

Appendix D

Wisconsin's Source Water Assessment Program - 6/2/98

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The following summary of Wisconsin's developing Source Water Assessment Program (SWAP) is presented for public water system stakeholder review. Several key issues and questions requiring stakeholder input are outlined starting on page 3.

Required Elements of the Source Water Assessment Program

1. delineation of assessment area boundaries for all public water systems;
2. inventory of significant potential sources of contamination (SPSC) within those boundaries;
3. an analysis of susceptibility; and
4. provision of the assessment results to the public.

Note that there is no required source water *protection* component.

States have until February 6, 1999 to develop and submit their SWAP plan. The State intends to involve the public in developing a plan that meets the needs of Wisconsin in fulfilling the stated purpose in the Act: "for the protection and benefit of public water systems."

Incentives

The 1996 Safe Drinking Water Act (SDWA) Amendments require an EPA-approved State SWAP in order to issue permanent monitoring relief for chemical contaminants to water suppliers. Additionally, an approved SWAP is a condition for future funding for source water protection.

Funding

States can set aside up to 10 percent of the total annual federal capitalization grant for federal fiscal year (FFY) 1997 for the required delineations and assessments. This set-aside is available only in FFY 1997 and must be obligated within four years. Any funds not spent for delineations and assessments are automatically returned to the Drinking Water State Revolving Fund. Wisconsin plans to set aside the full 10 % (\$4,154,640) of the FFY 1997 capitalization grant for the SWAP. Additionally, we intend to use \$120,000 for wellhead protection (WHP) implementation for state FY 1999. This money will be used for information and education activities and data integration.

We anticipate that Wisconsin's capitalization grant will be awarded in September, 1998. Consequently, September 30, 2002 will be the deadline to obligate the entire set-aside amount.

Program Goals

The DNR's stated goal is "to gather and utilize meaningful information to assist source water protection efforts and the overall drinking water program in the State."

Efforts to identify SPSCs will focus on assembling information that will address the greatest threats to drinking water, guide future source water protection efforts, and be useful to the State's public water system supervision program. The SWAP will maximize the use of existing information and will utilize Geographic Information Systems (GIS) to map delineations and assessments ("assessment" refers to items 2 and 3 above).

The primary goal of the SWAP is to produce assessments that will be useful to communities that are interested in developing WHP plans or watershed protection projects. The finished assessments will indicate the direction and intensity of subsequent source water protection efforts. The products of the

SWAP listed below are intended to assist cooperative efforts among state agencies, local governments, public water systems, and the general public:

- ☞ GIS databases that can produce maps of source water protection areas showing delineations and inventories of SPSCs;
- ☞ analyses of the natural resource characteristics that affect the sensitivity of the aquifers and surface waters to contamination;
- ☞ analyses of the water supply system characteristics that affect the vulnerability of the system to contamination;
- ☞ vulnerability assessments necessary for developing targeted monitoring for chemical and radiological contaminants; and
- ☞ information useful for future regulatory decisions.

Workplan

The DNR has begun to proceed on necessary initial activities such as gathering existing information and public input on the SWAP plan. Furthermore, due to opportunities presented by the currently ongoing vulnerability assessment program, the DNR has initiated a source water protection area delineation and assessment process for groundwater systems. This process is based on Wisconsin's EPA-approved WHP and vulnerability assessment plans and has been reviewed by the SDWA *Ad Hoc* Advisory Council (AHAC). The details of this strategy will be finalized after more public input has been obtained. The following outline covers work that is occurring or that is planned to start in the next year.

1. Assemble existing information

- identify and compile approved WHP plan area delineations and SPSC inventories.
- identify and compile existing vulnerability assessment SPSC inventories.
- identify and compile existing databases of SPSCs in WDNR, other state agencies, federal agencies, local governments, and planning organizations.
- use GIS to map source water protection areas, SPSCs and natural resource characteristics.

2. Implement public participation process

- develop state-specific questions for public participation
- identify members of the public interested in participating in SWAP plan development
- obtain, compile, and address input from interested members of the public and the SDWA AHAC.

3. Prepare SWAP plan

- prepare a discussion draft of the SWAP plan for public and SDWA AHAC input
- prepare a response to public and SDWA AHAC input
- prepare a final SWAP plan and submit to EPA

4. Groundwater system delineations and assessments

- locate and map all public water supply wells
- delineate source water protection areas by the following proposed methods
 - municipal wells: approved wellhead protection plan recharge area delineations if available or calculated fixed radius delineations based on 5 year time period and annual pumping history with a minimum radius of 1200 feet.

- other-than-municipal community and non-transient non-community wells: 1200-foot fixed radius.
 - transient non-community wells: 200-foot fixed radius.
 - begin to compile inventories of SPSCs for source water protection areas through vulnerability assessments
 - define susceptibility analysis
5. Surface water system delineations and assessments
- locate and map all surface water public water supply intakes.
 - delineate watershed boundaries as source water protection areas for each surface water public water supply intake.
 - establish basis for level of detail of assessment activities for different segments within delineated surface water source water protection areas by the following proposed criteria:
 1. Proximity of the stream discharge to intakes
 2. Magnitude of the stream discharge
 3. Likelihood of critical contaminants in the segment
 4. Water quality monitoring data
 - establish relationships with surface water programs to facilitate SWAP/watershed approach cooperation.
 - define susceptibility analysis

This is the first of at least two summaries prepared for review by the SDWA AHAC and other interested stakeholders.

Key Issues for Input on the Source Water Assessment Program

The following are issues that the DNR would like your input on to help us develop the Source Water Assessment Program (SWAP). Each section contains a statement of the issue and then one or more questions related to the issue. You may send responses to the questions to:

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Section 1 - Public Participation

Active stakeholder involvement is important in the development of the SWAP. The State has provided several opportunities for public comment and input so far. These opportunities include: 1) public information meetings held in Fond du Lac, Madison and Eau Claire in August of 1997; 2) three SDWA Ad Hoc Advisory Council meetings; 3) presentations at Wisconsin Rural Water Association training in Spooner, Shawano, Plover, Whitewater, and Fennimore; 4) a presentation at the Wisconsin County Code Administrators Spring Seminar; and 5) a presentation at the Wisconsin Environmental Health Association Board meeting. Other activities that have brought public involvement into the SWAP development process include a survey done of surface water system operators and two Technical Advisory Committee (TAC) meetings to develop a strategy for surface water system source water area delineation. We are also using the Wellhead Protection Newsletter to get feedback on our proposed

strategy. We plan to continue to work with interested stakeholders on specific topics and hold public meetings to give stakeholders the opportunity to comment on the SWAP plan which must be finalized and submitted to the US EPA by February 6, 1999.

Question

1-1 Should the state do more to provide adequate opportunity to participate in development of the SWAP program and to receive recommendations from technical, stakeholder groups, and citizen's perspectives. If so, who should be involved in giving input on the SWAP and how? (some possibilities include creating more technical advisory committees, directly soliciting feedback from important stakeholder groups, and using the media to solicit feedback from the public)

Another issue on which we are soliciting input is what level of public participation is appropriate during implementation of the SWAP. We offer the following proposal for your comments. Contaminant source inventories will be made with input from system owner/operators. The owners/operators will also be given an opportunity to comment on the assessment, including the contaminant source inventory, before the assessment is finalized. Once the assessments are finalized their conclusions, and the methodology for developing them, will be explained to the system owner/operator. In areas where interest is high, assessments can be explained at town meetings, with generic source water protection methods explained to community members to facilitate development of local prevention solutions.

Questions

1-2 If a TAC is involved in designing the contaminant source inventories and the susceptibility analyses, and system operators review the assessments as they are completed is there a need to further evaluate the acceptability of the assessments? If so, how?

1-3 Should the DNR report to the public periodically on the status of the SWAP program? If so, how often and what formats should be used?

Section 2 -Groundwater System Delineations

The following delineation methods are proposed for systems using groundwater

- Municipal water systems with an approved wellhead protection (WHP) plan and new municipal wells - recharge area delineated in approved WHP plan.
- Municipal wells without an approved WHP plan - calculated fixed radius (CFR) based on a 5-year time period and annual pumping history with a minimum radius of 1200'
- Other-than-municipal community wells - 1200' fixed radius
- Nontransient noncommunity wells - 1200' fixed radius
- Transient noncommunity wells - 200' fixed radius

A CFR delineation involves using a simple formula incorporating pumping rate from recent pumping reports, open interval length of the well, and porosity of the aquifer to calculate the radius of a cylindrical volume of aquifer that contains the amount of water pumped within 5 years. The land area above the aquifer volume is used as the wellhead or source water protection area. This is the method used in Wisconsin's approved WHP plan.

These methods do not take into account groundwater flow direction, recharge rates or several other parameters needed to accurately delineate recharge areas for most wells. More sophisticated computer modeling could be done, but the time, necessary data and cost involved would make it difficult to

complete the SWAP within the timeline and budget mandated by the EPA. Recharge areas for wells in all but the very simplest of hydrogeologic settings are very difficult to determine with any certainty. Recharge areas for wells in confined aquifers or fractured media are especially difficult to determine. Considering the expense of doing more advanced delineations and the limited resources available for delineations and assessments through the SDWA it is not practical to attempt site-specific recharge area delineation for the large number of public wells in the state.

The DNR will provide guidance and technical support to systems that want to delineate their recharge areas with greater accuracy than the above proposed methods. Technical assistance will be concentrated in areas where source water protection is considered to be a realistic prevention strategy, and where there is local interest to develop a wellhead protection program. In these areas, more advanced delineations can be created that afford a much more secure level of protection.

The 1200-foot fixed radius delineations proposed for other-than-municipal and non-transient non-community wells are based on minimum setback distances in NR 812. These delineations do not take into account specific well construction, aquifer or hydrologic factors. They are based on the assumption that the land area immediately surrounding the well contributes water to the well.

For transient non-community wells, the state intends to delineate a 200 foot radius circle around each well. This distance is based on modeling studies done in Minnesota that showed that most transient non-community wells in unconfined, porous media aquifers draw water from within a radius of 150 feet. There are approximately 11,000 transient systems in the state. Based on the number of these wells and the time constraints, we believe this approach makes the most sense for these well types.

Question

2-1 Do you agree with the delineation methods proposed for systems using groundwater? If not, what methods do you suggest be considered?

Section 3 - Surface Water System Delineations

The DNR convened a TAC to make recommendations on how to delineate source water protection areas for systems using surface water. The following is a strategy developed from their recommendations, the results of a survey of surface water system operators and the Source Water Protection Team's subsequent discussions.

Delineation Strategy: Source water protection areas will be assigned to each intake/intake cluster. Each delineated protection area will include watersheds (one or more) with the potential to adversely impact water quality at the associated intake/intake cluster.

1. *Lake Michigan/Lake Superior:* Based on size of the water sources and intake distribution, the entire Lake Michigan and Lake Superior watersheds will not be delineated. To promote local protection activities, each intake/intake cluster will be assigned an individual protection area that will include at least one locally discharging watershed.
2. *Lake Winnebago/Rainbow Lake:* Based on the well-mixed characteristic of the water sources, the entire Lake Winnebago and Rainbow Lake watersheds will be delineated and assigned to the associated intakes.

Delineation Strategy Implementation: Preliminary protection areas for surface water systems have been delineated. These delineations will be entered on GIS and available for public review by the end of this year. Fine tuning of the delineations will be conducted by SWAP-funded project personnel.

Protection Area Segmentation Strategy: Each protection area will be segmented by individual watersheds (direct discharging and major tributary watersheds). All protection areas, including Lake Winnebago, will be subject to segmentation. Each segment will be evaluated and ranked based on potential to impact intakes:

1. Low impact potential (Level 1 Segment)
2. Moderate impact potential (Level 2 Segment)
3. High impact potential (Level 3 Segment)

Segment ranking will determine the level of assessment conducted. Four criteria may be used to evaluate and rank each segment:

1. Proximity of the stream discharge to intakes
2. Magnitude of the stream discharge
3. Likelihood that critical contaminants exist in the segment
4. Water quality monitoring data

Segmentation Strategy Implementation: Segmentation evaluation and ranking will be conducted by SWAP funded project personnel after the delineations have been finalized. Relationships with surface water programs will be established to facilitate SWAP/watershed approach cooperation.

Questions

3-1 There are a number of other factors that could be used for classifying segments that are more time consuming and expensive. Considering funding constraints, are there any other criteria that should be used to rank segments for varying levels of assessment?

3-2 The segmentation strategy will result in different levels of assessment within individual protection areas (i.e., some portions will be assessed in greater detail than others). Is this appropriate?

3-3 Three segment rankings are proposed. Should additional rankings (ex., low-moderate, moderate-high) be considered to allow more levels of assessment?

3-4 The segment evaluation criteria have not been assigned any particular weight or importance relative to each other. Should the segment evaluation criteria be weighted? How?

3-5 Should land use data be used to determine the “likelihood of critical contaminants in the segment”? If so, what land uses should be considered “critical”? Are there any critical point sources that should be inventoried and used for this determination?

3-7 Is water quality monitoring data necessary? If so, what parameters should be looked at?

Section 4 - Inventories of Significant Potential Sources of Contaminants

Groundwater Systems: The State has considered all currently regulated contaminants as well as all of the contaminants recently listed on EPA's "Drinking Water Contaminant Candidate List". Any location where significant amounts of a SDWA regulated or SDWA regulatory candidate contaminant is used, manufactured or stored shall be identified, to the extent practical, to assist the State in assessing the threat to source water contamination for a public water system. An initial draft list of these locations, or SPSCs, has been prepared (see attached) using the vulnerability assessment contaminant source list, the wellhead protection contaminant source list and the list of potential sources of contamination identified in the 1997 EPA SWAP draft and final guidances. Data availability will be a factor in selection of potential sources for assessments. Some information will exist only as decentralized paper files. Others may be available as complete GIS data layers. DNR and other state agency staff are determining the availability of existing state databases. These efforts will be continued through a TAC. This TAC will also determine the scope of the need for additional information from the field.

Other factors considered in developing the list of SPSCs are the number of sources in the state, significance as a groundwater contamination source in Wisconsin, the ease of field locating a particular contaminant source, and its significance to EPA. Discussions have occurred with appropriate DNR staff and external contacts to determine the feasibility of taking inventories of the listed SPSCs.

The general approach for contaminant inventories for community and non-transient non-community groundwater systems will be to locate all wells and significant contaminant sources using existing databases and supplement this information with site inspections and owner/operator interviews. Much of the contaminant inventory work has been done for these wells through the vulnerability assessment process in the years 1995, 1996, and 1997. In the vulnerability assessments to be done in 1998, 1999, and 2000 this information will be updated and expanded through use of the new contaminant inventory list.

There is little or no contaminant source inventory information for transient non-community systems. The general strategy for these wells will be to locate wells and SPSCs within the 200 foot radii by site inspections and/or owner interviews. Due to the large number of systems, SPSC inventories will focus on significant potential sources of nitrate and microbial contaminants only. Despite the reduced number of SPSC types to identify, the workload to inventory SPSCs for all of these systems will be quite large.

Surface water systems: Although there are only 20 surface water systems, there have been no previous contaminant source inventories for this purpose. In addition, the source water areas are very large (the Lake Winnebago watershed covers 6000 square miles). We propose that existing data be used for Low and Moderate level impact potential segments of surface water assessments. Interviews with system operators will also contribute to identifying SPSCs. Limited field location of SPSCs may be done for High level impact potential segments. The value added by conducting field activities within areas of heavy industrial and/or human densities seems limited. Data sharing activities between bureaus, departments, and agencies will be compiled into a GIS for assessments in areas of heavy industrial and human concentrations.

Assessments should lead to the end result of protecting public water systems by preventing contaminants from entering the drinking water. Since resources to do this adequately are finite, the state should do detailed assessments in source water protection areas when prevention is a viable strategy. In areas where the number of contamination sites preclude prevention as a trustworthy first line of defense, a

more general assessment of the environmental conditions of the area should be made to make effective use of available funds. Treatment rather than source water protection will be the drinking water public health protection strategy in these locations. The more general assessments will be beneficial to the public water supply because it can be used to justify a higher priority need for treatment. Regulatory controls developed from other legislation like CERCLA, RCRA, CWA, etc. will still be in place to reduce pollution. In areas where prevention is not a viable strategy, funds will be better spent by protecting the drinking water through treatment than by completing assessments that do not lead to an effective prevention strategy. The DNR will seek input and determine where prevention might be a viable strategy and where it would clearly not work.

The process of data collection has begun through mapping public system wells and intakes. Most of the work will be locating contaminant sources and mapping them within the source water protection area boundaries. The Source Water Protection workgroup conducted an initial review of many available data sources that provide SPSC data. A TAC on data integration consisting of officials with strong expertise in data management will soon convene to begin looking at the most efficient ways to develop data sharing methods, and work with GIS experts to map source locations. Whenever possible, field staff conducting source inventories will be provided computer generated maps that identify potential contaminant sources identified from shared databases. This will give staff preliminary information that will help them conduct a more complete inventory when out in the field.

There are several options that we might use to do the SPSC inventories. One would be to have the work done by DNR staff, probably limited term, full-time "Project" positions. Another option would be to contract with counties or other entities to do the work. Since the intent of the SWAP is to implement source water protection after the assessment is done, it would seem beneficial to encourage participation/involvement at the state and local levels to get follow-through on source water protection activities. However, not all counties and local governments are prepared to take on this type of work and produce consistent data. Data consistency concerns favor a centralized approach to doing the assessments. A third option is to hire a contractor to do SPSC inventories for the state. This is likely to be the most expensive option. By dividing the SWAP total (\$4,150,000) by the number of public water supply systems (15,062 wells and intakes) we have an average of \$275 per assessment. This average is inflated because it disregards other costs rising from required SWAP components including delineations, data integration, and making the results of the assessments public. This appears to be too little money to interest most contractors. Considering the resources available for the source water assessments and the incentive for economy (any unused money will revert back into the State Revolving Loan Fund), we propose that the DNR do the assessments.

Questions

- 4-1 The attached Public Water Supply Contaminant Use Inventory Form (Form 3300-215) lists potential sources of contamination that the WDNR proposes to use in its assessments of groundwater systems. Are there any other potential sources of contamination that need to be identified?
- 4-2 Do you agree with the proposed general approach for completing SPSC inventories within source water protection areas?
- 4-3 Is prevention a viable strategy for all public water supply systems including surface water systems? When should investments be made to actively pursue prevention strategies?
- 4-4 The exactness of the assessments will be determined by the accuracy of our data sources and GIS equipment. The detail of the assessments will be determined by how much time is spent identifying

every source. Is there a level of exactness and/or detail that you think should be achieved by each assessment to be considered "complete"?

4-5 Should the state contract out aspects of the assessments? If so, to whom?

Section 5 - Integration/Coordination with Other Programs

To be successful the SWAP will have to be integrated with other local, state and federal programs. Source water protection will rely on the usefulness and availability of the assessment results. Data-sharing between the agencies is a logical place to begin in sharing the responsibilities for SWP activities. The state has large amounts of SPSC data in many formats and locations. A major challenge of the SWAP will be to make use of that data. We propose to integrate the relevant data into a Geographic Information System (GIS). This will require cooperation between data custodians, whether they be at the local, state or federal level. The DNR's Source Water Protection Team includes representatives from the Wellhead Protection, Public Water Supply, Non-Point Source Pollution Abatement, and Water Resources programs. Some examples of how existing programs can be integrated are:

Wellhead Protection: Source water assessments will clearly be useful to communities interested in developing wellhead protection plans. The delineations and SPSC inventories completed through the SWAP are two of the major components of wellhead protection plans.

Watershed Approach: The DNR is developing an integrated watershed approach. This approach will be used to develop and implement watershed plans. The concept will likely emphasize identifying goals for the basin and priorities to meet the goals. Implementation programs will then focus on the priorities. The SWAP can contribute information useful in setting goals and priorities for the watersheds. Consequently, the type and quality of the information collected should be of use to those setting watershed priorities.

Nonpoint Source The nonpoint source grant program is developing a new system for scoring proposals for program funding. The scoring system could build in points for projects implementing the results of the assessments.

Some of the other programs that we plan to coordinate with include:

Local

- County Governments
- County Code Administrators
- Wisconsin Environmental Health Association
- Wisconsin Rural Water Association
- Regional Planning Commissions
- League of Municipalities
- Tribes
- DNR Public Water System programs
 - Wellhead Protection
 - Monitoring Relief
 - Underground Injection Control
 - Sanitary Surveys
 - Groundwater Rule
 - Capacity Development
 - Operator Certification
 - Chemical Monitoring Reform
 - Disinfection Byproducts Rule

- Other DNR Water Programs
 - Water Quality Standards
 - Watershed Approach
 - Clean Water Act State Revolving Fund
 - Index of Watershed Indicators
 - Clean Water Act Monitoring and Data Management
 - Non-Point Source Pollution Abatement
 - Total Maximum Daily Load
 - Clean Lakes Program
 - Wetlands
 - Pollution Discharge Elimination System
- DNR non-water programs
 - Pesticide State Management Plan
 - Pollution Prevention
 - Leaking Underground Storage Tanks
 - Spills
 - Landfills
- Other State Programs
 - DATCP - Pesticide and Nutrient Management
 - DOT- Salt Storage, Wetlands, Haz. Mat/Haz. Waste
 - Commerce - Petroleum Storage Tanks and Private Sewage Systems
- Federal Programs
 - Conservation Reserve Program - NRCS
 - Environmental Quality Incentive Program
 - Swampbuster
 - Wetlands Reserve Program

Questions

- 5-1 Other than data sharing and the other examples stated above, in what ways would you like to see the state SWAP be coordinated among various environmental and other state programs?
- 5-2 What other programs/agencies/organizations should be included in the SWAP?
- 5-3 How should the state's assessment program lead to state watershed approaches and link to wellhead protection and other protection programs?
- 5-4 Should the state carry out a source water protection program after the SWAP is completed? Is this a good use of SRF funds?

Section 6 - Funding (see p.1 for a description of SWAP delineation and assessment funding)

Besides the delineation and assessment set-aside, there are two other direct set-aside funding avenues for source water-related activities through the DWSRF capitalization grant.

- 1) Up to five percent of the capitalization grant can be set aside for implementation of the wellhead protection program. There is no state match necessary for these expenditures.
- 2) A State may use up to 10 percent of a state's capitalization grant to administer or provide technical assistance for source water protection programs within the state. The State must match this 10 percent dollar-for-dollar.

Questions

- 6-1 Understanding the funding mechanisms available for SWP activities through the drinking water state revolving fund, and understanding that any money set-aside from the capitalization grant is money that won't be spent on water system infrastructure repair, is the \$ 4.15 million spent on SWAP activities an appropriate sum? If not, how much should the state spend on SWAP program development and implementation, and should the resources come from the DWSRF and/or other resources?
- 6-2 The state is proposing to set-aside \$120,000 for wellhead protection implementation in the form of information and education activities and data integration for fiscal year 1999. Do you agree that this is a reasonable amount for these activities?

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