

**NEBRASKA**

**PESTICIDES AND GROUNDWATER**

**GENERIC STATE MANAGEMENT PLAN**

SUBMITTED TO THE  
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## ACRONYMS

ARD	Agricultural Research Division
BMP	Best Management Practice
CERCLA	Comprehensive Environmental, Response, Compensation and Liabilities Act
CES	Cooperative Extension Service
CRP	Conservation Reserve Program
CSD	UNL Conservation Survey Division
CWA	Clean Water Act
EPA	Environmental Protection Agency
FHA	Rural Economic Community Development
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FSA	Farm Service Agency
GIS	Geographic Information System
GWCD	Ground Water Conservation District
GWMA	Groundwater Management Area
GWMP	Groundwater Management Plan
HAL	Health Advisory Level
IANR	Institute of Agriculture and Natural Resources
MCL	Maximum Contaminant Level
NASS	National Agricultural Statistics Service
NDA	Nebraska Department of Agriculture
NDEQ	Nebraska Department of Environmental Quality
NHSS-R&L	Nebraska Health and Human Services System - Department of Regulation and Licensure
NDWR	Nebraska Department of Water Resources
NNRC	Nebraska Natural Resources Commission
NRCS	Natural Resources Conservation Service
NRD	Natural Resources District
NSDWA	Nebraska Safe Drinking Water Act
RC&D	Resource Conservation and Development
RCRA	Resource Conservation and Recovery Act
RUP	Restricted Use Pesticide
SDWA	Safe Drinking Water Act
SMP	State Management Plan
SPA	Special Protection Area
UNL	University of Nebraska - Lincoln
USDA	United States Department of Agriculture
USFW	United States Fish and Wildlife Service
USGS	United States Geological Survey
WHP	Wellhead Protection Program
WHPA	Wellhead Protection Area

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**INTRODUCTION**

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

In an attempt to provide consistent and effective protections to the nation's water resources, the EPA published The Pesticides and Ground-Water Strategy in October of 1991. It is this strategy which defines the approach the EPA will utilize to address the risk of groundwater contamination by pesticides. The strategy establishes the basis for developing this generic and any subsequent pesticide specific State Management Plan (SMP).

As a component of the Comprehensive State Groundwater Protection Program, the Pesticides and Ground-Water Strategy is formed around the establishment of pesticide specific State Management Plans (SMPs) for pesticide products that have been identified as posing a potential threat to groundwater quality. The process will require the EPA to assess each pesticide for its potential to cause contamination of groundwater. EPA's registration decisions will be based on preventing unreasonable risks from groundwater contamination. The Agency proposes to use Maximum Contaminant Levels (MCLs), as established under the Safe Drinking Water Act, as primary reference points in helping determine the levels of groundwater contamination that would pose unreasonable risks if found in an underground source of drinking water. When MCLs are not yet available for certain pesticides, EPA proposes the use of interim protection criteria, established by the Agency's drinking water health advisories, as its reference points.

If the EPA determines that a specific pesticide requires more control or greater management of use, the states will be notified that an SMP should be developed. The EPA will only register the specific pesticide for use in those states which have an EPA approved SMP in place for that pesticide. If a state does not develop an approvable SMP, then the use of that pesticide would no longer be allowed within the state.

Due to the physiological differences within and between states, the strategy allows the states to tailor their SMPs to best protect their groundwater resource. As a result, SMPs may vary between states.

The goal of the Pesticides and Groundwater Strategy is to, "prevent contamination of groundwater 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". The Strategy recognizes that the primary responsibility for coordinating and implementing groundwater protection programs has been and should continue to be with the states. This approach is expected to provide a more flexible, ecologically based method for preventing contamination through the linking of federal, state, and local activities rather than attempting a single, uniform national regulatory program which cannot consider local or regional variances in topography, soils, precipitation, pesticide use or other factors.

The first step in the program is state development of a generic SMP. This plan establishes the processes under which a pesticide specific SMP would be developed. Generic SMPs are voluntary and provide the opportunity for the EPA to assess the viability of the plan before a state has a need to develop a pesticide specific SMP.

While the development of a pesticide specific SMP is a complex process, there are components of each plan that will be the same or similar. The generic SMP will help define those similar components in order to facilitate timely development of future pesticide specific SMPs and allow focused attention on individual criteria needed to effect management or control of individual pesticide products.

Because various agencies have interests and jurisdictions regarding groundwater protection, the generic plan will help identify programs and seek to integrate and coordinate program activities. As no single agency can accomplish all of the SMP requirements, the need for cooperation is imperative.

This and subsequent SMPs are intended to be flexible and will be revisited periodically in order to ensure the plans address changing circumstances and new information.

## **COMPONENT 1: PHILOSOPHY AND GOALS TOWARD PROTECTING GROUNDWATER**

Nebraskan's have long recognized the valuable role groundwater plays in nearly every aspect of their daily lives. It is Nebraska's abundant supply of groundwater which supplies virtually all of the state's 330,000 rural households and 85% of its public water supplies. It is groundwater which has brought economic development to the Great Plains and drives the region's largest industry, agriculture.

Irrigation accounts for 95 percent of the annual groundwater use in Nebraska. It is irrigation of nearly 7.5 million acres of cropland which has enabled the state to become one of the nation's leaders in agricultural production. In 1993, Nebraska ranked third in corn, sorghum, and pinto bean production and first in great northern bean and cattle production. In all, Nebraska's agriculture contributes over 8 billion dollars to the state's economy annually.

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. As a consequence, care must be taken to insure that the pesticide compounds used 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 water quality, as outlined in *Title 118-Groundwater Quality Standards and Use Classification* (NDEQ, 1991) include the following:

1. Protect, and where necessary, improve the quality of groundwater for human consumption; agriculture, industry and other productive, beneficial uses.
2. 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.
3. Existing high quality groundwater will be maintained and protected.

Nebraska's policy places a strong emphasis upon 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 of groundwater is drinking water. As groundwater which meets drinking water criteria is suitable for other beneficial uses, it is recognized that protecting groundwater for drinking water will typically protect it for other beneficial uses.

Nebraska's programs recognize that planning efforts must be firmly based upon sound scientific evidence and procedures 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 the conduction of valid water quality monitoring and assessment;
2. Permit the prediction of the potential for movement of specific agricultural chemicals from the point of application or through the soil profile to contaminate water supplies;
3. Assess the environmental or health risks of alternative products or techniques; and
4. Provide for evaluation and identification of localized areas of the state, which due to topography, soils, rainfall, geological substrate, hydrology and/or agricultural practices are more vulnerable to contamination and water quality degradation.

The use of accepted numerical health-based standards is an integral part of the Nebraska approach to water quality and public health protection.

Nebraska has in place a groundwater classification system which considers aquifer quality and potential uses. This classification system serves as an important tool in the proper implementation of protective measures. It facilitates the ability of the responsible agency to target protective or remedial activities to aquifers of primary concern.

The Nebraska approach recognizes that public ownership of any SMP at the local level is critical for successful water quality protection efforts. Planning, agency coordination and regulatory action are of minimal value if programs are not fully implemented and accepted. Implementation can occur only by increasing public support through information dissemination, education and participation. By identifying agricultural chemicals of specific concern, targeting of loading areas, and application of appropriate management practices on a voluntary basis, or subsequently on a mandatory basis if voluntary efforts are not sufficient, the state's water resources can be protected and public support energized.

Inherent in Nebraska's efforts to protect groundwater resources is the understanding that prevention is the preferred and most efficient means of achieving water quality goals.

### **Pesticides and Water Quality Protection Management Plan Goal**

The goal of the Nebraska Pesticide and Groundwater State Management Plan (SMP) is to assure groundwater quality is protected and maintained for beneficial use by minimizing or preventing degradation of the state's groundwaters from pesticide contamination.



Nebraska recognizes that in regions of the state, it may be necessary to evaluate and protect those surface waters closely hydrologically linked to groundwater in order to achieve groundwater quality goals.

Frequently, many of the activities undertaken for the protection of groundwater may have applicability to surface waters. To the extent possible and appropriate, opportunities will be seized to afford protection to surface waters as well. This generic, and subsequent pesticide specific SMP's are sufficiently flexible as to be adapted to address concerns related to pesticides and surface water quality. NDA, in cooperation with the appropriate federal, state and local agencies, will incorporate a more detailed and specific surface water component into Nebraska's generic and any subsequent pesticide specific SMP upon concurrence of the pesticide specific groundwater plans by EPA.

As the state lead agency for pesticide programs, the NDA has elected to develop a Generic State Management Plan. As many Nebraska programs have long been directed toward protection and management of the State's valuable groundwater resources, this plan seeks to bring people and agencies together necessary to obtain the best concepts and ideas on how to protect groundwater from potentially adverse effects associated with pesticides. The approach is intended to be flexible and make maximum use of existing programs and abilities and shall strive to improve capabilities in pesticide management when necessary to achieve state and national water quality goals.

The generic SMP and pesticide specific SMPs will contain twelve components. The detail within each component will be dependent upon various factors such as area groundwater vulnerabilities, pesticide use patterns, and agricultural practices.

NHSS-R&L and NDEQ will establish numerical health-based standards for agricultural chemicals in surface and groundwater, based upon the best available scientific data. The NDEQ shall be responsible for the adoption of standards for pesticides in surface and groundwater and the NHSS-R&L shall be responsible for the adoption of standards for pesticides in drinking water. Federal Maximum Contaminant Levels (MCLs) as promulgated under the Safe Drinking Water Act, or a National Primary Drinking Water Regulation will be used where possible. In the absence of an MCL, a non-promulgated federal number of Health Advisory Level (HAL) will be used.

EPA has developed health advisory levels for about 60 pesticides used in crop production (EPA, 1989). Should neither an MCL or HAL be available, an interim numerical standard based upon the best available scientific data will be established by NHSS-R&L and NDEQ.

NDA may develop and implement SMPs to address EPA requirements for an SMP as a condition for continued use of a pesticide or in response to a Nebraska initiated effort intended to address state concerns related to pesticides and water quality.

## **COMPONENTS 2 and 3: ROLES, RESPONSIBILITIES AND LEGAL AUTHORITIES**

There are many public and private organizations as well as thousands of citizens who share a deep commitment and responsibility to manage Nebraska's water resources. Given the complexity of groundwater protection, no single agency has sufficient authorities or expertise necessary to address all aspects of this issue. A successful strategy will therefore 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 within the private sector.

### **LOCAL AGENCIES**

#### *Natural Resources Districts (NRDs)*

Nebraska is divided into 23 Natural Resources Districts (NRDs), the boundaries of which approximate the major river basins in the state. A list of the 23 NRDs and map illustrating their locations are provided in appendix A. NRD's 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 for many years and contribute significantly to the prudent management and protection of the state's water and soil resources. The NRDs have served as a model in effective resource management to the rest of the nation and have statutory responsibilities in the areas of: 1) soil conservation; 2) flood control; 3) development and conservation of water resources; 4) pollution control; 5) development and management of fish, wildlife, and recreational facilities; and 6) forestry and range management. In addition, many of the NRDs have established very successful educational and outreach programs.

The NRDs receive statutory authority to administer these programs from the natural resources district law (Chapter 2, Article 32) with additional responsibilities described under Statutes Relating to the Natural Resources Commission (Chapter 2, Article 15), the Conservation Corporation Act (Chapter 2, Article 42), and the Instream Flow Statutes, Sections 46-2,107 to 46-2,119.

Of primary interest to the protection of Nebraska's water resources are the following statutes and responsibilities:

1. Groundwater Management and Protection Act (46-656 to 46-674.20) - Under this Act, NRD's may establish a Groundwater Management Area (GWMA) to address groundwater concerns. This Act also requires development of groundwater management plans.

## Groundwater Management Plan (GWMP)

Nebraska NRDs are required to develop groundwater management plans (GWMP). The GWMP's are based on the best information available and describe the groundwater resources located within the NRD, water use, water needs, groundwater management objectives, and potential or existing water quality concerns. NRD authority and activity under their GWMPs are limited to NPS groundwater concerns. Where point sources of groundwater contamination are concerned, NDEQ's Title 118 applies. However, the general goals of groundwater protection and pollution prevention apply in both cases, and activities under Title 118 will be coordinated with the NRDs' GWMPs to the greatest extent possible.

With respect to water quality, the GWMP must identify, to the extent possible, the levels and sources of groundwater contamination within the area, NRD goals relative to water quality including action levels and responses to contamination, and long term activities intended to protect groundwater quality. Although the formal processes for assessing water quality and assigning protections may vary with the NRD, the parameters on which decisions are based are similar and include those items detailed in Component 5 of this plan. During the development of a GWMP, each NRD actively solicits input from the public and makes use of expertise and information available through other state, local and federal agencies. Upon completion, the GWMP is submitted to the Nebraska Department of Water Resources which, in consultation with the Department of Environmental Quality, Conservation and Survey Division of the University of Nebraska, the Natural Resources Commission and other state agencies, evaluates the plan for adequacy and determines whether the plan should be approved or disapproved.

In addition, many NRDs are actively supporting and coordinating with Nebraska's Wellhead Protection (WHP) Program through their GWMPs. For instance, several NRDs work closely with their public water suppliers to gather the information necessary for Wellhead Protection Area (WHPA) designation and to inventory contaminant sources within those WHPAs for increased management and educational activities. As a result, GWMPs have increased attention to WHP in many areas of Nebraska.

NDA will attempt to support NRDs in the development and/or implementation of GWMPs where feasible and appropriate and where the NRDs objectives meet the intent of this and subsequent pesticide specific SMPs.

## Groundwater Management Area (GWMA)

GWMPs may be established for the protection of groundwater quality and/or quantity through either of two processes. An NRD may declare an area as a GWMA independently of any other agency upon determination of a need of such designation for the protection of groundwater quality or quantity. The NRD's GWMP must specify the general criteria for

establishing a GWMA. GWMA's may also be designated by the Nebraska Department of NDEQ for quality concern (these were formerly referred to as SPAs; see note p. 2&3 - 4).

Upon receipt of information indicating that groundwater contamination is occurring, this approach requires the director of the NDEQ undertake a study with the appropriate state agencies and NRD to determine the extent and source of the contamination. If nonpoint sources are responsible for the contamination and there is no suitable GWMA already in place to adequately address the problem, the NDEQ will consult with the NRD to evaluate the need for establishment of a GWMA. If a GWMA is deemed necessary and the area appropriately defined and designated, the NRD is required to submit an action plan outlining the steps the district intends to take to address the contamination problem. Should the NRD fail to submit a suitable action plan for the GWMA the NDEQ may specify the protective measures it deems necessary to protect the water resource.

Upon establishing a GWMA, an NRD may adopt any of a number of authorized controls intended to protect water quality and/or quantity. These may include a system for the allocation of water and requirements for well spacing, the use of water meters on irrigation systems, the use of "Best Management Practices" (BMP's), analysis of soil and water for chemical content, and educational programs. Typically, these controls are phased in over a period of years depending upon the current status of the water resource.

As of February 1997, groundwater management areas were in existence in the Central Platte, South Platte, North Platte, Lower Platte South, Upper Republican, Little Blue, Lower Niobrara, Lower Elkhorn, Lower Platte North, Lower Big Blue, Tri-Basin, Lower Republican, Upper Big Blue and Middle Republican NRDs and were being considered in several other NRDs.

A detailed description of the GWMA (formerly SPA) program is included in *A Manual on the Preparation of Special Groundwater Protection Area Action Plans* (1990) published jointly by NDEQ and the Nebraska Association of Resources Districts. Chapter 4 of the manual outlines the SPA process and has been included as appendix B. Although developed specifically as an outline for the SPA process, this document provides a useful review of one of the processes available for GWMA designation. Prior to Legislative Bill (LB) 108, there had been four SPAs established.

NOTE: With the passage of Legislative Bill (LB) 108 in 1996, all Special Protection Areas will be changed to Ground Water Management Areas. With this statutory change, NRDs can still work with the NDEQ to establish GWMA's in the same way that SPAs were formerly designated; NRDs will also have the ability to form GWMA's independently (as was the case before LB108). The authorities available to NRDs in all GWMA's will be uniform.

2. Erosion and Sediment Control Act (Neb. Rev. Stat. § 2-4602 to Neb. Rev. Stat. § 2-4613)  
- In an effort to prevent problems associated with erosion from agricultural,

nonagricultural, urban and rural areas, the Nebraska Legislature directed the NNRC to develop a statewide approach for erosion and sediment control. The program would implement the state's policy to develop a "comprehensive, and coordinated erosion and sediment control program to reduce the damage from wind erosion and storm water runoff, to retard nonpoint pollution from sediment and related pollutants, and to conserve and protect land, air and other resources of the state". Implementation of these programs is conducted by the NRDs in cooperation with the counties, municipalities, and other local governments and political subdivisions of the state and other public and private entities. The NRDs administer a variety of state, federal and local funds to establish land treatment practices such as terraces, grass waterways, etc.

Many of the erosion and sediment control practices implemented by the NRDs will have a significant effect in reducing off-field losses of pesticides via runoff, thereby protecting surface water from pesticide contamination. Although groundwater protection is not specifically addressed, erosion control practices may reduce pesticide contamination of groundwater by protecting hydrologically connected surface waters. There may additionally be some indirect benefits to groundwater in that implementing some erosion control practices may remove areas from cropping thereby reducing pesticide inputs.

3. Nebraska Chemigation Act, Chapter 46, Article 11 - The Act provides that persons wishing to utilize a chemigation system must first submit an application to the appropriate NRD. The NRD may then approve and issue the requested permit, provided the irrigation distribution system complies with the equipment requirements of section 46-1127 and the applicator has been certified as a chemigation applicator under sections 46-1128 and 46-1129.

The Nebraska Chemigation Act also provides the NRDs the necessary authorities to conduct compliance inspections to insure that chemigation operations within the district comply with this act and any additional provisions promulgated by the NRD to assure safe chemigation activities.

The NRDs cooperate in the implementation of rules and regulations pertaining to chemigation with the NDEQ by providing them information pertaining to permit applications and NDEQ also shares responsibilities relative to compliance inspections.

### *Groundwater Conservation Districts (GWCDs)*

Neb. Rev. Stat. § 46-614 to § 46-634 defines the mechanisms for the formation of a groundwater conservation district, GWCD, its legal authorities and responsibilities.

Nebraska has five GWCDs currently in operation. These are located within York, Clay,

Fillmore, Hamilton, and Seward Counties. The purpose and authorities of the GWCDs include: 1) gathering and supplying information concerning groundwater conservation; 2) promulgating and administering policies relating to groundwater with responsibilities to land treatment programs limited to recommendation; and 3) adopting, administering, and enforcing rules and regulations to ensure the proper conservation of groundwater within the district. Any rules and regulations adopted must receive concurrent approval of the NRD or NRDs in which the GWCD is located with additional consultation with the Nebraska Natural Resources Commission, Nebraska Department of Water Resources, and the Conservation and Survey Division of the University of Nebraska.

## STATE AGENCIES

### *Nebraska Department of Agriculture (NDA)*

The NDA serves as the lead agency in the administration of FIFRA within Nebraska and derives its authority from the Nebraska Pesticide Act. Within the NDA, it is the Bureau of Plant Industry which bears specific responsibility relative to groundwater and pesticides.

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

1. Registration of pesticide products - All pesticides used or sold within Nebraska must be registered with the NDA by the manufacturer or other person whose name appears on the product label.
2. Licensing and certification of private, non-commercial and commercial pesticide applicators - All persons applying restricted-use pesticides within the state of Nebraska are required to be licensed. Additionally, persons applying lawn care or structural pest control pesticides to the property of another for hire are required to be licensed.
3. Licensing of pesticide dealers - Persons engaged in either wholesale or retail sale of restricted-use pesticides or who sell general-use pesticides in containers holding greater than fifty pounds by weight or greater than one gallon by volume are required to obtain a pesticide dealer license for each distribution location. Pesticide dealers may only distribute restricted-use pesticides to other pesticide dealers or certified applicators.
4. Inspection of pesticide producing establishments - NDA has the authority to inspect pesticide manufacturers to ensure proper labeling, packaging, record keeping and product quality in accordance with EPA criteria.
5. Inspection of retail outlets - NDA inspects retail outlets to ensure that only those pesticide products registered for use in Nebraska are offered for sale.

6. Investigation of pesticide usage and reports of alleged pesticide misuse - The NDA undertakes routine inspections of pesticide users to ensure proper handling and application methods are utilized. Additionally, investigations are conducted in response to complaints or when violations of the law or rules are identified during routine inspection activities.

7. Establishing state-limited-use pesticides - NDA may name a product as a state-limited-use pesticide when the department determines that the pesticide, when applied 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. Under the provisions of state-limited-use, the NDA may regulate the timing of application, quantities applied and other conditions of use.

In addition to the regulatory responsibilities defined above, NDA has contracted with the UNL Water Center for development and maintenance of a repository for groundwater and pesticides data collected in Nebraska. NDA contracts with the UNL Water Center to collect, review, summarize and place into a database groundwater and pesticides data collected in Nebraska. This effort is intended to facilitate the sharing of data and coordination of ground water monitoring efforts among a variety of agencies. The management of the database is coordinated through a committee of cooperating agencies.

#### *Nebraska Natural Resources Commission (NNRC)*

The NNRC administers a number of programs of significance to groundwater and resource planning and management. NNRC receives its statutory authority to administer these programs from Chapter 2, Article 15 of the Nebraska Statutes and has additional authorities under the Erosion and Sediment Control Act (Chapter 2, Article 32), Instream Flow Statutes (Sections 46-2,107 to 46-2,119), and Flood Plain Management Statutes (Chapter 31, Article 10).

Under these authorities, the NNRC conducts water planning and water resources funding with additional responsibilities in soil and water conservation planning, flood plain management and administration of the Natural Resources Data Bank. The Natural Resources Data Bank is a primary source of information regarding Nebraska's resources and includes soil surveys, well location, geology, GIS databases, etc.

The NNRC 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 terraces, waterways, small dams, etc.), Small Watershed Flood Control Fund, and the Natural Resources Development Plan.

*Agricultural Statistics Service, Nebraska (NASS)*

The National Agricultural Statistics Service, United States Department of Agriculture in cooperation with the Nebraska Department of Agriculture operates the Nebraska Agricultural Statistics Service office.

Although having no authority relative to groundwater protection, this agency compiles and distributes information valuable to the SMP. The Service collects and distributes information regarding the agricultural statistics for the state concerning crop and livestock production, supplies, marketings, prices, pesticide usage, and other related agricultural statistics. The forecasts and estimates are based on sample surveys of farmers, ranchers, and agri-business firms. Annual county estimates are provided for irrigated and non-irrigated crop acreage, yield and production. Total acreage with irrigation water available is also estimated by county.

*University of Nebraska-Lincoln (UNL)*

UNL does not have specific statutory authority related to pesticides in groundwater but the education and research emphasis of the Cooperative Extension Service, State Experiment Stations and other University programs will be critical to State Management Plans. UNL's specific areas of emphasis relative to the SMP are in the areas of educational assistance to water and pesticide users of best management practices (BMPs) and research in water quality and efficiency.

The UNL Cooperative Extension Service is also actively involved with pesticide users through the Pesticide Applicator Training Program and works with the NRDs in training chemigators and many other outreach/educational programs. UNL has an agreement with NDA to prepare the educational materials and conduct the training of both private and commercial pesticide applicators. Component 7 of this SMP provides a description of some of the educational programs administered by UNL Cooperative Extension which bear significant importance to preventing pesticide contamination of ground and surface water resources.

The Agricultural Research Division (ARD) of the Institute of Agriculture and Natural Resources (IANR) is part of the University of Nebraska system. The Division operates five regional Research Extension Centers and several satellite agricultural research laboratories. The ARD conducts research in the areas of water use efficiency, water quality and other aspects directly related to agriculture and rural life. The statutory authority of this program is the Federal Hatch Act and subsequent acts.

The Nebraska Water Center is also located at the University of Nebraska and has a great deal of information and expertise which will contribute to an effective SMP. Established under the Water Resources Research Act of 1964, P. L. 88-379, the Center administers a variety of programs related to research, teaching, information dissemination or technology transfer in the area of water resources. Under a cooperative agreement with the Nebraska Department of Agriculture, the UNL Water Center serves as a repository for groundwater and pesticides data collected in Nebraska. The UNL Water



Center collects, reviews, summarizes and stores groundwater and pesticides data collected by various entities in Nebraska.

The Conservation and Survey Division of UNL surveys the State's soils, water and water power, geology, forests, road materials and industry. Included among the Survey Division's duties are: 1) to survey and describe the natural resources of the state; 2) investigate and report on the state's conservation problems; 3) provide an information bureau on the state's resources, industries, and development. This Division works cooperatively with a variety of state and federal agencies on water resource related topics and houses a wealth of water resource data valuable to an SMP.

*Nebraska Health and Human Services System - Department of Regulation and Licensure (NHSS-R&L)*

The Nebraska Health and Human Services System - Department of Regulation and Licensure (NHSS-R&L) is the agency responsible for enforcing the federal Safe Drinking Water Act (SDWA) and receives its statutory authorities to undertake these activities from the Nebraska Safe Drinking Water Act (NSDWA). The NHSS-R&L administers programs intended to insure that Nebraska's public drinking water supplies are suitable for human consumption. NHSS-R&L responsibilities and regulatory authorities of particular relevance to SMP development and implementation include:

- NHSS-R&L establishes drinking water standards to insure that drinking water supplied to consumers is of a quality not harmful to human health. These standards shall serve as the basis for formulating SMP goals relative to the protection of groundwater used as drinking water. To insure that these standards are being achieved, NHSS-R&L requires monitoring of public water supplies for those materials which may be potentially harmful to human health. In assigning human health or maximum contaminant levels, NHSS-R&L makes use of scientific assessments of the materials potential to cause adverse effects in human health. Federal Maximum Contaminant Levels (MCLs) as promulgated under the Safe Drinking Water Act, or a National Primary Drinking Water Regulation will be used where possible. In the absence of an MCL, a non-promulgated federal number or Health Advisory Level (HAL) will be used. NHSS-R&L will work with NDEQ to establish standards for those pesticides which do not currently have available an established numerical standard and for which an SMP is to be developed.
- Should neither an MCL or HAL be available, NHSS-R&L and NDEQ shall coordinate their efforts to establish an interim numerical standard based upon the best available scientific data.
- All public water supply systems are required to be permitted by NHSS-R&L prior to operation and NHSS-R&L promulgates rules and regulations pertaining to the siting, 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 the NSDWA.

- Should contaminant levels exceed the maximum contaminant level, NHSS-R&L requires notification by suppliers of drinking water to those persons serviced by the system. In the event contaminants are discovered in a public drinking water supply at levels determined to be harmful or potentially harmful by the NHSS-R&L, the department may require those actions deemed necessary to address such an occurrence and insure public safety.

### *Nebraska Department of Environmental Quality (NDEQ)*

The NDEQ is the state agency having primary responsibility relative to environmental protection in Nebraska. As such, the agency administers programs associated with RCRA, CERCLA, the CWA, etc. The NDEQ works closely with numerous federal, state and local agencies on a variety of programs and special projects bearing significance to groundwater protection and to the successful implementation of any SMP. NDEQ receives its authorities to administer these programs from the Nebraska Groundwater Management and Protection Act, the Nebraska Environmental Protection Act and the Nebraska Chemigation Act. Some NDEQ programs or activities related to groundwater protection include the following:

1. Ground Water Management Program - The Groundwater Management and Protection Act (46-656 to 46-674.20) provides NDEQ a variety of authorities and responsibilities relative to implementing the GWMA program. NDEQ works closely with NRDs in evaluating the need for GWMA designation and to insure any GWMA action plan is adequate to insure protection of the water resource. Fundamental NDEQ responsibilities relative to GWMA are outlined in the description of NRDs and programs discussed earlier in this component.
2. Chemigation - Under authorities granted by the Nebraska Chemigation Act (46-1101 to 46-1148), NDEQ maintains records of chemigation permits issued by the NRDs, cooperates with NRDs in the inspection of chemigation facilities, and issues required certificates to chemigators who have attended training sessions and demonstrated competency in chemigation practices. NDEQ also has the authority to revoke or suspend chemigation permits to protect human health or the environment.
3. Hazardous Wastes - NDEQ is responsible for the regulation of hazardous wastes in Nebraska. These duties include issuing permits, conducting hazardous waste inspections, investigating complaints, etc. The regulations pertaining to the management of hazardous wastes are outlined in *Title 128 - Rules and Regulations Governing Hazardous Waste*. These regulations require operators of hazardous waste facilities to install groundwater monitoring systems and should groundwater contamination be detected, NDEQ may require the operator to initiate appropriate remedial actions.
4. Wellhead Protection Program (WHP) - The Nebraska Wellhead Protection Program is

currently a voluntary program initiated in response to the 1986 amendments of the federal Safe Drinking Water Act (SDWA). These amendments require states to: 1) divide Wellhead Protection duties between organizations; 2) delineate Wellhead Protection Areas (WHPAs); 3) identify potential sources of groundwater contamination; 4) manage these sources; 5) provide alternative water sources for contingencies; 6) properly locate and protect new wells; and 7) obtain public participation. The Nebraska Wellhead Protection Program received EPA approval in June, 1991.

5. Groundwater Classification and Standards - NDEQ promulgates narrative and numerical standards for groundwater quality and has developed a groundwater classification system used to assign priorities for groundwater protection and remediation efforts. These standards and classification criteria are provided in *Title 118: Groundwater Quality Standards and Use Classification* and shall serve as the basis for formulating SMP goals. Federal Maximum Contaminant Levels (MCLs) as promulgated under the Safe Drinking Water Act, or a National Primary Drinking Water Regulation will be used where possible. In the absence of an MCL, a non-promulgated federal number or Health Advisory Level (HAL) will be used. NDEQ will work with NHSS-R&L to establish standards for those pesticides which do not currently have available an established numerical standard and for which an SMP is to be developed.

Should neither an MCL or HAL be available, NHSS-R&L and NDEQ shall coordinate their efforts to establish an interim numerical standard based upon the best available scientific data.

Title 118 and the classification system used therein are intended primarily to support the investigation and management of point sources of groundwater contamination, i.e., specific events of groundwater pollution. This system per se is not intended for use on a regional or aquifer-wide scale, but some of the same general concepts can be used to support a regional approach. For instance, where regional or nonpoint source concerns dominate, pesticide management activities must still take into account groundwater use, geology, health effects, etc.

6. Groundwater Remediation - NDEQ investigates and reports occurrences of groundwater contamination in order to assess the extent and magnitude of potential contamination and, if possible, to identify the source and potentially responsible parties. NDEQ has developed the Groundwater Remedial Action Protocol which may also be found in Title 118. The protocol defines the process NDEQ uses when evaluating groundwater contamination for possible remedial activities and establishes a means for prioritizing remedial activities in order to make the most effective use of resources.

7. Secondary Containment - NDEQ establishes criteria for the secondary containment of bulk fertilizer and pesticides and enforces the associated rules and regulations. Requirements regarding secondary containment are detailed in *Title 198 - Rules and Regulations Pertaining*

*to Agricultural Chemical Containment.*

8. Pollution Control - NDEQ administers a wide variety of pollution control programs designed to address surface and groundwater quality concerns. Of particular importance to the SMP, is the state's NPS management program required under the federal CWA and for which NDEQ serves as the lead agency. Under the NPS program, NDEQ works to facilitate coordination of inter-agency NPS activities, conducts public education programs on NPS topics, conducts NPS site evaluations, etc. NDEQ also coordinates the expenditure of CWA 319 funds. NDEQ works with a variety of agencies and organizations to target 319 monies to NPS areas of concern. Many of the projects funded under Nebraska's 319 program will contribute significantly to achieving the goal of groundwater protection from pesticides and support the objectives of the SMP process.

9. Monitoring/Assessment - NDEQ conducts numerous monitoring and site assessment studies in support of the NPS and other water quality protection programs. This and other ground water and pesticides data will be housed in a centralized database located at the UNL Water Center. A description of the database is included in the summary of NDA and UNL roles and responsibilities within this component.

#### *Nebraska Department of Water Resources (NDWR)*

The Nebraska Department of Water Resources (NDWR) administers laws relating to water use in Nebraska. The NDWR 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. The NDWR's duties also include the examination and approval for proposed diversions from streams; dams and reservoirs; measures streamflows, canal diversions, pumping of streams; and carries out agreements on interstate streams.

The NDWR has a variety of responsibilities and authorities relative to the regulation of groundwater. It has authority under the Nebraska Groundwater Management and Protection Act to adopt controls for groundwater control areas where NRDs do not exercise this authority, and issue permits to drill wells in designated control areas.

Some additional responsibilities of the NDWR in the area of groundwater and the associated statutes are as follows:

1. Neb. Rev. Stat. § 46-601 to § 46-613.02 - registration of all irrigation, public and private wells within Nebraska
2. Neb. Rev. Stat. § 46-634 to § 46-637 - NDWR issues permits for the pumping of groundwater for irrigation purposes. The NDWR takes into consideration the potential effects the pumping for irrigation may have on the flow of water in streams within fifty feet of the well.

3. Neb. Rev. Stat. § 46-635 to § 46-650 - Provides NDWR authority to grant and administer permits to public water suppliers to locate, develop and maintain groundwater into the area to be served and to continue existing use of groundwater and the transportation of groundwater into the area served.

4. Neb. Rev. Stat. § 46-651 to § 46-655 - NDWR regulates well spacing to help minimize the effects groundwater pumping may have on different, but adjacent, water users.

5. Neb. Rev. Stat. § 46-656 to § 46-674.19 - The Nebraska Groundwater Management and Protection Act provides the mechanisms for establishment of groundwater control areas. The NDWR may establish a groundwater control area when it has been determined that there may be an inadequate groundwater supply to meet present or future water uses or that dewatering of the aquifer may result in deterioration of the water resource. The decision to create a groundwater control area will be made following consultation with interested parties, appropriate state agencies and the local NRD. Once established, the local NRD administers the control program.

NDWR, in consultation with other agencies, reviews and approves groundwater management plans developed by NRDs as described earlier in this document.

## **FEDERAL AGENCIES**

### *U.S. DEPARTMENT OF AGRICULTURE - Farm Service Agency (FSA)*

The FSA is a federal program working to solve soil, water and pollution problems on agricultural land. Within FSA are two programs which could be utilized in a pesticide and groundwater program.

#### Conservation Reserve Program (CRP)

The CRP program is a 10-year conservation program designed to take highly erodible cropland out of production and convert it to trees, grasses or other permanent vegetative cover. The encouragement of this program in areas susceptible to run-off will reduce pesticide run-off and improve water quality.

#### Rural Clean Water Program

There are three objectives to the Rural Clean Water Program:

1. Achieve improved water quality in approved project areas in the most cost-effective manner possible. This will be achieved considering the need for adequate supplies of food and fiber and a quality environment.

2. Help agricultural landowners and operators:
  - a. Reduce agricultural non-point source water pollutants.
  - b. Improve water quality in rural areas to meet water quality standards or water quality goals.
3. Develop and test programs, policies and procedures for controlling agricultural non-point source pollution.

The Rural Clean Water Program provides financial and technical assistance to private landowners and operators, including irrigation districts, that control agricultural lands designated as critical areas or sources of non-point pollution in the approved project area.

#### *USDA Natural Resource Conservation Service (NRCS)*

The NRCS has a great deal of experience with providing technical assistance to farmers in the area of soil conservation. They are also familiar with preparation of farm plans and mapping and can provide assistance in the areas of BMP or pest management program implementation.

A number of programs with NRCS may relate to pesticides and groundwater issues.

#### Resource Conservation and Development (RC&D)

The RC&D program is intended to support development of agricultural community resources. Consulting technical assistance is provided by the NRCS on project area priorities dealing with soil and water conservation, among others. Each RC&D area is sponsored by local units of government including counties, cities and conservation districts. The projects are operated by a council made up from representatives of these sponsors. The statutory authorities of this program are Public Laws 74-46; 87-703 and 97-98 as amended.

#### Conservation Operations

Under this program, NRCS provides technical assistance to recipients of the Agricultural Conservation Program and the Rural Clean Water Program administered by the Farm Service Agency. This program is also covered under Public Law 74-46, as amended.

#### P.L. 566 Watershed Planning and Operations

Under this program the NRCS provides technical and financial assistance to local organizations representing people living in small watersheds. The NRCS has assisted local watershed districts in planning and construction of projects for the purpose of watershed protection and agricultural water management, among other projects.

This program also authorizes the USDA Secretary of Agriculture to cooperate with state and local agencies in the planning and carrying out works of improvement for soil conservation.

### Inventory and Monitoring Program

This program provides information on the soil, water, and related resources of Nebraska. The information is the basis for determining problems, establishing priorities developing objectives and goals, and for periodically measuring accomplishments. This program also receives its statutory authority from Public Law 74-46, as amended.

### *BUREAU OF RECLAMATION*

The Water Resources Planning Act, Public Law 89-90, established the Principles and Standards for federal participation in the preparation of regional or river basin studies and for the formulation and evaluation of federally assisted water and related land resources projects. Within the framework of the laws, the Bureau of Reclamation's Planning Program produces river basin reports, specialized technical reports, and definite plan reports. Types of investigations undertaken in the Planning Program include environmental subjects.

### *U.S. CORPS OF ENGINEERS*

\_\_\_\_\_The Corps of Engineers regulate several water bodies and other areas within Nebraska. Two of their programs may be impacted by any pesticide and groundwater program.

#### a. Regulatory Program

The Corps regulatory program focuses primarily on weighing the economic and environmental benefits of development versus ecosystem preservation in deciding whether a permit for a proposed activity would be "contrary to the public interest". When reviewing permit applications, the Corps looks at all the relevant factors including conservation, economics, general environmental concerns, water quality, and the general welfare of the public. The statutory authority of this program is Section 10 of the Rivers and Harbors Act of 1989 (33 U.S.C. 403), and Section 404 of the Clean Water Act (33 U.S.C. 1344).

#### b. Water Supply

The Water Supply Act of 1958, as amended, authorizes the federal government to assist nonfederal interests in the development of water supply at federal lake projects.

*ENVIRONMENTAL PROTECTION AGENCY (EPA)*

The EPA is charged with protecting the nation's environment to include ground and surface water. Many of EPA's programs are directly related to protection of water resources. Some of the programs and their statutory authority include:

Pesticides and Groundwater Strategy (As implemented by this, and subsequent pesticide specific, State Management Plan(s)), Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 136-136y), FIFRA Sec. 23.

Clean Water Act, Non-Point Source Program  
(Section 319(h)(5) and (i)).

Wellhead Protection Program, Safe Drinking Water Act Amendments 1986.

State Revolving Fund Program, 42 U.S.C. 300g, Safe Drinking Water Act Amendments 1986  
(Public Law 104-182).

Public Water System Supervision Program, Safe Drinking Water Act.

National Pollutant Discharge Elimination System, Clean Water Act, as amended.

Clean Lakes Program, Clean Water Act, as amended, Sec. 314.

Underground Injection Control, Part C of Safe Drinking Water Act of 1974, sections 1422 and 1425,  
40 CFR 144, 145, 146, and a portion of 124.

National Environmental Policy Act (42 U.S.C. 4321-4347 Comprehensive Environmental Response,  
Compensation, and Liability Act (Public Law 96-510).

Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901-6986).

Endangered Species Act (16 U.S.C. 1531-1543).

Two particularly important programs include the Non-Point Source Pollution Control and the Water Quality Standards.

The Non-Point Source Pollution Control program requires the production of a state Non-Point Source Management Plan and provides grant funds in support of this effort, through Sections 106, 205(j) and 319 of the Clean Water Act of 1987 (CWA).

The Water Quality Standards program is designed to define the uses of state surface waters, determine the maximum allowable concentration of specific pollutants in water and define policies



to implement controls to protect human health and the environment. The specific responsibility for setting state standards rests with the Nebraska Health and Human Services System - Department of Regulation and Licensure and the Nebraska Department of Environmental Quality, however, the EPA may promulgate standards if it finds that the state is not following the Clean Water Act statutes, specifically Section 303.

#### *Rural Economic and Community Development (RECD)*

The Rural Economic and Community Development provides financial assistance for various projects, especially aimed at improving the environment in urban areas. They have three programs which may involve pesticides and groundwater.

a. Resource Conservation and Development Loans

Loan funds may be used in four different areas, one of which is for soil and water development, conservation, control and use facilities. The projects for the loans must be located in an authorized RC&D area. The statutory authority for this program is the Resource Conservation and Development Act 7 USC 1010 et seq.

b. Watershed Protection and Flood Prevention Loans

Loan funds may be used to help local sponsors provide the local share of the cost of watershed works of improvement for projects including water quality management. The statutory authority for this program is the Watershed Protection and Flood Prevention Act, as amended, 16 USC 1001 et seq.

c. Technical Assistance and Training Grants

Funds may be made available to private nonprofit organizations which will enable them to identify and evaluate solutions to water and waste facilities. With more stringent drinking water quality standards being passed, additional training for water treatment facilities may be essential. The statutory authority of this program is the Consolidated Farm and Rural Development Act, as amended, 7 USC 1921 et seq.

#### *U.S. FISH AND WILDLIFE SERVICE (USFW)*

U.S. Fish and Wildlife Service is given authority over fish, wildlife, and their supporting ecosystems by a number of statutes. The programs mainly support research conducted by the USFW in its research centers and laboratories and field operations conducted by USFW employees. Among the statutory authority of the USFW is:

Fish and Wildlife Act of 1956

The USFW 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 advice on USFW and USFW sponsored pesticide uses.

#### *U.S. GEOLOGICAL SURVEY (USGS)*

As above, there are a number of statutes that grant authority to the USGS for various groundwater-related functions. The statutes include:

Organic Act of March 1879 (20 Stat. 394; 43 U.S.C. 3)

Act of Oct., 1888 (25 Stat. 526)

Act of June 1896 (29 Stat. 453)

Act of May 1902 (32 Stat. 741; 44 U.S.C. 1318)

A number of programs fall within these statutory authorities. These include Interpretive Studies in Groundwater Hydrology, Research in Geochemistry; Interpretive Studies in Water Quality, and Water Resources Data. All of these programs work with determining water quality. The Research in Geochemistry currently is defining the geochemical characteristics of pesticides that determine the chemical and metabolic degradation processes in agricultural environments.

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

## **PRIVATE SECTOR**

### *Pesticide Manufacturers/Registrants*

The manufacturers and/or registrants of pesticides possess a knowledge of pesticide characteristics that will be helpful in the development of a pesticide specific SMP. Many registrants have been pro-active in outreach activities to better inform their customers and the public of the proper methods to use pesticides and still protect groundwater. The degree to which registrants contribute to SMP development and/or implementation will be dependent upon their respective abilities and interest to do so. Some of the expertise and or resources of the manufacturers/registrants may include the following:

1. Technical Support - The review of known monitoring data (specific pesticide) with NDA will allow for mutual acknowledgement of data existence and availability; agreeing to review and comment on proposed water quality research, reports, quality assurance project plans, and monitoring well siting plans; assisting in targeting of environmentally sensitive areas for prevention or monitoring activities; providing methodology for sample analysis of the

pesticide in the water matrix in instances where information is presently not available; and providing advice concerning sampling methodologies.

2. Information Dissemination - Providing a listing of registrant produced educational materials and a description of the distribution system for these educational materials; agreeing to review the SMP and providing comment on how a registrant's educational materials could be introduced into the state's described information dissemination network; agreeing to produce informational brochures explaining the SMP to pesticide dealers, certified commercial and private pesticide applicators; and providing groundwater training to registrant personnel (sales, distribution, etc.) to enhance their ability to serve as information resources on specific requirements.

3. 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 Clean Water Act section 319 projects, USDA Water Quality Incentive Projects, etc.); evaluation of the SMP and comment on how registrant funding could help support long and short term monitoring, prevention, and response activities with state agencies; evaluation and comment on how the registrant may cooperate and provide support to grower groups, universities, private consultants, and others for SMP administration and enhancement; and assist in assessing the economic benefit of allowing the continued use of a product.

4. Logistical Data - Providing a map of the specific pesticide's active ingredient primary distribution within the state.

5. Response to Detections - Providing technical support to NDA, NDEQ, or NHSS-R&L in response to detections at or above an established water quality trigger within a pesticide specific SMP.

6. Public Participation - Providing a spokesperson at designated public hearings or work group meetings.

#### *Agricultural Association/Advocacy Groups*

Agricultural association and advocacy groups are in an excellent position to relate perspectives on the use of specific pesticides. These organizations will 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 development of reasonable prevention actions. By providing information on a pesticide specific SMP, they can foster both information dissemination and public awareness and participation.

### *Environmental/Conservation Groups*

Environmental/conservation groups are involved in a wide variety of environmental activities. In this respect they may contribute to the SMP process by providing various perspectives related to SMP development and implementation. They may also provide useful opportunities to relate issues concerning SMP implementation to the public.

### **SMP Advisory Committee**

NDA will initiate the formation of an SMP Advisory Committee upon the designation by the EPA of a pesticide requiring a pesticide specific SMP. The SMP Advisory Committee will consist of NDA, representatives of an NRD(s), NDEQ, NHSS-R&L, NNRC, NDWR, CES, UNL-Water Center, USGS, NRCS and at least one representative of an affected pesticide user group, pesticide registrant, and a public interest or environmental organization. These representatives will be named during development of the pesticide specific SMP and will serve at the request of the Director of NDA.

The SMP Advisory Committee responsibility in SMP development is one of consultation to insure inclusion of various perspectives, coordination of activities and formulation of useful and feasible recommendations regarding implementation of a successful SMP. This committee's role is limited to an advisory capacity and recommendations stemming from this groups 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 regarding SMP development and/or implementation to the NDA. The SMP Advisory Committee will meet annually to review information and issues pertaining to the SMP. The SMP Advisory Committee may also convene upon determination by NDA that such a meeting would be appropriate.

## COMPONENT 4: RESOURCES

Nebraska has a wide variety of established programs relating to agriculture, human health, natural resources and environmental protection. These programs incorporate expertise from various levels of government and the private sector to achieve the common goal of environmental protection.

### Personnel

The UNL Water Center has published a valuable guide to water-related agencies, personnel and scientists in Nebraska. This directory lists the federal, state, local and UNL agencies and personnel who have expertise in various areas of water resources. Key personnel of each agency are also provided. Appendix D provides an abbreviated listing of some of the people and agencies involved in various aspects of water resource management and protection.

Several schools of higher education are present in the state which conduct agricultural and environmentally related research in addition to classroom education. Significant expertise is also found in state regulatory agencies. As a consequence, the state has a wealth of human technical and scientific talent which can be directed toward SMP development should the need arise and fiscal constraints be met.

Primary technical expertise required for pesticide specific SMP development would be provided as follows:

<u>SMP Tasks</u>	<u>Primary Entity(s)</u>
Water Quality Monitoring	NDA NRDs NDEQ NHSS-R&L UNL USGS
Chemistry and Sample Analyses	NHSS-R&L NDA UNL USGS
Site Investigations and Inspections	NDA NDEQ NRDs

Vulnerability Assessments	NRDs NDA NDEQ UNL USGS NHSS-R&L
Applicator Training and Certification (chemigation)	CES NDA NDEQ NRDs
General Pesticide Education	CES registrant
Enforcement	NDA NDEQ NRDs
Remediation	NDEQ
GIS Support	NNRC UNL
BMP Development and Technical Assistance	NRCS NRDs CES

Although state universities and other governmental agencies (i.e., NRDs, NDA, NDEQ, CES) have lead roles, the NDA will call upon other state and local governmental agencies for assistance when appropriate. Private individuals and associations will 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 eleven of this plan.

### **Fiscal**

Nebraska SMP development and implementation activities are financed through a combination of state general revenue (tax) monies, fee collections and federal grant awards. Nebraska agencies submit budgets to fund their physical and operational costs on a biennial basis to the Fiscal Office. These funding requests are then reviewed and revised for submittal by the Governor to the Unicameral. Frequently state revenues are matched in various ways with federal appropriations in order to develop, implement, and operate programs to achieve common objectives.

Some the federal and state partnerships providing funding for special projects beneficial to groundwater include Section 319 NPS programs, Reduced Use Pesticide Grants from EPA, etc.

Nebraska's Environmental Trust represents an additional source of funding for protection and enhancement of the state's environment. The Environmental Trust Fund was established through LB 1257 during the 1992 legislative session and provides funds to the public for activities which conserve, enhance and restore the natural, physical and biological environment in Nebraska. The Environmental Trust receives its monies from receipts from the Nebraska lottery. The Environmental Trust will provide approximately \$3.8 million to environmental projects during FY 94.

The Soil and Water Conservation Program is administered by the NNRC and provides state financial assistance to Nebraska landowners installing approved soil and water conservation measures. The program is coordinated by the NRDs at the local level with technical assistance provided by the USDA-NRCS. Many of these programs will have a beneficial effect on both surface and groundwater and in FY93 total expenditures exceeded \$3.4 million.

The agricultural chemical industry has expressed an interest in participating in groundwater protection. As areas of concern are identified, inquiries will be made to registrants, and others expressing interest in contributing to groundwater protection efforts regarding what technical, financial or other assistance they may be able to contribute.

### **Cost Estimates**

In consideration of current funding levels, sufficient state and federal funding is available to implement provisions of this Generic SMP. Accurate estimates of cost per pesticide specific SMPs will be dependent upon the degree of support required and that rendered from a variety of sources to include the pesticide registrants; agri-businesses; research entities; federal, state and local agencies; etc. A more thorough survey of resources available and needed for successful implementation of any SMP is underway.

## **COMPONENT 5: ASSESSMENT AND PLANNING**

### **Economic Assessment**

Upon notice from the EPA of its intent to designate a pesticide as one requiring a pesticide specific SMP, or upon a State determination that a pesticide specific SMP may be needed, NDA will conduct an evaluation of the product's economic value to the state of Nebraska. There is a potential that a pesticide named as requiring an SMP may not be used within Nebraska or may be of little economic value. Nebraska may elect not to expend the resources necessary to develop and implement an SMP for pesticides of little or no economic importance to the state.

In order to assess the importance of a particular product, Nebraska may initiate a formal study which examines the extent of the pesticide's use, it's financial contribution to the overall economy of the state, the availability of more environmentally sound replacement products and the costs to the state's economy if pesticide use was shifted to these alternative compounds.

The assessment process should recognize that 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 increased dependence upon tillage and other alternative weed control practices. These alternative pesticides and non-pesticide controls may also have associated risks to the environment and human health.

In the event the economic costs associated with SMP development and implementation exceed the economic value of the pesticide, Nebraska may elect not to register the pesticide for use within the state. SMPs 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 safe use.

### **Groundwater Vulnerability Assessments**

The decision to develop a pesticide specific SMP 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 to initiating additional scientific studies. Information described below will be examined as part of a comprehensive decision making process regarding groundwater vulnerability. This process is fundamental to the SMP in that it will establish the foundation for determining local groundwater vulnerability and is key in identifying an appropriate course of action.

#### Pesticide Assessment

Estimates of a pesticide's use within the state are available from NASS. Additional estimates of a pesticide's distribution of use may be made by contacting the registrant(s) and requesting information regarding the location of pesticide dealers distributing the product and quantity of the product provided to the dealer. 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 pesticides use within a given area is required, NDA may require the reporting of such information by the pesticide dealers and applicators. A review of such information may reveal that certain pesticides are not used in a given region of the state. Areas of no use may then be eliminated as a region of concern allowing resources to be focused to more critical areas.

Registrants and university researchers possess a great deal of technical information regarding a pesticide's physical and chemical characteristics which affect a given pesticides potential to leach to groundwater. University research contributes to our understanding of how and under what conditions pesticides are likely to migrate though the soil profile.

A summary of Nebraska's pesticide use compiled by NASS for 1993 appears in appendix E.

#### Groundwater Vulnerability

The NDEQ, in cooperation with UNL, recently completed a project to map the relative vulnerability of Nebraska's groundwater resources to contamination using the DRASTIC methodology. Each letter of the name DRASTIC refers to one of the hydrologic factors used in the evaluation which includes: D - depth to groundwater; R - net aquifer recharge; A - aquifer media; S - soil media; T - topography; I - vadose zone impact; C - hydraulic conductivity. Each factor was independently weighted and then added together to formulate a numerical index. This index represents an area's relative degree of potential for contamination. The scale of this analyses provides a useful evaluation of groundwater vulnerability in Nebraska on a regional basis.

Utilizing GIS to overlay land or pesticide use data, with the DRASTIC map, resource planners can begin the process of identifying areas potentially vulnerable to the pesticide. This information may be used as a basis for initiating more aggressive educational and outreach programs. This cursory survey will not, by itself, form the basis of any regulatory decision.

Other models may also have utility in the assessment of vulnerable areas. UNL and the USDA-ARS are currently refining the computer decision aid RIPS. RIPS is the acronym for **Relative Index for Pesticides and Soils** and was developed as a conservative estimator of pesticide leaching and groundwater contamination based on soil and pesticide properties and water table depth. The RIPS procedure provides a useful first approximation of pesticide leaching and groundwater contamination potential for specific pesticides and soils. RIPS and other computer models will offer assistance in identifying situations where a more thorough evaluation should be conducted. A summary of useful computer models is provided in EPA's *A Review of Methods for Assessing Aquifer Sensitivity and Groundwater Vulnerability to Pesticide Contamination*, 1993. It should be noted that modeling, by itself, shall not be used to base regulatory decisions, but rather serve merely as one of many aids to be used during the planning process.

Should model data, DRASTIC mapping, or routine monitoring reveal an area as particularly vulnerable to contamination, a more detailed evaluation of site specific conditions will be initiated.

Although, various agencies or entities with responsibilities or interests relative to pesticides and groundwater may initiate these activities at any time, the decision to undertake these actions for the purposes of supporting the SMP shall be made in conjunction with the SMP Advisory Committee and representatives of the agency requested to undertake these efforts. A more detailed assessment of a site'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
- initiation of a targeted monitoring program 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.
- assessment of area agronomic or pesticide management practices (cropping, methods and rates of application, irrigation, etc.)
- hydrologic studies
- examination of site specific soil conditions
- examination of climatic data
- determine the classification of the water resource under Title 118
- review of water use and well location data
- non-agricultural use considerations (forests, lawns and golf courses, ornamentals, utilities and rights-of-way, roadsides, and structures)
- pesticide user attitudes/opinions
- pesticide characteristics

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

In an effort to further the assessment process in Nebraska, NDA contracted with the UNL Water Center 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 groundwater prior to 1990. The latest assessment of monitoring data being conducted by the Water Center will aid in defining existing and potential problem areas. A comparison of the earlier work of Exner and Spalding to this recent study will contribute to discerning possible trends in the detections of pesticides in groundwater across Nebraska.

A great deal of the information needed to make a more detailed evaluation of site specific conditions is currently available from a assortment of sources in Nebraska. The Natural Resources Data Bank contains a variety of soil, land use, hydrologic, water quality and other data bases (appendix F).

The UNL Conservation and Survey Division also serves as a primary resource for assorted materials related to the state's geology, soils, water quality, water use, etc. The list of materials available from UNL is too extensive to iterate within the context of this report, but may be obtained by contacting the Conservation and Survey Division of UNL.

All assessment and planning activities must be coordinated with other agencies to insure 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, the Generic and any subsequent Pesticide Specific SMP will be revisited periodically to evaluate its sufficiency to achieve the goals set forth in Component 1. In this respect, SMPs are to be considered "living documents" and are capable of being adapted to changing circumstances and new information.

## COMPONENT 6: MONITORING

Groundwater monitoring plays an important role in evaluating and managing groundwater resources by providing data for the identification, prevention and abatement of pollution problems. Groundwater monitoring data serves to better define groundwater quality trends and provides valuable insight into the success or failure of prevention or mitigation measures. Nebraska has a variety of pesticide and groundwater monitoring programs already in place. This Generic State Management Plan 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 of the SMP stated in component one of this plan and is tied explicitly to component five 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 groundwater 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 to make sound management decisions. Specifically, an effective monitoring strategy will:

- a. Provide baseline data regarding the status of SMP designated pesticides and groundwater quality in Nebraska.
- b. Evaluate trends in the occurrence of SMP pesticides in ground water.
- c. Identify and evaluate groundwater contamination problem areas as they pertain to pesticide use.
- d. Confirm detections.
- e. Measure the success of SMP prevention/mitigation efforts.
- f. 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 groundwater monitoring programs which include pesticide sampling. Taken cumulatively, these efforts have resulted in the sampling of several thousand wells across Nebraska. The UNL Water Center published a report in 1990 titled *Occurrence of Pesticides and Nitrate in Nebraska's Groundwater* which compiled existing pesticides and groundwater data. Under a cooperative agreement with NDA, the UNL Water Center developed a similar report in 1994. Entities providing data for these reports included NHSS-R&L, NDEQ, NRDs, UNL Water Center, CSD, Lincoln-Lancaster County Health Department and the USGS. A map illustrating the cumulative sampling

points of these monitoring activities undertaken for atrazine is provided in appendix G. The 1994 report was based on analysis of pesticide residues in 3,151 groundwater samples. Although these monitoring efforts were undertaken with differing missions and objectives, they collectively serve to provide an extensive database on the status of Nebraska groundwater.

In support of the goals of the SMP, Nebraska will undertake the following monitoring activities:

### Baseline Monitoring

#### *Purpose/Objectives*

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

- Provide scientifically reliable estimates on the occurrence, concentration and distribution of pesticides in groundwater 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.
- Contribute data necessary for evaluation of SMP programs.

#### *Scope*

Nebraska's baseline monitoring strategy will utilize data obtained through ongoing monitoring undertaken to satisfy the requirements established under the SDWA and conducted by the NHSS-R&L and local public water suppliers. These public water supplies represent Nebraska's most valued water in that they serve as the primary source of drinking water for most of Nebraska's residents. This monitoring network consists of approximately 1700 municipal wells. A map illustrating the geographic distribution of the municipal wells is provided in appendix H. In addition to this municipal well data, the baseline strategy will utilize appropriate data from other entities with groundwater responsibilities (e.g. NRDs, NDEQ, UNL, USGS, etc.).

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 groundwater 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. Additionally, the baseline monitoring strategy may exclude

monitoring of municipal wells in areas where use of the pesticide of concern is limited or non-existent and the pesticide is not expected to occur as a result of migration from areas of use.

### *Design*

All wells are sampled on a rotating basis with each well being routinely sampled at least every third year by the local water provider according to guidelines provided by NHSS-R&L. Wells may be sampled more frequently following a significant detection of a pesticide or other extenuating circumstances.

Samples are analyzed in accordance with EPA methodology by a laboratory operated by NHSS-R&L. All sampling and analysis is done in accordance with an EPA approved QA/QC program.

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 NHSS-R&L, NDEQ, NRDs, USGS, and UNL for such purposes as GWMA designation, CDC studies, research, etc. Frequently these studies will make use of varying sampling and analytical protocols. When data obtained from these studies is to be included in the baseline database, sampling and analytical protocols will meet EPA requirements.

### 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. Specifically, problem area monitoring will be undertaken to:

- Evaluate trends in pesticide/groundwater baseline monitoring data.
- 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 SMP. Factors which will contribute to the selection of problem area monitoring locations may include but is not limited to:

- Evaluation of vulnerability data to include that generated from computer based decision aids and or models (i.e. DRASTIC, etc.).
- Agricultural management practices.
- NASS commodity and pesticide use surveys.

- Previous monitoring data.
- Pesticide physical and chemical characteristics.
- Site specific information such as hydrologic setting (i.e. depth to groundwater, etc.), 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 SMP. Whenever possible, these existing monitoring programs will be utilized to satisfy the monitoring requirements within a given problem area. These monitoring programs could include those undertaken by NHSS-R&L, NDEQ, NRDs, USGS, and UNL for such purposes as GWMA designation, CDC studies, research, etc.

Should current monitoring efforts be determined as insufficient to meet the goals of the SMP, NDA, in concert with the SMP Advisory Committee, will contact affected pesticide registrants to solicit input on the design of an effective monitoring strategy and to determine the registrant's ability to support resultant monitoring activities. If insufficient funds are available to support monitoring necessary to insure safe use of a pesticide, NDA may designate the pesticide as a state-limited-use pesticide and prohibit its use within a given problem area. NDA will work closely with the SMP Advisory Committee, 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 SMP Advisory Committee, will do the following:

- a. Establish the general geographic area of concern;
- b. Evaluate existing monitoring data (e.g. NDH, NRD, NDEQ, USGS, UNL, etc.) for completeness and appropriateness;
- c. Evaluate the need for monitoring wells in addition to those in existing use;
- d. Establish the number, location, and type (e.g., irrigation, municipal, domestic, dedicated) of monitoring wells to be used for that area; and
- e. Establish the general sampling schedule and parameters to be analyzed for all monitoring wells in the area.

Appendix I provides an approximation of possible problem areas based upon past monitoring efforts. These locations are not intended to indicate specific locations or levels of pesticides in

groundwater. Rather, they represent general areas in which pesticides have been detected and/or conditions suggest that pesticide contamination of groundwater may occur.

### *Design*

All wells within a problem area monitoring network 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. These monitoring efforts and resultant data will be coordinated through the SMP Advisory Committee. While sampling techniques and analysis may vary slightly, all sampling and analysis will be done in accordance with EPA approved methods and QA/QC.

## 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 eight.
- Provide detailed information regarding the effects of prevention or mitigation efforts on local pesticide concentrations.

### *Scope*

Response monitoring shall be initiated upon evaluation of site specific parameters such as soil type, land use, pesticide use, pesticide detections, etc. This analysis would 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 SMP Advisory Committee, will evaluate the ongoing monitoring and determine if additional monitoring (e.g. more monitoring wells, advanced analytical techniques, installation of dedicated monitoring wells, etc.) is necessary.

### *Design*

Wells included within a 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, NHSS-R&L, NRDs or agents acting on their behalf. Samples will be obtained and analyzed in accordance with EPA approved methods and QA/QC.

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

It is anticipated that groundwater 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 SMP requirements will be used. Upon determination by the SMP Advisory Committee that these monitoring activities are insufficient to meet a given areas need's, the NDA in cooperation with the SMP Advisory Committee will formulate a recommendation as to the most efficient approach to satisfy monitoring needs. NDA will expand its monitoring efforts to address insufficiencies based upon consultation with the SMP Advisory Committee and available resources. Monitoring activities which could be included are such items as training for sampling personnel, general and specialized analysis for various pesticides and groundwater, or installation of dedicated monitoring wells in appropriate locations.

## **COMPONENT 7: PREVENTION**

Remediation of pesticide contaminated groundwater is costly and, in many instances, unrealistic. 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 groundwater protection efforts.

The State of Nebraska has numerous programs dedicated to the prevention of groundwater contamination by pesticides. Preventative activities may include research, nonregulatory and/or regulatory programs. The success of either regulatory or nonregulatory approaches is ultimately dependent upon the acceptance and support of the pesticide user. As such, these programs will require close cooperation between industry, cooperative extension and state, federal, and local agencies to insure pesticide users receive consistent and accurate information regarding their responsibilities and contributions relative to a successful groundwater 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 insure adequate protection of our groundwater resources.

Activities to prevent pesticide contamination of groundwater include the following:

### **RESEARCH**

Pesticide related research examines numerous issues important to prevention. Researchers evaluate pesticide fate and transport processes, water management, decision aids, integrated pest management 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, NRDs, NDEQ, USGS, and USDA-ARS.

### **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 to increase awareness in general, to site-specific technical assistance programs that directly address pesticide use patterns in relation to soil, cropping, and use patterns. Some of the educational opportunities currently available include the following:

- Certification and Training - Certification of restricted use pesticide applicators and commercial lawn care and structural pest control applicators 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 groundwater contamination, techniques to reduce the risk to groundwater, etc. Certified applicators must demonstrate a fundamental understanding of pesticides and how to make safe use of 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, important pesticide characteristics, mode of action, etc. As pesticide SMPs are implemented, pesticide training will be bolstered to address any additional needs.
- Crop Protection Clinics - CES conducts approximately twelve crop protection clinics annually which are attended by agriculturalists, crop consultants, commercial 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 best management practices capable of reducing pesticide contamination of surface and groundwater. Management practices addressed include the use of biological controls, cultural practices, crop rotations integrated pest management systems, alternative products, resistant varieties, etc. Crop protection clinics will also provide an additional opportunity to educate large numbers of Nebraska farmers, and other agricultural professionals of any Pesticide SMP.
- 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, etc. NRDs have many successful programs intended to educate growers of proper water management techniques, nitrogen management and other agricultural practices which will have a beneficial effect on water quality.
- Newsletters and other mailings - CES distributes a number of newsletters and bulletins throughout Nebraska. These include *Crop Watch*, *Crop Production News*, and the *Soil Science News*. Additionally the CES produces and distributes *Neb Guides* and other valuable outreach materials which address agricultural and nonagricultural pesticide uses and issues.

NRDs also distribute newsletters and other educational materials which are capable of reaching numerous interests.

In addition to newsletters published by the NRDs, and the CES there are many agricultural associations which publish newsletters for their constituents. As

Pesticide SMPs are implemented, opportunities will be pursued to address specific commodity or user concerns through these association's 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 SMP development and implementation.
- Media Exposure - News releases will be utilized to advise the public of SMP development, implementation and requirements.

## **REGULATORY PREVENTION MEASURES**

In some instances, education and voluntary programs may be insufficient to prevent groundwater contamination. 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 groundwater quality. These options were described within Component 2 of this document and include designation of a GWMA by the NDEQ and NRDs and restrictions on timing, rate, methods of application and other conditions of pesticide use.

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

### **Tiered Approach**

Following discovery of any groundwater contamination, necessary appropriate actions will be taken. These actions may include voluntary and/or mandatory measures. Voluntary steps may be utilized when there is a potential for contamination or concentrations below some threshold level have been identified. Mandatory measures may be implemented in the event there is an increasing trend in pesticide concentrations which indicates some reference point established by the NDEQ and/or NHSS-R&L may be or has been exceeded. Following are examples of activities which may be included as a part of a voluntary or regulatory activity:

#### *Voluntary Measures*

1. Education

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

*Regulatory Measures*

1. Mandatory adoption of BMPs
2. Restrictions to soil type, rate of application, method of application, and timing of application
3. Use of anti-back siphoning devices for chemigation
4. Well construction and plugging standards
5. Training
6. Other restrictions

A more detailed explanation of how and/or when these measures may be implemented is provided in component 8.

## **COMPONENT 8: RESPONSE TO DETECTIONS OF PESTICIDES**

The protection of groundwater used as drinking water is of primary importance in Nebraska. The detection of pesticides in groundwater may occur through various monitoring activities. Upon detection of a specific pesticide identified by the EPA or NDA as having significant potential to adversely impact groundwater, a range of actions will be initiated. A similar approach may be utilized to address the occurrence of pesticides in surface waters which are hydrologically linked to groundwater. In all cases, the economic benefits of a pesticides use will be measured in conjunction with environmental and health aspects prior to formulating a regulatory response which would limit a pesticides availability for use.

### **NRD Activities**

Prior to discussing potential SMP responses to detections, it is important to note that Nebraska's NRDs administer a wide variety of programs which also provide mechanisms for responding to detections of pesticides. Care should be taken not to duplicate ongoing efforts. NRD activities/programs deemed adequate to meet the goals of the SMP will serve as the basis for addressing the pesticides and groundwater concerns for specific vulnerable areas within the NRD. In these instances, the SMP should be utilized to augment and/or support NRD activities in the local area of concern.

Upon notice from EPA that a pesticide has been named as one requiring an SMP, or State determination that an SMP may be warranted, NDA will inform appropriate state and local agencies. This will allow these agencies the opportunity to assess their current programs to determine how these may be impacted or adapted to address issues related to SMP designation. Of significant importance in this process will be the GWMPs developed by local NRDs. GWMPs covering areas of the state determined as potentially vulnerable to groundwater contamination from pesticides will be reviewed by the SMP Advisory Committee to determine the plans adequacy to address issues related to the pesticide in question. In cases where GWMA's have been designated, the affected NRDs have developed Action Plans similar to GWMPs for managing nonpoint source pollution. Those portions of NRDs covered by GWMA's do not require development of separate GWMPs which frequently have similar requirements.

Although GWMPs were not developed with EPA's SMP process in mind, the plans do outline the NRDs intended approach to address non-point source contamination concerns. The plans establish action levels and detail responses the NRDs intend to undertake in the event of contamination. These plans and activities generally emphasize nitrogen fertilizers. However, planning efforts of NRD's 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 the plan, the SMP Advisory Committee will determine how or if the plan may meet SMP goals. The SMP Advisory Committee may determine that some GWMPs or Action

Plans do not address the issue of pesticides sufficiently to meet the requirements of the SMP. 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 the SMP only.

### **SMP Action Levels**

In Nebraska, the NDEQ is responsible for the adoption of standards for pesticides in surface water and groundwater, and the NHSS-R&L is responsible for the adoption of standards for pesticides in drinking water. The NDA shall utilize these standards, in consultation with an SMP Advisory Committee, in assigning nonpoint source action levels for any SMP at which prevention and mitigation measures will be implemented. Any pesticide specific SMP shall provide, at minimum, two contaminate action levels which are outlined in Table 8-A. These actions will be intended to 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.

Response actions described in Table 8-A 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 agent. This response strategy represents a guide for determining an appropriate minimum response to the occurrence of pesticides in groundwater. Actual responses will vary depending upon site and incident specific variables or pesticide characteristics. As MCLs, persistence, degradates and other parameters imperative to assigning action levels vary between pesticides, action levels will be assigned within the context of individual pesticide specific SMPs. Generally, it is expected that response triggers will be similar to the following:

LEVEL A - Contaminate concentrations at or above 10% of the MCL yet below 50% of the MCL or, in the absence of an MCL, a numerical standard established by the NDEQ for unfinished water or NHSS-R&L for finished water.

LEVEL B - Contaminate concentrations equal to or above 50% of the MCL and five years of supporting data indicating increasing trends which in pesticide concentrations, or any confirmed detection exceeding the MCL. In the absence of an MCL, a numerical standard established by the NDEQ for unfinished water or NHSS-R&L for finished water will be used.

**Table 8-A Contaminant Action Level Guidelines**

Action	Minimum Response Actions
Level A	<p>1) Annual notification of NDEQ, NDA, NHSS-R&amp;L, and appropriate NRD by monitoring entity.</p> <p>2) Encourage voluntary adoption of BMPs, etc.</p>
Level B	<p>1) Annual update of NDEQ, NDA, NHSS-R&amp;L, appropriate NRD, and pesticide registrant regarding status of previously identified level B concentrations; annual notification of aforementioned groups of newly identified level B concentrations; and immediate notification of new detections exceeding the MCL.</p> <p>2) Review of problem and alternatives by a committee designated during the pesticide specific SMP process. Upon completing problem review, the SMP Advisory Committee may recommend one or more of the following actions:</p> <p>a) Additional studies to confirm and assess the problem and/or a review of existing monitoring data to evaluate possible trends, etc.</p> <p>b) Increased efforts at encouraging voluntary adoption of BMPs.</p> <p>c) Mandatory requirements for BMPs or other restrictions. These may include, but are not limited to, restrictions on timing, rate, or method of application or possible prohibition of use.</p>

The number of wells 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 hydro-geology, soil and pesticide characteristics, pesticide use patterns, cropping patterns, etc. The complexities surrounding determination of numbers of wells 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 5, assessment and planning, by the SMP Advisory Committee. The SMP Advisory Committee will define the mechanisms for determining the appropriate numbers of wells experiencing detections needed to initiate a response and problem area delineation within pesticide specific SMPs.



Initial level B responses will focus on education and voluntary adoption of BMPs wherever possible. Regulatory or mandatory restrictions will not be utilized unless it is determined that education and voluntary measures would be unable to effectively address the problem. A prudent approach would provide voluntary programs an opportunity to effect change in contaminate concentrations before moving to mandatory restrictions. This will help ensure that unnecessary restrictions would not be implemented where there is potential for voluntary efforts to succeed.

Activities may be "staged down" when appropriate. Staging down of an activity may take place upon a determination that pesticide concentrations have declined to a lower action level and that changes in management practices have been adopted which will continue to reduce the risk of groundwater contamination. Staging down of activities within level B may also occur when detections are below the MCL and there is five years of supporting data indicating decreasing trends in pesticide concentrations.

### **Point Source**

In the event that assessment of the site, monitoring data, and other information reveals the probability of point source contamination, NDEQ will address the problem in a manner detailed in *Title - 118 Groundwater Quality Standards and Use Classification*. Title 118 will be employed for point source contamination regardless of whether it is a Level A or Level B concentration. In addition to the actions of NDEQ, point source contamination of groundwater which may have resulted from improper pesticide handling, disposal or other violations of the pesticide label shall be referred to the NDA for appropriate investigation and action as prescribed under the Nebraska Pesticide Act.

### **Nonpoint Source**

Where pesticide contamination of groundwater is detected at Level A, the data will be made available annually to appropriate agencies to include at minimum NDEQ, NDA, NHSS-R&L, and the appropriate NRD. Affected well owners will be notified of the findings and their significance. Measures will be taken to identify users of the pesticide in the area and to encourage these pesticide users to contact the 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.

Once pesticides are detected in groundwater at a concentration corresponding to level B, an appropriate response shall be made to prevent further degradation of groundwater. A response will include one or more of the following elements: 1) notification of the well owner, appropriate

agencies and registrant(s), 2) review of the problem and alternatives, 3) additional studies and/or review of existing monitoring data, 4) modification of existing use practices or prevention strategies.

### Notification

If during the monitoring activities of the NDEQ, NDA, an NRD or NHSS-R&L a pesticide concentration corresponding to level B is detected, the agency conducting the monitoring will notify each of the other appropriate agencies in the manner defined in Table 8-A. This exchange of information will facilitate communication regarding areas of concern and aid in insuring an effective and coordinated response.

Notification of the well owner of detections below the MCL and the potential significance of the detection shall be addressed by the monitoring entity. The owner of any affected well shall be notified immediately of any detection above the MCL. Owners of private wells will be encouraged to contact the 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.

### Review of Problem

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

### Site Investigation

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

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

### Modification of Prevention Activities

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

It is anticipated that the local NRD(s) will play a pivotal role in developing and implementing any protection strategy. These local agencies have extensive experience in establishing grassroots support for groundwater protection activities, conducting education and outreach, and establishing monitoring and groundwater protection programs. Many of the programs and activities currently undertaken by the NRDs with respect to protecting groundwater from nitrates will effectively dovetail with any future activities directed towards a pesticides and groundwater strategy.

The valuable role played by NRDs in groundwater protection cannot be overstated. Their proximity to the problem area, understanding of local conditions and people are key to successfully implementing any groundwater protection strategy. Should an NRD be unable to assist in encouraging adoption of voluntary BMPs by pesticide users, it is much more likely that mandatory restrictions or prohibition of use in the problem area may be necessary.

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, voluntary use reductions, etc.
- 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 timing or method and rate of application.
- Prohibition 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, registrants, etc. and these groups should be approached early in the process to solicit their support and insights.

In the event that an NRD or NDEQ feels use restrictions or prohibitions of use for a given pesticide are needed, they may request that NDA evaluate the need for these restrictions and ask that NDA designate the pesticide as a state-limited-use pesticide (SLU). The NDA shall base its decision to establish a pesticide as a SLU pesticide upon a thorough evaluation of all information regarding the need for such a designation and shall conduct a public hearing as detailed within the Nebraska Pesticide Act. During the public hearing, NDA shall solicit and hear evidence regarding the designation of any given pesticide as a SLU pesticide from all interested parties.

NRDs vary significantly in both technical and financial resources. Any successful GWMA or GWMP program will therefore require a commitment on the part of state and federal agencies to assist in identifying and providing resources to the NRDs in the development and implementation of these groundwater protection efforts.

Appendix C includes a useful overview of the Nebraska Groundwater Management and Protection Act.

## **COMPONENT 9: ENFORCEMENT MECHANISMS**

Different avenues of enforcement are available based upon the circumstances of a detected groundwater contamination. NDA has primary responsibility for enforcing pesticide control laws in Nebraska. The Nebraska Pesticide Act and a cooperative agreement with EPA regarding FIFRA establishes the authority of NDA as the state lead agency for regulation of pesticides. The Bureau of Plant Industry currently has a staff engaged in the investigation of misuse complaints and other pesticide related activities. NDA conducts pesticide use inspections which could be used to ensure compliance with possible use restrictions associated with any pesticide specific SMP. Enforcement tools currently available include suspension or revocation of a pesticide applicator's license; assessment and collection of a civil penalty from persons violating any provision of the Nebraska Pesticide Act; referral to the Attorney General or the county attorney to pursue appropriate actions; or referral to the EPA.

NDEQ is the state lead agency for surface and groundwater quality. Under an agreement with the NDA, NDEQ, in association with local NRDs, administers Nebraska's chemigation program which includes permitting and inspection of chemigation facilities, etc. The 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.

NDEQ also administers rules and regulations pertaining to the secondary containment and loadout facilities. Violations of these regulations may be referred to the Attorney General or county attorney for appropriate actions.

NRDs administer provisions established under the GWMA program and GWMPs. Enforcement authorities available under an GWMA or GWMP include issuance of cease and desist orders and suits 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.

An overview of enforcement authorities is provided in Appendix J.

## **COMPONENT 10: PUBLIC AWARENESS AND PARTICIPATION**

Public outreach, awareness and participation is essential to the state's water planning and to the development and implementation of a successful SMP. The Neb. Rev. Stat. § 84-1408 thru § 84-1414 and the Nebraska Administrative Procedures Act, Neb. Rev. Stat. § 84-901 thru § 84-920 provide the primary legal framework for informing and providing public access to governmental agency rule making and meetings. These statutes detail requirements government must adhere to in order to insure public access to information regarding issues of public interest.

Information regarding SMP development, progress, requirements, etc., will be distributed through traditional media contacts. Initial drafts of any SMP 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 conduct public meetings to hear any remaining concerns before formally submitting the generic and any subsequent pesticide specific SMP to the EPA for review.

An SMP Advisory Committee shall be established for any pesticide specific SMP. The committee shall provide suggestions and recommendations regarding SMP implementation. The SMP Advisory Committee will consist, at minimum, of NDA, a representative of an NRD(s), NDEQ, NHSS-R&L, NNRC, NDWR, CES, UNL-Water Center, USGS, NRCS and at least one representative of an affected pesticide user group, a registrant and a public interest or environmental organization. The SMP Advisory Committee role in SMP development is one of consultation to insure inclusion of various perspectives, coordination of activities and formulation of useful and feasible recommendations regarding implementation of a successful SMP. These recommendations will provide useful information and suggestions regarding groundwater protection activities.

If a pesticide detection places a public water supply out of compliance with the Nebraska Safe Drinking Water Act, NHSS-R&L may 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 detect is sufficiently high as to automatically result in exceedence of an annual MCL when averaged over quarterly sampling.

Should implementation of any SMP result in an GWMA designation or changes in a GWMP in an NRD or any changes in any state agency's rules and regulations, provisions have been made to insure 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 Pesticide Act. During the public hearing, NDA shall solicit and hear evidence regarding the proposed rule change from all interested parties. Additionally, the NDA has established a Pesticide Advisory

Board consisting of representatives of various state agencies and trade associations. This group provides comments and recommendations regarding any proposed rule changes proposed by NDA.

Throughout the SMP process, opportunities shall be pursued by the NDA, NDEQ, NRDs, CES, and others to inform the public of SMP development, requirements, etc. The public will be informed through traditional media outlets (i.e. newspapers, radio and television). 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.

## **COMPONENT 11: INFORMATION DISSEMINATION**

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

Many of the activities described in Component 7, "Prevention Strategies," will be instrumental in the successful dissemination of information regarding any SMP. Those activities detailed in Component 7 and of primary importance to information dissemination include: certification and training of pesticide applicators; crop protection 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 SMPs will be mailed to affected commodity organizations and user groups. The 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 SMP requirements is limited, the NDA will consider direct mailing of information to applicators in the affected user groups.

### Role of Other Groups in Informing Users

\_\_\_\_\_The educational roles of the CES, NRDs and others have been previously outlined in Components 3 and 7. As mentioned previously throughout this plan, commodity and trade organizations, pesticide dealers, and registrants will play a major role in SMP implementation. These groups will prove invaluable in the education of affected persons regarding SMP 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 would require supplemental labeling to inform the pesticide user.



## COMPONENT 12: RECORDS AND REPORTING

The NDA will maintain all records relating to the development and implementation of any SMP for a minimum period of four years. The information maintained will include the following:

- results from ground or surface water sampling and monitoring undertaken in support of the SMP to include number of samples taken and number of detects of subject pesticide
- the number of, and a summary of, inspections performed to determine compliance with groundwater labeling or any pesticide specific SMP provisions
- number and summary of completed enforcement actions related to non-compliance with the SMP
- a summary of significant findings or actions
- accomplishments
- identification of special issues relating to the SMP
- resource needs and availability

The NDA currently provides mid- and end-of-year reports to Region VII EPA, Pesticide Branch as required to satisfy the requirements of the cooperative agreement regarding administration of FIFRA within Nebraska. These reports shall include the appropriate information outlined above. NDA shall notify Region VII EPA of any significant pesticide detection requiring modification of any pesticide specific SMP or any additional restrictions to the pesticides use. The NDA will make available to EPA, upon request and appropriate allowance of time, any and all records related to the development and implementation of state management plans.

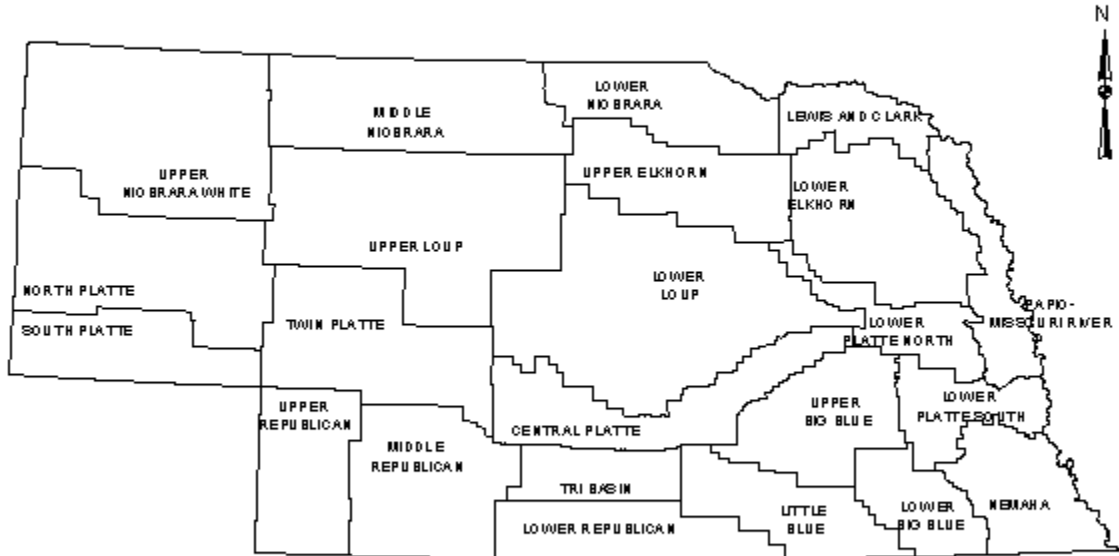
In addition to information provided in mid- and end-of-year reports, NDA shall submit biennial reports to Region VII EPA which give thorough reconsideration to the strategies and implementation items listed in the generic or any pesticide specific SMP. In its review the NDA will consider, in addition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

- Does the plan still reflect the current philosophy on groundwater management?
- Are the roles of the cooperating entities still the same?
- Are there new or modified prevention strategies that need to be incorporated?
- Has plan been appropriately implemented?

- Has the plan been effective in achieving its stated goals?
- Does the plan require adaptation to changing circumstances?

# Appendix A

## Nebraska Natural Resources Districts



Central Platte NRD  
 215 North Kaufman Ave  
 Grand Island, NE 68803

Tri-Basin NRD  
 1308 2nd St  
 Holdrege, NE 68949

Lower Platte North NRD  
 PO Box 126  
 Wahoo, NE 68066-0126

Twin Platte NRD  
 PO Box 1347  
 North Platte, NE 69103-1347

Lower Platte South NRD  
 PO Box 83581  
 Lincoln, NE 68501-3581

Upper Republican NRD  
 PO Box 1140  
 Imperial, NE 69033-1140

Lower Republican NRD  
 PO Box 618  
 Alma, NE 68920-0618

South Platte NRD  
 PO Box 294  
 Sidney, NE 69162-0294

Middle Republican NRD  
 PO Box 81  
 Curtis, NE 69025-0081

Upper Big Blue NRD  
 105 Lincoln Avenue  
 York, Nebraska 68467  
 (402) 362-6601

Lower Big Blue NRD  
805 Dorsey Street, Box 826  
Beatrice, Nebraska 68310  
(402) 228-3402

Upper Elkhorn NRD  
301 North Harrison Street  
O'Neill, Nebraska 68763  
(402) 336-3867

Lower Elkhorn NRD  
Country Club Plaza  
700 West Benjamin Avenue  
P.O. Box 1204  
Norfolk, Nebraska 68702  
(402) 371-7313

Little Blue NRD  
Second and Main Street  
P.O. Box 100  
Davenport, Nebraska 68335  
(402)364-2145

Upper Loup NRD  
First and Main Street  
P.O. Box 212  
Thedford, Nebraska 69166  
(308) 645-2250

Lower Loup NRD  
Hadar Industrial Park  
North Highway 11  
P.O. Box 210  
Ord, Nebraska 68862-0210  
(308) 728-3221

Lewis and Clark NRD  
North Highway 15  
P.O. Box 518  
Hartington, Nebraska 68739-0518  
(402) 254-6758

Papio - Missouri River NRD  
8901 South 154th Street  
Omaha, Nebraska 68138-3621  
(402) 444-6222

Nemaha NRD  
125 Jackson Street  
P.O. Box 717  
Tecumseh, Nebraska 68450  
(402) 335-3325

Upper Niobrara - White NRD  
807 East 3rd Street  
P.O. Box 470  
Chadron, NE 69337  
(308) 432-4469

Middle Niobrara NRD  
526 East 1st Street  
Valentine, Nebraska 69201  
(402) 376-3241

Lower Niobrara NRD  
410 Walnut Street  
P.O. Box 350  
Butte, Nebraska 68722  
(402) 775-2343

North Platte NRD  
1054 Rundell Road  
P.O. Box 36  
Gering, Nebraska 69341  
(308) 436-7111

## APPENDIX B

### Chapter 4

*A Manual on the Preparation of Special  
Groundwater Protection Area Action Plans*  
(NDEQ & NARD, 1990)

Key to eventual development of an action plan for a designated special groundwater protection area (SPA) is an understanding of the process which leads to the designation, action-plan development, and administration of the action plan. Of interest and importance to a natural resources district (NRD) in this process is timing. This chapter will explain in some detail the process both in text and with a flow chart. See figure 4-1.

#### Origination of Requests for Designation

The Nebraska Groundwater Management and Protection Act (GWMPA) does not specify who should be the source for a request for the designation of an SPA other than a state agency or political subdivision. See NRS SS. 46-674.03, -674.04. Given their key responsibilities once an SPA is designated, NRDs should make every effort to be either the requestor or knowledgeable about the request at the earliest stage. An NRD that feels that requests could come from its board may want to develop a system for making requests and make that system widely and publicly known. Certainly, NRDs should encourage all other governmental subdivisions within their district to let them know when the governmental subdivision may have submitted a request for an SPA to the Nebraska Department of Environmental Control (NDEC).

NDEC will notify an NRD when a request for SPA designation in their district has been submitted. See 196 NAC 3.002. This notification will include a copy of the request and a general description of the area that might be considered for inclusion in the SPA. From this point onward, NDEC will work with the NRD to ensure that they are aware of the process and progress being made toward determination of SPA designation.

The GWMPA does not specify what should be in the request for an SPA designation. The best advice would be for the NRD or any other requestor to work with NDEC prior to submitting the request. It is highly recommended that a meeting between NDEC, the NRD, and the requestor, if other than an NRD, be held before the request is formally submitted to NDEC. Such a meeting could be part of NDEC's preliminary investigation required by the act. At such a meeting NDEC can determine the complete nature of the possible request and the information available to support the request. This process will ensure that NDEC has the best possible advance warning and information about the request and that only requests of the highest priority and potential will be submitted. Additionally, it may be determined that the request would be best submitted after additional information is obtained by the NRD and/or requestor. The above procedures are not intended to subvert the purpose of the law but to make it more workable and effective and to prevent wasted efforts on the part of the NDEC or any NRD.

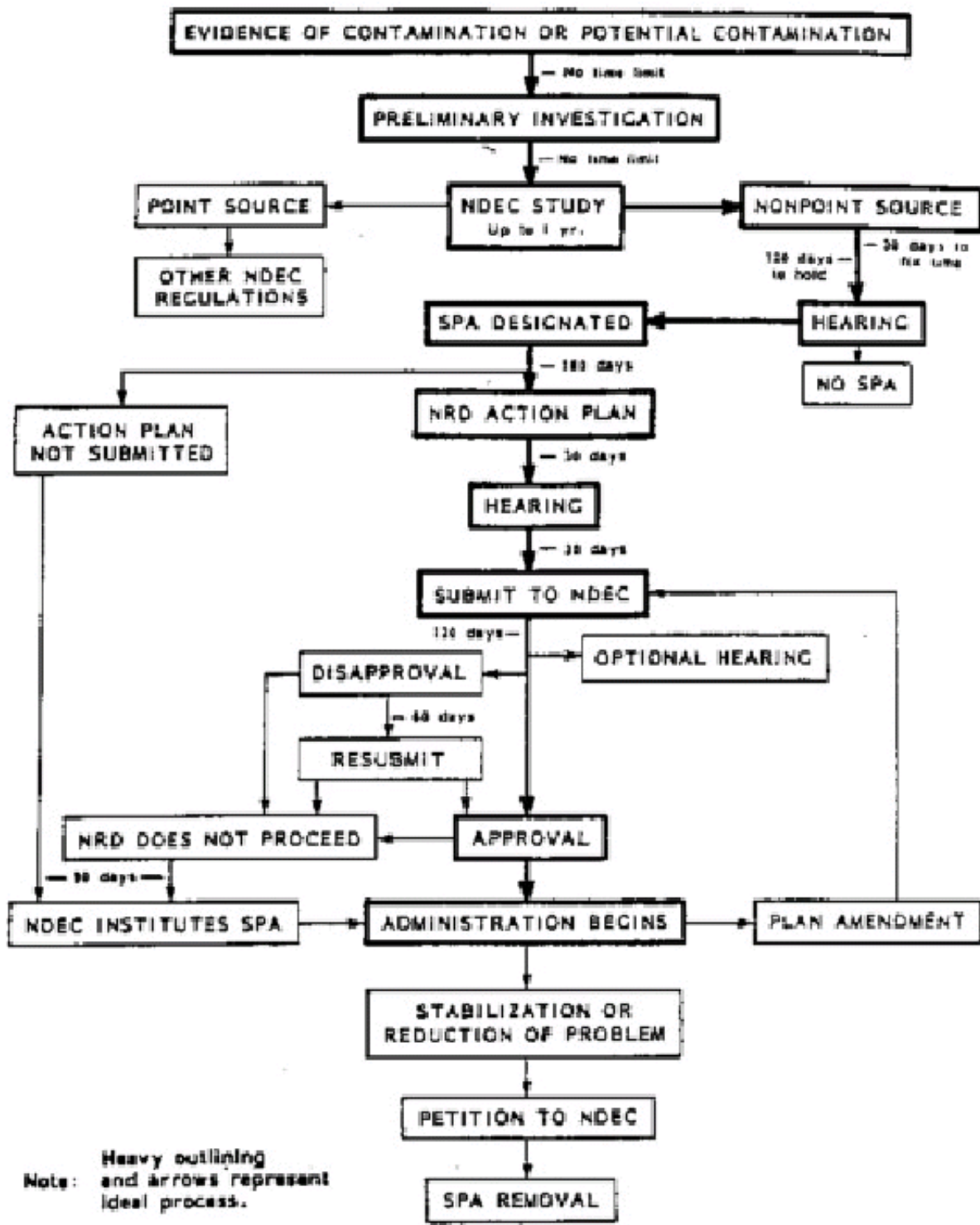


FIGURE 4-1. FLOW CHART OF SPA PROCESS



At this point it is important to remember that requests for SPA designation can be made if there is reason to believe that contamination of groundwater is occurring or likely to occur in the reasonably foreseeable future. See NRS S. 46-674.07(1). This prevention aspect makes even more important the earliest coordination between NDEC, an NRD, and a requestor if other than an NRD. Such coordination, which would include pre-request meetings as described in the previous paragraph, is vital in these cases where trends as shown in existing information will be the basis for a request for designation.

### SPA Designation Process

#### Designation Study

Upon receiving a request for SPA designation and after a preliminary investigation, if the NDEC director believes that groundwater contamination is occurring or is likely to occur in the area within the reasonably foreseeable future, NDEC must, in cooperation with any appropriate state agency and NRD, initiate a study to determine the source or sources of the contamination and the affected area. NRS S. 46-674.04 The study must be completed in 1 year, at which time NDEC must issue a written report. The study must take into account any ground-water quality portions of the NRD groundwater-management plan. Most plans at least partially address quality concerns. But, since a quality concern is not required in these plans, the plans may have limited impact on the SPA process. If the study indicates that one or more of the contamination sources is a point source, NDEC must expeditiously use the procedures authorized in the Nebraska Environmental Protection Act to stabilize or reduce the level and prevent the increase or spread of such contamination. NRS S. 46-674.05.

#### Designation Hearing

If the study indicates that one or more of the sources of groundwater contamination is not a point source or does not have the potential to be such a source, the NDEC director must hold a public hearing to consider SPA designation. NRS S. 46-674.46. Within 30 days after issuing the study report, NDEC must consult with the affected NRD or NRDs and establish a place for the SPA-designation hearing. The hearing must be held within 120 days after the NDEC report has been issued. Notice of the hearing must be published weekly for 3 consecutive weeks prior to the hearing and must identify the area to be considered for SPA designation. The purpose of the hearing is to consider the NDEC report, to hear any other evidence, and to obtain testimony regarding whether an SPA should be designated. All interested persons must be allowed to appear and give testimony. The University of Nebraska-Lincoln Conservation and Survey Division, the Nebraska Department of Health, the Nebraska Department of Water Resources, the Nebraska Natural Resources Commission, and the affected NRD(s) must present at the hearing any relevant information in their possession. The NDEC director may conduct additional studies after the designation hearing, after which the director must determine whether an SPA should be designated.



## Designation Criteria

In evaluating SPA designation, the considerations by the director of NDEC must include:

- (1) whether groundwater contamination has occurred or is likely to occur in the reasonably foreseeable future;
- (2) whether groundwater users, including but not limited to domestic, municipal, industrial, and agricultural users, are experiencing or will experience in the reasonably foreseeable future substantial economic hardships as a direct result of current or reasonably anticipated activities which cause or contribute to groundwater contamination;
- (3) whether methods are available to stabilize or reduce the level of groundwater contamination; and
- (4) administrative factors directly affecting the ability to implement SPA regulations. NRS S. 46-674.07(1).

If the NDEC director determines that an SPA should not be designated, he or she must issue an order to that effect. NRS S. 46-674.02(2).

If the NDEC director determines that an SPA should be established, the director must consult with the relevant state agencies and the affected NRD or NRDs in establishing the SPA boundaries. NRS S. 46-674.07(3). In making the boundary determination, the NDEC director must consider the effect of the boundaries on political subdivisions and the socioeconomic and administrative factors directly affecting the ability to implement local groundwater protection programs. When the boundaries have been determined, the NDEC director must issue an order designating the area as an SPA. NRS S. 46-674.07(4). The order must include a geographic and stratigraphic (i.e., geologic) definition of the SPA. The NDEC director must prepare a report specifying the reasons for establishing the SPA, fully disclosing all possible causes of contamination. NRS S. 46-674.07(3).

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## SPA Action - Plan Development

### Preparation and Hearings

Once an SPA is designated, within 180 days the local NRD or NRDs must prepare for NDEC review an “action plan” containing proposed regulations to stabilize or reduce contamination and to prevent its increase or spread. NRS S. 46-674.08. Within 30 days of the plan’s preparation, a public hearing on the plan must be held by the NRD or NRDs. The text of the proposed action plan must be made available to the public at least 30 days prior to the hearing. Within 30 days after the hearing, the NRD or NRDs must adopt and submit an action plan to NDEC.

## General Contents

Action plans must include the specifics of an NRD education program to inform persons of methods available to stabilize or reduce contamination levels and to prevent its increase or spread. NRS S. 46-674.09. Action plans must also include at least one of the following:

- (1 ) mandatory water-user participation in educational programs;
- (2) mandatory best management practices; and
- (3) other reasonable requirements necessary to carry out the purpose for which the SPA was designated.

Best management practices are defined as “schedules of activities utilized to prevent or reduce present and future contamination of groundwater which may include irrigation scheduling, proper timing of fertilizer and pesticide application, and other fertilizer and pesticide management programs.” NRS S. 46-674.09. In preparing and amending an action plan the NRD’s considerations shall include whether such action

- (1) will mitigate or eliminate the conditions which led to SPA designation or
- (2) will improve SPA administration. NRS S. 46-674.10.

SPA regulations may be varied within an SPA based on variations in land use, or climatic, hydrologic, geologic or soil conditions in order to control contamination in an effective and equitable manner. However, regulations must be uniform where such conditions are substantially similar.

## NDEC Approval or Disapproval

The NDEC director must approve or disapprove the proposed NRD action plan within 120 days of the plan’s submission to NDEC. NRS S. 46-674.10(2). The NDEC director may hold a public hearing on the proposed action plan prior to approving or disapproving the plan. In considering whether to approve or disapprove the plan (including an amended plan), the NDEC director’s considerations must include, but are not limited to, whether implementing the action plan

- (1) will mitigate or eliminate the conditions which led to SPA designation or
- (2) will improve SPA administration.

If the NDEC director disapproves the action plan, the order must list the reasons the action plan was not approved. NRDs have 60 days after action-plan disapproval within which to submit a revised plan. NRS S. 46-674.10 (4).

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### SPA Action-Plan Administration

#### NRD Administration

Once the plan has been approved, the regulations must be published weekly in local or locally-circulating newspapers for 3 consecutive weeks, the last publication occurring no less than 10 days before the SPA regulations take effect. NRS S. 46-674.11. SPA regulations must be administered by the NRD for the period of time necessary to stabilize or reduce groundwater contamination and to prevent its increase or spread. Action plans may be amended following the same procedures as for their adoption.

NRDs can levy a property tax of up to two cents per \$100 on all taxable property within the SPA for program administration. NRS S. 46-674.19.

#### NDEC Administration

NDEC must establish and enforce SPA regulations

- (1) if the NRD did not develop an action plan within 180 days of SPA designation,
  - (2) if the NRD does not submit a revised action plan within 60 days of an order of disapproval, or
  - (3) if the NRD submits a revised action plan which is not approved by NDEC.
- NRS S. 46-674.12.

NDEC must adopt SPA regulations within 90 days of

- (1) NRD failure to propose an action plan,
- (2) NRD failure to file a revised plan, or
- (3) NDEC disapproval of a revised action plan.

Before adopting SPA regulations the NDEC director must hold one or more public hearings on the proposed regulations, presumably within the SPA. NDEC is responsible for administering and enforcing its SPA regulations.

The GWMPA provides no source of special program financing for NDEC administration of an SPA.

### Penalties

Any person violating an SPA regulation is either

- (1) subject to a civil penalty of up to \$500 per day of violation, or
- (2) guilty upon conviction of a class III misdemeanor (0-3 months imprisonment, 0-\$500 fine, or both per day of violation).

Each day of continued violation constitutes a separate offense. NRS SS. 46-674.17, 28-106(1).

### Quality Monitoring and Information Programs

In addition to the action-plan preparation and implementation authorities described above, NRDs within which SPAs have been designated must establish in cooperation with NDEC a groundwater-quality monitoring program. NRS S. 46-674.17. The NRD must also, if appropriate, provide landowners or irrigation system operators with current information regarding fertilizer and chemical use relative to local soils and cropping patterns.

### SPA Removal

SPA designation may be removed by the NDEC director at an NRD's request if the director determines the groundwater contamination within the SPA has stabilized or been reduced to a level not detrimental to beneficial uses of groundwater. NRS S. 46-674.14. This language could pose a problem if it were mandatory, as the "not detrimental to beneficial uses" standard may be less stringent than the "prevention and elimination of health hazards" standard. Presumably the director will exercise his or her discretion consistent with the SPA program's broader purposes.

### Administrative Change and Review

There is no statutory provision for allowing an NRD to assume SPA regulation with NDEC approval if NDEC must establish and enforce SPA regulations. There also is no provision authorizing NDEC to review NRD administration of an SPA program or to assume administration of an improperly administered SPA program. However, close cooperation between NDEC and the NRD is desirable. NDEC will attempt to provide all the technical assistance that its resources will allow.

## APPENDIX C

### An Outline of Nebraska's Ground Water Management and Protection Act

Prepared by James R. Cook, Legal Counsel  
Nebraska Natural Resource Commission  
1992 Dealer "Positive" Symposium  
November 17, 1992

Since its original enactment in 1975, the Groundwater Management and Protection Act (§§46-656 to 46-674.20) has been modified several times. There are now three different kinds of areas that can be established to allow management of groundwater use and related activities. The similarities and differences in those areas are outlined below. The number at the end of most items is the applicable Nebraska statute.

- I. Reasons for establishing
  - A. Control areas - To protect groundwater quantity. §46-658
  - B. Management area - To protect groundwater quantity or quality. §§46-673.01 to 46-673.13
  - C. SPAs - To protect groundwater quality from nonpoint source contamination. §46-674.06
  
- II. Method of formation
  - A. Control areas - By director of DWR after a hearing is requested by NRD; test is whether there is an inadequate supply of groundwater for present and reasonably foreseeable use. §46-658
  - B. Management areas - By NRD after preparation of a groundwater management plan and a hearing conducted by NRD; no specific test that must be applied. §§46-673.01 to 46-673.06
  - C. Special protection areas (SPAs) - By director of DEQ after a study, hearing and determination that nonpoint source contamination is occurring. §§46-674.04 to 46-674.07

### III. General consequences of formation

#### A. Control areas

1. Permits immediately required for new nondomestic wells over 100 gpm. §46-659
2. NRD may adopt regulatory controls that are subject to NDWR approval. §46-666
3. NRD may levy tax in control areas that is up to 1.8¢ per \$100 actual valuation. §46-673

#### B. Management areas

1. Permits immediately required for new nondomestic wells over 100 gpm. §46-659
2. NRD shall adopt one or more of the authorized controls (those adopted must be in the Management plan). §46-673.06
3. NRD shall determine the total amount of water to be withdrawn consistent with groundwater reservoir life goal and adopt controls to allow the beneficial use of that amount of water. §46-673.08
4. NRD may levy tax up to 1.8¢ per \$100 valuation in management area. §46-673

#### C. SPAs

1. Permits are not required for new wells.
2. The NRD involvement is to prepare (within six months) an "action plan" designed to stabilize or reduce the level and prevent the increase or spread of groundwater contamination. §46-674.08
3. NRD holds hearing on action plan and submits it to NDEQ for approval. §46-674.08
4. NDEQ shall adopt protective measures if NRD does not. §46-674.12
5. NRD monitors water quality and provides irrigators with

information about fertilizer and chemical usage. §46-674.18

6. NRD may levy a tax in whole district up to  $\frac{1}{2}\text{¢}$  per \$100 actual valuation. §46-674.19

IV. Authorized controls

A. Control areas. §46-666

1. Allocate water among groundwater users.
2. Adopt a system of rotation.
3. Adopt well spacing requirements.
4. Require water meters.
5. Close the area to further wells.
6. Adopt other reasonable rules and regulations.

B. Management areas. §46-673.09

1. Allocate water on an acre/inch basis.
2. Adopt a system of rotation.
3. Adopt well spacing requirements (more limited authority than for control areas). §46-673.12
4. Require water meters.
5. Require best management practices (irrigation scheduling, timing of fertilizer and pesticide application, and other fertilizer and pesticide management programs). §46-657(18)
6. Require analysis of water or deep soils for fertilizer and chemical content.
7. Develop educational programs to protect water quality (see special protection areas). §46-674.09
  - a. Require water users to participate in educational programs.

- b. Require best management practices (see definition under B.5 above).
- c. Impose such other reasonable requirements as are necessary to accomplish the purposes for which SPA was formed.

V. Enforcement

- A. For all three types of areas, the primary enforcement tool is the issuance of Cease and Desist Orders and suits against alleged violators who fail to abide by Cease and Desist Orders. §46-663
- B. Violation of Cease and Desist Orders is a Class IV misdemeanor.
- C. Violation of SPA statutory provisions for which penalties are not otherwise provided, subject the violator to a civil penalty of up to \$500 or to prosecution for a Class III misdemeanor. §46-674.17

VI. Areas established to date

- A. Control areas exist in the Upper Republican, Upper Big Blue and Little Blue NRDs.
- B. Water management areas exist in the Central Platte, South Platte, and Tri Basin NRDs and are in the process of being formed in the Upper Elkhorn and Lower Loup NRDs.
- C. Special protection areas exist in the Little Blue, Lower Republican, Middle Republican, and Upper Big Blue NRDs. Studies of other areas are under way.



## APPENDIX D

### PESTICIDE AND WATER QUALITY RELATED AGENCIES

#### FEDERAL AGENCIES

##### Farm Service Agency

Mr. Frank Johannsen, State Executive  
Director  
USDA Farm Service Agency  
7131 A Street  
P.O. Box 57975  
Lincoln, Nebraska 68505-7975  
(402) 437-5581

##### U.S. Corps of Engineers

Col. Donald E. Hazen, Commander  
U.S. Corps of Engineers  
Missouri River Division  
Downtown Station  
P.O. Box 103  
Omaha, Nebraska 68101-0103  
(402) 221-7200

Col. Wilbur H. Bootan, Jr., Commander  
U.S. Army Corps of Engineers  
Kansas City District  
700 Federal Building  
Kansas City, Missouri 64106-2896  
(816) 426-2301

Col. Stewart H. Bornhoft, Commander  
U.S. Army Corps of Engineers  
Omaha District  
215 North 17th Street, Room 5425  
Omaha, Nebraska 68102-4978  
(402) 221-3900

##### U.S. EPA, Region VII

Dr. Alan Everson, Nebraska Water Quality  
Coordinator  
U.S. EPA, Region VII  
Water Management Division  
726 Minnesota Avenue  
Kansas City, Kansas 66101  
(913) 551-7535

Ms. Luetta Flournoy  
U.S. EPA, Region VII  
Water Wetlands & Pesticides Division  
Pesticide Program Development  
726 Minnesota Avenue  
Kansas City, Kansas 66101  
(913) 551-7453

Mr. Mike Beringer, Environmental Scientist.  
Geographic Planning & Pesticides Branch  
Water Wetlands & Pesticides Div.  
726 Minnesota Avenue  
Kansas City, Kansas 66101  
(913) 551-7351

##### U.S. Fish and Wildlife Service

Mr. Robert L. McCue, Field Supervisor  
Nebraska-Kansas Field Office  
U.S. Fish and Wildlife Service  
Federal Building  
203 West 2nd Street  
Grand Island, Nebraska 68801  
(308) 381-5571

U.S. Geological Survey

Dr. Linda Weiss, District Chief  
U.S. Geological Survey  
Federal Building Room 406  
100 Centennial Mall North  
Lincoln, Nebraska 68508-3883  
(402) 437-5082

U.S. Bureau of Reclamation

Mr. Robert D. Kutz, Project Manager  
Bureau of Reclamation  
Nebraska-Kansas Projects Office  
P.O. Box 1607  
Grand Island, Nebraska 68802  
(308) 381-5501

U.S. Natural Resources Conservation  
Service

Mr. Ronald E. Morland, State  
Conservationist  
USDA Natural Resources Conservation  
Service  
Federal Building Room 152  
100 Centennial Mall North  
Lincoln, Nebraska 68508-3866  
(402) 437-5301

STATE AGENCIES

Agricultural Statistics Service, Nebraska

Mr. Dave Loos,  
State Statistician  
Federal Building, NASS 273  
P.O. Box 81069  
Lincoln, Nebraska 68501  
(402) 437-5541

Game and Parks Commission

Mr. Rex Amack, Director  
Game and Parks Commission  
2200 North 33rd Street  
P.O. Box 30370  
Lincoln, Nebraska 68503  
(402) 471-0641

Dept of Environmental Quality

Mr. Randolph Wood, Director  
Nebraska Department of Environmental  
Quality  
1200 North Street Suite 400  
P.O. Box 98922  
Lincoln, Nebraska 68509-8922  
(402) 471-2186

Health and Human Services System -  
Regulation and Licensure

Ms. Deb Thomas, Director  
Nebraska Health and Human Services  
System - Department of Regulation and  
Licensure  
Nebraska State Office Building  
Third Floor  
P.O. Box 95007  
Lincoln, Nebraska 68509  
(402) 471-2674

Natural Resources Commission

Mr. Dayle E. Williamson, Director  
Nebraska Natural Resources Commission  
Nebraska State Office Building  
Fourth Floor  
P.O. Box 94876  
Lincoln, Nebraska 68509  
(402) 471-2081

Department of Water Resources

Mr. Michael Jess, Director  
Nebraska Department of Water Resources  
Nebraska State Office Building  
Fourth Floor  
P.O. Box 94676  
Lincoln, Nebraska 68509-4676

Nebraska Department of Agriculture

Mr. Larry E. Sitzman, Director  
Nebraska Department of Agriculture  
P.O. Box 94756  
Lincoln, NE 68509-4756  
(402) 471-2341

UNIVERSITY OF NEBRASKA

UNL Water Center

Dr. Bob G. Volk, Director  
UNL Water Center  
103 Natural Resources Hall  
Lincoln, Nebraska 68583-0844  
(402) 472-3305

Dr. Roy Spalding, Assistant Director  
UNL Water Center  
103 Natural Resources Hall  
Lincoln, Nebraska 68583-0844  
(402) 472-7558

UNL Extension

Dr. Larry D. Schulze, Extension Pesticide  
Coordinator and Assistant Professor  
101 Natural Resources Hall  
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A list of Nebraska's twenty-three Natural Resources Districts is provided in appendix A.

## Appendix E

### Nebraska Agricultural Pesticide Usage

The data provided below represents 1993 pesticide usage and was obtained from the Nebraska Agricultural Statistics Service (NASS) as reported in *NEBRASKA AGRI-FACTS*, Special Issue #4.

#### Corn: Frequency and Extent of Pesticide Usage By Active Ingredient, Nebraska, 1992-1993

Agricultural Chemical <u>1/</u>	Area Applied <u>2/</u>		Applications		Rate per Application		Rate per Crop Year		Total Applied	
	1992	1993	1992	1993	1992	1993	1992	1993	1992	1993
Herbicides:	Percent		Number		Pounds per acre				1,000 pounds	
2,4-D	10	10	1.0	1.0	0.39	0.45	0.39	0.45	314	371
Alachlor	41	32	1.0	1.0	1.43	1.40	1.46	1.43	4,963	3,617
Atrazine	73	80	1.1	1.1	0.97	0.89	1.06	1.02	6,389	6,497
Bromoxynil	4	6	1.0	1.0	0.24	0.25	0.24	0.26	76	121
Cyanazine	17	18	1.0	1.0	1.53	1.65	1.54	1.70	2,181	2,471
Dicamba	8	8	1.0	1.1	0.32	0.31	0.32	0.33	215	203
Glyphosate	---	2	---	1.0	---	0.49	---	0.49	---	97
Metolachlor	23	35	1.0	1.1	1.34	1.29	1.34	1.38	2,559	3,826
Nicosulfuron	4	5	1.0	1.0	0.02	0.03	0.02	0.03	8	10
Primisulfuron	7	6	1.0	1.0	0.02	0.02	0.02	0.02	14	11
Propachlor	---	1	---	1.0	---	3.14	---	3.14	---	135
Simazine	---	*	---	1.0	---	1.60	---	1.60	---	23
Trifluralin	---	1	---	1.0	---	0.60	---	0.60	---	25
Insecticides:										
Carbofuran	5	4	1.1	1.1	0.91	0.81	1.02	0.89	413	262
Chlorpyrifos	15	8	1.0	1.0	0.93	1.05	0.96	1.05	1,207	664
Fonofos	4	3	1.2	1.0	0.88	0.91	1.08	0.91	358	202
Methyl parathion	11	12	1.3	1.2	0.42	0.44	0.56	0.53	501	513
Permethrin	7	2	1.2	1.0	0.10	0.10	0.12	0.10	64	15
Phorate	---	3	---	1.0	---	1.18	---	1.18	---	303
Tefluthrin	8	5	1.0	1.0	0.12	0.11	0.12	0.11	80	43
Terbufos	16	15	1.0	1.0	1.04	1.06	1.06	1.06	1,417	1,254

1/ Insufficient reports to publish data for the following agricultural chemicals: Herbicides: Bentazon, Butylate, Dimethenamid, EPTC, Imazethapyr, Metribuzin, Paraquat, Pendimethalin. Insecticides: Bt (Bacillus thuringiensis), Diazinon, Dimethoate, Trimethacarb. 2/ Refers to acres reported as receiving one or more applications of a specific agricultural chemical.

#### Winter Wheat: Frequency and Extent of Herbicide Usage By Active Ingredient, 1992-1993

Agricultural Chemical <u>1/</u>	Area Applied <u>2/</u>		Applications		Rate per Application		Rate per Crop Year		Total Applied	
	1992	1993	1992	1993	1992	1993	1992	1993	1992	1993
	Percent		Number		Pounds per acre				1,000 pounds	
<b>NEBRASKA</b>										
2,4-D	18	32	1	1	0.29	0.27	0.29	0.27	97	182
Dicamba	---	7	---	1	---	0.1	---	0.1	---	15
Metsulfuron-methyl	16	10	1	1	0.004	0.004	0.004	0.004	1	1

1/ Insufficient reports to publish data for the following agricultural chemicals. Herbicides: Glyphosate, Picloram, Triasulfuron. 2/ Refers to acres reported as receiving one or more applications of a specific agricultural chemical.

**Soybeans: Frequency and Extent of Herbicide Usage By Active Ingredient, Nebraska, 1992-1993**

Agricultural Chemical <u>1/</u>	Area Applied <u>2/</u>		Applications		Rate per Application		Rate per Year		Total Applied	
	1992	1993	1992	1993	1992	1993	1992	1993	1992	1993
	Percent		Number		Pounds per acre				1,000 pounds	
Alachlor	18	16	1.0	1.0	1.46	1.87	1.46	1.87	639	768
Bentazon	4	5	1.0	1.0	0.63	0.65	0.63	0.65	67	79
Chlorimuron-ethyl	14	18	1.1	1.1	0.02	0.02	0.02	0.02	6	9
Clomazone	13	14	1.0	1.0	0.38	0.43	0.38	0.43	121	153
Fluazifop-P-butyl	---	6	---	1.0	---	0.07	---	0.07	---	10
Glyphosate	---	8	---	1.1	---	0.41	---	0.45	---	96
Imazaquin	12	7	1.0	1.1	0.08	0.09	0.08	0.10	25	18
Imazethapyr	39	38	1.0	1.0	0.05	0.06	0.05	0.06	53	59
Metribuzin	13	18	1.0	1.1	0.24	0.28	0.24	0.30	78	142
Pendimethalin	25	27	1.0	1.0	0.78	0.86	0.78	0.89	493	630
Quizalofop-ethyl	---	6	---	1.0	---	0.05	---	0.05	---	7
Thifensulfuron	7	9	1.0	1.0	0.005	0.004	0.005	0.004	1	1
Trifluralin	35	24	1.0	1.0	0.82	0.87	0.86	0.87	758	553

1/ Insufficient reports to publish data for the following agricultural chemicals. Herbicides: 2,4-D, Acifluorfen, Clethodim, Dimethenamid, Ethalfluralin, Fenoxaprop-ethyl, Metolachlor, Propachlor, Sethoxydim. 2/ Refers to acres receiving one or more applications of a specific agricultural chemical.

## APPENDIX F

NEBRASKA Natural Resources  
Information System  
Natural Resources Data Bank  
DATA BANK RESOURCES  
Updated through December 1993

Natural Resources Commission  
P.O. Box 94876  
Lincoln, Nebraska 68509  
(402) 471-2081

### STATEWIDE DATA BASES

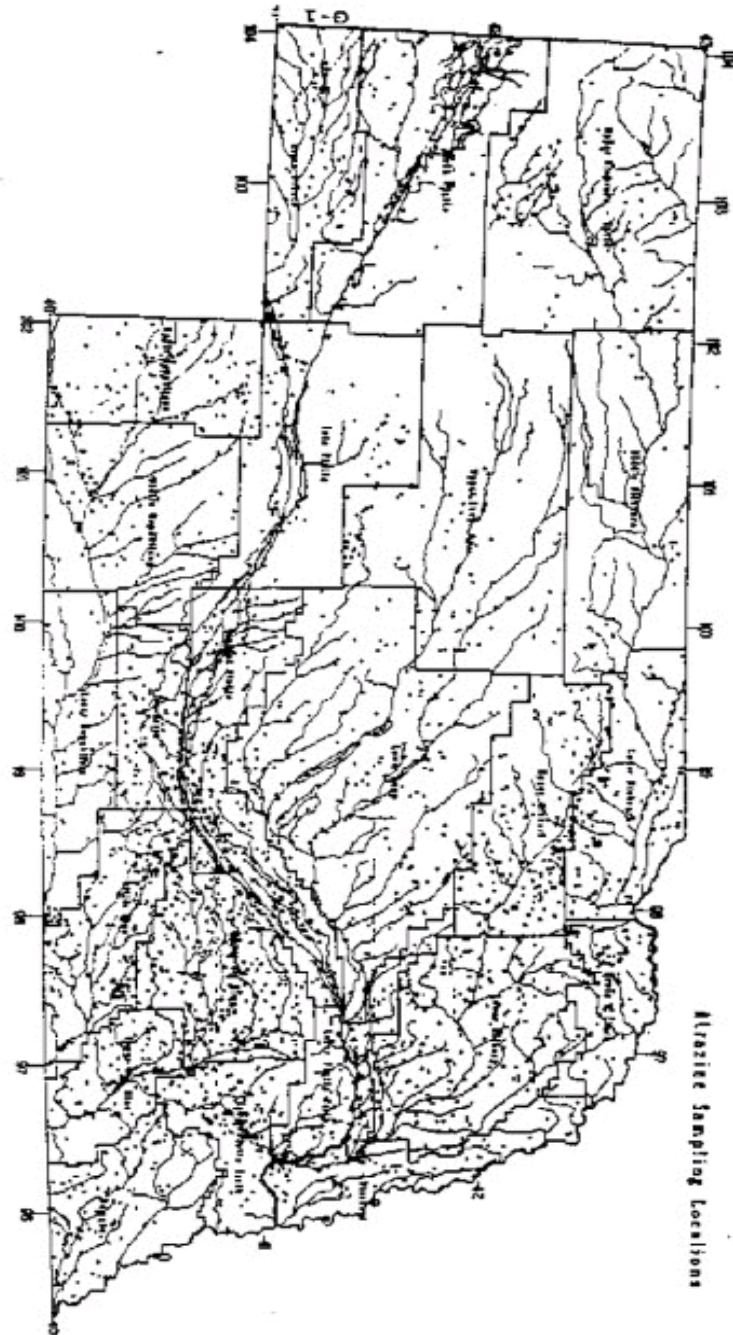
DATA FILE	DATA SOURCE	NUMBER OF STATIONS	NUMBER OF RECORDS	UPDATED THROUGH DATE
Rainfall	U.S. National Climatic Center - Nashville, NC	373	135,584	December, 1991
Temperature	U.S. National Climatic Center - Nashville, NC	208	78,886	December, 1991
Snowfall	U.S. National Climatic Center - Nashville, NC	324	63,960	December, 1991
Evaporation, Wind Movement	U.S. National Climatic Center - Nashville, NC	27	4,691	December, 1991
Events	U.S. National Climatic Center - Nashville, NC	315	40,420	December, 1991
	U.S. National Climatic Center - Nashville, NC	24	2,609	December, 1991
Hourly Rainfall	U.S. National Climatic Center - Nashville, NC	83	137,989	June, 1987
Soil Temperature	U.S. National Climatic Center - Nashville, NC	6	424	December, 1991
Stream Flow	USGS National Center Reston, VA	300	106,604	September, 1990
Peak Flow	USGS National Center Reston, VA	401	11,254	September, 1990
Surface Water Rights	Nebraska Department of Water Resources	Rights	8,441	December, 1991
Well Registration	Nebraska Department of Water Resources	Wells	85,342	February, 1993

Well Permits	Nebraska Department of Water Resources	Permits	2,298	June, 1986
Canal Diversion and Misc.	Nebraska Department of Water Resources	265	40,615	December, 1990
Reservoir Storage	Nebraska Department of Water Resources	45	7,717	December, 1990
Dams Inventory	Nebraska Department of Water Resources	2,303	11,515	December, 1993
Drinking Water - Chem. and Bact.	Health and Human Services System	691	98,684	July, 1982
Groundwater Quality Sampling	NRD's	682	16,876	December, 1991
Surface Water Quality	U.S. EPA STORET 1,381	5,893	100,294	November, 1988
Groundwater Quality	295	2,801	5,691	August, 1992
Groundwater Quality Monitoring	Data Source NRD's	2,746	10,343	June, 1989
Agricultural Crop	Nebraska Department of Agriculture	93 counties	6,834	December, 1991
Decennial Census	U.S. Bureau of Census Washington, DC	county	PL94-171	1990 Census
TIGER/LINE file	U.S. Bureau of Census Washington, DC	base data	---	1990 Census
County Population Estimates	U.S. Bureau of Census Washington, DC	93 counties	558	June, 1991
Soil Mapping Units	USNRCS Nebraska	88 counties	4,820	March, 1989
Soil Surveys Digitization	USNRCS Nebraska	61 counties	437,416	December, 1993
Soil Series Interpretations	USNRCS Nebraska	93	2,089	March, 1984
Soil Erosion Parameters	USNRCS Nebraska	61 counties	218,736	September, 1992
NE Resources Inventory	USNRCS Nebraska	93 counties	22,819	1982 data

Land Use	USNRCS Nebraska	61 counties	109,397	December, 1993
Groundwater Levels	USGS Lincoln	Wells - 4,312	228,380	December, 1992
Test Holes Header Information	C & S Division - UNL	Wells - 3,520	3,261	December, 1979
Center Pivots	C & S Division - UNL	93 counties	30,925	December, 1988
Geographic Names	C & S Division - UNL	USGS Maps	11,302	March, 1985
Water Use Municipal, Community	Natural Resources Commission	93 counties	-----	Data 1990
Hydrologic Delineations	Natural Resources Commission	13 basins	-----	September, 1993
Section Corners	Natural Resources Commission	93 counties	-----	September, 1993
Hydrographic Data	Natural Resources Commission	93 counties	-----	September, 1993



**APPENDIX G**  
**Distribution of Past Atrazine Sampling Locations**

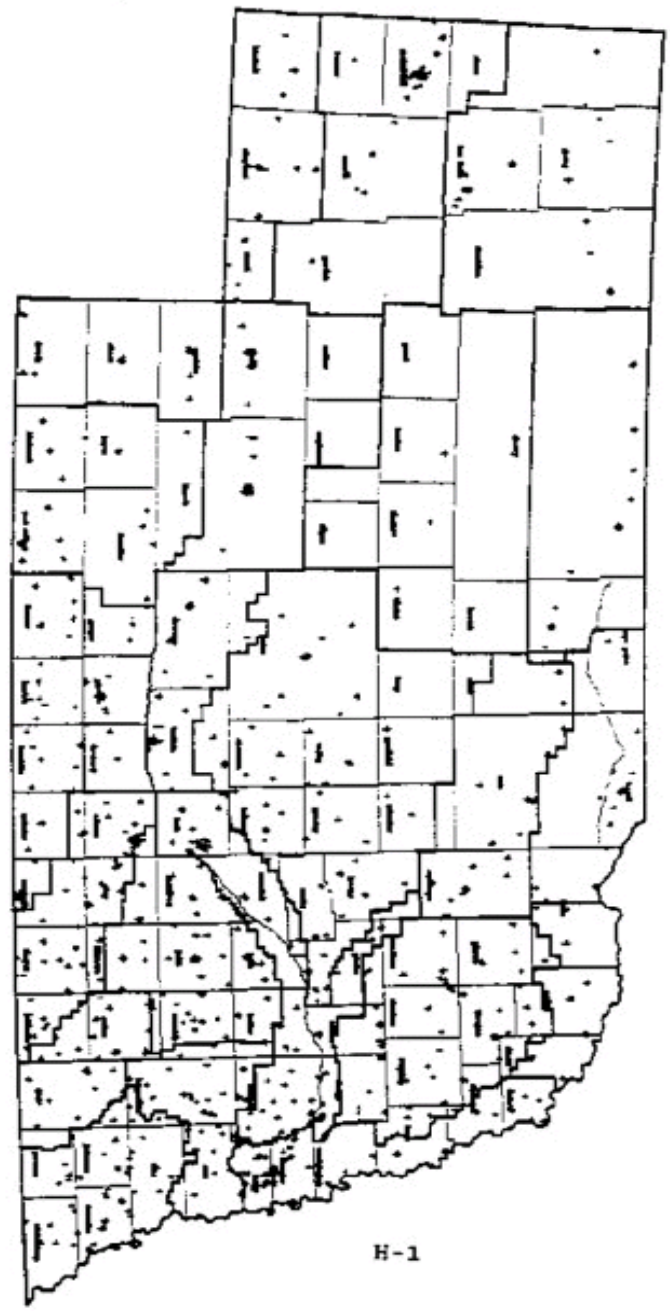


# APPENDIX H Municipal Well Locations

NORTH CAROLINA NATURAL RESOURCES COMMISSION

## PUBLIC WATER SUPPLY WELLS LOCATION MAP

DATA DATE



H-1

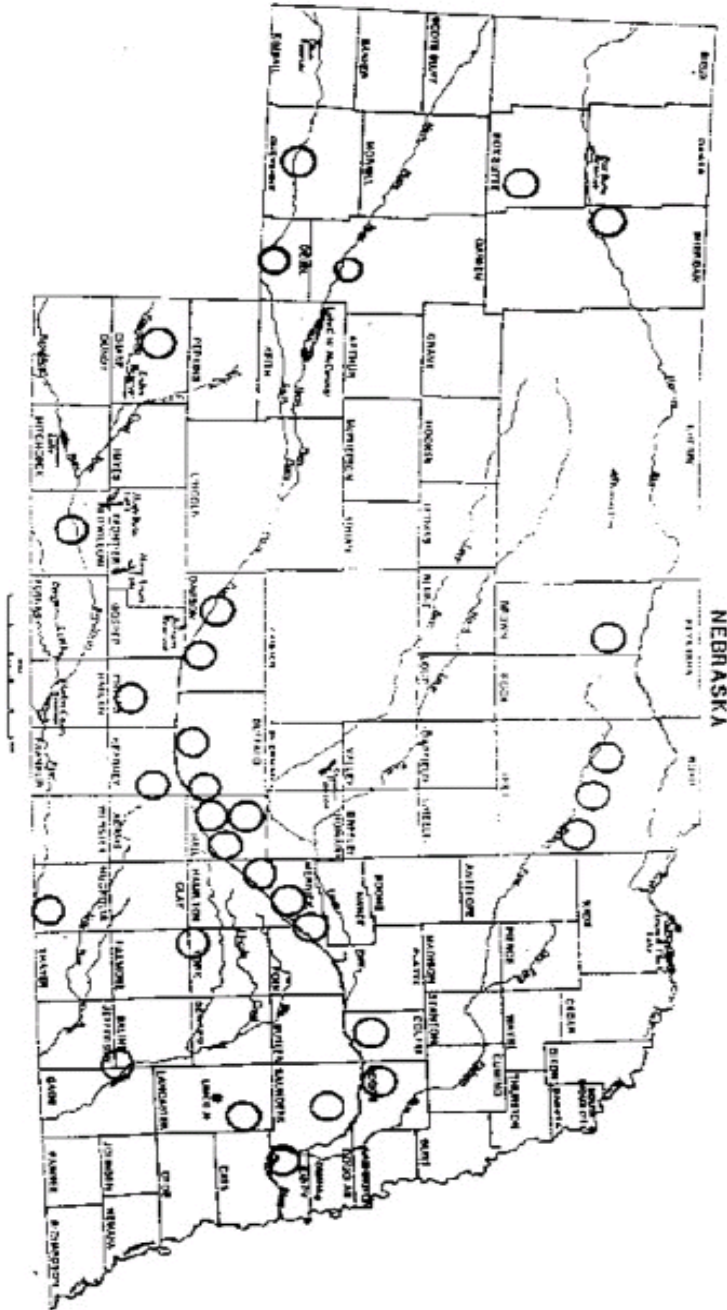


Prepared By: **North Carolina Natural Resources Commission**  
 Office of Water - **WATER**  
 Department of Water Resources, 1204  
 Research Triangle Park, North Carolina  
 Raleigh, NC 27615  
 Date: April 1999

**LEGEND**  
 • Public Water Supply Wells  
 --- NHD Boundaries  
 --- County Boundaries

# APPENDIX I Potential Problem Area Distribution

GENERAL LOCATIONS FOR "PROBLEM AREAS" PESTICIDE MONITORING IN NEBRASKA



○ - General locations where pesticides have been detected and/or conditions suggest that pesticide contamination of ground water may be present.

NOTE: Circles indicate general locations only. Actual monitoring in any one area may involve several wells spread over all or parts of these areas.

## APPENDIX J

### Enforcement Authorities

#### GENERIC STATE MANAGEMENT PLAN NEBRASKA ENFORCEMENT MATRIX

VIOLATION	ENFORCEMENT ENTITY	AUTHORITY	REFERRAL TO 2ND AGENCY	AUTHORITY	REPORTS TO:
Misuse	NDA  NDEQ	NE Pest. Act  See components 2 & 3	NDEQ  NDA	See components 2 & 3  NE Pest. Act	Archive per SMP Component 12
Drinking Water Standard Exceeded	NHSS-R&L	NSDWA	NDEQ  NDA	See components 2 & 3  NE Pest. Act	Archive per SMP Component 12
Chemigation	NRD	NE Chemigation Act	NDEQ  NDA	NE Chemigation Act  NE Pest. Act	NHSS-R&L, if potential to impact public wellhead
Improper Disposal	NDA	NE Pest. Act.	NDEQ	Title 128	
Non-compliance with GWMA provision	NRD  NDEQ	Ground Water Mgt. & Protection Act	NDEQ  NRD	Ground Water Mgt. & Protection Act	