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## Overview of Source Water Environmental Education Team (SWEET Team) Conducting Public Education under a WREN Source Water Protection Grant

*Source Water Environmental Education Teams (SWEETs) raise awareness and provide education to Pennsylvania citizens and local officials about protecting sources of community drinking water.*

### Role of SWEET Team in Source Water Protection

The purpose of a **Source Water Environmental Education Team** or "**SWEET**" **Team** is to raise public awareness about ways to protect local water supply sources (both ground water and surface water sources that provide public water supply) and to provide Pennsylvania local leaders and residents with education and knowledge about their sources of drinking water, and ways to protect sources. The first step is to help communities understand where their source water areas are located that are in need of protection; the next steps is to offer information and guidance about ways to eliminate, reduce, or contain the major risks of contamination. If major risks identified in the source water protection plan (A and B Risks) located in key source water protection areas (Zones 1 and 2 for groundwater, and/or Zones A and B for surface water) cannot be reduced, or eliminated, then SWEET Teams can help educate about options and the need for emergency response coordination with public water systems.

#### **SWEET Teams provide information about:**

- Location of public water supply lands using source water protection maps, location of source water protection zones, recharge areas, and highlight any significant geologic aspects of the source water areas (e.g. sink holes, karst geology);
- Explain time of travel in the local source water area and the time period in which a contaminant could reach a public water supply well or intake;
- Major potential sources of current or future contamination (risk factors) to the local public water supplies using information in the source water assessments\* or Source Water Protection Technical Assistance Plans (SWPTAP) developed by DEP;
- Source water protection management measures needed to prevent, capture, or minimize pollutants before they arrive at the water treatment plant;
- Land uses and land use practices compatible with water supply lands in the County or region;
- Emergency response coordination for spill response and spill management etc.

SWEET Teams are instrumental in helping communities take a holistic approach to public water supply protection that goes beyond reliance on technological treatment only, thereby reducing risks to public health.

The need for source water protection may not be apparent to many decision makers and the general public. Even though the entire community depends daily on an adequate supply of clean safe drinking water, many community leaders do not know where their valuable recharge areas are located, and do not understand how their decisions about land use, growth and development on or near recharge lands, may jeopardize the future of the public water supply, or result in increased treatment costs. Individual property owners or businesses located within recharge areas may also not be aware that they are occupants of recharge lands, and that their daily actions can affect the

town's water supply. Ground water, in particular because it is hidden below the surface, is often "out of sight and out of mind."

Most water utilities in Pennsylvania typically do not own or control land use in their contributing watershed and recharge areas. Watershed boundaries often do not match political jurisdictions. Wellfield areas or source watershed areas may overlap among multiple systems and municipalities or Counties. Fragmented efforts by individual groups, systems, or municipalities working in isolation are generally not effective on their own. Cooperation and "buy-in" from both public and private stakeholder interests is essential to meet emerging challenges to assure a safe and reliable drinking water supply for the future.

Projects are encouraged to complete their Source Water protection Brochure or Fact Sheet **prior** to conducting public education events, so that the SWEET Team may distribute the brochure or fact sheet to attendees at their education events.

## What is Source Water? Why is protection of source water important?

### *Safe Drinking Water Starts at the Source!*

Source water is the untreated, raw water from streams, rivers, lakes, springs and underground aquifers that serve as sources of a community's municipal drinking water. Many water sources are shared resources with communities upstream or within an aquifer. **SAFE** and **RELIABLE DRINKING WATER** is fundamental to the viability of Pennsylvania communities. In Pennsylvania, assessing source waters is mandated under the federal Safe Drinking Water Act; however, **establishing a Source Water Protection Program is completely voluntary**, and allows for local control over local water quality issues based on community input.

*"While many Pennsylvanians get their drinking water from on-site private wells, the majority of consumers rely on public water supply systems. More than 2,100 community water supply systems in the state service more than 10.2 million people." Pennsylvania Water Atlas*

Drinking water sources are vulnerable to a variety of potential sources of contamination that include both point and nonpoint sources of pollution. Source Water Protection is an important component of integrated watershed management and offers an extra margin of safety beyond water treatment technology, making it useful to guard against contaminants, including unregulated emerging contaminants.

By placing multiple integrated barriers from the source to the consumer at the tap, source water protection can help protect communities from the risk of contamination and waterborne disease from inappropriate land use practices and potential contaminant sources located in the vicinity of drinking water wells and surface water intakes. A successful **multiple barrier approach** includes:

- Source water protection measures and activities such as understanding water supply areas, identifying and reducing contamination in watersheds; and appropriate land management for water supply lands;
- Appropriate source water treatment;
- Properly trained, certified water operators.

The multi-barrier approach recognizes that while each individual barrier may be not be able to completely remove or prevent contamination, and therefore protect public health, together the barriers work to provide greater assurance that the water will be safe to drink over the long term. The American Water Works Association (AWWA) developed a new **G300 ANSI standard for source water protection** intended to allow for peer review of SWP programs.

Public awareness and education about the ways to prevent contamination from daily activities in water supply areas is an important component of source water protection programs. Informed citizens are essential partners to develop the support necessary that will make local source water protection a reality.

## Source Water Protection (SWP) Benefits

As the old adage goes, "An ounce of prevention is worth a pound of cure." Maintaining and improving source water quality is a logical, prudent, and sound economical approach that provides multiple benefits that include public health, economics, and overall protection for the ecosystems that provide clean drinking water:

- **Public Health Protection** – provides a first line of defense in a **multiple barrier approach** that reduces risks to public health by minimizing exposure to pollutants, such as metals, fertilizers, pesticides, volatile organic compounds, and waterborne diseases. Source water protection helps keep harmful contaminants out of the water supply, including emerging contaminants, such as pharmaceutical and personal care products, delivering safer water to the treatment plant and the consumer. Protection is especially important for sensitive populations like infants, expectant mothers, immuno-compromised individuals, and the large elderly population in PA. Protected high quality water supply areas contribute to quality of life for Pennsylvania citizens.
- **Reduced Treatment Costs** – Clean water is less expensive to treat and reduces system operation costs, energy costs, water treatment infrastructure costs, chemical treatment costs, water monitoring and testing costs, and overall system maintenance costs.
- **Economic Benefit** – Communities and consumers bear the economic burden when drinking water sources are contaminated. Source Water Protection ensures the viability of high quality low cost water supply sources over the long term in the watershed. It avoids the costs of contamination, monitoring, remediation, legal expenses, and costs of alternative supplies. The economic benefits from a public health standpoint are reduced health care costs and reduced loss of productivity and work time. Safe and plentiful water enhances the community's potential to attract economic development and tourism to maintain a healthy economy in Pennsylvania. EPA has established that costs of protection are very low compared with high costs of remediation. The cost of a single contamination event can run into the millions of dollars: treatment systems may have to be expanded, or a new water source found to meet regulatory requirements or to address new contaminant threats. Other avoided costs include decreased property values, loss of tax base and loss of citizens' confidence in their drinking water, public utilities and community leaders.
- **Sustainability and increased certainty** – Protected water supply sources sustain local ecosystems that furnish drinking water and assure quality of life for future generations. Protection improves community confidence, provides more consistent influent water quality, and reduces emerging contaminants in source waters.

## SWEET Team Members

- SWEET Team members conduct source water protection education in the community using the visual tools/ models outlined below.
- The SWEET Team generally consists of three to five member partners, with two (2) members from organizations other than a community water system, and at least one (1) member representing a community water system.
- Here are suggestions for potential SWEET Team members:  
County/Local Planning Commission Member, Conservation District Educator/Watershed Specialist, Educator, Healthcare professional, Public Water System Member/Water Professional, Water Authority Board Member, Cooperative Extension Staff, Municipal/County/COG Official, Watershed Association Member, Environmental Advisory Council Member, Land Conservancy Representative, Agricultural Representative, Civic leader/Municipal leader/Corporate Sustainability representative from area business, volunteers with professional water resource background.

## What is expected of SWEET Team Members?

- SWEET Team members are expected to have good presentation skills to conduct public educational presentations, and sufficient subject matter knowledge about local water resources and natural resource protection measures to be able to familiarize community audiences with basic protection strategies.
- Team members are expected to read the Source Water Protection Plan(s) for their water system(s) and become familiar with the specific source water areas and major risk factors outlined in the source water protection assessments (SWAP) Reports\* or Source Water Protection Technical Assistance Plans (SWPTAP) completed for the public water systems by PA DEP within their target areas. They are expected to incorporate and educate about the key risks to the water supply sources and offer information about recommended SWP management measures that will reduce key risks in their presentations.
- SWEET Teams are expected to use the following three (3) Visual Teaching Aids for municipal and public education events during the project. Research has shown that visual tools greatly aid audience understanding of complex concepts like groundwater and source water protection. Therefore, for best success, WREN requires the use of visual tools in outreach under its SWP Education Grants:
  1. Ground water flow model (that demonstrates the behavior of ground water, movement of contamination, and the relationship of ground water to surface water),
  2. EnviroScape® Drinking Water & Wastewater Treatment Model that demonstrates the source of drinking water pollution and its prevention by tracing the path of water from **source** to **treatment** plant, to the end user, and beyond,
  3. Maps that illustrate the source water protection areas within the region or county. Consult DEP Regional SWP Coordinator for maps. WREN SWP Grant Funds may be used to produce the maps.

**Ground water simulator model**– It is often difficult for audiences to understand an unseen underground resource like groundwater, and how it becomes polluted. The groundwater simulator is an effective tool to demonstrate the impacts of point and nonpoint source pollution on water resources through the use of colored dyes to depict how water as well as contaminants can migrate through the environment and to drinking water wells.



**Groundwater Simulator Model**



**EnviroScape® Drinking Water and Waste Water Treatment Model**

**NOTES ON Visual Tools:** Grantees are expected to practice and develop a comfort level in demonstrating the models prior to public events. Grantees are encouraged to investigate whether models such as a groundwater simulator model and EnviroScape may already be on hand locally that may be borrowed. A variety of models may be available through the County Conservation District ([www.pacd.org](http://www.pacd.org)), or local watershed organization. Please check with WREN if you need assistance locating models. Groundwater models may also be available through PRWA or the Pennsylvania Groundwater Association (<http://www.pgwa.org/>).

## Conducting a Source Water Protection Briefing for Municipal Officials as required under WREN Grant

SWEET Teams are expected to conduct at least one public information briefing for County and local municipal officials about the importance of source water protection and appropriate management measures. For ease in scheduling, WREN suggests requesting time and scheduling the briefing during a regular public meeting. Use source water protection maps and the visual teaching aids described below; use of pre-determined evaluation tools should be included to evaluate the education effort.

The goal of the session is to assist County and local municipal officials, community stakeholders, emergency responders, and members of the public in learning key information about local source water protection areas, major risk factors, and suggested management measures that will reduce major risks to public water supply:

- a. Where public water supply lands, recharge areas and protection zones are located
- b. Any significant geologic aspects of the source water areas (sink holes, karst geology)
- c. The major potential risk factors in the source water protection areas to purity as identified in DEP's Source Water Assessment Program Report (SWAP), DEP Source Water Protection Technical Assistance Plan (SWPTAP) Management Strategies, or other source water protection plan
- d. Suggested source water protection management measures to reduce risks in source water areas
- e. Relevant information on emergency response plans, contingency plans, alternate water supplies.
- f. Assist county and local officials about their roles and responsibilities in protecting source waters, beneficial or detrimental municipal policies and practices, and how land use impacts drinking water quality and land use practices appropriate for water supply lands
- g. Discuss the group's perspective on the adequacy of current ordinances and whether existing land use approaches are protective of community water supplies for the future
- h. Conduct survey/evaluation to determine audience knowledge pre and post event.

## Conducting Public Education Source Water Protection Events (Three educational events required under WREN SWP Grant)

- Conduct **three (3) additional public education events** (in addition to the municipal official briefing) during the WREN grant period at locations around the region/County using the visual teaching aids described below to educate citizens about the importance of protecting their sources of drinking water.
  - Target audience is adult stakeholders that live, work, or conduct business, within the source water protection areas: community stakeholders, businesses and industries operating within the county/target region, large landowners (golf courses/business campuses, educational institutions), agricultural producers/farmers, residents, civic organizations, conservation groups, public health professionals, and residents living in the source water protection areas.
  - These events may be special source water protection/water resource events, or may be conducted jointly with ongoing community events such as fairs, community days, etc. WREN recommends that SWEET Teams consider conducting short presentations at events such as meetings of civic organizations (Rotary, Kiwanis, Lions Club and Jaycees), local League of Women Voters, Fire Departments, Chambers of Commerce, Scout programs, emergency management, or other organizations where community leaders may gather. Use an evaluation tool to determine results of the education effort.

## Conducting Source Water Protection Education at Schools

The primary target audience for WREN SWP Education efforts is community leaders and adults living and working in the source water protection area. Given the time constraints and curriculum demands on school administrators, WREN does not REQUIRE that a school presentation be conducted under the WREN SWP Grant. However, Grantees are required to offer to conduct a **presentation to a local school district**, and if granted permission, to make the presentation within a school or schools using the models.

***NOTE: In addition to the required educational activities completed under a WREN Source Water Protection Grant, SWEET Teams are encouraged to conduct additional source water protection education/outreach activities as determined by the Collaborative. Please feel free to contact WREN with any questions about grant requirements.***