

4 Step 4: Developing Management Strategies

Introduction: what this step is about

When you have completed your inventory of existing and potential contaminant sources (PCSs) and ranked them by level of risk (Step 3), you are ready to make specific plans to reduce the potential for contamination of your community's drinking water supply. The delineated wellhead protection area (WHPA) (Step 2) defines the area that needs to be managed. In this step, the Planning Team will develop a **management plan** that sets up methods for managing the threat posed by each PCS identified in the inventory. Approaches to managing the threat posed by PCSs may be regulatory, nonregulatory, or a combination of these strategies. Additionally, some contamination sources may not be a threat and may not require management. At this point, the Team may need to set new goals and priorities based on the information that has been gathered up to this point.

Local government is responsible for wellhead management, but pollution prevention is the job of the whole community.

Local government is usually responsible for managing the WHPA; however, the process of developing a management strategy can be an opportunity for community involvement in efforts to preserve the resource and manage future growth. New laws or regulations, for example, obviously require government authority, but everyone in the community can make lifestyle changes that prevent pollution. If your WHPA falls in more than one jurisdiction, you will need to cooperate with neighboring communities in joint management of the WHPA.

Your community can use a number of strategies to manage the land around its wells and protect the wells from contamination. The following sections describe both regulatory and nonregulatory (voluntary) controls that can be used in your management plan. Regulatory controls include new local ordinances, zoning and subdivision restrictions, and health regulations. Nonregulatory controls can be local or regional, and include education programs, community programs for proper disposal of hazardous materials, programs for businesses within the WHPA to minimize potential pollution, and conservation easements or even outright purchase of property around the public water supply (PWS) wells. Some specific management measures – sometimes called Best Management Practices (BMPs) – are presented in this chapter as possible tools for your management plan.

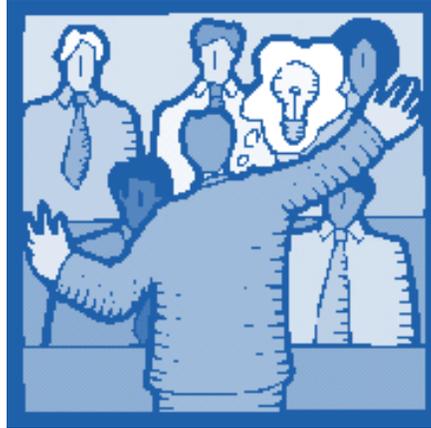
Management plans can use regulatory and nonregulatory controls to prevent ground-water contamination.

You should keep several points in mind in developing a management plan. First, an entirely nonregulatory approach alone may work, but a completely regulatory approach will rarely be successful. Education is a critical part of any program to protect an unseen resource like ground water. Second, understand that not every approach will work in every town or region. Management approaches must fit the local natural, social, economic, and political landscape. This is an important reason for local wellhead protection (WHP) efforts. North Carolina's WHP Program provides local governments with the ability to broaden the protection already provided through state regulatory programs, better control the

Key Points for Your
Management Plan

- Education is a critical part of any management plan
 - Management strategies must fit local conditions
 - Start with the highest risk sources first
 - Assess existing programs first before proposing new ones
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location of future PCSs, and protect public water supplies from PCSs that are not currently regulated. Third, the place to start is with the most urgent problems or highest risks. Immediate threats should be dealt with first and then the Team can work to prevent future contamination. Finally, in deciding what management tools are appropriate, the Team should first assess whether existing programs are adequate to protect ground water before proposing new strategies.



Procedure: what you need to do to complete Step 4 toward your WHP plan



The management plan must provide a method for managing the threat from each PCS source occurring within the WHPAs (e.g., highways, railroads, airports, septic systems, above ground storage tanks). Examples of management strategies, options, and practices that may be employed in the WHPA are discussed in the following pages. The planning Team may also wish to contact the North Carolina Rural Water Association (see “Resources and References section”) for examples of additional management options for the identified PCSs.

Public involvement in the process of developing a management plan must be documented and included in your plan.

Non-regulatory options

Management of your WHPA does not have to include regulation of land use or activities to protect your drinking water supply. Voluntary management strategies can reach a broad spectrum of the community and cross municipal boundaries. Ground-water protection is possible only if the entire community joins together to protect this community resource, regardless of political boundaries. These measures can be taken by themselves or in combination with regulatory approaches.

Acquisition



Purchases of property, development rights, or conservation easements are secure but potentially expensive ways to protect the wellhead area. The only way to absolutely guarantee community control over the activities on lands in the WHPA may involve outright purchase of the land or of a more limited interest, such as surface-use rights. These may be accomplished using fee simple purchase, purchase of partial interests, conservation easements or restrictive covenants. Setting priorities as part of a long-range plan can decrease the cost of acquisition, as can the encouragement of donations and bargain sales.

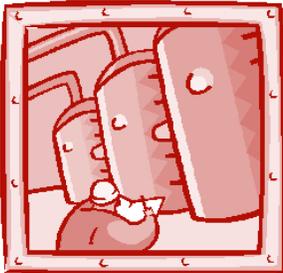
Monitoring regulated or potentially regulated sites

The state maintains and enforces rules and regulations governing ground-water protection. These include rules regulating point and nonpoint sources of contamination, underground injection, underground storage tanks, mining, landfills, coastal concerns, hazardous waste facilities, and well construction. Because these existing rules and regulations provide a baseline of protection to PWS wells, developing a local WHP program is voluntary in North Carolina. Local governments and PWS suppliers are not expected to manage PCSs that are state regulated. However, the town may choose to monitor compliance with existing ground-water protection measures. Monitoring the performance of protection measures that are part of another management program requires that the Team work with both the lead agency of that regulatory program and with the operator(s) of the facility itself. The goals are (1) to make sure that operators of

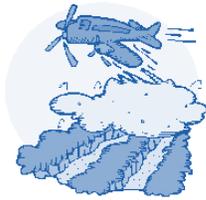
Monitor PCS compliance with existing state regulations – don't assume that discharges and storage tanks regulated by other programs are always in compliance.

potential sources of contamination fully understand their responsibilities and are complying with their permits; and (2) that the regulatory agencies are fully aware of conditions and activities in the WHPA. The following are examples of PCSs that relate to existing regulatory programs:

- If **facilities permitted to discharge** waste to the land surface are located within the WHPA (Non-NPDES Permitted Facilities), the Team should contact the Division of Water Quality to ensure that such operations are in compliance with applicable regulatory and permit requirements, such as routine monitoring and reporting requirements.
- If any soil or ground-water **contamination incidents** have been identified within the WHPA, the Team should contact the property owners and the Division of Water Quality, Groundwater Section, to insure that remediation efforts proceed in accordance with schedules established by these agencies. The Team should also notify the State agency of the location of the facility within the WHPA and its proximity to a public water supply well.
- All owners/operators of regulated **underground storage tanks (USTs)** and other facilities subject to federal and/or state regulations located within the WHPA should supply documentation that their facility is in compliance with said regulations. The Team should obtain copies of the UST permit for each facility. If any UST sites are found to be non-compliant, the Division of Waste Management, UST Section, should be notified.
- If an **abandoned UST site** is found within the WHPAs, the Team should contact the Division of Waste Management, UST Section, to determine if a closure report was submitted. This will document that no soil or ground-water contamination was identified during the closure of the USTs. If a closure report was not submitted, the Team should notify the UST Section of the location of the facility within the WHPA and its proximity to a public water supply well.
- Any individual, industry, business, or government agency installing or planning to **install a regulated UST** within the WHPA should be notified of the North Carolina UST Regulation 15A NCAC 2N .0301 stipulating specific siting and secondary containment requirements for UST systems installed after January 1, 1991. These regulations specify that no UST system may be installed within 100 feet of a public water supply well or within 50 feet of any other well used for human consumption and requires secondary containment for UST systems within 500 feet of a public water supply well or within 100 feet of any other well used for human consumption. Violations of this regulation should be reported to the Division of Waste Management, UST Section. The UST Section should also be notified of the location of the facility within the WHPA and its proximity to a public water supply well or any other well used for human consumption
- Facilities with an underground buried storage capacity of more than 42,000 gallons of oil, or an aggregate above ground storage capacity greater than 1320 gallons of oil, or an above ground storage capacity of a single container in excess of 660 gallons are subject to the Oil Pollution Prevention regulations contained in Federal Regulations found at 40 CFR 112. These facilities must prepare and implement a Spill Prevention Control and Countermeasures (SPCC) Plan. The Town should verify the status of the SPCC Plan for each subject facility located within the WHPA. The North Carolina General Statutes require registration of any facilities storing more



than 21,000 gallons of petroleum product. Subject facilities not in compliance with these regulations should be notified of their regulatory responsibility under this regulation. The Team should also notify the Division of Water Quality, Groundwater Section if such facilities do not promptly come into compliance.



- **Injection wells** are subject to rules as set forth in North Carolina Administrative Code 15A NCAC 2C.0200. Monitoring and reporting may be required if the injection well is part of a ground-water remediation system requiring a non-discharge permit. The Division of Water Quality, Ground Water Section, administers the Underground Injection Control Program.
- **Abandoned dumps** are regulated by the Division of Waste Management, Solid Waste Section. Management strategies include installation of a monitoring well between the dump and the water supply well to monitor for contaminants; or proper closure of the facility, that may involve constructing an impermeable cap on top of the dump to reduce infiltration from precipitation.
- **Pesticide** laws are enforced by the North Carolina Department of Agriculture, Pesticide Section. They State of North Carolina Pesticide Board licenses pesticide dealers and applicators. If you have large areas of intensive agriculture in your WHPA, you may want to contact the Pesticide Section (see “References and Resources” section) to see if growers in the WHPA or their contracted applicators have current pesticide applicators licenses.



Educational programs

Public education and involvement are essential parts of any WHP effort. Public education can be used first to inform community residents about the connection between land use in the WHPA and the quality of their drinking water. Sometimes common, legal activities can pose threats to drinking water, and these behaviors can change only through awareness and learning. Through public education, communities can work to prevent ground-water pollution through applying BMPs. Communities can also use education programs to build support for regulations.

Education efforts can be targeted to businesses, industries, farms, and residents within the WHPA. Education programs may be the best, and only, way to apply a WHPA management strategy across multiple political jurisdictions. Some of these kinds of educational activities can work for your community:

- **Brochures and public notices** can publicize the WHP effort to all sectors of the community. Use the creativity and knowledge of your planning Team to develop effective materials for your community, including **public service announcements, editorials** in local papers, and other **media** events. **Signs along major roads** can alert people that they are entering the WHPA.
- **Pollution prevention information** should be systematically provided to all businesses, industries, farms, residents, and other PCSs within the WHPA. The Team should distribute information on waste handling practices, best management practices, standard operating procedures, and waste disposal methods that could reduce the potential for ground-water contamination, along with information about the North Carolina Division of Pollution

Public education and involvement are essential parts of any wellhead protection effort.

Communities can use education programs to prevent ground-water pollution through voluntary actions or to build support for regulations.



Prevention and Environmental Assistance (DPPEA). The DPPEA provides free technical and other nonregulatory assistance to reduce the amount of waste released into the air and water and on the land and serves as a central repository for waste reduction and pollution prevention information (919-715-6500 or 800-763-0136). Examples of target audiences include:



- Personnel at **municipal owned and/or operated facilities**
- Facilities within the WHPA that store types and amounts of hazardous materials and are subject to the reporting requirements of SARA Title III Section 312, Emergency Planning and Community Right to Know Act.
- All businesses in the WHPA that produce **auto wastes** (oils, acids, antifreeze, etc.)
- Facilities within the WHPA with **pesticide** storage or otherwise involved with the application of pesticides (Ensure that each has pesticide operators licensed by the State of North Carolina, and that proper records are maintained to ensure compliance with all NC Pesticide laws)
- The Team should provide information regarding the threat posed by **improperly constructed/abandoned wells** to owners of such wells identified within the WHPA. Owners of such wells should be encouraged to have wells properly closed in accordance with the state’s well construction standards found at 15A NCAC 2C.0100, “Criteria and Standards Applicable to Water Supply and Certain Other Wells”.
- All farms, residents, businesses, and industries in the WHPA with **septic systems** should be provided information on the WHP Program and on proper septic system maintenance.
- Homeowners should be educated on the use and disposal of **household hazardous wastes**. Household products that contain hazardous substances such as oil-based paints, solvents, or pesticides may be a threat to ground water when disposed of improperly such as in septic systems. At a minimum, brochures, such as the appropriate publications available from the NC Cooperative Extension Service, should be provided to homeowners.



A good source of information for homeowners on ground-water protection is the series of Home*Assessment*System (Home*A*Syst/Farm*A*Syst) publications (see “Resources and References” section). This series includes “Protecting Your Drinking Water Supply,” covering well construction, protection, and abandonment; and “Improving your Septic System”.

Community action programs

In addition to focusing on specific cases within the WHPA, community action programs can generate awareness and participation in general pollution prevention activities. Examples include:

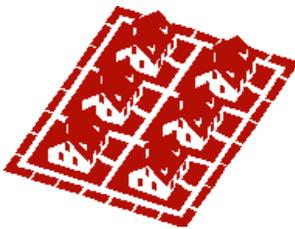
- Hazardous waste disposal;
- Proper closure of abandoned wells;
- Removal of old buried tanks;
- Identifying and upgrading improperly functioning septic systems;

- Promotion of pollution prevention and best management practices for the WHPA; and
- Hosting household hazardous waste collection days.

Regulatory strategies

In general, regulatory tools require sufficient administrative and technical resources to carry them out. Regulations must be specific; to avoid court challenge, regulations must address actual threats or problems appropriately. Because regulatory tools require legal authority, issues of jurisdiction must be dealt with at the start. A town with a WHPA entirely inside its borders can control planning, management, and future development through town policies and ordinances. A town with all or part of its WHPA outside its own borders cannot zone the entire WHPA. The town must cooperate with the neighboring town(s) or approach the county to include it in the county-wide zoning program. Other water providers, such as a Conservancy District or a corporate-owned utility usually lack any legal jurisdiction and must make the best use of non-regulatory options.

Zoning ordinances



Zoning is the division of land in a town or county into districts and applying land use regulations uniformly through each district. Within each district, the zoning ordinance can specify permitted uses, lot size, and design and performance requirements for specific activities. Zoning is widely used by towns to guide development under a comprehensive plan and can be adapted to protect wellhead areas. In North Carolina, the use of zoning to protect water supplies is within the scope of local government authority “to promote public health and welfare and provide water, sewerage, and other public requirements.”

Zoning has some drawbacks. It can be politically contentious to enact new zoning or change existing zones. Usually zoning affects future development rather than existing uses, although nonconforming uses can be phased out eventually. Uniform zoning can be difficult when more than one town is involved or if the WHPA is located outside planning jurisdictions. In North Carolina, municipalities may extend zoning boundaries up to one mile beyond their city limits. County zoning only applies outside of municipal jurisdiction.

Some useful zoning options include:

- **Overlay Districts.** WHP districts can be incorporated into existing zoning with an overlay district, a district with more restrictive controls superimposed over or within an existing district(s). Because it has been defined through the delineation process, using the WHPA as an overlay is usually legally defensible. Overlays may specify different density requirements, source prohibitions, or design standards for the protection of the sensitive wellhead area.
- **Zoning for Source Controls.** Because zoning is meant to promote public health and safety, limiting or banning the use of specific hazardous substances for the purpose of protecting water supplies is a permissible zoning measure. Zoning districts, especially overlay districts, can be defined to prohibit the use of substances that would be hazardous to the drinking water supply, or activities that use such substances.

Zoning can be used to set development standards that specify:

- The location of specific land use activities
 - Density of development
 - Design, construction, and ongoing operation of land use activities
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- **Zoning for Performance and Design Standards.** Through zoning, local government can guide structure design and set standards to ensure that certain activities do not threaten the drinking water supply. Design standards can require certain safety precautions for activities that might threaten ground water, such as facilities that store or handle pesticides or solvents. Performance zoning sets standards for permissible **effects** of land use activities; any use is allowed in the zone as long as standards are met. This technique is commonly used to set standards for noise and dust in industrial areas; for WHP, performance standards can limit the amount of hazardous substances stored on site or promote control of runoff from storage and loading areas.
- **Zoning for Density Standards.** Reducing the number of housing units can reduce the impact of residential development within the WHPA. Requiring large lots in unsewered developments, for example, reduces the number of units within the WHPA, reducing the amount of septic system leachate. Cluster zoning or Planned Unit Development (PUD) increases density in a section of a zone while the remaining area of the zone is left in open space. Average density throughout the zone remains the same. Cluster zoning can be used to guide more dense residential development to outside the WHPA, while not restricting the total number of units allowed.

Subdivision regulations

Subdivision regulations can:

- Require low-leakage sewers
 - Require advanced wastewater treatment facilities
 - Regulate the design of drainage systems
 - Limit pavement coverage
 - Direct the location of development within the subdivision
 - Require land for set-aside
-

Subdivision ordinances are applied when a piece of land is actually being divided into lots for sale or development to ensure that growth does not outpace available local facilities. Subdivision ordinances are therefore useful primarily for controlling new development. Like zoning, subdivision regulations can establish source controls, density standards, and design/performance standards. An important feature of subdivision regulations for WHP is the open space dedication requirement. In North Carolina, towns can require developers to set aside some land to be preserved as open space. Locating the open space lands within WHPA boundaries could be an important protection tool. Because many public community wells in North Carolina serve single subdivisions, subdivision regulations can be a very useful tool for protecting those wells.

Building code enforcement

Cities and counties have the authority to establish building codes that govern the construction and maintenance of buildings and other structures. Under this authority, structures can be inspected during and after construction to ensure that codes are followed. By including WHP design standards in the building code, especially for industrial and commercial facilities, application of the standards can be enforced.

Health regulations

The local board of health may have the authority to adopt more stringent rules in the WHPA to protect the public health, safety, and welfare. Specific measures could include regulation of or prohibition of underground fuel storage tanks, regulation of small private sewage treatment plants, septic system mainte-

nance programs, toxic and hazardous material handling regulations, and private well inspection/protection. Health ordinances might be used to require developers within the WHPA to monitor ground water for contaminants.

WHP ordinance

Local governments can develop and enforce their own standards and permitting systems by creating a freestanding wellhead protection ordinance.

Land use regulations within a WHPA can be enforced under a town's general ordinance-making authority. This authority enables local governments to regulate or prohibit activities that are damaging to the health, safety, and general welfare of its citizens. Under this authority, a community can draft a free-standing WHP ordinance that sets source controls, density standards, and performance/design standards within the WHPA. Local ordinances must be written carefully; a WHP ordinance that attempts to regulate too broadly may be susceptible to legal challenge.

Site plan reviews

Site plan review is a critical part of all of the above options. A systematic site plan review procedure for all proposed development provides an opportunity to verify and enforce other requirements. However, this tool requires sufficient administrative and technical resources, and must be specific in its application to actual threats in order to avoid court challenge. Site planning places the burden of proof on the developer, and like other regulatory tools, it is more effective for future development than for existing development.

Special considerations for regulatory options



- **Agriculture.** Farms cannot be zoned by a county with the exception of swine farms (see North Carolina General Statute (NCSG) 153A-140 and 153A-340), or if they are used for “non-farm” purposes. The North Carolina Department of Agriculture has some regulatory authority as set forth in NCGS Chapter 106.
- **Enforcement.** What can you realistically do with the staff that you have? Don't let enforcement be your only tool for accomplishing protection.
- **Plan review.** Provide guidance and clear expectations for developer application requirements. Consider developing a checklist.
- **Permits.** What data do you need on the permit? What kind of format should the data be in? Who is to review the permit? How will compliance be monitored?
- **Construction inspections.** If you are enforcing design standards, you need field staff to ensure that specific design requirements are being met.
- **Fees.** Determine and publish your fee structure.
- **Abandonment requirements.** Set requirements for closing facilities and clean-up, especially for sites housing potential pollutants. Pay attention to proper sealing of abandoned wells.
- **Inspection protocols**
- **Penalties and fines**
- **Appeals, variances, and waivers**

Best Management Practices (BMPs)

Best Management Practices are tools that work to control or prevent ground-water contamination. BMPs can be structures or behaviors; can apply to farms, factories, businesses, or homes; and can be written into regulations or promoted as voluntary measures.

Best Management Practices are protective measures that have worked in many locations to prevent or control threats to drinking water quality. BMPs may be structures like improved storage tanks or behaviors like reduction of the amount of household hazardous materials used in the WHPA. Some BMPs are farming practices that reduce the chances for fertilizers or pesticides to be lost from farmland and enter the water supply. Other BMPs are design, operation, and maintenance requirements for commercial and industrial facilities. Still others may be small lifestyle changes for homeowners that reduce pollution potential.

In some cases BMPs may be written into a regulatory requirement, such as in setting design standards in a zoning overlay district. Most often though, BMPs are voluntary measures that can be encouraged through public education and community action programs or through technical assistance and cost-share programs such as those offered by the USDA – Natural Resources Conservation Service for agricultural land.

Several attachments to this chapter provide a selection of BMPs that have proven to be effective in protecting water quality. These are not complete lists of all possible BMPs, but represent practices that address most commonly occurring PCSs. Your Team must select and tailor these measures to the needs of your WHPA. NCRWA consultants and PWS Section representatives can discuss specific management techniques that have worked in other communities, and advise on the feasibility of proposed management strategies.

Involving the public

Determining a Public Involvement Strategy

- Identify the target audience (people using the water system, landowners in the WHPA)
 - Involve the public in deciding how to generate community awareness
 - Determine the message(s) used
 - Identify public awareness techniques and publicity methods
 - Personal contact
 - Meetings
 - Exhibits/speakers
 - Fact sheets, brochures
 - Newspapers, radio, TV, internet
 - Determine resources and costs
 - Develop methods to let the public know how they can participate, where to submit comments, how to obtain additional information
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Effective management of your WHPA will rely heavily on public support and public action. Community involvement with and sense of ownership of its water supply generate support for the work and cost involved in protecting drinking water supplies. Educating the public about the importance of good drinking water and the damage that seemingly harmless activities can have builds awareness. Heightened awareness, along with information about how to prevent pollution of the water supply, is a key ingredient of an effective management program. An educated, involved public can make informed decisions about the future of its water supply, including changing their own practices and supporting new regulations. The fact is, because so many ground-water protection measures are voluntary, management of your WHPA cannot succeed without public involvement. The community must be involved in the process of choosing the management strategies for protection of their water supply.

How can you involve the community? Start public meetings and education programs when you first begin your WHP effort. Because drinking water is often taken for granted and ground water is so often misunderstood, the first efforts might address topics like:

- Where the drinking water comes from
- How ground water behaves
- Relationships between land use and ground-water quality
- Threats to ground-water quality

- Costs of ground-water protection vs. clean-up of contaminated water supplies

Organize a citizen advisory group or subcommittee of the Planning Team to develop a public involvement strategy and coordinate outreach activities. The work of this group could include developing and carrying out public information campaigns, organizing community action efforts like hazardous waste pick-ups, and developing a system for soliciting public input to the management plan. It is vital to build a foundation for sustainable community involvement; the need for WHP will not go away after the plan is written.

Finally, document and record all public involvement in the process.

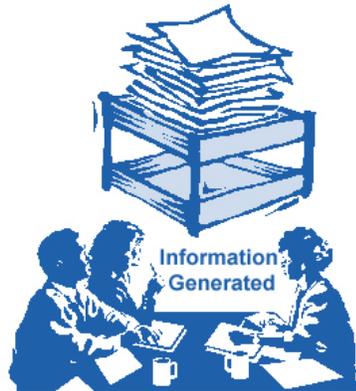
Examples of Community Outreach Activities

- **Surveys:** conduct a community-wide water knowledge survey
- **Signs:** post signs along roads and in housing areas to identify your WHPA
- **Guidance:** distribute BMP guidelines to appropriate audiences
- **Speakers:** provide speakers to community groups to discuss topics like septic system maintenance and underground storage tanks
- **Newsletters:** distribute newsletters or bill inserts about the WHP program
- **Media coverage:** submit press releases, stories, and articles to local media to keep public informed on progress and issues
- **Schools:** encourage local school districts to participate, e.g., by adding wellhead protection to curriculum, holding art or essay contests
- **Volunteer monitoring:** Set up a volunteer monitoring program for ground-water quality and/or land use activities in the WHPA
- **Water festivals:** organize public activities to promote the management program, present progress, and recognize the protection effort

Products that should result from Step 4, to be included with the final plan:

When you've completed this step, you should have the following information to include with the final plan you submit to PWS:

1. Management strategies adopted for each PCS type occurring within the WHPA including:
 - Educational strategy
 - Procedures developed to address problem PCSs
2. Documentation of public involvement in the process of choosing management strategies





Resources and References

- Farm*A*Syst Home*A*Syst. These are a series of fact sheets that detail Best Management Practices to protect water quality on the farm and at home. Available from your county center of North Carolina Cooperative Extension (or <http://www.soil.ncsu.edu/assist/index.html>).
- Inglese, O. 1992. *Best Management Practices for the Protection of Ground Water: A Local Official's Guide to Managing Class V UIC Wells*. Connecticut Department of Environmental Protection, Hartford, CT.
- North Carolina Rural Water Association (NCWRA). Phone: 336-731-6963, <http://www.ncrwa.com>
- North Carolina Department of Agriculture, Pesticide Section. Phone: (919) 733-3556, <http://www.agr.state.nc.us/fooddrug/pesticid/index.htm>
- New England Interstate Water Pollution Control Commission. 2000. *Source Protection: A National Guidance Manual for Surface Water Supplies*. NEIWPC, Lowell, MA.
- North Carolina Cooperative Extension Service. Soil Facts-A series of publications including BMPs for ground-water protection. Available from your county center of North Carolina Cooperative Extension (or <http://www.soil.ncsu.edu/extension/pubs.php>).
- US EPA. 1989. *Wellhead Protection Programs: Tools for Local Governments*. EPA 440/6-89-002. Office of Ground Water Protection, U.S. Environmental Protection Agency, Office of Water, Washington, DC.
- USEPA. 1993. Wellhead Protection: A Guide for Small Communities. EPA/625/R-93/002. Office of Research and Development, Cincinnati, OH.

Attachments:

Beginning with the next page, you will find attachments that are provided to make it easier for you to prepare your plan document.

Remember, the attachments that are labeled “Example” are only for you to give you ideas.

- **Attachment 1: Typical crop, chemical and water management BMPs for ground-water protection**
- **Attachment 2: General agricultural/rural BMPs for ground-water protection by PCS**
- **Attachment 3: General BMPs for commercial/industrial facilities by source**
- **Attachment 4: General residential/homeowner BMPs for ground-water protection**
- **Attachment 5: Example of a partial plan, showing the portions of the plan that result from this step.** The example plan shows you the kind of information that you are expected to include in the plan that you submit for approval. Your final plan will be different than the fictional Town of Clearwater plan that is provided as an example. Your management strategies will vary according to the PCS types in your WHPA.

Attachment 1: Typical crop, chemical, and water management BMPs for ground-water protection¹

Crop	
Typical BMP	Effect
Crop rotation	Reduces pest/weed pressure → reduces pesticide requirements
Cover crop	Protects soil and reduces erosion
Realistic yield goals	Reduces tendency to over-fertilize → reduces potential leaching/runoff losses
Buffer zones	Filters and traps sediment and chemicals in runoff
Riparian and wetland protection	Protects sensitive areas
Chemical	
Typical BMP	Effect
Fertigation / chemigation	Reduces pest/weed pressure → reduces chemical requirements
Site specific management	Precise feeding → prevents leaching of excess nutrients
Nutrient management: soil testing and plant analysis	Reduces nutrient availability for loss by avoiding excessive or unnecessary applications
Manure management	Reduces leaching/runoff losses by proper amount, timing, and method of application
Nitrogen timing (split applications)	Minimizes residual N → reduces leaching/runoff losses
Integrated pest management	Pesticide application timing improves plant uptake, avoids unnecessary application Selection of less toxic or less persistent ingredients may pose lower risk to ground water Sprayer calibration promotes accurate and uniform application of chemicals, reduces chance of loss Field scouting ensures pesticide application only when a pest exists at damaging levels → avoids unneeded chemical applications
Agrichemical mixing and handling	Protects groundwater by capturing accidental spillage and equipment wash-water
Water Management	
Typical BMP	Effect
Irrigation management	Reduces leaching and runoff of nutrients and agrichemicals
Controlled drainage	Reduces runoff/nitrification

Adapted from: *Best Management Practices for Wheat*, 1994. National Association of Wheat Growers Foundation

¹ The Natural Resources Conservation Service (NRCS) has documented numerous agricultural BMPs. These may be obtained from your local NRCS office or may be found on the Web at http://www.nrcs.usda.gov/nhcp_2.html Also see “Soil Facts – Good Soil Management Helps Protect Groundwater” Publication AG-439-09 available from the North Carolina Cooperative Extension Service, or on the Web at <http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-09/>

Attachment 2: General agricultural / rural BMPs for ground-water protection by PCS¹

Private Wells: Contaminants of any kind should be prevented from entering the well directly or from entering the soil in the vicinity of the well. The casing and well cap (seal) should be in good condition. Backflow protection should be maintained in the plumbing carrying water from the well. The water from the well should be periodically tested for contaminants, especially if it is a very old well or a well of questionable design. For further recommendations and information see the Farm-A-Syst publication “Protecting Water Supply”, #1 WQWM-165 / AG-566-1 available from the NC Cooperative Extension Service.

Abandoned Wells: The well should be checked to see if it was properly abandoned according to the standards of the North Carolina DENR (<http://gw.ehnr.state.nc.us/113C.htm> and <http://gw.ehnr.state.nc.us/rules.htm>). If it was not, additional steps can be taken to correct or improve the abandonment. Contaminants should be prevented from entering the abandoned well directly or through the surrounding soil surface, particularly if the well was improperly abandoned.

Pesticide Storage and Handling Areas: Good pesticide handling includes special care with more leachable pesticides (see Soil Facts AG-439-31, *Protecting Groundwater in North Carolina: A Pesticide and Soil Ranking System* available from the NC Cooperative Extension Service or on the web at <http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-31/>), care to prevent leaks or spills onto the soil where chemicals might leach to ground water, and storage accessible only to properly trained workers. Pesticides should always be stored downslope (or downgradient) and a sufficient distance (minimum 50 feet) away from any wells. Adequate containment such as concrete pads and curbs should be in place to prevent spills or leakage from reaching the soil and ground water. Mixing and loading should be done in such a way as to prevent leaks, spills, or overflows onto the soil. Equipment and plans should be in place for containment and cleanup in case a spill does occur. The water source for mixing should have adequate backflow protection. Sprayer tanks and equipment cleaning rinse water should be properly disposed of (sometimes it can be applied to crops that might benefit from it). Used containers should be properly disposed of. See the Farm-A-Syst publication “Improving Storage and Handling of Pesticides”, #5 WQWM-169 / AG-566-5 available from the NC Cooperative Extension Service.

Fertilizer Storage and Handling Areas: Similar practices for pesticide storage and handling areas can also be applied to fertilizer storage and handling areas. The goal is to prevent large amounts of fertilizer from reaching the ground water. Spills and leaks should be prevented or minimized. Any fertilizer not being used by the plants is a potential threat to ground water and a waste of the farmer's money. For further recommendations and information see the Farm-A-Syst publication “Improving Storage and Handling of Fertilizer”, #6 WQWM-170 / AG-566-6 available from the NC Cooperative Extension Service.

Livestock Waste Storage and Treatment: Leachate from stored manure should be prevented from reaching ground water. Large manure piles should be covered and rest on an impermeable surface. Unlined waste lagoons or manure pits should be located downslope and at least 100 feet away from any wells to prevent leachate from entering the well. For further recommendations and information see the Farm-A-Syst publication “Improving Storage, Handling, and Disposal of Livestock Waste”, #7 WQWM-171 / AG-566-7 available from the NC Cooperative Extension Service.

Attachment 2 (Continued)

Petroleum Product Storage and Handling: Overflows, spills and leaks of fuel can threaten ground water. The volumes of fuel, lubricants, hydraulic fluids, coolants, or other products added to and dispensed from underground tanks should be checked and recorded regularly – unaccounted-for product may indicate a leak. Abandoned tanks should be properly removed to prevent leakage to ground water of any residual fuel. Tanks, especially if underground, should be downslope and at least 100feet from any wells. Old tanks without adequate corrosion protection should be checked more frequently than newer ones for possible leaks. Protection should exist to prevent overflows, spills and leaks from reaching the ground water. Pumps, piping and hoses should be checked periodically for leaks. Small amounts of lubricants, hydraulic fluids, etc. should be stored under cover to prevent rainwater from carrying contaminants to the soil or weather conditions from damaging containers. All materials should be labeled properly to prevent misuse and used materials should be recycled or disposed of properly. Soil testing or ground water in the vicinity of the tank should be tested if serious questions remain about the integrity of an underground tank. For further recommendations and information see the Farm-A-Syst publication “Improving Fuel Storage, #2 WQWM-166 / AG-566-2” available from the NC Cooperative Extension Service.

Hazardous Waste Management: Unused farm, vehicle/equipment maintenance, and home chemicals should be recycled or disposed of properly. The storage of hazardous materials near wells should be avoided and these chemicals should never be allowed to leak or to be dumped onto soil in the vicinity of any wells. Empty chemicals containers should be recycled or disposed of properly. Temporarily stored hazardous materials should be promptly and safely transported to a proper disposal facility. Used vehicle/equipment batteries should be recycled or disposed of properly. For further recommendations and information see the Farm-A-Syst publication “Improving Storage and Handling of Hazardous Waste”, #3 WQWM-167 / AG-566-3 available from the NC Cooperative Extension Service.

Household Wastewater Management: Chemicals that might harm the organisms in the septic tank and make treatment less effective should not be introduced into the wastewater system. Drainfields should be downslope and at least 100 feet away from any wells. Solid residues from septic tanks need to be pumped out every 2 to 3 years. For further recommendations and information, see the Farm-A-Syst publication “Improving Septic Systems”, #4 WQWM-168 / AG-566-4 available from the NC Cooperative Extension Service.

Farm or Farm Household Waste Disposal/Fill Areas: Materials that may readily leach through the soil and contaminate ground water should not be disposed of onto the soil in the wellhead protection area. Dead animals should not be buried in the wellhead protection area if there is a significant chance that infectious organisms or nitrates from decaying corpses might contaminate the ground water. The risk of ground water contamination increases with larger quantities of animals buried. Unmonitored public access to a disposal area that could lead to improper, or unknown, disposal should be prohibited. For further recommendations and information on poultry composting, see the “Composting Poultry Mortality in North Carolina Publication Number: PS Facts #11 ” and “Greene County Animal Mortality Collection Ramp Publication Number: EB AE-186-93 ” available from the NC Cooperative Extension Service and at <http://www5.bae.ncsu.edu/programs/extension/publicat/wqwm/psfact11.html> and http://www5.bae.ncsu.edu/programs/extension/publicat/wqwm/ebae186_93.html, respectively.

Attachment 2 (Continued)

Milking Center Wastewater Handling Facilities: The storage or discharge of untreated milking center wastewater such that it might contaminate ground water should be avoided. Discharge of wastewater should be downslope and away from any wells. If the wastewater is stored in unlined lagoons or lined lagoons that might leak, there should be confidence that significant amounts are not leaching to the ground water. Steps should be taken to collect, store, and agronomically apply the wastewater. For further recommendations and information, see the Farm-A-Syst publication “Improving Storage, Handling, and Disposal of Livestock Waste”, #7 WQWM-171 / AG-566-7 available from the NC Cooperative Extension Service.

Confined Animal Feeding Operations (CAFO): CAFOs or feedlots should be located downslope and away from any wells. If a CAFO is unpaved, the threat of excess nutrients leaching to ground water should be investigated. Runoff from paved CAFOs, if collected, should be diverted into treatment systems, and away from any wells. Where possible, excess solid wastes should be scraped off yards periodically and stored properly to reduce nutrient concentration of runoff. Large concentrations of livestock pose a higher threat to ground water if wastes are not managed properly.

Livestock Grazing and Pastures: If chemicals are applied to grazing areas for weed or pest control, management should consider the threat to ground water. The threat to ground water may increase with increasing herd density. For further recommendations and information, see the Farm-A-Syst publication “Grazing Livestock and Water Quality”, #8, AG-566-08 / E00-38848, available from the NC Cooperative Extension Service.

¹Most of the referenced publications are available at: <http://www.soil.ncsu.edu/publications/farmassist/>

Attachment 3: General BMPs for commercial/ industrial facilities by source

Source	Description
Design BMPs	
Floor Drains	Eliminate floor drain discharges to the ground, septic systems, storm sewers, or any surface water body from any location in the facility. If connection to sanitary sewer is impossible, storage in a holding tank and pump-out may be required. If no floor drains are installed, all discharges to the floor should be collected, contained, and disposed of by an appropriate waste hauler in accordance with federal and state requirements.
Dry Wells	Dry wells should be eliminated in ALL cases unless they receive ONLY CLEAN WATER DISCHARGES that meet all established Maximum Contaminant Levels (MCLs) promulgated under the <i>Safe Drinking Water Act</i> , meet other state and local standards for drinking water, and comply with any other state and local requirements.
Storage Facilities	Loading, unloading, and storage of materials and waste should be done within an enclosed or roofed area with secondary containment and isolated from floor drains to prevent potential spills from contaminating storm water or discharging to the ground.
	Underground storage tanks should not be used, unless explicitly required by fire codes or other federal, state or local regulations. Where required, underground tanks should have double-walled construction or secondary containment such as a concrete vault lined or sealed with an impermeable material and filled with sand. Tanks should have appropriate secondary containment monitoring, high level and leak sending alarms, level indicators, and overfill protection
	Above-ground tanks should have 110 percent secondary containment or double-walled construction, alarms, and overfill protection, and should be installed in an enclosed area isolated from floor drains, storm water sewers, or other conduits which may cause a release into the environment.
	Tanks and associated equipment should be tested periodically for structural integrity.
Cooling Water	Cooling water may be discharged to a storm sewer, sanitary sewer, or stream, provided all federal, state, and local requirements are met. Any cooling water from solvent recovery systems should be free of contamination from solvent, metals, or other pollutants and should not discharge to the ground. Closed-top cooling systems should be considered to eliminate cooling water discharges.
Storm Water Management	Materials and wastes should be isolated in roofed or enclosed areas to prevent precipitation and runoff contact with materials and wastes. Uncovered storage areas should have a separate storm water collection system which discharges to a tank. Storm water from building roofs may discharge to the ground.
Work Areas	Consolidate waste-generating operations and physically separate them from other operations to reduce the total work area exposed to solvents.

Attachment 3 (Continued)

Connection of Municipal Sanitary Sewers	Existing and future facilities should connect their sanitary facilities to municipal sanitary sewer systems where they are available.
Cross-Connections	Cross-connections such as sanitary discharges to storm sewers, storm water discharges to sanitary sewers, or floor drain discharges to storm sewer systems, should be identified and eliminated.
Holding Tanks	Facilities should discharge to holding tanks if they are located where municipal sanitary sewers are not available, subsurface disposal systems are not feasible, existing subsurface disposal systems are failing, or if they are high risk facilities located in wellhead protection areas.
Operational BMPs	
Material & Waste Inventory Control	Conduct monthly monitoring of inventory and waste generation.
	Order raw materials on an as-needed basis to avoid waste and reduce inventory.
	Ensure materials and waste containers are properly labeled
	Maintain products Material Safety Data Sheets to monitor in inventory and the chemical ingredients of wastes. Make MSDS sheets available to employees.
Preventative & Corrective Maintenance	<p>Implement a regularly scheduled internal inspection and maintenance program to service equipment, to identify potential leaks and spills from storage and equipment failure, and to take corrective action as necessary to avoid a release to the environment. At a minimum, the schedule should address</p> <ul style="list-style-type: none"> • Tanks, drums, containers, pumps, equipment, and plumbing; • Work stations and waste disposal stations; • Storage areas, and storm water catch basins and detention ponds; • Evidence of leaks or spills within the facility and on the site; • Areas prone to heavy traffic from loading and off loading of materials and wastes; • Proper handling of all containers; • Drippage from exhaust vents; • Proper operation of equipment, solvent recovery, and emission control systems.
Spill Control	Use emergency spill kits and equipment. Locate them at storage areas, loading and unloading areas, dispensing areas, work areas.
	Clean spills promptly and as prescribed in Material Safety Data Sheets (MSDS); all spilled materials should be collected, handled, and disposed of in accordance with federal, state, and local regulations.
	Minimize the use of disposable granular or powder-absorbents.

Attachment 3 (Continued)

Materials & Waste Management	Store materials in a controlled, enclosed environment to prolong shelf life, minimize evaporative releases, and prevent moisture from accumulating.
	Keep containers closed to prevent evaporation, oxidation, and spillage.
	Place drip pans under containers and storage racks to collect spillage.
	Segregate wastes, e.g., hazardous from non-hazardous, acids from bases, and oils from solvents, to minimize disposal costs and facilitate recycling and reuse.
	Use dry cleanup methods and mopping rather than flooding with water.
	Dispose of accumulated wastes through an appropriately licensed waste transporter in accordance with federal, state, and local regulations.
Management	<p>Involve management in conducting a waste stream analysis to determine the potential for waste reduction and pollution prevention. This analysis should include the following steps:</p> <ul style="list-style-type: none"> • Identify plant processes where chemicals are used and waste is generated; • Evaluate existing waste management and reduction methods; • Evaluate feasibility of waste reduction options; • Implement measures to reduce wastes; and • Periodically evaluate waste reduction program.
Employee Training	<p>Employees should be trained prior to working with equipment or handling of materials, and should be periodically refreshed when new regulations or procedures are developed. Training programs should include the following:</p> <ul style="list-style-type: none"> • Proper operation of process equipment; • Loading and unloading of materials; • Purchasing, labeling, storing, transferring, and disposal of materials; • Leak detection, spill control, and emergency procedures; and • Reuse/recycling/material substitution.
	Improve employee awareness of the environmental and economic benefits of waste reduction and pollution prevention.
Record Keeping	Facility plans, plumbing plans, and subsurface disposal system plans and specifications must be updated to reflect current facility configuration. Copies of associated approvals and permits should be maintained on file.
	OHSA requirements, health and environmental emergency procedures, materials management plans, inventory records, servicing/repair/inspections logs, and hazardous waste disposal records must be maintained up to date and made available for inspection by regulatory officials.

Source: Inglesse, O. 1992. *Best Management Practices for the Protection of Groundwater: A Local Official's Guide to Managing Class V UIC Wells*. Connecticut Department of Environmental Protection, Hartford, CT, 138 pp

Attachment 4: General residential/homeowner BMPs for ground-water protection

Source	Management Practices / Programs
Septic Systems	Septic system maintenance ordinance – ensures systems are inspected and pumped out regularly to prevent malfunction
	Septic system tracking program – requires registration of all systems and encourages routine maintenance
	Municipal septic system program – town assumes responsibility for system maintenance, fee charged to homeowner
	Homeowner education program
Lawn Care¹	Minimize groundcover disturbance to reduce need for turf-care chemicals and excessive watering
	Select low-maintenance vegetation to reduce need for fertilizers and pesticides
	Fertilizer/pesticide management <ul style="list-style-type: none"> • Soil test before fertilizing to reduce excessive applications • Select slow-release formulations to reduce leaching • Use minimum dosage of pesticides to achieve adequate pest control to reduce amount of chemical available for loss • Calibrate application equipment to minimize application rate • Don't apply lawn chemicals before a heavy rainfall to avoid chemical leaching and runoff
	Water wisely; reduced watering lessens transport of pesticides and nutrients into ground water
Household Hazardous Waste	Proper storage of hazardous materials reduces the possibility of leaks and spills
	Recycle and reuse to community household hazardous waste collections minimize possibility of improper disposal or accidental release
	Storm drain stenciling with messages such as “Dump No Wastes – Water Supply Protection Area” discourages use of storm drains for unwanted chemicals

Source: New England Interstate Water Pollution Control Commission. 2000. Source Protection: A National Guidance Manual for Surface Water Supplies. NEIWPCC, Lowell, MA.

¹Specific Guidance for North Carolina Lawn Care BMPs is presented in “Soil Facts – Managing Lawns and Gardens to Protect Water Quality”, Publication AG-439-21 available from the North Carolina Cooperative Extension Service or <http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-21/>

Attachment 5: Example of a partial plan, showing the portions of the plan that result from this step

Introduction.

There are two approaches to managing a Wellhead Protection Area (WHPA), regulatory and non-regulatory. The Town of Clearwater has chosen a non-regulatory approach to manage their Wellhead Protection Area. The Clearwater Town Board is responsible for implementing the Wellhead Protection Program; they have accepted the recommendations submitted by the Wellhead Protection Committee for management of the potential contamination sources found during Step 3 of the Wellhead Protection planning process. The implementation of Clearwater's Wellhead Protection Program will begin upon approval of the program by the NC Public Water Supply Section, and will be completed within ninety days.

The Clearwater WHP Management Plan identifies three general areas for non-regulatory management efforts: (1) General education/public information; (2) Pollution prevention using Best Management Practices (BMPs) focused on specific source types; and (3) Compliance monitoring with existing state ground water management regulations or programs. As a result of public comment and concern, the Plan also identifies some initial regulatory approaches that could be taken should such steps become necessary.

General Education and Public Information.

The Planning Committee recommends that a Wellhead Protection Brochure be developed to convey the following information:

- An explanation of what ground water is and information about the wells in the Clearwater water system
- An explanation of the Wellhead Protection Program
- Sources of ground water pollution
- Tips on protecting their water supply
- Phone numbers to contact for more information

The Planning Committee recommends that brochures be delivered to each resident, business and industry within the Wellhead Protection Areas. Copies of this brochure will be made available at the Town Hall, Public Library, and other locations deemed necessary for public education on Wellhead Protection. Distribution of a brochure to all town residents should be considered, possibly by mailing a copy in each water bill.

The Planning Committee recommends the Town put up signs indicating that one is entering a Wellhead Protection Area at the appropriate locations on Highways 61 and 99 as soon as they are made available from NCDOT. Spill response numbers will also be posted at the Town Hall.

All Town personnel at the Town of Clearwater garage, wastewater treatment plant, and water plant will be educated on wellhead protection, including why their activities are considered a potential contamination source and steps that they can take on the job to reduce the potential for contamination. The town building inspector and health inspector will receive general training in wellhead protection issues, including potential contamination sources and pollution prevention measures, so that they may be observant of potential problems in the course of their duties.

Attachment 5 (Continued)**Pollution prevention.**

The Planning Committee recommends site visits to all businesses and Town operations on the PCS list that handle significant amounts of potential contaminants. High-risk sites identified in Step 3 will be targeted first:

In this example, only WHPA zone 1 (well #1) shown in following table

CATEGORY	MAP CODE	NAME	LOCATION
Gas station	13A	Sanders' Market	North Main St.
Gas station	13B	Quick-E-Mart	Hwy 61 South
Underground storage tank	1A	Simpson's Fuels	Hwy 61 & North Main St.
Underground storage tank	1C	Abandoned gas station	Hwy 61 & Pine St.
Above ground storage tank	26A	Town of Clearwater Maintenance Yard	North Main St.

These visits will ensure that personnel at these sites are informed about wellhead protection. Wellhead Protection brochures will be distributed, and information specific to the sites will be provided. Specific information will include; why the sites are considered a potential contamination source, specific steps they can take to reduce the potential for contamination, (e.g., information about best management practices, standard operating procedures, waste handling practices, etc.), and information for contacting the Division of Pollution Prevention and Environmental Assistance (DPPEA) to investigate further steps that they can take to reduce the amount of waste released.

During the PCS inventory, conducted as part of Step 3, Team members documented facility numbers, certification numbers, and the number and size of tanks at every facility with an underground storage tank (UST). All locations have current UST permits in place. In the future, if any location is found not to be in compliance with UST rules and regulations, the Division of Waste Management, Underground Storage Tank Section will be immediately notified. Likewise, facilities with above ground storage tanks (ASTs) subject to Oil Pollution Prevention regulations, contained in Federal Regulations found at 40 CFR 112, will be asked for a copy of their Spill Prevention Control and Countermeasures (SPCC) Plan. The Town of Clearwater will verify the compliance status with regard to this regulation of each subject AST located within the WHPAs. Facilities with subject ASTs found not to be in compliance with this regulation will be notified of their responsibility under this regulation.

The Town of Clearwater will notify any individual, industry, business, or government agency installing or planning to install an underground storage tanks within the Town's wellhead protection area of the following regulation:

North Carolina Underground Storage Tank (UST) Regulation 15A NCAC 2N .0301 stipulates specific siting and secondary containment requirements for UST systems installed after January 1, 1991:

- (1) No UST system may be installed within 100 feet of a public water supply well or within 50 feet of any other well used for human consumption.

Attachment 5 (Continued)

(2) Secondary containment is required for UST systems within 500 feet of a well serving a public water supply or within 100 feet of any other well used for human consumption.

Violations of this regulation will be reported to the Division of Waste Management, Underground Storage Tank Section. The UST Section will also be notified of the location of the facility within the WHPA and its proximity to a public water supply well or any other well used for human consumption. Similar notification will be given regarding new aboveground storage tanks (ASTs) subject to regulation.

Members of the Planning Committee will visit all pesticide storage/users in the WHP area to educate them about why they are considered a potential contamination source and steps they can take to reduce the potential for contamination from their operations. The Planning Committee recommends that Town personnel be observant in the vicinity of the cemetery to watch for proper herbicide use in the area.

The Planning Committee will distribute a fact sheet available from the Clearwater County Cooperative Extension office on proper septic system operation and maintenance to be delivered to each residence using an on-site wastewater system within the WHP. Public service announcements encouraging people to pump septic tanks regularly are also being prepared.

Owners of improperly constructed/abandoned wells identified within the WHPAs will be provided information regarding proper closure of these wells. Owners will be encouraged to have these wells properly abandoned in accordance with the state's well construction standards found at 15A NCAC 2C.0100, "Criteria and Standards Applicable to Water Supply and Certain Other Wells". If information exists that a well is improperly constructed or is contributing to the contamination of ground water, the Town of Clearwater will notify the Ground water Section, Division of Water Quality.

Smith Trucking is under contract by the town to collect household waste, but does not collect hazardous waste. The County is presently developing a hazardous waste site at the County Landfill at Fayston; this site is scheduled to be open to the public two days per week to dispose of hazardous household wastes such as oil-based paints, oil, solvents, etc. When this project is completed, the Town will publicize that the facility is open to the public. In the meantime, the Planning Committee recommends that the Town offer a Household Hazardous Waste Collection Day twice a year, so that residents may dispose of hazardous waste properly. This information will be included in the wellhead protection brochure.

The Town of Clearwater Wastewater Treatment Facility employees perform a daily inspection of all lift stations for leaks and/or overflows and maintain a daily log on any incidents found. The wastewater collection system is checked visually on a monthly basis, with problem areas inspected more often. Scheduled maintenance and repairs are performed during the warm months of the year.

Attachment 5 (Continued)

Emergency numbers for the Railroad are located at crossings in the WHPAs and at Town Hall. The Railroad will be contacted in the event of an emergency situation along the sections of railroad crossing the Wellhead Protection Areas.

Compliance Monitoring.

Planning team members have contacted the Division of Water Quality regarding facilities permitted to discharge wastewater to the land surface (Non-NPDES Permitted Facilities) to ensure that any such operations located within the WHPA were in compliance with applicable regulatory and permit requirements.

The Planning Committee has evaluated two abandoned gas stations. The first site has been visited and the underground storage tanks have been removed. The site at Highway 61 and Pine St. is being followed up on to determine the status of the tanks. If they are found to be still on site, the Underground Storage Tank Section of the Division of Waste Management will be notified.

The Town of Clearwater will contact the State Division of Waste Management's UST section to determine if a closure report was submitted on any other abandoned underground storage tanks found in the future, and that no soil or ground water contamination was identified during the removal of UST's. If a closure report was not submitted, the Town of Clearwater will contact the UST Section with the location of the facility within the WHPA and its proximity to a public water supply well.

All ground water contamination sites that were still shown to be in remediation were visited by planning team members to find out the current status of the site. The Town is gathering documentation of the current status of these sites, and calls will be made to the State agencies responsible for overseeing the remediation efforts of any questionable sites.

If any soil or ground water contamination events occur within the WHPA, the Town of Clearwater will contact the property owners and the State agencies with oversight responsibilities for remediation efforts to ensure that cleanup proceeds in accordance with any schedules established by these agencies.

Town of Clearwater officials have been made aware of the problem of potential contamination sources that exists in the area around Well # 1, and immediate action will be taken to clean up any potential sources of contamination. The above ground diesel storage tank near Well #1 will be moved and sewer lines will be inspected and replaced where necessary.

Attachment 5 (Continued)

Public input.

Four public meetings were held in the process of developing Clearwater's Wellhead Protection Plan. The last two meetings focused on discussion of the final ranked list of PCSs developed in Step 3 and on initial suggested management strategies. Some meeting participants suggested that the railroad should be given a much higher ranking because of the potentially disastrous impacts of overturned tank cars. It was decided that, while the consequences of such an event were great, the likelihood was a very low and few local management practices could be applied.

Appropriate response to such events will be addressed in the Contingency Plan.

The fourth public meeting collected numerous ideas from participants concerning education and pollution prevention ideas for management of the wellhead protection areas. Many of these specific ideas have been included in this plan. Some participants expressed doubt that a completely voluntary approach would be adequate to protect the town drinking water supply, especially given the rapid development currently underway nearby. Those at the public meeting questioned whether current zoning regulations are adequate for the protection of Clearwater's wells. Areas around well sites #1 and #2 are currently zoned for residential use only and some participants urged that the town consider the use of cluster zoning or planned unit development to guide septic systems away from the wellhead protection area. Several residents suggested updating town subdivision regulations to encourage open space dedication within the WHPA and to promote ground water protection BMPs in new residential developments. The area around Well #1 could continue to acquire new businesses under current zoning for commercial and light industrial use. Meeting participants suggested that the town consider developing a zoning overlay district for the entire WHPA that could regulate the use and storage of hazardous materials from commercial and industrial activities. As a result of these concerns, the Planning Committee recommends that the Board investigate these and other zoning modifications or regulations to keep additional hazardous materials out of this WHPA.

Public notification was made to the citizens of Clearwater that the completed draft of Clearwater's Wellhead Protection Program was available at Town Hall for a period of thirty days for review and comment. The public notice appeared in the local paper and was included in customers' water bills the previous month. Written comments will also be considered in the implementation phase of Clearwater's Wellhead Protection Program.