Town of Chester,
New Hampshire

# Source Water Protection Plan

Wason Pond, Chester, NH

Prepared by the Southern New Hampshire Planning Commission (SNHPC)
for the Town of Chester
Funding provided through a NH DES
Source Water Protection Grant

# Adopted by Planning Board:

_____

**Signature of Chair and Date**

# Adopted by Board of Selectmen:

_____

**Signature of Chair and Date**

# Record of Plan Updates:

**This Plan should be Reviewed Annually and Updated Every Three Years**

| Date Reviewed | Reviewer | Changes or Comments |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

# Table of Contents

# 1. Introduction

This plan has been developed utilizing grant funds made available through the NH DES 2007 - 2008 Local Source Water Protection Program. These grant funds were obtained by the Southern New Hampshire Planning Commission on behalf of the Town of Chester as part of the Commission's regional source water protection initiative. This initiative has been developed to encourage all municipalities within the region to prepare source water protection plans and adopt local ordinances to protect their drinking water sources.

Source water protection involves preventing the pollution of the groundwater, lakes, rivers and streams that serve as sources of drinking water for local communities. Communities often take for granted that a plentiful supply of high quality sources of drinking water, whether they are from groundwater or surface water, or both, will always be available. However, these natural resources are vulnerable to depletion and contamination and as such need to be protected.

Because the Town of Chester and its residents are dependent upon groundwater as the primary source of drinking water within the community, this plan focuses on protecting the active public water systems located in Chester as well as the aquifers serving private wells.

The specific purpose of a Source Water Protection Plan is to identify public water system vulnerabilities and offer guidelines and recommendations to manage potentially contaminating land uses. This Source Water Protection Plan (e.g. "Plan") inventories and assesses the threats to the 23 existing public water systems existing within the Town of Chester and recommends changes to local protections (e.g. zoning ordinance/site plan regulations) as the preferred management strategy.

A Public Drinking Water System is defined as a "system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year (Chapter Env-ws 300 NH Drinking Water Rules). The 24 public water systems covered by this plan are identified in the Well Summary Report contained within Section 6 of this document.

The overall goal of this Source Water Protection Plan is to protect drinking water supplies. The plan provides the Town of Chester information (data and maps), guidance, priorities and actions to protect the town's groundwater (aquifers) and public drinking water sources from contamination. The plan was prepared by the Southern New Hampshire Planning Commission with assistance offered by the Chester Planning Board and the Chester Source Water Protection Plan Committee. The primary objective of the plan is to identify the existing and potential contamination sources occurring within the source water protection areas

of all 23 public water supplies, including the Village Center and to provide specific recommendations to manage these threats in order to maintain quality drinking water. The plan is a working document that should be reviewed annually and updated every three years to remain current.

## Groundwater & Sources of Contamination

The water stored in the cracks and openings of subsurface rock material is groundwater. Groundwater is one of the Earth's most critical natural resources. The term aquifer is used to describe an underground rock formation that stores and transmits groundwater.

The New Hampshire Department of Environmental Services (NH DES) estimates that 70 to 75 million gallons of groundwater are supplied for drinking water in New Hampshire per day and approximately 60 percent of the residents in the state rely on groundwater for their drinking water.[1] In addition to being an important part of the hydrologic cycle, groundwater also provides an estimated 40 percent of the total flow in New Hampshire's rivers, which in turn feed the state's lakes, reservoirs, and estuaries.[2]

In New Hampshire, natural contaminants such as arsenic and radionuclides (randon, uranium, radium and gross alpha), are known to occur in a significant percentage of wells at concentrations that exceed health-based maximum contaminant limits (MCLs), particularly in bedrock wells under certain geologic conditions.[3] Because New Hampshire's groundwater can be somewhat corrosive, lead and copper from older plumbing are also detected in tap water. Anthropogenic (human caused) contaminants are also frequently detected in some areas, typically associated with certain land uses or previous contamination events.

The most common causes of groundwater contamination in New Hampshire are leaking underground storage tanks, mishandling of industrial chemicals, and urban runoff.[4] In addition, new health studies indicate that some natural contaminants (such as arsenic and manganese) may produce human health effects at concentrations at or below current health-based guidelines and criteria.

Contaminants can be found in stormwater runoff or can be associated with road salt application near wells, leaking or malfunctioning septic systems, gas tanks/fluid transfers, vehicle washing/discharging, and hazardous waste transport and disposal. Groundwater can be contaminated when chemicals are spilled or

[1] Model Groundwater Protection Ordinance, New Hampshire Department of Environmental Services and Office of Energy & Planning, February 1999, Revised June 2006, pg. 1.
[2] Ibid., pg. 1.
[3] NH DES Drinking Water Protection Program, Private Well Working Group White Paper, February 15, 2008.
[4] Model Groundwater Protection Ordinance, New Hampshire Department of Environmental Services and Office of Energy & Planning, February 1999, Revised June 2006 , pg. 1.

discharged onto or into the ground. Liquids can flow through the ground into groundwater, and both solids and liquids can be flushed downward by rain and snowmelt. Once contaminants reach groundwater, they often move along with the flow of the groundwater often to a source of drinking water.

Many of the contaminants present in homes and businesses and public buildings served by private or publicly owned water wells are often odorless, tasteless, and colorless. The only way to identify their presence is to have the water tested. Exposure to contaminants in water from private or public wells is a public health issue for a significant percentage of private and often public well users.[5]

The significance of this issue is growing, since private wells and their related aquifers now serve a greater percentage of the state's population than they did in the past and this trend is likely to continue with more diffuse development patterns.[6] This is true particularly for the Town of Chester as a majority of the residents and businesses within the community rely on their own private wells for water supply.

Well water testing is an important issue for many communities and private well owners across the state and this issue is raised here for the town's consideration. While owners and operators of public water systems in New Hampshire are subject to stringent reporting and water testing requirements issued by NH DES and EPA. Exposure to contaminants in water from private wells is a public health issue for a significant percentage of private well users.

The USGS has reported that MTBE (methyl-*tert*-butyl ether), a highly mobile contaminant, strongly correlate with urban factors including population density, housing density, and percentage of urban land use or roads posing a significant threat to groundwater throughout Southern New Hampshire.[7] These findings emphasize the importance and need for managing both land use activities as well as the handling of potential contaminants.

Although MTBE has now been removed from the gasoline supply in the state, gasoline contains many other toxic compounds. Land uses associated with gasoline releases to groundwater remain a concern. Industrial solvents are especially potent contaminants; only 5 ounces of TCE (tetra-chloroethylene), a common industrial solvent, can make up to 7.8 million gallons of water unacceptable for drinking based on federal standards.[8]

---

[5] Ibid., pg.1.

[6] The term "private well" refers to a water supply well that does not serve a public water system. This plan only focuses on public water supply wells, but the issue of contamination is often similar.

[7] Methyl tert-Butyl Ether Occurrence and Related Factors in Public and Private Wells in Southeast New Hampshire, Joseph D. Ayotte, Denise M. Argue, and Fredrick J. McGarry. (USGS, 2004).

[8] Ibid.

While there are many state and federal programs that directly or indirectly serve to protect groundwater, local land use controls and inspection (including testing and/or monitoring) programs are necessary to maximize the effectiveness of groundwater protection.

## Planning Approach and Methodology

A carefully researched and documented Source Water Protection Plan is an important step in source water protection to provide guidance, priorities and implementation actions necessary to protect public drinking water sources and groundwater (aquifers) from contamination. Actions taken by water system owners, managers, surrounding landowners, and the municipality are all important in achieving source water protection within the community.

A **Source Water Protection Plan** consists of the following elements:

- An inventory of active public water systems in the community;
- A delineation of wellhead protection areas (WHPAs);
- An inventory of potential contamination sources (PCSs);
- An assessment of risks posed by PCSs;
- A management program to minimize risks to the water source(s); and
- A contingency plan for responding to security threats and emergency loss of the water supply.

Drinking water source protection basically involves three main planning efforts:

**Step One: Source Inventory and Delineation** which includes:

- **Well Summary Report**. This is an inventory of all the active public water systems existing within the community utilizing local knowledge and the Source Water Assessment prepared by NH DES for each municipality within the state.

  In the Town of Chester, a total of 22 public wells have been identified and addressed in this plan.

- **Delineation of Wellhead Protection Area (WHPA)**. A WHPA delineation is typically based on technical studies that identify the ***surface area*** around the public water well(s) systems(s) that contribute groundwater to the well.[9]

[9] There are a number of methods for delineating WHPAs for public water supply wells. The methods range from simple and inexpensive to complex and costly. Grant funds through NH DES are available for refining delineations. Only the WHPAs mapped by NH DES are accounted for in this plan.

In Chester, a total of 11 WHPAs are currently delineated among the 22 active public water supplies within the community. It should be noted here that the "Public Water Supply and Wellhead Protection Areas" map on page 12 shows overlapping WHPA's from the surrounding towns of Sandown and Fremont. These overlapping WHPAs are not included in this plan. All 11 WHPAs have been mapped by NH DES as concentric circles surrounding each well. The circles vary from 1,000 to 1,500 feet in diameter. The size of the circles is based upon the production volume of the wells as approved or reported to NH DES.

**Step Two: PCS Inventory and Threat Assessment** which includes:

- **Potential Contaminant Source Inventory**. This inventory identifies all the potential contaminant sources (PCS) in and around the wellhead protection area that could pose a threat to drinking water.[10]

- **Threat/Vulnerability Analysis**. This analysis determines how susceptible the groundwater or aquifer is to contamination. A vulnerability ranking of "low", "moderate" or "high" has been assigned by SNHPC based on the hydrogeologic setting and the apparent visible physical risk of the potential contaminant source to pollute the groundwater. Because this grant project does not evaluate specific groundwater quality data which may or may not be available for each of the identified public water wells in Chester, the vulnerability analysis employed in this plan is based upon SNHPC's best field judgment including as applicable consideration of the number of vulnerability rankings found within the NH DES Source Water Assessment Report for Chester.

**Step Three: Management and Protection Program** which includes:

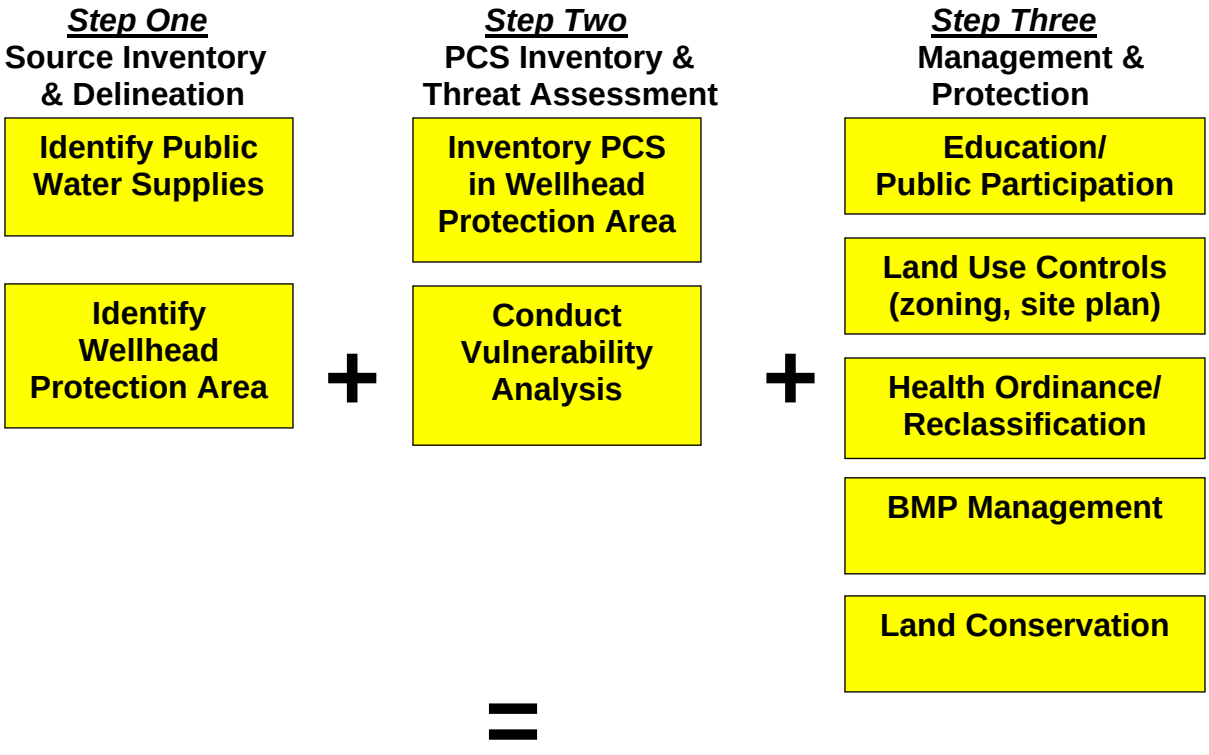
- **Management Program.** This is best developed by a local Source Water Protection Advisory Committee consisting of the regional planning commission, the municipality, and interested and knowledgeable parties and consultants. It explains how the town's drinking water source(s) will be protected using strategies to address the most significant threats. These strategies can include:
    - Education/public participation
    - Land use controls (zoning ordinances, site plan regulations, etc.)
    - Health ordinance and groundwater reclassification
    - BMP management (public or private actions)
    - Land conservation (public or private actions)

- **Contingency Plan.** A contingency plan is typically included in a Source Water Protection Plan when addressing security issues and emergency loss of water supply. Generally, a contingency plan is required for municipal or

[10] See Appendix A for definition of a PCS and Wellhead Protection Area.

privately owned domestic water supply and treatment systems and not individual wells.

The general steps in carrying out the three main planning efforts are reflected in the following chart below:




## Plan Approval, Implementation and Update

The Town of Chester has formed a Source Water Protection Advisory Committee to oversee the development of this plan. This Committee will be aid in implementing the plan and future plan updates and amendments. The Town of Chester Planning Board is ultimately responsible for developing and implementing the recommendations and proposed aquifer protection ordinance and land use regulations contained within this plan. This also includes drafting necessary warrant article(s) for Town Meeting consideration.

To obtain approval of the plan, the Planning Board should hold a public hearing to seek public input and comment. After the public hearing and upon review of public comments, the plan should be presented to and adopted by the Board of Selectmen and also be included or referenced in the town's updated Master Plan, as appropriate.

Lastly, it should be the responsibility of the Chester Planning Board, Town Administrator, Health Officer as applicable, and Board of Selectmen to update this Plan every three years. To assist the town in updating the Plan, an annual review checklist is provided at the front of this document.

## 2. Summary of Plan Contents

The location of 22 identified active public water well systems and the 11 delineated wellhead protection areas located within the Town of Chester are shown on the maps in Appendix A. These maps depict all the existing wellhead protection areas. Each map contains a chart and numbering system which identifies each public water well system.

- The **Well Summary Report** is provided in Section 6 of the Plan. Each active public water well systems have been inventoried and photographed (where permitted) and the current owner/well operator identified.

- The results of the **PCS Inventory/Threat Assessment** can be found in Section 3 of the Plan.

- The wellhead location and wellhead protection area maps are found in Appendix A. Additional maps are found throughout the document in their respective sections.

- The **Management/Protection Program** can be found in Section 5. This includes a review of the town's existing land use regulations related to groundwater protection and provides a recommended Aquifer Protection Ordinance and proposed groundwater protection performance standards for the town to consider as part of the Planning Board's Site Plan Regulations.

- Appendix B is a summary of the definitions of the key terms used in the plan as well as a summary of the grant agreement/scope of work between NH DES and SNHPC to prepare the plan.

- Appendix C contains the NH DES Source Water Assessment Report for public water systems within the Town of Chester.

- Appendix D identifies the NH DES list of all known contamination sources and potential contamination sources found within Chester.

# 3. PCS Inventory & Threat Assessment

## Active Public Water Systems in Chester

A total of 22 active water systems are currently operating within the Town of Chester (See Well Summary Report provided in Section 6 of the Plan). All of the wells are sources of water for public water systems as defined by NH DES. Public water systems are split into the following three groups:

- Community Systems: a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents;
- Non-Transient/Non-Community Systems: a public water system designed to serve at least 25 people, for at least 6 months per year. Examples include day care, schools, and commercial property: and
- Transient/Non-Community Systems: a public water system designed to serve at least 25 people, for at least 60 days per year. Examples include restaurants, campgrounds, motels, recreational areas and service stations.

Of the 22 active public water systems identified in this plan, 15 of these systems have been identified in the NH DES Source Water Assessment Report prepared for the Town of Chester (see Appendix C). These systems include: five (5) community wells; two (2) non-transient, non-community wells; and eight (8) transient, non-community wells.

In addition to the 15 systems identified by NH DES on the Public Water Supply Source Assessments, the Town of Chester's Source Water Protection Committee has identified an additional 7 wells located within the community which provide drinking water to the public. These additional 7 wells are located at both municipal-owned and private owned facilities and are identified as follows:

1. Chester Post Office
2. Chester Ball Field (well to be replaced in the future)
3. Chester Fire Station
4. Chester Rod & Gun Club
5. Chester Congregational Church
6. CJR Condos
7. Senator Bell Farm

## Wellhead Protection Areas in Chester

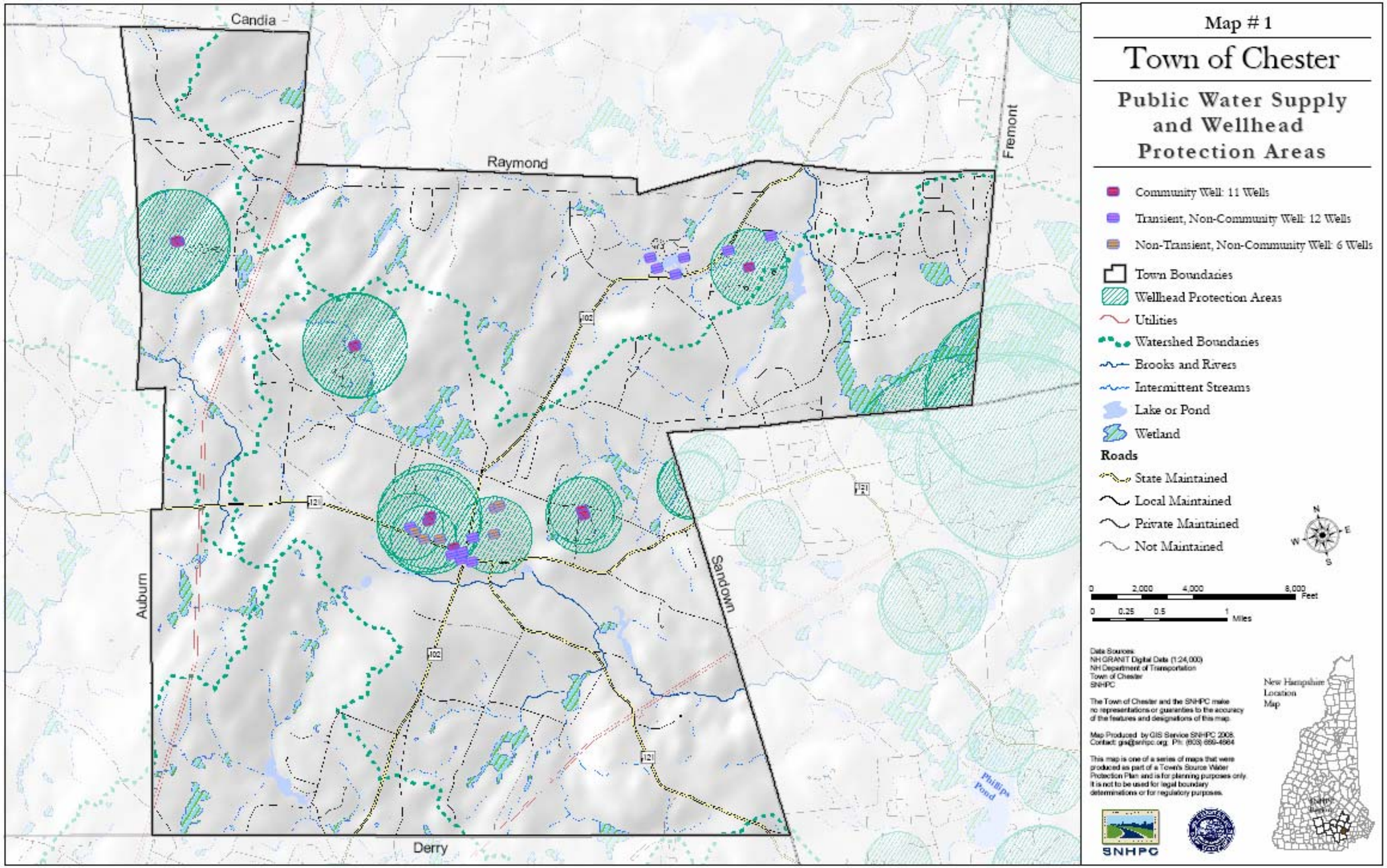
At the present time, there are a total of 14 public water systems which are located within a total of 11 designated wellhead protection areas within the town. These 14 systems are identified below and are shown on the maps located with Appendix A of this plan:

1. Chester College of New England (5 wells) – Map No#s 1 through 5
2. Villages at Chester Condos (2 wells) – Map No#s 6 and 7
3. Chester Brook Condos (3 wells) - Map No#s 8 through 10
4. Oak Hill Subdivision (2 wells) – Map No#s 11 through 12
5. Shaker Heights – Map No#13
6. Chester Academy – Map No# 14
7. Shaker Heights Professional Plaza – Map #15
8. The Olde Post Restaurant – Map No# 16
9. Chester Congregation Church – Map No#17
10. Fellowship Bible Church – Map No#18
11. Chester Ball Field – Map No#19
12. Chester Municipal Center (2 wells) – Map No#20 and 21
13. Spollett's General Store – Map No#22
14. Stevens Memorial Hall – Map No#27

The designated 11 wellhead protection areas are shown on the following Map 1, "Public Water Supply and Wellhead Protection Areas".

WHPAs are not delineated for transient, non-community wells under state and federal requirements. As a result the following wells do not have delineated WHPAs:

1. Wason Pond Cottage
2. Wason Pond Community Center


Candia
Raymond
Fremont
Auburn
Sandown
Derry
121
102
Phillips Pond
Map # 1
Town of Chester
Public Water Supply and Wellhead Protection Areas
Community Well: 11 Wells
Transient, Non-Community Well: 12 Wells
Non-Transient, Non-Community Well: 6 Wells
Town Boundaries
Wellhead Protection Areas
Utilities
Watershed Boundaries
Brooks and Rivers
Intermittent Streams
Lake or Pond
Wetland
Roads
State Maintained
Local Maintained
Private Maintained
Not Maintained
N
S
E
W
0 2,000 4,000 8,000 Feet
0 0.25 0.5 1 Miles
Data Sources:
NH GRANIT Digital Data (1:24,000)
NH Department of Transportation
Town of Chester
SNHPC
The Town of Chester and the SNHPC make no representations or guarantees to the accuracy of the features and designations of this map.
Map Produced by GIS Service SNHPC 2008.
Contact: gis@snhpc.org; Ph: (603) 669-4664
This map is one of a series of maps that were produced as part of a Town's Source Water Protection Plan and is for planning purposes only. It is not to be used for legal boundary determinations or for regulatory purposes.
SNHPC
New Hampshire Location Map

## PCS Inventory

A combination of GRANIT and NH DES GIS layers as well as field surveys and aerial photography (orthophotos) were used to identify known contamination sources (KCS) and potential contamination sources (PCS) found within each of the 11 wellhead protection areas identified in this plan. The boundaries of all 11 WHPAs and the site locations of each identified PCS and KCS are shown on the maps provided in the Appendix of this plan.

In conducting the PCS Inventory, the SNHPC utilized Environmental Fact Sheet WD-WSEB-12-3 (which is depicted in the following Table 1) as a guide in identifying potential contamination sources. The location of KCSs in Chester is provided through the NH DES One Stop web data base.

Many of the land use activities and/or facilities identified in Table 1 typically use, produce, handle, or store regulated substances (which, if improperly managed could find their way to a source of public drinking water). However, a release or discharge to groundwater may never occur from a PCS provided the facility is employing best management practices as required currently under State Rule ENV-Wq-401 (BMPs for Groundwater Protection) for all regulated substances in regulated containers.

**Table 1**
**NH DES List of Potential Contamination Sources**

| Potential Contamination Sources (PCS) | | |
|---|---|---|
| Vehicle Service and Repair shops | General Service and Repair shops | Metal Working Shops |
| Salt Storage and Use | Snow Dumps | Storm Water infiltration ponds or leaching catch basins |
| Manufacturing Facilities | Underground or above ground Storage Tanks | Cleaning Services |
| Waste and Scrap Processing and storage | Food Processing Plants | Transportation Corridors |
| Septic Systems (at Commercial and Industrial Facilities | Laboratories and certain professional offices (medical, dental, veterinary) | Use of Agricultural Chemicals |
| Fueling and Maintenance of Earth moving equipment | Concrete, asphalt, and tar manufacture | Cemeteries |
| Hazardous Waste Facilities | | |

(Source: NH DES WD-WSEB-12-3 NH Drinking Water Source Assessment Program Plan, May 1999, Appendix G.)

## Vulnerability Assessment

As described in the Planning Approach and Methodology section of this plan (page 7), a threat and vulnerability assessment of each PCS and KCS was conducted. All of the threats found as a result of the PCS Inventory are summarized in Table 2 and shown on the maps in Appendix A. The threats identified within the WHPA of each public water system is ranked as either "low", "medium" or "high" based upon SNHPC's best field judgment. This decision making process include, as applicable, consideration of the vulnerability rankings found within the NH DES Source Water Assessment Report for Chester (see Appendix D).

DES's source water assessment rankings consider the existence, relative proximity and density of certain land uses including, lagoons, animals, agricultural and urban land cover, septic systems, pesticides, highways and railroad lines, and known chemical releases into the ground in relationship to the public water system. The overall size and operation of the activity on the site and what impact the use could have within the WHPA as well as the character of the surrounding physical terrain was also considered by SNHPC in assigning the vulnerability ranking. Additional information was obtained through contact with landowners and operators of each active public water system.

**Table 2**
**Summary of Groundwater Threats Located Within Wellhead Protection Areas, Town of Chester, NH**

| Map Location | Type of Site | Identified By | Contamination Source | Threat Level | Use | Zoning | In WHPA |
|---|---|---|---|---|---|---|---|
| 1 | Cemetery | SNHPC | Chester Village Cemetery (Long Meadow Cemetery) | Medium | Cemetery | AR | Yes |
| 2 | Repair Shop | SNHPC | A&P Auto Shop | Medium | Auto Repair Shop | AR | No |
| 3 | Earth moving & Equipment Storage | SNHPC | Lighthall Septic and Excavation | Low | Machinery Storage | AR | No |
| 4 | Waste & Scrap Storage | SNHPC | LeClair's Garage | **High** | Auto salvage and junk yard | AR | No |
| 5 | Above/Underground Storage Tank | SNHPC | Chester College | Medium | Residential college with dorms, classrooms, cafeteria areas | AR | Yes |
| 6 | Above/Underground Storage Tanks | SNHPC | Residential Storage Tanks | Low/Medium | Residential storage tanks for heating fuel and septic | AR | Yes |
| 7 | Highway | SNHPC | Route 121/102/102A | **High** | Main highway | AR | Yes |

Source: Southern New Hampshire Planning Commission

## Inventory of Wellhead Protection Areas

The location and description of the threats identified within or near the 11 delineated wellhead protection areas are described as follows:

**Threat #1**: The Chester Village Cemetery is located near the center of town on Raymond Road and located within the WHPA of Chester Academy. It is large well maintained cemetery. It poses a low threat to the town's drinking water as there is no commercial application of herbicides or pesticides. The use of herbicides by commercial applicators is sometimes a concern to groundwater. The town should carefully evaluate and control the application and amount of any herbicides or pesticides used at the Village Cemetery. If commercial applications are conducted in the future, they should be completed by licensed applicators.

**Threat #2**: A&P auto shop is located on Raymond Road, far away from the town center. This site is not located within a WHPA; however, it is a large auto body repair shop that appears to be an active business. The site is considered to a medium risk because of the size of the lot upon which it is located; the limited number of auto and truck equipment stored on the site; and the fact that this equipment is stored inside a large garage outside of State setbacks to water system wells where the vehicles are repaired. The site most likely has multiple types of fuel – gas and diesel, stored at the garage which could lead to higher probability that there would be a release of regulated substances into the ground. Therefore, while there are no known releases at this time, this PCS is considered a medium risk.

**Threat #3**: Lighthall Septic and Excavation is a business which has an office and equipment storage on Raymond Road. While it is not located within a WHPA, it is located within about one mile of the Chester Municipal Building well. Currently, there is no excavation activity on site and the site is only used for the storage of excavation and earthmoving equipment. Most machines are stored on pavement however some machines appeared to be stored on packed dirt. In order for the site to remain a low threat all machines should be moved onto impervious surfaces so that any accidental leaks of regulated substances are not able to infiltrate into groundwater. The site appears to have low traffic and low traffic impacts and therefore is considered to be a low threat for groundwater contamination.

**Threat #4:** LeClair's garage is located on Fremont Road. This site is not located within a WHPA, but it is located within one mile of the Chester Municipal Building well. This site was a former auto salvage yard and it is identified by NH DES as a brownfields site due to groundwater contamination resulting from petroleum and other volatile organic compounds such as polychlorinated biphenyls. It is considered a Known Contamination Source (KCS) and preliminary soil and groundwater testing has been conducted on site by NH DES and EPA. As a result, this KSC is considered to be a high threat for groundwater contamination.

**Threat #5:** Chester College is located along Route 121. It has dormitories and dining halls. The college has both above and below ground heating fuel tanks and septic tanks. These tanks are located within the WHPA**,** but there have been no known leaks. If a spill were to occur this could affect the college's own drinking water system as well as the Chester Municipal building water system which is very close by. Due to the existence and location of these tanks, this PCS is considered to be a medium threat at this time.

**Threat #6:** There are approximately 43 housing lots that have septic tanks and outside heating fuel tanks both above ground and under ground around the village district. These lots fall into the Villages at Chester Condos, Chester Brook Condos, Chester College, and Chester Municipal Building WHPAs. These individual septic systems could become a threat if system failure, leaks or other improper care occurs. The systems could also pose a potential threat if not properly maintained. This threat is considered to be a Low to Medium risk for groundwater contamination at this time

**Threat #7:** Routes 121/102/102A run through Chester village center and within the Chester Academy, Chester College and Chester Municipal Center WHPAs. Routes 121/102/102A are currently a known cause for well contamination because the town library's drinking water system has been contaminated due to road salting in winter months. The library is located along Routes 121/102/102A in the village center. Changes must be made to the salting practices along Routes 121/102/102A through the Village Center and the Town of Chester needs to pursue an alternative drinking water supply for the library. As a result, Routes 121/102/102A are considered to be a High risk for groundwater contamination.

## Maintaining Best Management Practices

Many of the existing Medium to High level threats described above and identified in Table 2 (Map Location #1 – Chester Village Cemetery; Map Location #4 – Le Clair's Garage; Map Location #5 – Chester College; Map Location #6 – Housing Lots; and Map Location #7 – State Routes 121/102/102A) are located within designated WHPAs within the community. As such these sites should be inspected on a routine basis to minimize and prevent additional or future groundwater contamination. Town officials, such as the Building Inspector/Health Officer and Code Enforcement Officer can be readily trained by NH DES to conduct BMP Compliance Surveys.

The BMP Compliance Survey reflects a set of standards how regulated substances, such as salt, fuel oil, fertilizers, etc. must be stored, transported, labeled, and protected in accordance with Env-Wq 401 (NH Administrative Rule). These standards help to minimize the release of regulated substances which can contaminate groundwater. If a site is not able to meet the standards within Env-Wq 401, the site owner or representative must correct the deficiency and make improvements.

As part of this plan, a total of four BMP Compliance Surveys were conducted in Chester by SNHPC staff and town officials. The surveys were completed at the Town Salt Shed, the State Salt Shed and Garage, the Chester Town Garage, and the Fire Department Fueling Station. Each site met all of the BMP Compliance Survey standards and no infractions were identified. At all the sites, the storage and transport of regulated substances met the proper regulatory standards as required by Env-Wq 401. More information about the Best Management Practice (BMP) Compliance Survey can be obtained from NH DES[11] and copies of the completed surveys for each of the four sites surveyed in Chester can be obtained from the Chester Planning Department.

It is the recommendation of this plan that the Town of Chester consider conducting BMP Compliance Surveys on the sites identified with Medium to High levels of threat in Table 2 on a regular basis. These surveys would ensure that all regulated substances are safely stored, adequately labeled, and handling procedures are correct and safe.

In order for the Town of Chester to begin conducting BMP Compliance Surveys to inspect these existing land uses on a routine basis, the town's groundwater protection ordinance would need to be amended which would ensure necessary local enforcement. In addition, provisions for conducting BMP Compliance Surveys should also be added to the Planning Board's site plan and subdivision regulations which would allow the town to conduct inspections for new activities requiring plan approval.

[11] NH DES Best Management Practice Site: http://des.nh.gov/organization/divisions/water/dwgb/dwspp/bmps/index.htm

# 4. The Need for Aquifer Protection

## Chester's Aquifers

Aquifers, much like wetlands, serve as a storage place for water. An aquifer can consist of surficial geologic deposits, such as sand and gravel, or it can be fractured bedrock, but it must be able to store and allow the movement of water.

Aquifers are one of New Hampshire's most critical and important natural and economic resources. This is especially important in the Town of Chester because the majority of the town's population rely upon groundwater as its primary source of drinking water.

Stratified-drift aquifers e composed of coarse to fine consolidated glacial meltwater deposits typically found adjacent to or within the basins of major streams and rivers. Stratified drift aquifers in many municipalities are the principal high yielding aquifers for community water well systems. The distribution and hydraulic characteristics of the stratified-drift aquifers are related to the original environment in which the sediments were deposited. Various types of stratified-drift deposits are found in Chester.

In 1990 and 1995, the U.S. Geological Survey produced two significant groundwater studies available at the following website: http://pubs.usgs.gov/wri/wrir_92-4192/html/pdf.html. These are:

> "**Geohydrology and Water Quality of Stratified-Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins, Southeastern New Hampshire"** (1990);
>
> **"Geohydrology and Water Quality of Stratified-Drift Aquifers in the Middle Merrimack River Basin, South-Central New Hampshire"** (1995).

The 1990 and 1995 aquifer studies identified the more productive aquifers in Chester as the stratified-drift aquifers which consist mainly of layers of sand and gravel, parts of which are saturated and can yield water to wells and springs (see following Aquifer Transmissivity Map, map number 2 on page 21, which was prepared by the Complex Systems Research Center at the University of New Hampshire as a result of the 1990 and 1995 studies referenced above).

The most significant of the several stratified-drift aquifers lie largely to the east of Raymond Road (NH Route 102) in the northeastern part of the community. Other less significant aquifers are along the Chester-Sandown line, between Sandown Road (NH Route 121 A) and Fremont Road; in the North Pond Road area; along the Chester-Auburn line, north of Chester Street and Haverhill Road. Detailed

information concerning the characteristics and capabilities of these aquifers is presented in the previously referenced studies.

Municipalities may use existing USGS Technical Studies and the more recent surficial geologic maps prepared by NH DES as a basis for municipal groundwater and aquifer protection ordinances. As shown in the following Aquifer Transmissivity Map, map number 2 on page 21, the greatest aquifer transmissivity in Chester (which falls in the range of 0 to 1,000 feet squared per day) is concentrated within the northeast corner of town. There are also other areas of the community with smaller aquifers containing a similar range of transmissivity.

The Town of Chester is currently fortunate to have an adequate supply of drinking water as a result of these high yielding aquifers. However, as the community continues to grow and develop, it will become increasing important that these critical resources be protected from risky land uses which have the potential to pollute the town's only drinking water supply.

The location of LeClair's Garage on Fremont Road is a case in point. As previously described in this plan, this former automotive salvage yard is littered with broken down vehicles, debris, and motor vehicle parts. As a result of car crushing and other vehicle disposal activities causing the release of fuel oils and gasoline, polychlorinated biphenyls and other organic compounds into the environment, the soils and groundwater around the site are now contaminated.

The Town of Chester strives to protect the community's groundwater and aquifers to the highest level possible. In addition, the town should (if it has not already done so) encourage or require that all junkyards within the community be certified through the New Hampshire Green Yards Program and follow the program's Environment Guidance Manual[12].

Information on the pollution prevention measures under this program can be found online at: http://www.des.nh.gov/sw/Green Yards.

.

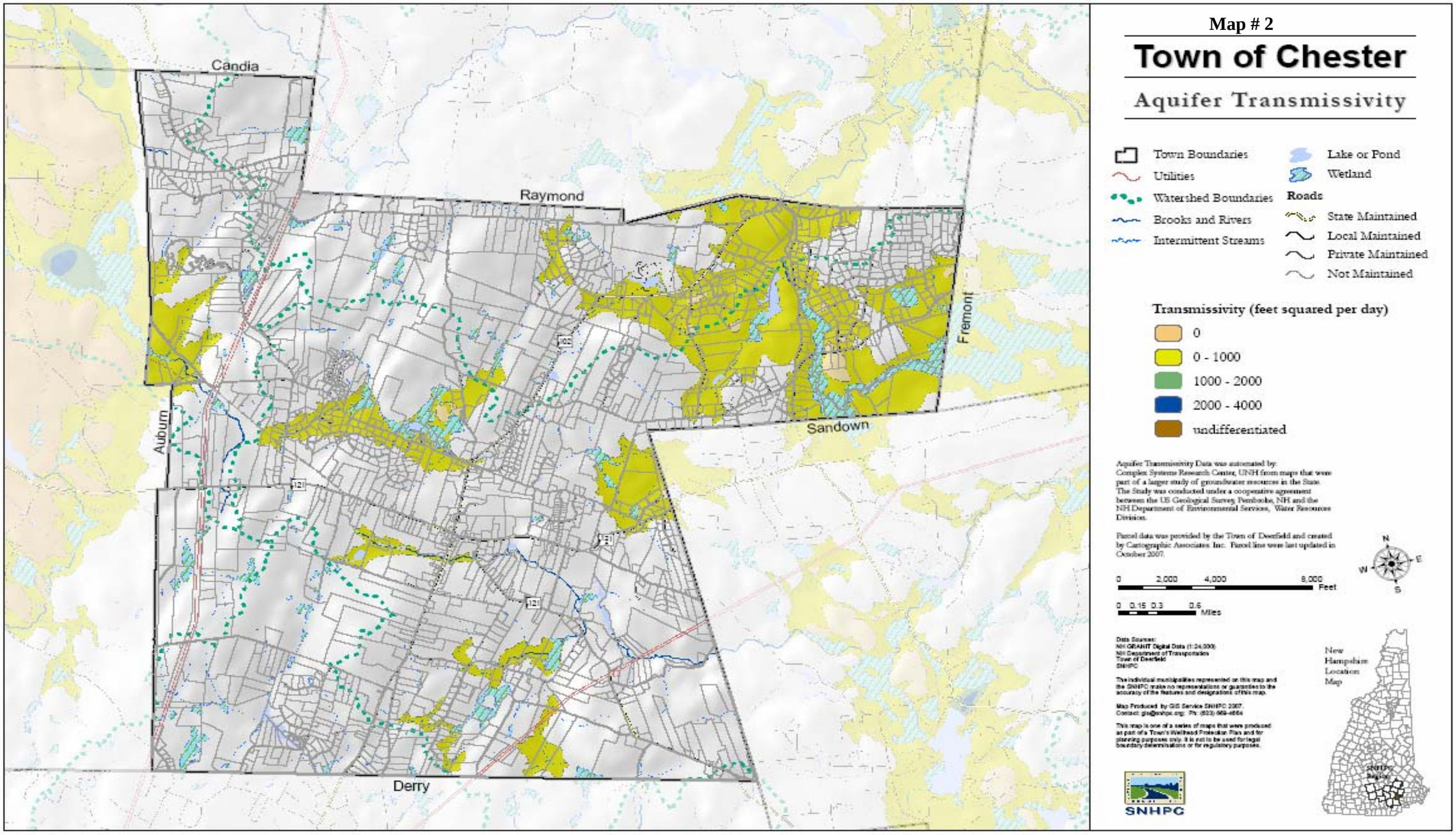
## Well-Yield Probability

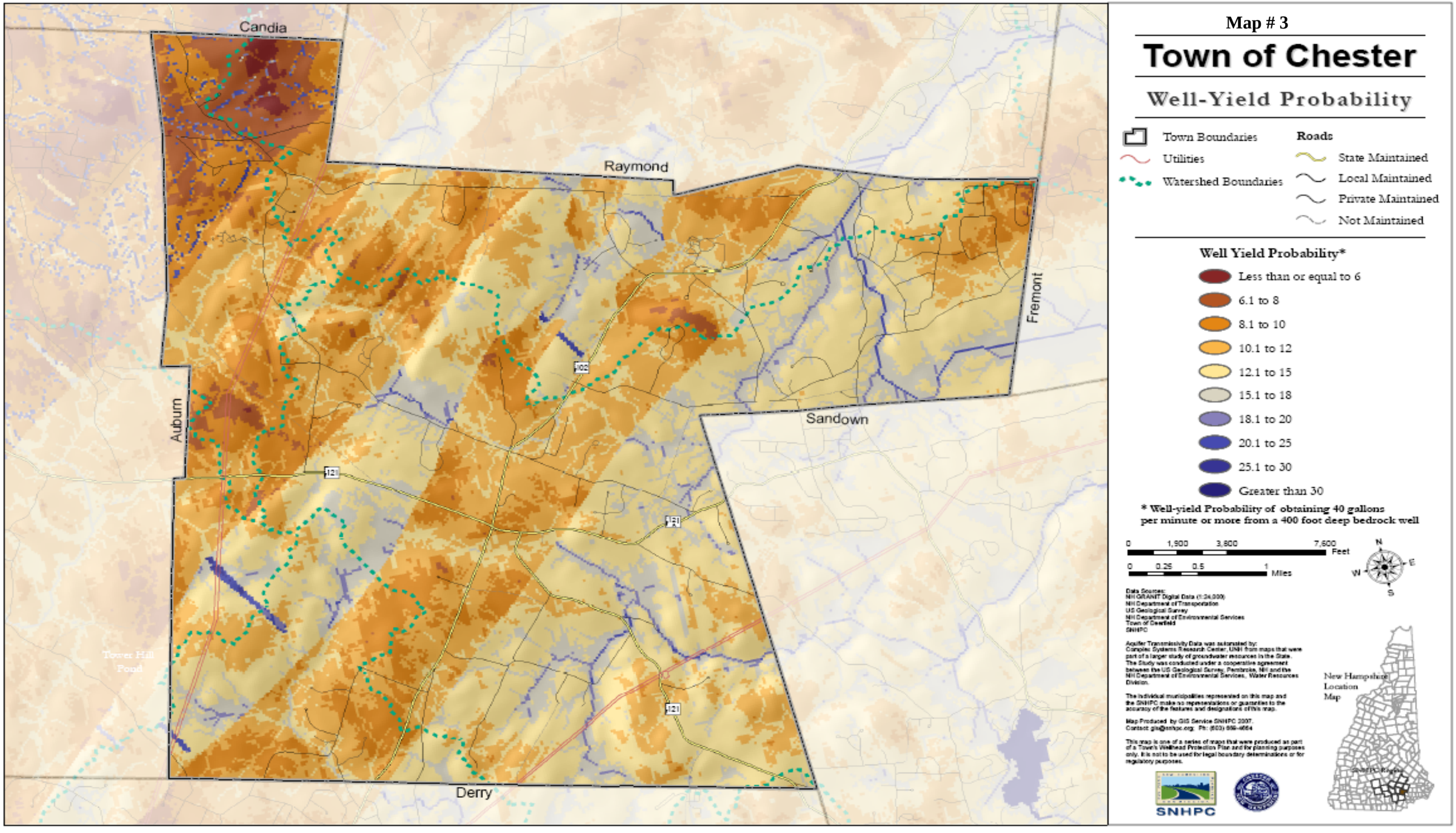
The following Well-Yield Probability map prepared for the Town of Chester is based upon the United States Geological Survey (USGS) study of Well-Yield Probability for the State of New Hampshire (2000 & 2001).

The parameters for this study are based upon estimates of obtaining 40 gallons per minute or more of water from a 400-foot deep bedrock well. The results of this study in Chester indicate that while the north and west area of the community have very low well yield level probability of less than six units, the majority of Chester has a well-yield probability level of 12.1 to 15.0 units. A unit represents how many gallons are obtained from a 400-foot bedrock well per minute.

[12] NHDES "Green Yards Program and Manual", http://des.nh.gov/organization/divisions/waste/swmb/tsei/greenyards/index.htm

While this well-yield probability data may be useful for community-wide planning purposes, it should not be used by the Town of Chester as justification for groundwater or aquifer protection regulations.


Candia
Raymond
Fremont
Sandown
Auburn
Derry
121
28
Map # 2
Town of Chester
Aquifer Transmissivity
Town Boundaries
Utilities
Watershed Boundaries
Brooks and Rivers
Intermittent Streams
Lake or Pond
Wetland
Roads
State Maintained
Local Maintained
Private Maintained
Not Maintained
Transmissivity (feet squared per day)
0
0 - 1000
1000 - 2000
2000 - 4000
undifferentiated
Aquifer Transmissivity Data was automated by:
Complex Systems Research Center, UNH from maps that were
part of a larger study of groundwater resources in the State.
The Study was conducted under a cooperative agreement
between the US Geological Survey, Pembroke, NH and the
NH Department of Environmental Services, Water Resources
Division.
Parcel data was provided by the Town of Deerfield and created
by Cartographic Associates Inc. Parcel line were last updated in
October 2007.
N
S
E
W
0 2,000 4,000 8,000 Feet
0 0.15 0.3 0.6 Miles
Data Sources:
NH GRANIT Digital Data (1:24,000)
NH Department of Transportation
Town of Deerfield
SNHPC
The individual municipalities represented on this map and
the SNHPC make no representations or guarantees to the
accuracy of the features and designations of this map.
Map Produced by GIS Service SNHPC 2007.
Contact: gis@snhpc.org; Ph: (603) 669-4664
This map is one of a series of maps that were produced
as part of a Town's Wellhead Protection Plan and for
planning purposes only. It is not to be used for legal
boundary determinations or for regulatory purposes.
SNHPC
New
Hampshire
Location
Map


Candia
Raymond
Fremont
Auburn
Sandown
Derry
Tower Hill Pond
121
102
Map # 3
Town of Chester
Well-Yield Probability
Town Boundaries
Utilities
Watershed Boundaries
Roads
State Maintained
Local Maintained
Private Maintained
Not Maintained
Well Yield Probability*
Less than or equal to 6
6.1 to 8
8.1 to 10
10.1 to 12
12.1 to 15
15.1 to 18
18.1 to 20
20.1 to 25
25.1 to 30
Greater than 30
* Well-yield Probability of obtaining 40 gallons per minute or more from a 400 foot deep bedrock well
0 1,900 3,800 7,600 Feet
0 0.25 0.5 1 Miles
N
S
E
W
Data Sources:
NH GRANIT Digital Data (1:24,000)
NH Department of Transportation
U.S Geological Survey
NH Department of Environmental Services
Town of Deerfield
SNHPC
Aquifer Transmissivity Data was automated by:
Complex Systems Research Center, UNH from maps that were part of a larger study of groundwater resources in the State. The Study was conducted under a cooperative agreement between the US Geological Survey, Pembroke, NH and the NH Department of Environmental Services, Water Resources Division.
The individual municipalities represented on this map and the SNHPC make no representations or guarantees to the accuracy of the features and designations of this map.
Map Produced by GIS Service SNHPC 2007.
Contact: gis@snhpc.org Ph: (603) 669-4664
This map is one of a series of maps that were produced as part of a Town's Wellhead Protection Plan and for planning purposes only. It is not to be used for legal boundary determinations or for regulatory purposes.
SNHPC
New Hampshire Location Map

# 5. Management/Protection Program – Land Use Controls

As described in the Introduction section, on page 8, under Step 3, Management and Protection (see page 8), there are a number of tools available to municipalities to protect groundwater including zoning, land acquisition, public education, state reclassification, BMPs and inspections. These tools have been grouped under five protection strategies: Education/Public Participation; Land Use Controls, Health Ordinance/Reclassification, BMP Management and Land Conservation. Most of these strategies require the adoption of local regulations (zoning, site plan, health ordinance, etc.) while others are entirely non-regulatory (such as education and land conservation).

All of these techniques are described in *The DES Guide to Groundwater Protection,* available from NH DES's Drinking Water Source Protection Program at (603) 271-7061.

In deciding the best way to use these management/protection techniques, this section includes a review of the town's existing master plan, zoning and site plan regulations. This review will be helpful in identifying and assessing existing gaps in protection and include, as necessary, recommendations and specific ordinance revisions and language for improving the town's existing regulations.

NH DES recommends prohibiting a short list of high-risk land uses that historically have been associated with groundwater contamination and managing (via BMPs) these uses that use regulated substances (e.g. Gas, oil, etc.)

## Master Plan

Before adopting or amending existing regulations, a municipality should address the need for groundwater protection in its master plan, typically within the natural resources section. Groundwater protection may also be addressed in a document (generally incorporated by reference into the master plan) referred to as the *water resources management and protection plan.* Guidance on drafting such a plan is available from DES (271-0688) or the Office of Energy and Planning (271-2155). This document should inventory local water resources (i.e. wetlands, rivers, aquifers) and address a wide range of water resources management issues, including identifying the value and use of specific water resources, a summary of current threats, and an analytical approach to evaluating whether local land use controls will be needed to protect water resources now, and in the future.

Chester's 2006 Master Plan has no reference to a water resources management and protection plan as Chester does not have such a management plan. While there are a number of goals and references in the Town of Chester's 2006 Master Plan which recognize the importance and need to protect the town's drinking water

and aquifers, there are no drinking water protection recommendations contained within the plan.

Given the lack of a water resources management plan, it is important that this Source Water Protection Plan, at a minimum be included and adopted by reference as part of the town's next Master Plan Update.

## Zoning Ordinance

The Town of Chester currently has a **Groundwater Protection District** (Article 16 of the town's Zoning Ordinance) which is an overlay district that is superimposed over the existing (underlying) zoning districts. The ordinance includes detailed performance standards in addition to permitted and prohibited uses.

Because the Groundwater Protection District (GWPD) applies to the entire town; there is no official groundwater protection district zoning map which identifies all the stratified drift aquifers and aquifer recharge areas within the community.

The advantage of having a groundwater protection district apply to the entire town is its simplicity, the removal of aquifer boundary disputes, and the high degree of protection that can be achieved, provided the ordinance includes the most effective protection measures possible.

The main drawbacks of relying exclusively on one groundwater or aquifer protection district apply to the entire town are that ordinance may be legally vulnerable to challenges and the purpose and extent of the district may be questionable.

While the stated purpose of Chester's GWPD is to regulate those land uses that could contribute pollutants to the town's present and future public water supply, the town's GWPD needs to be compared to the updated NH DES Model Groundwater Protection Ordinance in order to identify weaknesses and areas where the ordinance can be improved as well as identify other protection measures that could be implemented by the town to ensure a high level of protection.

## Identified Weaknesses

The general purpose statement of Chester's GWPD to support a town-wide district should be expanded to address not only existing and potential groundwater supply areas, but also ***surface waters hydrologically influenced by groundwater*** as well as ***active community water systems.*** These are the specific community water well systems and wellhead protection areas identified in this source water protection plan. In order address the surface waters that are fed by groundwater, the planning board and/or conservation commission will need to identify these resources through its natural resources inventory of data or retain a hydrogeologist to conduct field research.

While Chester's existing GWPD covers the entire town, the district should also include and specify that all the ***Wellhead Protection Areas*** for public water well systems as defined in the ordinance and are shown on a map to accompany the ordinance. This can be accomplished by referencing this source water protection plan; or referencing the latest WHPA delineations accepted or on record at NH DES for community water systems; or utilizing the Wellhead Protection Area map, map number 1, contained in the plan.

Chester's GWPD Performance Standard requires a stormwater management plan for any use which renders impervious more than 15% or more than 10,000 square feet of any lot, whichever is greater. The NH DES model ordinance recommends a standard of more than 15% or ***2,500 square feet*** of any lot, whichever is greater. The NH DES 2,500 square foot trigger represents the typical footprint of a single family home. Chester's 10,000 square foot trigger is much larger.

Under prohibited uses in Article 16.8 of the town zoning ordinance, Chester's GWPD could prohibit the ***outdoor storage of road salt or other deicing chemicals in bulk***, particularly in delineated well head protection areas. Salt is very difficult to remove from groundwater and outdoor storage of salt is a PCS required to follow BMPs by State Statutes. The Chester Planning Board may want to discuss and amend the town's ordinance to prohibit this use/activity.

The development and operation of a ***snow dump*** is also a prohibited use under the NH DES Model Ordinance. One option to consider would be to restrict snow dumps within the Wellhead Protection Areas only and to continue to allow them as a Conditional Use as currently established by the town's GWPD.

The development or operation of a ***petroleum bulk plant or terminal*** or the development or operation of a ***gasoline station*** are also prohibited uses under the NH DES model ordinance. These uses are included as part of the list of prohibited uses in the NH DES Model Ordinance because of DES's experience with groundwater contamination at gas stations and petroleum bulk storage facilities across the state. Chester's GWPD could be significantly improved if the ordinance prohibited these uses from locating within Wellhead Protection Areas.

The Town of Chester could also require that a Conditional Use Permit be issued for these uses, and that an adequate ***spill prevention, control and countermeasure (SPCC) plan*** be required. Chester's GWPD requires that an adequate plan is put into place to prevent, contain and minimize the releases from catastrophic events such as spills or fires. The content of this plan is not defined in the ordinance and the ordinance does not specify who should enforce it. The NH DES Model Ordinance recommends that the SPCC Plan be submitted to the fire chief, health officer, or emergency management officer in town. To make the town's groundwater ordinance more effective, it must have both preventive protection measures as well as emergency clean up practices to turn to in the event of a spill.

## Summary

Overall the Town of Chester's GWPD includes most of all the provisions and performance standards set forth by the NH DES Model Groundwater Protection Ordinance, and in many cases goes beyond the Model Ordinance by requiring, for example, a conditional use permit for the siting and operation of a commercial car wash.

Chester's current GWPD includes all of the model ordinance provisions for maintenance and inspection, and clearly identifies that inspections shall be carried out by the town's Code Enforcement Officer at reasonable times with prior notice to the landowner.

Chester's GWPD advocates a balanced approach between the use of reasonable performance standards together with restrictive zoning. It also includes necessary authorization to conduct BMP Compliance Surveys as well as the submittal of performance guarantees or bonds to ensure the construction and completion of any facilities that may be required for compliance with the performance standards of the ordinance. In summary, Chester's GWPD could be improved as follows:

- Specifically define the content of a SPCC Plan, who should prepare the plan and specify town review and use during inspections;
- Prohibit gasoline stations and petroleum bulk plant or terminals from locating in Wellhead Protection Areas and require that these uses be only allowed by Conditional Use. These restrictions could also be considered for any use using significant volumes of regulated substances dry cleaning, dyeing, printing or photo processing activities;
- Prohibit snow dumps and outdoor storage of road salt or other deicing chemicals in bulk in Wellhead Protection Areas; and
- Reduce the requirement for the submittal of a stormwater management plan from 10,000 to 2,500 square feet.
- Add language and map of Wellhead Protection Areas to be included as part of the GWP District.

## Site Plan Regulations

The Chester Planning Board has adopted Site Plan Regulations under the provisions of RSA 674:43 and 44. These regulations empower the Planning Board to review and approve or disapprove site plans for the development or change or expansion of use of tracts for non-residential uses, or for multi-family dwelling units (defined as three units or more) whether or not such development includes the subdivision or resubdivision of the site.

In reviewing the Board's Site Plan Regulations there are a number of improvements that could be made to Chester's regulations which would improve groundwater and aquifer protection within the community. The goal of these improvements should be to raise awareness about the need for resource

protection among municipal officials, planning board members, property owners, developers and the public. Simple but necessary actions can be taken to promote groundwater and drinking water protection within the community.

In justifying the need for amending the Planning Board's site plan regulations, it must be restated that Chester relies entirely upon public or private wells for drinking water and thus the town has an interest to protect contributing groundwater to these water resources for the greater public good. In addition, it can not be assumed that the town's GWPD alone will protect the town's groundwater and local aquifers. Most local officials often assume that an applicant and his/her engineer have carefully considered and evaluated all environmental concerns during the zoning or site design process. However, this is not always the case and contamination is more common than most officials realize.

The first step the Planning Board should take during the site plan review process is to require the applicant or developer provide information describing the environmental status of the site.[13] Have any releases occurred on the site? Is the site listed with NH DES or EPA as a hazardous waste site? Have hazardous materials or storage tanks been maintained on the site? These basic questions should be asked and considered standard information for all site plan applications. This information can can be easily incorporated into either the site plan application or submittal requirements of any municipality.

Information about existing contamination is not difficult to obtain. Both NH DES and EPA maintain lists of potential hazardous waste sites on their websites. It is not difficult for municipal officials or an applicant to review these records as part of the site plan review process to confirm that a site or an abutting parcel is not a listed hazardous waste site, with with contamination to soils or groundwater.

In addition, this source water protection plan can be used to help identify both known and potential contamination sources as well as the location of active community water systems and designated wellhead protection areas.

To address these issues, a number of improvements are recomended to the Chester Planning Board's Site Plan Regulations. These suggestions include:

1. Adding a submittal requirement under Article 7 to have all site plans identify existing aquifers, designated wellhead protection areas for public water systems as well as existing and potential contamination sources. Much of this information is available from this Source Water Protection Plan as well as NH DES and EPA websites.

2. Adding the following requirements under Article 7:

[13] Todd H. Dresser, "Using the Site Plan Review Process to Promote Aquifer Protection", Cuoco & Cormier Engineering Associates, Inc., Nashua, NH

Proposed Use: Any application for site plan review which involves the proposed receiving, handling, storing or processing of any regulated substance (as defined by RSA 339-A:2) shall disclose this information as part of the application submission. Copies of all appropriate state permits and as required by the NH DES for the proposed use shall be submitted to the Town of Chester Health Officer and Chester Fire Department.

Prior/Existing Use: Site plan or subdivision applications which involves property contaminated by hazardous or toxic materials (as defined by RSA 339-A:2) shall disclose such information as part of the application. If the Board finds that a potential health risk or an environmental threat exists from a previous or existing use of the site, then the Planning Board shall require that any environmental assessment that has been completed and submitted to NH DES shall be submitted to and reviewed by the Town Health Officer or third party consultant of the planning borad's choice prior to any Planning Board action.

3. Add a new **Groundwater Protection** section to the Planning Board site plan regulations which would be applicable for site expansion or new construction of all land uses which store or use regulated substances in containers with a capacity of 5 gallons or more. This new section would require:

    - A map of natural resources on and near the site, including an assessment of groundwater vulnerability;
    - A listing of the types and quantities of regulated and hazardous substances and pollutants which may be used on the site;
    - A map and/or diagram of facilities on the site related to groundwater protection, including secondary containment structures, loading/unloading areas, drinking water wells, septic systems, underground storage tanks and storm drain inlets;
    - A listing of all state and federal regulatory requirements for the proposed use; and a requiring that all approved plans state the specific rules related to ground water protection on the plan if they apply to regulated substances (Env-Wq. 401), Groundwater Discharge (Env-Wq 402), and stormwater management (e.g. Env-Wq 1500, AOT).
    - Identification and provision for adequate security at all groundwater protection BMPs proposed for the use within designated Wellhead Protection Areas;
    - Restrictions against all discharges to groundwater including direct and indirect discharges, without required state and federal permits and approvals;
    - Determination if non-domestic floor drains must be connected to an on-site holding tank authorized through a state groundwater discharge permit;

- Requirement that the design of all stormwater management and drainage facilities shall not increase flooding or the potential for pollution of surface or groundwater, on-site and off-site; and
- Requirement of a SPCC Plan to be submitted to the Fire Chief and Emergency Management Director addressing the following elements:
    - disclosure statements describing the types, quantities, and storage locations of all regulated substances that will be part of the proposed use or activity;
    - owner and spill response manager's contact information;
    - location of all surface waters and drainage patterns;
    - a narrative describing the spill prevention practices to be employed when normally using regulated substances;
    - containment controls, both structural and non-structural;
    - spill reporting procedures, including a list of municipal personnel or agencies that will be contacted to assist in containing the spill;
    - name of a commercial vendor who may be contacted by the municipality after a reported spill; and
    - list of clean up equipment with instructions available for use on-site and contact information for employees with adequate training to respond to a release and implement containment and clean up.

## Subdivision Regulations

The Chester Planning Board has also adopted Subdivision Regulations under the provisions of RSA 674:35. These regulations enable the Planning Board to review and approve or disapprove plans for the subdivision or resubdivision of property.

In the review of the Planning Board's Subdivision Regulations, there are no provisions or requirements which provide for the protection of groundwater or local aquifers. This could be accomplished by expanding the purpose statement to focus on mainating recharge on site.

In addition, it is recommended that the Planning Board adopt stormwater management regulations as part of the regulations and ordinances which would apply to all land development, including both site plans and subdivisions. Comprehensive stormwater management regulations could include groundwater protection improvements such as necessary BMPs for groundwater protection. Also Low Impact Development techniques and practices, should be included which encourage natural drainage solutions such as grass swales and retention ponds so that stormwater running off roads and parking lots can be naturally treated and cleaned before it soaks back into the ground. Finally, maintaining natural vegetation should be part of the ordinance because it is both a low impact development feature and it aids in cleaning stormwater run off. These primary steps will help to stop groundwater contamination before it starts.

## Excavation and Reclamation Regulations

The Town of Chester has also adopted Excavation and Reclamation Regulations under Chapter 155-E to safeguard the public health and welfare, preserve natural assets of soil, water, forests and wildlife; to maintain aesthetic features of the environment; to prevent land and water pollution; to protect groundwater resources; and to promote soil stabilization and to return the disturbed area to a suitable use after reclamation.

These regulations require aquifer locations and limits be identified by the U.S. Geological Survey and other acceptable sources as part of the application for a permit. The regulations also aim to prevent excavation projects from damaging a known aquifer, mapped by using information from the U.S. Geological Survey, and by prohibiting excavation to take place within eight feet of any known high water table. However, an exception to this standard can be granted by the Planning Board provided the applicant can demonstrate that the excavation will not adversely affect water quality.

## Recommended Actions

Having clear and effective local regulations and zoning is necessary to ensure groundwater and local aquifer protection in Chester. Given the existence of a total of 11 designated wellhead protection areas located within the community (see maps in the Appendix of this Plan) most of which are concentrated in the Town Center; the Medium to High level of threats and risks associated with identified potential and known contamination sources existing within these areas (see Table 2 on page 14); the extent of the town's aquifers within the community to specific areas (as shown on the Aquifer Transmissivity Map on page 21); and the weaknesses identified in the town's existing groundwater protection district regulations; it is recommended that the Planning Board consider the following steps in providing a higher level of groundwater and aquifer protection within the community.

**Step One**: **Adopt this Source Water Protection Plan as part of the Town's Master Plan and amend the plan on a regular basis**

- This is needed as the Town of Chester does not have a locally adopted Water Resources Management and Protection Plan.
- In addition, this source water protection plan provides useful information about the status of the town's public water systems. Because ownership of these systems change over time, new wells are installed and some wells may be closed in the future, it is important that this plan be amended and updated on a regular basis, particularly in documenting designated wellhead protection areas.

**Step Two: Amend the town's existing Groundwater Protection District to address the weaknesses identified in this Plan**

- While the Town of Chester has developed an excellent groundwater protection district to protect the town's stratified drift aquifers, the ordinance can be improved and updated to provide a higher level of protection as well as reflect some of the key provisions outlined in the NH DES Model Groundwater Protection Ordinance.

- Specifically these improvements could include:
  - considering applying the ordinance to only those mapped stratified drift aquifers identified on the latest Aquifer Transmissivity Map of Chester;
  - adding the existing 11 designated wellhead protection areas to the town's district, including future WHPA designations that may be accepted or on record with NH DES for future community water systems;
  - including additional SPCC Plan requirements for plan preparation and review;
  - adding additional provisions for inspections and conducting BMP Compliance Surveys;
  - prohibiting gasoline stations, petroleum bulk facilities, dry cleaning, dyeing, printing or photo processing activities using significant volumes of regulated substances from locating in designated WHPAs;
  - prohibiting snow dumps and salt storage and deicing chemicals in bulk from locating in WHPAs; and
  - reducing the trigger or requirement for when a stormwater management plan should be prepared from 10,000 to 2,500 square feet.

**Step Three: Amend the Planning Board's Site Plan and Subdivision Regulations to include the improvements identified in this Plan**

- In addition to these zoning ordinance revisions, the Planning Board's Site Plan and Subdivision Regulations could also be improved to raise awareness about the need for groundwater protection among municipal officials and the public.
- Further it can not be assumed that the zoning ordinance alone will protect the town's groundwater. Developers and applicants seeking plan approval should be required to provide information to the board about current contamination issues associated with a site, including copies of any environmental assessment reports and remediation plans approved by NH DES for the site. In addition, applicants should be asked to provide a list of the types and quantities of regulated substances, including provisions for implementing BMPs within WHPAs and submittal of a SPCC Plan.

- This submittal information would only be necessary for those applicants seeking plan approval for activities involving the storage and handling of regulated substances in containers over 5 gallon capacity.

**Step Four: Conduct municipal BMP Compliance Surveys**

Because the Town of Chester is currently responsible for maintenance and inspection to verify compliance with the performance standards contained within the town's existing GWPD (Section 16.13), it would not be difficult for the Town of Chester to conduct on a routine basis, BMP Compliance Surveys of existing PCS

or KCS containing regulated substances over 5 gallon capacity in accordance with Env-Wq 401. This could be accomplished as a mandatory requirement through the zoning powers of the municipality.

Provisions to provide for BMP Compliance Surveys should be added to the town's existing GWPD as well as applicable sections of the Planning Board's site plan and subdivision regulations. Amendments to the zoning ordinance would require town approval, while amendments to the Planning Board's regulations would require a public hearing.

NH DES has published guidance documents, such as the *DES Guide to Groundwater Protection*, *Groundwater Protection for Municipalities and Model Health Ordinances to Implement a Wellhead or Groundwater Protection Program*, and *Guidance and Sample Letters for Managing Groundwater Protection Areas* which can assist the Planning Board and the Town of Chester in implementing BMP Compliance Surveys (see NH DES website, Drinking Water Protection Program and these guidance documents which can be found at: http://des.nh.gov/organization/divisions/water/dwgb/dwspp/guidance_documents.htm).

In addition, the Planning Board can during the review of development projects (under site plan and subdivision regulations) impose fees to cover the cost of BMP inspections as well as require adequate performance surety for the installation, operation and maintenance of necessary BMPs which will ensure adequate groundwater and aquifer protection within the community.

An important point to keep in mind when implementing BMP compliance surveys is that these inspections have no enforcement authority unless, 1) they are based upon a local health ordinance adopted under RSA 31:39 or RSA 147; or 2) the surveys are enabled through groundwater reclassification as provided for under RSA 485C; or 3) the surveys are based on the planning and zoning statutes of the state (i.e. RSA 674:17,I) which enable the town to adopt local groundwater and aquifer protection and other land use regulations.

In the absence of any of these powers, Chester's groundwater protection would be limited to bringing about voluntary compliance with the best management practices

for PCSs. If efforts at voluntary compliance are not successful, the town can always refer violators to NH DES for enforcement, since the BMPs apply statewide. However, keep in mind that NH DES has limited personnel resources available for BMP enforcement. Therefore, every effort to work out a compliance timetable with violators is often the best course of action.

**Step Five: Require Private Well Testing**

Lastly, the Town of Chester should discuss and address the issue of private well testing. While the State of New Hampshire currently has no mandatory well testing requirements, some municipalities such as the Town of New Boston require basic potable water testing to be performed and results submitted to the Town Health Officer prior to the issuance of a Certificate of Occupancy.

This or a similar requirement could be easily instituted in the Town of Chester through the following amendment to its Site Plan and Subdivision Regulations:

**Water Testing:** Any public or private business or facility or residential development requiring site plan and/or subdivision approval shall submit the following information to the Town of Chester:

(1) Well water test results performed by a laboratory certified by the National Environmental Laboratory Accreditation Conference shall be submitted to the Chester Health Officer indicating the suitability of the well water for drinking water purposes prior to the issuance of a final Certificate of Occupancy Permit.

While this requirement would address new development, it would not address existing wells and the use of these wells in the future as a result of real estate transfers. This issue remains yet to be resolved by the state or local government.

# 6. Well Summary Report – Active Public Water Systems

**Chester Academy**
Chester, NH 03036
Operated by School District

EPA I.D.: 0435060
Non-Transient/ Non-Community System

**Oak Hill Condominium (2 wells)**
Red Squirrel Lane, Rt. 121A
Chester, NH 03036
Owner: Gregory Desmarais

EPA I.D.: 0432020
Community System

**Wason Pond Cottage**
Rt. 102, 603 Raymond Rd.

Owner's address:
101 Ash St
Manchester, NH 03104
(603) 887-5820

EPA I.D.: 0437010
Transient System

**Wason Pond Community Center**
Rt. 102, 603 Raymond Rd.

Owned by Town of Chester

EPA ID: 0437020
Transient System

**Villages at Chester Condos (2 wells)**
39 Villager Road
Chester, NH 03036
Owner: Laurence Thorne
EPA ID: 0432010
Community System

**Chester Brook Condominiums (3 wells)**
88 Lady Slipper Lane, North Pond Road
Owner: Karl Lennon
14 Sweet Briar Lane
Chester, NH 03036
EPA ID: 0432030
Community System

**Shaker Heights Professional Plaza**
692 Raymond Road
Owner: Jan Realty Group
199 Shepard Home Road
Chester, NH 03036
EPA ID: 0438010
Transient System

**Shaker Heights Condominium**
Shaker Heights Lane off of
Route 102 (Raymond Rd)
Jonathan Remillard (432-2973)
Remi-Son Investments
P.O. Box 219
Derry, NH 03038
EPA ID: 0432040
Community System

**The Olde Post Restaurant**
15 Chester Street
Owner: Jerome Gesel
27 Chester Street
Chester, NH 03036
EPA I.D.: 0438020
Transient System

**Fellowship Bible Church**
48 Rod and Gun Club Road
Owner: Dave Scott
EPA I.D.: 0439020
Transient System

**Chester College of New England**
Chester Road, Rt. 121
EPA I.D.: 0435050
Non-Transient System

**Chester College of New England**
40 Chester Street
EPA I.D.: 0435020
Community System

Note: Between the two systems above there are a total of five active wells providing drinking water to the college.

**Stevens Memorial Hall**
1 Chester Street
Chester, NH 03036
Owned by Town of Chester
EPA ID: 0439010
Non-Community Transient System

**Chester Municipal Center/GYM (2 Wells)**
84 Chester Street
Chester, NH 03036
Owned by Town of Chester
EPA ID: 0435030
Non-Community Transient System

**Spolletts General Store**
2 Haverhill Road
Chester, NH 03036
EPA ID: 0438050
Non-Community Transient

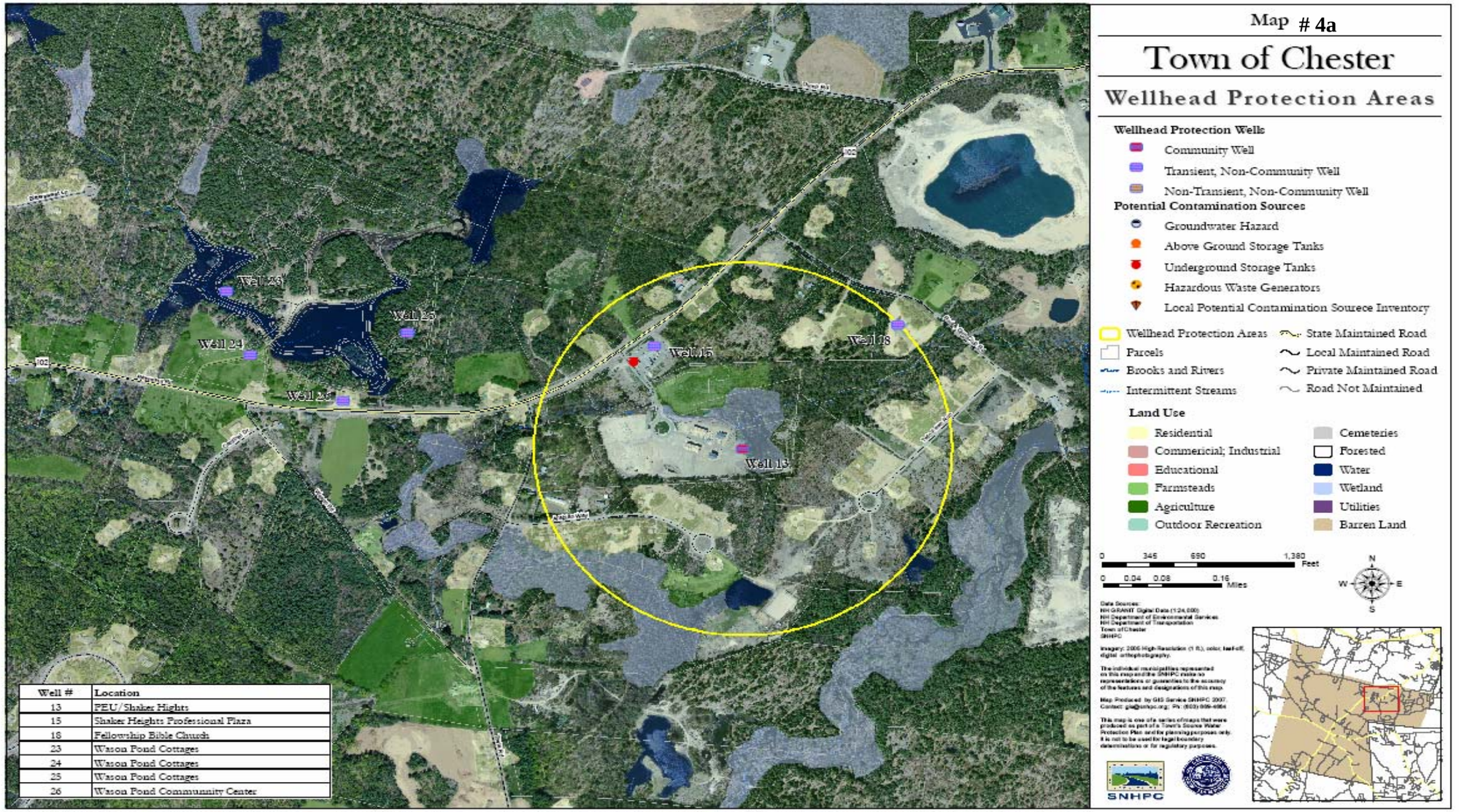
Owned by: Mary Gesel
15 Chester Street, Chester, NH
887-8493

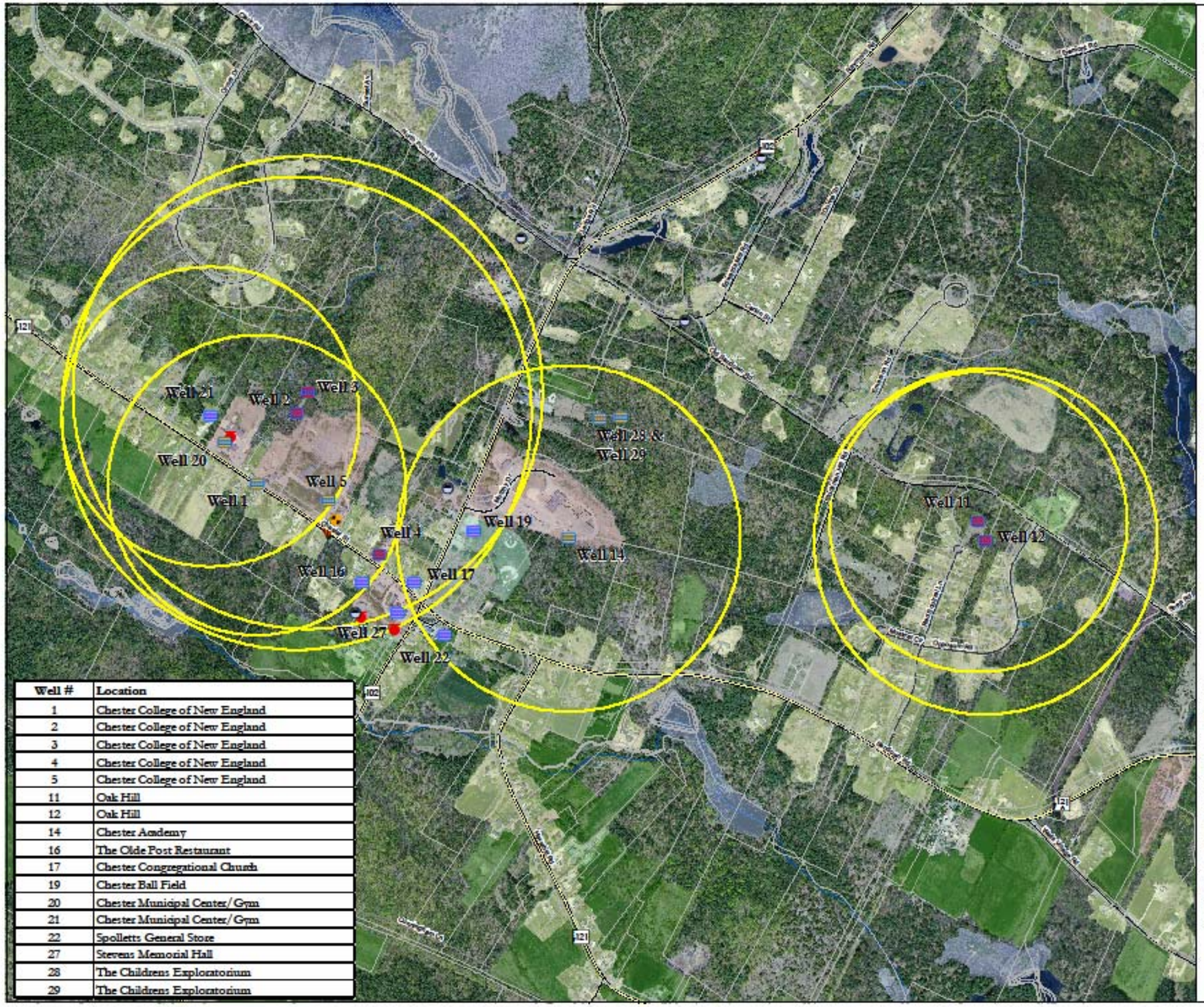
**The Children's Exploratorium** (2 wells)
CLOSED
EPA I.D.: 0438030 Non –Transient

**The following wells were added to this plan by the Chester Source Water Protection Advisory Committee. These wells do not have EPA ID numbers and are not included in the NH Source Water Assessment for the Town of Chester.**

| Well Name and Location | Well Contact Person Information |
|---|---|
| Chester Fire Station<br>22 Murphy Drive<br>Chester, NH 03036 | Chief Rich Antoine<br>22 Murphy Drive<br>Chester, NH 03036<br>887-3878 |
| Congregational Church<br>4 Chester Street<br>Chester, NH 03036 | Rev. Beverly Lindsey<br>36 Chester Street<br>Chester, NH 03036<br>887-4792 |
| Chester Rod & Gun Club<br>99 Rod & Gun Club Road<br>Chester, NH 03036 | 887-4629 |
| CJR Condo<br>Southwoods Road off of<br>Route 102 (Derry Rd) | Jack Como<br>P.O. Box 320<br>Salem, NH 03079<br>231-1663 |
| Senator Bell Farm<br>156 Derry Road<br>Chester, NH 03036 | Brian Nicoll & Jessica Hunt<br>156 Derry Road<br>Chester, NH 03036<br>887-2770 |
| Post Office<br>5 Chester Street<br>Chester, NH 03036 | Post Office<br>(887-3798) |
| Chester Ball field<br>84 Chester Street<br>Chester, NH 03036 | Town of Chester<br>Recreation Commission |

## Appendix A: Public Water Systems Located Within the Designated Well Head Protection Areas






| Well # | Location |
|---|---|
| 1 | Chester College of New England |
| 2 | Chester College of New England |
| 3 | Chester College of New England |
| 4 | Chester College of New England |
| 5 | Chester College of New England |
| 11 | Oak Hill |
| 12 | Oak Hill |
| 14 | Chester Academy |
| 16 | The Olde Post Restaurant |
| 17 | Chester Congregational Church |
| 19 | Chester Ball Field |
| 20 | Chester Municipal Center/Gym |
| 21 | Chester Municipal Center/Gym |
| 22 | Spolletts General Store |
| 27 | Stevens Memorial Hall |
| 28 | The Childrens Exploratorium |
| 29 | The Childrens Exploratorium |

Map # 4b

# Town of Chester

## Wellhead Protection Areas

**Wellhead Protection Wells**

- Community Well
- Transient, Non-Community Well
- Non-Transient, Non-Community Well

**Potential Contamination Sources**

- Groundwater Hazards
- Above Ground Storage Tanks
- Underground Storage Tanks
- Hazardous Waste Generators
- Local Potential Contamination Sourece Inventory

- Wellhead Protection Areas
- Parcels
- Brooks and Rivers
- Intermittent Streams
- State Maintained Road
- Local Maintained Road
- Private Maintained Road
- Road Not Maintained

**Land Use**

- Residential
- Commericial; Industrial
- Educational
- Farmsteads
- Agriculture
- Outdoor Recreation
- Cemeteries
- Forested
- Water
- Wetland
- Utilities
- Barren Land

0 500 1,000 2,000 Feet

0 0.04 0.08 0.16 Miles

N W E S

Data Sources:
NH GRANIT Digital Data (1:24,000)
NH Department of Environmental Services
NH Department of Transportation
Town of Chester
SNHPC

Imagery: 2005 High-Resolution (1 ft.), color, leaf-off, digital orthophotography.

The individual municipalities represented on this map and the SNHPC make no representations or guarantees to the accuracy of the features and designations of this map.

Map Produced by GIS Service SNHPC 2007.
Contact: gis@snhpc.org; Ph: (603) 669-4664

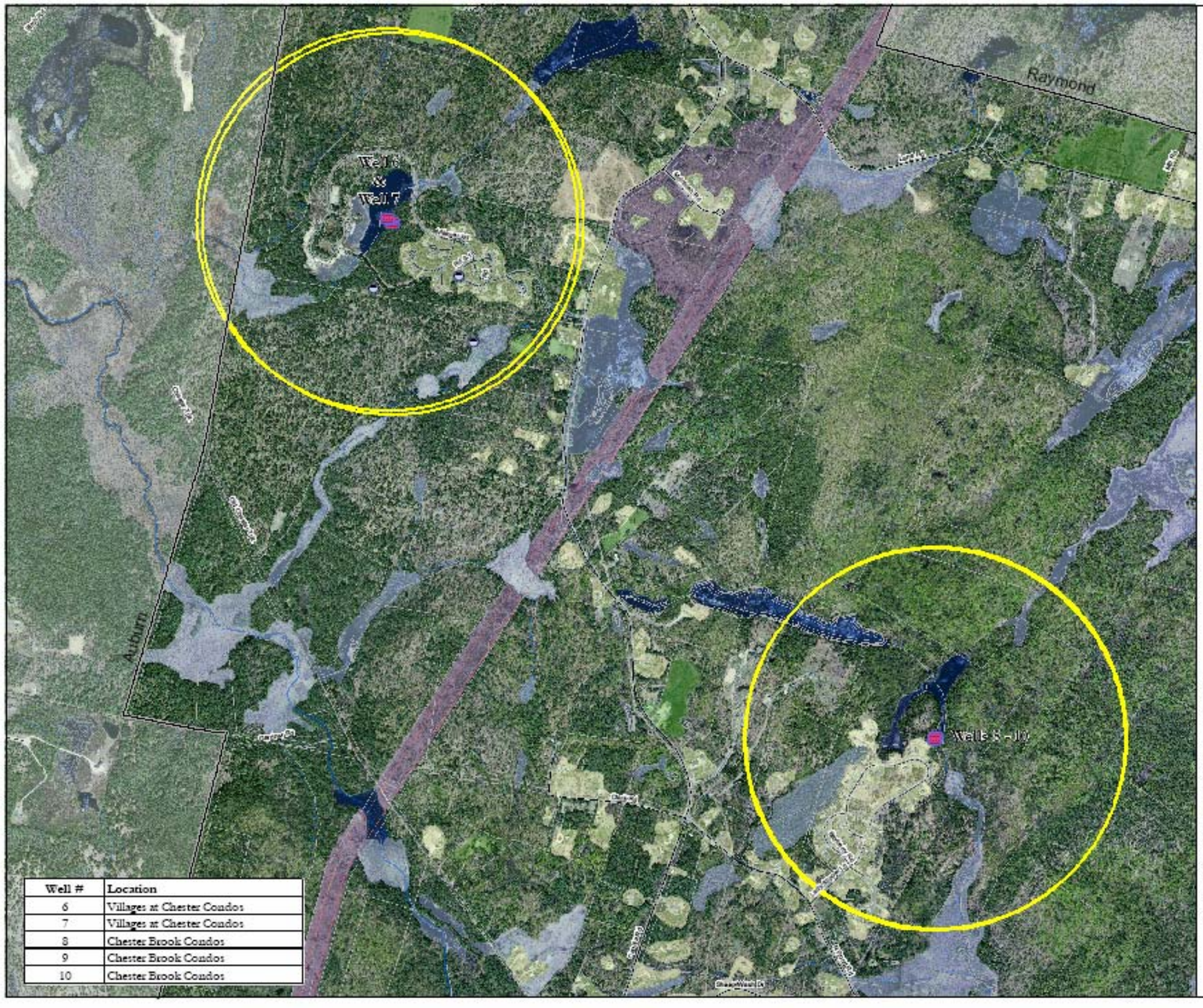
This map is one of a series of maps that were produced as part of a Town's Source Water Protection Plan and for planning purposes only. It is not to be used for legal boundary determinations or for regulatory purposes.

SNHPC

Map # 4c

# Town of Chester

## Wellhead Protection Areas




| Well # | Location |
|---|---|
| 6 | Villages at Chester Condos |
| 7 | Villages at Chester Condos |
| 8 | Chester Brook Condos |
| 9 | Chester Brook Condos |
| 10 | Chester Brook Condos |

**Wellhead Protection Wells**

- Community Well
- Transient, Non-Community Well
- Non-Transient, Non-Community Well

**Potential Contamination Sources**

- Groundwater Hazards
- Above Ground Storage Tanks
- Underground Storage Tanks
- Hazardous Waste Generators
- Local Potential Contamination Source Inventory

- Wellhead Protection Areas
- Parcels
- Utilities
- Brooks and Rivers
- Intermittent Streams

**Roads**

- State Maintained Road
- Local Maintained Road
- Private Maintained Road
- Road Not Maintained

**Land Use**

- Residential
- Commercial; Industrial
- Educational
- Farmsteads
- Agriculture
- Outdoor Recreation
- Cemeteries
- Forested
- Water
- Wetland
- Utilities
- Barren Land

0 550 1,100 2,200 Feet

0 0.05 0.1 0.2 Miles

N W E S

Data Sources:
NH GRANIT Digital Data (1:24,000)
NH Department of Environmental Services
NH Department of Transportation
Town of Chester
SNHPC

Imagery: 2005 High-Resolution (1 ft.), color, leaf-off, digital orthophotography.

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

Map Produced by GIS Service SNHPC 2007.
Contact: gis@snhpc.org; Ph: (603) 669-4664

This map is one of a series of maps that were produced as part of a Town's Source Water Protection Plan and for planning purposes only. It is not to be used for legal boundary determinations or for regulatory purposes.

SNHPC

# Appendix B: Definition and Application of Key Terms Used in this Plan

**Aquifer**
Geologic formation composed of rock, sand, or gravel that contains significant amounts of potentially recoverable water.

**Best Management Practices (BMPs)**
Means the practice or combination of practices determined to be the most practicable means of preventing or reducing, to a level compatible with water quality goals, the amount of pollution generated by nonpoint sources. BMPs are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility.

**Drinking Water Supply**
Water extracted from a stream, river, lake, pond or reservoir used as a public drinking water supply, as defined under RSA 485:1-a.

**Drinking Water Testing**
No drinking water test results have been obtained or included in this Draft Plan. In the future, the Town of New Boston as well as the residents of the community may want to obtain this information on a town wide basis to assess groundwater quality throughout the community as well as consider private well testing as a mandatory requirement as part of condition of a local well permit or the issuance of building/occupancy permits.

**Groundwater**
Subsurface water that occurs beneath the water table in soils and geologic formations.

**Groundwater Recharge**
The infiltration of precipitation through surface soil materials into the groundwater. Recharge may also occur from surface waters, including lakes, streams and wetlands.

**Leachable Wastes**
Waste materials, including solid wastes, sludge and agricultural wastes capable of releasing contaminants to the surrounding environment.

**Potential Contamination Source**
Means human activities that pose a risk that regulated contaminants might be introduced into the environment in such quantities as to degrade the natural groundwater system.

**Private Drinking Water Wells**

According to NH DES, private wells supply drinking water to about 40 percent of the population of New Hampshire but are not regulated or monitored for water quality by state and federal agencies. Although both public water systems and private drinking water wells must be registered with NH DES only a few communities within the state require water quality and quantity testing as a condition of a local well permit or building/occupancy permit. In addition, there are very few local requirements for subsequent monitoring of water quality or water quantity of private drinking water wells. For all private wells, NH DES recommends regular water testing of certain contaminants. See NH DES's website at: http://des.nh.gov/well_testing.htm for more details.

**Public Water System**

A public water system is defined as a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. There are three types of public water systems identified by NH DES:

- Community Systems: a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. These systems typically include municipal, apartment/condominium complexes, and mobile home parks.
- Non-Transient/Non-Community Systems: a public water system designed to serve at least 25 people, for at least 6 months per year. Examples include schools, day care facilities, year round office buildings, commercial and industrial use, and businesses with permanent employees.
- Transient/Non-Community Systems: a public water system designed to serve at least 25 people, for at least 60 days per year. Examples include restaurants, motels, hotels, ski areas, beaches and campgrounds.

Only Transient and Non-Transient/ Non-Community currently are recognized in New Boston by DES. In New Hampshire, 95 percent of the public water systems in the state are "very small" systems (serving less than 500 persons).

**Recharge Areas**

The land surface area from which groundwater recharge occurs.

**Regulated Substance**

**Defined by the Town of Chester:**

Administrative Rule Env-Wq 401) Any of the following, with the exclusion of ammonia, sodium hypochlorite, sodium hydroxide, acetic acid, sulfuric acid, potassium hydroxide, and potassium permanganate:

**(1)** Oil as defined in RSA 146-A:2, III.

**(2)** Any substance that contains a regulated contaminant for which an ambient groundwater quality standard has been established pursuant to RSA 485-C:6.
**(3)** Any substance listed in 40 CFR 302, 7-1-05 edition.
**(4)** The Chester Zoning Ordinance, Article 16 Groundwater Protection, Section 16.3, definition 16.3.9 "Regulated Substances" must also be referenced when defining a regulated substances in town.

These regulated substances will be found in large quantities, exceeding 5 gallons, commonly found in commercial or town owned settings.

Regulated substances to be monitored as threats do not include substances necessary for daily function within homes. These exceptions should be in modest amounts and would generally be used for fueling of lawn care equipment, generators, fertilizing of yards and small gardens, and lubricants and paint for small repairs and maintenance.

**Sanitary Protective Radius**
The area around a public water supply well which must be maintained in its natural undisturbed state as required by Env-Ws 378 or 379 (for community water systems); Env-Ws 372.12 and Env-Ws 372.13 (for other public water systems). Typically, the sanitary protective radius ranges from 75 to 400 feet, depending on the amount of water withdrawn from the well. The minimum radius for a community well is 150 feet. The "natural state" requirement for new community wells prohibits all development within the sanitary radius of the well. Other non-community public water systems (i.e. hotels, campgrounds, convenience stores, etc.) have a less restrictive natural state requirement that allows a limited set of uses (i.e. parking lots, tennis courts) within the sanitary radii.

**Site Coverage**
That portion of the entire parcel or site which, through the development of the parcel, is rendered impervious to groundwater infiltration.

**Solid Waste**
Any discarded or abandoned material including refuse, putrescible material, septage, or sludge, as defined by New Hampshire Solid Waste Rules. Solid waste includes solid, liquid, semi-solid, or gaseous waste material.

**Toxic or Hazardous Materials**
Any substance which poses an actual or potential hazard to water supplies or human health if such a substance were discharged to land or waters of the town. Hazardous materials include: volatile organic compounds, petroleum products, heavy metals, radioactive or infectious wastes, acids and alkalies. Also included are pesticides, herbicides, solvents and thinners, and such other substances as defined in the NH Water Supply and Pollution Control Rules, Section Ws 410.04(1), in the NH Solid Waste Rules, and in the Code of Federal Regulations 4O CFR 261 as amended.

**Wellhead Protection Area**

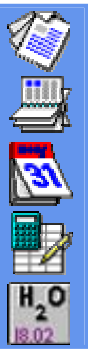
A Wellhead Protection Area (WHPA) is the area surrounding a public water supply well from which water and contaminants are likely to reach the well. NH DES only recognizes WHPAs for community water systems and for non-transient, non-community water systems, but not for transient systems.

# Appendix C: NH DES Assessment of Public Water Supply Sources – Town of Chester, NH

## *Public Water Systems Query Results*

Questions/Comments: Public Water System Contact | Container Request for Public Water Systems | Drinking Water and Groundwater Bureau Homepage

| EPA ID | Site Name & Location Address | Reports | Type | Category | Status | Population Served | Service Connections |
|---|---|---|---|---|---|---|---|
| 0435060 | **CHESTER ACADEMY**<br>22 MURPHY DR<br>RTE 102<br>CHESTER NH 03036 | | NON-TRANSIENT NON-COMMUNITY | SCHOOLS (PUBLIC, PRIVATE DAY SCHOOLS) | ACTIVE Date: 09-1999 | 750 | 1 |
| 0432030 | **CHESTER BROOK**<br>88 LADY SLIPPER LN<br>NORTH POND RD<br>CHESTER NH 03036 | | COMMUNITY | SINGLE FAMILY RESIDENCES | ACTIVE Date: 12-1999 | 100 | 40 |
| 0435050 | **CHESTER COLLEGE OF NE /DOUGLAS**<br>20 CHESTER ST<br>RTE 121<br>CHESTER NH 03036 | | NON-TRANSIENT NON-COMMUNITY | SCHOOLS (PUBLIC, PRIVATE DAY SCHOOLS) | ACTIVE Date: 01-1967 | 70 | 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0435020 | **CHESTER COLLEGE OF NEW ENGLAND**<br>40 CHESTER ST<br>RTE 121<br>CHESTER NH 03036 |  | COMMUNITY | DORMITORIES, BOARDING SCHOOLS, COLLEGES | ACTIVE Date: 07-1967 | 260 | 5 |
| 0435030 | **CHESTER MUNICIPAL CENTER /GYM**<br>84 CHESTER ST<br>CHESTER NH 03036 |  | NON-COMMUNITY TRANSIENT | TOWN OFFICES, LIBRARIES, POLICE & FIRE | ACTIVE Date: 01-1985 | 100 | 1 |
| 0439020 | **FELLOWSHIP BIBLE CHURCH**<br>48 ROD AND GUN CLUB<br>CHESTER NH 03036 |  | NON-COMMUNITY TRANSIENT | FUNCTION HALLS, CHURCHES, SOCIAL CLUBS | ACTIVE Date: 01-1983 | 200 | 1 |
| 0432020 | **OAK HILL**<br>RED SQUIRREL LN<br>RTE 121A<br>CHESTER NH 03036 |  | COMMUNITY | SINGLE FAMILY RESIDENCES | ACTIVE Date: 07-1999 | 125 | 50 |
| 0432040 | **PEU /SHAKER HEIGHTS**<br>SHAKER HEIGHTS LN<br>CHESTER NH 03036 |  | COMMUNITY | APARTMENTS | ACTIVE | 68 | 22 |
| 0438010 | **SHAKER HEIGHTS PROF PLAZA**<br>692 RAYMOND RD<br>CHESTER NH 03036 |  | NON-COMMUNITY TRANSIENT | SERVICE STATION | ACTIVE Date: 01-1979 | 50 | 13 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0438050 | **SPOLLETTS GENERAL STORE**<br>2 HAVERHILL RD<br>CHESTER NH 03036 |  | NON-COMMUNITY TRANSIENT | SNACK BAR, TAKE OUT FOODS | ACTIVE | 100 | |

| EPA ID | Site Name & Location Address | Reports | Type | Category | Status | Population Served | Service Connections |
|---|---|---|---|---|---|---|---|
| 0439010 | **STEVENS MEMORIAL HALL**<br>1 CHESTER ST<br>CHESTER NH 03036 |  | NON-COMMUNITY TRANSIENT | FUNCTION HALLS, CHURCHES, SOCIAL CLUBS | ACTIVE | 50 | 3 |
| 0438020 | **THE OLDE POST RESTAURANT**<br>15 CHESTER ST<br>RTE 121<br>CHESTER NH 03036 |  | NON-COMMUNITY TRANSIENT | RESTAURANT | ACTIVE<br>Date: 01-1979 | 50 | 3 |
| 0432010 | **VILLAGES AT CHESTER CONDOS**<br>VILLAGER RD<br>CANDIA RD<br>CHESTER NH 03036 |  | COMMUNITY | CONDOMINIUMS | ACTIVE | 100 | 40 |
| 0437020 | **WASON POND COMMUNITY CENTER**<br>RTE 102<br>603<br>RAYMOND RD<br>CHESTER NH 03036 |  | NON-COMMUNITY TRANSIENT | RECREATIONAL FACILITY, HISTORICAL SITE | ACTIVE | 30 | 1 |
| 0437010 | **WASON POND COTTAGE**<br>RTE 102<br>603<br>RAYMOND RD<br>CHESTER NH 03036 |  | NON-COMMUNITY TRANSIENT | RECREATIONAL FACILITY, HISTORICAL SITE | ACTIVE | 25 | |

## Explanatory Notes

*Abbreviations used in the following notes:*

*HAC = hydrologic area of concern for a surface water source. For small or undeveloped watersheds, the HAC includes the entire watershed. For all other surface sources, the HAC includes only a portion of the watershed close to the water system intake.*

*WHPA = wellhead protection area for a groundwater source. For community and non-transient systems, the WHPA is the area from which water is expected to flow to the well under extremely dry conditions. For transient systems, the WHPA is the area within 500 ft of the well.*

**EPAID:** Each public water system is identified by a 7-digit federal ID number.

**Source number**: Each source is further identified by a 3-digit number.

**Source description**: An abbreviated description of the source from NHDES's database. (Some common abbreviations: BRW=bedrock well; GPW=gravel-pack well; GRW=gravel well; DUG=dug well; PTW=point well; SPR=spring; ART=artesian well; INF=infiltration well.)

**Source type**: G=groundwater (well or spring); S=surface water (lakes, reservoirs, ponds, rivers); E = water purchased from another system (*Purchased sources are not assessed per se, but the original sources used by the seller are assessed*).

**Date Assessment Completed**: The date NHDES completed the process of reviewing available data, collecting new data, and entered the assessment information into its database.

**Number of Vulnerability Rankings**: The number of High, Medium, and Low rankings for that source listed in the columns to the right. Each criterion is explained below. Some criteria do not apply to all types of sources or systems.

**Detects**: Confirmed detections of certain contaminants (after treatment) of suspected human origin, not including disinfection byproducts. L = none detected at or above trigger levels in the most recent round of sampling. There is no M ranking for this criterion. H = contaminants were detected at or above trigger levels.

**Well/Intake**: The integrity of the well (if a groundwater source) or the intake (if a surface water source). L = no unresolved deficiencies with the well or intake identified in the most recent sanitary survey. There is no M ranking for this criterion. H = there are unresolved deficiencies.

**KCSs**: Known contamination sources in the vicinity of the source. This includes any site known to DES where contaminants are known or very likely to have been released to the ground, and where remediation is not complete. L = none present in the WHPA (for groundwater sources) or in the HAC (for surface water sources). M (for community and non-transient systems) = one or more KCSs in the WHPA or HAC but not within 1,000 ft of the well or intake. *There is no M ranking for transient systems.* H = one or more KCSs within the WHPA or HAC within 1,000 ft of the well or intake.

**PCSs**: Potential contamination sources in the vicinity of the source. This includes any site known to DES where contaminants are known or very likely to be used in significant quantities, but where there are no known releases to the ground. L (for community and non-transient systems) = no PCSs within 1,000 ft of the well in the WHPA (for groundwater sources) or none present in the HAC (for surface water sources). L (for transient systems) = none present in the WHPA. M (for groundwater sources serving community and non-transient systems) = 10 or fewer PCSs within 1,000 ft of the well in the WHPA. M (for surface water sources) = one or more PCSs in the HAC but not within

1,000 ft of the intake. *There is no M ranking for transient systems.* H (for groundwater sources serving community and non-transient systems) = more than 10 PCSs within 1,000 ft of the well in the WHPA. H (for transient sources) = one or more PCSs in the WHPA. H (for surface water sources) = one or more within 1,000 ft of the intake in the HAC.

**Highways/RRs:** The presence of numbered state highways or active railroads in the vicinity of the source. L = none present in the WHPA or HAC. M (for community and non-transient groundwater sources) = one or more in the WHPA but not within 1,000 ft of the well. M (for surface sources) = one or more in the HAC but not within 300 ft of the source water. *There is no M ranking for transient systems.* H (for transient sources) = one or more in the WHPA. H (for community and non-transient groundwater sources) = one or more in the WHPA within 1,000 ft of the well. H (for surface sources) = one or more in the HAC within 300 ft of the source water.

**Pesticides:** Whether or not pesticides have been routinely applied in the vicinity of the source. This is based on the presence of land parcels owned by registered pesticide applicators. L = no application areas in WHPA or HAC. M (for community and non-transient sources) = application site(s) in WHPA or HAC but not within 500 ft of the well or within 300 ft of the intake. *There is no M ranking for transient systems.* H = application site(s) within 500 ft of the well or within 300 ft of the intake.

**Septics:** The presence or density of septic systems and sewer lines in the vicinity of the source. L (for community and non-transient groundwater sources) = no septic systems or sewer lines located within 500 ft of the well, and fewer than 30 septic systems in the remainder of the WHPA. L (for surface sources) = no septic systems within 500 ft of surface water. L (for transient sources) = no septic systems or sewer lines within 75 ft of the well. M (for community and non-transient groundwater sources) = fewer than 10 septic systems and no sewer line located within 500 ft of well, and fewer than 30 septic systems in remainder of the WHPA. M (for surface sources) = low density of septic systems (lots averaging 2 acres or more) within 500 ft of surface water in the HAC. *There is no M ranking for transient systems.* H (for community and non-transient groundwater sources) = 10 or more septic systems or any sewer line within 500 ft of the well and/or high density of septic systems (more than 30) in the WHPA. H (for surface sources) = densely developed shoreline (lots averaging less than 2 acres) within 500 ft of surface water in the HAC. H (for transient sources) = one or more septic systems or sewer lines within 75 ft of the well.

**Urban Land Cover:** The percentage of urban land cover in the vicinity of the source, based primarily on satellite images. *This criterion does not apply to sources serving transient systems.* L = less than 10% of the WHPA or HAC is urban, and less than 10% of the WHPA within 1,000 ft of the well is urban. M (for community and non-transient groundwater sources) = less than 10% of WHPA is urban but 10% or more of the WHPA within 1,000 ft of the well is urban. M (for surface sources) = between 10% and 20% of HAC is urban. H (for community and non-transient groundwater sources) = 10% or more of WHPA is urban. H (for surface sources) = 20% or more of HAC is urban.

**Ag Land Cover:** The percentage of agricultural land cover in the vicinity of the source (in the WHPA or within 300 ft of surface water in the HAC), based primarily on satellite images. *This criterion does not apply to sources serving transient systems.* L = no ag land. M = less than 10% ag land. H = 10% or more ag land.

**Animals:** The presence of concentrations of 10 or more animal units in the vicinity of the source. L = none in the WHPA or (for a surface source) within 300 ft of surface water in the watershed. M (for community and non-transient groundwater sources) = one or more such farms in the WHPA but not within 1,000 ft of the well. M (for a surface source) = none within 300 ft of surface water in the HAC, but one or more within 300 ft of surface water in the watershed. *There is no M ranking for transient systems.* H = one or more in the WHPA within 1,000 ft of the well or (for a surface source) within 300 ft of surface water in the HAC.

Lagoons: The presence of wastewater treatment lagoons or spray irrigation sites in the vicinity of the source. L = none in the WHPA or (for a surface source) in the entire watershed. M (for community and non-transient groundwater sources) = one or more in the WHPA but not within 1,000 ft of the well. M (for a surface source) = none within 300 ft of surface water in the HAC, but one or more in the watershed. *There is no M ranking for transient systems.* H = one or more in the WHPA within 1,000 ft of the well or (for a surface source) within 300 ft of surface water in the HAC.

Dry Discharge: The presence of dry-weather stormwater discharge sites in the vicinity of the source. *Only a handful of surface sources were evaluated for such discharges; no discharges were found.*

Sanitary Radius: The presence of development not associated with the well within the sanitary radius (within 75 to 400 ft of the well). *Applies only to groundwater sources serving community and non-transient systems.* Of particular concern are sewer lines, septic systems, or storage of regulated substances in this area. L = no inappropriate land uses or practices. No medium ranking. H = inappropriate land uses or practices were discovered during the most recent sanitary survey, and have not been corrected.

Trophic status: The projected trophic (nutrient) status of the source as predicted by a computer model using a future land development scenario for the watershed. *This criterion applies only to 24 lakes, ponds, and reservoirs included in the phosphorus loading study.* L = oligotrophic (relatively good clarity and water quality with low algae population). M = mesotrophic (intermediate clarity, quality, and algae population). H = eutrophic

# Appendix D: NH DES Documented Known Contamination Sources (KCS) in the Town of Chester, NH

| Above Ground Storage Tanks | | |
|---|---|---|
| AST_Site | Facility | Status |
| 552 | CHESTER SUBSTATION | |

| Hazardous Waste Generators | | |
|---|---|---|
| RSITE_ID | SITE_NAME | STATUS |
| 3451 | P & R EXCAVATING | INACTIVE |
| 4606 | WHITE PINES COLLEGE | ACTIVE |
| 1793 | LIKE NU AUTO BODY | UNKNOWN |
| 1794 | STONE MACHINE CO INC | ACTIVE |
| 1017 | A T & T | INACTIVE |

| Underground Storage Tanks | | |
|---|---|---|
| USTSITE_ID | FACILITY | STATUS |
| 911 | YOUR VARIETY | |
| 934 | CAREY ENT. (FORMER MARSH PROPERTY) | |
| 941 | TOWN HALL | |
| 4203 | GRANITE STATE TELEPHONE | |
| 4202 | GRANITE STATE TELEPHONE | |
| 4035 | AT&T | |

| Groundwater Hazards | | | |
|---|---|---|---|
| DESID | SITE_NAME | PROJ_TYPE | Status |
| 11030 | VILLAGES AT CHESTER | SEPTIC | |
| 11031 | VILLAGES AT CHESTER | SEPTIC | |
| 11032 | VILLAGES AT CHESTER | SEPTIC | |
| 11034 | FORMER AVIATION CO. (ST. MARY'S BANK) | LUST | Leaking underground fuel storage tank |
| 11718 | GEORGE HASBANY PROPERTY | LUST | Leaking underground fuel storage tank |
| 12556 | GRANITE STATE TELEPHONE | HOLDTANK | Holding tank registration |
| 13386 | GREGOIRE RESIDENCE | OPUF | |
| 13446 | URQUHART CHINN RESIDENCE | OPUF | |
| 13723 | AT&T | LUST | Leaking underground fuel storage tank |
| 14119 | RENE THIBAULT | OPUF | |
| 15042 | CAREY ENT FORMER MARSH PROPERTY | LUST | Leaking underground fuel storage tank |
| 16500 | NINA ST. PIERRE | OPUF | |
| 17600 | MIKE CUNNINGHAM PROPERTY | OPUF | |
| 17601 | NH DOT PS 513 | HOLDTANK | Holding tank registration |
| 17260 | LECLAIR'S GARAGE, INC. | ETHER, HAZWASTE | |