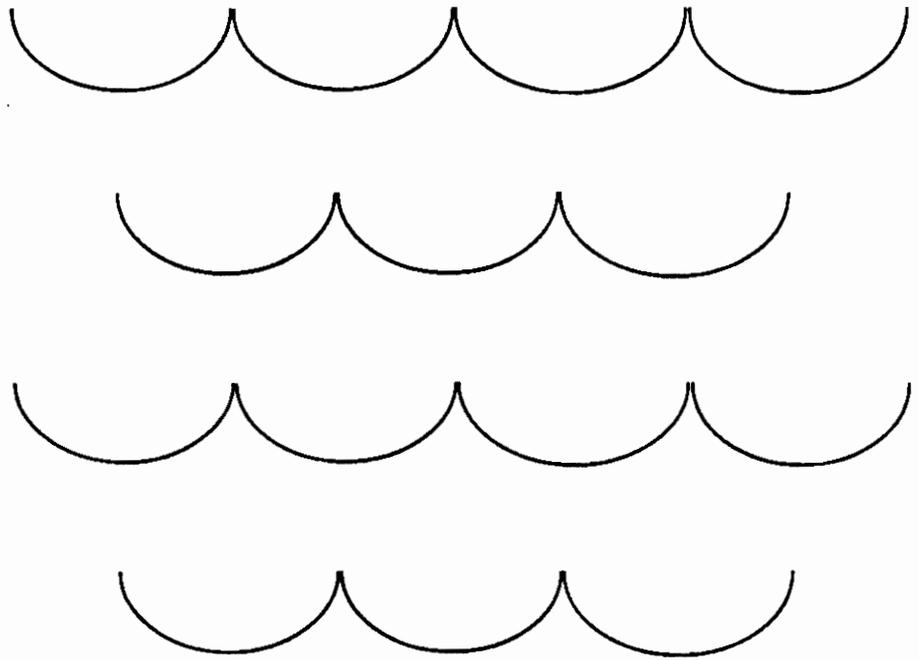




GENERIC STATE MANAGEMENT PLAN FOR PESTICIDES AND GROUND WATER



Prepared by

The North Dakota
Department of Agriculture
Plant Industries Division

Roger Johnson
Commissioner of Agriculture

SEPTEMBER 1998

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ACRONYMS

1. BMP Best Management Practice
2. CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
3. CRTG Contamination Response Task Group
4. CWA Clean Water Act
5. EPA United States Environmental Protection Agency
6. FIC Federal Initiatives Coordinator
7. FIFRA Federal Insecticide, Fungicide and Rodenticide Act
8. GIS Geographic Information System
9. GSMP Generic State Management Plan
10. GTS Geographic Targeting System
11. HAL Health Advisory Level
12. IDN Information Distribution Network
13. MCL Maximum Contaminant Level
14. NDCC North Dakota Century Code
15. NDDA North Dakota Department of Agriculture
16. NDGS North Dakota Geological Survey
17. NDDH North Dakota Department of Health
18. NDSU North Dakota State University
19. NDSWC North Dakota State Water Commission
20. NDWRD North Dakota Water Resource District
21. PSC Public Service Commission
22. PSMP Pesticide State Management Plan
23. QA/QC Quality Assurance/Quality Control
24. RCRA Resource Conservation Recovery Act
25. SDWA Safe Drinking Water Act
26. SOP Standard Operating Procedure
27. UIC Underground Injection Control
28. USDA United States Department of Agriculture
NRCS Natural Resource Soil Conservation Service
29. USGS United States Geological Survey

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Appreciation is expressed to members of the Working Committee, the Technical Committee, the Advisory Committee and other interested parties, who developed the North Dakota Water Generic State Management Plan for Pesticides and Ground Water. Appreciation is also expressed to pesticide industry representatives, agricultural interest groups, and private individuals that provided comments on the plan. Primary contributors and respective agencies are listed below.

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Natural Resources Conservation Service
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United States Environmental Protection Agency
Dan Jackson
Frank Chianelli

CONCURRENCE SIGNATURES

The following agency representatives have read the *North Dakota Generic State Management Plan for Pesticides and Ground Water* and concur with their agency's roles and responsibilities as outlined in the plan, provided adequate resources are available for implementation.

North Dakota Department of Agriculture
Commissioner of Agriculture



North Dakota State Liaison



North Dakota Department of Health

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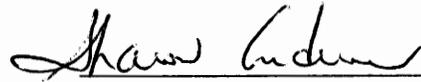
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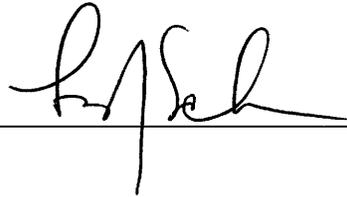
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Commissioner of Agriculture

North Dakota State Liaison

North Dakota Department of Health

North Dakota State Water Commission



North Dakota State University
Extension Service

North Dakota Geological Survey

United States Geological Survey

United States Department of Agriculture
Natural Resource Conservation Service

INTRODUCTION

Protecting water from pesticide contamination will help ensure North Dakota of a safe supply of water for the future. The intent of the *North Dakota Generic State Management Plan for Pesticides and Ground Water* is to prevent water degradation by pesticides while protecting the beneficial uses of pesticides.

This plan was developed following guidelines outlined by the United States Environmental Protection Agency. One of EPA's main goals was to provide states with the opportunity to manage the use of targeted pesticides in order to protect water resources. North Dakota must have an EPA approved Pesticide State Management Plan for each pesticide EPA determines to be a contamination threat to ground water. Without an approved state management plan for the pesticide of concern, registration of the pesticide will not be allowed within the boundaries of the state. EPA has indicated that it prefers the state management plan implementation approach instead of national cancellation of a pesticide of concern.

Development of the Generic State Management Plan (GSMP) provides North Dakota with an outline to follow when EPA requires Pesticide State Management Plans (PSMPs) for pesticides of concern. This document is developed around 12 components outlined in EPA guidance documents and details a coordinated effort of federal, state, and local government agencies, agricultural interest groups, pesticide industry representatives, and private individuals. Development and implementation of this strategy will remain a statewide effort.

COMPONENT I.

NORTH DAKOTA'S PHILOSOPHY AND GOALS TOWARD PROTECTING WATER

"The philosophy of the North Dakota State Management Plan is to prevent water degradation by pesticides. The goal is to promote a degradation prevention policy for waters of the state while promoting the beneficial uses of pesticides."

The philosophy statement is based on a water degradation prevention policy identified in existing statutory authority, and is the basis for the development of the State Management Plan (SMP). The statutory authority relating to pesticides and ground water protection is identified in North Dakota Century Code (NDCC) 23-33, "Ground Water Protection", and in NDCC 61-28, "Control, Prevention, and Abatement of Pollution of Surface Waters". Specific reference relating to pesticide and water quality issues is defined in NDCC § 23-33-01:

23-33-01 Degradation Prevention Program - Maintenance of waters. *This chapter establishes a degradation prevention program for the purpose of protecting ground water resources, encouraging the wise use of agricultural chemicals, providing for ground water protection, providing for public education regarding preservation of ground water resources, and providing for the safe disposal of waste in a manner that will not endanger the state's ground water resources. Waters of the state must be maintained within standards established under this chapter unless it can be affirmatively demonstrated that a change in quality is justifiable to provide necessary economic or social development and will not adversely affect the beneficial uses of water.*

While both North Dakota State law and the philosophy specify a "degradation prevention" policy, practical implementation of this plan requires that parameters defining the meaning of "degradation" be established. Criteria for evaluating degradation will be based primarily on the current and future potential adverse impacts on the beneficial use of the resource and potential human health impacts. The standards used to evaluate degradation and human health impacts will be either Safe Drinking Water Act Maximum Contaminant Levels (MCL), or health advisories levels (HAL) developed by the Environmental Protection Agency (EPA) or other states. In addition, other criteria, including classification of the state's water according to current use and future usability for human consumption, livestock, irrigation, industrial needs, wildlife, and other potential applications, will be applied in defining degradation.

The adoption of the drinking water standard (MCL, HAL, or other health-based level) for ground water protection ensures all present and reasonably expected ground water sources for drinking water, both private and public, will be protected at least within that standard. Contamination levels exceeding the MCL (or appropriate alternative water quality standards described above) in any current or reasonably expected potential source of drinking water will be considered as a failure of prevention, and a failure to meet the ground water protection goal. A reasonably

expected potential source of drinking water is any ground water source, not currently used for drinking water, having a quantity, yield, and quality suitable for development as a human drinking water supply, using cost effective recovery and treatment methods.

To avoid failure in meeting water quality protection goals, a contaminant reference point of 25% of the MCL, the HAL, or other accepted standard designed to protect human health will serve as an action level for response. Levels below the 25% action level may be established to protect beneficial uses of the water resource other than those attributed to human health and will be considered on a case by case basis.

The term "non degradation" is interpreted as not allowing any aquifer to be contaminated so that its current highest level of use is impaired. In accordance with the stratified classification of waters provided by the North Dakota Department of Health, protection afforded to ground water supplies will be dependent on the "usability" of the aquifer. Highest priority will be given to present and future drinking water supplies. An example of a low priority for protection from pesticides would be certain bedrock aquifers with salinity levels that render them inappropriate for most uses, including human and livestock drinking water, irrigation, and industrial use.

Reasonable and cost effective SMP implementation requires that this plan be preferentially applied. Application will be based on a priority system. Priority of monitoring and application will be based on current and future potential use and on vulnerability to contamination. If a contaminated aquifer is hydrologically connected with other waters, including aquifers or surface waters, having a higher classified level of use or potential use, priority will be given to protection of higher classified waters based on their use or potential use.

Contamination prevention measures will emphasize Best Management Practices (BMP), pesticide user education, and technical assistance. If pesticide contamination of a water resource should occur, a response strategy will be developed and implemented. The appropriate response will be dependent on the specific pesticide and concentration at which it is detected. Responses may include further ground water monitoring, contamination prevention measures, mitigation of a site-specific problem, or temporary pesticide control measures.

STATE MANAGEMENT PLAN GOALS:

- Establish cooperation and commitment among participating federal, state, and local government agencies.
- Identify water resources with potential for contamination from pesticides using geologic surveys, soil surveys, groundwater resources surveys, surface water mapping, analysis of geographic information system, site observations and personal experiences.
- Identify pesticides registered and quantities used in North Dakota which have the potential to contaminate water resources, and encourage pesticide manufacturers and registrants to develop safer pesticides that pose less risk to human health and the environment
- Develop BMPs which prevent water degradation by pesticides.
- Establish a ground water quality monitoring network.
- Plan and develop water resource and pesticide educational material to educate water users in methods to prevent or reduce pesticide contamination of water resources.

COMPONENT II.

ROLES AND RESPONSIBILITIES OF COOPERATING AGENCIES

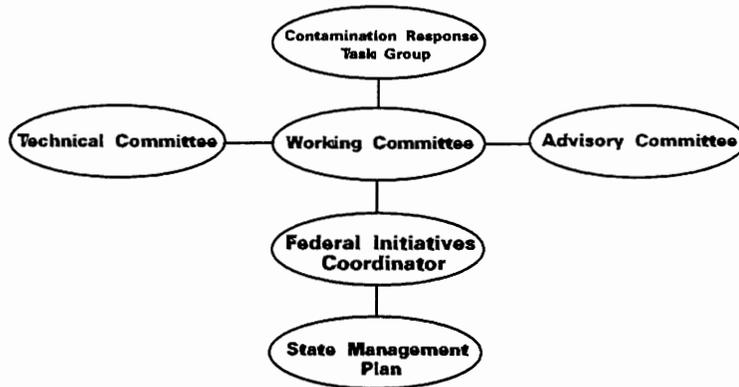
A pesticide contamination prevention and response program requires cooperation among federal, state, and local government agencies, pesticide industry representatives, agricultural interest groups, environmental groups, and the general public. This section of the State Management Plan (SMP) will explain the coordinating mechanism and describe the roles and responsibilities of cooperating agencies.

COORDINATING MECHANISM

North Dakota State government agencies and federal agencies have substantial investigative capabilities and tools, which are dispersed among the agencies. For example, the North Dakota Department of Health has resources for conducting water quality investigations, the North Dakota State Water Commission has the capability for hydrologic exploration and investigation, the North Dakota Geological Survey has the capability for conducting geological exploration and investigation, the North Dakota Department of Agriculture is staffed for investigation of pesticide violations, the Natural Resource Conservation Service has the capability to investigate the relationship between soils and ground water, the Extension Service has expertise in the relationship between agriculture and water, and the United States Geological Survey has substantial capabilities in hydrologic, water quality, and geologic investigations. Because of diverse investigative capabilities, a coordinating body is needed to integrate agency functions in investigating pesticide contamination cases.

A committee process has been developed to coordinate planning and response activities of the cooperating agencies and groups involved in the SMP. The committee process consists of a Working Committee, a Technical Committee, an Advisory Committee, Contamination Response Task Groups, and the Federal Initiatives Coordinator (FIC). A description of each committee and group will be given after Figure 1, which shows the structure of the Committee Process.

Figure 1. Committee Process



State Liaison/Federal Initiatives Coordinator

The North Dakota Pesticide Control Board, with concurrence from members of the Working Committee, designated the Federal Initiatives Coordinator (FIC) of the North Dakota Department of Agriculture as the State Liaison. The FIC will serve as a single contact point for all official communications between North Dakota and EPA regarding the State Management Plan.

The FIC will serve as the chairman of the Working Committee, Technical Committee, Advisory Committee, and Contamination Response Task Groups. The FIC may request other Working Committee members to serve in a co-chair capacity for the Technical Committee, Advisory Committee, and Contamination Response Task Groups as necessary. The FIC will also assist cooperating agencies in program development and implementation of the State Management Plan.

Contact the following:

Federal Initiatives Coordinator
North Dakota Department of Agriculture
Pesticide Division
600 East Blvd., Dept 602
Bismarck, ND 58505-0020
(701) 328-2980 Fax (701) 328-4567

Working Committee

The purpose of the Working Committee is to coordinate statutory authority, expertise, and resources of agencies cooperating in the development and implementation of this plan. The Working Committee will use the SMP as a template for future Pesticide State Management Plans (PSMP). The Working Committee will meet quarterly during implementation of a PSMP, or at the call of the FIC.

The Working Committee membership is comprised of representatives from federal and state agencies that have statutory authority, programs, or responsibilities involved with pesticides and/or water resource protection.

Representatives on the Working Committee:

North Dakota Department of Agriculture; Federal Initiatives Coordinator
North Dakota Department of Health; Ground Water Program Coordinator
North Dakota Geological Survey; Geologist
North Dakota State Water Commission; Hydrologist
North Dakota State University Extension Service; Water Quality Specialist
USDA, Natural Resource Conservation Service; Water Quality Coordinator
United States Geological Survey; Water Quality Coordinator

Technical Committee

The purpose of the Technical Committee is to assist the Working Committee in establishing priorities and appropriate response procedures through 1) reviewing and evaluating activities and conditions likely to cause pesticide contamination, 2) providing a scientific assessment of the PSMP implementation process, and 3) providing a forum for communication between scientific disciplines.

The Technical Committee is composed of individuals from research universities in North Dakota and federal and state agencies involved with ground water regulation, pesticide regulation, or other related areas of concern. Members of the Technical Committee include specialists in hydrology, agronomy, weed science, soil science and soil conservation, entomology, agriculture economics, wildlife biology, water chemistry, geochemistry, geology, and others. A list of affiliated agencies is listed in Appendix A.

The Technical Committee held a statewide coordinating meeting on May 13, 1992, using the fiber optics Interactive Video Network. The purpose of the meeting was to provide an independent evaluation of optimal goals and priorities for ground water protection in North Dakota and provide guidance for establishing a scientific and technical response structure. The conclusions of this meeting were formulated in the *Position Statement of the Technical Committee* (See Appendix B). The position statement is intended to be used as a primary guide document, or "template", in the development and implementation of a PSMP by the Working Committee, Contamination Response Task Groups, and responding state agencies. A condensed version of the position statement is also available for public information purposes.

The FIC serves as chair of the Technical Committee and the committee meets at the call of the FIC.

Advisory Committee

The Advisory Committee is comprised of farm, industry, and public interest groups that provide input for SMP. Advisory Committee members are recognized as being uniquely capable of providing information on pesticide use, based on experience and private research, that will aid the SMP planning process. Membership on the Advisory Committee is open to any agency, organization, or person wishing to provide input on the Generic State Management Plan (GSMP) or future PSMPs. Comments from the Advisory Committee have been solicited for both the GSMP and the Position Statement of the Technical Committee. A list of current Advisory Committee members is listed in Appendix A. The Advisory Committee meets at the call of the FIC.

Contamination Response Task Groups

The purpose of the Contamination Response Task Groups (CRTG) will be (1) to coordinate the investigation of the pesticide detection case, (2) and to facilitate the sharing and effective integration of information from various participating agencies in investigating the pesticide detection case, (3) determine the immediate scale of the investigation, and expand the scale of investigation as necessary, (4) recommend protective and mitigative actions, (5) make recommendations concerning public notification on the problem. and (6) coordinate the application of regulatory jurisdictions in the implementation of regulatory actions.

Make up of the CRTG may vary according to each contamination incident. The group will always include Working Committee representatives, and may initially be composed of the entire Working Committee alone. Representatives from the North Dakota Department of Agriculture (NDDA) and North Dakota Department Health (NDDH) will be included in all CRTGs, because these agencies have primary statutory responsibilities for protecting ground water quality and regulating pesticide use. Minimum membership will include an environmental scientist from the NDDH, a hydrologist from the NDSWC, a soil scientist from the NRCS, an Extension agent, and scientists from the NDGS and USGS.

The CRTG will also solicit ad hoc participation from additional pools of expertise and concerned groups, including all committees and agencies listed in this section. In summary, the CRTG will be formed to meet the technical needs of individual contamination cases and will respond accordingly.

STATE AND FEDERAL AGENCIES ROLES AND RESPONSIBILITIES

Regulatory authorities for ground water protection from pesticide contamination are distributed throughout state government. Although state agencies have the central role in developing and implementing SMPs, federal and local government participation is needed to ensure effective implementation. The following government agencies are members of the Working Committee and are identified as the main cooperators in the SMP. Agency roles and responsibilities are identified below.

North Dakota Department of Agriculture

The Pesticide Division of the North Dakota Department of Agriculture enforces the statutory authority to regulate pesticide use, storage, distribution, and transportation. The Pesticide Division enforces the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through a Consolidated Pesticide Cooperative Enforcement Agreement with EPA.

Responsibilities include:

- Implementing the statutory authority to regulate pesticide use, storage, distribution, and transportation and enforcing FIFRA
- Registering all pesticides in North Dakota and reviewing labels
- Conducting pesticide inspections and investigations for compliance with all regulations
- Inspecting and regulating chemigation systems
- Administering Project Safe Send, a voluntary pesticide disposal program and assisting with a pesticide container recycling program.
- Serving as the coordinating agency for the State Management Plan (SMP)

Coordinating Agency:

North Dakota Department of Agriculture
Plant Industries Division
600 East Blvd., Dept 602
Bismarck, ND 58505-0020
(701) 328-2231 Fax (701) 328-4567

North Dakota Department of Health

The Environmental Health Section (EHS) of North Dakota Department of Health is the primary environmental protection agency in the state. The Division of Water Quality, which is part of the EHS, is responsible for water quality protection within the state.

Responsibilities include:

- Administering and enforcing provisions of the Resource Conservation Recovery Act (RCRA), the Clean Water Act (CWA), the Underground Injection Control Program (UIC), the Safe Drinking Water Act (SDWA) and assists EPA with implementing the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Conducting surface and ground water quality monitoring, site impact assessments, and providing oversight for remedial action activities
- Coordinating the Wellhead Protection Program and the Clean Water Act Section 319 Non-Point Source Water Quality Task Force

North Dakota Geological Survey

Responsibilities include:

- Providing geologic maps and chairing the State Mapping Advisory Committee
- Making geological determinations
- Serving as coordinating agency for developing the Geographic Information System (GIS) and serving as the State clearinghouse for spatial data
- Assisting the NDDA in developing ground water vulnerability programming, utilizing GIS technology

North Dakota State Water Commission

The NDSWC and the state engineer are responsible, through the permitting process, for the evaluation and management of ground water and surface water resources and for the allocation of the state's waters. See Appendix C for additional information.

Responsibilities include:

- Evaluating and managing ground and surface waters and allocating state waters
- Conducting hydrologic investigations

North Dakota State University Extension Service

The NDSU Extension Service maintains an extensive education network throughout the state of North Dakota, with agents in most counties of the state. See Appendix C for additional information.

Responsibilities include:

- Developing educational and training materials on water quality protection for farmers, pesticide applicators, pesticide dealers, and the general public
- Administering the Certification Program for private and commercial pesticide applicators
- Publishing information on aquifer sensitivity assessment for pesticide users

United States Environmental Protection Agency

Responsibilities include:

- Developing a national strategy for protecting the nation's ground water resources from pesticide contamination
- Regulating the national marketing and use of pesticides
- Providing technical assistance, program oversight, and federal funding
- Administering the Clean Water Act, the Safe Drinking Water Act, the Federal Insecticide, Fungicide and Rodenticide Act, National Environmental Policy Act, the Resource Conservation Recovery Act, and other Congressional Acts

Contact the following for EPA technical support:

Groundwater Program Director
Mail Code 8P2-W-GW
United States Environmental Protection Agency, Region VIII
999 18th Street, Suite 500
Denver, CO 80202-2466
(303) 312-6137 Fax (303) 312-6741

United States Department of Agriculture Natural Resource Conservation Service

Responsibilities include:

- Providing assistance to land users in management of soil, water, air, plants, and animal resources
- Providing land users with technical and financial assistance to develop, improve, and/or maintain these resources through implementation of conservation plans
- Providing technical assistance for developing and implementing Best Management Practices (BMPs)
- Coordinating with the Working Committee to ensure consistency with the Conservation Compliance Plans developed in the Food Security Act of 1985, and subsequent future modifications of the act

United States Geological Survey Water Resources Division

Responsibilities include:

- Providing hydrologic information and water resource assessment
- Conducting analytical and interpretive water resource appraisals
- Conducting and providing research in hydraulics and hydrology
- Disseminating water resource data and interpretations through published reports, maps, and other public releases
- Providing scientific and technical assistance in hydrology

LOCAL GOVERNMENTS

North Dakota Century Code identified in Component III authorizes participation by local government agencies and organizations in the protection and remediation of the state's water resources. Involvement by local government agencies has typically been at the request of the local landowners and has not been at the request of the NDDH.

Protection or remediation of water quality resources can be addressed by County/Township boards through either the implementation of appropriate zoning restrictions or enactment of ordinances, after following the required public disclosure and comment requirements.

Local health districts, where they are established in the state, generally are involved in the enforcement of water protection measures. All of the established districts contract with the NDDH to conduct environmental inspection, investigate contamination complaints and work with the NDDH to insure the protection of the environment.

INTERGOVERNMENTAL COOPERATION AND NOTIFICATION

Cooperation may be necessary among bordering states, Indian reservations, and Canada to protect a water resource from pesticide contamination. Notification will be given to all bordering states, Indian reservations, and appropriate provinces of Canada to brief them on this plan and to provide contact information for the FIC. The Working Committee will coordinate efforts to work with these entities.

The county government of the affected site(s) will be notified no later than the first CRTG report (90 days after first notification of the FIC). If, after examining the initial sampling evidence and the hydrologic conditions of the aquifer, the CRTG considers it possible that landowners, enterprises, municipalities, counties, states, reservations, or Canada neighboring on the designated contaminant site or sites may be affected, these parties will be notified no later than the first report (90 days after notification of the FIC). With each quarterly reassessment of the contaminant case, potential vulnerability of these parties will be reassessed, and the parties will be apprised of the recent status of the contaminant case by the FIC. All other parties, including Advisory Committee members and the general public, will be apprised of CRTG actions through the public Information Distribution Network described in Part XI.

COMPONENT III. LEGAL AUTHORITY

The Working Committee, in consultation with the Office of Attorney General for North Dakota, believes that existing state statutory authority provided to cooperating agencies is adequate for state management plan implementation. However, the Working Committee may identify weaknesses or shortcomings in existing statutory authority and make recommendations to appropriate legislators for necessary authorities to implement this plan. The following review of statutory authority was completed by the North Dakota Attorney General's Office.

STATUTORY AUTHORITY FOR GROUND WATER PROTECTION

The statutory authority to protect ground water from pollutants has been granted to a number of North Dakota regulatory agencies, who protect water quality and oversee the application, use, and storage of pesticides. The primary regulatory authorities are the NDDH and the NDDA.

North Dakota Century Code Chapter 23-33, Ground Water Protection, establishes a degradation prevention policy to protect ground water resources, with an emphasis on pesticide education, monitoring, and agency cooperation. The NDDH is charged with administering the chapter. However, the commissioner of agriculture is given specific authority to implement mitigation activities, pursuant to NDCC Ch. 4-35, to prevent pesticide-related contamination of ground water.

The primary water quality protection provision which addresses both surface and ground water quality can be found in NDCC Ch. 61-28, Control, Prevention, and Abatement of Pollution of Surface Waters. NDCC Ch. 61-28 is called Safe Drinking Water Act and is administered by the NDDH. Under the authority provided in the chapter, the NDDH may develop comprehensive programs for the prevention, control, and reduction of pollution in the waters of the state. "Waters of the state" is defined as all waters within the jurisdiction of this state including all streams, lakes, ponds, impounding reservoirs, marshes, watercourses, waterways, and all other bodies of accumulations of water on or under the surface of the earth, natural or artificial, public or private, situated wholly or partly within or bordering upon the state, except those private waters which do not combine or effect a junction with natural surface or underground waters just defined (NDCC § 61-28-02(11)). Prohibitions under NDCC Ch. 61-28 are detailed in NDCC § 61-28-06.

- "Pollution" means the man-made or man-induced (terms in statute) alteration of the physical, chemical, biological, or radiological integrity of any waters of the state (NDCC § 61-28-02(7)).

- "Wastes" means all substances which cause or tend to cause pollution of any waters of the state (NDCC § 61-28-02(10)).

Under normal circumstances, the NDDH has no authority to prevent the use of the contaminated private well by the landowner. The NDDH will notify the landowner of any pesticide detection,

particularly those that may result in harm to human health. However, enforced limitations of the well use can be applied if use of the well contributes to the spread of contaminants in the aquifer.

The state engineer is responsible, through the permitting process, for allocation of water resources, evaluation and management of ground and surface water, well construction specifications, and procedures for protecting aquifers from contamination on well sites (NDCC Ch. 61-04).

North Dakota water resource districts may promulgate rules concerning the management, control, and conservation of waters and the prevention of pollution, contamination, or other misuse of water resources, streams or bodies of water included within the district (NDCC § 61-16.1).

The NDGS is empowered to require all exploration, development, and production operations of subsurface mining to be conducted in such a manner as to prevent pollution of fresh water supplies (NDCC § 38-12-02(1)(d)) and to require that geothermal energy extraction be conducted in a manner to prevent contamination and pollution of surface water and ground water resources (NDCC § 38-19-03(1)(c)).

The North Dakota Public Service Commission protects ground water through regulations of surface mining and reclamation operations. (NDCC § 38-14.1)

The North Dakota Industrial Commission, Oil/Gas Division, protects ground water concerning oil/gas development in the State. (NDCC § 38-08-04)(1)(c))

LOCAL GOVERNMENT AUTHORITY

The authority allowing each agency/political subdivision to address water quality issues is identified in the following table.

Municipalities	NDCC § 40-05-01(61) The governing body of a municipality shall have the power to prevent the pollution of or injury to any water supply belonging to the municipality or any public water supply within, or within one mile of, the limits of the municipality.
Water Resource Board	NDCC § 61-16.1-09(8) Each water resource board shall have the power and authority to make rules and regulations concerning the management, control, regulation, and conservation of waters and prevent the pollution, contamination or other misuse of the water resources, streams or bodies of water included within the district.
County Commission	NDCC § 11-33-03(1,2,5) Object of regulation. These regulations shall be made in accordance with the comprehensive plan and designed for any or all of the following purposes: to protect and guide the development of non-urban areas, to secure safety from fire, flood and other dangers, and to conserve and develop natural resources.

Township

NDCC Ch. 58-03-11

Establishment of zoning districts- Limitation - Scope of zoning regulations and restrictions. For the purpose of promoting the health, safety, morals or the general welfare, or to insure the orderly development of approaches to municipalities, the board of township supervisors may, subject to the provisions of chapter 54-21.3, regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings or structures,and the location and use of buildings, structures, and land for trade, industry, residence or other purposes.

EPA'S LEGAL FRAMEWORK FOR STATE MANAGEMENT PLANS

According to EPA's *Guidance for Pesticides and Ground Water State Management Plans* (December 1993), provisions under FIFRA support the use of SMPs for continued use of specified pesticides. FIFRA provides EPA with regulatory authority requiring North Dakota to develop SMPs for continued use of a pesticide of concern.

FIFRA Section 3: Provisions under Section 3 allow EPA to adopt rules to classify one or more pesticides for restricted use classification. Prior to adoption, EPA must publish the details of the proposed action in the *Federal Register*, and provide opportunity for public comment. The SMP will be specified as part of the restrictions required in addition to the restricted use classification, or in lieu of the restricted use classification.

FIFRA Section 6: Provisions under Section 6 allow EPA to propose cancellation of the pesticide, unless there is an approved SMP in place.

Any action EPA pursues under Section 3 or Section 6 will be referenced on the pesticide label as a State Management Plan requirement. This will allow the pesticide of concern to be used legally in states with an approved PSMP.

STATUTORY AUTHORITY FOR PESTICIDE CONTROL

The NDDA regulates the use, storage, disposal, distribution, and transportation of pesticides through the North Dakota Pesticide Control Board, (NDCC Ch. 4-35). The NDDA regulates the registration of all pesticides in North Dakota (NDCC § 19-18-04).

The North Dakota Pesticide Control Board has been granted the authority to administer all provisions of North Dakota Century Code Chapter 4-35 and has the authority to issue regulations in conformance on NDCC Ch. 28-32, and to carry out provisions. The Pesticide Control Board is made up of the Commissioner of Agriculture, the director of the North Dakota State University (NDSU) Extension Service, and the director of the NDSU Agricultural Experiment Station. The Board acts through the office of the Commissioner of Agriculture.

The NDSU Extension Service oversees the certification of all commercial and private pesticide applicators (NDCC § 4-35-09; 4-35-14).

COMPONENT IV. RESOURCES FOR STATE MANAGEMENT PLANS

This component describes resources available from cooperating agencies and provides an assessment of potential resources and funding needed to develop and implement the SMP. The Working Committee believes the state currently has adequate technical and financial resources available for SMP implementation. The adequacy of technical and financial resources will be reassessed on a regular basis as the SMP is implemented.

North Dakota Department of Agriculture Plant Industries

The Plant Industries office of the North Dakota Department of Agriculture is located in Bismarck, and contains several divisions. Two divisions, Pesticide and Registration have statutory responsibilities and resources directly related to ground water protection activities.

The Pesticide staff includes two administrative support personnel, six consumer protection inspectors, and one administrator. The Pesticide division is responsible for complaint investigations, pesticide inspections, law enforcement, educating pesticide users about ground water concerns, and planning and implementing management strategies to solve identified problems or concerns.

The Registration staff includes one administrative support person, one registration specialist, and one administrator. The Registration Division is responsible for evaluating labels, label restrictions, and the registration of pesticides in North Dakota. In the event of a pesticide contamination incident, the Pesticide and Registration Divisions are committed to using their legal authorities and personnel to effect SMP plans.

The NDDA is the only North Dakota agency with a budget allocated directly for SMP development and implementation. Current funding for SMP development is provided to the Pesticide Division through EPA grants, state special fund money, and state general fund money. EPA grant funds received through a cooperative agreement provides the main funding source for the SMP. Pesticide program activities related to ground water protection are 85% EPA/FIFRA funded and 15% state general fund match. The total Pesticide division ground water protection program is allocated \$103,737 for fiscal year 1998. A detailed budget sheet for the NDDA ground water protection budget is included in Appendix C.

Future SMP resource needs will be assessed on a regular basis. It is believed that EPA grants, state special fund money, and state general fund money will continue as funding sources for the SMP activities. Future state general fund monies are expected to decrease.

North Dakota Department of Health (NDDH) Environmental Health Service (EHS)

The state office of the NDDH is located in Bismarck. The EHS is comprised of several divisions, including Water Quality, Chemistry, and Environmental Engineering. The EHS currently consists of 125 employees directed to address environmental protection issues relating to air, solid waste and water quality. The staff consists of administrative support personnel, environmental engineers, scientists and chemists. In the event of a pesticide contamination incident, the EHS will participate in the SMP by providing professional assistance and resources, within their guidelines, to address the incident.

The total annual budget, including both federal and non-federal funding, amounts to approximately seven million dollars per year (1998 est.). These funds are used to insure the implementation of mandated environmental protection programs, respond to contaminant concerns and address environmental issues not addressed by the mandated programs. The EHS has been involved in the assessment, evaluation and remediation of contaminant incidences ranging from small accidental releases covering less than 100 square feet to remediation of a contaminated ground water resource covering over 550 square miles. The expertise of the EHS to assess contaminant sources, define the responsible parties (if any) and direct appropriate protection of the public/environment will be available as funding allows.

As part of the total budget, the EHS receives \$200,000 from the Environmental and Rangeland Protection Fund (a state special fund) for the establishment of a ground water quality monitoring network. These funds are used for well installation, water sample analysis, data interpretation and reporting, and prioritizing aquifers by vulnerability. A portion of this funding could also be used for more directed and concentrated investigative sampling if needed.

North Dakota State University Extension Service

The NDSU Extension Service was created to be a technology transfer agent for research based information concerning agriculture and domestic issues. The core of the Extension Service is the county agent, with an Extension office in every county. Extension develops comprehensive educational programs, dealing with a wide range of topics. The Pesticide Applicator Certification Program, a comprehensive water quality program, and a set of Best Management Practices are three of Extension's educational efforts having a direct effect on ground water protection. Information for these programs is largely drawn from research conducted at NDSU. NDSU Extension has ties to many academic departments at NDSU and has a diverse spectrum of Extension Specialists available for technical information. These Specialists range from farm management, to irrigation, to water quality, to video production. A list of NDSU Extension Specialists and cooperating academic departments is included in Appendix C.

In the event of a verified ground water pesticide incident, county Extension staff would be among the first people involved. County staff will use Extension resources to disseminate information locally and act as facilitator for meetings to educate the public about the problem. County staff would bring in Extension Specialists to provide technical expertise and suggest workable solutions.

North Dakota Geological Survey (NDGS)

The NDGS state office is located in Bismarck. Staff personnel include geologists, hydrologists, lab technicians, information processors, and administrative support personnel. The NDGS provides geologic investigations, provides the primary source of geologic information in the state, and makes recommendations on resource development and management, land use, environmental impacts, and natural-hazard assessments. In the event of a pesticide contamination incident, the NDGS can provide extensive technical information and geologic data related to ground water.

North Dakota State Water Commission (NDSWC)

The NDSWC state office is located in Bismarck and has a ground water staff of 14 hydrologists, with primary educational background in hydrology, geology, soil science, and civil, agricultural and geologic engineering. The NDSWC provides the following information: complete ground water surveys for all counties, a network of monitoring wells in 2,528 locations, computer data base on well water levels, data base on 13,000 wells, well records, information on basic water quality, and data on long term pump tests. It maintains records of water use by permit holders, maintains and operates a rotary drill rig for exploration and resource evaluation, and other data sources. A complete list of information available from NDSWC is listed in Appendix C.

In the event of a pesticide contamination incident, the NDSWC will provide all of the data listed above and listed in Appendix C for assessment of water contamination incidents and the relationship between aquifer hydrology and contaminant risk. Water Commission staff provide information on hydrology and provide staff for the Working Committee, Technical Committee, and Contamination Response Task Groups.

United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS)

The NRCS state office is located in Bismarck and has 57 state soil conservation districts and eight resource conservation and development councils. Staff personnel include soil scientists, soil technicians, and soil conservationists. The NRCS provides technical and financial assistance to develop and implement best management practices. These practices focus on assisting land users with resource plans, which address soil, water, animal, plant, and air resources. The NRCS will support and participate in SMP activities, within financial and staffing constraints.

United States Geological Survey (USGS) Water Resources Division (WRD)

The WRD has the primary responsibility for providing hydrologic information and appraising the nation's water resources. The USGS provides water resource assessments, data use to assess water quality, maintains a database on water quality data, and provides research study reports on availability, quality, and movement of ground water. In the event of a pesticide contamination incident, the USGS will provide extensive technical information and will make available all data and reports compiled by the USGS. Further USGS information is found in Appendix C.

COMPONENT V. BASIS FOR ASSESSMENT AND PLANNING

NORTH DAKOTA GROUND WATER RESOURCES

Ground water is a vital resource to North Dakota. Nearly the entire rural population, along with many municipalities, relies solely on ground water to supply their daily water needs. About 60% of the total population depends on ground water for their drinking water, and virtually all (95%) of North Dakota's rural residents depend on ground water for their primary drinking water supply. An estimated 44 billion gallons of water are withdrawn yearly from aquifers in North Dakota. During 1991, ground water supplied 27,546 acre-feet for municipal use; 13,739 acre-feet for rural domestic use; 7,110 acre-feet for rural water systems; 13,669 acre-feet for livestock consumption; 5,881 acre-feet for industrial use; and 85,804 acre-feet for irrigation in North Dakota (North Dakota State Water Commission, 1993).

Because of its importance to the people of North Dakota, ground water has been extensively investigated and the information compiled. Moreover, information on ground water is being continuously expanded in ongoing exploratory and investigative programs through several federal and state agencies. Appendix D contains a report listing all the water quality projects conducted in North Dakota.

NORTH DAKOTA PESTICIDE USE

According to survey results outlined in *Pesticide Use and Pest Management for Major Crops in North Dakota-1992*, 19 million acres were treated with herbicides, insecticides, and fungicides in 1992. Herbicides, insecticides, and fungicides were applied one or more times to 17.6 million, 0.9 million, and 0.6 million acres, respectively, in North Dakota in 1992. Also, survey results revealed that 79% of the reporting farmers used herbicides, 14% used insecticides, 6% used fungicides, and 2% used desiccants.

Upon request of the NDDA, a pesticide registrant must report the amount and type of each registered pesticide sold, offered for sale, or otherwise distributed in the state (NDCC Ch. 19-18-04.1). Information required must include the brand name, amount, and formulation of each pesticide selected. However, specific brand names may not be identified in any report or otherwise made public.

The NDDH, in cooperation with the NDDA, has developed a pilot project to initiate the Pesticide Use Report. Five pesticides were selected and use data was collected for the 1992 and 1993 growing seasons. The NDDA is currently in the process of collecting use data for 1996.

BASIS FOR ASSESSMENT AND RESPONSE STRUCTURE

The SMP regulatory response structure is based on recommendations of the Technical Committee and summarized in the Position Statement (see Appendix B). The Technical Committee noted the large variability of agronomic practices and conditions, and soil, climatic and hydrologic conditions affecting pesticide contamination of ground water. The Technical Committee also cited the potential for adverse economic impacts that might result from inappropriate over-regulation or under-regulation. It was determined that while vulnerability indices were adequate for guidance of sampling plans in implementing the PSMP, they were not sufficiently accurate to justify or to guide regulatory actions in and of themselves. It was recommended that regulatory actions be based on clearly probable problems, as indicated by actual field sampling evidence, rather than by hypothetical concerns, as indicated by vulnerability indices alone. The Technical Committee raised particular concern over the technical and scientific issues involved in interpreting data from detections in single wells for assessment of aquifer conditions. The importance of investigations considering all local factors, including well construction and placement, local soil, vadose and aquifer characteristics, agronomic history, other nearby land uses, and recent climatic events were stressed. Because of these concerns, the Technical Committee recommended the SMP be constructed to allow maximum flexibility for investigation and tailoring of regulatory action to the precise agronomic, soil, hydrologic and climatic circumstances of the contaminant case initiated by pesticide detections.

Sampling data for the assessment of pesticide contamination is provided primarily by the NDDH from the baseline ground water monitoring program. The baseline monitoring program consists of ongoing sampling from all North Dakota aquifers considered most vulnerable to contamination (as estimated using the DRASTIC index) on an approximate one square-mile grid, and on an approximate ongoing six year sampling cycle. The sampling plan is weighted towards wells considered most vulnerable within the aquifer, notably shallow wells. Details of the sampling program are summarized in Component VI and vulnerability assessment of aquifers is further described in Appendix E. Other pesticide samples will also be used as a basis for initiating regulatory action, such as those taken by NDDH for other ground water protection programs and by other agencies conducting special projects. For example, pesticide detection in water samples taken from public water supplies through the Safe Drinking Water Act will also be used as a basis for implementation of the PSMP. The NDDH will be the primary agency responsible for routine ground water sampling related to the PSMP. Other state and federal agencies may assist by arrangement with the NDDH.

SYSTEMS DEVELOPED TO AID IN PLANNING, ASSESSMENT, AND PREVENTION

Two specific assessment systems have been developed to aid in planning, assessment, and prevention to support the SMP's goal of protecting water resources from pesticide contamination. The two assessment systems perform different functions. The NDSU system is designed for both regional and site specific applications to categorize conditions affecting aquifer sensitivity, while the NDDH system is designed to prioritize aquifers throughout the state.

North Dakota's Assessment System for Ground Water Contamination from Agricultural Pesticide Use

The ground water assessment system was developed by NDSU Extension specifically to guide the development of a system of Best Management Practices (BMP) for North Dakota conditions. A variety of ground water assessment systems were reviewed. Various aspects of each system were adapted, particularly those held common to several systems. The intent of the NDSU system is not to establish an artificial rating system for aquifer sensitivity or vulnerability. Rather, this system is intended to help categorize conditions that affect aquifer sensitivity for the purpose of making field management recommendations to agricultural producers.

The NDSU assessment system applies a three-step approach. Each step requires specific natural resource information, which eventually leads to a ground water sensitivity category. The system is designed to utilize natural resource information that is universally accessible for North Dakota producers and their advisors.

The first step of the system separates useable and important sources of ground water from those that are not. Ground water sources are identified by the North Dakota Geological Survey and by the State Water Commission. Also, the North Dakota Geological Survey, the United States Geological Survey, and the State Water Commission jointly conducted ground water studies on a county basis. The second step identifies land use and pesticide use patterns over important aquifers. The sources of information for determining land use and pesticide use include ASCS records and maps, *Pesticide Use on Major Crops in North Dakota*, North Dakota Agricultural Statistic, and the USDA Agricultural Census. The third and final step establishes aquifer sensitivity categories based on the combination of the following four "filtration" factors: 1) aquifer depth - water flow direction; 2) soil and geological material texture; 3) soil organic matter; and 4) pesticide chemistry. Application of the assessment system will help the producer place his land in one of four broad aquifer sensitivity categories. Aquifer depth and water flow information is determined from County Groundwater Studies Reports and County Soil Survey Reports.

Once the aquifer sensitivity category determination is made, the appropriate management practices tailored to each producer's operation can be recommended. The development of the BMP system will focus on the high and high-intermediate sensitivity categories. However, BMP recommendations are not exclusively applied to these categories. The BMP system is flexible and adaptable to each situation. Appendix I contains several BMP's.

The first phase of ground water protection is applying the assessment system developed by NDSU. Development of a BMP system in North Dakota is the second phase of the ground water protection process; however, it must be followed up by a third and final phase to be successful. The final phase is a comprehensive educational program for the agricultural community. An educational program is absolutely necessary to introduce and explain concepts of ground water assessment and BMPs. The educational program will not only target producers, but also those individuals who regularly advise producers.

Three guidance documents have been developed, printed, and distributed to provide more detail on the assessment system, and are as follows: Extension Bulletin No. 63, *An Assessment System for Potential Ground Water Contamination from Agricultural Pesticide Use in North Dakota*,

Extension Report No. 18, *An Assessment System for Potential Ground Water Contamination from Agricultural Pesticide Use in North Dakota - Technical Guidance*, and Extension Report 25, *Best Management Practices for Groundwater Protection from Agricultural Pesticides: Technical Paper*. These documents will provide producers and consultants with materials for conducting assessments of farm sites. Extension Bulletins are found in Appendix E.

Limitations of the NDSU assessment system

Application of this assessment system depends on information extracted from a number of different sources. It is important that the limits of accuracy of that information are kept in mind. In order to gather and compile data over large areas, it's necessary to group and organize that information so that it is manageable. County soil survey reports, water resources reports, and agricultural statistics are examples of this process. Average or grouped data lose some of their accuracy as the focus of study is narrowed to smaller and smaller areas.

Regional ground water assessments based on generalized information should under no circumstances be used to recommend or dictate site specific management practices. Regional ground water sensitivity determinations are useful when attempting to utilize limited funding and manpower efficiently. Efforts to identify and monitor water quality problems can be maximized by focussing on areas that have the greatest potential for contamination due to low filtration of pesticides.

Another limitation is actually getting the educational information to the individuals using the pesticide in the more vulnerable areas. This limitation is being overcome by incorporating the information into a Geographic Information System and placing the information on the World Wide Web. The goal is to make the information more accessible and user friendly.

North Dakota's Geographic Targeting System for Ground Water Monitoring

The NDDH's Division of Water Quality has developed a system for prioritizing aquifers throughout the state. With limited state and federal funding, it is imperative that prevention and monitoring efforts be focused on the highest priority aquifers. The Division of Water Quality has developed a Geographic Targeting System (GTS) to assist in determining high priority aquifers.

The targeting and prioritizing of aquifers will focus protection efforts to areas considered most likely to experience contamination and to areas posing the greatest risk if contaminated. By prioritizing the ground water resources of the state, baseline monitoring of ground water quality can be accomplished in a more efficient and orderly fashion.

The GTS is not intended to map recharge areas or vulnerable areas within aquifers where more stringent BMPs or restrictions will be applied. It will be used to compare aquifers or sub-aquifer areas as whole units. The GTS is designed to be a planning and prioritizing tool. The ranking of the aquifers and associated maps cannot be used in lieu of site specific evaluations because of local variations and complexities in hydrogeologic conditions. Response to contamination of a water resource will be prioritized according to water quality action levels based on a percentage of the MCL or HAL or other pesticide concentration which considers its impact on the beneficial use of the water resource.

The use of GTS is exemplified by the first six years (1992 through 1997) of the North Dakota Ground Water Monitoring Program. Each of the state's aquifers were prioritized based on vulnerability to pesticide contamination in the GTS report (Appendix G). Following the order of prioritization, sampling plans were laid out for each aquifer, with water samples to be taken from wells on approximately each square mile of the aquifer. Each year, several aquifers are sampled, in order of priority determined by the GTS, until all of the aquifers have been sampled. The sampling circuit is then repeated. The approximate sampling interval is about five years. The sampling plans are described more clearly in the next component (VI. Ground Water Monitoring Program), and in the individual published reports for each sample year available from the NDDH.

North Dakota Administrative Code, Section 33-16-02-01, states public policy is to protect and maintain all waters of the state, including ground water. Therefore, the policy of the NDDH has been to protect all beneficial uses of water. However, from a practical standpoint, the GTS gives current or reasonably expected drinking water sources the highest priority for protection.

The GTS system uses three factors to determine current and reasonably expected drinking water sources. Vulnerability, sensitivity, and risk are all given equal weight in determining the final ranking used to direct ground water monitoring. Vulnerability was determined using EPA's Drastic Model. Sensitivity primarily relates to the usage of agricultural pesticides and fertilizers. Therefore, market value of agricultural production per acre was used as a surrogate for fertilizer and pesticide use. Risk is related to the loss of beneficial water use, or the amount of harm resulting from aquifer contamination. Therefore, total volume of water permitted was used to represent the aquifer's potential risk. A complete report on the GTS is contained in Appendix F.

Limitations of the GTS assessment system

The ambient ground water monitoring program is designed to assess the pesticide detections of the top 50 most vulnerable aquifers in the state on a 5 year rotating basis. This monitoring program has been limited to the top 50 aquifers for two primary reasons: 1) funding and staffing constraints limit coverage to the most vulnerable aquifers and; 2) aquifers identified as lower on the priority list are typically less vulnerable and have a reduced appropriated use or potential to impact a significant portion of the population. The Department has chosen to address this limitation by sampling aquifers prioritized as less vulnerable to contamination on a less frequent basis (i.e. once every 10 to 20 years) or in response to public interest/concern and closely monitor analytical results obtained pursuant to the Safe Drinking Water Act requirements for public drinking water supply systems. Significant pesticide detections below any action limit, as defined in the State Management Plan, will result in prioritizing the aquifer into a higher vulnerability category (i.e. sampling once every 5 years). An additional enhancement relates to the installation of monitoring wells to fill in data gaps by adding to the existing monitoring network in aquifers currently sampled by the Department.

GEOGRAPHIC INFORMATION SYSTEM

Applications for incorporating data into a Geographic Information System (GIS) are being explored. Several agencies maintain databases that may be incorporated into a program to test the use of GIS in development of an assessment system for the program.

COMPONENT VI. GROUND WATER MONITORING PROGRAM

Authority

The NDCC § 23-33-06 authorizes the NDDH, in cooperation with the NDSWC and other agencies, to coordinate and conduct a ground water monitoring program to determine the impacts of pesticides on the state's ground water resources. The NDDH will be responsible for performing the actual monitoring activities. The NDSWC will provide technical assistance when necessary.

Objective and Scope

The objective of the ground water monitoring program is to determine the overall quality of North Dakota's ground water resources with regard to pesticides. Initial monitoring efforts will provide a baseline against which future water quality comparisons can be made and will determine if there are areas which need additional management plans to protect the resource.

The ground water monitoring program focus is on major glacio-fluvial aquifers. Bedrock aquifers will not be included because they are generally less vulnerable to contamination, lower in quality, less utilized, and, where located at the surface, are in areas where chemical applications are lower - predominantly in the uplands and badlands of the Great Plains physiographic province.

Design and Justification

The ground water monitoring program is designed to provide a consistent approach to water quality determinations by defining target populations and criteria for sample site selection.

Target Population

The target population, or set of environmental units for the ground water monitoring program, is all ground water wells capable of producing significant amounts of water from the major glacio-fluvial aquifers. Statistically, it is impossible to use a whole aquifer as the target population for a monitoring study, because it is impossible to take an "overall" sample of an aquifer. Ground water samples must be collected from wells or springs; therefore, the population that most closely correlates to the overall quality of an aquifer is the set of all wells completed in an aquifer.

Criteria for Selecting Aquifers

The NDDH's Division of Water Quality has completed a process of prioritizing aquifers in the state based on the potential for ground water degradation and the greatest adverse impacts from actual pollution. The Geographic Targeting System (GTS) for ground water monitoring was developed in cooperation with, and approved by, the EPA Region VIII 319 Non-Point Pollution Prevention Program. Aquifers are chosen for ground water monitoring based on a combination of their geologic vulnerability, the volume of ground water which is withdrawn from the aquifer for beneficial uses such as drinking water supplies or irrigation, and general pesticide usage in the area.

The assessment of vulnerability is based on the DRASTIC model (Aller *et. al.*, 1987). The acronym DRASTIC stands for **d**epth to ground water, **r**echarge, **a**quifer media, **s**oil media, **t**opography, **i**mpact of the vadose zone, and **h**ydraulic conductivity. These parameters are considered important in the transport of contaminants to ground water.

The geographic targeting system does not evaluate small areas within aquifers to determine recharge zones or critical areas, but rather evaluates aquifers as whole units to determine their relative priority for this program. For a complete description of the geographic targeting system, see the full report of methods and results dated March 1994. This report is on file with the EPA Region VIII Ground Water Program and 319 Non-point Pollution Prevention Program (program groups may have changed since the 1995 reorganization of EPA Region VIII).

Monitoring Schedule

The GTS includes the 192 major glacio-fluvial aquifers in the state, which have been mapped and studied. Twenty-four of the aquifers are classified as high priority, 113 are moderate priority, and 55 are low priority. Monitoring from 1992 through 1995 has been conducted in all of the high priority aquifers, and seven of the moderate priority aquifers. Approximately the top 50 aquifers ranked by the GTS will be monitored on a five-year cycle. The second cycle of monitoring will begin in 1997. Other aquifers will be evaluated using existing and future data acquired through the Safe Drinking Water Program and other monitoring projects as resources are available. The results from 1992 through 1995 have shown a very low percentage of detections. The majority of these detections are less than five percent of the MCL or HAL, and none would require formation of the CRTG. Based on these results, aquifers ranked lower than the 50 on the monitoring priority list do not seem likely to have major impacts from pesticides.

Criteria for Acceptable Sampling Wells

Because of the necessity to produce reliable and representative data, some limitations are put on the target population. A number of criteria are used to determine whether a well is acceptable for use as a sampling point and that the sample is representative of ground water in that area. Well data available is used to determine relationships between well and site characteristics, and ground water quality. The criteria for well selection are:

1. Wells capable of being pumped dry by small capacity pumps (1-2 gallons per minute), or which can be bailed dry, are not included in the target population,
2. The well must have a drilling log available to document the construction of the well and geology of the aquifer material at the site,
3. The well must be accessible and open for bailing or have an operable pump installed,
4. The well must be capable of being sampled before any treatment of the water occurs, and,
5. Permission of the owner or other responsible person must be received before the well may be sampled.

Sampling Grid

Every population unit in the target population would be sampled in an ideal monitoring program. However, due to the practical constraints of time, budget, and personnel, not all wells can be sampled. A sampling grid is used based on existing township, range, and section boundaries. The

size of the grid unit is one section, normally one square mile. Sections of land, which partially overlie an aquifer, are included with that aquifer if they contain an acceptable sampling point.

Selection of Sampling Points

A maximum of one well from each section is sampled for this survey. The shallowest well, which meets the sampling criteria and is nearest the center of the section, is selected for sampling. Based on previous sampling results, wells with a depth greater than 100 feet are generally not sampled. In this case, an alternative well is chosen for sampling.

Temporal Variability

All wells with an initial pesticide detection are resampled at least once for confirmation purposes. Wells having laboratory analytical chromatographic peaks below minimum detection limits, which resembled peaks caused by pesticides, will also be resampled.

Quality Assurance/Quality Control

The objective of a ground water monitoring program is to produce data that is valid, accurate, complete, representative of the medium being sampled, and comparable with other data. In view of this objective, a Quality Assurance Plan and a set of Standard Operating Procedures were developed and are followed to encompass every aspect of ground water monitoring, including sample collection, handling, preservation, field monitoring, and uniform standards for the analysis and reporting of chemical data. The EPA Region VIII Ground Water Program has approved these plans and procedures. Included with these procedures are methods for providing quality assurance/quality control (QA/QC). The Standard Operating Procedures used for this project include: 1) water chemistry sampling procedures, 2) procedures for measuring temperature, pH, and conductivity, 3) procedures for measuring water levels, 4) well purging procedures, and 5) procedures for the use and maintenance of sampling mechanisms. Field sampling personnel are required to be familiar with these procedures and have appropriate instruction manuals available for reference in the field. The project leader serves as the project quality assurance representative providing quality assurance oversight for the program.

A number of quality control checks are used in the field, including equipment calibration, submittal of field duplicates to establish sampling and laboratory precision, blank samples to assure noninterference with preservatives, sampling equipment, or sample containers, and the use of standard solutions, reagents, and lab-packaged vials of preservatives. A field duplicate sample is a duplicate or a blank. The laboratory is not informed of which samples are duplicates or blanks.

All equipment is inspected prior to departure for the field. Conductivity and pH meters are calibrated according to the manufacturer's specifications using standard solutions. Meters are recalibrated daily and during sampling activities when necessary. Teflon tubing is used with the peristaltic sampling pumps, and Teflon bailers are used to prevent adsorption of pesticides to the sampling mechanism and facilitate cleanup.

To minimize cross-contamination of samples, the bailers and other equipment are decontaminated between wells. Because the focus of this study is on pesticides (organics), decontamination

procedures are followed that are appropriate for these parameters. The equipment is first washed with de-ionized water. This is followed with an acetone rinse, and then a hexane rinse. Disposable latex lab gloves are worn throughout sampling to prevent contact with the sample and protect the skin from the acetone and hexane rinses. Water level measurement tapes are rinsed with de-ionized water between wells. The gloves and the nylon cord used on the bailers are discarded and replaced after each well is sampled. Sample bottles are double-rinsed with sample medium, or, for blank samples, with de-ionized water. All samples collected are preserved with the appropriate preservative, and then packed in ice and transported to the laboratory. Holding times are carefully monitored, and samples are transported to the lab twice weekly, when necessary.

Analyses

The NDDH's Division of Chemistry laboratory, utilizing EPA-approved analytical methods, analyzes all samples. Sample custody procedures, sample analytical methods used, and calibration procedures for the Division of Chemistry laboratory are included in the DC Quality Assurance Manual, Volume 1, (NDDH 1990), which has been approved by EPA Region VIII.

Site Survey

A site survey form, or questionnaire, was developed to collect data which would assist in the interpretation of the analytical results. The form is used to record conditions around the well, which may have an influence on the quality of the ground water in the area. The form contains sections on well characteristics, activities performed and conditions around the well, and the parameters measured during the well purging process.

Field personnel who collected the sample(s) at each site complete the survey. If the collection point is a private domestic or stock well, or a public water supply well, an interview is conducted with the owner or other responsible person to obtain as much site specific information as was available. If the collection point is a government agency monitoring well, the collector completes as much of the questionnaire as possible from field observation. When possible, drilling log information; such as, well depth, diameter, etc., is measured and verified. Water level measurements recorded are those measured at the time of the survey, or those currently reported by the owner, in the case of private wells. Water levels from the drilling logs are not entered on the site survey form unless more current information is unavailable. Site characteristics recorded are those within approximately one-eighth mile or less of the well. The field sheets are retained by the Division of Water Quality.

Data Management

All data is stored and evaluated using a relational database system. Information from the field questionnaire sheets is entered into the database and is used to relate the field information with the analytical results of the water sampling. Analytical data from the laboratory is electronically transferred to minimize data entry error. Programs were written to statistically evaluate the quality of the data with respect to blanks and duplicates and determine water quality relationships to site information and well construction. Examples of statistical functions of the database programs are found in the monitoring reports completed for each of the sampling years. Appendix G contains the Groundwater Monitoring Program for 1996.

COMPONENT VII.

PREVENTION ACTIONS

Protection of ground water from pesticide contamination is best undertaken before it occurs. A substantial measure of ground water protection already exists through use limitations imposed by the pesticide labeling process. However, despite labeling, the fact remains that the pesticide user is in actual control of the pesticide application. In some cases, pesticide labeling restrictions and pesticide applicator certification may not be sufficient to prevent serious ground water degradation. Regulatory response measures must be in place to deal with such cases. Prevention actions are described in a two level approach.

The first level of preventive actions includes all measures undertaken to prevent movement of pesticides to ground water, regardless of the amount and without reference to specific standards. Preventative actions used within this level consist of general educational programs and tools aimed at promoting practices among pesticide users that will likely prevent or minimize pesticide contamination when routinely applied. These can be referred to as "Routine Ground Water Contamination Prevention Tools for Pesticide Users." The second and more restrictive level of "prevention" consists of actions taken to "prevent" the exceedence of SMP standards (MCL, HAL, or others) once pesticides are detected in ground water. The second level prevention actions are referred to as "Standards-Based Ground Water Contamination Measures."

I. ROUTINE GROUND WATER CONTAMINATION PREVENTION MEASURES

Routine measures are those conducted on an ongoing and voluntary basis for preventing all pesticide contamination of ground water, without reference to any specific standards. These measures may be considered as "good use habits" to be promoted at all times for all users of pesticides. Routine measures for the North Dakota PSMP include: 1) establishing BMPs, 2) providing field evaluation methods to help target the application of BMPs in the field, 3) providing ongoing educational opportunities on BMPs for producers and for educators working with producers (including extension agents, vendors, and applicators), 4) providing application information promoting ground-water protection to all pesticide applicators, and 5) independent education efforts provided by private associations and chemical dealers with an interest in protection of ground water and the proper use of pesticides.

- 1) The Working Committee has set a high priority on implementation of BMPs that can be practically incorporated into North Dakota farming systems. The NDSU Extension Service has completed development of a management selection process that helps accomplish the task. A copy of this process and the BMPs developed by NDSU Extension are provided in Appendix H.
- 2) As part of the management selection process, the NDSU Extension Service has developed a ground water contamination sensitivity assessment system that can be related to farming

practices. The assessment system is based on soils, geologic, hydrologic, and pesticide data. A description of the groundwater sensitivity assessment system was given in Component V. Computer aided display of the assessment results has been demonstrated as a part of an educational program in McIntosh County. Quick and easy display of aquifer sensitivity in McIntosh County has resulted in significant interest in this type of information among local residents. This software supports discussion of management practices designed for groundwater protection by pesticide users. Aquifer sensitivity maps for Griggs, Williams and Golden Valley Counties will be added in 1998. Assessment coverage will be expanded to include all counties in North Dakota as soil survey maps for those counties become available in digitized form. The computer ground water sensitivity assessment application is accessible on the Internet at: [http://www. Ageng.ndsu.nodak.edu:83/](http://www.Ageng.ndsu.nodak.edu:83/).

- 3) In conjunction with the PSMP, the NDSU Extension Service will conduct educational programs specifically designed for each county as aquifer sensitivity information becomes available. Educational efforts will target groups that have specific interests in terms of groundwater protection from pesticides such as county weed boards, water management districts, soil conservation districts, water system managers and other individuals who advise producers. Local individuals will be taught how the management process can be used to make appropriate decisions in their county. The structure and content of the educational program is based on the result of a pilot program conducted in five southeastern North Dakota counties in 1997. This program will be extended to the four counties mentioned above in 1998.
- 4) All applicators of restricted use pesticides must be registered in North Dakota. Certification and training of applicators is conducted by the NDSU, Extension Service. Selection of management practices based on resource assessment is included as a part of applicator certification training. Over 7,500 individuals received this training in 1997.
- 5) An important part of pesticide contamination prevention will be exercised by the pesticide and agricultural industries and by independent agricultural associations. Some pesticide manufacturers and dealers have adopted the position that developing contamination prevention programs that are product specific can minimize use impacts. The independent and voluntary promotion of pesticide BMPs by industry is welcomed by the Working Committee as a valuable asset in preventing the necessity for mandatory regulatory response. Close association of industry technical representatives with dealers and applicators and routine educational efforts to update dealers and applicators on proper chemical usage make these educational efforts particularly valuable.
- 6) In addition, independent agricultural associations are undertaking educational efforts. The North Dakota State Weed Control Association has produced groundwater sensitivity maps for each county concerning Picloram. This effort was not associated directly with the PSMP, but does represent the willingness of independent organizations to assist with resource protection from pesticide contamination in North Dakota. State Weed Control Association maps are available through the Association and NDDH.

II. “STANDARDS-BASED” GROUND WATER CONTAMINATION PREVENTION MEASURES

“Standards-Based” prevention measures are those designed to prevent the level of ground water contamination from exceeding designated standards. Routinely these are health based (EPA-MCL or HAL), but other standards may be used to protect other beneficial uses of water where necessary. North Dakota PSMP failure will have occurred if any detection of a pesticide in an aquifer reaches the designated standard, and if the pesticide detection has been replicated in a second sample taken from the same well at least 30 days after the first sample. All voluntary and non-voluntary actions designed to prevent SMP failure (by these or alternative standards) will be considered as preventative measures.

Standards for Initiating Regulatory Action

If routine education is not sufficient to prevent aquifer contamination by pesticides, state regulatory agencies will intervene. In some cases, where appropriate, local or federal jurisdictions may also be used. The PSMP for intervention is based principally on two action benchmarks.

The first benchmark is the Prevention Action Level (PAL). The PAL is the routine "trigger point" for engagement of the regulatory portion of the PSMP and is set at 25% of the MCL. However, other trigger points may be used if damage to the environment or water using enterprises, other than drinking water use, is likely to occur. For example, if a crop highly sensitive to a given herbicide is irrigated from an aquifer having detections of that herbicide that are below PAL, but which might damage the crop, the PSMP would respond on the basis of the potential damage that would be incurred at that lower level.

The second benchmark is the MCL. This benchmark constitutes SMP failure. Failure will require immediate stringent and non-voluntary prohibitions of pesticide use and remedial action in the area of the detection. These actions would be taken by the NDDH and NDDA. However, it is undesirable that this level of contamination should ever be reached.

If a pesticide is detected in ground water at concentrations exceeding the PAL, or an alternative trigger point where appropriate, a second water sample will be taken from the same well at least 30 days after the first sample and analyzed for the previously detected pesticide. If the second sample confirms detection above PAL, the regulatory portion of the PSMP will be engaged. The NDDH notifies the FIC of the detection and the FIC initiates the CRTG.

For pesticide concentrations between the failure point (MCL) and the point of mandatory plan implementation (PAL), the CRTG will choose its course of action from the list of potential voluntary and mandatory actions described in “Voluntary Management Measures and Non-voluntary Management Measures” of this component. However, the CRTG will not be constrained by a rigid matrix of actions. Rather, the course of action chosen will be based on consideration of all the available facts bearing upon the contaminant case. These facts will include, but need not be limited to 1) the concentration of the pesticide detected, 2) proximity of the detection case to public and private drinking water supplies, or to other interests that may be damaged, 3) the hydrology of the aquifer and the likelihood of contamination migration, 4) trends in the data (detections

increasing or decreasing, and the rate of increase or decrease), 5) likelihood of a non-point rather than point source as determined by preliminary investigation of the CRTG, 6) the vulnerability of the aquifer at the point or area of detection, and 7) known use patterns for the pesticide in the vicinity of the detection.

Voluntary Management Measures

If a PAL is reached and the CRTG process has been engaged, the CRTG may recommend voluntary actions as an initial attempt at solving the problem. Voluntary actions may be feasible where field data and circumstances provide reasonable assurance that the designated standard will not be quickly reached. Under such conditions, the CRTG may recommend intensified education aimed at voluntary mitigation of the problem within the defined pesticide area. Voluntary measures involve the specific targeting of educational measures and the application of BMPs to producers and applicators within the pesticide case area. Voluntary measures for prevention plan failures thus consist of an intense and directed application of routine educational practices within a defined problem area.

Non-voluntary Management Measures

In some incidents, voluntary management measures may not be sufficient to prevent ground water degradation from pesticides. Non-voluntary measures may be necessary to reduce the potential for pesticide contamination. Non-voluntary measures will be initiated by the state agency having appropriate statutory authority, on recommendation from the Working Committee.

The Working Committee, with input from the CRTG, will consider all factors for the contaminant case, including but not limited to:

- The specific pesticide of concern, its properties and uses
- The level of contamination
- Confirmation and replication of the detection
- Overall extent of contamination
- Water quality, current use, and usability of the aquifer
- Health, economic, and other consequences of pesticide contamination in the aquifer
- Health, economic, and other consequences of proposed limitations imposed on pesticide use

When non-voluntary actions become necessary, the Working Committee will recommend the appropriate authority be used to prevent ground water degradation. The following steps describe non-voluntary measures that may be taken, in order of increasing regulation. Other restrictions may be devised, if needed.

Step 1 - Restricted Use Classification

The first non-voluntary restriction is reclassification of the pesticide of concern into Restricted Use Classification status in North Dakota. Only certified applicators would be able to apply the pesticide of concern. Pesticides, which are identified by EPA as requiring a PSMP, will have been previously classified as federally restricted use.

Step 2 - Special Restriction of Pesticide Use

The second non-voluntary restriction will be special restrictions on pesticide use. Some of the restrictions are as follows:

- **Setback Areas (Buffer Zones)**
Setback areas may be required near surface water, wellheads, and springs to limit application in sensitive areas.
- **Restriction to Soil Type**
Application of the pesticide may be limited to soil types that have high adsorption and dissipation capabilities.
- **Change in Rate of Application**
A lower rate of application of the pesticide may be required in areas considered sensitive.
- **Change in Method of Application**
Application methods that decrease potential for pesticide leaching may be required.
- **Change in Timing of Application**
Seasonal changes or yearly limitations in applications may be required.
- **Other Restrictions**
Additional restrictions may become evident in the course of investigation to a ground water contamination incident.

Step 3 - State Special Restricted Use Classification

Once a pesticide is reclassified as restricted use, the pesticide may be sold to and applied by persons certified in a special classification.

Step 4 - Pesticide Management Areas

Areas where pesticide use presents an unreasonable threat to the quality of ground water resources may be considered critical, and additional restrictions or prohibition of use of the pesticide of concern may be enacted.

Step 5 - State Cancellation of Registration

The most restrictive action that may be taken is state cancellation of the pesticide of concern. This step has the equivalent result as the state refusing to develop a PSMP.

In the Administrative rule making process for North Dakota, the special restrictions listed above are enacted through a recommendation from the Working Committee to the North Dakota Pesticide

Control Board. These special restrictions require approval from the North Dakota Pesticide Control Board. The rule making process takes approximately 90 days.

For contaminant cases requiring immediate action, mandatory restrictions can be initiated by the NDDH. The NDDH has the statutory authority to implement immediate enforcement actions to prevent ground water degradation. The statutory authority for the Pesticide Control Board and the NDDH is identified in Component III.

BASIS FOR STATE REGULATORY ACTION

In most instances, the Working Committee will base regulatory actions on the extent and nature of actual field pesticide detections and not on vulnerability indices. However, vulnerability indices may be used as guides for investigation and further sampling. Normally, first investigative samples following an initial detection above PAL would be taken in the area of the first detection. Sampling will be expanded if additional samples indicated the problem was widespread in nature. If a potential widespread problem is indicated, vulnerability indices may be used to guide investigative sampling throughout the aquifer, or within a larger geographic, hydrologic, or agronomic area thought to be at risk. These determinations are made by the CRTG based on facts pertaining to the pesticide detection case, and recommendations are given to the Working Committee.

The Working Committee will generally use voluntary measures when feasible and where plan failure does not seem immediate or likely. Voluntary measures would consist primarily of establishing BMPs to minimize pesticide movement, and promote them in meetings with pesticide users in the area of contamination, and in on-farm consultations and visits. Such BMP promotions would be targeted specifically to the problem area. Some voluntary measures were described in Voluntary Management Measures of this component. However, if available information indicates that the MCL may soon be reached, (high initial concentration in the first pesticide detection or a trend indicating a fast rise in concentrations of later samples would establish this danger), non-voluntary measures would be undertaken. Non-voluntary measures would include such measures as mandatory BMPs and local limitations or cancellations of use of an offending pesticide.

The Working Committee will outline and guide a course of regulatory activity, which will 1) prevent the ground water resource from reaching the MCL (or an alternative lower standard where appropriate and necessary), 2) decrease pesticide concentrations in ground water to levels below PAL (or alternative trigger points where appropriate and necessary), and 3) provide reasonable assurance of non-recurrence for the pesticide case.

Contaminant case closure will occur when the Working Committee determines that the threat to the aquifer is no longer present. When a contaminant case is closed, the CRTG working on the case will be ended. Minimal criteria for closing a contaminant case and dissolving the CRTG will include 1) repeated samplings in the well of the initial detection and in the surrounding area of the aquifer with detection levels below PAL, and 2) a trend indicating a consistent decrease in detections levels for the target pesticide. In addition, before closing a pesticide contaminant case, the CRTG will be expected to provide a reasonable period of time for assurance of non-recurrence and a reasonable assurance that the causes of the contaminant detection have been eliminated or mitigated so as to prevent future recurrence. After closing the contaminant case, wells in which the pesticide detections initiating the case occurred will revert to the normal schedule of samples as

described in Component VI. If necessary, there may be several CRTGs engaged at one time for different areas. The following hypothetical example is provided to illustrate the manner in which the PSMP is expected to function.

A HYPOTHETICAL CASE EXAMPLE

1. In the course of routine monitoring by the NDDH, a well in an aquifer in eastern North Dakota is found to have a pesticide detection above the PAL, but below MCL. The NDDH re-samples the well three months after the initial sample and finds that the well is still above PAL. The NDDH notifies the FIC.
2. The FIC assembles a CRTG to coordinate investigation and regulatory action regarding the detection. The CRTG includes an environmental scientist from the NDDH; a hydrologist from the NDSWC, who is familiar with the aquifer of concern, a soil scientist from the NRCS; a local or area Extension agent; and scientists from the NDGS and USGS. Composition of the CRTG may vary, but minimal composition is described in Component III.
3. The FIC notifies the governing bodies and public in the area of the pesticide detection of the nature, location, extent of the detection, and the assembly of the CRTG. Conditions of the detection are also reported to the manufacturer of the chemical detected and EPA.
4. The CRTG meets within 30 days of notification. In this example, the CRTG decides the NDSWC representative will provide a brief assessment of the flow system or further investigative needs to define the flow system. The NDDA inspector will conduct a site investigation for possible label violations or spills and a survey of pesticide use and recent agronomic practices in the immediate area of detection. The NDDH will sample all wells within one mile of the detection and review all past pesticide data for the aquifer. The well from which the initial sample was taken will be sampled quarterly for the specific pesticide detected. Further water samples may be taken, depending on the course of the NDDA and NDSWC investigations. The CRTG also decides to solicit input from industry representatives and university specialists concerning possible causes for the detection. The CRTG agrees to meet 30 days later to evaluate results of the initial investigation.
5. Thirty days later, the CRTG meets again to review information. The NDDA determines label violations have not been proven and the pesticide in question was used on a nearby field. Because the detection level was only slightly above the PAL, it is decided a voluntary course should be taken initially. Extension, in consultation with NRCS, agrees to provide BMPs. The CRTG chairman, with the assistance of members, provides an initial progress report of the investigation. The FIC communicates progress to the public.
6. NDDA and Extension schedule and conduct meetings in the area of contamination to promote BMPs. In the next quarter, the CRTG meets again to review most recent sampling data. Data indicates no further detections of concern have arisen within one mile of the contaminated well. Reviews of previous data in the aquifer and in other similar aquifers have not shown evidence of an extensive problem. The concentration in the contaminated

well has decreased to slightly below PAL. Continuing education is recommended. BMPs are promoted as an ongoing program integrated with regular Extension pesticide programs. They are also promoted in brochures and at meetings through local farm groups and government bodies. A report of the findings and recommendations of the meeting is submitted to the FIC. The FIC releases the results to the public, local government, and industry.

7. After two years the pesticide detections have diminished to far below PAL in a consistent decreasing trend. There has been no recurrence near the original detection, or in routine samples in other aquifers. The CRTG decides and recommends that the well with the initial contamination should be sampled every two years until no detection is made. The NDDH agrees to carry out sample recommendation. The CRTG also decides to disband until further indications of a problem occur. A final report is filed with the FIC. The FIC notifies EPA, the public, local government, and industry of the case closure.

This hypothetical case was provided to give a sense of how the CRTG is expected to proceed. Obviously, there could have been serious problems requiring more stringent ongoing action. For example, further detections in the vicinity of the initial well could result in recommendations for more extensive samples throughout the aquifer, or in other aquifers having similar conditions. Education on BMPs could have been extended to other aquifers. Rising levels of pesticide in the well having initial detection could result in a recommendation that use of the detected pesticide be banned in the immediate area of the detection. Increased detections elsewhere in the aquifer could result in further label restrictions on the offending pesticide or even label cancellation if necessary.

It is believed the CRTG will provide the best method for formulating a reasonable response to a wide range of conditions and for coordinating investigative and regulatory activity. The CRTG should provide both the flexibility and expertise necessary to tailor the PSMP to meet the conditions of the individual contaminant case and to assure appropriate ground water protective measures without undertaking excessive and unnecessary restrictions on the farmer.

COMPONENT VIII. RESPONSE TO DETECTIONS OF PESTICIDES

This component continues the prevention process described in Component VII and addresses the responses for contamination above PAL, which is 25% of MCL. Pesticide detections above designated standards (MCL, HAL, or other health-based level) triggers further pesticide use restrictions and initiates immediate prevention actions by state agencies.

ACTIVATING THE RESPONSE STRUCTURE

The NDDH conducts a routine sampling program designed to evaluate pesticide presence in vulnerable aquifers on a five-year cycle. Sampling procedures are described in Component VI. If a pesticide is detected in quantities equal to or exceeding a preventative action level (PAL) of 25 percent of MCL for a given pesticide, a second sample will be taken at least 30 days after the first. If the second sample remains above the PAL, the regulatory response structure of the PSMP is activated. Detections of pesticides from other monitoring programs or projects; such as, the Safe Drinking Water Program of the NDDH's Division of Municipal Facilities, or special projects of the NDSWC, the USGS, the NDGS, the NRCS or other agencies, may also be used to activate the PSMP regulatory response structure. In some cases, trigger points lower than a PAL may be used to engage the PSMP, if significant damage to water uses other than drinking water uses appear likely.

REGULATORY RESPONSE TO DETECTIONS

Voluntary BMPs will be used for pesticide detections near PAL and where pesticide data trends indicate that concentrations are not rising at a rate likely to cause plan failure before voluntary actions can be effective. Conversely, non-voluntary actions will be used for detection levels near MCL, or where rising trends indicate that plan failure may occur without immediate and highly effective prevention actions.

Voluntary actions will include BMP education and promotion specifically targeted to the pesticides used, crops raised, and characteristics of the detection case area. Educational efforts will be accomplished through meetings conducted by NDSU Extension and the NDDA, educational and conservation assistance programs of the NRCS, and media announcements (newspaper, radio, television, magazine). Voluntary measures were outlined in Component VII.

Non-voluntary actions primarily include: restricted use classification, special restrictions of pesticide use, pesticide management areas, or cancellation of registration. Non-voluntary actions are summarized in Component VII. Primary enforcement authorities used will be the NDDA, the Pesticide Control Board, and the NDDH. However, other federal, state, and local jurisdictions may be used when necessary. Statutory authorities are summarized in Component III and enforcement mechanisms are summarized in Component IX.

DRINKING WATER SUPPLY RESPONSE

In the event a pesticide contamination incident potentially impacts a public drinking water supply, the NDDH's Division of Municipal Facilities will be notified. Under requirements of the Safe Drinking Water Act, the Division of Municipal Facilities will work with the public water system to minimize health impacts and insure compliance with applicable Safe Drinking Water Act standards. The Working Committee will assist the Division of Municipal Facilities in meeting its clean water objectives, even when those objectives are below the levels established by the PSMP. If "trigger points" activating Safe Drinking Water Act actions for a given pesticide are below those of the PAL used in the PSMP, then those lower "trigger points" will be adopted by the PSMP process within the area of the public supply wells. The Working Committee will assist by coordinating the action of the appropriate state and federal agencies who can define the extent, severity, and environmental/human health risk relating to a specific contamination event. Also, they can assist in providing input to the selection of the appropriate remedial action alternative(s). In addition, they can keep the Division of Municipal Facilities informed of the scope and progress of activities.

In the event a pesticide incident contaminates a private drinking water well, the NDDH's Division of Water Quality will be notified and provided with all information pertaining to the pesticide contaminant case. The well owner and /or well water users will also be notified.

The EHS remediation plan involves the evaluation of each contamination incident on a case by case basis, using a variety of factors including type and concentration of contamination, environmental risk, public health risk, and its impact on the current and future potential beneficial use of the resource. Future potential beneficial use of a water resource is determined by the classification of the resource as identified in North Dakota Administrative Code 33-16, Water Quality Standards, its impact on other water resources or beneficial uses (i.e. ground water discharge to streams), background water quality and water quantity. The state has the authority to pursue action to eliminate the source of contamination, require the construction of adequate controls to minimize its discharge into the environment, require modification of the operation of an activity or facility to minimize contamination and require remediation of the resource. The level of effort required to return a contaminated water resource to its background condition will be dependant, in part, upon the extent of contamination, risk to receptors, natural environmental conditions, and initial source of the contamination. Remediation of a contamination incident may include contaminant removal treatment at the point of use, application of engineered options designed to remove the contaminant from the water resource or by allowing the quality of the water to return to its pre contamination level through monitored natural intrinsic remediation.

The state has historically addressed both point and non point source contamination incidents and is expected to address future contamination issues related to pesticide use in the same manner as described above.

LIMITATIONS TO SMP

A limitation to the SMP may be gaps in the information available on the State's current water quality. However, this is not currently considered a significant problem as the State has an ongoing program for installing monitoring wells. The State Water Commission maintains and operates a rotary drilling rig to install from 100 to 150 new monitoring wells each year.

STATE MANAGEMENT PLAN FAILURE

If the MCL is exceeded, the PSMP will be considered as having failed. If PSMP failure occurs, the Working Committee will direct a course of regulatory actions to correct and/or remediate the pesticide contamination case. Regulatory actions will include special restrictions of the pesticide use, pesticide management areas, and state cancellation of the pesticide. These actions are outlined in Component VII. State cancellation of the pesticide is the strongest enforcement action available to prevent water degradation. The SMP also calls for remediation of ground waters for high priority aquifers

Actions to assure that affected public and private water supplies are remediated and safe water is available for human and livestock consumption will be undertaken by the NDDH. Where necessary and feasible, cleanup will be undertaken. Use of the detected pesticide within the affected area will not be allowed to resume until the cause of the contamination has been determined, measures reasonably assured to prevent future recurrence have been taken, and concentrations of pesticide have decreased below PAL and exhibit a consistent decreasing trend.

COMPONENT IX.

ENFORCEMENT MECHANISMS

Primary enforcement authority for implementing the SMP lies with the NDDH and the NDDA. A review of the legal authority for implementing the SMP is found in Component III.

Under NDCC Ch. 61-28, the NDDH has the authority to intervene in any case where the "potential" to pollute is involved, in order to protect North Dakota's ground water. This authority is general in nature and could be used to limit pesticide use. However, because the primary mechanism for limiting pesticide use lies with the North Dakota Pesticide Control Board, as enforced by the commissioner of agriculture, application of NDDH authority to limit pesticide use would most likely be limited to cases of acute contamination, where high and immediate risk would warrant immediate intervention without waiting for a more lengthy hearing process. In most cases, limitations of pesticide use would likely be enacted through the statutory authority of the North Dakota Pesticide Control Board.

To ensure that requirements of PSMPs are followed, enforcement action may be necessary. Authority under the North Dakota Pesticide Control Board, enforced by the commissioner of agriculture, will be the primary entity for enforcement action for requirements under the PSMPs. The NDDA's Pesticide Division will monitor compliance and enforce ground water protection labeling as part of its use, marketplace, and dealer inspections. The Pesticide Division will focus use inspections on those commodities, growers, and areas where pesticide use involves a PSMP as labeling. Applicators, who violate the label or other federal or state law related to this plan, will be subject to enforcement action as outlined in the NDDA's Pesticide Division's Enforcement Response Policy submitted and on file with EPA Region VIII.

Authority of the North Dakota Pesticide Control Board, as described in NDCC Ch. 4-35, can be enforced by the following penalties:

- NDCC § 4-35-23(1) - Any registrant, applicator, other than a private applicator; wholesale dealer, retailer, or other distributor who knowingly violates any provision of NDCC Ch. 4-35, shall be guilty of a class A misdemeanor.
- NDCC § 4-35-23(2) - Any private applicator or other person not included in subsection 1, who knowingly violates any provision of this chapter, shall be guilty of a class B misdemeanor.
- NDCC § 4-35-23(4) - In addition to criminal sanctions, which may be imposed pursuant to subsections 1 and 2, a person found guilty of violating this chapter or rules adopted under this chapter is subject to a civil penalty not to exceed five thousand dollars for each violation. The civil penalty may be imposed by a court in a civil proceeding, or by the commissioner of agriculture through an administrative hearing pursuant to NDCC Ch. 28-32.
- NDCC § 4-35-24(7) - If a civil penalty pursuant to section 4-35-23 is imposed by the commissioner of agriculture through an administrative hearing and the civil

penalty is not paid, the commissioner of agriculture may collect the civil penalty by a civil proceeding in any appropriate court. Additionally, the commissioner of agriculture may suspend or revoke a certification issued pursuant to this chapter for failure to pay a civil penalty within thirty days after a final determination is made that the civil penalty is owed.

Penalties may range from a minimum of \$400 to a maximum of \$5,000 per violation.

The Contamination Response Task Group and the Working Committee, as described in Component VIII, will recommend appropriate use of statutory enforcement action. The Working Committee will coordinate State regulatory actions regarding pesticide use to prevent ground water contamination, to ensure that conflicting, repetitive, or inappropriate actions are not taken, and to facilitate communication between agencies having statutory responsibilities.

COMPONENT X.

PUBLIC AWARENESS AND PARTICIPATION

Success of the SMP will depend largely on statewide public awareness and participation from the potentially regulated community and the general public.

Public Role in SMP Development, Implementation, and Revision

Section II detailed the Advisory Committee, which is comprised of farm, industry, public, interest groups, and concerned individuals. It is recognized that Advisory Committee members will be uniquely capable of providing input to aid the PSMP planning process. Membership on the Advisory Committee is open to any agency, organization, or person wishing to provide comment on the GSMP or future PSMPs.

The GSMP has been open for public comment. Comments from the Advisory Committee have been solicited for both the GSMP and the Position Statement of the Technical Committee. The FIC will make notice to the general public, utilizing the Information Distribution Network (IDN), when a draft PSMP has been developed for a pesticide of concern. The FIC will allow at least 30 days for public comment on the draft PSMP.

Development of future PSMPs may require agencies represented on the Working Committee to seek additional legal authorities. The agency seeking the rule-making must follow NDCC Ch. 28-32, Administrative Practices Act, to allow for public comment through public hearings or written comments.

The Working Committee will utilize an outreach program to publicize the SMP statewide. Outreach activities may include, but are not limited to: public meetings, public hearings, public notices, public service announcements, press releases, direct mailings, public speaking engagements, and routine pesticide inspection activities.

Public Notification Process for Detection of Pesticides in Ground Water

Confirmed baseline ground water monitoring results will be annually published in a report by the NDDH and made available by request. Baseline monitoring results indicating a potential adverse affect to users of the water resource or public health will be released by the North Dakota State Health Officer or the assigned representative of the Health Officer.

The Working Committee will gather monitoring information regarding a contamination incident being investigated by a CRTG. Information gathered will be presented to the North Dakota State Health Officer for release to the general public. All confirmed monitoring results will be publicly disclosed along with their relationship to health-based standards. All monitoring data (with the exception of the name of the well owner and the exact well location, which will remain confidential) will be made available for public review. In the event a pesticide contamination incident impacts a private drinking water well, the NDDH will provide the owner and/or well user information as outlined in Component VIII.

The FIC, with input from the Working Committee, will utilize the Information Distribution Network (IDN) (described in Component XI) to disseminate SMP information to the public regarding updates, changes, or modifications. The FIC will also be responsible for informing farmers, industry representatives, pesticide applicators, agriculture interest groups, public interest groups, and individuals concerned with future PSMP strategies developed in North Dakota. The FIC will be responsible for notifying the public of the pesticide case, for informing them of the results of each CRTG meeting, and for notifying the public of pesticide case closure.

COMPONENT XI.

INFORMATION DISSEMINATION

The Information Distribution Network (IDN) was developed to insure the SMP information reaches the potentially regulated community and the general public. The FIC, after consultation with the Working Committee, will prepare information to be released through the IDN. All information released concerning the SMP will be reviewed and approved by the Working Committee prior to release.

The IDN was designed to release information on a statewide basis or to specific audiences or geographic areas in North Dakota.

The IDN uses a variety of communication channels, including the following:

Press Releases

A computer database has been developed containing over 200 media sources that will be contacted through press releases. Appendix I is a listing of potential mass media outlets.

Pesticide Certification Meetings

Pesticide certification and recertification meetings conducted by NDSU Extension Service will be used to communicate ground water protection information to commercially and privately certified pesticide applicators. There are approximately 20,000 privately and 3,000 commercially certified applicators in North Dakota. The NDSU Extension Service holds seven commercial certification and recertification meetings annually. County agents conduct nearly 150 private certification meetings annually. Information concerning the SMP will be presented at all commercial and private certification meetings.

Public Meetings and Workshops

The FIC will schedule a tour of public meetings to educate pesticide users and the general public concerning SMP information. The FIC will coordinate this effort with the NDSU Extension Service Pesticide Program. Workshops and public meetings will be held in areas of the state where the pesticide of concern managed in a PSMP is utilized. Workshop and public meeting notices will be heavily publicized through the IDN.

Pesticide Dealers and Registrants

Pesticide dealers and registrants are in a unique position to provide one-on-one assistance to pesticide users. Dealers and registrants will be encouraged to continually provide information concerning PSMPs to pesticide users.

Pesticide Inspections

The NDDA's Pesticide Division will continually provide information to pesticide applicators and dealers during pesticide inspection activities. Pesticide inspectors will assist applicators and dealers by disseminating information regarding requirements of PSMPs.

Special Districts

The FIC will release information to special districts including soil conservation districts, irrigation district, water resource district, county health units, and others as identified. Special districts can be targeted to disseminate information to a particular geographic area or interest.

COMPONENT XII. RECORDS AND REPORTING

Documentation of the SMPs serves two functions. First, records provide a source of data for state agencies and EPA to share. Second, documentation provides a basis with which to assess the implementation and effectiveness of the SMP. State agencies keep certain records pertaining to their regulatory responsibilities and these records are used in the SMP. All records relevant to the SMP will be maintained for a period of at least four years. The NDDA's Plant Industries Division will serve as the collection point for the records and will make the information available to EPA upon request. The records will include the following information:

- Monitoring and sampling data
- Results of analysis
- Issuance of permits
- Types and numbers of enforcement action taken
- Records of any site-specific regulatory actions

The NDDA's Plant Industries Division will also be responsible for providing the EPA with a SMP Biennial Report. The Biennial Report will consist of two components: a programmatic evaluation and an environment evaluation. The programmatic evaluation includes the following information:

- A discussion of the accomplishments and progress for each of the 12 components and demonstrate that all components are operational
- Identification any special issues within the state regarding the SMP
- Description of projected available resources for the next two years, with a comparison to the resources necessary to carry out the SMP
- Description of any proposed modifications or updates to the SMP
- Data on the number of inspections performed to determine compliance with provisions of the SMP, completed enforcement actions relating to noncompliance, and summary of findings.
- Description of response actions taken for detections of the specific pesticide

The environmental evaluation includes the following information:

- Results and analyses from ground water sampling and monitoring, as well as a summary of significant finds, which would prompt a State to increase the oversight of use of the pesticide or modify the SMP.
- An assessment of pesticide usage and whether use of the specific pesticide has increased, decreases, or remained essentially the same over the past two years.

The state will maintain pertinent records for the SMP for a period of four years and report any significant findings to the appropriate EPA Regional Office.