Town of Candia, New Hampshire

Source Water Protection Plan

Tower Hill Pond, Candia, NH

Prepared by the Southern New Hampshire Planning Commission (SNHPC)
for the Town of Candia
Funding provided through a NH DES

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 Candia 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 need to be protected.

Because the Town of Candia 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 Candia as well as the aquifers serving private wells.

The purpose behind 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 13 public water supplies existing within the Town of Candia 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 goal of this Source Water Protection Plan is to protect drinking water supplies. The plan provides the Town of Candia information (data and maps), guidance, priorities and actions to protect the town's groundwater (aquifers) and public drinking water supply sources from contamination. The plan was prepared by the Southern New Hampshire Planning Commission. The primary objective of the plan is to identify the existing and potential contamination sources within the source water protection areas (e.g. wellhead protection areas) of the 13 public water supplies located within the Town of Candia, and to provide specific recommendations to manage these threats in order to maintain high 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 of 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 frequently 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.

Some of these events include stormwater runoff from impervious cover, 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 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 system 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

[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.

public health issue for a significant percentage of private and often public well users.[4]

The significance of this issue is growing, since private wells drawing water from local 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.[5] This is true particularly for the Town of Candia as a majority of the residents within the community rely on private wells for water supply. Businesses within town also rely on private wells, excluding the ten public water system wells found within this study.

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 system in New Hampshire are subject to stringent reporting and water testing requirements issued by NH DES and EPA, there are typically no local requirements in Candia for private well testing and disclosure to homeowners or renters or prior to real estate transfers or the issuance of Certificate of Occupancy. Exposure to contaminants in water from private wells is a public health issue for a significant percentage of private well users.

The most common causes of groundwater contamination in New Hampshire are leaking underground storage tanks, mishandling of industrial chemicals, and urban runoff.[6] Contaminants can be found in stormwater runoff or can be associated with 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 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.

The USGS reported that MTBE (methyl-*tert*-butyl ether), a highly mobile contaminant, strongly correlates 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 to properly manage land use activities, particularly the handling of potential contaminants.

---

[4] Ibid., pg.1.

[5] 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.

[6] Model Groundwater Protection Ordinance, New Hampshire Department of Environmental Services and Office of Energy & Planning, February 1999, Revised June 2006 , pg. 1.

[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).

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]

While there are many state and federal programs that directly or indirectly serve to protect groundwater, it is generally acknowledged among all programs that 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 systems 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 (PCS's);
- An assessment of risks posed by PCS's;
- 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 steps:

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 Candia, a total of 13 public water systems (wells) have been identified and addressed in this plan.

[8] Ibid.

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

A total of eight delineated WHPAs are currently delineated in the Town of Candia. These WHPAs have been mapped by NH DES as circles surrounding each well. The circles vary from 1,000 to 3,000 feet in diameter. The size of the circles is based upon the production volume of the wells as approved or reported to NH DES. A map showing the wells and wellhead protection areas is provided on the following page.

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 of "low", "moderate" or "high" has been assigned by SNHPC based on the hydrogeologic setting, potential contaminant sources, and a review of groundwater quality data. Because specific groundwater quality data is not available for each of the identified public water system wells in Candia, the vulnerability analysis employed in this plan is limited to an assignment of risk utilizing the NH DES susceptibility ranking criteria found within the Source Water Assessment report for Candia. See Appendix C.

Step Three: Management and Protection Program which includes:

- **Management Program.** This may be 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 State groundwater reclassification
  - BMP management to reduce contaminate releases
  - Land conservation (public or private actions)

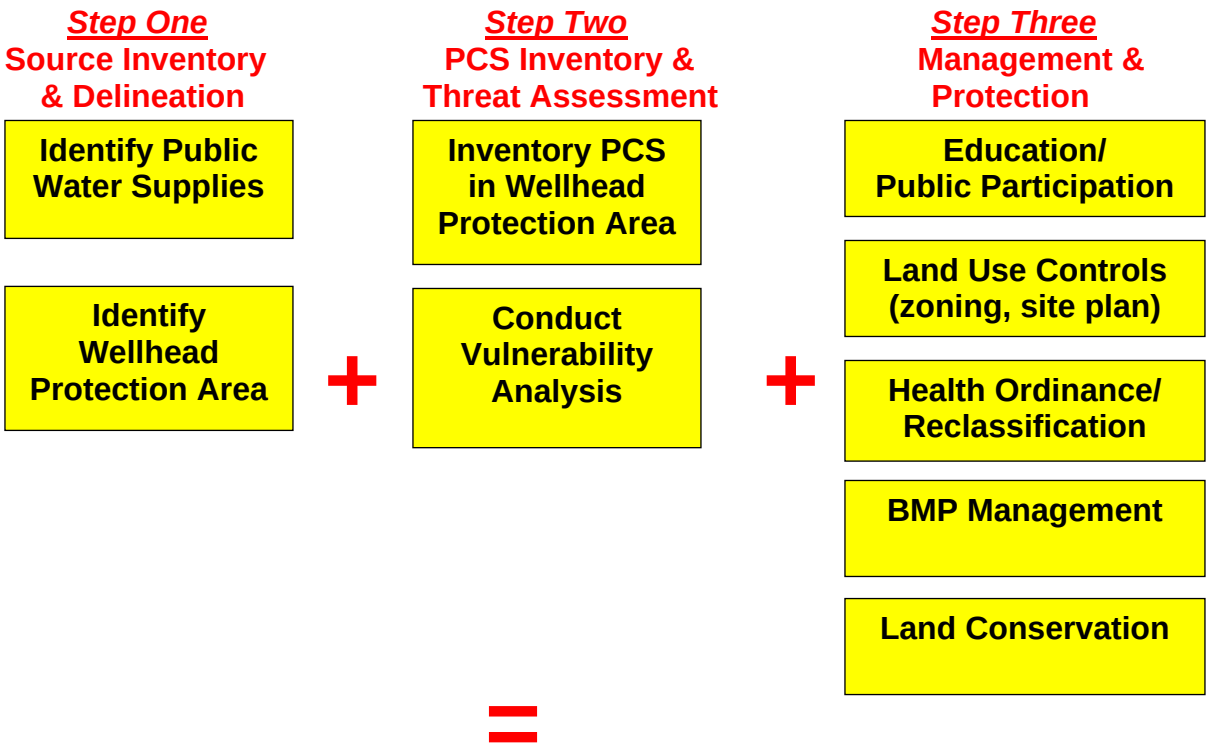
[9] There are a number of methods for delineating WHPAs for public water supply wells. The methods range from simple and inexpensive to complex and costly. Grant funds through NH DES are available for refining delineations. Only the WHPAs mapped by NH DES are accounted for in this plan.

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

Public Well Map

- **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 public water supplies and not individual wells.

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



Plan Approval, Implementation and Update

Formation of a local Source Water Protection Advisory Committee in Candia may be useful in the future update and revision of this plan. The Candia Planning Board should be responsible for developing the type of ordinance and land use regulations recommended by this plan, including drafting necessary warrant article(s) for Town Meeting consideration.

To obtain approval of this plan, it is recommended that the Planning Board 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. The plan should also be referenced and/or included in the town's updated Master Plan as appropriate.

Finally, it is the responsibility of the Candia Planning Board, Town Administrator, Health Officer, and Board of Selectmen, where applicable 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. Overview of Plan Contents

The general location of the ten public water system wells and the eight delineated wellhead protection areas located within the Town of Candia are shown on the Maps in Appendix A, Wellhead Protection Areas.

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

- 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 to be made part of the Planning Board's Site Plan Regulations.

- Appendix B contains a summary of the definitions of the key terms used in the plan.

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

- Appendix D provides a summary of all the NH DES documented Known Contamination Sources (KCS) within the Town of Candia, including NH DES's local potential contamination source inventory and list of hazardous waste generators, groundwater hazards, above ground storage tanks, and underground storage tanks.

3. PCS Inventory & Threat Assessment

Active Public Water Systems in Candia

A total of 13 active water systems are currently operating within the Town of Candia (see Well Summary Report provided in Section 6 of this plan). All of the wells are sources of water for public water systems as defined by NH DES. Public water supplies 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.

All 13 active water systems currently operating in Candia are included in the NH DES Source Water Assessment Report prepared for the Town of Candia (see Appendix C). These systems include: 2 Community wells, 7 Transient/Non-Community wells, and 4 Non-Transient, Non-Community wells. The 13 active water system wells operating in Candia include:

1. Hillcrest Manor Apartments (three wells)
2. Country Lane Manor
3. Candia Woods Golf Link
4. Henry W Moore School
5. M and C Children's Learning Place
6. Remington Education Center
7. Birchwood Plaza
8. Candia Getty
9. Charmingfare Farm
10. DC Mobil
11. Liquid Planet Water Park
12. Stubby's Place Restaurant
13. Winged Spur Main House

As shown on previous map on page 9 of this plan, a total of 8 wellhead protection areas (WHPAs) are mapped for the following public water system wells:

1. Candia Woods Golf Course (Well # 16 & 17)
2. Hillcrest Manor Apartments (Well # 21, 22, 23)
3. Remington Education Center (Well # 5)

4. Henry W. Moore School (Well # 8, 9, 10)
5. Birchwood Plaza (Well # 12)

6. Country Lane Manor (Well # 1)
7. Stubby's Place Restaurant (Well # 18)
8. DC Mobil (Well # 13)

WHPAs are not delineated for transient, non-community wells under state and federal requirements. These include the following systems:

1. Charmingfare Farm (Well # 2)
2. Candia Getty (Well # 20)

PCS Inventory

A combination of GRANIT and NH DES GIS layers were used to identify known contamination sources (KCS) and potential contamination sources (PCS) found within each of the 8 WHPAs identified in this plan. The boundaries of all eight WHPAs and the site locations of each identified PCS and KCS are shown on the maps provided in Appendix A 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 Candia is provided through the NH DES One Stop web data base.

Many of the PCSs 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.

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 in the WHPA of each public water system are ranked as either "low", "medium" or "high" based upon SNHPC's best field judgment which includes the size, character of physical terrain and outward appearance. This decision-making process includes as applicable, consideration of the vulnerability rankings found within the NH DES Source Water Assessment Report for Candia (see Appendix D).

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)

These rankings apply to 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 supplies.

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, as applicable of each active public water system.

The Potential Contamination Sources (PCS) and the Known Contamination Sources (KCS) identified as a result of the inventory and assessment conducted for this plan are shown in the following Table 2. The type of site, source of information, contamination source, and level of threat, land use type, and zoning is also provided in Table 2.

Table 2
Summary of KCSs and PCSs Located Within Wellhead Protection Areas, Town of Candia, NH

Map Location	Type of Site	Identified By	Contamination Source	Threat Level	Use	Zoning
1	PCS	SNHPC	Getty Gas Station	Low	Gas and fueling station	Instit.
2	PCS	SNHPC	Cemetery	Low	Cemetery	Instit.
3	PCS	SNHPC	Candia Truckers	Medium	Trucking company/storage	Comm.
4	PCS	SNHPC	Fred's Auto & Truck Repair	Medium/High	Out of service auto shop	Comm.
5	PCS	SNHPC	Car World Auto Parts Storage	High	Salvage yard for vehicles	Comm.
6	PCS	SNHPC	ATs Equipment	Low	Heavy machine sales/storage	Comm.
7	PCS	SNHPC	Mobile Gas Station	Medium	Gas/fuel station	Comm.
8	PCS	SNHPC	Complete Pet Center	Low	Veterinary and boarding kennel	Comm.
9	PCS	SNHPC	Robert F Pinard Dentistry	Low	Dentist Office	Comm.
10	PCS	SNHPC	Lahr's Transmission	Medium	Transmission repair shop	Comm.
11	PCS	SNHPC	Pleasant Hill Landscape	Low	Landscape Office, equipment storage	Comm.
12	PCS	SNHPC	Green River Growers	Low	Plant nursery	R
13	PCS	SNHPC	Cemetery	Low	Cemetery	R
14	PCS	SNHPC	Different Dreamer Farm	Low	Equine Facility	R
15	PCS	SNHPC	Cow Farm	Low	Private farm with livestock	R
16	PCS	SNHPC	Truck Storage	Medium	Big rig truck storage and office	R
17	PCS	SNHPC	Sunbelt Rentals	Low	Heavy machinery rental site	R

Source: Southern New Hampshire Planning Commission

Inventory of Wellhead Protection Areas

The location and a brief description of the PCS sites that were identified within or near the 8 delineated wellhead protection areas are described as follows.

Threat #1: The Getty gas station is located at the Junction of Highway 43 and Main Street. While this site is not located within a WHPA, it is close to the Candia Woods Golf Link well. The facility is small in size and well maintained. It poses a low threat to this well as the station is located on all paved surfaces reducing the risk of regulated substances being released into the groundwater. Although there are large amounts of regulated substances stored on the site, there are no known

releases into the groundwater. Therefore, this PCS is considered a Low Risk at this time.

Threat #2: The town's Cemetery is located at the Junction of Highway 43 and Route 27 inside of the Henry W. Moore School WHPA and also near the Candia House of Pizza well. This site is small in size and well maintained. It currently does not have any new burial plots. It poses a low threat to the school and pizza house wells as there is no commercial application of herbicides or pesticides. In addition, there are no septic systems on site and no known storage of regulated substances. The town should carefully evaluate and control the application and amount of any herbicides or pesticides used at the cemetery. If commercial applications are conducted in the future it should be conducted by licensed applicators. Therefore, this PCS is considered a Low Risk at this time.

Threat #3: Candia Truckers is located at the Junction of Highway 43 and Route 27 inside of the Henry W. Moore School WHPA. This PCS consists of a trucking company that stores its trucks on site. It is a small facility and there appear to be no major repairs on site (except indoors). It is considered a medium risk given the limited number of auto and truck equipment stored on 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 would 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 #4: Fred's Auto & Truck Repair is located on Route 27 East within the Birchwood Plaza WHPA. It was originally a truck repair shop, but is no longer in business and is currently for sale. The site has been recognized by the Southern New Hampshire Planning Commission as a potential Brownfields site with the potential for on site petroleum contamination. As a result, this PCS is considered a Medium/High risk.

Threat #5: Car World Auto Parts Storage is located on Route 27 East inside the Birchwood Plaza WHPA. It is a very large "you pull auto parts" salvage yard that houses multiple vehicles only suitable for parts. It is a secure site, but because of its size, the number of vehicles stored on site, the likelihood that the site is storing larger amounts of regulated substances and the storage areas do not appear to be paved or contained, there is a high degree of risk associated with potential spills and poor handling of regulated substances. Therefore, while there are no known releases at this time, this PCS is considered a High Risk.

Threat #6: ATs Equipment is located on Route 27 inside of the Birchwood Plaza and the DC Mobil WHPA. Although large machinery is stored on the site, it poses a low threat as it is primarily a sales operation and repairs are conducted on site.

In addition, there are no known storage tanks and only one on site septic system exists for the office. As a result, this PCS is considered a Low Risk.

Threat #7: The Mobile Gas Station is located on Raymond Route/Route 27. This PCS is not located within a WHPA, but it is located within 2 miles of Birchwood Plaza and Henry W. Moore School WHPAs. It poses a low threat to the town's drinking water at this time as there are no known releases into the ground. Although much of the site is paved there are below ground fuel oil tanks there is always the potential for spills and leaks. Because of this threat, this PCS is considered to be a Medium Risk.

Threat #8: Complete Pet Center is located at 472 Raymond Road. This PCS is a veterinary clinic, pet kennel and pet rescue shelter. It is not located within a WHPA, but it is located within 2 miles of the Country Lane Manor WHPA. It poses a low threat because there are no outdoor kennels. As a result, this PCS is considered to be a Low Risk.

Threat #9: Robert F. Pinard Dentist is a small dental practice located at 410 Raymond Road. It is located within 2 miles of both the Birchwood Plaza WHPAs. This PCS poses a low threat as it is not located within a WHPA and there are no known releases to the ground. As a result, it is considered to be a Low Risk.

Threat #10: Lahr's Transmission is a transmission repair shop located at 304 Raymond Road. This PCS is located within the WHPA of the DC Mobil and Birchwood Plaza public water system. Because activities on the site include the storage and repair of large and regular sized vehicles, it poses a medium threat to groundwater due to the potential release or spill of fuel oils, fluids and other regulated substances which are stored on site. As a result, it is considered a Medium Risk.

Threat #11: Pleasant Hill Landscapers is located at 33 Raymond Road. The site is currently occupied by a landscaping company. It poses a low threat to groundwater due to the storage of construction vehicles on site. While there is a private road running through the property at one time, it is unclear how many, if any, equipment pieces were kept on site. Because of this, this PCS is considered a Low Risk.

Threat #12: Green River Growers is located on High Street within the Country Lane Manor WHPA. This PCS consists of a plant nursery and green house business. It is a large site, but well maintained. Because there are no known storage of regulated substances and no known releases into the ground, this PCS is considered a Low Risk.

Threat #13: The Town Cemetery located in the Village Center is located within the WHPA of the Henry W. Moore School. This cemetery is well maintained and there are no septic systems or storage of regulated substances on site. It poses a

low threat to the wells at the school as there is no commercial application of herbicides or pesticides. The town should carefully evaluate and control the application and amount of any herbicides or pesticides used at the cemetery. If commercial applications are conducted in the future; it should be conducted by licensed applicators. Therefore, this PCS is considered a Low Risk at this time.

Threat #14: Different Drummer Farm is an equine facility located at 55 South Road. This site is located within the Candia Congregational Church WHPA. The farm contains more than 10 animals and consists of a large amount of land. It poses a low threat to groundwater as none of the existing fields are located within 300 feet of any surface water. Therefore, this PCS is considered a Low Risk at this time.

Threat #15: There is an unnamed cow farm located at South Road. This PCS is not located any WHPA, but it is located within one mile of the Candia Congregational Church WHPA. The farm appears to have over 10 animals, but it is not a commercial diary operation. Because the farm has adequate land area to house these animals and none of the farm's existing fields are located within 300 feet of any surface water, it is considered a Low Risk at this time.

Threat #16: There is an unnamed truck storage site located at junction of Old Candia Road and South Road. This use has dozens of big rig trucks stored on site and an office, all of which are located within both the Hill Crest Manor apartments and the Candia Woods Golf Course WHPA. This PCS poses a medium threat to the town's groundwater given the size of the facility, the large number of trucks stored on site, and the existence of above ground storage containers. Because these containers are stored on impervious surfaces and there appears to be no on site truck repairs, this PCS it is considered a Medium Risk.

Threat #17: Sunbelt Rentals is located at 17 Old Manchester Road off Route 101 within the Candia Woods Golf Course WHPA. It is a rental facility and office for smaller sized heavy machinery. This PCS poses a low threat to groundwater as no machinery repairs appear to be conducted on site and there is no known on site storage of regulated substances. As a result, it is considered a Low Risk at this time.

Maintaining Best Management Practices

Existing threats within a WHPA, should be monitored so that they remain a low risk for becoming a contamination source to the town's groundwater. This can be done by conducting Best Management Practice (BMP) Compliance Surveys. These surveys, established by NH DES, are routinely conducted on commercial sites that store over five gallons of a regulated substance. The BMP Compliance Survey

reflect a set of standards concerning how regulated substances must be stored, transported, labeled, and protected in accordance with Env-Wq 401 (NH DES Administrative Rule). These standards help to minimize the release of regulated substances that can contaminate groundwater. If a site is not able to meet the standards within Env-Wq 401, the site owner or representative must correct these infractions and make improvements.

A total of three BMP Compliance Surveys were conducted in Candia by the Southern New Hampshire Planning Commission as part of this plan. The surveys were completed at the Town Salt Shed, the State Salt Shed and the Candia Recycling Center. Each site did not have any Env-Wq 401 violations and no infractions were identified. At all the sites, the storage and transport of regulated substances met the proper regulatory standards for the BMP Compliance Surveys. 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 Candia can be obtained from the Candia Planning Department.

Given the number of PCS and KCS in Candia with the potential to contaminate groundwater identified and included in Table 2; it would be beneficial for the Town of Candia to develop a town wide program that regularly conducts BMP Surveys on PCS sites. The surveys ensure that all regulated substances are safely stored, adequately labeled adequately, and handling procedures are correct and safe. These surveys can be conducted by town employees such as the Town of Candia's Building Inspector, Code Enforcement or Health Officer who can be readily trained by NH DES to perform these surveys. The program will prevent PCS sites from contaminating ground water. In addition to being a preventative step in protecting groundwater, the BMP survey program can also monitor progress of contamination sites.

[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

Candia'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 Candia because all of the town's population relies upon groundwater (aquifers) as its primary source of drinking water. The main aquifers found in Candia are fractured bedrock or unconsolidated glacial deposits commonly referred to as stratified drift aquifers. Stratified drift aquifers are composed of coarse to fine consolidated glacial melt water deposits and are 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 system wells. The distribution and hydraulic characteristics of stratified-drift aquifers are related to the original environment in which the sediments were deposited. Stratified-drift aquifers also provide coarse aggregate material used for construction.

In 1990 and 1995, the U.S. Geological Survey (USGS) produced two significant groundwater studies which are 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).

As recommended by NH DES, these studies and future updates to these studies may be used by municipalities as the basis for municipal groundwater and aquifer protection ordinances. Copies of these technical reports can be obtained by contacting the NH DES Public Information Office at 271-2975.

The 1990 and 1995 USGS studies are important as they identify the more productive aquifers in Candia 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 the following Aquifer Transmissivity Map which was prepared by the Complex Systems Research Center at the University of New Hampshire).

Stratified-drift aquifers are generally sufficient enough to provide drinking water to the whole town. However, as noted in the town's master plan, Candia has a limited number of stratified drift aquifers making up roughly only 10 percent of the town.

The greatest transmissivity of these aquifers (which falls within the range of 0 to 1,000 feet squared per day) as shown on the following Aquifer Transmissivity Map are found mostly along the town's major rivers – the North Branch River drainage and in the lands around Mill Brook near the southern town line. There are also several stratified-drift aquifers with high transmissivity located near NH Route 43 and 101.

In order for a stratified drift aquifer to be productive, water must be able to flow freely from the sand and gravel to a well. The qualities that make a stratified drift aquifer highly transmissive and the way that water flows through it also makes these aquifers susceptible to contaminants[12]. Because Candia has a limited amount of stratified drift aquifers and these aquifers are susceptible to contaminants, it is important that the Town of Candia have in place effective aquifer protection measures and groundwater protection regulations.

[12] "The DES Guide to Groundwater Protection". NH DES Water Supply and Engineering Bureau. Revised December 2004

Aquifer transmissivity

Well-Yield Probability

The following Well-Yield Probability map prepared for the Town of Candia is based upon the USGS study of Well-Yield Probability for the State of New Hampshire (2000 and 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 majority of Candia has well-yield probability levels of 8.1 to 10.0 as shown on the map. The next closest well yield-probability levels are 6.1 to 8, and less than 6. Again these varying levels are spread evenly through the town.

While this well-yield probability data may be useful for community planning purposes (such as evaluating water availability to future subdivisions), it should not be used by the Town of Candia as justification for groundwater or aquifer protection regulations.

Well yield

5. Management/Protection Program – Land Use Controls

As described in the Introduction section 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 of the plan 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.

Review of Town Master Plan

Before adopting or amending regulations, a municipality should address the need for groundwater protection in its master plan, typically within the natural resources section of the plan. 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*. It is recommended in state statutes (RSA 4-C:22 and RSA 674:2) that municipalities include a local water resource management and protection plan (local water plan) in their master plan, to be implemented through local ordinances and conservation programs.

Guidance on drafting such a plan is available from NH DES (271-0688), the Office of Energy and Planning (271-2155) and the Southern New Hampshire Planning Commission. 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.

Currently the Town of Candia's existing Master Plan (2004) includes a water resources and groundwater section with the following specific goals and objectives outlined for the community:

- Conduct studies and gather data to better identify surface water and groundwater issues and limitations;
- Enact appropriate land use regulations to protect the quality and quantity of surface and groundwater to support future growth (i.e. storm water management, surface water buffers, wellhead/aquifer protection).

While these goals and objectives recognize and support the need for protecting the town's surface and ground water resources, the master plan has no reference to a local water resources management and protection plan because Candia does not have such a management plan in place.

Therefore, it is highly recommended that the Town of Candia aim to develop a local water plan, and that this plan be adopted and included by reference as part of the town's master plan in the near future.

Given the lack of a local 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 existing master plan.

Review of Zoning Ordinance

In addition, to the lack of a local water plan, the Town of Candia does not have any aquifer or groundwater protection regulations in place as part of its zoning ordinance. While the town's zoning ordinance does include Wetlands Protection regulations, these regulations do not address the need to protect groundwater, potential water supplies, existing aquifers, aquifer recharge areas or other sensitive groundwater areas such as wellhead protection areas.

To provide meaningful and effective groundwater protection, the Town of Candia must develop an aquifer protection ordinance and groundwater protection regulations. These land use regulations can be made specific to the Town of Candia while being influenced by the NH DES and Office of Energy and Planning (OEP) Model Groundwater Protection Ordinance (amended June 2006). In addition, the town's aquifer and groundwater regulations should address the wellhead protection areas and the threats identified within those areas as identified in this plan.

The town's aquifer protection ordinance should also prohibit uses that are threats to groundwater and that would have negative impacts on water quality. In addition, the town's aquifer or groundwater protection ordinance should include provisions for BMP compliance surveys done for identified specific threats on a regular basis.

In drafting an aquifer or groundwater protection zoning ordinance one of the first decisions for the Town of Candia to make is whether the zoning ordinance, if it is to be adopted as an overlay district, should apply to specific aquifers and wellhead protection areas or whether it should be applied to protect groundwater throughout the entire community.

For example, Candia may wish to include only wellhead protection areas, only some aquifers, or only some areas of the town's mapped aquifers, such as areas where transmissivity is mapped at 1,000 ft^2/day or greater in the ordinance. Additionally, the town may want to include in the jurisdiction of the ordinance any identified potential (future) public drinking water supplies that may be a priority for protection. All of these factors are important considerations.

No mater what the town decides, to be effective, Candia's aquifer or groundwater protection district and/or district boundaries should be reflected on the town's zoning map. In addition, the aquifer or groundwater protection district ordinance should include all or most of the performance standards, the Spill Prevention, Control and Countermeasure Plan, list of prohibited and permitted uses, exemptions, and maintenance and inspection regulations as recommended in the Model Groundwater Protection Ordinance. A copy of this ordinance is provided as part of the recommendations of this plan and should be used by the Planning Board as a guide in drafting the town's final ordinance.

Review of Site Plan Regulations

The Candia Planning Board has adopted both Major and Minor Site Plan Review 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, 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 Major Site Plan Regulations, Section 7.07 Groundwater Protection is the only provision within the regulations which currently addresses groundwater protection. Specifically, this section requires the following:

> The quality of groundwater (reference RSA 149.1 VIII) shall not be adversely affected by the proposed development. The applicant shall certify that the proposed development does not violate the rules and regulations of the Water Supply and Pollution Control Commission with regard to groundwater and shall meet the following requirements:
>
> A. Groundwater Pollution Monitoring Devices:
> Any proposed or expanded site with the potential for contaminate leaching shall have provision for suitably designed and approved monitoring wells

installed around the perimeter of the site. Said design and installation shall be approved by the Planning Board through the Town Engineer at the expense of the applicant.

B. Surface Drainage Control Measures:
Any proposed or expanded site with the potential for surface runoff degradation shall have provision for the containment and diversion of

surface water runoff to suitable and approved catchment facilities. Said design and construction to be approved by Planning Board through the Town Engineer at the expense of the applicant.

It appears that these regulations were adopted in the early 1980's, and while somewhat useful for addressing the quality of surface runoff and sites with potential contamination sources, the regulations today are out of date and need to be updated. Specifically, there is no longer a Water Supply and Pollution Control Commission at the state level. There are also no specific BMPs for protecting water resources from non-point source pollution which are typically administered through the NH DES Alteration of Terrain and Wetland Permits at the state level and by municipalities through stormwater management regulations at the local level.

To address water quality concerns, the Town of Candia should consider updating its zoning, site plan and subdivision regulations to include necessary stormwater management requirements and BMPs. This could also include provisions for the use of low impact development practices which are recommended by the Environmental Protection Agency and the Stormwater Center at the University of New Hampshire. There is a significant amount of information on low impact development at the Center for Watershed Protection at www.cwp.org.

In addition to these major updates, there are a number of specific improvements which can be made to the Planning Board's site plan regulations which would provide for enhanced groundwater and aquifer protection. 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 of simple but necessary steps and actions which 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 Candia relies entirely upon public or private wells for drinking water and thus the town has an interest and duty to protect contributing groundwater to these water resources for the greater public good. In addition, it can not be assumed that these out of date site plan regulations are going to be adequate to protect the town's groundwater and local aquifers. Most 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 basic first step the Planning Board should take during the site plan review process is to require the applicant or developer to 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 adopted as standard requirements for all site plan applications and they 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 or generator of hazardous waste.

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 recommended to the Candia Planning Board's Major Site Plan Regulations. These suggestions include:

1. A submittal requirement under Section II: Procedures and Submission Requirements 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. Add the following requirements under Section III: Standards and Requirements for Site Development:

   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 as required by the NH DES for the proposed use shall be submitted to the Town of Candia Health Officer and Candia Fire Department.

   Prior/Existing Use: Site plan or subdivision applications which involve 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

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

from a previous use 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 3rd party consultant of Board's choice and applicant's expense) prior to any Planning Board action.

3. Update existing Article 7.0, Section 7.07, Groundwater Protection as follows:

   All land uses requiring site plan approval, which store or use regulated substances in containers with a capacity of 5 gallons or more within a delineated wellhead protection area, shall be required to submit and address the following requirements:

   1. A map of natural resources on and near the site, including an assessment of groundwater vulnerability;
   2. A listing of the types and quantities of regulated and hazardous substances and pollutants which may be used on the site;
   3. A map and/or diagram of facilities on the site related to groundwater protection, including secondary containment structure, loading/unloading areas, drinking water wells, septic systems, underground storage tanks and storm drain inlets, as applicable;
   4. A listing of all state and federal regulatory requirements for the proposed use and a note on the plan which identifies the specific rules related to groundwater protection as applicable to regulated substances (Env-Wq.401), groundwater discharge (Env-Wq.402), and stormwater management (e.g. Env-Wq. 1500, AOT);
   5. Identification and provision for adequate security of all groundwater protection BMPs proposed for the use;
   6. Identification of any restrictions against discharges to groundwater, including direct and indirect discharges as required by state and federal permits and approvals;
   7. Verification or approval that all general purpose floor drains be connected to an on-site holding tank; or a system authorized through a state subsurface disposal permit;
   8. Verification or approval 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
   9. Submittal of an adequate Spill Prevention, Control and Countermeasure (SPCC) Plan approved by 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.

Review of Subdivision Regulations

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

In the review of the 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 of the regulations to focus on maintaining recharge on site.

In addition, it is recommended that the Planning Board adopt more up-to-date and comprehensive stormwater management regulations as part of the ordinances of the Town of Candia which would apply to all land development, including both site plans and subdivisions.

These updated and comprehensive stormwater management regulations should include necessary BMPs for groundwater protection and Low Impact Development (LID) practices and techniques.

LID practices encourage natural drainage solutions such as grass swales, rain gardens and retention ponds, etc. so that stormwater running off roads and parking lots can be naturally treated and cleaned before it soaks back into the ground. Maintaining natural vegetation should be made an important part of the ordinance because it is both a low impact development feature and aids in cleaning stormwater runoff. These primary steps will help to stop groundwater contamination before it starts.

Review of Earth Excavation and Reclamation Regulations

The Town of Candia adopted Earth Excavation Regulations under RSA 155-E on January 11, 1989. These regulations are now out of date and need to be updated. This issue should be addressed by the Planning Board immediately in order 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 are important as they should provide for groundwater protection by requiring 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 should also prevent excavation projects from damaging a known aquifer, mapped by the

USGS, by prohibiting excavation to take place within a specific vertical depth (typically anywhere from 4 to 8 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 the excavation will not adversely affect water quality.

Recommend Actions

Having a strong groundwater (aquifer) protection ordinance, site plan and subdivision regulations, and earth excavation ordinance is necessary to ensure groundwater and local aquifer protection in Candia.

Considering that there a number of identified wellhead protection areas (see maps in the Appendix of this plan) concentrated in the village area and throughout the town; the threats and risks associated with the potential and known contamination sources existing within or near these area, the limit number of stratified-drift aquifers within the community, and the weaknesses identified in the town's existing regulations, it is recommended the Planning Board consider the following actions or 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/update the plan on a regular basis.

This can be easily accomplished and addressed immediately as part of or upon the adoption of this plan.

Step Two: Develop and adopt a local Water Plan as part of the Town's Master Plan.

This action recommendation will require a comprehensive study of the town's water resources and will require at least a year to complete as well as necessary funding. The Town of Candia should consider applying for a Community Technical Assistance Grant (CTAP) grant to obtain the necessary funding to complete this plan.

Step Three: Update Earth Excavation and Reclamation Regulations.

This will require a review of the Town's existing ordinance and review of available ordinances from other communities and crafting the town's existing ordinance and review of regulations for Candia based upon amendments to RSA 155-E which have not occurred since 1986. The Town of Candia should address this issue quickly and prepare the necessary ordinance as a warrant article for the 2010 town meeting. Local funding will need to be appropriated to the Planning Board in order to address this recommendation. The Southern New Hampshire Planning Commission can assist with this recommendation.

Step Four: Develop and adopt a Groundwater (Aquifer) Protection Ordinance.

This should be accomplished as part of the development of the town's local Water Plan and drafting of Earth Excavation and Reclamation Regulations. The Town of Candia should address this issue quickly and prepare the necessary ordinance as a warrant article for the 2010 town meeting. Local funding will need to be appropriated to the Planning Board in order to address this recommendation.

The Southern New Hampshire Planning Commission can assist with this recommendation. As a starting point the NH DES Model Groundwater Protection Ordinance should be used to develop Candia's ordinance (see Appendix E for a copy of the NH DES model ordinance).

Step Five: Amend the Town's Site Plan Regulations to address Groundwater Protection as Recommended by this Plan.

This action recommendation should be addressed upon adoption of this plan and can be easily accomplished by the Planning Board with the assistance of the Southern New Hampshire Planning Commission. A public hearing and not a warrant article is required to amend the board's regulations. Local funding will need to be appropriated to the Planning Board in order to address this recommendation.

Step Six: Amend the Town's Subdivision and Site Plan Regulations to include Updated and Comprehensive Stormwater Management Regulations, including LID practices.

This action recommendation should be addressed upon adoption of this plan. Assistance can be obtained in accomplishing this by retaining a consultant, utilizing the town's engineer and applying for funding assistance through the New Hampshire Estuaries Project Technical Assistance Program.

Step Seven: Adopt a Municipal BMP Survey Program.

This action recommendation should be addressed in combination with the updating the town's stormwater management regulations. Because the Town of Candia is currently responsible for BMP inspections for stormwater runoff, all that would be needed in order to carry out this responsibility for groundwater protection would be to obtain the support of the Board of Selectmen to allow the town's Health Officer and Code Enforcement Officer to participate in ongoing training opportunities offered by NH DES.

A number of BMP surveys were conducted in Candia as part of the development of this plan. Surveys were completed at the Town Salt Shed, the State Salt Shed and the Candia Recycling Center. The Town of Candia should continue to conduct BMP surveys of town-owned facilities to ensure compliance with state rules, specifically Env-Wq 401. In addition, the town should consider conducting BMP surveys in wellhead protection areas located throughout the community and all active community water system owners to ensure that BMPs are being followed. The NH DES Source Water Protection Program can offer assistance to the Town of Candia is establishing this program.

Step Eight: Private Well Testing

Lastly and most importantly, the Town of Candia should discuss and address the need and issue of private well testing. While the State of New Hampshire currently has no mandatory well testing requirements, a number of 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 Candia through the following amendment to the Planning Board's 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 Candia:

(1) Well water test results performed by a laboratory certified by the National Environmental Laboratory Accreditation Conference shall be submitted to the Candia 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 of local government.

6. Well Summary Report – Active Public Water System

Hillcrest Manor Apartments (3 wellheads)
467 Old Candia Rd Candia
Candia, NH 03034
934-7100

EPA ID: 0362010
Community

Frank Gerdarneau, (603)934-7100

Country Lane Manor
843 High St
Candia NH 03034
483-2653

EPA ID: 0363010
Community

Julie Bourgeois, (603)483-2653

Candia Woods Golf Link
313 South Rd
Candia, NH 03034
(603) 483-2307

EPA ID: 0366020
Transient

Henry W. Moore School
12 Deerfield Rd
Candia, NH 03034
(603) 483-2251

EPA ID: 0365010
Non-Transient, Non-Community

Henry Barbuto, (603)485-2251

M and C Children's Learning Place
205 Main St
Candia, NH 03034
(603) 483-5336

EPA ID: 0365020

Non-Transient, Non-Community
Candia Congregational Church
182 High St
Candia, NH 03034
(603) 483-0506

EPA ID: 0365030
Non-Transient, Non-Community

Remington Education Center
19 Stevens Lane
Candia, NH 03034
(603) 483-5664

EPA ID: 0365040
Non-Transient, Non-Community

Birchwood Plaza
143 Raymond Road
Candia, NH 03034

EPA ID: 0366040
Non-Transient, Non-Community

Ron Severino, (603)483-2133/ (603)234-8501

Appendix A: Wellhead Protection Area Maps

Insert Wellhead Protection Area Map 4a

Insert Wellhead Protection Area Map 4b

Insert Wellhead Protection Area Map 4c

Insert Wellhead Protection Area Map 4d

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
Water extracted from a stream, river, lake, pond or reservoir used as a public drinking water system, 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 Candia 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 lest 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 Candia 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 in [New Hampshire] 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.

Sanitary Protective Radius

The area around a public water system 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 system well from which water and contaminants are likely to reach the well. NH DES only recognizes WHPAs for community water supplies and for non-transient, non-community water supplies, but not for transient systems.

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

Assessments of Public Water Supply Sources - CANDIA

This report is a summary of NH Department of Environmental Services' assessments of the vulnerability of each source used by the public water system(s) located in this municipality. The sources listed here are grouped first by the type of public water system and then by the system itself. Each source was ranked according to a number of criteria; a vulnerability ranking is given for each criterion that applies to the source. *An explanation of each column in the report can be found on the last page.*

Source Number	Source Description	Source Type	Date Assessment Completed	Number of Vulnerability Rankings			Susceptibility Ranking Criteria												
				Highs	Mediums	Lows	Detects	Well/Intake	KCSs	PCSs	Highways/RRs	Pesticides	Septics	Urban Land Cover	Ag Land Cover	Animals	Lagoons	Dry discharges	Sanitary radius	Trophic status
System Type C — C=Community; P=Non-Transient, Non-Community; N=Transient																			
EPAID 0362010 — **System Name:** HILLCREST MANOR APTS																			
001	BRW	G	4/18/2000	4	2	6	L	L	L	M	H	L	H	H	H	L	L		M
002	BRW	G	4/18/2000	4	2	6	L	L	L	M	H	L	H	H	H	L	L		M
003	BRW	G	8/20/2001	4	3	5	L	L	L	M	H	M	H	H	H	L	L		M
EPAID 0363010 — **System Name:** COUNTRY LANE MANOR																			
001	BRW	G	1/30/2002	4	2	6	H	L	L	L	H	L	H	L	M	M	L		H
System Type N — C=Community; P=Non-Transient, Non-Community; N=Transient																			
EPAID 0366020 — **System Name:** CANDIA WOODS GOLF LINK																			
001	BRW	G	7/11/2001	2	0	7	L	L	L	H	L	H	L			L	L		
System Type P — C=Community; P=Non-Transient, Non-Community; N=Transient																			
EPAID 0365010 — **System Name:** HENRY W MOORE SCHOOL																			
003	BRW	G	8/3/2001	3	3	6	L	L	H	M	H	L	M	L	H	L	L		M
EPAID 0365020 — **System Name:** M AND C CHILDRENS LEARNING PL																			
001	BRW	G	10/1/2001	3	2	7	H	L	L	L	H	L	M	L	M	L	L		H
EPAID 0365030 — **System Name:** CANDIA CONGREGATIONAL CHURCH																			
001	BRW	G	9/1/2006	1	4	7	L	L	L	L	H	L	M	M	M	L	L		M

Source Number	Source Description	Source Type	Date Assessment Completed	Number of Vulnerability Rankings			Susceptibility Ranking Criteria												
				Highs	Mediums	Lows	Detects	Well/Intake	KCSs	PCSs	Highways/RRs	Pesticides	Septics	Urban Land Cover	Ag Land Cover	Animals	Lagoons	Dry discharges	Sanitary radius	Trophic status
EPAID 0365040 **System Name:** REMINGTON EDUCATION CENTER																			
001	BRW	G	9/1/2006	2	3	7	L	L	L	L	H	L	M	M	H	L	L		M	
EPAID 0366040 **System Name:** BIRCHWOOD PLAZA																			
001	BRW	G	4/18/2000	4	3	5	H	L	H	M	H	L	M	L	M	L	L		H	

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

Final Draft

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

Potential Ground Water Contamination		
CSITE_ID	**SITE_NAME**	**ADDRESS**
4520	COUNTRY LANE MANOR	ROUTE 27
2006	MOORE SCHOOL	12 DEERFIELD RD
6782	PRECISION TRUCK & EQUIPMENT	35 HIGH STREET
5370	MAIDEN-PETRIN FUNERAL HOME	CANDIA FOUR CRNERS
2889	PRECISION TRUCK & EQUIPMENT	35 HIGH STREET
4128	CANTERS CAR WORLD	ROUTE 27
1184	D C MOBIL	179 RAYMOND RD
446	BRUCE TRANSPORTAION	286 RAYMOND RD/ RT 27
6542	ED HEFFERNAN RESIDENCE	14 STUMP ST
2753	GETTY STATION #55256	234 OLD CANDIA RD
3385	PAGE STREET STORAGE TRAILER RENTALS	424B OLD CANDIA ROAD
4623	NH DOT PS 509	376 OLD CANDIA RD
2339	INSULATING TECHNOLOGIES INC	468 OLD CANDIA ROAD

Hazardous Waste Generators			
RSITE_ID	**SITE_NAME**	**ADDRESS**	**STATUS**
3637	CLEAN HARBORS HHWC	NEW BOSTON RD	INACTIVE
3634	COMPETITIVE AUTO BODY INC	CANDIA FOUR CORNERS	INACTIVE
4563	PRECISION TRUCK EQUIP CO INC	JCT 27 & 43	NON-NOTIFIER
4564	CLASSICS PLUS	13 HIGH ST	INACTIVE
3635	CANTERS CARWORLD INC	134 RAYMOND RD	ACTIVE
4561	D C MOBIL STATION	179 RAYMOND RD	INACTIVE
3636	AUTO BODY OF CANDIA	200 RAYMOND RD	INACTIVE
3633	CHARMINGFARE CLEANERS	RTE 27	INACTIVE
4588	HIGH SPEED TECH INC	16 DEER RUN	ACTIVE
4560	PINARD ROBERT F DMD	410 RAYMOND RD	ACTIVE
4562	BRUCE TRANSPORTATION GROUP	286 RAYMOND RD	INACTIVE
5935	SOULE TRUCK INC	286 RAYMOND RD	ACTIVE
4559	CANDRAY PET CARE CENTER	472 RAYMOND RD	ACTIVE
3638	CANDIA WOODS GOLF LINKS	313 SOUTH RD	ACTIVE
350	GETTY PETROLEUM CORP	290 OLD CANDIA RD	ACTIVE
351	NEW ENGLAND TELEPHONE CO	TOWER HILL RD	INACTIVE
4589	NATIONS RENT NE INC	17 OLD MANCHESTER RD	ACTIVE
353	FDIC RCVR FOR NUMERICA BANK	RTE 101	INACTIVE
4565	PAGE STREET STORAGE TRAILERS	424 OLD CANDIA RD	ACTIVE
4590	NH DOT DISTRICT 5	376 OLD CANDIA RD	ACTIVE
234	INSULATION TECH	468 OLD CANDIA RD	INACTIVE

Above Ground Storage Tanks		
ASTSITE_ID	**FACILITY**	**ADDRESS**
227	VIKING OIL CO INC	5 HIGH ST
941	NATIONS RENT	17 OLD MANCHESTER RD
226	NH DOT PS 509	376 OLD CANDIA RD

Underground Storage Tanks		
USTSITE_ID	**FACILITY**	**ADDRESS**
4223	CANDIA RCL	HIGH ST
780	MOORE SCHOOL	12 DEERFIELD RD
781	MOORE SCHOOL	12 DEERFIELD RD
783	CANDIA FIRE DEPT	11 DEERFIELD RD
4531	PRECISION TRUCK & EQUIPMENT	35 HIGH STREET
2156	D C MOBIL	179 RAYMOND RD
4383	VERIZON	166 MAIN ST
811	GETTY STATION #55256	234 OLD CANDIA RD
813	BELL ATLANTIC	TOWER HILL RD
4557	NATIONS RENT	17 OLD MANCANDIA RD
2155	NH DOT PS 509	OLD RTE 101

Appendix E: NH DES Model Groundwater Protection Ordinance