Meaning of Source Water Protection:

Measures have been implemented or are in the process of being implemented to <u>reduce</u> the risk of potential contamination of the source water.

Goals for Source Water Protection Planning

Goals of Minnesota's source water protection program for surface water systems are:

- Address contaminants that can potentially impact the **acute and chronic health of human beings**;
- Engage appropriate parties such that **implementation buy-in** is accomplished;
- Reduce the incidents of potential drinking water contamination occurrences by **establishing barriers of protection** before the source water reaches the treatment plant;
- Increase awareness of drinking water protection through **information and education**;
- Provide a **sustainable source water resource**;
- Provide for **cost-effectiveness**;
- Build an **aesthetic acceptance and confidence** by the user;
- Accomplish **pollutant reduction** in light of the need to balance demands of multiple users of the resource.

Development of source water protection plans is voluntary. However, for the plans to be endorsed/approved by state agencies and local units of government, certain minimum elements must be met. When the words "requirements" or "must" are used in this guidance, it means that the elements being described have been agreedto by the workgroup members and endorsed/approved by the Environmental Quality Board (EQB). Public water suppliers relying on surface water that use this guidance in development of their source water protection plans will be in the strongest position to obtain cooperation and assistance as they implement their plans. A plan will not be endorsed/approved by EQB if it does not follow the protocols of this guidance document.

General Content of a SWP Plan

Part 1 must contain the following elements:

- **Assessment of the data elements used in the plan,**
- **Delineation of the SWPA, including Priority A and B Designations, the DWSMA and the SWPW, and**
- **Description of the source water setting**

Part 2 must contain the following elements:

- **Data Elements, including inventory of potential contamination sources and land uses,**
- **Impact of changes on public water supply intake,**
- **Issues, problems, and opportunities,**
- **SWP goals,**
- **SWP objectives and a plan of action,**
- **Approach(es) used to evaluate the progress of the plan of action, and**
- **Contingency strategy to address water supply interruption.**

General Procedures SWP Plan Development

Identify an SWP Plan Manager

The principal duties of this position may include:

- Coordinating the technical, policy, and educational aspects of SWP plan development and implementation;
- Serving as liaison with MDH and local units of government;
- Writing the SWP plan;
- Scheduling and conducting meetings;
- Chairing the SWP team; and
- Overseeing data management and reporting.

Appoint an SWP Team

The principal duties of the team may include:

- Assembling information about the water system;
- Providing information and input related to the boundaries of the DWSMA;
- Locating contaminant sources within the DWSMA;
- Developing goals, objectives, and management strategies for contaminants of concern; and
- Providing local control and ownership of the SWP plan.

The SWP team could include:

- System water operator*
- Public utilities director*
- City administrator or clerk*
- Council member*
- Local business representative
- Citizens within the DWSMA
- Local educator
- County water planning staff
- Planning and Zoning Administrator
- Landowner representatives (farmers, loggers, etc.)
- Watershed and/or Soil and Water Conservation Staff
- State agency staff
- Minnesota Rural Water Association staff
- Others as appropriate for the area

* Suggestions followed by an asterisk are appropriate for water systems owned and operated by a local unit of government.

Develop a Public Participation Process

At a minimum this must include:

- Notifying local governments within the DWSMA of the intent to develop an SWP plan;
- Meeting with local governments at least once during SWP plan development• Submitting a copy of the approved Part 1 of the SWP plan to local governments; and
- Local government review of Part 2 of the SWP plan (described on page 14) before submittal to MDH.

Hold Scoping Meeting Regarding Part 1

Because the level of effort needed to determine the delineations and sensitivity analysis will vary from supplier to supplier and source water to source water, a Source Water Protection Staff person of MDH will convene a panel of surface water professionals to meet with the public water supplier to determine the delineation criteria, data elements and information needed to: 1) delineate the SWPA, including Priority A and B Designations, the DWSMA and SWPW, and 2) analyze the sensitivity and susceptibility. The panel of surface water professionals will consist of a representative from the DNR, MPCA, BWSR, MGS, and USGS. Another topic to be discussed may include what delineation method(s) would be most appropriate given data availability and the type of water supply that is being used. The types of existing data elements which a panel may suggest are categorized as: 1) the physical environment; 2) land use; 3) water quantity; and 4) water quality. MDH will assist the public water supplier with collecting this data, which is on-file with state and federal agencies. MDH will formally notify the public water supplier in writing of the results within 30 days of the scoping meeting.

It is important to define a geographic area as the protection area. This area will be known as the Source Water Protection Area (SWPA). The SWPA will be further delineated into two areas designated as Priority “A” and “B.” To better understand the geographic location of the SWPA, the Source Water Protection Watershed (SWPW) needs to be defined as well.

Criteria for Delineating Priority A and B Designations of the Source Water Protection Areas

PRIORITY A DESIGNATION - The menu of criteria includes, but is not limited to:

- Time of travel,
- Minor watersheds that drain to the waterway above an intake,
- Upstream hydrology,
- Topography,
- Topographic divide,
- Soils,
- Intake depth and length,
- Public water supply system,
- High, medium and low flows,
- How long the system can supply its daily demand while the intake is shut off,
- How quickly specialized treatment can be put on-line,
- Time needed for an observer/responder to notify the water utility of a spill,
- Knowledge of potential contaminant sources,
- Existence of major transportation routes,
- Barges, boats, or other potential contaminant sources in direct contact with the waterway, and

Direct connection between mine pits.

PRIORITY B DESIGNATION - The menu of criteria includes, but is not limited to:

- Groundwater flows, including groundwater divides;
- Depth of the lake or volume of water;
- Intake depth and length;
- Eco-region context;
- Type of lake - inland, Lake Superior, mine pit;
- Tributary influences;
- Immediate “lakeshed” or “pitshed;”
- Watershed-to-lake area ratio;
- Current direction;
- Flow rate;
- Time of travel;
- Residence time;
- High, medium and low flows;
- Geology surrounding the water body;
- Topography surrounding the water body;
- Type of land cover surrounding the water body;
- Soils;
- Watersheds;
- Hydrology, including changes in hydrology;

- Knowledge of the land use, including shoreland classification;
- Knowledge of potential sources of contamination;

Water quality information about the source water, such as total suspend solids, fecal coliform bacteria, dissolved oxygen, phosphorus.

It is important to understand that any Priority A Designation is within the Priority B Designation for the purpose of achieving the stated goals of source water protection planning.

Criteria for Delineating the Drinking Water Source Management Area (DWSMA)

The DWSMA is the surface and subsurface area surrounding a public water supply intake, including the source water protection areas, that must be managed. The boundaries of the DWSMA are geographic features such as: 1) right of ways for highways, streets, roads, and railroads; 2) section, half-section, quarter-quarter section or other fractional section lines of the United States public land survey; 3) property or fence lines; 4) public utility service lines; and 5) water features, such as a stream/river bank and the lakeshore. The DWSMA must flollow the Priority A and B Designations as closely as possible.

Criteria for Delineating the Source Water Protection Watershed

The SWPW provides information about the geographic location of the SWPA and DWSMA. What is an appropriate watershed will vary based a number of criteria. The menu of criteria includes, but is not limited to:

- Type and size of public water supplier;
- Type and size of the source water body;
- Volume of water drawn;
- Upstream area;
- DNR minor watershed boundaries with local adjustment/groundtruthing;
- Local flow direction and volume;
- Currents;
- Tributary influences;
- Residence time;
- Knowledge of the land use, including shoreland classification; and
- Knowledge of potential sources of contamination;

Analyzing the Sensitivity and Susceptibility of the Source Water to Contamination

In determining the sensitivity of a source water, the intrinsic physical properties of the geologic setting or the landscape within the watershed must be considered. Factors influencing the sensitivity of a surface water include volume of water, seasonal changes in flow rates, topography, hydrology, geology, vegetation, soil types. These factors help

attenuate contaminants and affect their movement to the public water supply intake. For example, a larger volume of water in a source water and the rate at which it flows can help attenuate or dilute contaminants before they enter a public water supply intake.

Susceptibility is defined as the likelihood that a contaminant will enter a public water supply at a level which may result in an adverse human health impact. The susceptibility of all surface water is determined to be high because there are no practical means of preventing all potential contaminant releases into the surface water. However, a susceptibility determination for a specific public water supply system must be included in the plan, based on comparing the sensitivity of the surface water intake to the presence of a potential source of contamination which may release a contaminant of concern. This secondary analysis allows for a differentiation between each surface-water based public water supply system.

Submit Part 1 to MDH for EQB Approval

Notification of review results will be communicated by MDH to the public water supplier within 60 days after EQB approval. Once the delineation of the SWPA, the DWSMA, and the analysis of sensitivity and susceptibility are approved, the public water supplier can begin Part 2 of the SWP plan. If the EQB does not approve a part of the submittal, the public water supplier will receive written notification that identifies the deficiency and the reasons for disapproval. The public water supplier will need to re-submit the corrected portion of Part 1 of the SWP plan before moving on to Part 2.

Submit Part 1 to Local Units of Government

The public water supplier or MDH will need to submit a copy of the approved Part 1 to local units of government, or provide a notice defining how to obtain a copy within 30 days of EQB approval. The MDH and public water supply will need to coordinate this effort

Hold Public Meeting Regarding Part 1 Approval by EQB

Within 60 days of notification that EQB has approved Part 1 of the plan, the public water supplier must hold at least one information meeting for the general public

Hold Scoping 2 Meeting Regarding Part 2 of SWP Plan

MDH will hold a Scoping 2 meeting to identify relevant data elements for Part 2 of a SWP plan. In the development of Part 2 of the Source Water Protection plan, the public water supplier must collect and consider existing information which describes: 1) the physical environment; 2) land use; 3) water quantity; and 4) water quality MDH will formally notify the public water supplier in writing of the results within 30 days of the scoping meeting.

Conducting a Potential Contaminant Source Inventory

The focus of the inventory within the Priority A Designation will be point sources of potential sources of contamination. Both point and non-point sources must be inventoried in the Priority B Designation. While it is not necessary to conduct an inventory within the SWPW, a section about the type of land use and associated non-points source is to be included in the SWP plan and will be based on existing data

Identifying Contaminants of Concern

The identification of contaminants of concern is another fundamental element of SWP. This identification must be based on the inventory, the public water supplier's opinion and the contaminants listed in the Federal Safe Drinking Water Act. This identification will also be used to determine the extent of management strategies for the inventoried source.

Identifying the Impact of Expected Changes to Land and Water Resources on the Public Water Supply

Identifying the Issues, Problems, and Opportunities

Establishing SWP Goals

Identifying Objectives and Plan of Action

The core of an SWP plan is the identification and implementation of effective contaminant source management strategies that will protect a public water supply intake from potential contamination. These management strategies may range from nonregulatory activities, such as public education, to regulatory activities, such as the adoption of ordinances. The management of point sources of contamination will be the focus of the Priority A Designation. The Priority B designation management must focus on both point and non-point sources of contamination. If determined to be appropriate at the Second Scoping Meeting based information in Part 1 a source water protection plan may need to identify management strategies for non-point source of contamination located in the SWPW.

There are hundreds of activities that could be implemented as management strategies, but Part 2 of the SWP plan must use management strategies which most effectively address local land and water uses, as well as resource needs.

Another important part of an SWP plan is the prioritization of management strategies. A number of factors will need to be considered when management strategies are selected and prioritized. Such factors include:

- Knowledge of a contamination of a public water supply intake;
- Types and quantities of the potential contamination sources;
- Location of the potential contaminant source in relation to the intake;
- Capability of the source water to attenuate or dilute a contaminant;
- Capability of the geologic material in the source water protection area to absorb a contaminant;
- Existence and effectiveness of existing official controls;
- Time required to obtain cooperation; and

  Administrative, legal, technical, and financial resources needed.

The plan of action in the SWP plan will be required to:

- Address the problems and opportunities identified in the plan;
- Identify and prioritize the management strategies that will be used;
- Identify proposed changes in intake construction, maintenance, and use; and
- Identify who is responsible to implement each management strategy selected.

Identifying a Strategy to Evaluate the Effectiveness of Management Strategies

Preparing the Contingency Strategy for an Alternate Water Supply

Submit Part 2 of the SWP Plan to Local Units of Government

Before the SWP plan is submitted to MDH, the public water supplier must submit a copy of Part 2 of the SWP plan to local units of government that are wholly or partially within the SWPA, or provide a notice defining how to obtain a copy of Part 2. Local units of government will be allowed 60 days to review and comment on Part 2 of the plan.

Hold a Public Hearing/Public Information Meeting Regarding the SWP Plan

A public utility or governmental public water supplier is to hold a public hearing on the SWP plan after the 60-day local government review and before the SWP plan is submitted to MDH

Submit the SWP Plan to MDH for State Agency Review

The public water supplier must submit seven copies of the following to MDH:

- Part 2 of the SWP plan,
- All written comments received on the plan and the public water suppliers response to the comments received, and
- A summary of changes made to the plan as a result of the local review process.

MDH will forward copies of the plan submittal to the following agencies for comment:

- Minnesota Department of Agriculture,
- Environmental Quality Board,
- Minnesota Department of Natural Resources,
- Minnesota Pollution Control Agency,
- Minnesota Board of Water and Soil Resources, and
- Other agencies EQB or MDH believe could assist with review.

These agencies will have 60 days in which to submit comments to MDH regarding whether any portion of the proposed SWP plan is contrary to state or federal law or if it does not satisfy the review criteria.

Submit the SWP Plan to EQB For State Approval

After the 60-day review done by local units of government, the public water supplier must submit within 30 days, a copy of the SWP plan to MDH. MDH must forward, within 30 days, a copy of the SWP plan to EQB for endorsement/approval, along with a recommendation regarding the endorsement/approval of the plan. EQB will have 60 days after receipt of the plan from MDH to act upon the plan.

Notification of State Review Results - The EQB will communicate the results of the State's review to the public water supplier within 90 days after the supplier has submitted Part 2 to MDH.

Implement the SWP Plan

Upon notification from EQB that the SWP plan has been approved, the public water supplier may proceed with implementation. This must begin within 60 days of approval notification and the public water supplier must notify local units of government within the DWSMA of the SWP plan adoption or future plan amendments.