NEBRASKA
STATE MANAGEMENT PLAN
FOR
PESTICIDES AND WATER RESOURCES

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Executive Summary

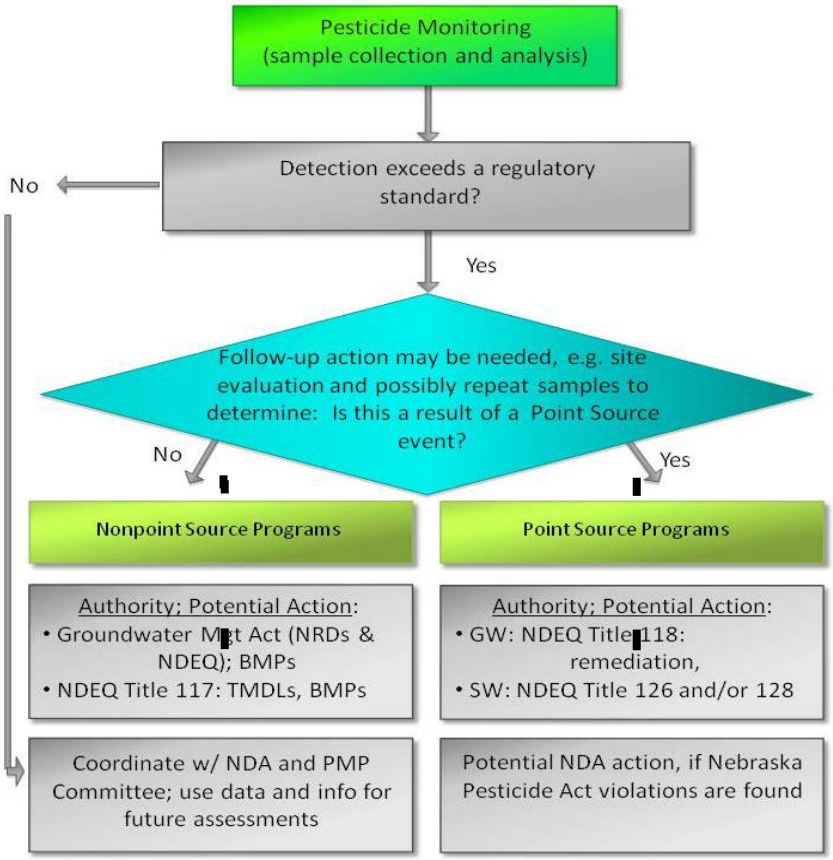
This document is divided into chapters or components which describe the activities and responsibilities of the various agencies, groups, and individuals involved in water quality protection, pesticide education, and pesticide regulation. It describes the type of information available to these individuals and groups to make decisions in assessing, managing, and regulating pesticides for water quality protection. In addition, it proposes the process used for the formation of a Pesticide Management Plan Advisory Committee (PMPAC) that would advise the Director of the Nebraska Department of Agriculture (NDA) regarding how to address pesticides in our water resources.

The U.S. Environmental Protection Agency (USEPA) grants individual states the ability to regulate pesticides, if corresponding State legislation is in place, and assists with funding these programs through cooperative agreements. NDA, through authority of the Nebraska Pesticide Act, is the State agency responsible for regulating pesticides and pesticide use in Nebraska. In the mid-1990s, state pesticide agencies were directed by USEPA to develop generic state management plans for protecting ground water from pesticide contamination. These "generic" plans were to be the precursor or template for more detailed, pesticide-specific management plans for active ingredients identified by USEPA through national-level risk assessments. Much of the background in national policy leading up to the development of that plan for Nebraska can be found in the Nebraska Pesticides and Groundwater Generic State Management Plan (1997). To summarize, USEPA recognized that specific pesticide label use restrictions developed using national datasets and risk models may not now be protective enough of the resource, given localized conditions in land use, pesticide use, and other factors. USEPA encouraged states to come up with their own, individualized, process for managing pesticide use to protect natural resources.

Since that time, NDA has been given statutory authority to regulate pesticides for protecting surface water quality. The State Management Plan for Pesticides and Water Resources (this document, hereinafter referred to as SMP) merges the process for identifying and evaluating pesticides in ground water, as outlined in the early generic state management plan, with NDA's authorities and responsibilities for protecting *all* water resources, including surface water, from pesticide contamination. The process described here will be used as a guide for developing Pesticide-specific Management Plans (or PMPs) for protecting human and/or environmental health from unreasonable adverse effects of pesticides in water for specific, potentially more localized, situations that can't be, or most likely won't be, addressed by product label language approved at the Federal level. As described here, a State Management Plan Committee (SMP Committee) will be formed consisting of representatives from the "core" agencies of NDA, Department of Environmental Quality (NDEQ), Department of Health and Human Services (NDHHS), Department of Natural Resources (NDNR) and natural resources districts. This SMP Committee will, if determined by a review of available information, recommend to NDA that it convene a PMPAC which will include representatives of the core agencies indicated above, and other stakeholders such as pesticide users, pesticide manufacturers, environmental advocate/public interest groups, University of Nebraska Extension, University of Nebraska Water Center, University of Nebraska Biological Systems Engineering, USDA Natural Resources Conservation Service, and the U.S. Geological Survey. This committee would be charged with developing a PMP, if needed, and make recommendations to NDA for revising or adding regulations if it was determined by the committee to be necessary. NDA would chair the Committee, and make a strong effort to include those stakeholders that are most involved or relevant to the specific pesticide issue at hand. (See pages 11 and 13 for additional details)

The goal of USEPA and NDA strategy for regulating pesticides is to "prevent contamination of water resources that would cause unreasonable risks to human health and the environment resulting from the normal, registered use of pesticides by taking appropriate actions where such risks may occur" (USEPA 1991). State and Federally recognized water quality standards for drinking water and aquatic life will be used, when available, to gauge potential risk and to make risk-based decisions. Other science-based reference points or concentrations may also be used, as needed, if they are determined to be valid for the situation and conditions at hand. At the most basic level, a water sample from either ground water or surface water is analyzed for a suite of potential active ingredients. If a concentration is found that approaches or exceeds a threshold, or trigger level, it must be determined whether that concentration is the result of an accidental spill or some other point source pollution event, or whether it is the result of pesticides being used according to label directions. This latter case is called nonpoint source pollution, which is generally thought of as originating from many locations or events. It is a more diffuse type of pollution coming from more than one pesticide application in an area; generally, no one pesticide application can be pinpointed as the cause, because many pesticide applications likely contribute to the problem. Each of these categories – point source vs. nonpoint source – is treated differently under State statutes dealing with protecting water quality. Depending on the extent and severity of point source contamination, some type of remediation is usually directed by an agency for those events. Because no one person or event is the cause of nonpoint source pollution, measures to reduce or prevent further contamination undoubtedly will require more people to do things differently to affect positive changes in water quality.

The following flow chart depicts a generalized process for evaluating individual sample results and what action(s) may be taken.



Imagining this process taking place for many samples, possibly hundreds, collected in a specific geographic area (such as a watershed or an aquifer) and through time (such as repeated samples within a season or year, or across many years), one can begin to visualize what is described in this SMP for developing PMPs for addressing pesticides in water concerns.

This monitoring data, along with land use information, pesticide use data, factors affecting ground water and surface water vulnerability, and other information will be evaluated by the PMPAC to determine if additional protective measures are warranted to prevent further contamination. Protective measures could range from simply raising pesticide applicator awareness regarding the water quality of specific geographic locations, to adopting specific use restrictions for pesticide products containing the active ingredient. In all likelihood, a PMP might contain a suite of protective measures or stages, each becoming more focused or regulatory as time passes and if improvements are not seen.

Acronyms

ALS	Aquatic Life Standard
BMP	Best Management Practice
CDC	US Department of Health and Human Services - Centers for Disease Control
CERCLA	Comprehensive Environmental, Response, Compensation and Liabilities Act
CWA	Clean Water Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FSA	USDA Farm Service Agency
GIS	Geographic Information System
GWMA	Ground Water Management Area
GWMP	Ground Water Management Plan
GWM&PA	Ground Water Management and Protection Act
HAL	Health Advisory Level
IPM	Integrated Pest Management
MCL	Maximum Contaminant Level
NARD	Nebraska Association of Resources Districts
NASS	USDA National Agricultural Statistics Service
NAWQA	National Water Quality Assessment
NDA	Nebraska Department of Agriculture
NDEQ	Nebraska Department of Environmental Quality
NDNR	Nebraska Department of Natural Resources
NDHHS	Nebraska Department of Health and Human Services System
NGPC	Nebraska Game & Parks Commission
NPDES	National Pollutant Discharge Elimination System
NRCS	USDA Natural Resources Conservation Service
NRD	Natural Resources District
NSDWA	Nebraska Safe Drinking Water Act
NTNC	Non-Transient Non-Community
NWIS	National Water Information System
PMP	Pesticide Management Plan
PMPAC	Pesticide Management Plan Advisory Committee
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RC&D	Resource Conservation and Development
RCRA	Resource Conservation and Recovery Act
RUP	Restricted-Use Pesticide
SDWA	Safe Drinking Water Act
SLU	State-Limited-Use
SMP	State Management Plan
TMDL	Total Maximum Daily Load
UNL	University of Nebraska - Lincoln
UNL-ARD	UNL Agricultural Research Division
UNL-BSE	UNL Department of Biological Systems Engineering
UNL-CSD	UNL Conservation Survey Division
UNL-CES	UNL Cooperative Extension Service
UNL-PSEP	Pesticide Safety Education Program, UNL Department of Agronomy and Horticulture
UNL-WC	UNL Water Center
USDA	United States Department of Agriculture
USEPA	Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WHP	Wellhead Protection Program
WHPA	Wellhead Protection Area.

Glossary

Integrated Pest Management (IPM): A sustainable approach to manage pests with biological, cultural, physical, and chemical methods to minimize economic, human health, and environmental risks.

Nonpoint source pollution: Generally, pollution resulting from land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification coming from many diffuse sources. Compare to point source pollution, below.

Pesticide: As defined by the Nebraska Pesticide Act, it is a substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest or any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant, including any biological control agent.

Pesticide of interest: A term used by State pesticide agencies for reporting and evaluation purposes; one that has the potential to occur in ground or surface water at concentrations approaching or exceeding a human health or ecological reference point. A reference point is the concentration of a pesticide active ingredient in water used to judge the severity of contamination.

Pesticide of concern: A term used by State pesticide agencies for reporting and evaluation purposes; an active ingredient that has been found to approach or exceed a human health or ecological reference point in water, and where the State intends to specifically address these concentrations.

Point source pollution: any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged

NEBRASKA STATE MANAGEMENT PLAN (SMP) FOR PESTICIDES AND WATER RESOURCES

INTRODUCTION

USEPA is the federal agency responsible for administering the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), which provides USEPA the statutory authority to register pesticides for specific uses, provided these uses do not pose unreasonable risks to human health or the environment. USEPA may use its authority to cancel or suspend registration of those pesticides determined to pose unreasonable risks. Additionally, USEPA may require specific label statements which direct pesticide users of the application methods needed to reduce risks to people and the environment.

NDA, through authority of the Nebraska Pesticide Act, is the State agency responsible for regulating pesticides and pesticide use in Nebraska. In the 1990s, state pesticide agencies were directed by USEPA to develop generic state management plans for protecting ground water from pesticide contamination. Much of the background in national policy leading up to the development of that plan can be found in the Nebraska Pesticides and Groundwater Generic State Management Plan (1997).

The SMP merges the process for identifying and evaluating pesticides in ground water, as outlined in the early generic SMP, with NDA's authorities and responsibilities for protecting all water resources, including surface water, from pesticide contamination. This SMP will be used as a guide for developing PMPs for protecting human and/or environmental health from unreasonable adverse effects of specific pesticides in water for specific, potentially more localized, situations than can't be addressed by label language approved at the Federal level.

The goal of USEPA and NDA strategy for regulating pesticides is to, "prevent contamination of water resources that would cause unreasonable risks to human health and the environment resulting from the normal, registered use of pesticides, by taking appropriate actions where such risks may occur" (USEPA 1991). State and Federally recognized water quality standards for drinking water and aquatic life will be used, when available, to gauge potential risk and to make risk-based decisions. Other science-based reference points or concentrations may also be used, as needed, if they are relevant to the situation.

Because various groups and agencies have interests and jurisdictions regarding water quality protection, this SMP will help identify agencies, groups, individuals, and programs in seeking to integrate and coordinate program activities. Because no single agency can accomplish all of the SMP requirements, the need for cooperation is imperative.

This SMP, and subsequent PMPs, are intended to be flexible and will be revisited periodically in order to ensure they address changing circumstances and incorporate new information.

COMPONENT 1: RATIONALE AND GOALS FOR PROTECTING WATER RESOURCES

Nebraskans have long recognized the valuable role water plays in nearly every aspect of their daily lives. Nebraska's abundant ground water provides drinking water to virtually all of the state's rural households and 90 percent of its public water supplies. Ground water has brought economic development to the Great Plains and enables the state's agricultural industry to thrive.

In 2010, ground water withdrawals supplied various uses with 4.71 million gallons per day (United States Geological Survey (USGS), 2014). Irrigation accounted for 91 percent of the annual ground water use in Nebraska. The irrigation of nearly 9 million acres of cropland has enabled the state to become one of the nation's leaders in agricultural production (NE Dept. of Revenue, 2013). In all, Nebraska's agriculture contributes over $21 billion annually to the state's economy (2011 Nebraska cash receipts from all farm commodities).

Surface water is also important to Nebraskans and Nebraska agriculture. In 2010, surface water diversions supplied various uses with 3.32 million gallons per day (USGS, 2014), with agricultural irrigation accounting for approximately 41 percent of that total. Excluding hydroelectric power uses, agriculture accounts for approximately 85 percent of all surface water use. The outdoor recreation benefits of surface water (boating, fishing, camping, etc.), play a large part in the tourism dollars spent in the state (Nebraska Game and Parks Commission, 2010).

Pesticides play an important role in agricultural production and are also widely utilized in maintenance of trees, turf, ornamental plantings, and the control of structural and public health pests. These are important uses, but care must be taken to ensure that pesticide compounds do not impair state water supplies. The protection of our water resources is critical to ensuring the protection of public health and safety, environmental resources, and to assure sustainable economic viability.

Specific goals and policies pertaining to surface water and ground water quality are outlined in state statutes and regulations. NDEQ is the primary State agency responsible for protecting and maintaining water quality. NDEQ's *Title 118, Groundwater Quality Standards and Use Classification* (NDEQ, 2006) includes the following goals:

- Protect, and where necessary, improve the quality of ground water for human consumption, agriculture, industry, and other productive, beneficial uses.
- Achieve appropriate water quality standards wherever attainable. When determining whether such standards may indeed be attained for a given aquifer, consideration is given to environmental, technological, social, and economic factors.
- Existing high-quality ground water will be maintained and protected.

Similarly, *Title 117, Nebraska Surface Water Quality Standards* (NDEQ, 2011), includes the following goals:

- The water quality of surface waters shall be maintained and protected. Water quality degradation, which would adversely affect existing uses, will not be allowed.

- Class A State Resource Waters: These are surface waters which constitute an outstanding state or national resource, such as waters within national or state parks, national forests or wildlife refuges, and waters of exceptional recreational or ecological significance. Waters which provide a unique habitat for federally designated endangered or threatened species and rivers designated under the Wild and Scenic Rivers Act are also included. The existing quality of these surface waters shall be maintained and protected.
- Class B State Resource Waters: These are surface waters which possess an existing quality which exceeds levels necessary to maintain recreational and/or aquatic life uses. The existing water quality of these surface waters shall be maintained and protected. However, the State may choose, in accordance with Neb. Rev. Stat. §81-1513, to allow lower water quality as a result of important and necessary economic or social development in the area. The highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices (BMPs) for nonpoint source control shall be achieved.

The Nebraska Legislature included the following text in the preamble of the Nebraska Pesticide Act (Neb. Rev. Stat. §§2-2622 through 2-2654):

> The Legislature hereby finds that pesticides are valuable to our state's agricultural production and to the protection of humans and the environment from insects, rodents, weeds, and other forms of life which may be pests but that it is essential to the public health and the welfare that pesticides be regulated to prevent adverse effects on humans and the environment.

In addition, the Act describes the SMP and pesticide-specific management plans (PMPs), and guidelines for how they are to be implemented.

Nebraska's water resources protection policy places a strong emphasis on comprehensive and broad-based planning, as well as proper coordination of management activities. All useable and potentially useable waters are subject to protection and management. Although all beneficial uses are afforded protection, the highest and most sensitive beneficial use is drinking water. Because water, which meets drinking water criteria, is suitable for other beneficial uses, it is recognized that protecting water for drinking water, if applicable, will typically protect it for other beneficial uses.

Nebraska's programs recognize that planning efforts must be firmly based on sound scientific procedures and best available data which can be used to focus and maximize protection efforts and resources. Inherent in the state's approach is the use of scientific procedures which:

1. Allow for valid water quality monitoring and assessment;
2. Predict the potential for overland or through-the-soil profile movement of specific agricultural chemicals from the point of application to water supplies;
3. Assess the environmental health or human health risks of alternative products or techniques; and
4. Evaluate and identify local areas of the state, which, due to topography, soils, rainfall, geological substrate, hydrology, and/or agricultural practices are more vulnerable to contamination and degradation of water quality.

The use of accepted numerical health-based standards is an integral part of the Nebraska

approach to water quality and public health protection.

The Nebraska approach recognizes that public involvement in the development of any PMP is critical for successful water quality protection efforts. Planning, agency coordination, and regulatory action are of minimal value, if programs are not transparent and acceptable to the public it is intended to protect or potentially impact. Successful implementation can occur only by obtaining public support through information dissemination, education, and participation.

Inherent in Nebraska's efforts to protect water resources is the understanding that prevention is the preferred and most efficient means of achieving water quality goals. This concept is stressed in many of the agencies' outreach activities, which are described in Component 5.

Pesticides and Water Quality Protection Goal

The goal of the Nebraska SMP for Pesticides and Water Resources is to assure water quality is protected and maintained for beneficial uses by minimizing or preventing degradation of the state's water from pesticide contamination. A measure of whether this goal is being met is to compare water quality data collected within a geographic area, such as a Natural Resource District (NRD), aquifer, watershed, or smaller area, against a health-based standard.

NDHHS and NDEQ establish numerical human health-based standards for agricultural chemicals in surface and ground water, based upon the best available scientific data and Federal guidelines. NDEQ is responsible for the adoption of standards for pesticides in surface and ground water, and NDHHS is responsible for the adoption of standards for pesticides in drinking water. For the purposes of the process described in this document, Federal Maximum Contaminant Levels (MCLs), as promulgated under the Safe Drinking Water Act (SDWA) and National Primary Drinking Water Regulations, will be used, when available. In the absence of an MCL, a non-promulgated federal Health Advisory Level (HAL) will be used. MCLs and HALs for those chemicals and pesticide products that have been developed are available on-line (USEPA, 2009). Should no MCL or HAL be available, an interim numerical standard based upon the best available scientific data may be established by NDHHS for drinking water, or NDEQ for other ground water uses. USEPA has also developed and published human health benchmark concentrations (USEPA 2012) for many pesticide active ingredients for which there are no drinking water health advisories or enforceable MCLs. These benchmarks are levels in water at or below which no adverse health effects are anticipated. In the absence of an MCL, HAL, or other state standard, a human health benchmark might be used as a reference concentration for implementing a PMP.

USEPA has also developed aquatic life standards (ALS) and aquatic life benchmarks for many pesticides, including levels protective of aquatic plants, insects, fish, and plankton species, as well as aquatic communities, in general. These are based on a variety of studies submitted during the pesticide registration and registration review process. These benchmarks are available on-line and are updated periodically (USEPA, 2010). In the absence of a state ALS for a specific pesticide, an aquatic life benchmark might be used as a reference concentration for implementing a PMP.

COMPONENT 2: ROLES AND RESPONSIBILITIES

There are many public and private organizations, as well as thousands of citizens who share a deep commitment and responsibility to manage and protect Nebraska's water resources. Given the complexity of water quality protection, no single agency has sufficient authorities, resources or expertise necessary to address all aspects of this issue. A successful strategy will be one which best coordinates the authorities and resources of local, state, and federal programs, while soliciting and making use of the knowledge and insight available from the private sector.

The Nebraska Pesticide Act stipulates that "The department shall involve the natural resources districts and other state agencies, including the Department of Environmental Quality, the Department of Natural Resources, or the Department of Health and Human Services, in matters relating to water quality." These agencies will form the SMP Committee, as explained below.

SMP Committee

The SMP Committee will be comprised of representatives of the "core agencies" listed above and will meet at least annually to review summaries of monitoring data and to determine whether there is enough evidence or need for developing a PMP for a specific active ingredient. If such a determination is made, representatives from these same agencies, as well as many other stakeholders, will be included in a pesticide-specific PMPAC, tasked with looking closer at the various parameters described in this document. In addition to the core agencies, the PMPAC may consist of a representative from the University of Nebraska – Lincoln Cooperative Extension Service (UNL-CES), farm organizations, farmers, crop consultants, environmental advocacy organizations, and one or two at-large representatives. These representatives will be named by the Director of NDA prior to development of any PMP and will serve at the request of the Director. Appendix A provides more detail into how the PMPAC will be selected and operated.

Figure 1 visually describes the participants of the SMP Committee and a PMPAC, and the general process of determining the need for, and the development of, a PMP.

Figure 2 provides a flowchart that depicts the potential decision process of how the SMP Committee and PMPAC would work together and exchange information.

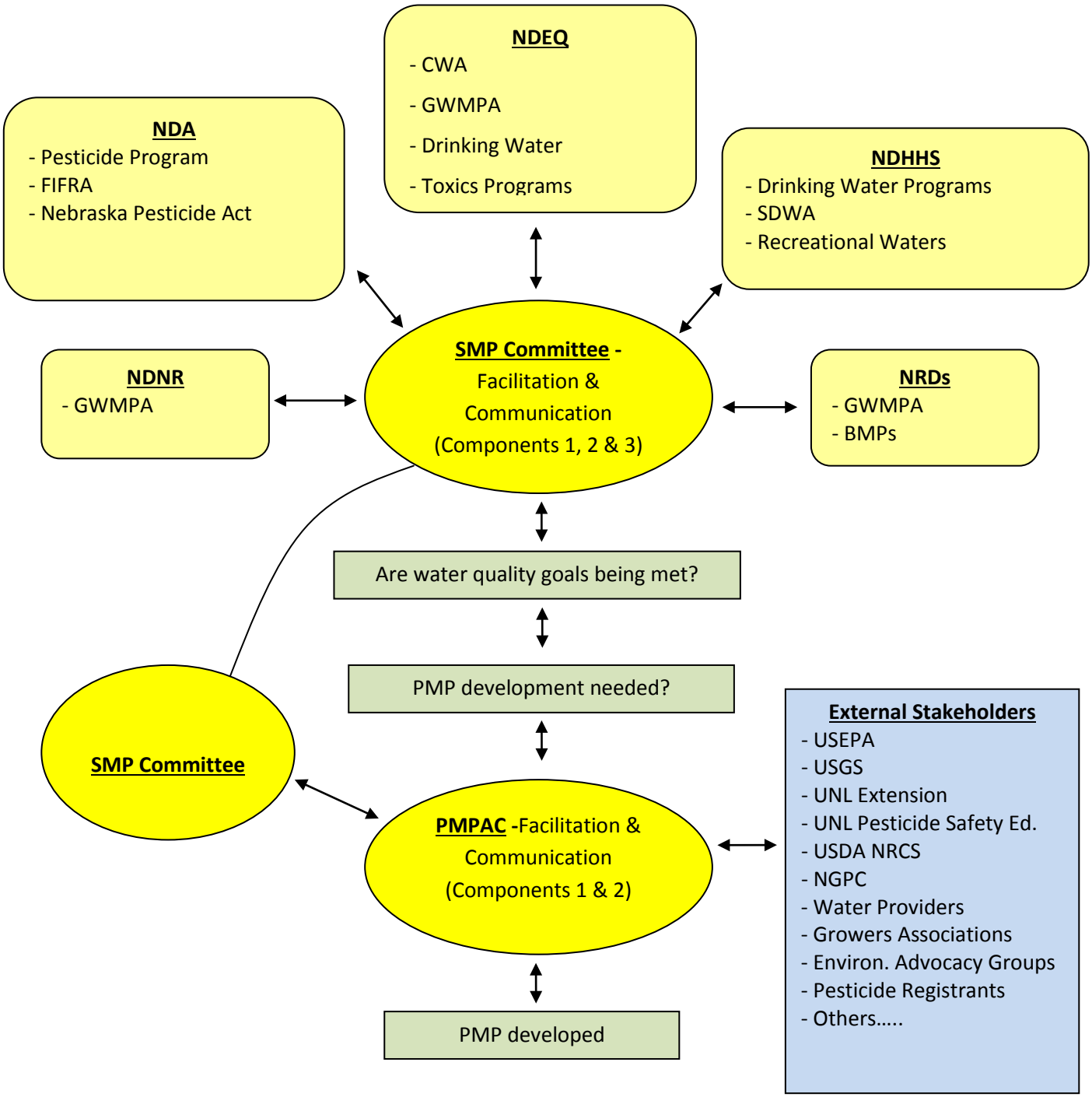


Figure 1. The general relationship of the SMP Committee and PMPAC, including core agencies and other stakeholders.

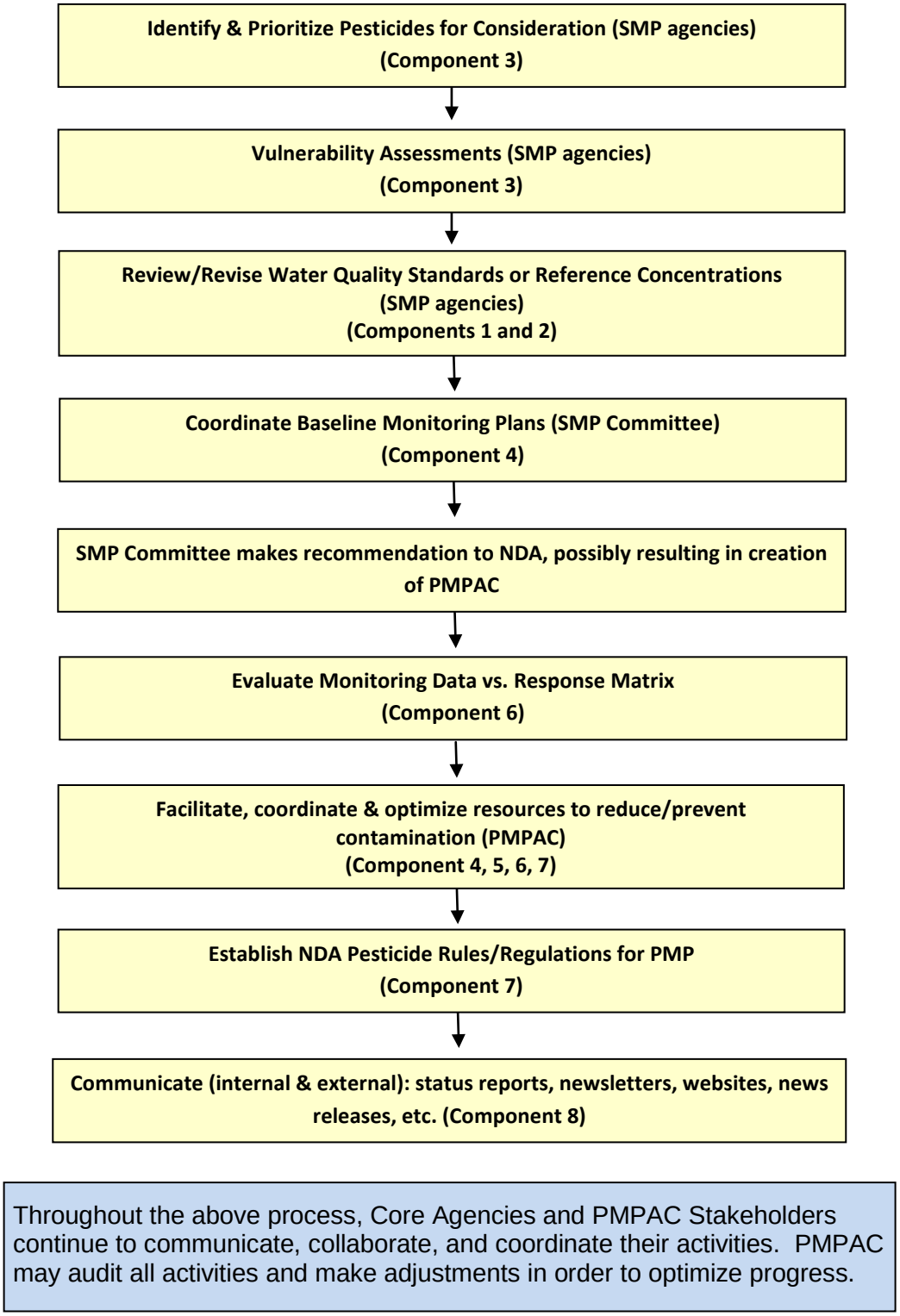


Figure 2. A generalized overview of the SMP/PMP process.

The SMP Committee's responsibility in PMP development is one of consultation to ensure inclusion of various perspectives, coordination of activities, and formulation of useful and feasible recommendations regarding implementation of a successful PMP. This Committee's role is limited to an advisory capacity and recommendations stemming from this group's activities are not binding on any of the participants. It serves as a venue for the informal exchange of ideas and information and may provide formal recommendations to NDA regarding PMP development and/or implementation. The SMP Committee will meet at least annually, if feasible, to review information and issues pertaining to the PMP. The SMP Committee may also convene when NDA determines that such a meeting is appropriate.

It is beyond the scope of this SMP to detail every agency, organization, statute, or program that might affect pesticides and water quality, or be affected by PMP activities. However, brief descriptions of the core SMP agencies are provided below, along with web links for more information, if available. Additional agencies, groups, and individuals will undoubtedly be solicited for involvement and are listed, as well, for reference.

SMP Core Agencies

Natural Resources Districts *(NRDs)*

Nebraska is divided into 23 NRDs, the boundaries of which approximate the major river basins in the state. A map of NRDs is provided in Appendix B. NRDs are financed primarily through local property taxes and are governed by a locally elected Board of Directors.

Nebraska's NRDs have been in the forefront of conservation since 1972, and contribute significantly to the prudent management and protection of the state's water and soil resources. NRDs have statutory responsibilities in the areas of: (1) soil conservation; (2) flood control; (3) development and conservation of water resources; (4) nonpoint source pollution control; (5) development and management of fish, wildlife, and recreational facilities; and (6) forestry and range management. In addition, NRDs have established very successful educational and outreach programs.

NRDs are authorized to conduct and administer these programs in Neb. Rev. Stat. §§2-3203, with additional responsibilities described under Statutes Relating to the Natural Resources Commission (Neb. Rev. Stat. §§2-1501), the Conservation Corporation Act (Neb. Rev. Stat. §§2-4201), and the Instream Flow Statutes (Neb. Rev. Stat. §§46-2,107 to 46-2,119).

Of primary interest to the protection of Nebraska's water resources are the following statutes and responsibilities (all of Nebraska's Statutes can be accessed on-line):

- Ground Water Management and Protection Act (GWM&PA) (Neb. Rev. Stat. §§46-701 to 46-754). This requires NRDs to develop ground water management plans (GWMP) for addressing potential nonpoint source pollutants. Ground water management areas for ground water quality can also be designated under the act, and implement Ground Water Management Area (GWMA) controls, including soil and water testing, education, and mandatory BMPs for water quality protection, among others. BMPs are defined in the act as 'schedules of activities, maintenance procedures, and other management

practices utilized to prevent or reduce future contamination of ground water which may include irrigation scheduling, proper timing of fertilizer and pesticide application, and other fertilizer and pesticide management programs.
- Erosion and Sediment Control Act (Neb. Rev. Stat. §§2-4601 to 2-4613)
- Nebraska Chemigation Act (Neb. Rev. Stat. §§46-1101 to 46-1148)

Nebraska Department of Agriculture *(NDA)*

NDA serves as the lead agency in the administration of FIFRA in Nebraska and derives its authority from the Nebraska Pesticide Act (Neb. Rev. Stat. §§2-2622 through 2-2659). Within NDA, the Pesticide Program bears specific responsibility relative to water quality and pesticides.

Under the Nebraska Pesticide Act, the Pesticide Program regulates the use, sale, and distribution of pesticides in Nebraska. Included among these responsibilities are:

- Registration of pesticide products;
- Licensing and certification of private, non-commercial, and commercial pesticide applicators;
- Licensing of pesticide dealers;
- Licensing of aerial pesticide businesses;
- Inspection of pesticide producing establishments;
- Inspection of retail outlets;
- Investigation of pesticide usage and reports of alleged pesticide misuse; and
- Establishing State-Limited-Use (SLU) pesticides.

The intent of the Nebraska Pesticide Act is for these activities to be carried out for the protection of human health and the environment, and the development of this SMP and subsequent PMPs for water quality are specifically listed among these duties in the Act. If warranted, state limited-use (SLU) designation allows NDA to develop specific use regulations, including licensing requirements, timing of application, geographic restrictions, and other conditions of use. The Act stipulates that in order for a SLU pesticide to be designated, a public hearing must be held to adopt and promulgate rules and regulations for the entire state or for a designated area within the state. A state limited-use pesticide, according to the Act, will be designated as such when:

- NDA determines that the pesticide, when used in accordance with its directions for use, warnings, and cautions and for uses for which it is registered, may, without additional regulatory restrictions, cause unreasonable adverse effects on humans or the environment, including injury to the applicator or other persons because of acute dermal or inhalation toxicity of the pesticides.
- The water quality standards set by NDEQ or the NDHHS, pursuant to this section are exceeded.
- NDA determines that the pesticide requires additional restrictions to meet the requirements of the Pesticide Act, the federal act, or any plan adopted under the Pesticide Act or the Federal Act.

See the Nebraska Pesticide Act and Regulations online for additional information.

Nebraska Department of Environmental Quality *(NDEQ)*

NDEQ is the State agency having primary responsibility relative to environmental protection in Nebraska. As such, the agency administers programs associated with the federal Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental, Response; Compensation and Liabilities Act (CERCLA); the Clean Water Act (CWA); and others. NDEQ works closely with numerous federal, state, and local agencies on a variety of programs and special projects related to water protection and, ultimately, to the successful implementation of any PMP. NDEQ receives its authorities to administer these programs from the Nebraska Environmental Protection Act (Neb. Rev. Stat. §§81-1501 to 81-1532), the Nebraska Groundwater Management and Protection Act (Neb. Rev. Stat. §§46-701 to 46-754), the Wellhead Protection Area Act (Neb. Rev. Stat. §§46-1501 to 46-1509), the Nebraska Chemigation Act (Neb. Rev. Stat. §§46-1101 to 46-1148), and others. Some of NDEQ programs or activities related to pesticides and water quality protection include the following:

- Ground water Management Area Program
- Chemigation Program
- Underground Injection Control (for subsurface chemigation)
- Hazardous Wastes
- Wellhead Protection Program (WHP)
- Ground water Classification and Standards
- Ground water Remediation
- Agricultural Chemical Secondary Containment
- National Pollution Discharge Elimination System (NPDES) permitting program
- Wastewater Operator Certification Program
- Surface Water Monitoring and Assessment Programs
- Surface Water Quality Standards
- Nonpoint Source Management Program

Nebraska Department of Health and Human Services *(NDHHS)*

The Environmental Health Unit of NDHHS is the agency responsible for enforcing the federal SDWA and receives its statutory authorities to undertake these activities from the Nebraska Safe Drinking Water Act (NSDWA); Neb. Rev. Stat. §§71-5301 to 71-5313). NDHHS administers programs intended to ensure that Nebraska's public drinking water supplies are suitable for human consumption. NDHHS responsibilities and regulatory authorities of particular relevance to PMP development and implementation include:

- Establishing drinking water standards to ensure that drinking water supplied to consumers is of a quality not harmful to human health. To ensure these standards are achieved, NDHHS requires monitoring of public water supplies for those materials which may be potentially harmful to human health. In assigning human health or MCLs, NDHHS makes use of scientific assessments of the materials' potential to cause adverse effects in human health.
- All public water supply systems are required to be permitted by NDHHS prior to operation, and NDHHS promulgates rules and regulations pertaining to the location, design, construction, alteration, and operation of public water supply systems. Permits granted to providers of public drinking water may be denied, revoked, or suspended for noncompliance with requirements set forth by NSDWA.

- Should contaminant levels exceed the MCL, NDHHS requires notification to those persons serviced by the drinking water system. In the event contaminants are discovered in a public drinking water supply at levels determined to be harmful or potentially harmful by NDHHS, NDA may require actions deemed necessary to address such an occurrence and ensure public safety.

NDHHS also oversees the Water Well Standards and Contractors' Practice Act (Neb. Rev. Stat. §§46-1201 to 46-1241), which provides for the protection of ground water through the licensing and regulation of water well contractors, pump installation contractors, water well drilling supervisors, pump installation supervisors, water well monitoring technicians, and natural resources ground water technicians. In addition, this provides for proper placement, construction, and decommissioning of water wells, and provides data on potential water supplies through well logs which promotes the economic and efficient utilization and management of water resources.

Nebraska Department of Natural Resources *(NDNR)*

NDNR administers a number of programs of significance to water and resource planning and management. NDNR receives its statutory authority to administer these programs from Neb. Rev. Stat. §§61-205, Neb. Rev. Stat. §§2-1501, the GWM&PA (Neb. Rev. Stat. §§46-701), and has additional authorities under the Erosion and Sediment Control Act (Neb. Rev. Stat. §§2-4601), Instream Flow Statutes (Neb. Rev. Stat. §§46-2,107 to 46-2,119), and Flood Plain Management Statutes (Neb. Rev. Stat. §§31, Article 1001).

Under these authorities, NDNR conducts water planning and water resources funding with additional responsibilities in soil and water conservation planning, flood plain management, integrated water management, and administration of the Natural Resources Data Bank – a primary source of information regarding Nebraska's resources, including soil surveys, well locations, geology, and other spatial databases, etc.

NDNR serves as a facilitator in coordinating cooperation between local, state, and federal agencies in planning, developing, and promoting the implementation of a comprehensive program of resource development, conservation, and utilization for Nebraska soil and water resources. The agency administers various soil and water resources development and management funds, including: the Soil and Water Conservation Fund (a cost-sharing program for conservation practices), Small Watersheds Flood Control Fund, Natural Resources Water Quality Fund, Water Well Decommissioning Fund, Interrelated Water Management Plan Program Fund, and the Resources Development Fund.

NDNR also administers laws relating to surface water use (quantity) in Nebraska. NDNR is responsible for the issuance of rights for the use of water in natural streams, and regulation of use in accordance with the water rights system. NDNR's duties also include reviewing proposed stream diversions, dam and reservoir proposals, measuring stream flows, canal diversions, pumping of streams, and carrying out agreements on interstate streams.

NDNR has a variety of responsibilities and authorities relative to the regulation of ground water. Some responsibilities of NDNR in the area of ground water are as follows:

- Registration of all water wells within Nebraska.

- Issue permits for the pumping of ground water for irrigation purposes for wells located within 50 feet of the bank of a stream channel.
- Grant and administer permits to public water suppliers to locate, develop, and maintain ground water in the area to be served and to continue existing use of ground water and the transportation of ground water into the area served.
- Regulate well spacing to help minimize the effects ground water pumping may have on adjacent water users.
- GWM&PA provides the mechanisms for establishment of ground water management, fully appropriated, and over-appropriated areas.

NDNR, in consultation with other agencies, reviews and approves ground water and integrated management plans developed by NRDs. NDNR designates fully appropriated or over-appropriated areas, and, in conjunction with NRDs, adopts management plans for such areas.

Other Agencies, Groups, and Individuals
(Which may be consulted during PMP development)

University of Nebraska-Lincoln (UNL) *http://snr.unl.edu/, http://water.unl.edu/, http://bse.unl.edu/, http://agronomy.unl.edu/*, and *UNMC College of Public Health*

The education and research emphasis of the Cooperative Extension Service, UNL School of Natural Resources, UNMC Department of Environmental, Agricultural and Occupational Health, State Experiment Stations, Water Center, Biological Systems Engineering, Agronomy/Horticulture, and other University programs will be critical to PMPs. UNL's specific areas of emphasis relative to the PMP are in the areas of educational assistance to water and pesticide users, researching and promoting the use of pesticide and agricultural BMPs, research in water quality and water use efficiency, and providing natural resource information.

USDA Natural Resource Conservation Service *(NRCS)*

NRCS has a great deal of experience with providing technical assistance to farmers in the area of soil and water conservation. They prepare farm conservation plans containing BMPs with recognized standards for implementation and maintenance, and can provide assistance in the areas of conservation and pest management BMP implementation. A number of programs administered by NRCS may relate to pesticides and water quality issues.

USDA National Agricultural Statistics Service *(NASS)*

The USDA NASS compiles and distributes information valuable to the PMP process. NASS collects and distributes information on state agricultural statistics concerning crop and livestock production, supplies, markets, prices, pesticide usage, and other related statistics. The forecasts and estimates are based on sample surveys of farmers, ranchers, and agri-business firms.

U.S. Geological Survey *(USGS)*
http://ne.water.usgs.gov, http://water.usgs.gov/coop/, http://toxics.usgs.gov/, http://water.usgs.gov/nawqa/, http://water.usgs.gov/nasqan/, http://waterdata.usgs.gov/nwis

USGS has a number of programs dealing with water and water quality, including the Cooperative Water Program, the National Toxics Program, the National Water-Quality Assessment Program (NAWQA), and the National Stream Quality Accounting Network (NASQAN). USGS water-quality data is publically available through the National Water Information System (NWIS). The USGS Nebraska Water Science Center partners with other Federal and state agencies, Natural Resources Districts, counties, municipalities, and tribal nations on water-quality projects in Nebraska.

USGS also works cooperatively with a number of agencies gathering data for specific projects.

U.S. Environmental Protection Agency *(USEPA)*

USEPA is charged with protecting the nation's environment, including ground and surface water. Many of USEPA's programs are directly related to protection of water resources, including Pesticides and Ground water Strategy, CWA, Non-Point Source Program, Wellhead Protection Program, Public Water System Supervision Program, National Pollutant Discharge Elimination System (NPDES) Program, Underground Injection Control, and National Environmental Policy Act. Many of the responsibilities have been delegated to states having state authority in these areas.

USDA Farm Service Agency *(FSA)*

FSA strives to equitably serve all farmers, ranchers, and agricultural partners through the delivery of effective, efficient agricultural programs for all Americans. These programs can be divided into various categories, including commodity operations, conservation programs, disaster assistance, energy programs, and aerial photography.

U.S. Fish and Wildlife Service *(USFWS)*

USFWS is given authority over fish, wildlife, and their supporting ecosystems, and its programs are conducted by its research centers, and laboratory and field operations. The USFWS Environmental Contaminants program includes research, field appraisals and recommendations to identify, evaluate, predict, and avoid or lessen effects of environmental contaminants on fish, wildlife, and their supporting ecosystems. Other responsibilities include oversight of USFWS-sponsored pesticide uses. In addition, USFWS oversees the Endangered Species Act, and works with USEPA to determine potential effects on endangered species and develop measures to reduce these effects.

Nebraska Game & Parks Commission *(NGPC)*

NGPC operates the Nebraska Natural Heritage Program, which collects information on the status, distribution and ecology of natural communities and rare, threatened, and endangered species in Nebraska and analyzes and manages this information using standardized methods. NGPC also provides recommendations on pesticide applications requiring an NPDES permit. In addition, NGPC manages many recreational and wildlife lands which may require the use of pesticides for controlling pests in cropland, rangeland, and water. NGPC also conducts research and monitoring of sites that may provide data which can be used by NDEQ, NDA and others to assist in assessment and management decisions for surface water.

Pesticide Manufacturers/Registrants

The manufacturers and/or registrants of pesticides possess knowledge of pesticide characteristics that will be helpful in the development of a pesticide-specific PMP. Many registrants have been proactive in activities to better inform their customers and the public of the proper methods to use pesticides and protect water quality. The degree to which registrants contribute to PMP development and/or implementation will be dependent upon their respective abilities and interest to do so. Pesticide registrants also have a vested business interest in how the State of Nebraska regulates their marketable products; therefore, they understandably will have a significant interest in providing support to NDA. Some of the expertise and/or resources of the manufacturers/registrants may include the following:

- Technical Support – Providing or reviewing monitoring data; reviewing proposed water quality research, reports, quality assurance project plans, and monitoring site plans; identifying environmentally sensitive areas; providing methodology for sample analysis of the pesticide in instances where information is presently not available; and providing advice concerning sampling methodologies.
- Information Dissemination – Providing a listing of registrant-produced educational materials and a description of the distribution system for these materials; review a proposed PMP and commenting on how a registrant's educational materials could be used; producing informational PMP brochures for pesticide dealers, commercial and private pesticide applicators; and providing water quality training to registrant personnel (sales, distribution, etc.) to enhance their ability to serve as information resources on specific requirements.
- Financial Assistance – Providing a listing of all registrant-supported water quality research, demonstration, prevention, and abatement activities within the state (including matching funds allocated to State and Federal projects and programs); identifying how registrant funding could help support long- and short-term PMP monitoring, prevention, and response activities with partnering agencies; evaluating how they may cooperate and provide support to grower groups, universities, private consultants, and others for PMP administration and enhancement; and assist in assessing the economic benefit of allowing the continued use of a product.
- Logistical Data – Providing a map of the active ingredient’s primary distribution within the state and a list of those distributors.
- Response to Detections – Providing technical support to NDA, NDEQ, or NDHHS in response to detections at or above an established water quality trigger within a pesticide-specific PMP.
- Public Participation – Providing a spokesperson at designated public hearings or work group meetings.

Agricultural Associations & Advocacy Groups

Agricultural associations and advocacy groups are in an excellent position to relate perspectives on the use of specific pesticides. Examples of organization in this category include, but are not limited to, the Nebraska Corn Growers Association, Nebraska Soybean Association, Nebraska Sorghum Producers Association, and Nebraska Wheat Growers Association. These organizations can provide a variety of useful information ranging from practical BMP methods to economic realities of reduced use of a specific pesticide. This information will prove important in the development of reasonable prevention actions. By providing information on a

pesticide-specific PMP, they can foster information dissemination, public awareness, and public participation.

Environmental & Conservation Advocacy Groups

Environmental and conservation groups are involved in a wide variety of environmental activities. In this respect, they may contribute to the PMP process by providing various perspectives related to PMP development and implementation. They may also provide useful opportunities to relate issues concerning PMP implementation to the public. Examples of organizations in this category that may potentially be involved include, but are not limited to, the Nebraska Wildlife Federation, Pheasants Forever, Rainwater Basin Joint Venture, and the Nature Conservancy.

Personnel

Although state universities and other governmental agencies (i.e., NRDs, NDEQ, and UNL-CES) have lead roles, NDA may call upon other state and local governmental agencies for assistance, when appropriate. Private individuals, businesses, and associations may also be asked to provide assistance in undertaking preventative programs and determining proper solutions to problems. Agricultural industry, grower associations, and farmer organizations will be asked to play an active role in problem solution and grower outreach. Notification of these organizations will occur through the processes and mechanisms defined in Component 8 of this Plan. The following table lists general activities likely needed for pesticide-specific PMP development, the component which describes these activities in this document, as well as the organization or agency that may be involved or asked for assistance.

SMP Tasks	SMP Component	Primary Entity(s)
Water Quality Monitoring and Sample Analysis	4	NRDs, NDEQ, NDHHS, UNL-WC, USGS, registrants, NGPC, NDA, USEPA
Site Investigations and Inspections	3, 6, 7	NDA, NDEQ, NRDs
Vulnerability Assessments	3	NRDs, NDNR, NDA, NDEQ, UNL, USGS, NDHHS, registrant
Applicator Training and Certification	2, 5, 8	UNL-PSEP, UNL-CES, NDA, NDEQ, NRDs
General Pesticide Education	2, 5, 8	UNL-CES, registrant
Pesticide Enforcement	2, 6, 7	NDA, NDEQ, NRDs, USEPA
Require Remediation of Spills	2, 6, 7	NDEQ
Secondary Containment & Load-out Facilities	2, 5, 7	NDEQ, NDA, USEPA
GIS support	3	NDNR, NDEQ, UNL, NRDs
BMP Development & Technical Assistance	5, 8	NRCS, NRDs, UNL-CES, UNL-BSE, registrant

Fiscal

Nebraska PMP development and implementation activities may be financed through a combination of State general funds (taxes), fee collections, and federal/state grant awards. Nebraska agencies submit budgets to fund their physical and operational costs on a biennial basis to the State Fiscal Office. These funding requests are then reviewed and revised by the

Governor and submitted to the Legislature. Frequently, State revenues are matched in various ways with federal appropriations in order to develop, implement, and operate programs to achieve common objectives. While NDA's pesticide program currently uses no state general funds, other agencies do. It would be up to any particular agency to decide for itself how to fund their portion of the PMP development.

As needs or areas of concern are identified, inquiries will be made to many of the other stakeholders listed above as to what technical, financial, or other assistance they may be able to contribute to PMP development and/or implementation.

Cost Estimates

At current funding levels, sufficient state and federal funding should be available to implement provisions of this SMP. A more thorough survey of the resources available and those needed for successful implementation may be needed if/when a PMP is developed.

COMPONENT 3: RESOURCE ASSESSMENT AND PLANNING

Based on recommendations from the SMP Committee that a PMP may be needed, NDA may conduct an evaluation of the pesticide's value to the State of Nebraska. In order to assess the importance of the product, Nebraska may initiate a study which examines the extent of the pesticide's use, its financial contribution to the overall economy of the state, the availability of more environmentally sound replacement products, and the impact to the state's economy, if the use of the pesticide was shifted to alternative compounds or pest control methods.

This assessment process should recognize there may be environmental and health costs associated with any decision affecting a pesticide's use. Placing further restrictions on a pesticide's use may result in a shift to other pesticides or an increased dependence upon other alternative pest control practices. These alternative pesticides and non-pesticide controls may have associated risks to the environment and human health.

In the event the economic costs associated with PMP development and implementation exceed the economic value of the pesticide, NDA will evaluate the regulatory options which are outlined in Component 5: Regulatory Activities, and Component 7, Enforcement Mechanisms. PMPs will be developed for those pesticides which are found to provide an economic, health, or environmental benefit to the state and for which measures are available to provide for its continued safe use.

Vulnerability Assessments

The decision to develop a pesticide-specific PMP will require a review of a variety of information critical to any regulatory or non-regulatory, decision-making process. This may range from examining existing data and evaluating models based on available information, to initiating additional scientific studies to increase the knowledge base. The information described below will be examined as part of a comprehensive decision-making process regarding water quality vulnerability. This process is fundamental to the PMP in that it will establish the foundation for determining local water vulnerability, and is key to identifying an appropriate course of action.

Pesticide Use

Estimates of pesticide use for commonly used agricultural active ingredients within the state are available periodically from NASS. Additional estimates of a pesticide's distribution of use may be available from the registrant(s), including the location of pesticide dealers distributing the product and quantity of the product provided. The Nebraska Pesticide Act requires pesticide dealers to maintain records of all sales of restricted-use pesticides (RUPs). It further requires applicators of RUPs to maintain records of where, when, and at what rate the pesticide was applied. In the event detailed information regarding a pesticide's use within a given area is required, NDA may require, through revised regulations, the reporting of such records by the pesticide dealers and/or applicators. A review of such information may reveal that certain pesticides are not used in a given region of the state. Areas of the state where the pesticide of concern is not used may be eliminated from review, allowing resources to be focused to other, more critical regions.

A summary of Nebraska's statewide pesticide use, compiled from NASS data for 1993-2007, has been posted on NDA's web site. Trends of use for certain pesticide active ingredients are fairly dramatic while others show little to no trend. These data represent only a small subset of all active ingredients registered in the state, and are estimates of agricultural uses only.

Pesticide Properties

Modeled and field research contributes to the understanding of how, and under what conditions, pesticides are likely to migrate through the soil profile or over the ground surface. A great deal of technical information is available regarding a pesticide's physical and chemical characteristics, which affect a given pesticide's potential to impact water resources, including persistence (or half-life), solubility, and adsorption (binding) ability. Any PMPAC will need to identify the most relevant and reliable models and data for predicting fate and transport of pesticides, and how they will be utilized in determining areas vulnerable to pesticide contamination.

Resource Vulnerability

Ground water vulnerability in Nebraska has been examined in the recent past by several entities. In basic terms, intrinsic ground water vulnerability is a function of soil properties (sand, silt, and clay composition, percent organic matter content, etc.), and depth to the water table. Other factors affecting ground water vulnerability include climate, soil moisture content, types of crops grown, field management practices, etc.

In an effort to further the assessment process in Nebraska, NDA contracted with the UNL Water Sciences Laboratory in 1994 for the compilation of existing monitoring data. This project was similar to one reported by Exner and Spalding (1990) in their atlas titled *Occurrence of Pesticides and Nitrates in Nebraska's Groundwater*. This publication summarized the monitoring data of a variety of governmental agencies and institutions and provides a useful assessment on the occurrence of pesticides in ground water prior to 1990. The 1994 assessment of monitoring data, *Assessment of Pesticide Occurrence in Nebraska Groundwater*, aided in defining existing and potential problem areas, as well as identifying data gaps.

Based on this analysis, NDA annually contracts with UNL to serve as a repository for ground water and pesticides data collected in Nebraska. UNL collects, reviews, summarizes and stores

pesticides data collected by various entities in Nebraska (e.g., USGS, UNL, NDEQ, NRDs, NDA, NDHHS, and others). This database, called the *Quality-Assessed Agrichemical Contaminant Database for Nebraska Groundwater* (UNL, 2000), is available to the public online at NDNR's web site. This resource has proven valuable to NDA, NDEQ, NRDs, and others in characterizing ground water vulnerability in many of the published and unpublished reports mentioned below, and will be used in determining if pesticide-specific PMPs are needed and to assist in the PMP process. Updates summarizing the pesticide data contained in the Agrichemical Database are also found at this web site.

NDA compiled pesticide ground water quality data into an unpublished report entitled *Groundwater Vulnerability Assessment & Pesticides in Groundwater Summary* (NDA 2001), which compares relative statewide ground water vulnerability to detections of four commonly used herbicides (alachlor, atrazine, metolachlor, and simazine; Figure 3). This report concluded that enough information existed to determine vulnerable areas to pesticides, but the water quality data may be lacking in the spatial and temporal extent needed to develop a PMP for these herbicides.

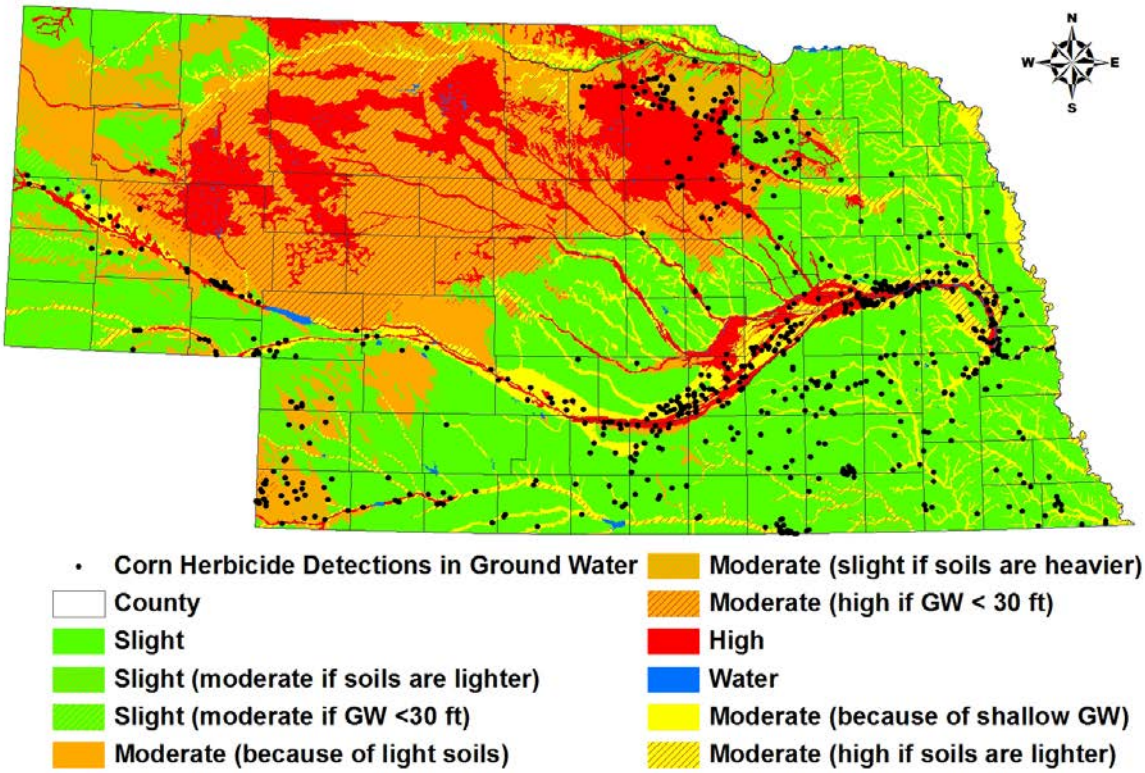


Figure 3. Historical detections of four corn herbicides in ground water compared to relative ground water vulnerability (alachlor, atrazine, metolachlor, and simazine). Data are from UNL Conservation & Survey Division (CSD) (1999) and UNL (2000).

NDEQ has reached similar conclusions with its pesticide assessments in the *Nebraska Groundwater Quality Monitoring Report* (NDEQ 2013, and earlier). Because of this, NDA, NDEQ, and the Nebraska Association of Resources Districts (NARD) have cooperated in a project attempting to fill these data gaps. Local NRDs have the resources to analyze water

samples for certain active ingredients using immunoassay analytical equipment. NRDs routinely collect ground water samples as part of their programs addressing nitrate contamination, and the immunoassay analysis project was seen as an extension of this effort that would have far reaching benefits. A "network" of wells will be sampled semi-frequently and analyzed for pesticides to better characterize ground water quality and hopefully, identify trends (Figure 4).

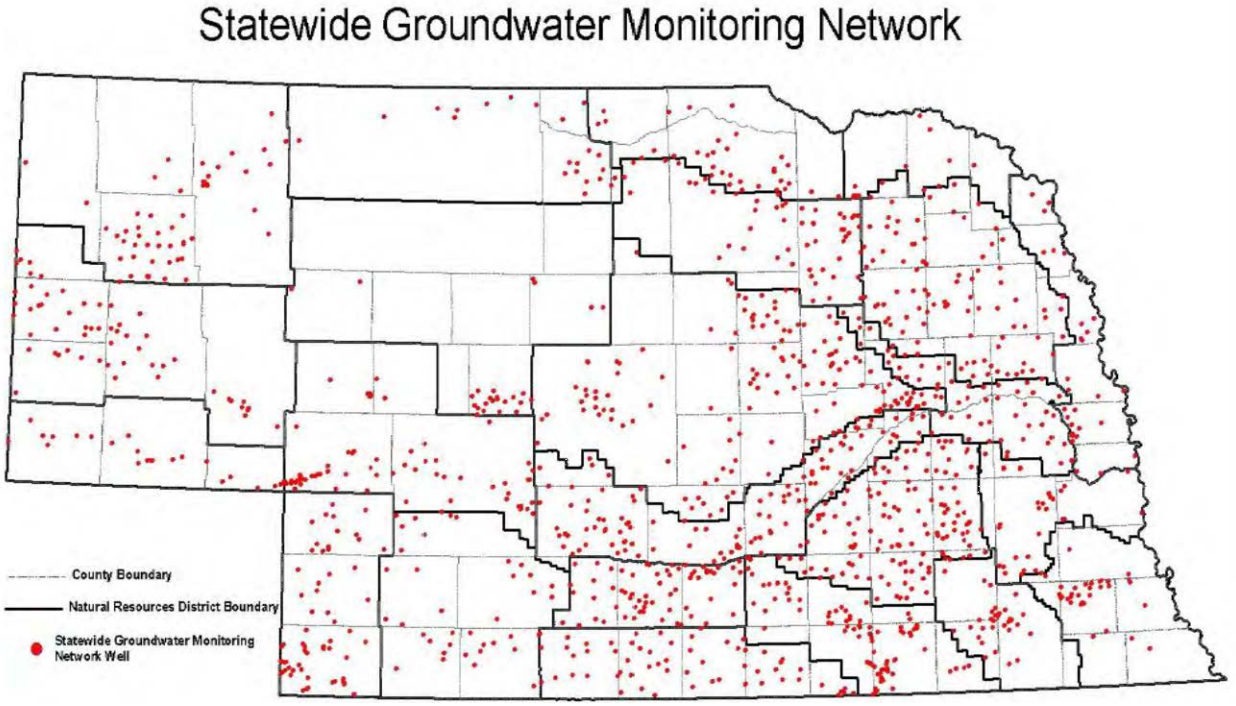


Figure 4. This monitoring network of ground water wells was established by NDEQ and NRDs to better assess agrichemical contaminants, including pesticides. (NDEQ, 2013)

Surface water vulnerability is also dependent on many of the same factors affecting pesticide movement to ground water, including pesticide properties, soil type, climate, soil moisture content, types of crops grown, field management practices, etc. Topography (field slope) also plays a major role. Surface water quality data for pesticides are not as readily or easily accessible; however, various agencies do monitor surface water for pesticides and report their results. Examples from NDEQ and USGS are described below.

NDEQ collects both ambient and targeted surface water quality samples in its monitoring and assessment programs (see Nebraska's Water Quality Monitoring Strategy 2009-2015 for an overview). Pesticides are analyzed using immunoassay methods for all of these programs, and include acetochlor, atrazine, and metolachlor. These monitoring data are used to document existing water quality conditions, assess the support of beneficial uses (such as aquatic life, recreation, and public drinking water supply), and prioritize water quality problems. More information on NDEQ's monitoring and assessment program results can be found online.

Figure 5 shows the waters in Nebraska that are classified as impaired by atrazine, a commonly used herbicide used for both grass and broadleaf weeds, mainly in corn and grain sorghum, and the only pesticide currently in use for which an impairment has been designated.

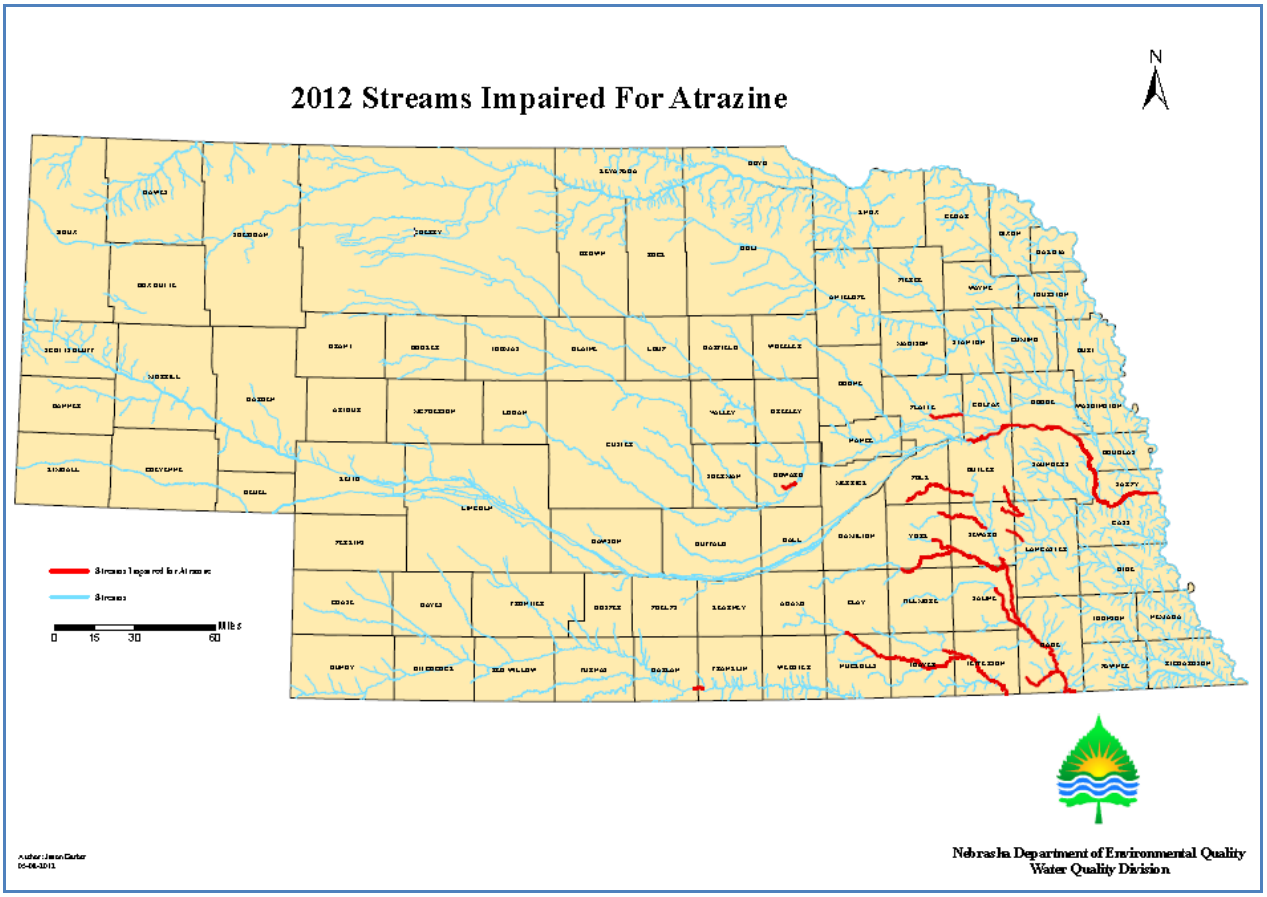


Figure 5. Water bodies determined by NDEQ's monitoring programs to be impaired by atrazine.

Water bodies which do not support their assigned beneficial uses, as described in the surface water quality standards, are classified as impaired. Impaired water bodies are added to a schedule for the development of a Total Maximum Daily Load (TMDL), a document which describes the estimated source(s) of the pollutant and the pollution control goals and strategies needed to meet water quality standards and remove the impairment. NDEQ reports biennially on the status of impairments and water quality trends, as well as TMDL development and watershed management activities in its Integrated Report (see 2014 Surface Water Quality Integrated Report).

USGS also collects surface water samples for pesticide analysis through several programs, the most notable of which is the National Water Quality Assessment Program (NAWQA). In Nebraska, this program assesses groundwater and streams in the South Platte and Central Nebraska basins, including the Lincoln metropolitan area, as well as groundwater in the High Plains Aquifer System Historical surface water quality data from NAWQA and other USGS programs, including ambient and site specific projects, are stored and available from the National Water Information System (NWIS).

As a condition of USEPA funding for a portion of NDA's Pesticide Program, NDA has completed "Pesticides of Interest" evaluations on approximately 57 active ingredients identified as having water quality concerns by state pesticide agencies across the country. These evaluations will

be formalized into a complete report, and will be available for consideration by the SMP Committee. For these evaluations, water quality data are compiled and compared with available water quality standards or reference concentrations to determine whether these pesticides of interest should become a “pesticide of concern”; that is, in need of additional consideration for applicator training, monitoring, etc. Mitigation activities and monitoring data will then be used to measure whether progress in reducing water quality concentrations has been made.

Should modeled data, resource mapping, or routine monitoring reveal an area to be particularly vulnerable to contamination, a more detailed evaluation of site-specific conditions may be initiated. Although various agencies or entities with responsibilities or interests relative to pesticides and water quality may initiate these activities at any time, the decision to undertake these actions for the purposes of supporting a PMP should be made, in conjunction with the PMPAC, in an effort to reduce duplicative efforts.

A more detailed assessment of a site or region's vulnerability could include one or more of the following:

- Review past monitoring data to determine current status of the resource and/or discern possible trends;
- Initiate targeted monitoring programs within the area to better define background conditions, delineate the magnitude and extent of potential problems, serve as an early warning system for future detections, etc.;
- Assess agronomic or pesticide management practices (crops grown, methods and rates of application, irrigation, etc.);
- Review of hydrologic studies;
- Examine site-specific soil conditions;
- Examine climatic data;
- Review the classification of the water resource under Title 117 and Title 118;
- Review current water use, well location, and well construction data;
- Assess non-agricultural pesticide use in the watershed (forests, lawns and golf courses, ornamentals, utilities and rights-of-way, roadsides, and structures);
- Evaluate pesticide user attitudes/opinions; and
- Review pesticide characteristics as they apply to the specific site or watershed.

The inter-relationship of these many parameters must be examined in order to better assess the potential impact of pesticides on water quality. A thorough examination of these variables is fundamental to any successful water resources protection effort and essential to supporting any proposed regulatory action.

All assessment and planning activities must be coordinated with other agencies to ensure efficient use of resources. When appropriate, sub-county assessments will be used to clearly define the extent of pesticide occurrence. These assessments will facilitate the targeting of needed mitigation actions to specific areas of concern.

SMP Evaluation

As part of the assessment process, this SMP and any subsequent pesticide-specific PMP will be revisited periodically to evaluate its sufficiency in achieving the goals explained in Component 1. In this respect, these plans are to be considered "living documents" and are capable of being adapted to changing circumstances and new information.

COMPONENT 4: MONITORING STRATEGY

Water quality monitoring plays an important role in evaluating and managing water resources by providing data for the identification, prevention, and abatement of pollution problems. Monitoring data serves to better define water quality trends and provides valuable insight into the success or failure of prevention or mitigation measures. Nebraska has a variety of pesticides and water monitoring programs already in place and several have been discussed above. This SMP will endeavor to make efficient use of these ongoing efforts wherever and whenever feasible. The monitoring strategy outlined here will serve to support the goals and objectives in Component 1 of this SMP and is tied explicitly to Component 3, which addresses assessment and planning.

Monitoring Goals

For the purposes of this SMP, monitoring shall include those activities intended to facilitate the efforts of environmental managers and decision makers in developing and implementing water protection policies and programs as they relate to pesticide use. Monitoring will be used in conjunction with chemical, physical, geological, biological, and other environmental data necessary for sound management decisions.

Specifically, an effective monitoring strategy will:

- Provide baseline data regarding the status of pesticides of interest in Nebraska water;
- Evaluate trends in the occurrence of PMP pesticides in water;
- Identify and evaluate water contamination problem areas as they pertain to pesticide use;
- Confirm detections;
- Measure the success of PMP prevention/mitigation efforts; and
- Afford sufficient flexibility to be easily adapted to changing circumstances and new information.

In Nebraska, a number of state, federal, and local agencies have initiated or continue to operate water monitoring programs which include pesticide sampling; several were mentioned in Component 3. Taken cumulatively, these efforts have resulted in the sampling of several thousand wells and surface water sites across Nebraska.

In support of the goals of the SMP, Nebraska will undertake the monitoring activities described in the following pages. Figure 6 provides a visual depiction of these activities, whether the SMP or PMPAC, or both, is/are responsible for it, and how they relate to one another.

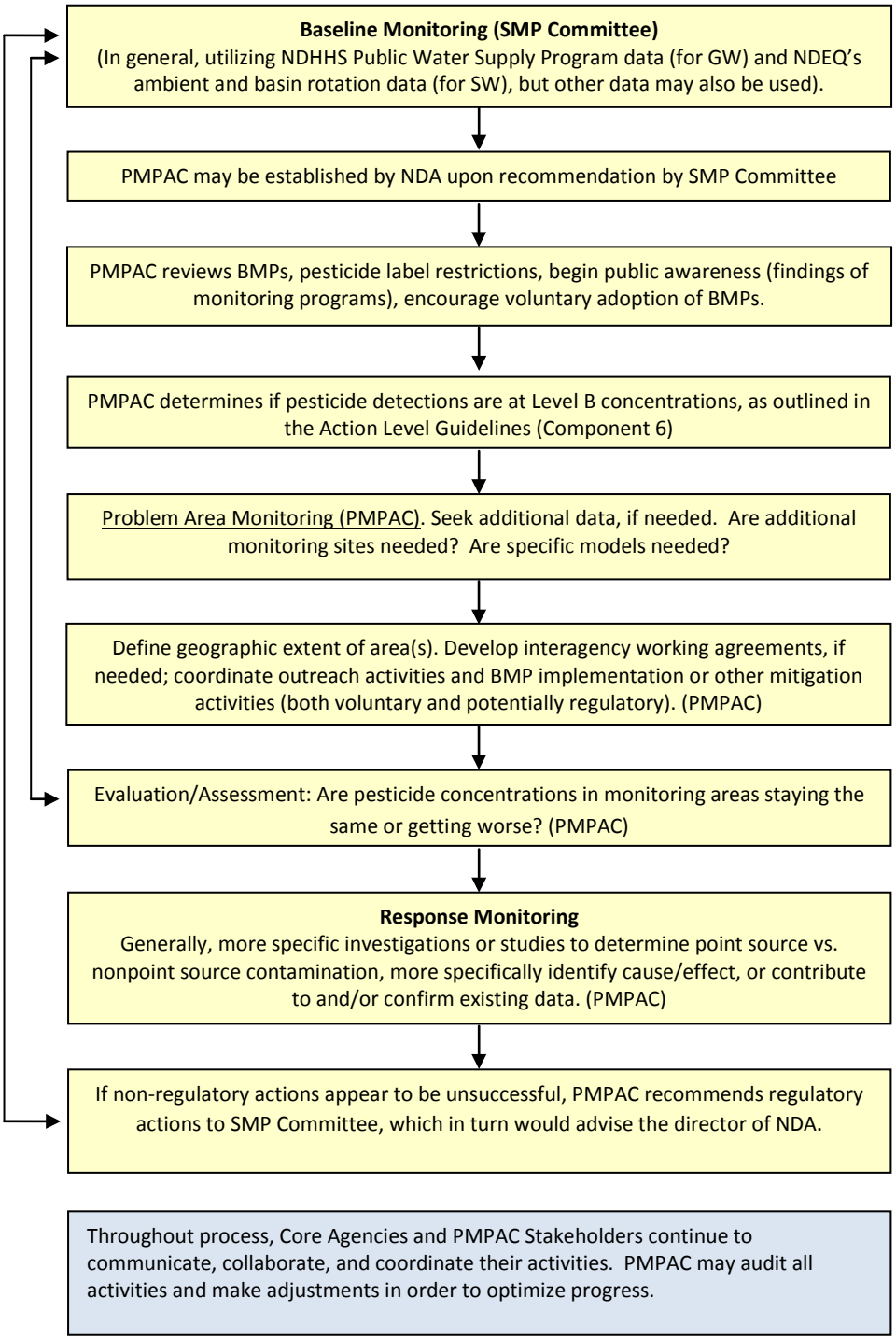


Figure 6. A generalized concept of SMP/PMPAC monitoring, prevention activities, response to detections, and the coordination needed between/among these activities (Components 4, 5, & 6).

Baseline Monitoring

Purpose/Objectives

Baseline monitoring will provide continuing data on the general occurrence of pesticides in Nebraska's water resources. Specifically, baseline monitoring will:

- Provide scientifically reliable estimates on the occurrence, concentration, and distribution of pesticides in water across Nebraska relative to the use, value, and vulnerability of these resources.
- Serve as an "early warning system" for pesticides in areas not currently experiencing pesticide detections at a frequency or level which merits problem area monitoring (see next section).
- Contribute data necessary for evaluation of PMP-initiated activities.

Scope of Ground Water Monitoring

Nebraska's baseline monitoring strategy for ground water will utilize data obtained through ongoing monitoring undertaken to satisfy the requirements established under the SDWA and conducted by NDHHS and local public water suppliers. These public water supplies include Community Water Systems and Non-Transient Non-Community (NTNC) systems, and represent Nebraska's most valued water in that they serve as the primary source of drinking water for most of Nebraska's residents (See ***NDHHS' Nebraska's Public Water Supply Program*** for a report of this program). This monitoring network consists of approximately 1,700 wells sampled for a number of pesticides and pesticide degradates, including compounds for which MCLs have been established. A map illustrating the geographic distribution of the municipal wells is provided in Figure 7.

Many municipal wells have been sited specifically to minimize potential contamination by agricultural chemicals and other contaminants. Frequently, however, these high-capacity wells will exhibit a sufficiently large radius of influence as to provide useful data on an area's overall ground water quality. Should a municipal well be determined to be incapable of providing useful information on the occurrence of pesticides in an area due to placement, construction, hydrogeology, etc., or a municipal well is simply unavailable, a suitable well will be selected or constructed to fill the resulting gap in coverage.

In addition to these data, the baseline strategy will utilize appropriate data from other entities with ground water responsibilities, as described above (e.g., NRDs, NDEQ, UNL, USGS, etc.).

Design of Ground Water Monitoring

All wells are sampled on a rotating basis with each well-being routinely sampled at least every third year, according to guidelines provided by NDHHS. Wells are sampled more frequently following a detection of a pesticide (quarterly), if the area is deemed vulnerable (at least annually), or other extenuating circumstances. Suppliers can request a sampling waiver for their system in certain situations, such as when no chemicals are used in the capture zone. In these cases, sampling may only be conducted every six years. Samples are analyzed in accordance with USEPA methodology by a laboratory operated by NDHHS. All sampling and analysis is done in accordance with an USEPA approved Quality Assurance/Quality Control (QA/QC) program.

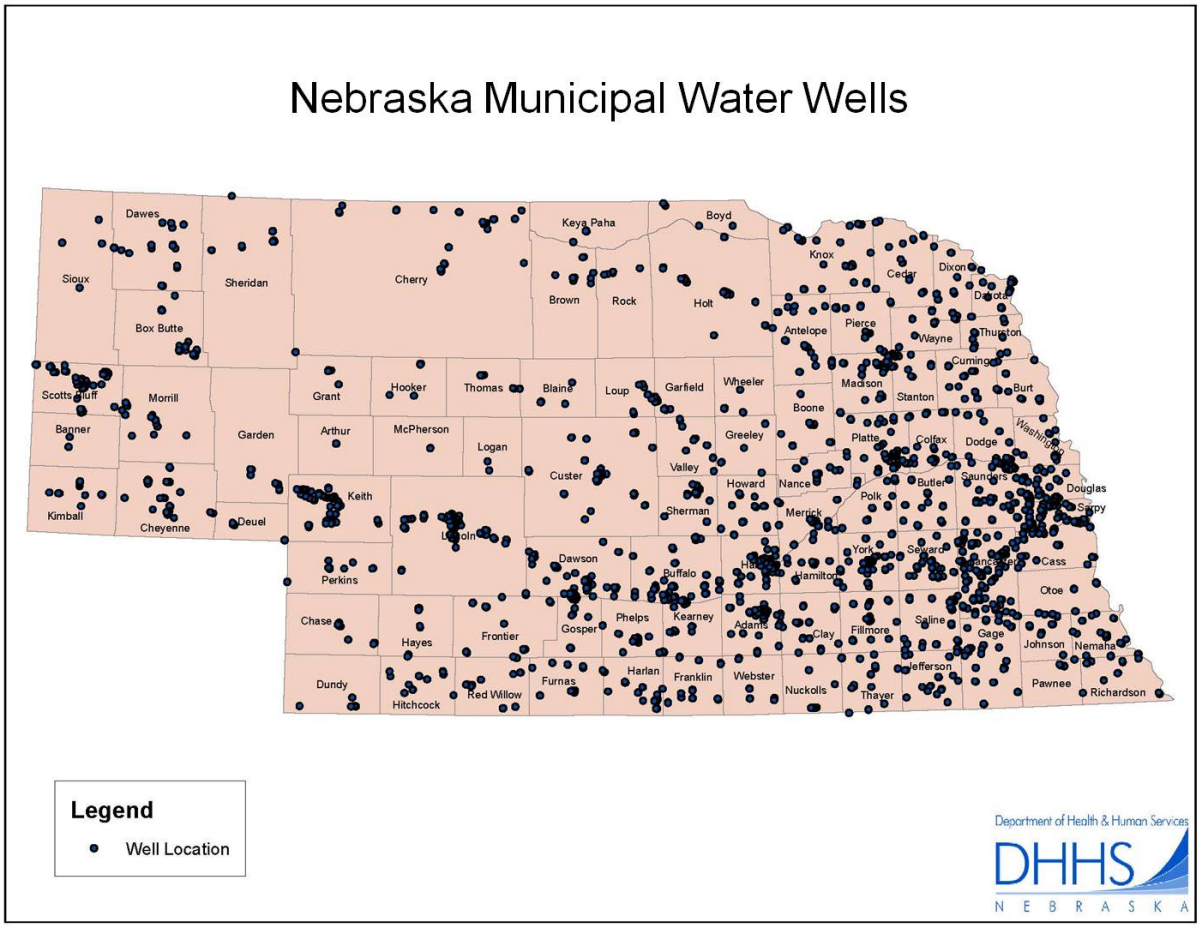


Figure 7. Geographic distribution of Nebraska's community water supply wells to be used as the main network for the baseline monitoring strategy for ground water.

Although municipal wells are defined formally as part of Nebraska's baseline monitoring strategy, data obtained through other monitoring efforts will also be utilized for this purpose. This may include, but is not limited to those monitoring studies undertaken by NDHHS, NDEQ, NRDs, USGS, and UNL for such purposes as local ground water management area designation, national water quality studies, localized research, etc. Frequently, these studies will make use of varying sampling and analytical protocols. When data obtained from these studies are to be included in the baseline database, sampling and analytical protocols will meet USEPA requirements. (See National Water Quality Monitoring Council 2006, USEPA 2011, and USEPA 2013)

Scope of Surface Water Monitoring

For surface water, water quality data collected, as part of NDEQ's ambient and basin rotation monitoring programs, will be used as a baseline (Figures 8 and 9).

Monitoring streams and impounded waters helps NDEQ determine what the current water quality is, as well as answer questions about whether the water is safe for people and/or livestock to consume, for recreation, for consumption of fish, drinking, and for industrial or

agricultural uses (that is, meeting its beneficial uses). This monitoring also helps NDEQ make assessments that are used for implementing watershed improvement programs, setting permit discharge limits, and to prepare the Integrated Report to the United States Environmental Protection Agency, as required by the federal CWA (sections 303(d) and 305(b)). NDEQ also uses the information to assess how effective its programs are in improving water quality.

Design of Surface Water Monitoring

Ambient stream monitoring is done at 97 fixed locations across the state on a monthly basis (Figure 8), while 30 to 35 lakes and reservoirs are also monitored monthly from May through September. Some of the monitoring sites are chosen to represent the water quality of basins with complex combinations of potential sources of pollution. Other sites are at the outlets of basins where conditions are fairly uniform, while still others are in streams with the most strict water quality standards for aquatic life (see the discussion in the previous component, Assessment and Planning). NDEQ monitors for several different water quality parameters to be able to assess stream and lake water quality. Monthly samples are collected at all sites for ammonia, chloride, nitrate-nitrite, total nitrogen, total phosphorus, and total suspended solids. Quarterly samples for selenium and arsenic are collected at all sites, and for various other metals at sites representing watersheds with a complex mix of pollution sources for various metals. Of particular interest to NDA are spring and summer samples for herbicides which are collected at all stream and lake sites. This monitoring scheme uses an immunoassay method for acetochlor, atrazine, and metolachlor.

In addition to the schedule described above, NDEQ utilizes a basin rotation sampling scheme (Figure 9), where approximately 40-50 sites per year are sampled more frequently (usually weekly during what would be considered the pesticide use season). The immunoassay methods for acetochlor, atrazine, and metolachlor are also utilized for these samples.

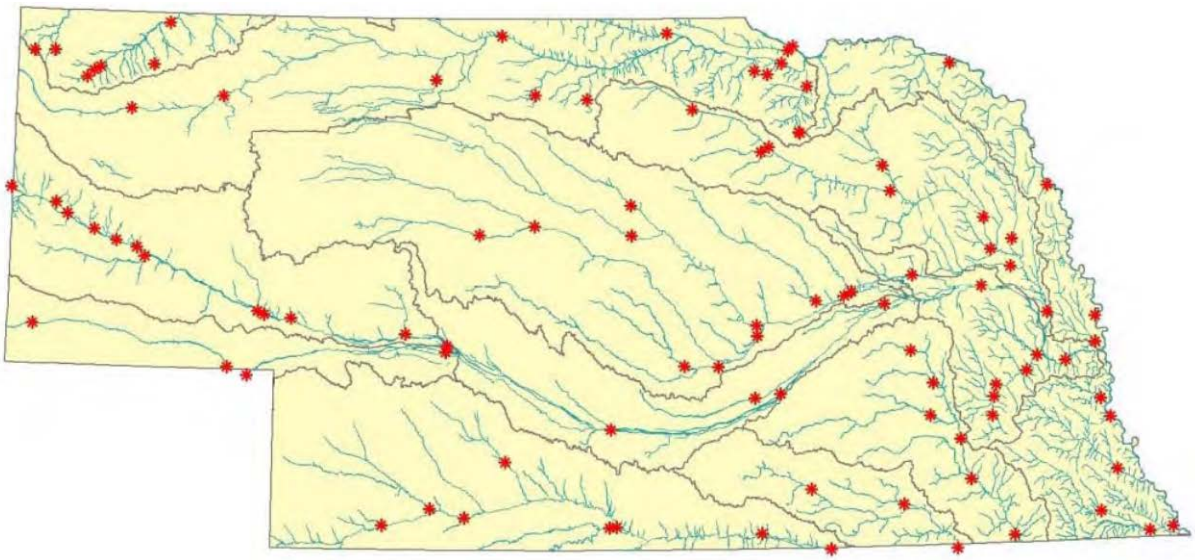


Figure 8. Locations of NDEQ ambient stream monitoring sites, which are sampled monthly throughout the year.

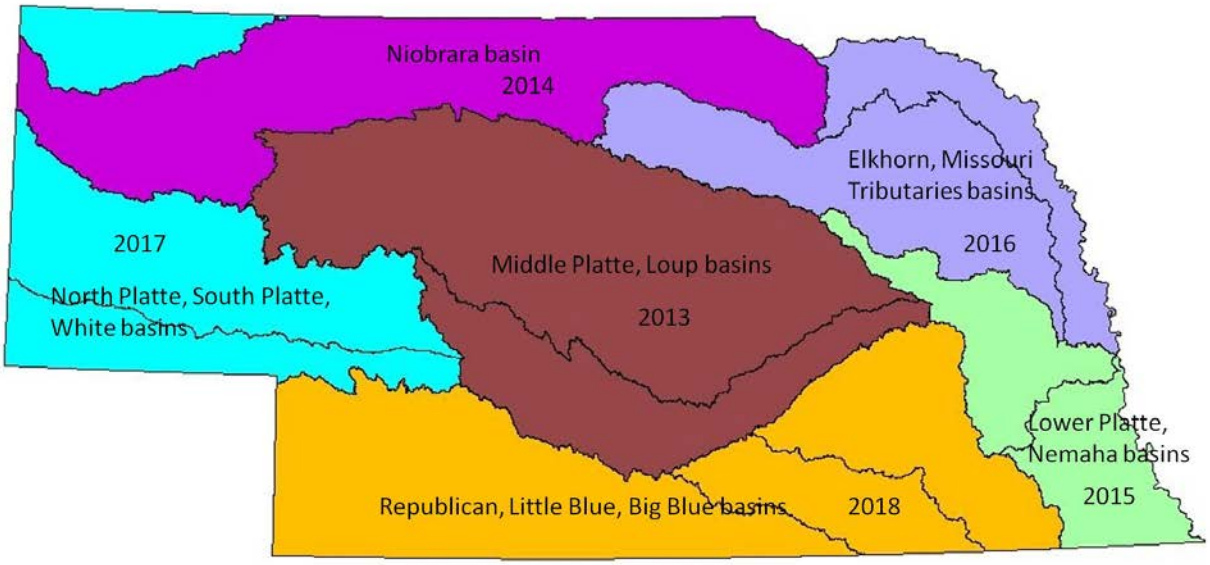


Figure 9. Schedule for NDEQ's six-year basin rotation monitoring program. Sites are sampled weekly throughout the use season, generally April through September.

NDA will also periodically review the USGS NWIS database for these and other pesticides of interest to determine if increasing concentration trends or potential concerns are occurring.

Water quality data collected by any resource agency may be used for baseline monitoring, however. While sampling techniques and analysis will vary slightly, all monitoring activities, for this purpose, should be conducted through a NDEQ-approved or equivalent Quality Assurance Project Plan (QAPP) using USEPA-approved pesticide analytical methods (see National Water Quality Monitoring Council 2006, USEPA 2011, and USEPA 2013).

Problem Area Monitoring

Purpose/Objectives

Problem area monitoring will provide data regarding the occurrence of pesticides in sufficient detail to facilitate management decisions affecting pesticides and their use within a given area of concern. These management decisions, or "trigger levels" are identified in Component 6, Table 1, page 40.

Specifically, problem area monitoring will be undertaken to:

- Evaluate trends in baseline monitoring data for surface water and ground water; and
- Evaluate success of prevention and/or mitigation measures.

Scope

The scope of problem area monitoring efforts will be defined within the context of any subsequent pesticide-specific PMP. Factors which will contribute to the selection of problem area monitoring locations may include, but are not limited to:

- Evaluation of vulnerability data to include information generated from computer-based decision aids and or models;
- Agricultural management practices;
- NASS commodity and pesticide use surveys;
- Previous monitoring data;
- Pesticide physical and chemical characteristics; and
- Site specific information, such as hydrologic setting (i.e., depth to ground water and stream flow), soil type, topography, etc.

It should be noted that information obtained through any method described above, will not, by itself, be used to formulate a monitoring strategy or initiate a formal response. The above list is intended to provide insights into the types of activities likely to be employed during the decision making process.

Existing monitoring efforts in problem areas will be evaluated for completeness and adequacy relative to the PMP. Whenever possible, existing monitoring programs will be utilized to satisfy monitoring requirements within a given problem area. These monitoring programs could include those undertaken by NDHHS, NDEQ, NRDs, USGS, and UNL for such purposes as GWMA designation, Centers for Disease Control (CDC) studies, specific projects and research.

Should current monitoring efforts be determined as lacking to meet the goals of the PMP, NDA may, upon recommendation from the PMPAC, contact affected pesticide registrants to solicit input on the design of an effective monitoring strategy and to determine the registrant's ability to support the needed monitoring activities. If insufficient funds are available to support monitoring necessary to ensure safe use of a pesticide, NDA may designate the pesticide as a state-limited-use pesticide (SLU) and restrict its use within a given problem area. NDA will work closely with the PMPAC, pesticide registrants, commodity groups, and others during the process of designating a pesticide as an SLU pesticide.

Once a problem area(s) has been identified, NDA, together with the PMPAC, will do the following:

- Establish the general geographic area of concern;
- Evaluate existing monitoring data (e.g., NDH, NRD, NDEQ, USGS, UNL, etc.) for completeness and appropriateness;
- Evaluate the need for additional monitoring sites;
- Establish the number, location, and type (e.g., irrigation, municipal, domestic, or dedicated well; or grab, auto, or integrated sampler) of monitoring site to be used for that area; and
- Establish the general sampling schedule and parameters to be analyzed for all designated monitoring sites in the area.

NDA will seek to coordinate these activities with the appropriate agencies or groups to maximize the use of funding, expertise, and personnel.

Design

Ground water: All wells within a problem area network designated by the PMPAC will be sampled a minimum of once annually. Sampling will be timed in a manner most likely to capture concentrations of concern. More frequent sampling may be conducted based upon a variety of

parameters specific to the site and pesticide occurrence. These wells may be sampled by NRDs, NDEQ, NDA or their agents, and these efforts will be coordinated through the PMPAC. While sampling and analysis techniques may vary slightly, all sampling and analysis will be done in accordance with an appropriate QA/QC plan and with USEPA approved analytical methods.

Surface water: Problem area monitoring conducted by NDEQ will primarily pertain to priority areas within Nebraska's Nonpoint Source Management Program. These are areas where problems have been detected through ambient or routine monitoring programs. Problem areas may be targeted for detailed monitoring to determine source areas and loadings. This information is typically collected to facilitate a "project" to address watershed level concerns. However, water quality data may be collected by any resource agency. While sampling techniques and analysis will vary slightly, all monitoring activities will be conducted through a NDEQ approved or equivalent QAPP, and USEPA-approved pesticide analytical methods.

Response Monitoring

Purpose/Objectives

Response monitoring may be undertaken to investigate pesticide contamination events, to delineate the cause and extent of contamination, and to provide input for establishing mitigation measures or adapting preventive measures to changing circumstances. Specifically, response monitoring will:

- Confirm detections in baseline or problem area monitoring;
- Provide data necessary to estimate causal factors relating to pesticide detections;
- Contribute data which may initiate trigger mechanisms defined in Component 6; and
- Provide detailed information regarding the effects of prevention or mitigation efforts on local pesticide concentrations.

Scope

Response monitoring shall be initiated to evaluate site-specific parameters, such as soil type, land use, pesticide use, pesticide detections, etc. This analysis will be used to determine the source of the pesticide detection and contribute to formulating an appropriate response.

The actions outlined for problem area monitoring will continue in this phase. In addition, NDA, together with the PMPAC, will evaluate the ongoing monitoring and determine if additional or different monitoring is necessary.

Design

Ground water: Wells included within a designated response monitoring network will be sampled a minimum of once annually. More frequent sampling may be conducted based upon a variety of parameters specific to the site and pesticide occurrence. Response monitoring will be undertaken by NDEQ, NDA, NDHHS, NRDs or agents acting on their behalf. Samples will be obtained and analyzed in accordance with USEPA approved methods and QA/QC.

Given the significant importance of ensuring quality at all levels of monitoring, the PMPAC or their representatives will develop a well-defined set of minimum requirements for monitoring data within the context of pesticide-specific PMPs.

It is anticipated that ground water monitoring data from various agencies will also be able to meet the requirements of these three levels of monitoring. This being the case, wherever possible, cooperating agencies' monitoring data meeting PMP requirements will be used. Upon determination by the PMPAC that these monitoring activities are insufficient to meet a given area's needs, NDA will cooperate with the PMPAC to formulate a recommendation as to the most efficient approach to satisfy monitoring needs. NDA may initiate monitoring efforts to address insufficiencies after consultation with the PMPAC and a review of available resources. Monitoring activities which could be included are such items as training for sampling personnel, general and specialized analysis for various pesticides in water, or installation of dedicated monitoring wells or sites in appropriate locations.

Surface water: Response monitoring conducted by NDEQ will primarily pertain to complaint and spill investigations, or special or detailed studies identified as a priority through Nebraska's Nonpoint Source Management Program. Monitoring and assessment approaches for these sites will be determined on a case-by-case basis. Data needs and monitoring approaches will be based on the scope, extent, and geographical location of the problem. Water quality data may be collected by any resource agency, however. While sampling techniques and analysis will vary slightly, all monitoring activities should be conducted through a NDEQ-approved or equivalent QAPP using USEPA-approved analytical methods.

COMPONENT 5: PREVENTION ACTIVITIES

Remediation of pesticide contaminated ground water is costly and, in many instances, unrealistic. Pesticide contamination of surface water may be seen as being temporary because it is often being 'flushed' downstream. This view fails to take into account the probability that impacts are not temporary and problems to other users or ecological systems downstream are likely the result of behavior or management practices that are repeated. Clean-up costs and technological challenges make prevention of pesticide contamination the most effective and economical means of addressing water quality concerns. Prevention is, and will remain, an integral part of Nebraska's water resources protection efforts.

The State of Nebraska has numerous programs dedicated to the prevention of water contamination by pesticides. Preventative activities may include research, non-regulatory and/or regulatory programs. The success of either regulatory or non-regulatory approaches is ultimately dependent upon the acceptance and support by the pesticide user. As such, these programs will require close cooperation between industry, UNL-CES, and state, federal, and local agencies to ensure pesticide users receive consistent and accurate information regarding their responsibilities and contributions relative to a successful water resources protection program. A successful prevention strategy will also be one which provides a balance between economic considerations regarding any preventative strategy and the need to ensure adequate protection of our water resources.

Activities to prevent pesticide contamination of water include the following:

Research

Pesticide related research examines numerous issues important to prevention. Researchers evaluate pesticide fate and transport processes, water management practices, decision aids, IPM practices and other BMPs with potential for reducing pesticide inputs or aiding in reducing pesticide losses from the area of application. This research aids significantly in improving the understanding of how, where, when, and why pesticide contamination of water resources may occur and facilitates development of alternative activities useful for preventing or reducing future contamination.

Some of those most actively involved in pesticide or related research in Nebraska include UNL-Biological Systems Engineering and Department of Agronomy and Horticulture and Department and School of Natural Resources, NRDs, USGS, and USDA Agricultural Research Service.

Education

There are a variety of mechanisms available to educate the pesticide user and others on issues related to sound pesticide management. These activities may range from large mass media events for increasing awareness in general, to site-specific technical assistance programs that directly address pesticide use in relation to soil, cropping, and use patterns. Some of the educational opportunities currently available include the following:

- **Applicator Certification and Training.** NDA certification of commercial lawn care and structural pest control applicators, and all users of RUPs, is the cornerstone of Nebraska's efforts to educate pesticide users. Pesticide applicators are currently provided information on topics regarding environmental fate of pesticides, factors leading to water resource contamination, techniques to reduce the risks to water quality, etc. Certified applicators must demonstrate a fundamental understanding of pesticides and how to safely use these products. This understanding must include, among other things, how to read and comprehend a pesticide label, how to properly calculate rates and calibrate equipment, understand important pesticide characteristics and mode of action, etc. Training sessions for both commercial and private applicators are developed and coordinated through UNL's Pesticide Safety Education Program (UNL-PSEP) and UNL-CES. If pesticide-specific PMPs are implemented, pesticide training will be bolstered to the extent feasible, to address any additional needs. More information can be found at the UNL-PSEP web page.

  In addition, certification and training is required for the Chemigation Program, to protect the irrigation water source from contamination by fertilizer or pesticides. UNL-CES, along with NRDs, provides training for chemigators, and NRDs conduct inspections of the irrigation equipment.

- **Crop Production Clinics.** UNL-CES conducts eight to ten crop production clinics annually which are attended by crop producers, crop consultants, and commercial and private pesticide applicators, etc. These clinics typically provide information on pesticide and fertilizer management practices and, as such, serve to provide agriculturalists and others with valuable information on BMPs capable of reducing pesticide contamination of

surface and ground water. Management practices addressed include the use of biological pest controls, cultural pest practices, diverse crop rotations, IPM systems, alternative pesticide products, resistant crop varieties, etc. Crop production clinics will also provide an additional opportunity to educate large numbers of Nebraska farmers, and other agricultural professionals of PMPs that may be developed and implemented. Examples of the topics covered at these clinics can be found in the videos and proceedings available at the Crop Production Clinic web page. In addition, participants receive the current version of the UNL Extension publication, EC130 Guide for Weed Management (UNL-CES, 2013), which contains relative leaching and runoff potential ratings for herbicides, along with chapters covering many of the pesticide management topics mentioned above.

- **NRD Programs.** Nebraska's NRDs conduct or participate in numerous educational activities directed towards protection of the state's water resources. These programs range from classroom activities for school children to voluntary education on BMPs, and mandatory training and system requirements for chemigators, ground water management areas (for nitrogen), etc. NRDs have many successful programs intended to educate growers of proper irrigation management techniques, nitrogen management, and other agricultural practices which will have a beneficial effect on water quality. In recent situations involving small watersheds impacted with atrazine, the local NRD has been a key player in bringing together pesticide users to discuss the environmental impact of pesticide use on the watershed.

- **NRCS Pest Management Standard.** In conservation programs having specific geographic focus with a water quality concern, as well as statewide conservation programs involving USDA cost-share, the NRCS Pest Management Standard is required in the conservation plan. This standard identifies water quality as a resource consideration, and employs the Windows Pesticide Screening Tool as a means for preventing pesticide losses from individual fields. If the risk of off-site pesticide movement is “intermediate” or “high,” based on an evaluation of the soil-pesticide properties interaction, the operator is expected to mitigate these impacts by choosing appropriate BMPs. The BMPs are “scored” based on their relative risk reduction potential, and the number of BMPs needed is dependent on the initial risk potential of the evaluation.

- **Newsletters and Other Mailings.** UNL-CES distributes a number of statewide newsletters and bulletins throughout Nebraska. These include Crop Watch, for crop production, pest management, and conservation information. Additionally, UNL-CES produces and distributes *NebGuides* and other valuable outreach materials which address agricultural and nonagricultural pesticide uses and issues. UNL’s Pesticide Safety Education Program is also using web media, such as YouTube and blogs, to educate applicators. Individual county Extension offices may also produce periodic newsletters or blogs that are distributed to their constituents. NDA produces the Pesticide and Noxious Weed Newsletter twice annually, which goes to dealers, registrants, and commercial applicators, as well as other interested individuals and groups. NRDs also distribute newsletters and other educational materials which are capable of reaching numerous interests.

In addition to these newsletters, there are many agricultural associations which publish newsletters for their constituents. As PMPs are implemented, opportunities will be pursued to address specific commodity or user concerns through these associations' newsletters and direct mail pieces.

- **Talks to Civic and Growers Groups.** Other avenues of public education are presentations to civic and grower groups. State, local, and federal agencies routinely address growers, other agencies, environmental groups, etc. on a host of topics. These opportunities will be utilized to encourage discussion and communicate on issues important to PMP development and implementation.

- **Media Exposure.** News releases will be utilized to advise the public of PMP development, implementation, and requirements.

- **Web Pages.** NDA and UNL-PSEP pages will be utilized extensively to have PMP information available to pesticide users and the public. PMPAC member agencies and other partners will be encouraged to promote PMP activities and educational material on their web sites, as well.

Regulatory Prevention Measures

In some instances, education and voluntary programs may be insufficient to prevent water from becoming contaminated. In these situations, regulatory controls will be considered. NRDs, NDEQ and NDA have the ability to implement a variety of control options intended to protect water quality. These options were described in Component 2 of this document and include designation of a GWMA by NDEQ and NRDs, and restrictions on pesticide application methods, timing, rate and other conditions of pesticide use as determined by NDA.

Regulatory prevention activities currently include, among other activities: NRD irrigation water management, enforcement of pesticide label requirements by NDA, NRD and NDEQ enforcement of activities related to chemigation such as training, permitting, installation of back siphon prevention devices, etc., and NDEQ enforcement of Nebraska's rules and regulations related to the secondary containment of pesticides.

Tiered Approach

Following discovery of water contamination by pesticides, appropriate actions will be taken, and may include voluntary and/or mandatory measures. Voluntary steps may be utilized when there is a potential for continued contamination or when concentrations are below an identified threshold level (see Component 6). Mandatory measures may be implemented in the event there is an increasing trend in pesticide concentrations which approaches or exceeds a drinking water standard, ALS, or reference concentration. Following are examples of activities which may be included as a part of a voluntary or regulatory activity:

Voluntary Measures

- Educational programs including regionally targeted UNL Pesticide Safety Education Program training addressing identified pesticide contaminants and management practices for reducing water contamination;

- Development, promotion, and adoption of voluntary BMPs addressing on-farm mixing, loading, handling, disposal, storage, and use of pesticides, irrigation practices, IPM concepts, water management, etc.;
- Participation in container recycling program;
- Participation in collection programs for unused, canceled, or suspended products; and
- Voluntary label changes or educational programs undertaken by pesticide registrants.

Regulatory Measures

- Mandatory adoption of BMPs;
- Restrictions to soil type, rate of application, method of application, and timing of application;

- Well construction and plugging standards;
- Additional training; and
- Other restrictions on how, when or where the PMP pesticide may be used.

A more detailed explanation of how and/or when these measures may be implemented is provided in the next section.

COMPONENT 6: DETECTION RESPONSE

The protection of water used as drinking water is of primary importance in Nebraska, including ground water, surface water hydrologically linked to ground water and surface water used directly for drinking water. As explained previously, however, other beneficial uses of water exist and are also worthy of protection. Upon detection of a specific pesticide identified by the PMP Committee as having significant potential to adversely impact water resources, a range of actions will be initiated. In all cases, the economic benefits of a pesticide's use will be measured in conjunction with environmental and health aspects prior to formulating a regulatory response which would limit a pesticide's availability for use.

Upon a determination by the SMP Committee that a PMP may be warranted, NDA will inform appropriate state and local agencies that they will create a pesticide-specific PMPAC. This will allow these agencies the opportunity to assess their current programs to determine how they may be impacted or adapted to address issues related to PMP development. Of significant importance in this process will be the GWMPs developed by local NRDs. Although GWMPs were not developed with the PMP process in mind, these plans outline the NRD's intended approach to address nonpoint source contamination concerns. The plans establish action levels and detail responses NRDs intend to undertake in the event of contamination. These plans and activities generally emphasize nitrogen fertilizers. However, planning efforts of NRDs frequently note that if pesticide contamination from nonpoint sources is detected, a more detailed approach will be developed in conjunction with appropriate state agencies.

Upon review of these plan(s), the PMPAC will determine how or if the plan may meet PMP goals. The PMPAC may determine that some GWMPs do not address the issue of pesticides sufficiently to meet the requirements of the PMP. In these instances, the local NRD will be contacted to provide insight as to whether the plan can be adapted to meet these needs or whether the area of concern will be addressed by other means.

PMP Action Levels

In Nebraska, NDEQ is responsible for the adoption of standards for pesticides in surface water and groundwater, and NDHHS is responsible for the adoption of standards for pesticides in drinking water. NDEQ also promulgates ALS. Non-regulatory human health benchmarks and aquatic life benchmarks are published by USEPA and may be used for comparison in developing a concentration to be used as an action level (see USEPA 2010 and 2012). NDA will utilize these standards and reference concentrations, in consultation with a PMPAC, in assigning nonpoint source action levels for any PMP where prevention and mitigation measures will be implemented. Any pesticide-specific PMP shall provide, at minimum, two contaminant action levels which are outlined in Table 1. These actions will be intended to achieve appropriate water quality standards wherever attainable. When determining whether such standards may be attained for a given aquifer or watershed, consideration will be given to environmental, technological, social, and economic factors.

It should be noted that Table 1 has different action levels for ground water and surface water. Ground water is the main source of drinking water in the State, and because of that, there may be a need to begin addressing causes of contamination prior to meeting or exceeding a water quality standard for human health concern. Surface water quality standards, on the other hand, are most generally set to protect aquatic life. While surface water resources may often become contaminated sooner to a contamination event than do ground water resources, they may also be remediated easier and quicker than ground water resources. In cases where surface water is used as drinking water, the PMPAC may reconsider these action levels.

(Table 1 on following page)

Table 1. Contaminant Action Level Guidelines (to be used by both the SMP Committee and any Pesticide-Specific PMPAC)

Action Level	Contaminant Trigger*	Minimum Response Actions
A	GW: >=10% but < 50% of MCL, HAL or benchmark SW: >=30% but < 70% ALS or benchmark	1. Annual update for, and review by, the core agencies of the SMP Committee (NDEQ, NDA, NDHHS, NDNR, and appropriate NRD(s)). To accomplish this, NDA will request data from the various monitoring entities, if a common repository does not exist. 2. A coordinated effort on the part of the agencies and groups involved to encourage voluntary adoption of BMPs, etc., by landowners, tenants, and applicators. 3. If assessments are found to be trending toward Action Level B conditions, it is assumed the SMP Committee may recommend NDA establish a pesticide-specific PMPAC.
B	GW: >= 50% of MCL, HAL or benchmark SW: >=70% of ALS or benchmark	1. Annual update for, and review by, the PMPAC (NDEQ, NDA, NDHHS, NDNR, appropriate NRD(s), and other identified stakeholders), as well as pesticide registrant(s) and other stakeholders invited to participate, as described in Component 2. This update will include information on the status of previously identified **Level B** concentrations, newly identified **Level B** concentrations, and new detections exceeding an MCL, ALS, or other reference concentration or benchmark. NDA will request data from the various monitoring entities, if a common repository does not exist. 2. Review of problem and alternatives by the pesticide-specific PMPAC. Upon completing problem review, the PMPAC may recommend one or more of the following actions: (a) Notification of the well owner(s) or other water users, appropriate agencies, and registrant(s); (b) Additional studies to confirm and assess the problem and/or a review of existing monitoring data to evaluate possible trends, etc.; (c) Increased and coordinated efforts at encouraging voluntary adoption of BMPs, etc., by landowners, tenants, and applicators; and (d) Modification of existing pesticide use practices or prevention strategies on a voluntary basis.
C	GW: exceeds MCL, HAL or benchmark; SW exceeds ALS or benchmark	1. Establish statewide declaration of contaminant as a state limited-use pesticide. • This involves a regulatory hearing held to declare the contaminant as a state limited-use pesticide, which authorizes NDA to establish additional restrictions by regulation. • PMPAC then advises the Director of Agriculture on the most appropriate additional restrictions, which could only be formalized by regulation.

*The contaminant trigger or threshold is identified for ground water as “GW” and surface water as “SW”.

Response actions described in Table 1 will be based upon confirmed contaminant concentrations. Confirmation of Level B concentrations, which could potentially result in additional restrictions on a pesticide's use in Nebraska, will be undertaken by NDA or its designated agent (such as NDEQ, an NRD, or UNL). This SMP response strategy represents a guide for determining an appropriate minimum response to the occurrence of pesticides in water. Actual responses will vary depending upon site and incident specific variables or pesticide characteristics. Because MCLs, persistence, degradates, and other parameters imperative to assigning action levels vary between pesticides, action level triggers will be assigned within the context of each pesticide-specific PMP.

The number of samples (number of sites or wells, number of years, etc.) required for initiating responses is dependent upon such items as specific pesticide characteristics, areas of use, etc. Delineation of a vulnerable or problem area is dependent upon an area's hydrogeology, soil and pesticide characteristics, pesticide use patterns, cropping patterns, etc. The complexities surrounding determination of numbers of samples with detections needed to initiate a response or delineation of problem area size are best addressed through a thorough examination of information outlined in Component 3, Resources Assessment and Planning, by the PMPAC. The PMPAC will define the mechanisms for determining the appropriate numbers of sites/samples experiencing detections needed to initiate a response and problem area delineation within pesticide-specific PMPs.

Initial Level B responses will focus first on education and voluntary adoption of BMPs wherever possible. Regulatory measures will not be recommended unless it is determined that education and voluntary measures have been unable to effectively address the problem. A prudent approach would provide voluntary programs an opportunity to demonstrate change in contaminant concentrations before moving to regulatory recommendations. This will help ensure that unnecessary restrictions will not be implemented where there is potential for voluntary efforts to succeed.

Activities may be "staged down" when appropriate. Staging down, simply put, is reducing the level of response activity when pesticide concentrations have declined to a lower action level and where management practices have been adopted which will continue to reduce the risk of contamination. Staging down of activities within Level B may also occur when detections are below the MCL, and there are enough years of supporting data indicating decreasing trends in pesticide concentrations.

Point Source vs. Nonpoint Source

In the event an assessment of a site, review of monitoring data, and other information reveals the probability of point source contamination, NDEQ will be notified to address the problem in a manner detailed in Title 117 or 118 (Surface Water Quality Standards, and Groundwater Quality Standards and Use Classification, respectively). This process will occur regardless of whether it is an Action Level A or Level B concentration. In addition to the actions of NDEQ, point source contamination of water which may have resulted from improper pesticide handling, disposal, or other violations of the pesticide label shall be referred to NDA for appropriate investigation and action as prescribed under the Nebraska Pesticide Act.

Where pesticide contamination of water is detected at Action Level A and has been deemed to be a nonpoint source problem, the data (or a summary) will be made available annually to the appropriate agencies, to include at minimum, NDEQ, NDA, NDHHS, NDNR and the appropriate

NRD(s). In the case of ground water, affected well owners should be notified of the finding and its significance, likely by NDA, UNL-CES or NRD mailings or other media. Measures will be taken to identify users of the pesticide in the area to encourage them to contact the UNL-CES, NRCS, or local NRD to receive advice and information regarding farmstead evaluations, irrigation and pesticide management techniques, alternative pesticides or pest control techniques and other practices beneficial to water quality. NDA may contact the pesticide registrants to ascertain their interest in assisting in education and outreach activities. Dependent upon specific incident information, there may be additional follow-up and evaluation by the appropriate state and local agencies.

If pesticides are detected in water at a concentration corresponding to Action Level B and deemed to be a nonpoint source problem, an appropriate recommended response shall be made to prevent further degradation of water. A response may include one or more of the following elements:

1. Notification of the well owner(s) or other water users, appropriate agencies, and registrant(s);
2. Review of the problem and alternatives;
3. Additional studies and/or review of existing monitoring data;
4. Increased, coordinated efforts at encouraging voluntary adoption of BMPs, etc., by landowners, tenants, and applicators; and
5. Modification of existing use practices or prevention strategies, potentially leading to mandatory requirements for BMPs or pesticide use restrictions.

The PMPAC will be responsible for coordinating which partner(s) will carry out each response and presenting recommendations to the SMP Committee, which is then responsible for any formal recommendations to the director of NDA.

Notification

Initially, it is envisioned that NDA will make an annual request for monitoring data of the various data collectors. However, it may become necessary for these agencies and groups to notify NDA and the PMPAC, if concentrations corresponding to Level B are detected. This exchange of information will facilitate communication regarding areas of concern and aid in ensuring an effective and coordinated response. The PMPAC will work with the monitoring entities to coordinate an information exchange, if a more frequent interval is needed.

A coordinated effort will be developed by the PMPAC for notifying well owners or other users of detections below and above the MCL. Owners of private drinking water wells will be encouraged to contact the UNL-CES, NRCS, or local NRD to receive advice and information regarding farmstead evaluations, irrigation and pesticide management techniques, alternative pesticides or pest control techniques and other practices beneficial to water quality. Information on potential health risks may also be developed and distributed.

If pesticide detection places a public water supply out of compliance with the NSDWA, NDHHS will require the supplier to give notice to those persons served by the system and will require such actions as necessary to protect the health of the water users. A public water supplier must notify water users if, on an annual basis, the average of a minimum of four samples is at or above the MCL, or if a single detection is sufficiently high as to automatically result in exceedance of an annual MCL when averaged over quarterly sampling.

Review of Problem

NDA will, at minimum, arrange an annual meeting of the PMPAC to review Level B detections and evaluate response mechanisms. NDA may initiate a meeting of the PMPAC to discuss Level B detections more frequently, if needed.

Site Investigation

The PMPAC will evaluate whether additional studies are needed to better define the cause and scope of the problem and to determine whether any discernible trend can be identified. Such a study may entail increased monitoring in the area or a review of existing data. This information will form the basis on which the PMPAC shall identify future recommendations regarding the appropriate response to the pesticide detection.

Any monitoring study will require close coordination between all agencies and organizations involved to ensure good communication and an effective strategy.

Modification of Prevention Activities

Following review of all pertinent information, the PMPAC shall propose and take the steps necessary to implement the appropriate actions necessary to prevent or mitigate pesticide contamination of the resource.

It is anticipated that the local NRD(s) and UNL-CES will play a pivotal role in developing and implementing any protection strategy. These local agencies have extensive experience in establishing grassroots support for water protection activities, conducting education and outreach, and establishing monitoring and nonpoint source pollution reduction programs. Many of the programs and activities currently undertaken by NRDs and UNL-CES, with respect to protecting ground water from nitrates, will effectively dovetail with any future activities directed toward a pesticide and ground water protection strategy. NRDs have also been instrumental in coordinating activities and programs for surface water protection.

The valuable role played by NRDs and UNL-CES in ground and surface water protection cannot be overstated. Their proximity to the problem area and understanding of local conditions and people are key items to successfully implementing any protection strategy.

Potential actions in areas of concern may include any one or more of the following:

- Continued or increased efforts at educating and encouraging pesticide users to adopt BMPs or voluntary use reductions.
- Establishment of additional requirements for pesticide user training, adoption of BMPs and/or restrictions beyond label requirements. Additional restrictions may include, but are not limited to, restrictions on pesticide application timing, rate method of application, or geographic areas of use.

Continued or increased efforts at encouraging voluntary adoption of BMPs or use reductions may be addressed through the coordinated efforts of a variety of state, federal, and local agencies. These efforts can be augmented significantly through the participation of grower organizations and registrants, and these groups should be approached early in the process to solicit their support and insights.

In the event the PMPAC feels use restrictions or prohibitions of use for a given pesticide are needed, it may request NDA to evaluate the need for these restrictions and ask NDA to designate the pesticide as a state-limited-use pesticide (SLU), which is required by the Nebraska Pesticide Act in order to establish additional regulations. NDA shall base its decision to declare a pesticide as a SLU on a thorough evaluation of all information regarding the need for such a designation and shall conduct a public hearing as detailed in the Nebraska Pesticide Act (see description of SLU under the NDA section in Component 2). The PMPAC shall be involved in this process as well. During the public hearing required for declaring a SLU, NDA shall solicit and hear evidence regarding the designation of any given pesticide as a SLU pesticide from all interested parties.

COMPONENT 7: ENFORCEMENT MECHANISMS

Different avenues of enforcement are available based upon the circumstances of a detected water contaminant. NDA has primary responsibility for enforcing pesticide laws and regulations in Nebraska. The Nebraska Pesticide Act, which provides for a cooperative agreement with USEPA regarding FIFRA, establishes the authority of NDA as the state lead agency for regulating pesticides. NDA currently has staff engaged in investigating misuse complaints and other pesticide related activities. NDA conducts pesticide use inspections which could be used to ensure compliance with potential use restrictions associated with any pesticide-specific PMP. Enforcement tools, currently available, include suspension or revocation of a pesticide applicator's license; assessment and collection of administrative fines from persons violating any provision of the Nebraska Pesticide Act; referral to the Attorney General or the county attorney to pursue appropriate civil or criminal actions; or referral to the USEPA for Federal violations (Neb. Rev. Stat. §§2-2622 through 2-2659; Title 25, Chapter 2 – Pesticide Regulations).

NDEQ is the state lead agency for surface and ground water quality. NDEQ, in association with local NRDs, administers Nebraska's chemigation program which includes permitting and inspection of chemigation facilities, equipment, etc. NDEQ and local NRDs conduct inspections, etc., relative to enforcement of the Nebraska Chemigation Act. Enforcement actions may include suspension or revocation of a chemigation permit, or civil penalty (Neb. Rev. Stat. §§46-1139 to 46-1141; Title 195 - Rules and Regulations Pertaining to Chemigation).

NDEQ also administers rules and regulations pertaining to secondary containment and loadout facilities for pesticides and fertilizers. Violations of these regulations may be referred to the Attorney General or county attorney for appropriate actions (Neb. Rev. Stat. §§81-1508, 81-1504; Title 198; Rules and Regulations Pertaining to Agricultural Chemical Containment).

NRDs administer provisions established under the GWM&PA and subsequent GWMPs and GWMAs. Enforcement authorities available under a GWMA include issuance of cease-and-desist orders, or civil penalties against alleged violators who fail to abide by cease-and-desist orders. Violations of GWMA statutory provisions for which penalties are not otherwise provided are also subject to civil penalties. See the Neb. Rev. Stat. §§46-701 (the Ground Water Management and Protection Act), and individual NRD web pages for local rules/regulations (see Appendix B). An overview of enforcement authorities is provided in Appendix C.

COMPONENT 8: PUBLIC AWARENESS AND INVOLVEMENT

Public outreach, awareness, and participation are essential to the state's water planning and to the development and implementation of a successful PMP. Neb. Rev. Stat. §§84-1407 through 84-1414 and the Nebraska Administrative Procedure Act, Neb. Rev. Stat. §§84-901 through 84-920 provide the primary legal framework for informing and providing public access to governmental agency rulemaking and meetings. When applicable, these statutes detail requirements to which state government must adhere in order to ensure public access to information and due process regarding issues of public interest.

A PMPAC will be established before developing any pesticide-specific PMP. The Committee will provide suggestions and recommendations to the NDA regarding PMP implementation. The PMPAC will consist of members as identified in APPENDIX A: Pesticide Management Plan Advisory Committee – Operational Guidance. The PMPAC's role in PMP development is one of consultation to NDA to ensure inclusion of various perspectives, coordination of activities, and formulation of useful and feasible recommendations regarding implementation of a successful PMP. These recommendations will provide useful information and suggestions regarding water protection activities.

Information regarding proposed PMP development, progress, or requirements of any proposed or established PMP will be distributed through traditional media contacts. Initial drafts of any PMP will be provided to governmental agencies, grower/commodity organizations, registrants, environmental organizations, and other interested parties for review and to solicit comments and insights. Following review and incorporation of appropriate suggestions, NDA shall allow public responses and comply with the public hearing requirements of the Nebraska Pesticide Act (§2-2626 (1-4 and15) and the Administrative Procedure Act, before formally making any PMP use restrictions a part of NDA's rules and regulations.

Should implementation of any PMP result in a GWMA designation, changes in a GWMP in an NRD, or any changes in any State agency's rules and regulations, provisions have been made to ensure public participation. The GWMA and GWMP process and changes in any State agency's rules and regulations require a public hearing and notice. Any changes in rules and regulations by NDA regarding pesticides shall require a public hearing, as detailed within the Nebraska Administrative Procedure Act. During the public hearing, NDA shall solicit and hear evidence regarding the proposed rule change from all interested parties by identifying those constituents most likely to be impacted by the decision, and specifically seeking their participation and input. Additionally, NDA has established a Pesticide Advisory Board consisting of representatives of various State agencies and trade associations. This group provides comments and recommendations regarding special local need pesticide requests, emergency exemption pesticide requests, and could be used to review and comment on rule changes proposed by NDA.

Throughout the PMP process, opportunities shall be pursued by NDA, NDEQ, NRDs, UNL-CES, and others to inform the public of PMP development, requirements, etc. The public will be informed through traditional media outlets (i.e., newspapers, radio, and television), as well as NDA web pages and electronic notifications. Interested parties, such as grower associations, researchers, and industry will be informed through memoranda or other announcements as appropriate. Outreach activities will include, but are not limited to public hearings, public

notices, select mailings, speaking engagements, newspapers, radio, television and other media, as appropriate.

Because the user is ultimately responsible for management of pesticides, measures prescribed in any pesticide-specific PMP must be communicated to pesticide users, as well as appropriate industry groups and regulatory officials.

Many of the activities described in Component 5, Prevention Activities, will be instrumental in the successful dissemination of information regarding any PMP. The activities of primary importance to information dissemination include: certification and training of pesticide applicators, crop production clinics, newsletters and other publications, media outlets, and presentations to grower groups and trade associations.

Additional opportunities to target affected groups include:

Mailings to Commodity Groups

Copies of pesticide-specific PMPs and updates will be mailed to affected commodity organizations and user groups. NDA currently maintains a database of commodity and user organizations and will update it, as needed.

Direct Mailings to Applicators and Pesticide Dealers

When the number of applicators affected by any pesticide-specific PMP requirement is limited, or there are specific PMP requirements for the affected applicators, NDA will consider direct mailing of information to applicators in the affected user groups. NDA can utilize the list of certified and licensed pesticide applicators as the database for this communication.

Role of Other Groups in Informing Users

The important educational roles of UNL-CES, NRDs, and others have been previously outlined in Components 2 and 5. As mentioned previously throughout this plan, commodity and trade organizations, pesticide dealers, and registrants will play a major role in PMP implementation. These groups will prove invaluable in the education of affected persons regarding PMP requirements. NDA will cooperate with interested representatives of these groups in their efforts to inform their membership, customers, etc.

Labeling or Supplemental Information

Pesticides designated as state-limited-use pesticides and for which additional restrictions governing use have been established may require supplemental labeling to inform the pesticide user. NDA will work with USEPA and the affected registrant(s) to revise or produce supplemental labeling to be reviewed and approved by USEPA. The resulting label and requirements and other information will be highlighted in many, if not all, of the previous communication venues mentioned above.

COMPONENT 9: RECORDS AND REPORTS

NDA will maintain all records relating to the development and implementation of any PMP for a period of four (4) years, or the retention time designated in the NDA Pesticide Program's Quality Management Plan. The information maintained will include the following:

- Results from ground or surface water sampling and monitoring undertaken in support of the PMP to include number of samples taken and number of detections of the subject pesticide;
- The number of inspections performed to determine compliance with labeling for ground or surface water protection, or any pesticide-specific PMP provisions, and a summary of the results of those inspections;
- The number and summary of completed enforcement actions related to non-compliance with the mandatory provisions of the PMP;
- A summary of significant findings or actions;
- An assessment of any accomplishments achieved as a result of the PMP;
- Identification of special issues relating to the PMP; and
- Resource needs and availability.

NDA currently provides mid- and end-of-year reports to Region VII USEPA as required under a cooperative agreement. These reports will include the information outlined above, if available. NDA shall notify Region VII USEPA of any significant pesticide detections requiring modification of any pesticide-specific PMP or any additional restrictions to the pesticide's use. NDA will make available to USEPA, upon request with an appropriate allowance of time, any and all records related to the development and implementation of PMPs.

In addition to information provided in mid- and end-of-year reports, NDA shall submit reports to Region VII USEPA, as deemed necessary, which give thorough reconsideration to the strategies and implementation items listed in this SMP or any pesticide-specific PMP. In its review NDA will consider, in addition to many of the items described above, the following:

- Does the plan still reflect the current rationale and goals for protecting water resources?
- Are the roles of the cooperating entities still the same?
- Are there new or modified prevention strategies that need to be incorporated?
- Has the plan been appropriately implemented?
- Has the plan been effective in achieving its stated goals?
- Does the plan require adaptation to changing circumstances?

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WEB ADDRESSES

(not specifically identified in the text or references)

National Water Quality Assessment (NAWQA) program (http://water.usgs.gov/nawqa/)

Natural Resources Districts (http://www.nrdnet.org/)

Nebraska Department of Agriculture (http://bit.ly/NDAPP)

NDA Pesticide and Noxious Weed Newsletter (http://bit.ly/NDAPPnews2)

Nebraska Department of Environmental Quality (http://deq.ne.gov/)

NDEQ Chemigation Program (http://1.usa.gov/161pyOh)

Nebraska Department of Health and Human Services (1.usa.gov\NNXQed)

Nebraska Department of Natural Resources (http://dnr.ne.gov/)

Nebraska Game and Parks Commission (http://outdoornebraska.ne.gov)

Nebraska Legislature (1.usa.gov/OV4MKU)

Nebraska's statewide pesticide use (from NASS & USGS data) (http://bit.ly/NDApestuse)

Regulations for the Nebraska Pesticide Act (http://1.usa.gov/12cCeoB)

Regulations for the Chemigation Act (http://bit.ly/19dTDzI)

Regulations for the Agricultural Chemical Containment Act (http://bit.ly/19dTDzI)

UNL Pesticide Safety Education Program (PSEP) (http://pested.unl.edu/)

UNL-PSEP YouTube videos (http://bit.ly/1dQk7F3)

UNL Crop Production Clinic web page (http://agronomy.unl.edu/cpc)

UNL Crop Watch (http://cropwatch.unl.edu/)

UNL Extension *NebGuides* (http://www.extension.unl.edu/)

USDA Natural Resource Conservation Service (http://1.usa.gov/1oEkhXN)

USDA National Agricultural Statistics Service (1.usa.gov\PYVvSm)

USDA Farm Service Agency (http://1.usa.gov/VVj59l)

U.S. Environmental Protection Agency (http://www.epa.gov/pesticides/)

U.S. Fish and Wildlife Service (http://www.fws.gov/mountain-prairie/)

U.S. Geological Survey (http://usgs.gov)

USGS Nebraska Water Science Center (http://ne.water.usgs.gov)

APPENDIX A: Pesticide Management Plan Advisory Committee – Operational Guidance

If the SMP Committee determines that a specific pesticide active ingredient merits further attention in order to address continued exceedances in water resources, the Director of Agriculture will, in consultation with the SMP Committee, establish a PMPAC for the specific pesticide in question. This PMPAC will include technical representatives of the agencies which make up the SMP Committee, and representatives from stakeholder groups identified by the NDA or SMP Committee. These groups would represent the agriculture commodity and agribusiness groups potentially impacted by potential regulation on the specific pesticide in question, environmental and public advocacy groups, university or research interests, and one or two at-large members who are identified as individuals with particular expertise in the issues at hand. (See Figure 1, page 11.)

Members should, but are not required to, have scientific or policy expertise in the areas of water quality regulation or programs which the organization they represent is involved in hydrology, natural resources, pesticide chemistry, pesticide use, public health (drinking water), soil chemistry, toxicology or agricultural production.

The Director of Agriculture will invite the organizations and advocacy groups to nominate a representative to the PMPAC by providing a standard nomination application. The applications would be reviewed by NDA, and members selected by the Director. Potential organizations that would be considered for the PMPAC are:

Farm organizations
Farmers
Environmental advocacy organizations
Pesticide industry
University of Nebraska Extension
At-large (1 or 2, at the Director's discretion)

Members will be selected by the Director, with preference given to candidates with relevant scientific background, broad representation of their interest group, and experience in Nebraska.

The SMP Committee and PMPAC will be chaired and moderated by the Division Administrator of the NDA's Animal and Plant Health Protection focus area. NDA will also provide a committee recording secretary for both committees, and invite selected individuals from the agency to participate in committee meetings, as needed.

The PMPAC chair and/or the secretary will be responsible for assembling information and requesting additional technical assistance for the meetings. The committee chair will receive comments from the PMPAC and present them to the SMP Committee, which will meet to consider all comments and provide the Director of Agriculture with a clearly defined set of recommendations.

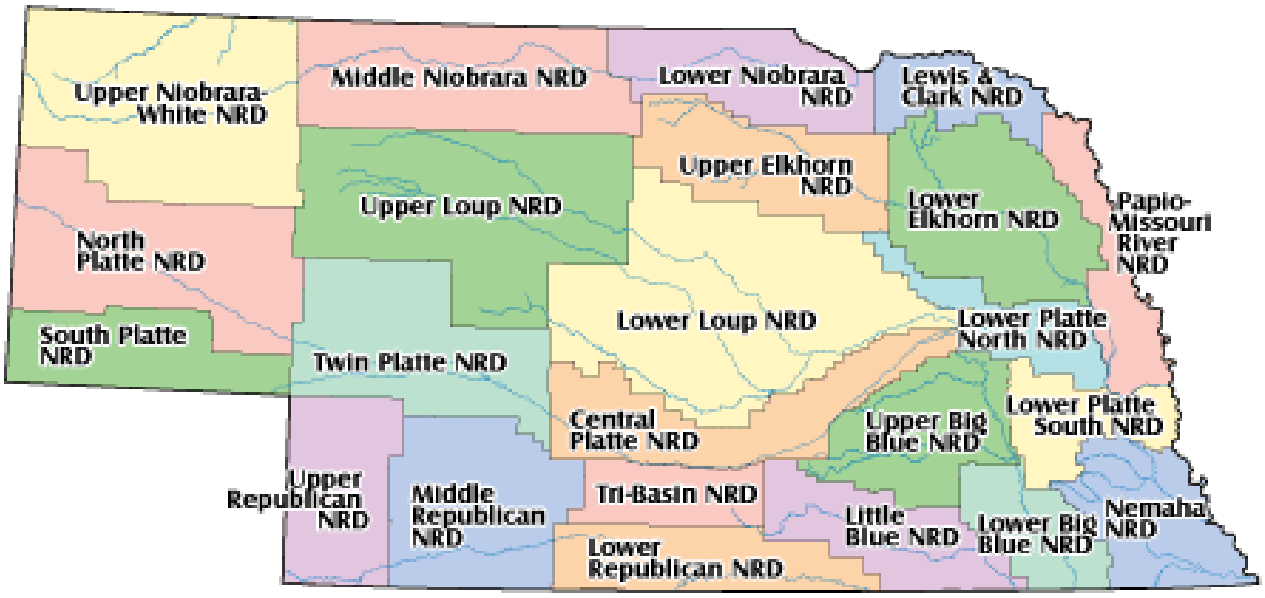
PMP Advisory Committee Recommendations

It is envisioned that the work of the PMPAC will be to review the available relevant data related to the specific pesticide active ingredient, assess the impact that chemical has on the

environment, particularly water resources and aquatic ecosystems, and submit specific comments on how best to ameliorate the continued exceedances of the pesticide. All comments will be considered and memorialized, with the understanding that they will be given to the SMP Committee for further consideration and eventual submission to the Director of Agriculture in the form of a suite of options.

In all likelihood, a PMP might contain a suite of options or recommended protective measures or stages which would progressively place more focus on the specific contamination problem, as time passes and if improvements are not seen. The plan would recommend which individual agency program or coordinated agency effort would be used at each stage. Any recommendation to NDA for regulatory changes will be reviewed by the Director, and it is the Director who determines the next step or stage

APPENDIX B: Directory of Natural Resources Districts



APPENDIX C: Enforcement Authorities

STATE MANAGEMENT PLAN - NEBRASKA ENFORCEMENT MATRIX

VIOLATION	ENFORCEMENT ENTITY	AUTHORITY	REFERRAL TO 2ND AGENCY	AUTHORITY	REPORTS TO:
Pesticide Misuse	NDA NDEQ	Nebraska Pesticide Act (Title 25)	NDEQ NDA	Nebraska Pesticide Act (Title 25)	Archive per SMP Component 9
Drinking Water Standard Exceeded	NDHHS	NSDWA (Title 179)	NDEQ NDA	Nebraska Pesticide Act (Title 25)	Archive per SMP Component 9
Chemigation	NRD	Nebraska Chemigation Act (Title 195)	NDEQ NDA	Nebraska Chemigation Act (Title 195) Nebraska Pesticide Act (Title 25)	NHSS-R&L, if potential to impact public water supply
Secondary Containment & Load-out Facilities	NDEQ	(Title 198)	NDA	Nebraska Pesticide Act (Title 25)	
Improper Disposal	NDA	Nebraska Pesticide Act (Title 25)	NDEQ	Nebraska Hazardous Waste Regulations (Title 128)	
Non-compliance with GWMA provisions	NRD NDEQ	Ground water Management and Protection Act	NDEQ NRD	Ground water Management and Protection Act	

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