiently define the ground water resource and provide long-term background information for analysis. The basic information needed includes:

1. further ground water resource evaluative studies, including detailed mapping of surficial and buried aquifers for the entire State, especially in recharge areas;

2. development of sufficient ground water quality information to accurately define baseline conditions statewide, and preparation of comprehensive reports to organize and interpret this information;

3. accelerated development of county geologic atlases;

4. more complete information on the patterns of water use, both permitted and unpermitted;

5. update of State land use data base at the Land Management Information Center which is now 20 years old;

6. more detailed monitoring of water levels, and creation of a depth-to-water map to facilitate evaluation of the ground water contamination potential throughout various parts of the State; and

7. testing of aquifer hydrogeologic properties, and related testing of the tightness of confining beds and low permeability formations to assess the degree of protection these aquifers are afforded.

Recommendations: Legislative/Funding. A new emphasis on the gathering of basic data and the stated purpose for such data collection is needed in Minnesota for the successful implementation of any ground water protection strategy. It is recommended additional funding be allocated as follows:

Need 1: DNR, with advice from the Water Resources Committee agencies, should prioritize aquifers for evaluation and cooperative studies, and work with the U.S. Geological Survey and local governments to develop aquifer study reports;
Need 2: MPCA should reexamine and possibly refocus the objectives of their ambient ground water monitoring program, and also use data from other programs to develop sufficient ground water quality information to meet State and local information needs;
Need 3: Minnesota Geological Survey should accelerate creation of county geologic atlases; with the goal of completing all counties in the State by year 2000;
Need 4: State agencies should develop computer-compatible maps showing sites of water use and known or suspected pollution;
Need 5: Land Management Information Center should update the 1969 land use files, using current information;
Need 6: DNR and U.S. Geological Survey should expand the observation well network for monitoring water levels where needed to adequately evaluate the effects of climate and water withdrawals on the available resource; and
Need 7: Minnesota Geological Survey and U.S. Geological Survey should evaluate the hydrologic properties of aquifers and aquitards, with results going into a computerized file accessible by all interested Minnesotans. Existing aquifer test data should also be automated.

Time frame for implementation - 1989 Legislative Session; initial funding for projects in July 1989.

Monitoring: Although information is constantly growing, ground water monitoring activities are not normally well coordinated. This lack of coordination results in information gaps, and hinders the transfer of information. State programs that monitor ground water quality and quantity should be better coordinated. This coordination would be most effective if it occurred at both the management level and through less formal staff interaction.

> Recommendation: Programmatic Change. Monitoring programs need to be evaluated at the management level through a coordinative body consisting of managers from all State agencies with ground water programs. The Water Resources Committee should coordinate development of a statewide interagency monitoring plan, with biennial reports on the nature and quality of ground water in the State and recommendations for modification of the monitoring plan. Other suggestions include creating more opportunities for staff interaction, creation of an electronic bulletin board for monitoring programs and establishment of a yearly statewide monitoring seminar such as "Minnesota Water '88" to display the programs and exchange information. Time frame for implementation - immediate; funding for electronic bulletin board in July 1989.

Research: State agencies have not effectively conveyed their research needs to colleges and universities, nor have they consistently looked to these research institutions to conduct ground water research. Research results are often poorly disseminated, and not well publicized.

> Recommendation: Legislative Change/programmatic Change: A continuing source of funding should be provided for ground water research. The submittal of proposed research projects for funding should be coordinated between State agencies and research institutions. This coordination has begun to occur as the University of Minnesota and state agencies are currently working together in developing Legislative Commission on Minnesota Resources proposals. There should also be a coordinated effort to disseminate statewide research results generated in Minnesota and from elsewhere when results may be applicable to Minnesota. Time frame for implementation - 1989 Legislative Session; first projects funded in January 1990.

Funding: This initiative may be costly to implement. Some funds should come from a stable, dedicated source of money such as user fees to allow for long-term research and resource evaluation efforts. This source should be supplemented from broad-based, general revenues. Other funding sources such as federal and local matching funds and grants from public and private sources should also be an important component of overall funding.

Initiative IV. To provide the public, decision-makers, regulators, and the regulated community with the necessary information and education for making environmentally sound decisions in areas which may impact ground water.

Topics Covered in This Initiative:

Initiative IV. To provide the public, decision-makers, regulators, and the regulated community with the necessary information and education for making environmentally sound decisions in areas which may impact ground water.

Part One: Information and Education.

Informing and educating the public about ground water is a crucial but complex task. Major components of this effort include:

1. Public information on existing knowledge and new findings about ground water, and the publicizing of new programs, availability of services and technical assistance, upcoming events and developments throughout the State and elsewhere.

2. Ground water education of various audiences including children, the general public, and regulated persons and activities.

3. Training for regulators, planners, and other officials at all levels of government.

4. Technical assistance to provide continued support in regulatory and planning efforts at all levels of government.

5. Dissemination of research results and any published information relating to the ground water resource.

Federal Government Role

The federal role in this area has primarily been in the publication of information and technology transfer by primarily the U.S. Environmental Protection Agency and U.S. Geological Survey. The U.S. Department of Agriculture Soil Conservation Service, through its association with local soil and water conservation districts, has responsibility for information and technology transfer to private land users as an integral part of the conservation planning process.

Minnesota State and Local Role

Policy: An informed and educated public is essential in protecting ground water resources as many sources of degradation can be directly attributed to individual behaviors and widespread practices of the public. Ground water protection requires not only the enforcement of regulatory programs but the fostering of appropriate voluntary actions by individuals to prevent degradation. Information and education must, therefore, be a key component of any ground water protection program.

Recommendation: Legislative/Funding: The legislature should enact a Statement of Policy establishing information and education as vital components of an overall ground water protection program. This statement should be backed up by committing funds to both an overall information and education program and to specific ground water management programs with information and education components. Time frame for implementation - 1989 Legislative Session.

Information: Ground water information is developed and disseminated by different State agencies with little or no coordination. The main purpose of these information efforts has been primarily to raise awareness of ground water resources and the issues involved with existing ground water related programs. This information has reached some specific audiences and not others. The development of published information has also been hampered by a lack of funds. Historically, information is published when agencies can scrape enough funds together but may be among the first programs to be cut when budgets are tight. Demonstrating the benefits of public information efforts is complicated by the difficulty in quantifying the results and measuring the effectiveness of these efforts.

Recommendation: Legislative/Funding: The development and dissemination of ground water information should be coordinated through a newly formed committee, which includes State agency personnel and private organizations and citizens with educational and information dissemination expertise. This committee should perform activities consistent with the priorities and policies of EQB, be provided with appropriate staffing levels, and should be responsible to the Minnesota Environmental Education Board. Funding should be provided to agencies to develop sufficient published materials on subjects, such as best management practices, household hazardous wastes, and septic tanks, for distribution throughout the State to a wide range of audiences including the general public, local decision-makers and officials, industries, and farmers. This committee should determine the types of information to be developed for specifically targeted audiences, how it will be disseminated, and how funds will be spent. Time frame for implementation - 1989 Legislative Session.

Education: The State requires environmental education at the elementary school level, but does not presently have a program of ground water education in the schools or for the general public. The objective of education is to provide information on ground water and attempt to develop new attitudes toward ground water protection and to foster good environmental stewardship. Attitudes and awareness should be developed to a point where they lead to actions that prevent ground water degradation. This development will be most successful through personal interaction between teacher and pupil at the primary and secondary education levels.

Recommendation: Legislative/Funding: Funding should be provided for the development of curriculum and in-service training of teachers at both the primary and secondary education levels. This curriculum should be incorporated into existing school programs K through 12. At the primary level general concepts of ground water and sources of contamination could be introduced. More detailed ground water study could be included in the earth sciences and/or general science curriculum at the junior high level while ground water policy issues could be covered in social studies at the high school level. The Minnesota Environmental Education Board, through the above proposed committee, should oversee curriculum development and dissemination. Time frame for implementation - 1989 Legislative Session; curriculum development beginning in July 1989.

Legislative/Funding. An essential component of any ground water education program is the training of State and local regulators. To maintain well-trained staff, technical assistance is required at all levels of

government. The general public and specific audiences need to be educated through seminars, workshops, and demonstration projects. An example of a demonstration project is showing ways of reducing environmental impacts of pesticide and nutrient applications in specific areas of the State. Again, funds will be needed to develop education programs for these audiences. The above committee should coordinate with the local government umbrella organizations to develop education materials and the delivery of educational services to the various audiences. Time frame for implementation - beginning when committee formed, July 1989.

Funding: The cost of generating information and participating in educational activities is relatively low, especially compared to the cost of remedial efforts after pollution has occurred. Possible sources of funding for information and education activities include broad-based, general revenues and grants from public and private agencies.

Part Two: Information Access.

Federal Government Role

The U.S. Environmental Protection Agency provides opportunities to states for getting together to discuss data management concerns including data needs, storage, access, and analysis. The agency also encourages states to work toward a common language, standards, and formats so data can be shared between states and federal agencies. A part of this effort is that the U.S. Environmental Protection Agency is currently studying changes needed in the STORET data base to make it more useful for ground water data. States are further encouraged to develop an implementation strategy for ground water data management.

State and Local Role in Minnesota

Access: Knowledge of and access to information is a major obstacle to widespread adoption of practices that protect ground water quality. Although several major ground water data bases have been automated, funding constraints have left gaps in the current system, where key data bases are still in manual form or only partially automated.

> Recommendation: Legislative/Funding. The Water Resources Committee should review the recommendations of the Systems for Water Information Management Ground Water Subcommittee's position paper that identifies needs for additional ground water data collection, automation and/or enhancements of automated systems, and integration of data. The Water Resources Committee should make recommendations for funding based on this paper and the discussions that it engenders.
>
> The Systems for Water Information Management Committee should be directed by the Water Resources Committee to provide statewide funding recommendations for data base development. These recommendations should be eventually adopted by the Water Resources Committee and include specific data automation and integration needs. The Water Resources Committee should further direct the Systems for Water Information Management to continue interacting with MPCA (in the development of the Integrated Ground Water Information System) and DNR and Minnesota Geological Survey (in the maintenance of WELLS and WELLOG systems), and promote use of these data bases by other agencies.
>
> Time frame for implementation - position paper complete by October 1988; 1989 Legislative Session for funding; these activities are ongoing and should continue but will require funding to maintain these efforts.

Coordination: Coordination of data management activities can aid the efficiency of many programs. Although State agencies' activities are coordinated through the Systems for Water Information Management Committee, local governments are not.

> Recommendation: Programmatic Change: The Water Resources Committee should affirm and promote the Systems for Water Information Management data consistency standards for State agency data collections, and continue working with local governments to encourage them to conform to these standards as well. In this way, the State agencies will be able to access

information collected at the local level, and to better transfer ground water information to local units of government.

The Systems for Water Information Management Ground Water Subcommittee should establish uniform file structures and data coding procedures, to be used by all agencies collecting ground water data. Since a central computer will not be used to house all the data, documentation should be developed to facilitate communication between the various systems' users to aid in data transfer.

Time frame for implementation - coordination is ongoing, with uniform file structures and data coding procedure recommendations to Water Resources Committee by July 1989.

Funding: Cost of information system development is high, often requiring purchase of new equipment and software, programming costs, and data entry. These costs may be offset, however, in increased ease of data access and transfer. Staff time is saved and environmental protection enhanced. Possible sources of funds are broad-based, general revenues and permit fees. All programs should make efficient, accessible data management a priority, and funds should be earmarked for these efforts.

TABLE SUMMARIZING STRATEGY RECOMMENDATIONS

The following table provides a summary of major elements identified in the Strategy according to initiative with a brief description of the goal and the mechanism to achieve each goal.

	Environmental Goal	Mechanism to Achieve	Lead Agency	Possible Funding Source	Time Frame to Initiate
Initiative 1 A. Ground Water Quality Protection					
1. Nondegradation (page 13)	prevention of contamination	1. Make nondegradation a legislative policy goal for the State 2. Apply goal to ground water and all activities through revisions of State rules 3. Develop response actions according to observed levels of ground water impact	MPCA		July 1988
2. Numeric Limits (page 14)	limit contaminants in ground water	1. Legislature direct MPCA to promulate criteria for developing numerical ground water limits 2. Establish process for developing numerical limits through revisions of State rules 3. Incorporate limits into local and other State agency programs	MPCA, MDH		July 1988
3. Protection of Sensitive Areas (page 15)	tailor management to local conditions	1. Legislative statement acknowledging the need for special protective measures in sensitive areas 2. Establish criteria to provide control measures that protect all ground water from degradation	MPCA	extra fees on development in sensitive areas	July 1988

	Environmental Goal	Mechanism to Achieve	Lead Agency	Possible Funding Source	Time Frame to Initiate
		3. Provide additional data on aquifers and sensitive areas 4. Local governments assist in delineating these areas			
B. Drinking Water Protection:					
1. Water Supply and Wellhead Protection (page 16)	protect public water supplies with zoning controls	Delineate and protect ground water recharge areas of water supply wells	MDH, local	EPA grant; local water utility fees	July 1989
2. Water Well Code Enforcement (page 16)	protect drinking water of well owners	Increase staff for enforcement and develop model well ordinance for local government	MDH	permit fees on wells	July 1989
3. Local Assumption of Water Well Code (page 17)	protect drinking water of well owners	Encourage counties to adopt local water well programs	local	permit fees on wells	July 1989
4. Well Sealing (page 17)	seal unused wells, prevent contamination	Develop pilot projects at the local level to deal with the issue of unused wells. Also, develop prioritization for sealing wells and conduct research on cost-effective sealing techniques	MDH, local	permit fees on wells	July 1989
5. Private Well Testing (page 18)	provide representative drinking water quality data	Develop State laboratory certification program and expand county well testing programs	MDH, local	laboratory fees, permit fees on wells	July 1989
6. Property Transfers (page 18)	protect drinking water quality	Register wells in property deeds, and require well testing in property transfers	local	registration fees	July 1989

	Environmental Goal	Mechanism to Achieve	Lead Agency	Possible Funding Source	Time Frame to Initiate
C. Program to Control Program:					
1. Review of State Programs (page 20)	provide a greater focus on ground water protection	State agencies self-evaluate programs affecting ground water resources	MPCA, MDA		July 1989
2. Source Control/Reduction (page 20)	reduce potential contaminants to ground water	Legislation adopted on the reuse/recycling of waste	MPCA, local	fees on polluting sources	July 1989
3. Expand and Enhance Irrigation Regulatory Programs (page 21)	prevent ground water contamination	Develop requirements on fertilizer applications through irrigation	MDA, DNR		July 1989
4. Development of Local Programs (page 21)	protect ground water at the local level	1. Legislature establish grant mechanism to help local governments develop and implement environmental programs 2. State provide technical assistance in ground water resource assessment, and program development/ implementation	BWSR, local		July 1989
5. Nonpoint Source Pollution (page 22)	control nonpoint sources of pollution	1. Expand education, research, and monitoring efforts regarding nonpoint source pollution 2. Develop State pesticide management plan with strong interagency coordination 3. Involve local governments in source identification and control through local water plans	MPCA, local	federal funds; fees on polluting substances	July 1988
6. Underground Injection Control (page 23)	protect ground water from injected fluids	Establish a State inter-agency work group to assess need for an injection program	MPCA, DNR, MDH	federal funds	July 1988

	Environmental Goal	Mechanism to Achieve	Lead Agency	Possible Funding Source	Time Frame to Initiate
7. Data Management (page 23)	coordinate, develop, and maintain automated data bases	Develop an information management system to link ground water data from programs in all State agencies	EQB/SWIM, interagency	permit fees	July 1989
Initiative 2					
A. Water Use Priorities (page 27)	ensure adequate supply	Evaluate State's current water allocation framework and priorities	DNR	permit fees	July 1988
B. Conservation (page 27)	ensure adequate supply	1. Revive program of getting unpermitted water appropriations under permit 2. Encourage uses for non-contract cooling water and contaminated ground water 3. Revise State rules for reinjection of ground water under controlled conditions	DNR	permit fees	July 1988
C. Contingency Planning (page 28)	ensure adequate quality and supply	Expand contingency planning efforts for public water supplies	DNR	permit fees	July 1988
D. Coordination of Quantity and Quality Concerns (page 28)	ensure adequate quality and supply	Develop coordinated approach among State agencies on problems of water supply and ground water pollution remediation	DNR	permit fees	July 1988
Initiative 3					
A. Coordination (page 33)	effective and efficient generation of information	Establish a committee of technical staff from State and federal agencies, and research institutions to coordinate State programs in monitoring, research, and resource evaluation	EQB/interagency		July 1989

	Environmental Goal	Mechanism to Achieve	Lead Agency	Possible Funding Source	Time Frame to Initiate
B. Research Evaluation (page 33)	increase basic knowledge of the resource	Collect pertinent baseline data on ground water resources needed to successfully implement the Strategy	DNR, MGS, local	federal and local matching funds	July 1989
C. Monitoring (page 35)	better information on ground water, coordination	Evaluate and coordinate State monitoring programs at both the staff and management levels	WRC/interagency	fees on polluters/ responsible parties	July 1988
D. Research (page 35)	increase knowledge of impacts and prevention	Coordinate efforts to develop and conduct research projects on a statewide basis	EQB/interagency	grants from public and private agencies	July 1989
Initiative 4					
A. Information and Education					
1. Policy (page 39)	foster voluntary actions in ground water protection	Legislative statement establishing information and education as vital components in ground water protection programs	EQB/interagency local		July 1989
2. Information (page 40)	raise public awareness	Coordinate the development and dissemination of information statewide to a wide range of audiences through a coordinative body	MEEB/interagency local	grants from public and private agencies	July 1989
3. Education (page 40)	promote stewardship	Coordinate the development of curriculum and in-service training for teachers at the elementary and secondary school levels	MEEB/interagency local	grants from public and private agencies	July 1989
B. Information Access					
1. Access (page 42)	improve availability of ground water information	Adopt and develop a statewide automated and integrated data base system	EQB/SWIM	federal government	July 1988
2. Coordination (page 42)	improve the exchange of data between State and local governments	Promote consistency standards for State agency and local government data	EQB/interagency local	local government federal government	July 1988

LEGISLATIVE CONCEPTS

The Strategy recommends the following major legislative initiatives, as outlined in the preamble to this document. These components represent a multi-pronged, integrated approach which will become a major ground water initiative for the 1989 Legislative Session. The EQB's Ground Water Advisory Committee recommended creation of a Joint Legislative Commission on Water at their June 3, 1988, meeting. At the time of publication of this document, this idea has not undergone in-depth review by State agencies, but preliminary indications are in favor of this commission's creation. If this commission is formed, it should have both surface water and ground water subcommittees, so ground water issues receive adequate attention from the commission.

*Prevention of contamination should be the top priority. This includes establishment of a goal of nondegradation for all ground water, development of numerical limits on ground water pollutants, and delineation of the especially sensitive areas of the State where special protective measures must be taken at the land surface to ensure protection of the resource below. Strong continued support is needed for cleanup of existing problems.

*Drinking water protection is crucial to the health and welfare of all Minnesotans. Components of this effort include the State developing a Wellhead Protection Program, promotion of better contingency planning and conservation measures, registration of all wells on property deeds and testing of wells at the time of property transfer, development of a prioritization scheme and incentive fund to address the problem of abandoned wells, and enforcement of the Water Well Construction Code.

*Ground water information and education are vital to the success of the prevention and cleanup efforts. Components of this effort are the development of educational opportunities for children and adults, the dissemination of information on our ground water resource and State programs to protect it, specialized training for target groups, and the furtherance of intergovernmental communication.

*Enhancement of local government participation in environmental protection is a critical need as well. The Strategy recommends development of a grant mechanism which would provide funds to local government for the development and implementation of local programs to address environmental concerns. State agencies should be authorized to develop rules for delegation of certain programs to local governments, and have staff in place for technical assistance to aid local governments in program development and implementation.

*Ground water resource evaluation, monitoring and research are needed for effective management of the resource. The extent of existing contamination is not documented, minor aquifers are not mapped, and recharge areas of major aquifers are not fully and clearly delineated. Research is also needed in the development of alternative technologies to replace current practices which impact ground water. The Strategy recommends development of a fund which would help to foster stable, long-term resource evaluation, monitoring and research.

*Control of pollution sources is a necessary component. Increased funding for staff in regulatory programs and for programs such as the Clean Water Partnership is needed to continue these efforts. Another important area is pollutant source reduction for both current and potential sources of pollution. Technical assistance in source control and reduction will be a necessary component.

More detail on these legislative initiatives follows.

Prevention of Contamination:

Ground water is an economically vital resource which provides drinking water for most Minnesotans. In many parts of the State, ground water quality has already been impacted by human-induced pollution. The cost of active cleanup is great, and it is not always possible to return the water to uncontaminated conditions. For these reasons, prevention of further contamination must be the cornerstone of Minnesota's ground water protection effort.

Nondegradation Goal. The Strategy recommends that the legislature state that nondegradation (meaning prevention of further contamination and appropriate actions to improve ground water quality in areas already impacted) is the policy goal of the State in the regulation of all potential sources of contamination. The nondegradation goal means that ground water impacts should be prevented to the maximum extent practicable regardless of whether the water is already impacted by human activities. While this goal is not currently achievable for many activities, the nondegradation goal will provide impetus for adopting improved technologies as they are developed. In areas already impacted, containment of pollutant sources should be the first priority, and should be followed up by a level of cleanup activity appropriate to the circumstances at each site.

In keeping with a goal of nondegradation, detection in ground water of manmade compounds, or levels of naturally occuring compounds beyond background levels, indicate that impacts have occurred. A plan for response actions should be developed commensurate with the observed level of potential health or environmental hazard.

The Strategy recommends that the State establish numerical limits for ground water pollutants, to be based on affording protection to human health and the environment. Adoption of these limits would not restrict the State from taking appropriate action when impacts are detected, however, they would form a "bottom line" of protection to all ground water from all activities and a goal for cleanups.

Numerical Limits on Ground Water Pollutants. The legislature is asked to direct MPCA to promulgate the criteria which would be used to develop these numerical limits, then to provide sufficient staff at both the MPCA and the MDH to develop the numbers based on the promulgated criteria. A statement of legislative intent is also necessary, clarifying the relationship between the goal of nondegradation and the numerical limits which will be established.

Due to the large degree of geologic diversity across the State, the sensitivity of ground water to pollution is greater in some areas than in others. In order

to protect the quality of all ground water to the same degree, additional protective measures must be applied to pollution sources in these sensitive areas. Minnesota needs to delineate these areas, as well as in developing alternate technologies to be used for greater protection.

Special Protective Measures. The Strategy recommends enactment of a legislative statement of intent which acknowledges the need for applying special protective measures in areas where ground water is more sensitive to contamination.

Delineation of Sensitive Areas. Legislation is also needed to authorize MPCA, with guidance from an interagency work group, to develop criteria for defining sensitivity, and to provide funds to DNR, Minnesota Geological Survey, and local governments to work to delineate these areas. Regulatory programs should be directed to assess their protection efforts in light of the criteria and maps developed, to determine whether the extra measure of protection required in sensitive areas is being given. Legislation may also be needed to enact some of these protective measures, such as allowing RIM funds to be used to acquire easements in sensitive areas, and enabling local units of government to zone for ground water protection.

Drinking Water Protection:

Seventy-five percent of all Minnesotans depend on ground water for drinking water. Of these, about half are served by public water utilities, and the rest obtain their water from private domestic water wells.

Water Supply Planning. Public water utilities are responsible development of water supplies, including locating sufficient amounts of suitable quality water to meet the needs of their citizens, and for obtaining the necessary approvals and permits from State agencies. The Strategy recommends that the legislature direct MDH and DNR to work more closely with the public water utilities during their planning process. MDH should develop guidelines for the utilities to adopt regarding Wellhead Protection, a program where the recharge areas of wells are delineated and special protective land use restrictions enacted in the wells' capture zone to prevent future problems with the wells. Additional staff will be needed by the agencies to conduct this effort.

Wells and Property Transfer. The legislature is further recommended to require testing of all domestic water supply wells at the time of property transfer to ensure that the water is of sufficient sanitary quality for a drinking water source. This testing should be done by certified laboratories, and the results reported to MDH or the county community health agency if they have been delegated authorities under the provisions of the Minnesota Water Well Construction Code. A portion of the well testing fee should be retained by the agency to whom the data are reported for data management. In addition, the legislature should require registration of all drilled wells, whether in current use or not, on the property deed at the time of transfer.

Sealing of Unused Wells. The Strategy recommends that the legislature develop a pilot program to demonstrate the effectiveness of counties in dealing with the issue of unused, unsealed wells. Components of this

project would be an inventory of wells within the project area, then developing ways to assure that the most critical of these are properly sealed in accordance with the Water Well Construction Code. MDH would be responsible for developing a prioritization scheme to aid in determining which wells to seal first. While methods of sealing are straightforward, lodged debris and equipment in wells can significantly increase costs of sealing. Research is needed into the development of technology for preparing problem wells for sealing.

Enforcement of Water Well Construction Code. MDH has identified the need for a significant increase in staff for enforcement of the Water Well Construction Code, as well as the addition of administrative penalties to its regulatory authorities. An expanded State program combined with delegation agreements in interested counties may be an effective approach. In this way, the need for additional staff at the State level could be partially offset over time by the assumption of the Water Well regulatory program by county governments. Initially, funds will be needed by counties in order to establish these programs. Once established, the programs can be maintained by permit fees on wells, or a private well tax added to the property tax for homes and businesses not served by public water supplies.

Ground Water Information/Education:

Ground water is a largely unseen and misunderstood resource. It becomes contaminated subtly and invisibly, without notice until wells are impacted. For these reasons, it is imperative that all Minnesotans are aware of the potential impacts of their actions. Development of a ground water education effort must be a cooperative project, growing from both government and private efforts, with input from concerned citizens. Without a strong education and information program, incentives and regulations are significantly less effective.

Need for Comprehensive Information and Education Efforts. The Strategy recommends that the legislature enact a statement of policy establishing information and education as vital components in an overall ground water program.

The Strategy recommends the following specific legislative package for promoting ground water education and information dissemination:

Education. The Minnesota Environmental Education Board should receive funding for additional staff responsible for ground water education for children and adults, along with sufficient funds to oversee development and dissemination of curriculum for all levels of school children in grades K through 12. Work done by the Minnesota Environmental Education Board should be coordinated through the Ground Water Information and Education Committee, with representatives from State agencies, as well as with educational personnel, the University of Minnesota and the Minnesota Extension Service. The target groups of this educational effort are adults and children in both urban and rural areas.

Information on Programs and the Resource. State agencies need to maintain effective information dissemination offices, not only to respond to public questions but to initiate informational efforts. The legislature should direct State agencies to take a more aggressive role in information dissemination and to fund their efforts.

Specialized Training. The Minnesota Extension Service should offer specific information to targeted groups on the impacts of activities such as row-crop agriculture, animal confinement areas, lawn fertilization and pest control, etc. This should include information on alternate practices which lessen the impact of these activities on ground water quality. Technology transfer from researchers to the general public is a vital part of this effort.

Intergovernmental Communication. Information exchange and training is needed for regulators, planners, and other officials at all levels of government. These decision-makers must be informed on the vulnerability of the ground water resource in areas with which they are involved, and on the development and implementation of programs with the potential to impact ground water. Increased communication is vital as well between the levels of government and all agencies involved. Funding is needed for the EQB to continue developing events and opportunities for communication and information exchange.

Enhancement of Local Government Participation:

Local governments are key players in the ground water protection effort, both in the areas of planning and in land use management. Many counties are participating in the creation of Comprehensive Local Water Plans which will enable them to identify local ground water impacts and to develop plans to address these impacts. Fifty-four of these counties received seed money from the Legislative Commission on Minnesota Resources to develop their plans, and several other counties are proceeding on their own with plan development. In the metropolitan area, Hennepin County has begun developing a ground water plan, and several other counties are considering whether they should create such a plan as well.

Grants to Local Governments. The Strategy recommends that the legislature establish a grant mechanism which would help local governments develop and implement environmental programs to address problem areas identified in the development of water plans, or to develop the plans if not already in progress. This grant could be administered by the Board of Water and Soil Resources, with the local governments reportable to the State agencies which are responsible for the programs which they seek to administer. Examples of programs of this type are the feedlot regulation program, the on-site sewage treatment system program, and other pollution sources which are locally important but are not regulated by the State. Agencies should be authorized to develop rules for delegation of these programs. Highest priority of grants would be given to those with the most comprehensive approach and those in sensitive areas of the State.

Water Well Construction and Abandonment Program. The legislature is further recommended to encourage counties to assume responsibility for the Water Well Construction Program and to provide additional funds to share the costs of program development through the Community Health Services subsidies, or another mechanism such as the grants to local governments described above. MDH should develop a model county well code ordinance, which would serve as baseline county requirements in order to receive authorization for the program.

Technical Assistance and Program Review. The State must have staff in place for technical assistance to aid local governments in program development and implementation, not only to ease the process of program transfer but to enhance intergovernmental communication. Implementation of local water plans will also require cooperation between State and local governments. It would be the responsibility of the State programs to oversee local efforts to ensure that minimum environmental protection goals are being met as a condition of continuance of the delegated authority.

Ground Water Resource Evaluation, Monitoring, and Research:

The current state of knowledge about ground water in Minnesota is not adequate for effective management of the resource. The extent of existing contamination is not documented, minor aquifers are not mapped, and recharge areas of major aquifers are not fully and clearly delineated. Research is also needed in the development of alternative technologies to replace current practices which impact ground water.

Long-term Research. All data generation activities at the State level should be coordinated through a Ground Water Technical Committee made up of technical staff from federal, State, and local agencies and research institutions, which the Strategy recommends the legislature create and provide staff. This committee would be responsible for recommending to EQB the dissemination of funds from a dedicated research fund and overseeing the development, implementation, and the evaluation of programs in monitoring, research, and resource evaluation. Dissemination of results and findings of the research would be done by the committee. The committee should be tied to or formed from existing committees within the State. Time frame for implementation - committee should be formed in July of 1989, and with the first awards for research projects in January of 1990.

Resource Evaluation. Aquifer studies are needed to accelerate delineation of aquifers and to determine aquifer characteristics. This information would be used by DNR in making decisions on appropriation requests, by MPCA in pollution investigations and cleanup as well as in establishment of monitoring requirements, by the Minnesota Department of Agriculture in tailoring pesticide training to local conditions, and by local governments in making land use decisions. Funding for these projects should come from a fund such as that described above, and should include funds for management of the data electronically in a format consistent with other State data collections.

Baseline Monitoring. Baseline monitoring is conducted by State agencies to determine existing, background ground water conditions. This is especially important when stress is exerted on the resource, such as pumpage, drought or widespread contamination from nonpoint sources of pollution. The Strategy recommends that the legislature increase funding to the agencies which conduct this research; MPCA for ambient ground water monitoring, the Minnesota Department of Agriculture for monitoring of pesticides in agricultural areas, and DNR for water level monitoring. These agencies in conjunction with MDH, State Planning Agency, and other interested agencies, coordinated through the Water Resources Committee, should be required to prepare a statewide interagency monitoring plan and subsequently publish results from their studies in a joint report biennially which describes the

nature and current quality of ground water in Minnesota and makes recommendations for modifications to the monitoring plan.

Control of Pollution Sources:

Minnesota has in place a number of effective programs to regulate sources or to fund cleanup of ground water contamination, including programs which regulate solid and hazardous waste and the State Superfund and Petroleum Tank Release Cleanup Fund. Other programs have developed with other environmental foci, but may impact ground water as well. A detailed evaluation of these programs will be conducted by September 1989, with a report to the legislature prepared in time for the 1990 Session. A number of needs have already been identified through the Strategy development process, including those listed below.

Scope of Programs Which Regulate Point Sources. The level of staffing and funding should be adequate to match the scope of the problem which it is intended to regulate. Scope of the problem is defined both by the number and relative size of the facility and by the potential severity of its impacts.

Source Control/Reduction. The Strategy recommends that the legislature adopt reuse/recycling legislation with the goal of waste reduction of consumer goals. Statewide pickup programs for household hazardous waste and waste agricultural chemicals should be expanded beyond the current demonstration projects. Fees should be imposed on products which have been shown to impact ground water as disincentives to use.

Irrigation Regulatory Programs. The Minnesota Department of Agriculture should be authorized to develop requirements to control fertilizer applications through irrigation systems. This should be undertaken in cooperation with farm chemical industry, commodity grower's groups, and irrigators' associations. Requirements should be distinct from those governing pesticide application through irrigation systems, and should be geared through best management practices for protecting the environment.

Nonpoint Sources of Pollution. Nonpoint sources of pollution are a problem of increasing concern. Appropriate agencies and the University of Minnesota should monitor or research ground water impacts resulting from the various nonpoint pollution sources as recommended in the strategies. Expanded educational and informational opportunities should be provided for the public regarding nonpoint source pollution of ground water. Nonpoint source pollution issues should be addressed by a combination of voluntary best management practice implementation and regulation. A need exists for funding of research, monitoring, and education regarding nonpoint source pollution. In addition, the legislature should increase funding for the Clean Water Partnership Program and other programs that address nonpoint source pollution impacting ground water (e.g., Wellhead Protection Program).

Information Management. Data management is a critical need for effective regulatory programs. The Strategy recommends that the legislature grant funds for development and maintenance of data management systems; and further that they should require that all ground water data collected be managed electronically, using consistent data elements and with sufficient documentation that other parties interested in the data can have ready access to it.

State Pesticide Management Plan. The Strategy recommends that the legislature direct and fund the Minnesota Department of Agriculture to develop a State Pesticide Management Plan with the Minnesota Department of Agriculture as the lead agency, strong interagency coordination through the EQB and strong involvement of growers. The plan should stress problem prevention and nondegradation, should delineate what to do when problems or issues arise, and include: 1) designating special protection areas, 2) taking preventative actions, and 3) initiating specific management plans for a pesticide following detection, including trigger levels for follow-up actions and enactment of pesticides use restriction where appropriate.

More Flexible Enforcement Tools. The addition of statutory authority to levy administrative penalties (fines) in less severe cases would enable the State to take action against less severe polluters without burdensome court procedures which are often not cost effective. In addition, agencies may identify the need for authority to invoke criminal penalties on those who intentionally discharge nonhazardous waste, similar to those for hazardous waste discharges.

SUMMARY OF THE

REPORT OF THE

ENVIRONMENTAL QUALITY BOARD

ADVISORY COMMITTEE ON GROUND WATER PROTECTION

JUNE, 1988

COMMITTEE PURPOSE

The EQB appointed an Advisory Committee on Ground Water Protection in January 1988. The charge was to:

1. Review the draft Minnesota Ground Water Protection Strategy under development by the Pollution Control Agency (and by mutual agreement with PCA, for review and approval by the EQB);

2. Review the draft Water Resources Strategy for the Control of Pests and the Management of Nutrients under development by the EQB Water Resources Committee; and,

3. Advise the EQB on the adequacy, policy choices, directions, priorities, justification, and implementation options of both strategies.

COMMITTEE PROCESS

The Committee met at three week intervals: February 19, 1988; March 11, 1988; March 31, 1988; April 21, 1988; May 13, 1988; and June 3, 1988. Thomas Anding, Associate Directer of the Center for Urban and Regional Affairs at the University of Minnesota, chaired the Committee.

A diverse membership representing farmers, industry, local governments, researchers, and citizen groups, brought a wealth of knowledge to the Committee. To expedite the review of the two strategies, two subcommittees were formed: A Ground Water Protection Subcommittee, chaired by Linda Lehman, and a Pest and Nutrient Management Subcommittee, chaired by Newell Searle. Each subcommittee thoroughly reviewed the relevant strategy and brought concerns and recommendations to the full Committee for its resolution.

Marilyn Lundberg, State Planning Agency, served as Committee Administrator. Staff from the State Planning Agency, Pollution Control Agency, Minnesota Geological Survey, Department of Health, Department of Agriculture, Department of Natural Resources, the Attorney General's Office, and University of Minnesota Center for Regional and Urban Affairs, and the University of Minnesota Center for Agricultural Impacts on Water Quality, assisted the Committee as it studied and discussed the two strategies.

To further help the Committee understand the issues associated with these strategies, Richard Kelly, Environmental Specialist Iowa DNR, and David Belluck, Ground Water Toxicologist Wisconsin Department of Health and Social Services, met with the Committee to discuss the ground water programs of their respective states.

The commitment of the members has been tremendous and reflects the concern and interest of the public. It is important to recognize that even though the Committee members represent very diverse interests, the recommendations were made unanimously.

MINNESOTA ENVIRONMENTAL QUALITY BOARD
300 Centennial Building · 658 Cedar Street · St. Paul, Minnesota 55155
612-296-2603

June 16, 1988

To: Environmental Quality Board

Fr: EQB Advisory Committee on Ground Water Protection

Re: Committee Report

The Report of the EQB Advisory Committee on Ground Water Protection is attached. Our Committee recognizes the importance of the Ground Water Protection Strategy and the Strategy for the Control of Pests and the Management of Nutrients and offers its support for passage of the legislative package needed to carry them out.

We would like to highlight our major recommendations. The Committee:

* Strongly supports implementing these strategies. Members are concerned about problems resulting from the control of pests and management of nutrients, as well as contamination from other sources, such as improperly constructed wells or leaking storage tanks.

* Recommends that there be a preamble to the two strategies that provides a context for the two strategies. In addition, this preamble should provide highlights of both strategies, and convey a sense of urgency for implemention.

* Recommends that prevention of further contamination be the cornerstone of Minnesota's ground water protection efforts. In addition, cleanup of appropriate areas should continue to be an important part of Minnesota's efforts.

* Supports Minnesota having nondegradation (meaning prevention of further contamination) for a goal in order to have continued movement toward improvement of ground water quality.

* Supports Minnesota revising and updating the current framework that establishes the degree of actions required. This framework would include numerical limits, or a process for developing them, as a way of gaging the severity of contamination, identifying appropriate preventive actions, and defining clean-up requirements.

* Recommends applying water quality protection to all ground water. It does not support "writing off" any aquifers. Special protection should also be given in areas sensitive to ground water contamination.

* Recommends that the strategies need to be carried out as a whole, since no single effort, whether it be education, research, monitoring, incentives, coordination, or regulation can alone achieve the desired results.

* Recommends the creation of a Joint Legislative Commission on Water. This Commission would create a focus at the legislature for water issues and programs and complement the coordinating function of the Environmental Quality Board. This Commission could also evaluate the present state structure for its effectiveness in carrying out the strategies.

* Recommends that the Environmental Quality Board (EQB) continues its strong role relating to water issues. The EQB should also take a lead role in ensuring that state programs, rules, and other activities recommended in the strategies are communicated to local government.

* Recommends that the state significantly increase funding for local water management activities, since local government has an essential role in protecting ground water.

* Recommends that the funding needed to carry out the strategies be a combination of broad based (all potential beneficiaries) and those related to specific impacts on water. Every user of water should pay the costs of general, statewide functions, such as coordinating, education, and research. Special taxes or fees should be used to underscore the relationship between specific activities and problems or benefits.

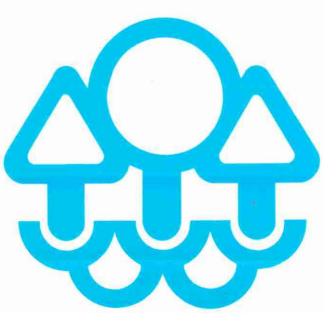
* Recommends the state obtain information to characterize aquifers in terms of quantity and quality. To do this, the state must establish clear goals for information needs that outline the purpose, scope, value, and coordination efforts.

* Recommends that state ensure water resources data compatibility between agencies and with local government. It should have clear goals that outline the purpose, scope, value, and coordination efforts of its monitoring programs. Water testing should be required at real estate transfers.

* Recommends that in considering the Strategy for the Control of Pests and Management of Nutrients, the state must recognize the significant role the federal farm programs play in shaping agriculture practices, and work to impact the direction of the new federal farm program as it is drafted in 1989 or 1990.

* Recommends a research project to better evaluate the number of abandoned wells, the priorities for sealing, and the methods and process for sealing.

The enclosed Committee Report contains more information about each recommendation as well as a number of specific recommendations about portions of the strategies.



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