COMPONENT SIX
MONITORING

6.1 INTRODUCTION

The Environmental Protection Agency (EPA) has indicated they will allow states to choose a State Management Plan (SMP) ground water monitoring approach most appropriate for their state. The EPA will review a range of activities to determine if a state's monitoring program supports its ground water protection goal, supports and accurately reflects its assessments and priority-setting scheme, and supports the connection between a state's monitoring program and its pollution prevention and response plans. South Dakota's monitoring approach will look at activities that encompass present day water quality, long term trends in water quality, the impact of agricultural chemicals on ground water, pesticide use data, and evaluation of pollution prevention and response measures.

The state has chosen a basic ground water monitoring protocol that includes three monitoring systems: *baseline monitoring* – State-wide monitoring used to measure ground water quality and compare it to known background water quality standards, *detection/response monitoring* – monitoring used to identify suspected areas of contamination and to respond to detections of pesticides found in ground water, and *evaluation or compliance monitoring* – which is used to conduct assessments on the impacts of prevention or response measures on ground water quality. The following discussion describes each of the three monitoring systems and indicates the location of additional information in other components if linkage is necessary. Component 7 (Prevention Actions (7.4-7.5 in general)) and Component 8 (Response to Detections (8.1 specifically and 8.2-8.6 in general)) describe how baseline and detection/response monitoring data will be used to implement appropriate actions to protect the states ground water. Component 9 (Enforcement Mechanisms) uses detection/response monitoring data to support enforcement actions taken as a result of an SMP investigation. Compliance monitoring will be used to evaluate the effectiveness of preventative or remedial actions taken by the state in Component 7 (Prevention Actions (7.4-7.5 in general)) and Component 8 (Response to Detections (8.1 specifically and 8.2-8.6 in general)).

6.2 MONITORING PROGRAM DESCRIPTION

6.2.1 HISTORICAL MONITORING EFFORTS

The first monitoring for pesticides in South Dakota's ground water was initiated in the early 1980's as part of the Oakwood Lakes-Poinsett Rural Clean Water Program project. The project was a 10-year U.S. Department of Agriculture effort to determine the water quality benefits from implementing best management practices. The South Dakota project included the installation and sampling of over 100 monitoring wells for the purpose of evaluating the impacts of conservation tillage, pesticide management and fertilizer management on ground water. Over 1,600 ground water samples from shallow, glacial outwash and alluvial materials were collected and analyzed for commonly used pesticides for over six years. The results of the study, published in the 10-year project report, indicated an absence of widespread pesticide contaminated ground water. Detections of very low concentrations of pesticides were "hit and miss" in the same monitoring well, occurring in one sampling event, but not in subsequent sampling events.

The information collected from the Rural Clean Water Program was used by the Department of Environment and Natural Resources (DENR) when the 1988 South Dakota Legislature directed DENR to address the concern of the potential effects of pesticide and fertilizer use on ground water. The DENR initiated a sampling program to assess the presence of these agricultural chemicals in the ground water in other areas of eastern South Dakota in reaction to the ever-increasing reports of pesticide occurrence from the neighboring states of Minnesota and Iowa.

6.2.2 RECENT MONITORING EFFORTS

The Pesticide and Nitrogen study was initiated in the Parker-Centerville aquifer in 1988. This project was expanded to the Bowdle aquifer in 1989, and was further expanded to the Delmont aquifer in 1992. The Geological Survey Program initiated a water quality monitoring program in 1989 in the Big Sioux aquifer. Monitoring parameters included pesticides (initiated 1991) and nitrates (initiated 1989). The South Dakota Department of Agriculture (SDDA) participated in selecting pesticides for analysis and by providing funding for the analyses of selected pesticides. Sampling continued for the Pesticide and Nitrate studies through 1994 and for the Big Sioux aquifer study through 1993.

The two studies included the installation of 72 monitoring wells at 35 sites in the four glacial outwash and alluvial aquifers. These aquifers were chosen for study due to the sensitivity of the aquifers and the agricultural chemical use over the aquifers. As in the Rural Clean Water Program project, the wells were nested, with the shallowest well screened across or near the water table and the deeper wells screened through discrete intervals of the saturated material. These monitoring wells were constructed specifically for collecting water samples for pesticide and nitrate analysis. Refer below to Figure 6-1 for an example of monitoring well construction. Samples were collected in a manner designed to eliminate the introduction of contaminants to the well, providing an accurate representation of the water quality in the aquifer.

The wells in the Big Sioux aquifer were sampled seasonally, however wells in the other three aquifers were sampled monthly from April or May through October. All of the samples were analyzed for pesticides that were commonly used in the study areas.

Monitoring may be required at sites where chemicals have been released into the environment due to spills. Parties responsible for the releases are required to assess the extent of contamination, remediate the affected areas, and in some cases, monitor the ground water tracking ground water contamination and the effectiveness of clean-up efforts. There are currently fifteen sites where ground water monitoring of this type is required. Sampling is conducted from specially constructed monitoring wells, installed by an environmental consultant, and sampled periodically (either quarterly or semi-annually) for chemicals that have been released.

6.2.3 LONG RANGE SMP MONITORING PLAN

Scope and Objectives - The objectives of the long range SMP monitoring program are to assess: the present water quality; the impact of agricultural chemicals on ground water; and long term trends of water quality, in shallow, sensitive aquifers in South Dakota (refer to Figure 5-3). The five areas of the SMP ground water monitoring plan are:

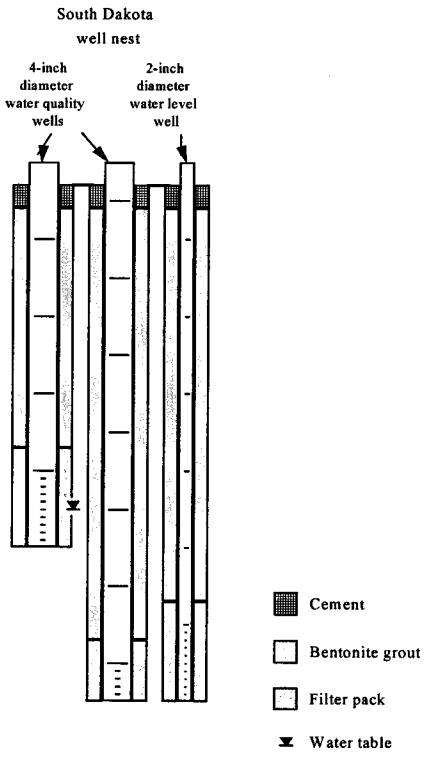
- Establish a permanent statewide ground water quality monitoring network to document existing ground water quality and any changes in ground water quality unrelated to point sources of pollution;
- Intensively monitor (four times per year) the ground water at selected sites in the Parker-Centerville, Bowdle, Delmont, Skunk Creek, Ogallala/Sand Hills, Vermillion West Fork, and Big Sioux aquifers and Alluvium at - Bear Butte Creek, Rapid Creek, and Spearfish Creek. Analyze the samples for commonly used pesticides, ammonia, and nitrate to document any short-term changes in concentrations;
- Annual monitoring will be performed at all permanent monitoring sites;
- Monitor the concentrations of pesticides in ground water at specific sites where pesticides have reached the ground water either from normal use, intentional or accidental spills; and
- Other monitoring could include public water systems and domestic wells. Also, a registrant may be asked to monitor a site(s). This could include special projects monitoring.

Design and Justification - A plan for the development of a permanent statewide ground water quality monitoring network as described above, was developed by a group of hydrologists, geologists, chemists, and engineers within DENR. The plan was implemented in the summer of 1994.

The statewide ground water quality monitoring network plan includes two methods for monitoring ground water: 1) systematic, regular sampling and analysis for organic and inorganic parameters to understand long term water quality changes, and 2) more frequent sampling and analysis to understand the seasonal impact of agricultural chemicals on ground water. The data generated from the network will document existing ground water quality and any changes in water quality in many of the most sensitive aquifers in the state.

The Statewide Ground Water Quality Monitoring Network will consist of specially constructed monitoring wells in the 24 aquifers listed in Component 5 and shown in Figure 5-3. It has taken approximately four years to install the monitoring wells for the initial network, which consists of 145 wells at 80 sites. Wells at most sites were installed as vertically-nested pairs as shown in Figure 6-1.

Figure 6-1. Monitoring Well Examples.



Source: Geological Survey Program.

The 24 aquifers that will be monitored cover areas throughout a large part of South Dakota and are some of the most vulnerable to land surface activities. The state's population uses these aquifers for drinking water.

Most monitoring well sites are located in areas remote from known point sources of contamination. Ideally, each well site uses either existing DENR observation wells or newly constructed 2-inch diameter wells for monitoring the aquifer water level, and two 4-inch diameter wells for collecting samples. Ideally, one of the 4-inch wells will be installed so the well screen intercepts the water table; the other 4-inch diameter well will be screened to intercept an interval of the aquifer below the shallow well (refer to Figure 6-1).

The wells are constructed of schedule 40 polyvinyl chloride (PVC) casing and screens. The casing and screen segments are flush jointed. Clean, well sorted, pre-sacked filter pack was used to cover the screen where native sediments do not collapse and fill the annulus. Bentonite and cement grout were used to seal the well annulus. All wells have locked metal well protectors cemented in place. Well depths range from approximately 10 to 60 feet.

All 4-inch diameter monitoring wells will be equipped with a dedicated submersible pump to avoid cross contamination between the wells during sampling and to maximize sampling efficiency. Water level measurements collected with pressure transducer and data loggers and any other in-situ tests can be taken from the 2-inch diameter well in the well nest that is locked and protected but is not equipped with a dedicated submersible pump. Using the 2-inch diameter wells in this manner protects the integrity of the 4-inch diameter water quality wells.

Monitoring Protocol - There will be two levels of monitoring: 1) systematic, regular sampling and analysis of water from all aquifers shown on Figure 5-3 for organic and inorganic components to document long-term water quality changes (baseline and evaluation monitoring) and 2) more frequent sampling and analysis of water from selected aquifers to document the seasonal impact of agricultural chemicals on the ground water (detection/response monitoring). All monitoring wells will be sampled annually and analyzed for common inorganic parameters including nitrates and pesticides commonly used in the area. Also, 25 wells at 14 sites will be sampled an additional three times between April and October and analyzed for nitrate and pesticides commonly used in the aquifer areas.

Quality Assurance/Quality Control - All of the monitoring will be conducted according to the DENR 106 Ground Water Quality Assurance Project Plan, as approved by EPA Region VIII.

Sampling Methods - Sampling methods are described in the Quality Assurance Project Plan.

Analyte and Analytical Methods - Table 6.1 lists the pesticides currently being analyzed for in each of the aquifers. The analytical methods are also specified. As aquifers are added into the network, selected pesticides used in the aquifer area may be added. Acceptable methods of analysis for those chemicals will be used. As a general rule, pesticides requiring or that are being considered for a SMP, will be included in the statewide monitoring network. However, extremely limited pesticide usage or no pesticide usage in the state will be taken into consideration when designing pesticide sampling projects.

6.3 DATABASE

Most SMP chemical and water level data are entered into DENR's databases. In particular, the pesticide data are stored in an organic water quality database developed by the Geological Survey Program. The database includes analytical data from ground water and surface water samples, date and time of sample collection, sample location, method of sampling, and monitoring well information. As databases are updated, steps will be taken to meet the EPA Minimum Set of Data Elements. See Appendix H for an example sampling sheet. Examples of the information available are provided in the data-encoding and data-output forms found in Appendix H.

6.4 STATEWIDE MONITORING NETWORK UPDATES

6.4.1 FINDINGS

As information on pesticide detections in ground water becomes available, the information will be passed on in a timely manner to SDDA and a Pesticide And Ground Water Advisory Group (PAGWAG) for review. Currently, and in general terms, the health of selected state aquifers is good. The DENR organic water quality data base indicates that from 1988 to 1995, 1,475 ground water samples taken from the Big Sioux, Bowdle, Delmont, and Parker/Centerville aquifers had only 11 pesticide detections (pesticides with a Maximum Contaminant Level (MCL) or Health Advisory (HA)) and only 4.5% had reached or exceeded 25% of the specific MCL or HA for a given pesticide.

Table 6.1 Pesticides Included In The Sample Analysis For Each Aquifer.

Trade Name	Common Name	Alluvium-Bear Butte Creek	Alluvium-Cheyenne River	Alluvium-Rapid Creek	Alluvium-Spearfish Creek	Antelope Valley	Big Sioux	Bowdle	Delmont	Highmore-Blunt
Common Herbicides										
Atrazine	**atrazine***	■	■	■	■	■	■	■	■	■
Desethyl atrazine	xxxxxxx	■	■	■	■	■	■	■	■	■
Desisopropyl atrazine	xxxxxxx	■	■	■	■	■	■	■	■	■
Bladex	**cyanazine***	■	■	■	■	■	■	■	■	■
Dual	**metolachlor***	■	■	■	■	■	■	■	■	■
Eradicane	EPTC									
Harness/Surpass	acetachlor	■	■	■	■	■	■	■	■	■
Lasso	**alachlor***	■	■	■	■	■	■	■	■	■
Prowl	pendimethalin									
Sencor	metribuzin					■				
Sonalan	ethalfluralin					■				
Treflan	trifluralin				■	■	■	■	■	■
Princep	**simazine***	■	■	■	■	■	■	■	■	■
Acid Herbicides										
2,4-D	2,4-D	■	■	■	■	■	■	■	■	■
Banvel	dicamba			■	■	■	■	■	■	■
Basagran	bentazon				■		■			
Buctril	bromoxynil						■			
MCPA	MCPA	■				■	■	■		
Tordon	picloram	■	■	■		■	■	■	■	
Organophosphate/ Carbamate Insecticides										
Furadan	carbofuran									
Lorsban	chlorpyrifos									
Parathion	parathion	■	■	■	■			■	■	■

Source: Geological Survey Program.

* Proposed SMP Pesticides

■ - A darkened box indicates the noted pesticide is monitored.

Table 6.1 Pesticides Included In The Sample Analysis For Each Aquifer (Continued).

Trade Name	Common Name	Missouri	Ogallala/ Sand Hills	Parker/ Centerville	Selby	Skunk Creek	Tulare	Vermillion East Fork	Vermillion West Fork
Common Herbicides									
Atrazine	**atrazine***	■	■	■	■	■	■	■	■
Desethyl atrazine	xxxxxxx	■	■	■	■	■	■	■	■
Desisopropyl atrazine	xxxxxxx	■	■	■	■	■	■	■	■
Bladex	**cyanazine***	■	■	■	■	■	■	■	■
Dual	**metolachlor***	■	■	■	■	■	■	■	■
Eradicane	EPTC	■		■		■	■	■	■
Harness/Surpass	acetachlor	■	■	■	■	■	■	■	■
Lasso	**alachlor***	■	■	■	■	■	■	■	■
Prowl	pendimethalin	■		■			■		■
Sencor	metribuzin		■	■	■	■	■	■	■
Sonalan	ethalfluralin	■	■	■	■	■	■	■	
Treflan	trifluralin	■		■		■	■	■	■
Princep	**simazine***	■	■	■	■	■	■	■	■
Acid Herbicides									
2,4-D	2,4-D	■	■	■	■	■	■	■	■
Banvel	dicamba	■	■	■	■	■	■	■	■
Basagran	bentazon	■		■		■	■	■	■
Buctril	bromoxynil	■	■	■	■	■	■	■	■
MCPA	MCPA		■		■	■	■	■	
Tordon	picloram		■	■		■	■	■	
Organophosphate/ Carbamate Insecticides									
Furadan	carbofuran						■		
Lorsban	chlorpyrifos		■						
Parathion	parathion	■	■	■	■		■	■	

Source: Geological Survey Program.

*Proposed SMP Pesticides

■ - A darkened box indicates the noted pesticide is monitored.

In more site specific terms, Table 6.2 indicates that certain monitoring well locations receive the majority of detections and the higher contaminant values. The Big Sioux aquifer is a good example of this. Factors impacting the ability of the pesticide to leach to ground water may include pesticide chemistry, soil structure, soil organic matter, precipitation, application timing, rate of application and others. The Big Sioux aquifer has (in the case of the five proposed SMP pesticides) 6 to 8 wells that have shown detections of SMP pesticides, while other wells have few or no detections. Well location and well depth along with the above mentioned pesticide and environmental factors plus many other factors may allow the pesticide to show up in the well water sample. More investigation and research, as is indicated by the implementation of this SMP, may be necessary to determine the cause, prevention and/or cleanup of the contamination.

6.5 OTHER MONITORING

6.5.1 SPILL RESPONSE MONITORING

Parties responsible for accidental and intentional releases of pesticides are required to remediate the environmental damage resulting from the incident. If pollutants reach or threaten waters of the state (including ground water), clean-up may be required. Monitoring of ground water may be required to ensure remediation efforts are successful and that there is no off-site migration of the pollutant(s). The vertical and horizontal extent of the contamination is assessed by installing monitoring wells up- and down-gradient and within the contaminant plume. Monitoring frequencies may vary from quarterly to semi-annually. Analytes include whatever was spilled or suspected of spilling at the site. All sampling and analysis must be done according to acceptable standard protocols and laboratory procedures.

Table 6.2 Big Sioux Aquifer Summary Information, August 1991 To August 1995.

	91 (Aug) - 92	1993	94-95 (Aug)
Total number of samples	134*	97**	168***
Total number of pesticide detections, including two atrazine metabolite detections	37	48	50
Number of atrazine metabolite detections	0	6	17
Total number of detections of SMP pesticides	21	32	27
Alachlor detections	0	2	1
Atrazine detections	13	21	26
Cyanazine detections	8	6	0
Metolachlor detections	0	3	0
Simazine detections	NA+	NA	0
Pesticide detections ≥ 50% of the MCL or HA			
Alachlor detections	0	0	0
Atrazine detections	0	3	1
Cyanazine detections	4	5	0
Metolachlor detections	0	0	0
Simazine detections	NA	NA	0
Detects ≥ the MCL or HA			
Alachlor detections	0	0	0
Atrazine detections	0	1	0
Cyanazine detections	0	4	0
Metolachlor detections	0	0	0
Simazine detections	NA	NA	0
Number of wells sampled	27	27	36
Number of wells with pesticide detections, including two atrazine metabolites	11	8	13
Number of wells with detections of SMP pesticides	**6**	**8**	**8**
Number of wells with atrazine metabolite detections	0	3	5

Source: Geological Survey Program.

+ NA - Not Analyzed. * 2,558 Total Number of Analysis. ** 2,110 Total Number of Analysis.
*** 3,552 Total Number of Analysis.

6.5.2 SAFE DRINKING WATER ACT MONITORING

South Dakota is delegated to administer the Safe Drinking Water Act and is enforcing the monitoring and MCLs for regulated pesticides in public water supplies. The results of this monitoring are available for SMP development and implementation.

6.5.3 FARM WELL PESTICIDE MONITORING

The SDDA collected 708 water samples from 457 private farm wells from 1994 to 1996. See Table 6.3 for a summary of Farm Well Sampling for proposed SMP pesticides.

Table 6.3 Proposed SMP Pesticides, 1994-1996 Farm Well Testing.

Pesticide	Detections	Concentrations (ppb)	Median (ppb)	Reference Point (ppb)
Atrazine	21	0.1-1.6	0.41	3$^{\nabla}$
Alachlor	0	NA**	NA	2$^{\nabla}$
Cyanazine	1	1.30	NA	1+
Metolachlor	1	2.40	NA	70+
Simazine*	0	NA	NA	4$^{\nabla}$

Source: SDDA.

* - Only sampled for in Farm Well Test #2.
**NA - Not Applicable.
ppb - part per billion.
$^{\nabla}$ - Maximum Contaminant Level (MCL).
\+ - Health Advisory (HA).

6.5.4 SURFACE WATER MONITORING

The Water Resources Institute (WRI) is currently working on a report involving surface water monitoring at eleven sites on four rivers in eastern South Dakota. Water samples have been taken from the Big Sioux, Vermillion, James and Missouri Rivers. Surface water samples have been analyzed for twenty-three pesticides and two pesticide metabolites. As the results become available, the data are sent to interested parties. The SDDA, along with other state and federal agencies and a PAGWAG will review this data to determine if pesticides are impacting river systems at levels of significance. These results will be used to determine if Voluntary BMP Education or Specific Regulations should be considered.

6.6 THE USES TO WHICH MONITORING WILL BE APPLIED

Monitoring results for pesticides will be used as an indication of the presence of pesticides in ground water and closely connected surface waters, the frequency at which detections of chemicals occur, the consistency at which pesticides are detected, and the concentrations of specific chemicals. Monitoring results may give a general view of the health of the aquifers and closely connected surface waters and may provide a long-term picture of any trends in water quality, including the frequency and magnitude of pesticide detections.

Only samples containing a verified detection of a SMP pesticide(s) will be considered during SMP investigations[1]. Routine or other, ground water and closely connected surface water samples may be used for purposes other than being used in an official SMP investigation. (Routine or other samples may be used as supporting evidence for initiating an official SMP investigation.)

A monitoring program may provide information such as: baseline water quality, seasonal changes (predictive and evaluation), and long term changes and/or trends (problem identification and evaluation). Systematic, regular monitoring will provide information on long term baseline water quality due to existing pesticide use practices or implementation of new practices. Results from samples drawn more frequently will provide information on short-term, seasonal impacts of agricultural chemicals on the ground water.

When a Pesticide Specific State Management Plan (PSSMP) is required for chemical registration, a monitoring plan can be modified if necessary to include analysis for that pesticide in areas of concern. Monitoring results can be used for preventative actions as described in Component 7 and/or action responses as described in Component 8. (See Components 7 and 8 for more details).

Ground water and surface water monitoring will also be used to identify areas where nonpoint source projects (Section 319 of the Clean Water Act) may be appropriate. It will assist in prioritizing areas in need of wellhead and source water protection programs, and other ground water protection programs.

Monitoring of surface water will continue to provide information to a PAGWAG as to pesticide loadings of surface waters. Surface waters in the state have been found to be hydraulically connected to ground water. Surface water may recharge ground water during high flows and ground water may recharge surface water during times of low flows. Farm well and other domestic well testing will continue to supply needed information to a PAGWAG. Private wells, particularly farm wells, in certain areas of South Dakota have been perceived to be potentially susceptible to pesticide contamination. Many of these wells are located near pesticide application, storage or mixing sites and/or draw from surficial, vulnerable aquifers. Many of these wells are poorly constructed or maintained by current standards, but continue to provide drinking water for rural families.

The gathering and interpretation of pesticide use data and ground water quality data from various sources shall be included in the ground water monitoring program. Dealer records, registrant sales records, commercial applicator spray records and statewide pesticide use record surveys may all be used to help define pesticide use in South Dakota. Data from the Statewide Ground Water Quality Monitoring Program, other DENR programs, South Dakota State University, United States Geological Survey, and SDDA sponsored data collection activities may be used to help define water quality in South Dakota.

The evaluation of the success or failure of pollution prevention and response measures will be incorporated into the pollution prevention and response measure components. These are components seven and eight respectively. Review of both the ground water data and the pesticide use data will be undertaken as it becomes available. If the information indicates that local water quality impairments are very high or increasing, the evaluation would then indicate that increasingly stringent response measures might be necessary.

[1] A verified detection is a detection that is determined to represent the condition of the ground water, leaving no doubt that this compound exists in the ground water. The sample will be a regulatory or specific monitoring well sample.

The South Dakota Department of Agriculture (SMP State Lead Agency) is ultimately responsible for review of data quality. However, an initial review of data will be undertaken by the SDDA Enforcement Agricultural Program Specialist, the SDDA Ground Water Agricultural Program Specialist, and a DENR Natural Resources Engineer. The SDDA and DENR have signed an agreement with EPA (State of South Dakota and U.S. Environmental Protection Agency Multi-Year Agreement (FFY 1998-FFY 2002) Amended FY 2000), establishing a Performance Partnership Grant. This grant establishes core program commitments. Commitments that include assurances that SDDA will maintain an EPA-approved Quality Assurance Program and any required Plan(s) that cover any data collection activities for which SDDA receives funding. The DENR will also continue to obtain EPA approval of Quality Assurance Project Pans for data collection and analysis work for which EPA provides funding.

Laboratories in the state performing SMP pesticide analysis operate with comparable plans and manuals. The South Dakota State Health Laboratory operates under the South Dakota State Health Laboratory Quality Assurance Manual. Modified EPA Method 525.2 is used to analyze for atrazine, simazine, cyanazine, alachlor, and metolachlor in ground water samples. State Health Laboratory procedures dealing with SMP pesticides meet or exceed EPA standards. The Oscar Olson Biochemistry Laboratory operates under a SDDA approved and EPA accepted Quality Assurance Project Plan for SMP pesticide analysis. The Biochemistry Laboratory uses multiclass, multiresidue gas chromatography methodology for SMP pesticide analysis. This methodology is outlined in the EPA Manual of Analytical Methods for the Analysis of Pesticides in Humans and Environmental Samples. The Water Resources Institute (on the SDSU campus) operates under the Water Pesticide Laboratory Procedures Manual for SMP pesticide analysis. State Management Plan pesticides (alachlor, atrazine, cyanazine, and metolachlor) are analyzed for in water samples at the WRI using EPA Methods 507 and 508.

6.7 PARTIES RESPONSIBLE FOR MONITORING

The SDDA is the lead agency responsible for pesticide use monitoring. This includes monitoring for pesticide impacts on human health and the environment. The DENR is the lead agency responsible for carrying out the monitoring program in ground water. South Dakota State University (SDSU) conducts monitoring of pesticide use, monitoring of selected surface waters for pesticides and occasional ground water pesticide monitoring associated with research projects. Through cooperation, fund pooling, and resource sharing, SMP monitoring will continue to provide the kind of data needed to develop and implement the SMP. The DENR intends to continue construction of monitoring wells, sampling and analysis of water from monitoring network wells, storage of the analytical results, evaluation of the data, and reporting of information. The SDDA intends to provide information necessary on chemical characteristics, use, regulations, data distribution, and other SMP pesticide data needs. SDSU provides pesticide characteristics, pesticide use, and BMP information. The county Cooperative Extension Service agricultural agent will be involved in collecting and distributing information related to SMP development and implementation.

The registrant is responsible for reporting to EPA under section 6-A-2 of the FIFRA, any pesticides found in ground water. The registrant may be required to supply supplemental information to EPA that could require monitoring for a particular pesticide or its metabolites. The registrant may be asked to supply funds to SDDA for the purpose of pesticide monitoring. This may include sampling ground water for the occurrence of pesticides, monitoring the use of pesticides or other monitoring yet to be determined.

Parties responsible for an accidental release to the environment are liable for required clean-ups and for enforcement monitoring. Public water suppliers are responsible for the sampling, analysis, and the reporting of monitoring results required under the federal and state Safe Drinking Water Acts.

State and federal funds have funded the monitoring of pesticide occurrence in ground water to date. Federal funds consist of FIFRA/SDDA and Nonpoint Source Pollution (Section 319) Clean Water Act (CWA) funds. The 1994 State Legislature appropriated $250,000 to initiate the statewide ground water quality monitoring network. It is estimated the cost of operating the statewide monitoring network will be between $160,000 and $190,000 per year. Partial funding for installation of the monitoring network came from a Section 319, CWA grant.

The scope and success of the statewide monitoring program depends on the funding available to continue it. The SDDA and DENR will continue to seek permanent sources of funding that will support the long term monitoring plan that is needed to implement PSSMPs.