Town of Walpole, NH
Drinking Water Protection Plan

January, 2015

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Acknowledgements
Funding for this project was provided through a United States congressional appropriation to the National Rural Water Association and Granite State Rural Water Association and was administered in cooperation with the US Department of Agriculture's Farm Service Agency.

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1. Introduction

1.1 Background and Purpose

Groundwater is a critical natural and economic resource for New Hampshire. It is our most frequently used source of drinking water, in addition to being an integral part of the hydrologic system and vitally important for fish, wildlife, and recreation. The New Hampshire Department of Environmental Services (DES) estimates that 70 to 75 million gallons of groundwater are supplied for drinking water in New Hampshire per day. Approximately 60 percent of New Hampshire residents rely on groundwater for their drinking water. Of the 2,416 public water supply systems in New Hampshire, 98 percent rely on groundwater. 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.

Groundwater can be contaminated when chemicals or other substances 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 groundwater flow. The most common causes of groundwater contamination in New Hampshire are leaking underground storage tanks, mishandling of industrial chemicals, and stormwater runoff. The presence in groundwater of some contaminants, such as MtBE (methyl*tertiary*butylether) strongly correlate with urban factors (population density, housing density, and the percentage of urban land use or roads) emphasizing the importance of controlling potential contaminants in developed or developing areas. Although MtBE has been removed from the gasoline supply, gasoline still contains many other toxic compounds. Land uses associated with gasoline releases to the ground are therefore still a concern. Some industrial solvents are especially potent contaminants; only 5 ounces of TCE (tetrachloroethylene), a common industrial solvent, can make up to 7.8 million gallons of water unacceptable for drinking based on federal standards. Although there are many state and federal programs that directly or indirectly serve to protect groundwater, it is generally acknowledged that local land use controls, inspection programs and public education are necessary to maximize the effectiveness of groundwater protection.

The primary goal of this Drinking Water Protection Plan is to protect groundwater that is used or may be used as a source for public drinking water systems in the Town of Walpole. This plan provides data, maps, guidance, priorities and actions to protect Walpole's groundwater (aquifers) and public drinking water sources from contamination. It serves as an informational tool and action plan for town officials, water system managers, developers, and residents. This plan is a working document that should be reviewed annually and updated every three years to remain current, active, and viable.

This plan is divided into three parts; Part I covers the public drinking water system and wells for the Town of Walpole; Part II covers the public drinking water system and wells serving the North Walpole Village District; Part III covers the transient and non-community non-transient systems within Walpole.

The Town of Walpole is a mostly rural-agricultural town of 3,734 people, with a median household income of about $68,000 (U.S. Census Bureau, 2010). It occupies approximately 36 square miles in southwestern New Hampshire in Cheshire County. Walpole is divided into two districts: Walpole and the North Walpole Village District with each having its own zoning ordinance. The North Walpole Village District is located north of Cold River and is more densely developed and more industrial. The North Walpole Village District has a population of approximately 830 individuals and a median household income of about $40,000 (US Census

Bureau, 2010). Additionally, the unincorporated village of Drewsville is also located in Walpole, however demographic information was unavailable.

1.2 Definitions

Public Water System: A "public water system" (PWS) 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 for at least 60 days out of the year" (Chapter Env-Ws 300, NH Drinking Water Rules). Public water systems are classified into three groups: community systems, non-community transient systems, and non-community non-transient systems.

- **Community systems** serve at least 25 individuals on a year-round basis. Examples include municipal water systems, mobile home park systems, condominium systems, and single family housing developments.
- **Non-community transient systems** serve at least 25 individuals, for at least 60 days per year. These water systems typically serve restaurants, hotels, service stations, campgrounds, or recreational areas.
- **Non-community non-transient systems** serve at least 25 individuals, for at least six months per year. These systems typically serve daycare facilities, schools, and commercial properties.

Wellhead Protection Area: A "Wellhead Protection Area" (WHPA), sometimes called a "source water protection area", is the surface and subsurface areas from or through which contaminants are reasonably likely to reach a water system source, such as a well. The wellhead protection area is divided into two zones: the Sanitary Protective Area, which encompasses the area immediately surrounding the well, and the Zone of Contribution which is the remainder of the wellhead protection area.

Aquifer: An aquifer is a layer of water-saturated, permeable rock, through which water can move and be extracted using a well.

1.3 Methods

To determine what potential contaminants were present in the WHPA's and to evaluate their risk to nearby wells, extensive research was performed examining land use practices and site histories. Information on above and underground storage tanks, hazardous waste and underground injection permits, and hazardous material spill reports was gleaned from New Hampshire Department of Environmental Services' One-Stop data portal (NH DES). This information was then verified and supplemented using a windshield survey, where sites were inspected visually from public throughways. At times, information garnered from NH DES's One-Stop was verified by interviewing site owners, public officials, and through public records. Land cover was determined using the 2010-2011 1-FT Color Aerial Photos. Soils and underlying geology was determined using the Natural Resource Conservation Service (NRCS) Web Soil Survey and the Soil Survey of Cheshire County, New Hampshire (USDA Soil Conservation Service 1989). Information on public water systems including average daily usage, service connections, and population served was also accessed from NH DES's One-Stop and then verified by system operators. A variety of sources were used to investigate site histories, these

include NH DES One-Stop, US EPA's national priority list for clean-up sites, the Vermont Department of Environmental Conservation (VT DEC), the Brattleboro Reformer, the Keene Sentinel, the Walpolean website, the Town of Walpole and North Walpole Village District, and countless personal communications.

Guidance on evaluating the risk presented these contaminants was provided by The DES Guide to Ground Water Protection (NH DES 2008), The Trust for Public Land Source Protection Handbook (Hopper and Ernst 2005), and Nonpoint Source Pollution: A Handbook for Local Governments (Jeer et. al. 1997). Furthermore, all information, data, and conclusions stated in this plan were reviewed by the Walpole Drinking Water Committee, and North Walpole Village Commissioners for accuracy.

All GIS data layers were accessed from the University of New Hampshire Extension's Geographically Referenced Analysis and Information Transfer System (NH GRANIT) and NH DES.

1.4 Drinking Water Resources in Walpole, NH

The Route 12 corridor through Walpole is largely rural, but has areas of dense residential and commercial development. These commercial and industrial development can be found in the Walpole Industrial Park on the Westmoreland town line, along Route 12 north of Walpole Village, and along Route 12 in North Walpole. Dense residential areas can be found off Route 12 in Walpole Village, along Route 123 in Drewsville, and along Route 12 in North Walpole.

Approximately 1,991 individuals are served through five public water systems in Walpole. The remaining 1,700 individuals in Walpole rely on private water systems for their drinking water supply, their systems will indirectly benefit from information and recommendations presented in this source water protection plan. Groundwater is the primary source of drinking water within the town of Walpole and all public, and presumably all private systems rely on gravel packed, or bedrock wells.

There are three community systems, two non-community non-transient systems, and one non-community transient system in Walpole. There is also one inactive non-community transient system in Walpole.

The Walpole Water Department provides domestic water and fire protection to an estimated population of 975 people through 400 service connections in the Town of Walpole. The Walpole Water Department develops its water from two gravel packed wells: The River Well (GPW 001) and the Watkins Hill Well (GPW002). The River Well is located approximately 2,250 ft west of New Hampshire Route 12 and 600 ft east of the Connecticut River, within the river's 100 year floodplain. The River Well serves as an alternate drinking water source, pumping into the Walpole Village System approximately one hour per day, during periods of peak demand. Watkins Hill Well, is located approximately 450 feet southwest of Watkins Hill Road and 125 feet south of Great Brook. Watkins Hill Well operates nearly continuously, serving as the Department's primary public drinking water source. A 2013 sanitary survey did not note any unresolved problems for either the River Well or the Watkins Hill Well.

The North Walpole Village District is an independent governmental body within the town of Walpole, tasked with providing fire protection, water and sewer service to its residents. The North Walpole Village District provides domestic water and fire protection to 900 individuals through 290 service connections. These connections are divided between two separate systems: the High and Lower systems. The High system is served by a bedrock well, located along the western slope of Fall Mountain approximately 1,500 ft northeast of Route 12. The Lower system

is supplied by a gravel packed well located between Route 12 and the Connecticut River on a Village Owned lot.

The Benson Woodworking System is a non-transient system serving 60 individuals, mostly employees, through two connections at a woodworking shop in Walpole near the Westmoreland, NH town line. The system is served through a bedrock well located on site.

The Drewsville Carriage House System is a non-transient system operated by Southwest Community Services that serves 31 individuals at a multi-family home and a "Head-Start" school through six connections. The system is located in Drewsville Center, a village of Walpole located in the northwest of the town along Route 123 and is served by a bedrock well located on-site.

The Hooper Golf Course System is a transient system that serves 25 individuals seasonally at a golf course in Walpole. The system, as well as the golf course are currently owned and operated by the Town of Walpole, however the property is for sale as of December 2014, therefore it is possible that this may change in the future.

Table 1. Public water systems in Walpole, NH. Usage information is current as of 2013. Data from NH DES

PWS ID	System Name	Population Served	Type of System	Number of Connections	Approximate Daily Usage (gallons)
2401010	Walpole Water Department	975	Community	400	196,161
2401020	North Walpole Village District Lower System	800	Community	250	70,000
2401030	North Walpole Village District High System	100	Community	40	10,000
2406010	Benson Woodworking System	60	Non-Transient	2	160
2405010	Drewsville Carriage House System	31	Non-Transient	6	N/A
2408010	Hooper Golf Course System	25	Transient	1	N/A

Walpole has a large aquifer area along the Connecticut River and along the Great Brook, and Cold River tributaries. This stratified drift aquifer is the result of alluvium deposits leftover

from the glacial Lake Hitchcock. This is a high-yielding, high-quality aquifer recharged largely from recharge zones located in the hills surrounding the Connecticut River Valley in Vermont and New Hampshire. The Connecticut River through Walpole, NH is known as a "gaining reach", meaning it gains water from groundwater rather than contributing to the aquifer. Wells outside of the aquifer areas are supplied either by water trapped in fractured bedrock, or from gravel packed wells adjacent to streams where water can be drawn from surface source through groundwater. Despite the high-quality of groundwater resources in Walpole, both natural and anthropogenic contaminants have been detected in the River Well and in the North Walpole Village District Lower System.

Due to the connection between surface water and groundwater, effective water resource management benefits all types of systems, whether they are public, private, surface or groundwater. Source protection efforts help to minimize the likelihood that contaminated water will enter a drinking water system. New Hampshire DES recommends that source protection plans be implemented for all public drinking water supplies. These plans should include a variety of management activities such as public education and land protection. One of the goals of this drinking water protection plan is to reduce the risk of contamination from entering drinking water systems in the Town of Walpole.

Public Drinking Water Systems in Walpole, NH

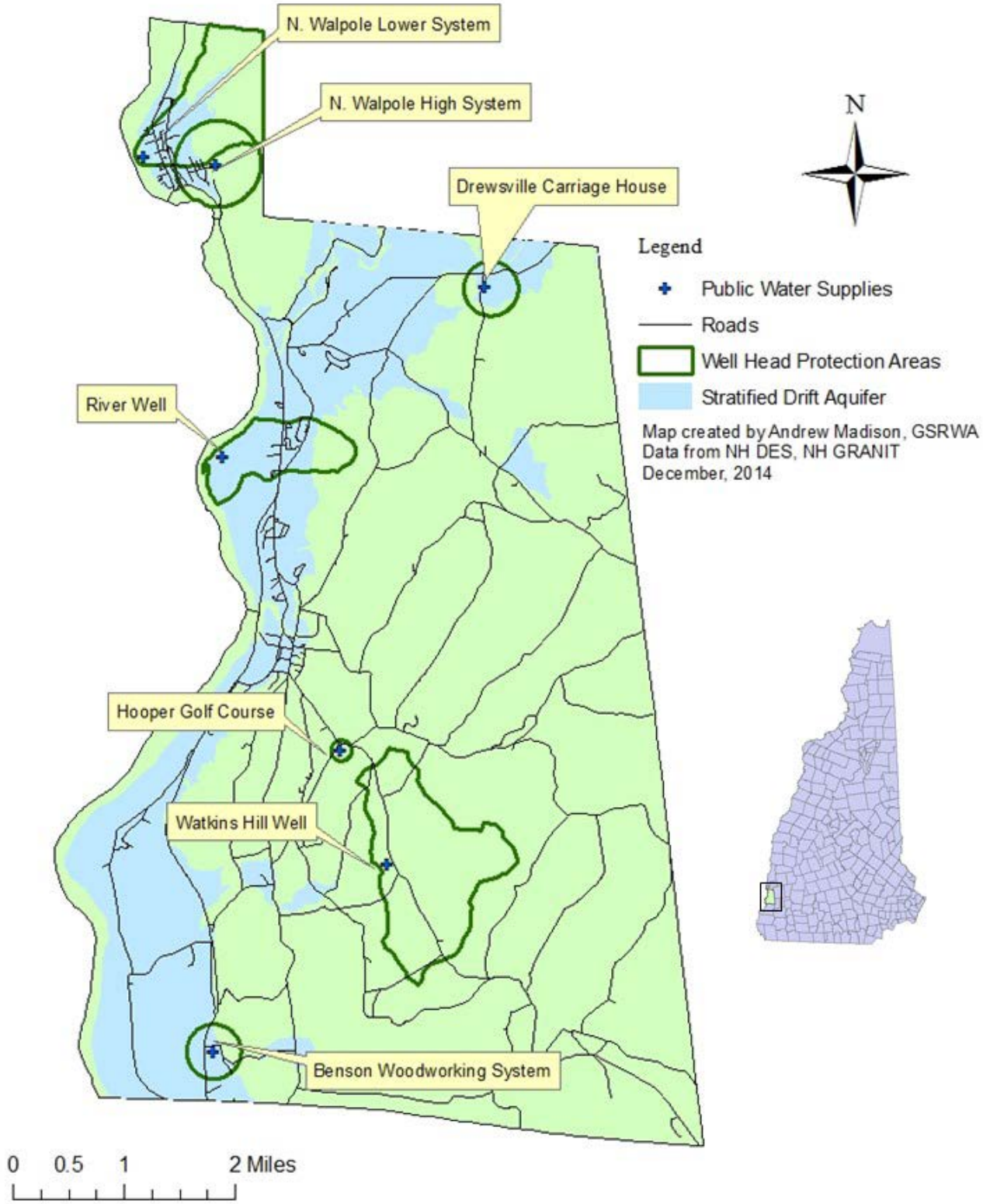

Figure 1. Public drinking water sources in Walpole, NH. Data from NH DES and NH GRANIT

1.5 History of Drinking Water Protection in Walpole

Walpole has historically been proactive regarding the protection of the town's drinking water resources. In 2002, the Walpole Select Board formed a Drinking Water Protection Committee with the assistance of Granite State Rural Water (then Northeast Rural Water) to address the concerns presented by increased development in the Route 12 Corridor and increased demands on Walpole's Municipal system. This Committee was comprised of members of the town Zoning, Planning, and Select Boards as well as the Conservation Commission and the Water Department. In 2003 they completed a Source Protection Plan for two wells serving the Walpole Municipal Water System which outlined a number of management actions the Town of Walpole could implement to protect its drinking water resources.

Following guidance from the 2003 Walpole Source Water Protection Plan, the Walpole Drinking Water Committee drafted a "Well-Source Protection Ordinance", which was approved by town voters in 2004. This ordinance defined Wellhead protection districts within the Town of Walpole and described prohibited land uses. Additionally, the town water department commenced a public outreach and education campaign which included mailings to town residents, and the introduction of a water education curriculum (ProjectWET) for Walpole Schools.

In May, 2013 the Drinking Water Protection Committee reconvened to update the Source Water Protection Plan and to review the 2004 "Town Well-Source Protection Ordinance". Between May,2013 and December 2014, the committee met almost monthly to develop a list of potential sources of contamination, and identify management actions that could be taken by the town. The Committee also reviewed a model groundwater protection ordinance created by NH DES as well as groundwater protection ordinances from other NH communities including Rindge and Berlin. The committee also met with NH DES' Source Water Protection Specialist who reviewed Walpole's current ordinance and provided the committee with an ordinance checklist. Using the information gained from these resources, the committee drafted a revised ordinance and submitted it to the Southwest Regional Planning Commission for review and comment. These comments were incorporated where appropriate and a draft Wellhead Protection Overlay District Ordinance was approved by the committee in October, 2014 and sent to Walpole's Planning Commission and Zoning Board for review. The revised Wellhead Protection Overlay District Ordinance was approved by the Planning Commission and Zoning Board in November, and opened for public comment at a Select Board hearing that same month. The revised Wellhead Protection Overlay District Ordinance is available in Appendix 6, and its relevance to this Source Water Plan is discussed in chapter 4.2. An index of meetings of the Walpole Drinking Water Committee meetings in available in Appendix 3.

In Feburary, 2014, the Walpole Drinking Water Committee met with the North Walpole Village District Board of Commissioners and discussed including North Walpole's drinking water systems into this plan. This action was approved by both committees and work began on North Walpole's Source Protection Plan in August, 2014. The North Walpole Village District Commissioners met monthly with GSRWA's Source Water Specialist to develop a potential sources of contamination inventory, to discuss Dioxane contamination in one of the Village's wells, and to discuss management practices the Village could adopt to address these threats.

This plan is the result of the research and input of the Walpole Drinking Water Committee and North Walpole Village District Commission members aided by Granite State Rural Water Association. It is a continuation of the drinking water process started by the Town of Walpole in 2002 with the forming of the Drinking Water Committee. This plan is a living, working document and must be periodically reviewed and updated every three years to remain relevant and useful.

Part I

Town of Walpole Water Department System

PWS ID: 2401010

2. River Well

2.1 Description of Source

The River Well is currently the back-up system for the Walpole Water Department and provides supplemental water to compliment the Watkins Hill Well during periods of high demand. The well provides approximately 275,000 gallons a month (2013) to the Walpole Village System on an as-needed basis. The well is located within the 100-year floodplain of the Connecticut River and produces approximately 375 gallons per minute. This source is notable for its water quality and quantity. There was a brief period during 1998 when water quality samples indicated elevated levels of nitrate. As a result the river well is currently on a quarterly nitrate sampling schedule, however nitrate concentrations have not been detected in excess of state standards since. There are no current detects from anthropogenic sources including volatile organic chemicals, synthetic organic chemicals, or metals.

Source ID	Name	Type	Date Drilled	Depth (feet)	Casing (inches)	Driller's Yield (gpm)	Average Daily Yield (gpd)
001	River Well	Gravel packed	July 1964	66	18	375	28,607

Table 2. River Well specifications. Source: NH DES and Town of Walpole Water Department.

2.2 Description of Wellhead Protection Area

2.2.1 Location and Land Use

The Wellhead Protection Area for the River Well extends east from the Connecticut River to the peak of Cheney Hill and covers 375 acres (Figure 2). This area includes agriculture, commercial land uses along Route 12, and some residences. Approximately 50% (187 acres) of the wellhead protection area is occupied by agricultural land uses, these lands are located within the floodplain of the Connecticut River and are adjacent to the well house. The commercial and industrial land uses are predominantly located along Route 12 and cover an area of 27.5 acres, however an additional 13.5 acres are zoned for commercial land use but are currently undeveloped. Residential land use and zoning accounts for 22 acres or approximately 6% of the Wellhead protection area. The remaining 124 acres is comprised of forest located in the upper reaches of the wellhead protection area along Cheney Hill (95 acres) or surrounding the well house along the Connecticut River (29 acres). This wellhead protection area was delineated by US EPA Region 1 in August 2001 and approved by NH DES in 2002.

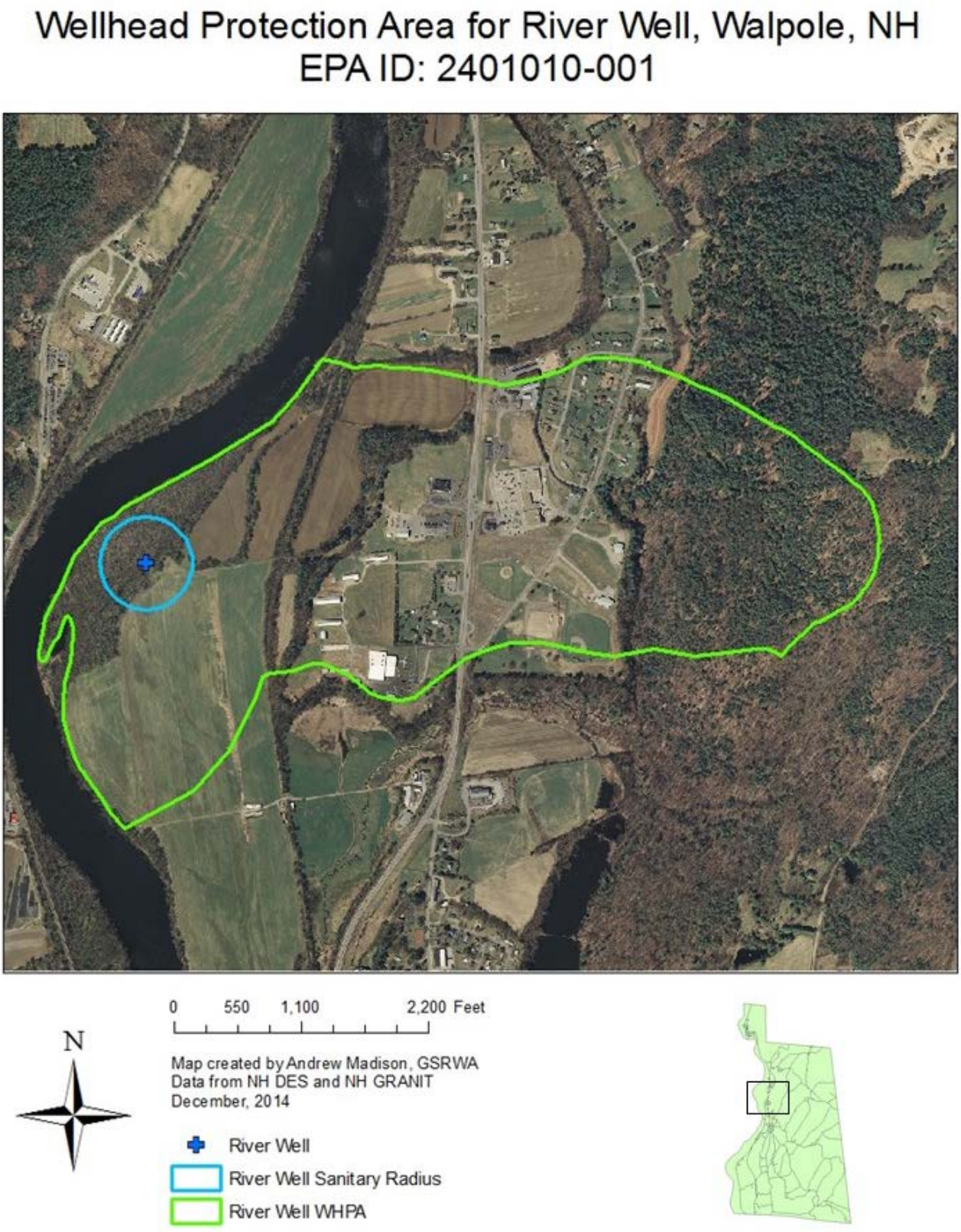

Figure 2. Wellhead Protection Area and Sanitary Radius for River Well, Walpole, NH. Data from NH DES and UNH GRANIT.

2.2.2 Topography, Geology, and Soils

The River Well is located in a high yielding, confined aquifer composed of coarse stratified drift with saturated thicknesses of greater than 120 feet (Moore et al. 1994). This aquifer is likely the distal end of two coalescing deltas that formed in glacial Lake Hitchcock. One delta was fed from the Cold River, entering the lake from the New Hampshire side. The other delta was fed by meltwater from the Vermont side and followed the current course of the Saxton's River (Moore et al. 1994). The combined delta has since eroded and been bissected by the Connecticut River. The New Hampshire side of the Connecticut River in Walpole has been eroded to floodplain level. It is within this floodplain that the River Well is located. The water-table altitude in this area ranges from approximately 240 feet to greater than 280 feet above sea-level. The well house is located in a hardwood forest community that occurs in small patches along the banks of the Connecticut River. The elevation within the Wellhead protection area increases from 250 ft above sea level at the well house, to 300 ft along Route 12, to a maximum elevation of 700ft along the top of Cheney Hill.

2.2.3 Surface Water Features

The River Well lies within the 100 year floodplain of the Connecticut River (Figure 3). Each spring the river floods, surrounding the pump house with water approximately 10-12' deep. In the Wellhead protection area there are several streams and wetlands including Blanchard Brook which runs through the zone of contribution. In a survey of Town wetlands, the floodplain forest next to the River Well was classified as second in importance for conservation in Walpole due to its biological functional value (Hall 1997). NH NHI lists Southern New England floodplain forests as imperiled because of their rarity or vulnerability.

2.3 Potential Sources of Contamination

2.3.1 Potential Impacts from Historic or Former Land Uses

Sites that previously held potential sources of contamination can continue to pose a threat to drinking water wells even if they are remediated. Contaminants travel slowly through groundwater and can remain bound to soils for years after being released into the environment and as such, groundwater contamination can be a persistent problem. Sites that formerly contained underground fuel storage tanks are frequently problematic for near-by wells, two such sites were identified in the Wellhead protection area of the River Well, however neither have shown signs of soil contamination.

Four underground storage tanks were removed from a poultry hatchery between 1987 and 1990, these included: (1) 1000 gal Gasoline; (1) 500 gal Diesel; (1) 10000 gal #2 Fuel oil; (1) 1000 gal #2 Fuel oil. No major leakages were discovered after the removal.

Two underground storage tanks were removed from the site that is now the Walpole Youth Sporting Complex. The two tanks were 10000 gal and 500 gal diesel tanks and were removed in 1988 and 1987 respectively. No soil contamination or signs of leakage were detected upon removal.

2.3.2 Potential Impacts from Existing Land Uses

Contemporary and on-going activities and land uses are likely to have the greatest impact on the purity of the River Well and are also the easiest to address. Existing land use activities in the Zone of Contribution which may have an impact on groundwater sources include:

- Transportation corridors
- Pesticide application
- Residential land use
- Agricultural land use
- Urban land cover
- Above and underground storage tanks
- General service and repair shop
- Vehicle service and repair shop
- RCRA Sites (facilities that generate hazardous wastes)
- Industrial or manufacturing
- Underground Injection Control

1). Transportation Corridors

Route 12 dissects the wellhead protection area, however, it is not within 1000 feet of the well. Roadways increase the risk of accidental releases of petroleum and automotive products reaching the source through automotive accidents or leaking fluids from cars. Hazardous weather, particularly in winter, increases the risk of accidents. Roadways are also a significant non-point source of pollution. The risk to the River Well is considered "Medium". In addition, Dearborn Circle and Upper Walpole Rd. are located within the River Well wellhead protection area.

2) Pesticide Application

Pesticide application sites within the wellhead protection area of the River Well include agricultural areas, baseball fields, and residential pesticide use. The Walpole Youth Sporting Complex baseball fields cover approximately 20 acres east of Route 12 and could represent a source of concentrated pesticide use. Agricultural operations are also located within the wellhead protection area between the well and Route 12. One farm in the WHPA is an organic operation and does not use chemical pesticides, while the other farm works to reduce pesticide application. Much of the latter farm is located downstream and down-gradient of the well. Household use is not likely to have a significant impact on the river well. The risk to the River Well from pesticides is "Medium".

3) Residential Land Use

Residential land use is associated with the presence of septic systems, oil heat, and lawn care products. On-site septic systems represent potential sources of nitrates, chlorides, bacteria, and viruses. If septic systems are improperly used for disposal of household hazardous wastes such as paints and solvents, septic systems can also be a source of synthetic organic compounds. There are approximately 30 residences in the wellhead protection area, most of them are located in the Dearborn Circle area. Sewer access is available for some, but not all residences in the wellhead protection area. Most Dearborn

Cir. Residences are without sewer service. NH DES's land use assessment has rated the risk from septic systems as "Low".

4) Agricultural Land Use
There are 187 acres of agricultural land within the wellhead protection area, this represents approximately 50% of the total Wellhead protection area. Although agricultural land can promote source water protection, by permitting infiltration and recharge, nitrates are often a common concern in extensive agricultural areas. NH DES's land use assessment has rated this land use as "High" risk. However, due to the location of crops along the river and downstream of the well and conservation practices implemented by the land owner, this report considers the risk to the river well to be "Medium".

5) Urban land cover
Approximately 27.5 acres (7.4%) of the wellhead protection area is occupied by urban land uses such as buildings, residences, roads, parking lots and other impervious surfaces. Water quality impacts such as non-point source runoff, automotive chemicals, petroleum products, and road salts, as well as loss of recharge, are associated with impervious surfaces. The NH DES SWAP report considers the risk to the River Well from urban land cover to be "High". However, the proportion of the wellhead protection area covered by urban land cover is less than 10%, and the town has taken action to limit the use of deicing chemicals in the area. This report considers the risk to the River Well from urban land cover to be "Medium".

6) Pharmacy and Photographic Processing Lab
There is one pharmacy with an attached photo processing lab located within the wellhead protection area of the River Well and approximately 2,500 ft from the well. This facility is a RCRA-permitted small-quantity hazardous waste generator (less than 220lbs of non-acute waste per month produced). Hazardous wastes produced by this facility include pharmaceuticals and photo-processing (C-41 process) chemicals such as silver-halide and chemical oxidizers. The risk to the River Well from this facility is considered "Low".

7.) Above and Underground Storage Tanks
There are currently no NH DES permitted/regulated under or aboveground storage tanks within the wellhead protection area of the River Well.
Aboveground storage tanks used for residential heating or under 660 gallons in volume for single tanks, 1320 for multiple tank systems, are not required to be permitted by NH DES and there are no restrictions on their use. One 500 gallon diesel aboveground storage tank is present at a hardware and building supply store within the River Well WHPA. This tank is covered and equipped with a secondary containment structure. This site previously held a 1,000 gallon diesel tank that was removed in 2008.
A windshield survey conducted in September, 2014 located three aboveground tanks, storing fuel and waste oil at a vehicle service and repair shop. These three tanks appeared to be less than 660 gallons in volume and therefore not subject to permitting by NH DES. No other tanks were identified in the wellhead protection area however, other tanks less than 660 gal may be stored in garages or sheds. Leaks from these tanks, even in

small quantities, could potentially contaminate the River Well. The risk to the River Well due to Storage Tanks is considered "High" due to the presence of small, unregulated aboveground tanks.

8.) Vehicle service and repair shop
There is one vehicle service, sales and repair shop located within the wellhead protection area at the intersection of Route 12 and Pinnacleview Drive. This facility sells and services light equipment including tractors, hand equipment, landscaping, and farm equipment. Automotive chemicals, waste oils, cleaning solvents and small quantities of fuels are likely present and could impact the river well if a release were to occur. The risk to the river well from this facility is considered "High" due to the type of waste produced and proximity to the well.

9). RCRA Sites
Entities which generate hazardous waste are regulated and permitted by NH DES under the Resource Conservation and Recovery Act (RCRA). Specific hazardous wastes at these sites may vary but fall under the categories of toxic, corrosive, reactive, or flammable. Common hazardous wastes in the wellhead area include waste oils, waste solvents, and septic sludge. There are three such facilities not already mentioned that are located within the River Well wellhead protection area. These include a machine shop, a chicken hatchery and a supermarket, all are considered small quantity generators, producing less than 220lbs/month of hazardous waste. The risk to the River Well from these facilities is considered "Medium".

10). Manufacturing
There is one manufacturing facility located within the wellhead protection are of the river well. This facility fabricates metal parts using different materials and in a variety of sizes. This facility is located approximately 2400 ft from the river well and along Route 12. Contaminants of concern include waste oils, waste solvents, and heavy metals. This facility is currently implementing best management practices (BMP's) to reduce the risk of an accidental release and participates in voluntary BMP inspections. The facility is also a RCRA permitted small quantity waste generator. Due to the proximity of this facility to the River Well, and the nature of the hazardous materials uses at this facility, the risk to the River Well is considered "High".

11). Underground Injection Control
Underground Injection Control (UIC) refers to the discharge of benign wastewater or stormwater into groundwater, this activity is permitted by NH DES. The Walpole Youth Sporting Complex currently possesses a permit for the discharge and infiltration of stormwater. The site is a former chicken hatchery that now comprises of a baseball field with seating, grounds keeping garage and parking. Stormwater will be diverted from the parking lots into a 24-inch gravel-lined pipe with an associated leachfield. The baseball field has an associated concrete dry well with a fabric lined leachfield. The leachfields can be a conduit for automotive chemicals, road salts, pesticides, and nitrates from the parking lot and baseball field into groundwater.

A drainage lagoon is located at the southeastern edge of the North Meadows Shopping Plaza. This lagoon receives runoff from the plaza's parking lot and allows it to slowly seep into the ground. This can create a hazard to the river well because it allows petroleum products, automotive chemicals, and road salts to leach into groundwater and travel towards the River Well. The risk to the River Well from UIC is considered "Medium".

2.3.3 Potential Impacts from Future Uses

The River Well wellhead protection area is currently zoned for agricultural, commercial, residential and timberland uses. Within the wellhead protection area, 41 acres are zoned commercial, some of which has yet to be developed. Future commercial development is likely to significantly increase impervious surface area and increase stormwater runoff, thereby reducing aquifer recharge. Currently the wellhead protection area is protected by an aquifer overlay zone in the Town's zoning which is in the process of being updated as of 2014.

2.3.4 Potential Impacts from Land Uses Located Outside the Wellhead Protection Area

Although land uses within the wellhead protection area will likely have the most significant impact on the well, activities outside the WHPA may still impact groundwater quality. Existing land uses located outside of the WHPA, which may have an impact on groundwater sources include:

- Transportation Corridors
- Underground Storage Tanks

1.) Transportation Corridors

Route 12 continues north and south of the wellhead protection area where the risks from road salt application and accidental petroleum releases are also present. Across the Connecticut River and approximately 3,500 ft away from the River Well is the I-91 corridor, which possesses the same types of potential contaminants as Route 12, however in a much greater volume. A railway is located approximately 1,000 ft west, across the Connecticut River, of the River Well. This stretch of railways frequently moves tanker cars and has been the site of numerous derailments. Approximately 1.5 miles up-stream of the River Well, the railway crosses a bridge over the Connecticut River.

The risk to the River Well from Route 12 and the I-91 corridor is likely low, given the distances involved, and the effect of the Connecticut River. The railway, however, could potentially be problematic if a release were to occur from a large capacity tank-car, especially if it were to happen on a bridge spanning the river. Railroads can be particularly problematic for water systems due to the variety of hazardous chemicals carried, the frequency of travel and the large volumes carried. Complicating the matter, the railway, along with I-91, are both located in Vermont, where they are not subject to regulation by the Town of Walpole, or the State of New Hampshire. The risk to the River Well from the railway is considered "High".

2.) Underground Storage Tanks

A gas station, built in 2013, is located approximately 2,000 ft north of the River Well WHPA along Route 12 and hosts five large underground storage tanks including:

- 15,000 Gallon gasoline.
- 10,000 Gallon gasoline.
- 5,000 Gallon gasoline.
- 15,000 Gallon diesel.
- 10,000 Gallon diesel.

A release from one of these tanks would likely travel to the River Well and, given the volumes involved, contaminate it beyond use. In addition to the risk from a release from the tanks, there is also a risk of a spill during the filling process, or smaller spills during everyday vehicle fueling. The site also consists of approximately one acre of impermeable surface, contributing to non-point source pollution. In accordance with NH DES regulations, all of these tanks have been equipped with overfill prevent and release detection devices at the time of construction, however these are not fail-safe. The risk to the river well from this facility is considered “High”.

Although it is difficult to evaluate the risks presented to the River Well from far upstream and up-gradient land uses and activities, such as those located above the Bellows Falls Dam, it is important for the River Well system managers to take note of upstream activities. Potential sources of contamination located above and in the vicinity of the Bellows Falls Dam can be found in sections 5.3 and 6.3 of this plan.

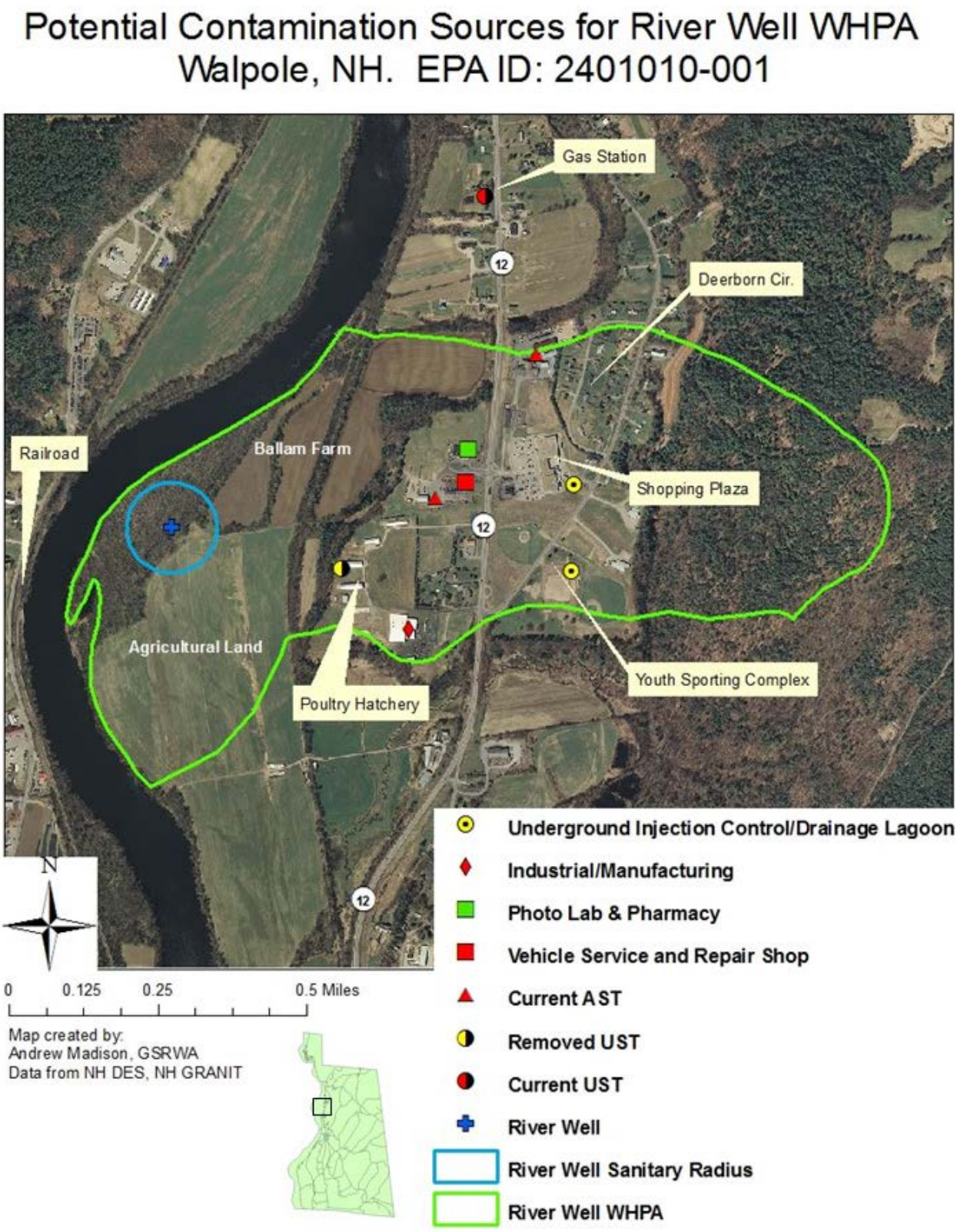

Figure 3. Potential sources of contamination in the River Well area. Source: NH DES, UNH GRANIT.

2.4 Current and On-Going Management Activities

1.) Land Acquisitions

The Town of Walpole has worked to protect the sanitary protective radius of the River Well by owning a 16.5 acre lot surrounding the well and controlling activities in that area. The Town of Walpole also acquired land following a recommendation stated in the 2003 Source Protection Plan. In 2007, the Ballam Farm, once the proposed site of a shopping center and a car dealership, was purchased by the town with the aid of the Trust for Public Land using federal, state, and local funds. That purchase secured a purchase of 60 acres of land, 52 of which would remain in active production under and agricultural conservation easement, and 8 acres to help protect the sanitary radius of the River Well and for the development of a second well, should the need arise. This purchase was approved by voters at the Walpole Town Meeting in March, 2007. Other producers in the wellhead protection area have agreed to limit fertilizer and pesticide use to help protect the purity of the well.

2.) Zoning Ordinances

In March, 2004, the Town of Walpole adopted a "Town Well Source Protection Ordinance" to help protect the wellhead protection areas of the Watkins Hill and River Wells. This ordinance defined the wellhead protection areas as defined by NH DES, listed prohibited activities and land uses within the Wellhead protection areas, and set standards for conditional use permits. The "Town Well Source Protection Ordinance" was updated in 2008 to ensure it was referenced in the town's zoning ordinance as Section K. In 2013, the Walpole Drinking Water Committee began work on drafting a new ordinance to replace the 2004 Town Well Source Protection Ordinance. The Draft 2014 Walpole Wellhead Protection Overlay District expands on the list of prohibited activities, conditional uses, and provides protection for the River Well and Watkins Hill WHPA's in light of new threats, specifically commercial and industrial development. The Walpole Drinking Water Committee , along with numerous town residents, raised concerns that the Watkins Hill Well may not be fully capable of meeting the town's future needs, and that the River Well may be a suitable source. Many were concerned about increasing commercial and industrial development along the Route 12 Corridor in the River Well WHPA. These concerns served as the catalyst for the creation of the Wellhead Protection Overlay District Ordinance, and for it to supersede the current Well Source Protection Ordinance. It is expected to be on the ballot for the Walpole Town Meeting in March 2015. In 2012 an ordinance was proposed in response to the gas station constructed along Route 12, approximately 2,000 ft north of the River Well WHPA. This ordinance was approved by voters at the March, 2013 Walpole Town Meeting as Section M of the Walpole Town Zoning Ordinance. This ordinance (Section M) is not related to the Walpole Well Source Protection Ordinance (Section K), nor is it related to the proposed Walpole Wellhead Protection Overlay District Ordinance.

3. Watkins Hill Well

3.1 Description of Source

The Watkins Hill Well provides approximately 187,145 gallons of water per day (2013) to the Walpole Water Department as its primary source. The well and the 4.4 acre lot it is located on was donated to the Town of Walpole in 1949 by the Britton Family, a family with historical agricultural roots to the Town. Watkins Hill Well supplies water to 50-60 residences as it pumps water to the 300,000 gallon storage tank located on Prospect Hill. From the tank, water flows by gravity to the Village where it provides services for approximately 400 homes and businesses in the Village. There are no current detects from anthropogenic sources including volatile organic chemicals, synthetic organic chemicals, or metals. The only treatment for this well is trace chlorination.

Source ID	Name	Type	Date Drilled	Depth (feet)	Casing (inches)	Driller's Yield (gpm)	Average Daily Yield (gpd)
002	Watkins Hill Well	Gravel packed	March 1949	35	18	154	180,520

3.2 Description of Wellhead Protection Areas

3.2.1 Location and Land Use

The wellhead protection area for the Watkins Hill Well covers 960 acres in the Watkins Hill area extending north, south, and east of Watkins Hill Rd (Figure 3). The Wellhead protection area is zoned for Rural-Agricultural and Timberland uses. Rural-Agricultural zoning occupies 778 acres, or 81% of the wellhead protection area, the remaining 182 acres (19%) is zoned for Timberland. Of the 778 acres zoned Rural-Agricultural, approximately 275 acres are in active production, most of which are used for hay or pasture. Only 23 residences are present within the wellhead protection area. The wellhead protection area for the Watkins Hill Well was initially delineated by US EPA Region 1 in August 2001 and approved by NH DES in 2002 along with the River Well wellhead protection area. This was re-delineated in 2012 by Douglas Heath, then Drinking Water State Program Coordinator with USEPA Region 1. This re-delineation was performed to take into account the entire Great Brook Watershed since it became clear that the Watkins Hill Well was drawing water from Great Brook itself in addition to the underlying aquifer. This meant that contaminants that would normally impact surface water, could also impact the Watkins Hill Well. This re-delineation was approved by NH DES in 2013 and approved by the Walpole Planning Commission in January 2014.

3.2.2 Topography, Soils, and Geology

This well is located in the nearly level, moderately well drained soils of the Great Brook floodplain. According to the Soil Survey of Cheshire County, this soil is classified as a Pootatuck fine sandy loam, resulting from alluvial deposits, with moderate to very rapid transmissivity (USDA Soil Conservation Service 1989). The stratified drift aquifer along the Connecticut River extends to within 2,700 ft west of the well. The rapid transmissivity of the

soils in the area likely allows the Watkins Hill Well to draw from this aquifer despite the separation. Great Brook likely contributes to the supply of the Watkins Hill Well. Elevation in the wellhead protection area changes from 640 ft above mean sea level at the well house to 1,240 ft at the eastern edge of the wellhead protection area.

3.2.3 Surface Water Features

Great Brook flows roughly from East to West approximately 100 feet from the Watkins Hill Well House. Due to the well's location near the stream and its location in highly permeable sand and gravel deposits, it is likely that the Watkins Hill Well can induce considerable amounts of water from Great Brook. Three wetlands have been inventoried within the Watkins Hill SPA: Murtha's Pond, a 7.7 acre surface water body located northeast of the well, a smaller pond due north of the well, and another small retention pond south of the well (Hall 1997).

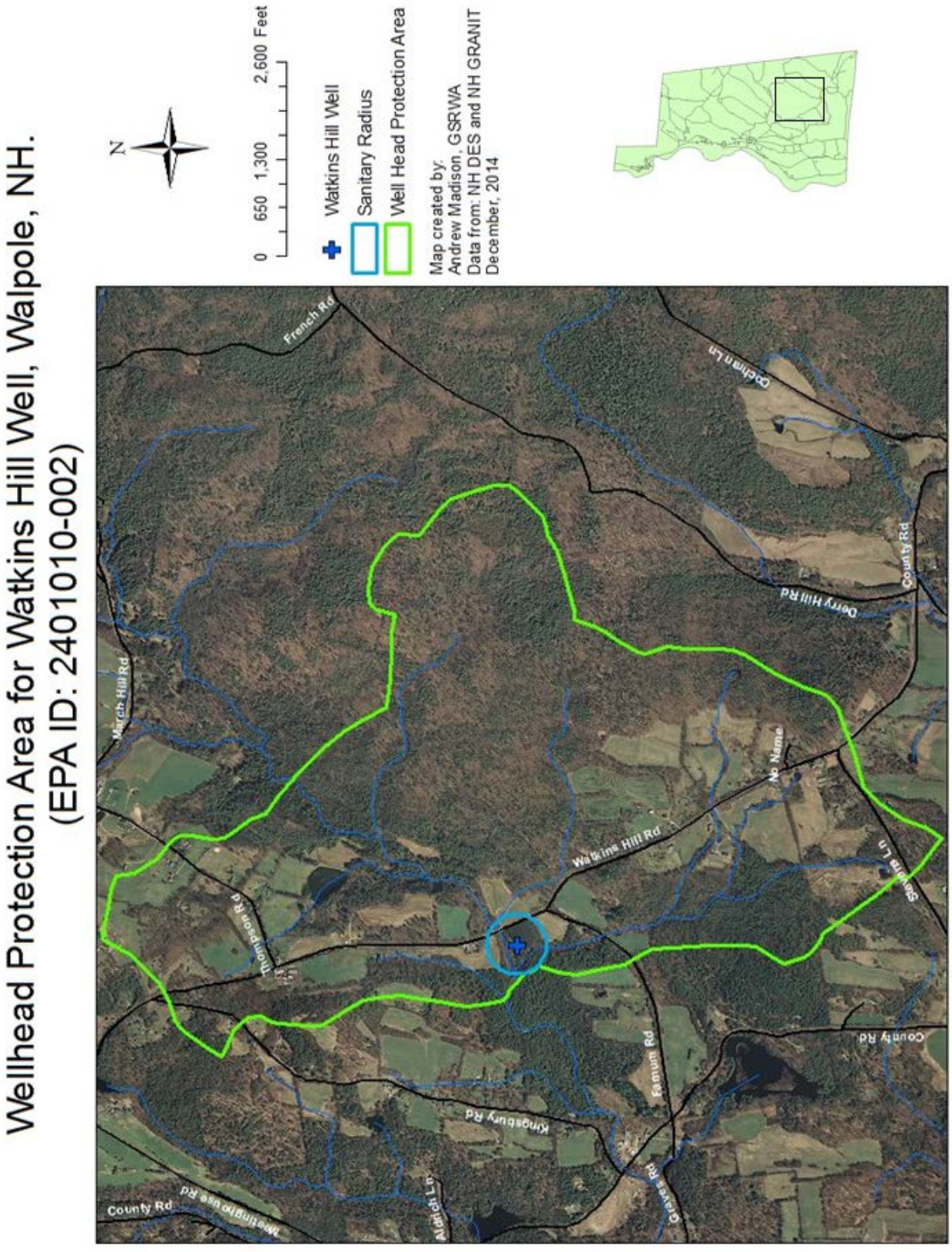

Figure 4. Wellhead Protection Area and Sanitary Radius for Watkins Hill Well, Walpole, NH. Data from NH DES and NH GRANIT.

3.3 Potential Contamination Sources

3.3.1 Potential Impacts from Former or Historic Land Uses

The Watkins Hill area has traditionally been rural and agricultural in nature and as such, historic land uses have been limited to agriculture, timber, and light residential. As such, there are no known impacts from former or historic land uses.

3.3.2 Potential Impacts from Current Land Uses

The Town of Walpole has worked to protect the sanitary protective radius of the Watkins Hill Well by owning a portion of its sanitary radius and controlling activities in that area. The Town of Walpole currently owns a 4.4 acre plot, donated in 1949 by the Britton family, upon which the Watkins Hill Well is located. Existing land use activities in the zone of contribution which may have an impact on surface water sources include:

- Transportation corridors
- Residential Land Use
- Agriculture

1). Transportation corridors
Watkins Hill Road dissects the wellhead protection Area from north to south. It is also located within 400 feet of the well. Other roads in the wellhead protection area include Thompson Road and Farnum Road. These three roads are small, rural roadways and do not see heavy traffic and vehicles transporting hazardous materials along these roads are rare. The portion of Farnum Road within the wellhead protection area is made of dirt and gravel. Roadways can be a source of chlorides found in road salts and increase the risk of accidental releases of petroleum and automotive products. Roadways are also a significant non-point source of pollution. Since the roadways within the Watkins Hill wellhead protection area are small and lightly traveled, the risk to the Watkins Hill Well is considered "Low".

2). Residential Land Use
The Watkins Hill area is a low-development, rural-agricultural area and residential density in this area is low. A windshield survey identified only 23 private residences in the area in the 960 acre (1.5 sq mi) area. Residential land use is associated with the presence of septic systems, oil heat, and lawn care products. On-site septic systems represent potential sources of nitrates, chlorides, bacteria, and viruses. If septic systems are improperly used for disposal of household hazardous wastes such as paints and solvents, septic systems can also be a source of synthetic organic compounds. Sewer service is not available in this area. Because of the low residential density, the risk to the Watkins Hill Well is considered "Low".

3). Agriculture
As mentioned earlier, agricultural land may serve many benefits for the protection of drinking water, including keeping land free from development and available for aquifer recharge. However, some agricultural activities may represent a source of contamination from pesticides, nitrates, bacteria, and viruses (associated with livestock concentrations). Rural-Agricultural zoning comprises 778 acres (81%) of the wellhead protection area

with approximately 275 acres of that actively in production. Much of the farmland within the wellhead protection area is dedicated to pasture and hay/alfalfa production with approximately 50 acres dedicated to cultivated crops such as silage corn. A 90-head dairy operation is present in the wellhead protection area and is located approximately 3,100 ft north of the Watkins Hill Well. Two 500 gallon aboveground storage tanks, containing diesel and gasoline are also on the premises of this farm. The risk to the Watkins Hill Well from agricultural activities is considered to be "Medium". It is important to note that the land upon which the Watkins Hill Well sits was donated to the town by the Britton Family and has been a source of high-quality drinking water since.

3.3.3 Potential Impacts from Future Land Uses

The Watkins Hill Well wellhead protection area is currently zoned rural-agricultural and timberland. Some increased residential development may occur, however, it is anticipated that this area will remain rural in character and continue to support agricultural activities (Walpole Master Plan).

Walpole's rural-agricultural zoning regulations help protect the wellhead protection area of the Watkins Hill well by restricting land uses to single or two-family residential, light office/commercial uses including lawyer's, doctor's, accountant's offices, and agricultural uses. The rural-agricultural zoning regulations do, however, offer a special exemption for industrial or commercial purposes

Although timberland zoning regulations do not allow for residential development aside from trailers or temporary logging/hunting camps, they acknowledge that future development is possible.

3.3.4 Potential Impacts from Land Uses Outside the Wellhead Protection Area

Although land uses and activities within the wellhead protection area have the most significant impacts on water quality at the well, contaminants located outside that area can still have an impact. Located approximately one mile northeast of the Watkins Hill Well on March Hill Rd. is a vehicle service, sales and repair shop. In November, 1993 six underground storage tanks were removed from this property consisting of one 500 and one 1,000 gallon gasoline tanks, two 500 and one 1,000 gallon #2 fuel oil tanks, and one 500 gallon kerosene tank. Upon removal VOC's were discovered at a concentration of 149ppm in the vicinity of the 500 gallon kerosene tank and greyish colored soils were discovered, both indicative of a product release. Upon laboratory analysis ethylbenzene and xylene were discovered in the surrounding soils at concentrations of 1,700 and 3,900 mg/kg respectively. In July, 1994 monitoring wells were installed around the area of the tanks and groundwater samples were taken. According to the site characterization report dated November, 1994, no contaminants were detected in groundwater samples. Additionally, the report stated that drinking water wells in the local area were not likely threatened since groundwater in that area has a northerly flow. The findings from the site characterization report suggest that the risk to the Watkins Hill Well from this site is low.

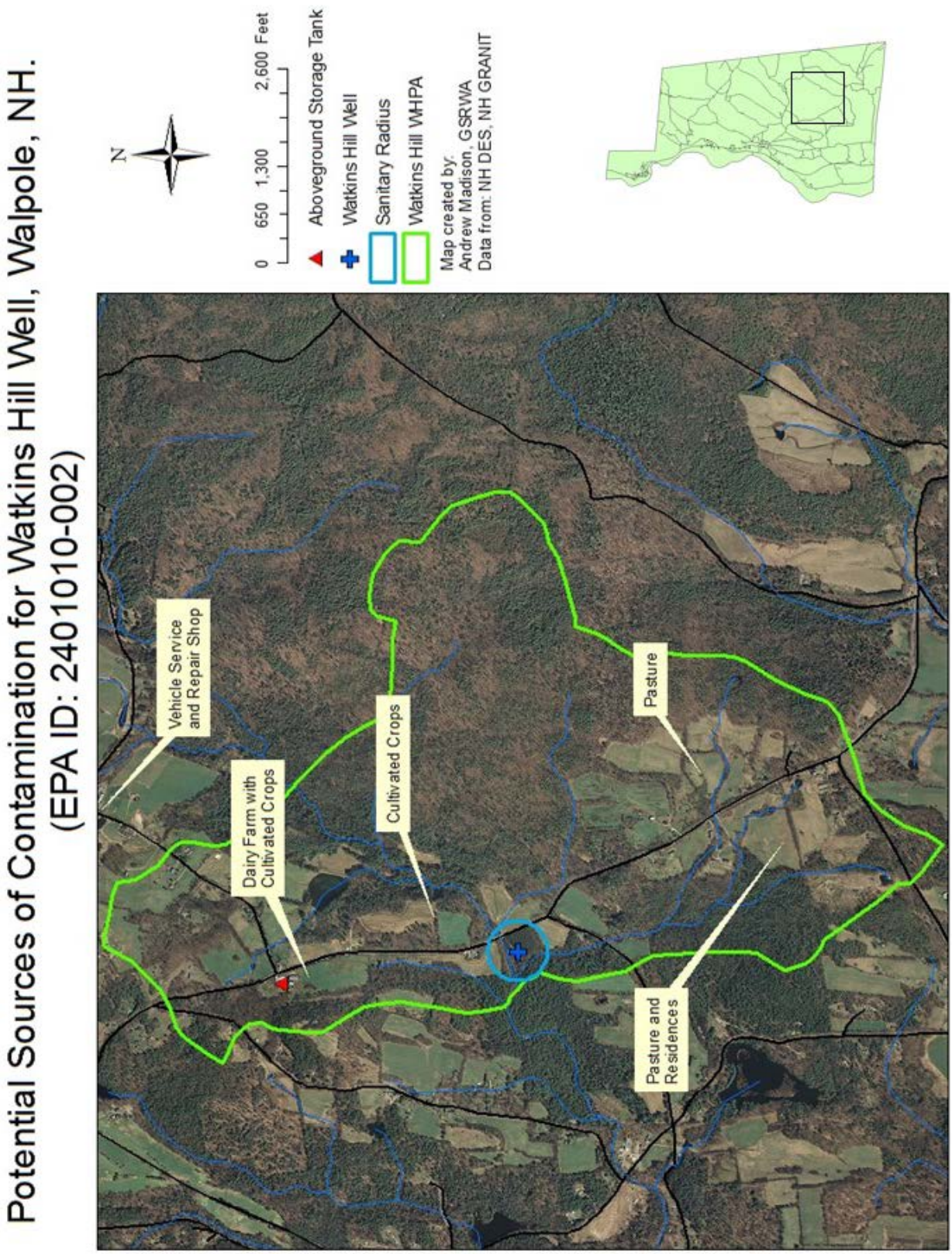

Figure 5. Potential sources of contamination in the Watkins Hill Well area. Sources: NH DES, NH GRANIT.

3.4 Current and On-Going Management Activities

The Town of Walpole has worked to protect the sanitary protective radius of the Watkins Hill Well by owning a portion of its sanitary radius and by controlling activities in that area. The Town of Walpole currently owns a 4.4 acre plot, donated in 1949 by the Britton family, upon which the Watkins Hill Well is located. However, the 4.4 acre plot covers less than half of the 11.5 acre sanitary radius. The timberland zoned area in the upper portions of the wellhead protection area can help protect ground water quality by preventing residential development, but only for as long as the timber is not harvested.

4. Management of Risk for the Town of Walpole System

In order to reduce the risks of contamination to the River and Watkins Hill wells, and to continue to properly steward this resource, the following activities should be implemented:

- Conduct an Education and Outreach Campaign
- Maintain a Drinking Water Committee
- Implement a Wellhead Protection Overlay District Ordinance
- Create a Zoning Map
- Create a List of Property Owners within the Wellhead Protection Area

4.1 Conduct an Education and Outreach Campaign

Public education and outreach is central to this plan because increased awareness by property owners, consumers, and local businesses leads to better management of contamination risks within the wellhead protection areas. The Town of Walpole and the Walpole Water Department routinely conducts, and should continue to conduct the following activities:

- Continue distribution of a notice highlighting the schedule for Walpole's Household Hazardous Waste Collection Days, to foster increased use of this service.

- Continue to distribute informational brochures on the ways residents can help to protect Walpole's groundwater resources. Examples of these informational materials can be found in Appendix 4.

- Maintain signs at the well houses which read "Tampering with this Facility is a Federal Offense".

- Distribute Example Letter #1 to property owners located within Walpole's wellhead protection areas. The purpose of this letter is to notify owners that their property is located within a wellhead protection area for Walpole's Water Supply. This letter will be sent within three months of receiving State approval of this plan. A factsheet on topics such as septic system maintenance, and heating oil storage, and a copy of the source protection map will be included with the notification letter. These materials are provided in Appendix 4.

- Distribute Example letter #2 along with appropriate maps to the following entities: Southwest Regional Planning Commission, Walpole Police Department, Walpole Fire Department, New Hampshire Department of Transportation District 4, and the Walpole Highway Departments. This is to increase institutional awareness of the wellhead protection areas and to encourage these entities to consider the sensitivity of the wellhead protection areas to contamination while executing their respective duties.

- Make available, information regarding the proper maintenance of septic systems, appropriate fertilizer use, and other general groundwater

protection information, at Town Hall, and local businesses such as hardware stores, and farm supply stores.

- Copies of this plan will be distributed to Town Boards and made available at the Town Hall, the Walpole Library, and on the Town website.

4.2 Maintain a Drinking Water Committee

Formed in 2002, the Walpole Drinking Water Committee oversaw the creation and implementation of a drinking water protection plan in 2003. This committee reconvened in 2013 to address new and emerging threats to Walpole's water supply by overseeing the creation and implementation of this report. After the management activities outlined in this plan have been implemented, the committee should meet annually to review this plan. The committee should update and resubmitted to NH DES, this plan once every three years for approval to ensure the plan remains accurate, up-to-date and viable. The steering committee should be composed of members representing groups such as:

- Water System Operator
- Selectboard
- Conservation Commission
- Planning Board
- Zoning Board of Appeals
- Walpole residents
- Local farmers and land owners
- Business Owners

4.3 Update the Current "Well Source Protection Ordinance"

Ideally, the most effective ways to protect groundwater is by owning land within the wellhead protection area. However when that option is not available or not viable, zoning ordinances designed to control land-use activities within the wellhead protection area can provide a strong level of protection for groundwater resources. An aquifer overlay zone will provide a tool for various town boards to use when considering the potential impacts of development proposals on town drinking water resources. The Walpole Drinking Water Committee has reviewed a draft wellhead protection overlay district ordinance created by NH DES as well as a similar ordinance implemented by Rindge, NH. Using the information gained from these documents, the Walpole Drinking Water Committee drafted a revised Wellhead Protection Overlay District Ordinance during 2014. This revised ordinance is designed to replace the current Town Well Source Protection Ordinance and will better address contemporary threats to Walpole's water supply, and guard against future threats to groundwater quality. This ordinance had been reviewed by Walpole's Select Board, Planning Committee, and Zoning Board of Appeals and has been recommended by all three. The proposed Wellhead Protection Overlay District is expected to be on the March, 2015 town ballot and, if approved, will replace the 2004 town Well Source Protection Ordinance and provide a higher level of regulatory protection for Walpole's drinking water sources.

4.4 Create a Zoning Map

It is imperative that landowners, public officials, water system operators, commercial developers, planning officials, and the general public have access to accurate, up-to-date maps of zoning districts. Although Walpole's zoning districts are defined through various ordinance, no map currently exists, which is publically accessible, that accurately displays Walpole's zoning districts. Having access to a map showing these districts will help land owners and developers better understand what activities are permitted on their associated lots, and will assist town officials and planners in decision making with regard to land uses within the town.

4.5 Create a List of Property Owners within the Wellhead Protection Areas

The creation of a list of wellhead protection area property owners had initially been a goal of this source water protection plan. The Town of Walpole is currently working with an independent contractor to map and identify taxable properties and their owners throughout the whole town. This database of property owners and lot numbers will not likely be completed in time to be made a part of this report. Upon the final completion of the mapping project, tax maps should be clipped by the established wellhead protection area and the owners of properties falling within identified and compiled. This list can then be used to contact property owners and provide them with information on how they can help protect Walpole's drinking water supply. This list should be created as soon as the GIS shape files and associated attribute tables are completed by the contractor and presented to the town.

Part II

North Walpole Village District Systems

PWS ID: 2401020 (Lower)

PWS ID: 2401030 (High)

5. North Walpole Village District Lower System

5.1 Description of Source

The North Walpole Village District Lower System is a community water system that serves approximately 800 people through 250 connections. This system has two gravel packed wells (GPW007 and GPW008) that are located in a sand and gravel aquifer 100 feet from the Connecticut River. Both gravel packed wells are located on a village owned commercial lot alongside the village police and fire stations. GPW007 has a capacity of 225 gallons per minute and was approved for use in 1988. GPW008 produces 80 gallons per minute and was approved for use in May 2004. The system also has two inactive bedrock wells (BRW002 and BRW003), drilled in 1951 and 1958 respectively, that are located 850ft and 2,600ft northeast of the two gravel packed wells respectively. BRW002, located on East St. has since been abandoned and filled Approximately 70,000 gallons per day are supplied to the system by GPW007 as of 2013. The two gravel packed wells feed into two underground, concrete storage tanks holding 275,000 and 325,000 gallons.

Table 3. Summary of well information for the North Walpole Village District Lower System, Walpole, NH.

Well ID	Total Depth	Casing Depth	Static Water Level	Year Drilled	Avg. Daily Yield	Casing Type
GPW007	60 ft	45 ft	15 ft	1988	70,000 gal	Steel
GPW008	60 ft	45 ft	15 ft	2003	Reserve	Steel

In October 2010, chlorinated VOCs were detected in GPW008. Because of the association of chlorinated solvents with 1,4,-dioxane, NHDES sampled GPW008 for 1,4-dioxane in July 2011. 1,4 – dioxane was detected at 3.17 ppb (parts per billion) and 3.24 ppb in GPW002. In July 2011, GPW007 was also sampled for 1,4-dioxane however, none was not detected. In October 2011, the District began using GPW007 as its primary source, at the request of NHDES. In November 2012 chlorinated solvents and 1,4-dioxane were detected in GPW007 for the first time. An NHDES study dated May, 2013 determined that the likely source of contamination is likely the result of historic activities located up-gradient from the well. The system is currently working with an engineering firm to determine the source of the contamination and to investigate potential remedies. In the event that a remedy is not found, the system operators are considering alternative sources such as alternative treatment or the two bedrock wells.

5.2 Description of Wellhead Protection Area

5.2.1 Location and Land Use

The North Walpole Village District Lower System has a wellhead protection area for its wells delineated by NHDES based on its withdrawal volume and incorporating the aquifer's zone of recharge. The wellhead protection area for North Walpole extends northeast from the

Connecticut River to the ridge of Fall Mountain and extends into both Charlestown and Langdon (Figure 4). The wellhead protection area is predominantly forest with 616 acres covered representing approximately 90% of the total wellhead protection area. However the area surrounding the two gravel packed wells is a densely populated residential/commercial area. Residential land use covers approximately 60 acres and industrial land use covers 12 acres, representing approximately 8% and 2% of the total wellhead protection area respectively. The majority of the wellhead protection area is zoned for industrial use with 440 acres or 64% covered. Some of this area is located along the slopes of Fall Mountain, and would be impractical for industrial use however. A 2 acre plot owned by the village district, where the two gravel packed wells are located, is zoned commercial. The remaining 246 acres, representing 35% of the wellhead protection area is zoned residential. The current wellhead protection area (upon which this report is based) is currently being re-evaluated and may change in size or shape in the future.

5.2.2 Topography, Soils, and Geology

The wellhead protection area extends from the banks of the Connecticut River in North Walpole at an elevation of 322ft to the ridge of Fall Mountain at 1,115ft. The two gravel packed wells are located in North Walpole at an elevation of 322ft while the bedrock wells are located at 330ft (BRW002) and 400ft (BRW003) above mean sea level. North Walpole is located in a stratified drift aquifer formed by deposits from glacial Lake Hitchcock approximately 12,000 years ago. This area sits within the 100-year floodplain of the Connecticut River and soils are comprised of well-drained sandy loams, resulting from alluvial deposits. The area around the well-house and adjacent to the river is primarily composed of Udorthents, very-deep, well-drained sandy loam, or Agawam and Windsor fine sandy loam. Lyman-Turnbridge formations comprised of shallow, well-drained sandy loam over schist or gneiss bedrock.

5.2.3 Surface Water Features

There are several small ponds within the wellhead protection area, two of which are minor impoundments, others may be beaver ponds or seasonal water bodies. An un-named, second order stream drains several small ponds on Fall Mountain and in the Village. Two ephemeral streams converge with this un-named stream, which drains into the Connecticut River.

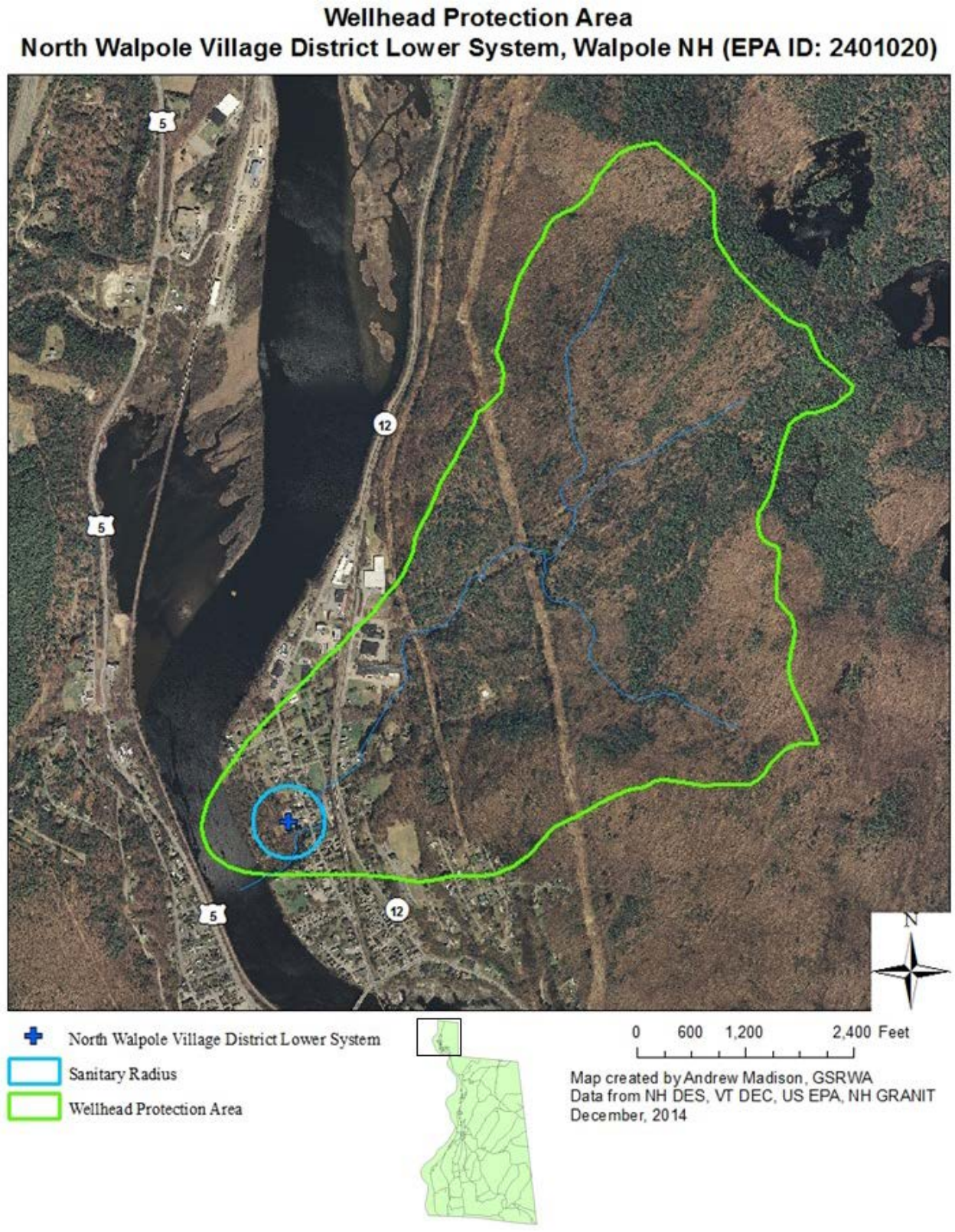

Figure 6. Wellhead Protection Area and Sanitary Radius for the North Walpole Village District Lower System, North Walpole, NH. Data from NH DES and NH GRANIT.

5.3 Potential Contamination Sources

5.3.1 Potential Impacts from Former or Historic Land Uses

Historic land uses, even from decades past, can have groundwater impacts in the present day. Under and aboveground storage tanks can be particularly problematic for water systems. Several above and underground storage tanks have been removed from the wellhead protection area.

Six aboveground storage tanks were closed at a bulk fuel storage facility on Main St. in 2008. These tanks consisted of the following: (2) 30,000 gallon diesel gasoline storage tanks; (2) 30,000 gallon kerosene storage tanks; (2) 27,000 gallon #2 heating oil storage tanks. These tanks were closed after a 2006 NH DES inspection revealed major upgrades were needed. Soil samples taken at the site discovered Naphthalene concentrations of 16,900 and 108,000 µg /mg-soil, which is in excess of the state recommended standard of 5,000 µg /mg-soil. Soil samples also discovered concentrations of 1,2,4-trimethylbenzene at 235,000 and 233,000 µg /mg-soil, in excess of the state standard of 130,000 µg /mg-soil. Groundwater revealed VOC's in excess of state ambient groundwater quality standards at one site during October 2010, but not during following sampling events. A soils delineation study conducted during the summer of 2011 identified a 30 by 75ft section of soil 17ft deep that had been impacted and needed removal, which was performed in December 2011. After the excavation and removal of contaminated soils, it was recommended that groundwater monitoring wells be installed to monitor for residual petroleum products remaining in soils. These wells were drilled during summer, 2012 and groundwater samples were collected during fall 2012 and spring 2013. Three monitoring sites showed concentrations of benzene and naphthalene to be in excess of state ambient groundwater quality standards, as a result another round of groundwater sampling was ordered by NH DES for spring and fall 2014.

A 500 gal kerosene underground storage tank, located at a former building supply company site on the corner of Main and Church St., was removed in 1992 with no soil contamination found.

In 2003, two 2,000 gallon gasoline underground storage tanks were removed from a former service station on Church St. No closure report was available for this removal, so it is unknown as whether any petroleum products were released.

A 1,000 gallon underground storage tank storing gasoline was removed from a former fertilizer storage facility on Route 12. No closure report was performed for this removal so it is unknown as to whether any petroleum products were released or if contaminated soils were present. A windshield survey revealed the presence of an inactive storage tank at this facility, however it was unclear as to the tank's origins or its former contents.

A 10,000 gallon #2 heating oil underground storage tank was removed from a metal working facility along Route 12 and immediately outside the current source protection boundary. Soil and groundwater samples were taken and no release or contamination was found according to the closure report.

Four large underground storage tanks were removed from a former bulk fuel storage facility on the corner of Duffy St and Route 12. One 10,000 gallon kerosene and one 20,000 diesel underground storage tank were removed in October, 1987 without any closure report filed or soil samples taken. In June, 1991two 20,000 gallon diesel tanks were also removed from the site. On this occasion a closure report was filed and soil samples taken and analyzed with no contamination found. A private residence is currently located on this site.

Historic tanks may have leaked overtime and contaminants may persist in groundwater and soils even after removal. When soil and groundwater samples are not taken after a removal (which is the case in a few removals in North Walpole) leaks, releases, and contamination levels cannot be determined and remediation actions may not take place. Although most tank removals show little or no release, it is still possible that product was released during filling operations or along attached pipelines. It is also possible that some tanks have been removed without any notice given to NH DES or to the town. The risk to the North Walpole Village District Lower System from removed above and underground storage tanks is considered to be "High" largely due to known releases as well as from the lack of closure reports from some tanks.

5.3.2 Potential Impacts from Current Land Uses

Existing land use activities in the wellhead protection area which may have an impact on groundwater sources include:

- Transportation corridors
- Residential land use (i.e. septic systems, oil heat, household hazardous waste)
- Urban land cover
- Above and underground storage tanks
- Industrial and manufacturing

1). Transportation Corridors

The active gravel packed well (GPW007) and its backup (GPW008) sit adjacent to Route 12 in a municipal lot containing town offices, a fire station and a police station. The wells are centrally located within a densely populated residential area with many local streets and within 1000 ft of an active railroad. Roadways increase the risk of accidental releases of petroleum and automotive products, are a significant source of chlorides form road salt application, and are also a significant non-point source of pollution. Railways also increase the risk of accidental release of petroleum products and other hazardous chemicals, however they are not major sources of non-point sources of pollution. Tank cars on railways can de-rail or otherwise be damaged and leak. Since these cars can contain any hazardous material and often have limited secondary containment and leak detection equipment, their presence in the wellhead protection area is especially hazardous. Both this report, and the NH DES SWAP Report (2005) consider the risk to the North Walpole Village District Lower System to be "High".

2). Residential Land Use

The active and back-up wells for the North Walpole Village District Lower System are both located in a densely populated area. Residential land use is associated with the presence of septic systems, oil heat, and lawn care products. Some residences may have the presence of automotive chemicals due to home automotive work. On-site septic systems represent potential sources of nitrates, chlorides, bacteria, and viruses. If septic systems are improperly used for disposal of household hazardous wastes such as paints and solvents, septic systems can also be a source of synthetic organic compounds. Although sewer access is available for most residences in the wellhead protection area, it may not be available everywhere. Oil heat is the most common form of household heating in the area and tanks are located either below ground in basements or above

ground and adjacent to the house. Most of these do not have protective containment structures. The risk to the North Walpole Village District Lower System is considered "High" by both this report and the NH DES SWAP Report (2005).

3). Urban Land Cover
Approximately 15% (100 acres) of the wellhead protection area is occupied by urban land uses such as buildings, residences, roads, and parking lots. Water quality impacts from non-point sources, as well as loss of recharge, are associated with levels of impervious surface area of 10% or more. Urban areas can also be a significant source of petroleum products and other automotive chemicals from heavy traffic. The two gravel packed wells both sit centrally within the urban area. The risk to the North Walpole Village District Lower System due to urban land cover is considered "High" by both this report and the NH DES SWAP (2005).

4). Above and Underground Storage Tanks
One, 10,000 gallon underground #2 heating oil tank is currently present at a facility that produces product display and floor cases located on Main St. This tank was installed in 1997 of a composite construction with plastic piping, and spill/overfill prevention. This tank replaced a 9,000 gallon #4 heating oil tank that was removed that same year. Since installation, the facility has been found to be in violation of NH DES regulations on several occasions including violations for operator training, registration, permit display, and leak detection testing. The most recent violation was found in September 2014 and regarded operation training and certification.
A 6,000 gallon underground #2 heating oil tank was installed at the North Walpole School on Mt. View Rd. in 1995. This tank replaced a similar 6,000 tank removed that same year. The new tank was installed with overfill/spill protection as well as leak protection. No soil or groundwater contamination was detected when the old tank was removed. This tank is located in the portion of the wellhead protection area that overlaps with the North Walpole Village District High System wellhead protection area.
Five aboveground storage tanks, all containing #2 heating fuel, are present at the woodworking facility on Main St. These consist of two 6,000 gallon and three 275 gallon tanks installed in 1995. All of these tanks are equipped with spill/overflow prevention and leak detection equipment.
Underground and aboveground storage tanks can present a significant risk to groundwater systems due to the risk of leaks and spills. Historic tanks may have leaked overtime and contaminants may persist in groundwater and soils even after removal. When soil and groundwater samples are not taken after a removal (which is the case in a few removals in North Walpole) leaks, releases, and contamination levels cannot be determined and remediation actions may not take place. The NH DES SWAP Report (2005) rates the risk to the North Walpole Village District System as "Medium", however given the number of tanks, volume of these tanks, and lack of closure reports for some historic tanks, this report considers the risk to be "High".

5). Industrial and Manufacturing
Two manufacturing or industrial facilities are present within the wellhead protection area and five more are located immediately outside and north of the current wellhead

protection area. Some of these sites possess active Hazardous Waste Permits issued by NH DES under the Resource Conservation and Recovery Act (RCRA).
A woodworking facility that produces window frames, doors and other wood finishings is located on Main St. The facility is currently an active RCRA-permitted small quantity generator producing 220 lbs. or less of hazardous waste per month. Waste paints and solvents are produced at this facility during the restoration and woodworking process, volatile organic compounds are present in these wastes.
Another facility and show room located on Main St. produces floor product racks, shelving and displays cases. Currently this facility is an inactive RCRA-permitted small quantity generator and has not reported a hazardous waste stream through a manifest since 1999. According to a 2001 NH DES hazardous waste survey, this facility reported that hazardous waste activities were no longer taking place at that facility. Former manifests reported waste streams including waste oils, solvents, and sodium hydroxide. An October, 2014 windshield survey found several 55-gallon drums labeled "flammable" stacked on a loading dock. It is unknown what these contained or if they are currently empty.
The facilities located in the wellhead protection area present a "Medium" risk to the North Walpole Village District Lower System.

5.3.3 Potential Impacts from Future Land Uses

The North Walpole Village District Lower System wellhead protection area is currently zoned for residential and industrial uses. A considerable amount of acreage within the Wellhead protection area zoned industrial has yet to be developed or is developed and is currently vacant. Future commercial development is likely to significantly increase impervious surface area and increase stormwater runoff, thereby reducing aquifer recharge. Future industrial development could introduce new sources of contamination depending on the industry. Increased vehicle and rail traffic from new industries could also increase the risk of an accidental release. There is also concern that the current wellhead protection area may not sufficiently account for the full zone of contribution. Therefore a potential expansion of the wellhead protection area may incorporate new lots potentially with unassessed risks to groundwater quality. This plan has attempted to assess the more serious risks from the industrial zone between the source protection boundary and the Connecticut River, however other risks in an expanded wellhead protection area have not been assessed. Many of the forested lots in the wellhead protection area are zoned for timberland but have not yet been harvested, it is unlikely that these lands could be developed due to the steep terrain. Currently the wellhead protection area is not protected by an aquifer overlay zone in the Village's zoning.

5.3.4 Potential Impacts from Land Uses Outside the Wellhead Protection Area

Although land uses and activities within the wellhead protection area have the most significant impact on water quality at the well, activities outside the wellhead protection area may still impact the well. Land uses outside the wellhead protection area that may impact the North Walpole Village District include:

- Industrial or manufacturing
- Transportation Corridors
- Above and underground storage tanks

- Historic Landfills

1.) Industrial or manufacturing
A facility located both on Main St. and immediately across the rail-road tracks on Route 12 produces commercial latex and vinyl wall coverings as well as wall papers. The company currently possesses an inactive hazardous waste permit and their last reported waste stream was in 2010. Previous wastes reported included waste oils and used solvents. The facility located between the railroad tracks and Route 12 was formerly the site of a metal rolling and stamping facility.
A warehouse and storage facility for fertilizers, pesticides and other agricultural products is located between Route 12 and the rail-road tracks immediately outside of the wellhead protection area. Products stored there are pre-packaged in small quantities for transport to retail stores or to customers. This facility does not produce or use these products therefore it does not possess an EPA Hazardous Waste Producer ID number. This site was formerly Twin State Fertilizer.
A facility that produces wood finishings, cabinetry, paneling and other architectural woodwork is located on Route 12 immediately north of the source protection boundary. This facility does not currently produce any hazardous waste in reportable quantities although varnishes, oils, and solvents may be stored in household quantities for use at job sites. As such, this facility does not possess an EPA Hazardous Waste Producer ID number. This site was formerly a building supply store.
A facility that produces vinyl lettering and wraps for cars and trucks and outdoor signs is located on Route 12 north of the source protection boundary. This facility is not currently reporting any hazardous waste stream and does not possess an EPA Hazardous Waste Producer ID number. This facility was formerly an auto parts store and vehicle service center.
Two retail stores are also present along Route 12, however neither of these facilities sell hazardous items.
Several industrial sites are located in Vermont along the banks of the Connecticut River and upstream of the village district wells, these include the following:
An automobile transmission manufacturing facility is located along the banks of the Connecticut River on Industrial Dr. in Rockingham, VT. This facility currently possess an RCRA large quantity generator permit through the State of Vermont and has recorded hazardous waste manifests including solvents, adhesives, and heavy metals (VT DEC). This facility is approximately one mile from the North Walpole Village District Lower System Well.
Three other facilities are also located along Industrial Dr. approximately 1-1.5 miles from the well, these include: A facility producing industrial coils and electronic cords generating waste solvents; A facility manufacturing jewelry producing small quantities of waste paints, adhesives, and solvents; A medical supply company producing waste adhesives and solvents.
Although these facilities are located outside the wellhead protection area, they are still located on the aquifer supplying both North Walpole Village District Systems. The release of a hazardous substance into either the Connecticut River or into groundwater risks that substance reaching the North Walpole Village wells, especially if that substance

is a persistence organic compound such as chlorinated solvents. The unique conditions created by the Bellows Falls Dam increase the likelihood that contaminants released into the Connecticut River will reach groundwater as opposed to traveling downstream. The risk to the North Walpole Village District Lower System from industrial and manufacturing sites located outside the wellhead protection area is "High".

2.) Transportation Corridors

Up-gradient and upstream of the Lower system wells, rail-road tracks are located on both the New Hampshire and Vermont sides of the Connecticut River. These railway tracks frequently carry tanker cars carrying a variety of hazardous substances in quantities of 20,000 gallons or more. Additionally, there is a rail loading/unloading facility located along Industrial Dr. in Rockingham, VT. At this type of facility cars can sit for days while being loaded or unloaded, increasing the risk that a leak may release large quantities of hazardous substances. The threat of derailment is always present with railways, and a derailment could result in the release of thousands of gallons of hazardous substances.

Route 12 also travels north of the wellhead protection area with US Route 5 traveling parallel across the Connecticut River in Vermont. Both of these roadways present the risk of a spill from a tanker-truck. The threat to the North Walpole Village District Lower System from these transportation corridors is considered "High"

3.) Above and underground storage tanks

An underground heating oil tank is present at a jewelry manufacturing facility along Industrial Dr. in Rockingham, VT. Aboveground storage tanks in Vermont are regulated by the Vermont Department of Environmental Conservation and any tank with a capacity above 2,000 gallons for a single tank and above 4,000 gallons for aggregate tank systems requires a permit. Strict setbacks from public drinking water sources and private wells mean placing large AST's within the congested Route 5 corridor in Rockingham is difficult. Therefore there are likely few AST's present along the Connecticut River in Rockingham, VT, however the presence of smaller, un-permitted AST's is likely. A windshield survey was not performed in Rockingham. The risk to the North Walpole Village District from above or underground storage tanks in Rockingham, VT is considered "Low". There are no AST's or UST's outside the wellhead protection area on the New Hampshire side of the river.

4.) Historic Landfills

A former, unlined open-pit landfill is located on the banks of the Connecticut River approximately five miles upstream of the North Walpole Village District wells on the Vermont side of the river. The 17-acre landfill operated from 1968 to 1991, accepting both household waste as well as being a certified hazardous waste facility for small quantity generators from 1983 until closure. In 1979 contaminants including heavy metals and VOC's were discovered in down-gradient drinking water wells. As a result the facility owners were ordered to conduct a hydrogeology study and to monitor

groundwater at the site in 1980 and again in 1983. The site was added to EPA's long term National Priority List (NPL) under the Superfund program in October, 1989. Groundwater interception trenches were installed in 1993 and the landfill was capped in 1994, long-term groundwater monitoring also began that year. The 1994 Record of Decision (ROD) listed average and maximum concentrations of heavy metals and VOC's discovered in groundwater during the 1980's, among the VOC's discovered were chlorinated solvents and heavy metals. After the 1994 capping, groundwater was monitored for the next 20-years and a review report on groundwater restoration was published every five years in 1999, 2004, 2009, and 2014. In the most recent project review report (2014), project goals for lead and arsenic had not yet been achieved and as a result the timeframe to achieve interim project standards for lead and arsenic was increased from 15 to 30 years with an expected project completion date now set for 2025. Due to groundwater seepage from bedrock aquifers and infiltration from rainwater, heavy metals and VOC's, specifically chlorinated solvents, were able to leach into groundwater. Among the chlorinated solvents discovered at the site were trichloroethene and tetrachloroethene, both of which commonly use 1,4-dioxane as a stabilizer.

5.4 Current and On-Going Management Activities

The North Walpole Village District currently owns 3.75 acres surrounding the Lower system wells, however the majority of the 400ft sanitary radius remains under private ownership and contains several residences as well as Village District offices, garage, and fire and police departments. Neither the wellhead protection area, nor the 400ft sanitary radius are currently under an aquifer overlay district or have any special zoning regulations.

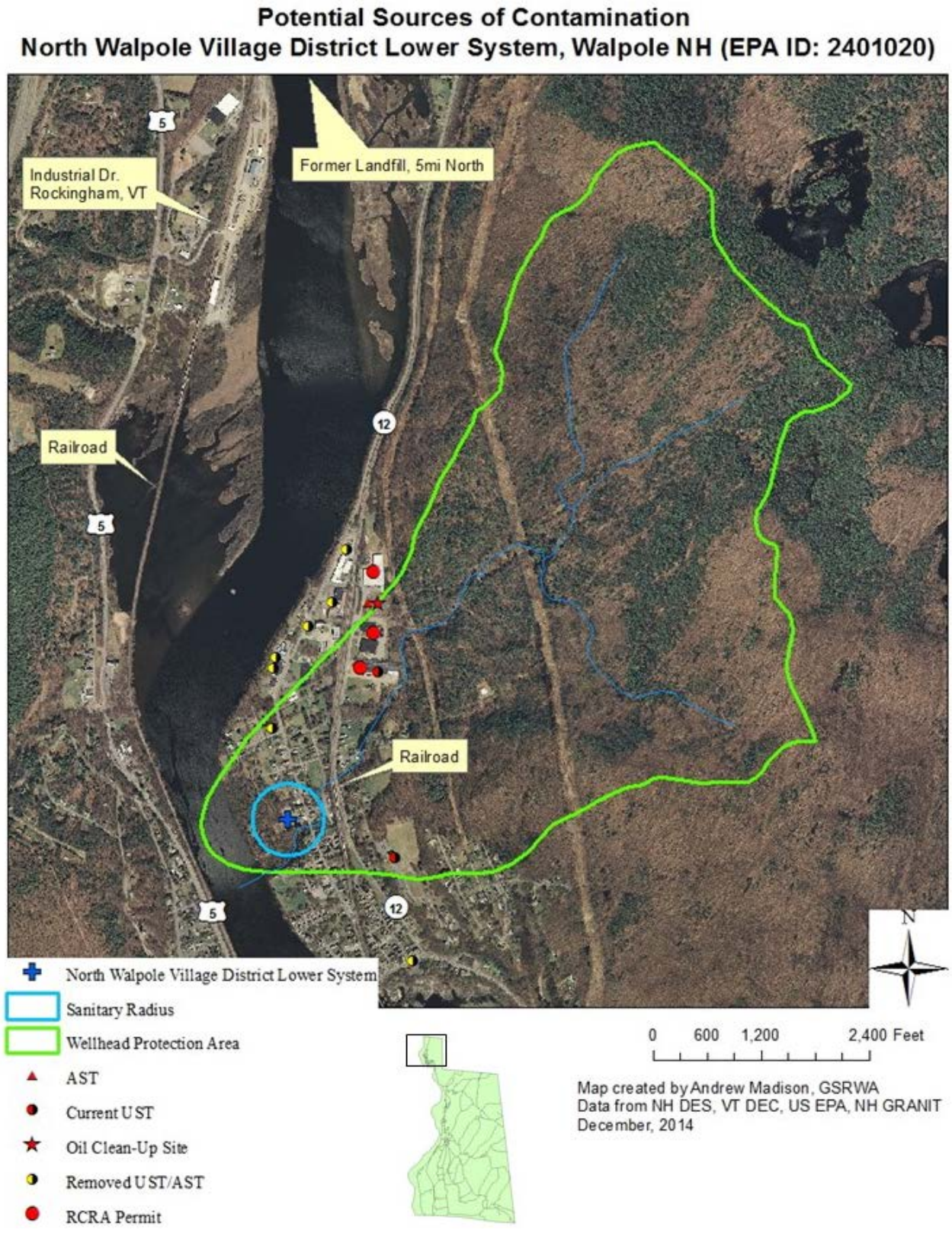

Figure 7. Potential Sources of Contamination in the North Walpole Village District Lower System area. Sources: NH DES, VT DEC, US EPA, NH GRANIT.

6. North Walpole Village District High System

6.1 Description of Sources

The North Walpole Village District High System is a community water system that serves approximately 100 people through 40 connections. This system has one bedrock well (BRW001) that is located 2000 feet from the Connecticut River on a village owned, forested lot east of a residential area. This bedrock well feeds into a 137,000 gallon storage tank nearby and is treated with trace chlorination. BRW001 has an average daily yield of 10,000 gallons and was approved for use in 1958. There are no current detects from anthropogenic sources including volatile organic chemicals, synthetic organic chemicals, or metals from the North Walpole Village District High System.

Table 4. Summary of well information for the North Walpole Village District High System, Walpole, NH.

Well ID	Total Depth	Casing Depth	Static Water Level	Year Drilled	Avg. Daily Yield	Casing Type
BRW001	360 ft	20 ft	40 ft	1958	10,000 gal	Steel

6.2 Description of Wellhead Protection Area

6.2.1 Location and Land Use

The North Walpole Village District High System has a wellhead protection area delineated by NHDES based on a fixed radius of 2,050 ft and covering 302 acres. The wellhead protection area is approximately 80% forest (241 acres) and 14% residential (43 acres). The Connecticut River below the Bellows Falls Dam flows through the southern corner of the wellhead protection area covering approximately 18 acres (6%). Route 12 runs through the southern end of the wellhead protection area and along it are two small commercial lots. Approximately 113 acres of the wellhead protection area overlaps with the North Walpole Village District Lower System wellhead protection area.

6.2.2 Topography, Soils and Geology

The wellhead protection area for the North Walpole Village District High System features steep slopes rising from the Connecticut River below the Bellows Falls Dam at an elevation of 280 ft to the northern edge of the wellhead protection area at 800ft above mean sea level. The well house is located on an inclining slope at approximately 500 ft. Excessively well-drained, Windsor fine sandy loam soils are located in the residential areas and along Route 12. Lyman-Turnbridge formations, characterized by shallow, well-drained sandy loam over schist and gneiss bedrock dominate the steep hillsides along Fall Mountain where the well-house is located.

6.2.3. Surface Water Features

The Connecticut River outflow from the Bellows Falls Dam travels west to east through the southern edge of the wellhead protection area. A small intermittent stream also drains an area of Fall Mountain through the wellhead protection area.

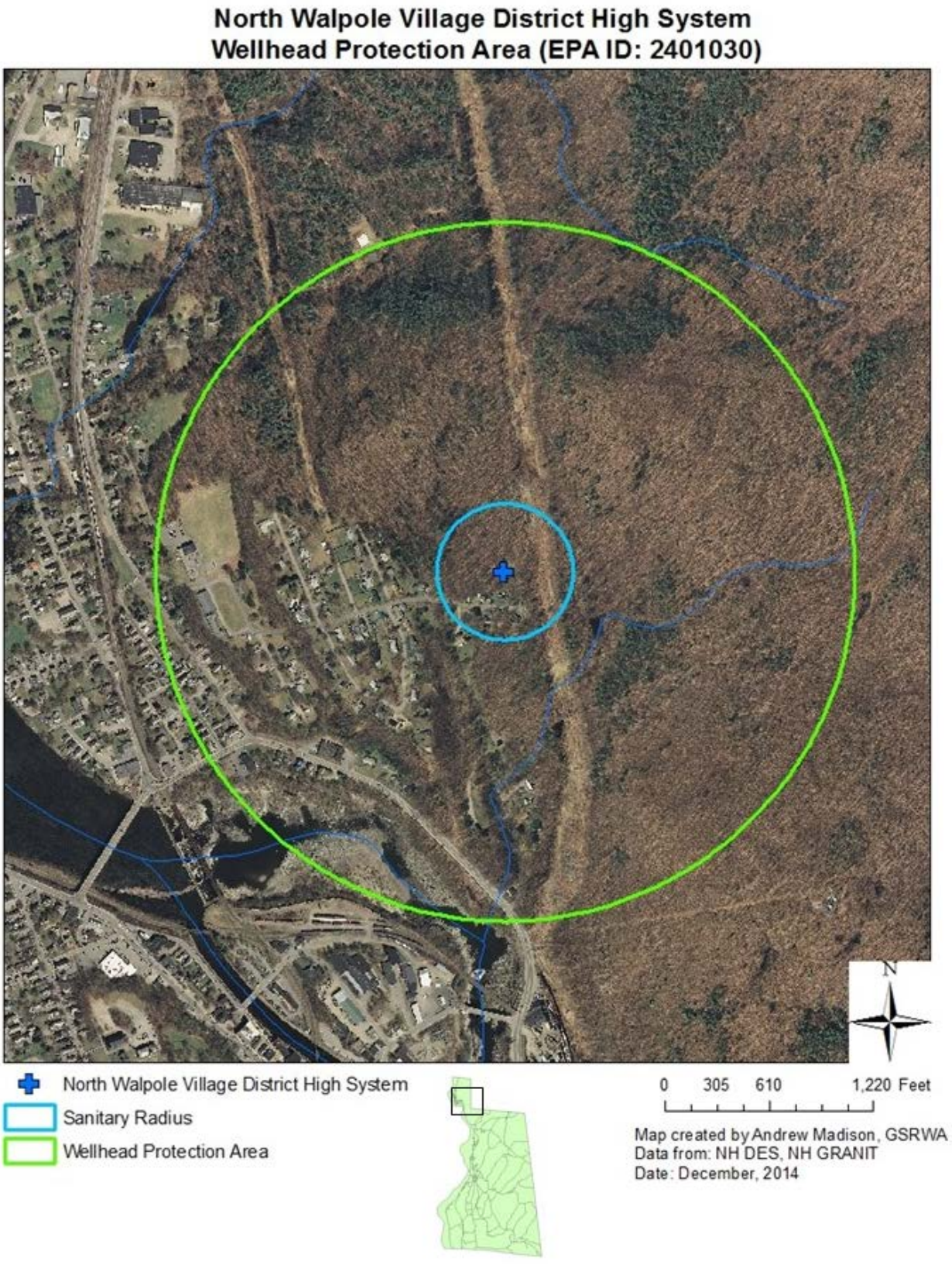

Figure 8. Wellhead protection area and sanitary radius for the North Walpole Village District High system. Sources: NH DES and NH GRANIT.

6.3 Potential Sources of Contamination

6.3.1 Potential Impacts from Former or Historic Land Uses

Much of the wellhead protection area for the North Walpole Village District High System is located on the slopes of Fall Mountain, where land uses have been limited. Former or historic land uses which may impact the North Walpole Village District High System include:

- Underground storage tanks
- Hazardous waste facilities

1.) Underground Storage Tanks

Underground storage tanks have been removed from two facilities within the wellhead protection area. A 7,600 gallon tank containing 1,200 gallons of #2 fuel oil and of an unknown age was removed from the site of a current grocery store along Route 12 in North Walpole. Contaminated soils and groundwater were found at the site of the tank, however samples taken from the most contaminated media found that they did not exceed state standards. As a result, no further remediation action was taken.

In 1993, a 4,000 gallon diesel gasoline tank was removed from an electric utility workshop facility on River Rd. off of Route 12 in the southwest corner of the Wellhead protection area. Although no odors or groundwater was detected, diesel fuel was detected at 20ppm in soils around the tank. Since the NH DES remediation target is 100ppm, no additional work was deemed necessary. This facility also possessed a small holding tank for waste oils as a part of an oil/water separator system in the garage floor drains. Since this system was cleaned out three times a year, and was connected to the Village sewer system, an NH DES UST permit was not required. The holding tank is no longer present at the facility.

2.) Hazardous Waste Facilities

Entities which generate hazardous waste are regulated and permitted by NH DES under the Resource Conservation and Recovery Act (RCRA). The electrical utility workshop facility possessed a small-quantity hazardous waste permit until 1999 when the property was sold to the New England Power Company and the facility use was changed. Waste streams from this facility included waste polychlorinated biphenols (PCB's), and waste oils. This facility no longer produces hazardous wastes and has been declassified as a hazardous waste facility. Since hazardous wastes are neither generated nor stored on the premises, the risk to the North Walpole Village District High System is "Low".

6.3.1 Potential Sources of Contamination from Current Land Uses

Existing land use activities in the Zone of Contribution which may have an impact on groundwater sources include:

- Transportation corridors
- Residential land use
- Urban land cover
- Above and underground storage tanks
- Underground injection control

1). Transportation Corridors
The well is located 1,400ft from Route 12 and 250ft from several small residential road. These residential roads are small and likely see only local traffic, however Route 12 is heavily traveled. Although the well-house is situated 200 ft above Route 12, its depth extends to 360 ft, meaning accidental releases could potentially reach it. Roadways increase the risk of accidental releases of petroleum and automotive products reaching the source and are also a significant non-point source of pollution. The risk to the North Walpole Village District High System from transportation corridors is considered "Medium".

2) Residential Land Use
There are numerous private residences in the wellhead protection area immediately downhill of the well-house. These neighborhoods are densely populated and cover approximately 43 acres or 14% of the wellhead protection area. Residential land use is associated with the presence of septic systems, oil heat, and lawn care products. Some residences may have the presence of automotive chemicals due to home automotive work. On-site septic systems represent potential sources of nitrates, chlorides, bacteria, and viruses. If septic systems are improperly used for disposal of household hazardous wastes such as paints and solvents, septic systems can also be a source of synthetic organic compounds. Sewer access is only available for the residences along Main St. and along Route 12. The residences closest to the well are largely reliant on septic systems. Oil heat is the most common form of household heating in the area and tanks are located either below ground in basements or above ground and adjacent to the house and most do not have protective containment structures. The risk to the North Walpole Village District High System from Residential Land Use is considered "High" by both this report and the NH DES SWAP Report (2001).

3) Urban land cover
Nearly 20% (61 acres) of the wellhead protection area is occupied by urban land uses such as buildings, residences, roads, and parking lots. Water quality impacts from non-point sources, as well as loss of recharge, are associated with levels of impervious surface area of 10% or more. Urban areas can also be a significant source of automotive chemicals and petroleum products as well. The risk to the North Walpole Village District High System due to urban land cover is considered "High" by both this report and the NH DES SWAP Report (2001).

4) Above and underground storage tanks
A 6,000 gallon #2 heating oil tank was installed at the North Walpole School on Mt. View Rd. in 1995. This tank replaced a similar 6,000 tank removed that same year. The new tank was installed with overfill/spill protection as well as leak protection. No soil or groundwater contamination was detected when the old tank was removed. This tank is located in the portion of the wellhead protection area that overlaps with the North Walpole Village District Lower System wellhead protection area.
Underground and aboveground storage tanks can present a significant risk to groundwater systems due to the risk of leaks and spills. Historic tanks may have leaked overtime and contaminants may persist in groundwater and soils even after removal. The

NH DES SWAP Report (2001) rates the risk to the North Walpole Village District System as "Low", however given the proximity and volume of the North Walpole School Tank, this report considers the risk to be "Medium".

5) Underground injection control
Underground injection control indicates the discharge of benign waste water into the ground not requiring a groundwater discharge permit. The New England Power Company Facility off of Route 12 possesses a well for the discharge of vehicle and road runoff from their small parking lot. The well is a Class V injection well, eight-feet deep, constructed of cement blocks and located on-site. This well could potentially introduce road salts, automotive chemicals, and petroleum products into the underlying aquifer. The risk due to underground injection control is considered "Medium" by this study due to the type of contaminants involved, but considering the limited quantities likely discharged.

6.3.3 Potential Impacts from Future Land Uses

The North Walpole Village District High System wellhead protection area is currently zoned for commercial and residential uses. Currently, 98% (298 acres) of the Wellhead protection area zoned Residential A&B and only 2% (5 acres) along the Connecticut River Zoned for commercial use. Much of the land zoned for commercial uses is either already occupied or is impractical for future development due to the steep ledges along the Connecticut River. Future development in some of the forested areas zoned for residential uses may also be impractical due to the steep slopes of Fall Mountain. Residential development in the forested parts of the wellhead protection area could increase the risk of contamination from faulty septic systems, household chemicals, lawn chemicals, or fuel oil tanks. Currently the wellhead protection area is not protected by an aquifer overlay zone in the Village's zoning.

6.3.4 Potential Impacts from Land Uses Outside the Wellhead Protection Area

Although land uses and activities within the wellhead protection area have the most significant impact on water quality at the well, activities outside the wellhead protection are may still impact the well. Land uses outside the wellhead protection area that may impact the North Walpole Village District, in addition to the list available in section 5.3, include:

- Hazardous Waste Sites
- Above or Underground Storage Tanks

1.) Hazardous Sites
The railyard located on Route 12 in North Walpole is a RCRA permitted large quantity hazardous waste facility. This facility maintains, repairs and, fuels locomotives and rail cars for a Vermont based rail-line. Typical hazardous waste manifests from this facility include oily debris, waste oils and lubricants, and waste fuels. The facility itself is located on a bedrock ledge, slightly higher in elevation than the depth of the High system bedrock well. This increases the possibility that released contaminants from this facility could reach the High system well through cracks in the bedrock. The risk to the North Walpole Village District High System from this facility is considered "High".

2.) Above and underground storage tanks

One 250 gallon diesel aboveground storage tank is located at the radio tower located on the summit of Fall Mountain to provide fuel for an on-site emergency generator. In December, 2008 approximately 200 gallons of diesel fuel leaked out of a fuel line from the tank to the generator. In January, 2009 erosion control berms were installed to prevent the movement of product and 322 tons of contaminated soils were removed from the site. In March, 2009 new soils were placed in the excavated area to promote the regrowth of vegetation. During the summer of 2009, groundwater monitoring wells were installed which revealed no further contamination, therefore NH DES determined in October, 2009 that no further action was needed.

Two vehicle service stations are located across the Connecticut River in Bellows Falls, Vermont. These two stations likely have several thousand gallons of gasoline and diesel present in underground storage tanks. Additionally, an aboveground storage tank of an unknown size and containing diesel is present at the Bellows Falls Train Station.

A railway yard possessing eight aboveground storage tanks is located one half mile south of the High system well along Route 12 and 400ft from the Connecticut River. These tanks include:

- Two 100,000 gallon diesel tanks.
- One 211,493 gallon #2 fuel oil tank.
- One 10,000 gallon kerosene tank.
- One 130 gallon #2 fuel oil tank.
- Two 275 gallon #2 fuel oil tanks
- One 500 gallon lubrication oil tank.

This facility is used as a bulk storage facility for the sale of heating fuel and the dispensing of diesel fuel to locomotives. All AST's are registered with NH DES and have appropriate leak detection systems and secondary containment installed. However, the large volumes present at this facility, its location on granite bedrock, and its proximity to the Connecticut River make it a "High" risk for both the North Walpole Village District High system and the downstream River Well.

6.4 Current and On-Going Management Activities

The North Walpole Village District currently owns a two-thirds acre forested plot surrounding the High system well, however the majority of the 400ft sanitary radius remains under private ownership. Neither the wellhead protection area, nor the 400ft sanitary radius are currently under an aquifer overlay district or have any special zoning regulations.

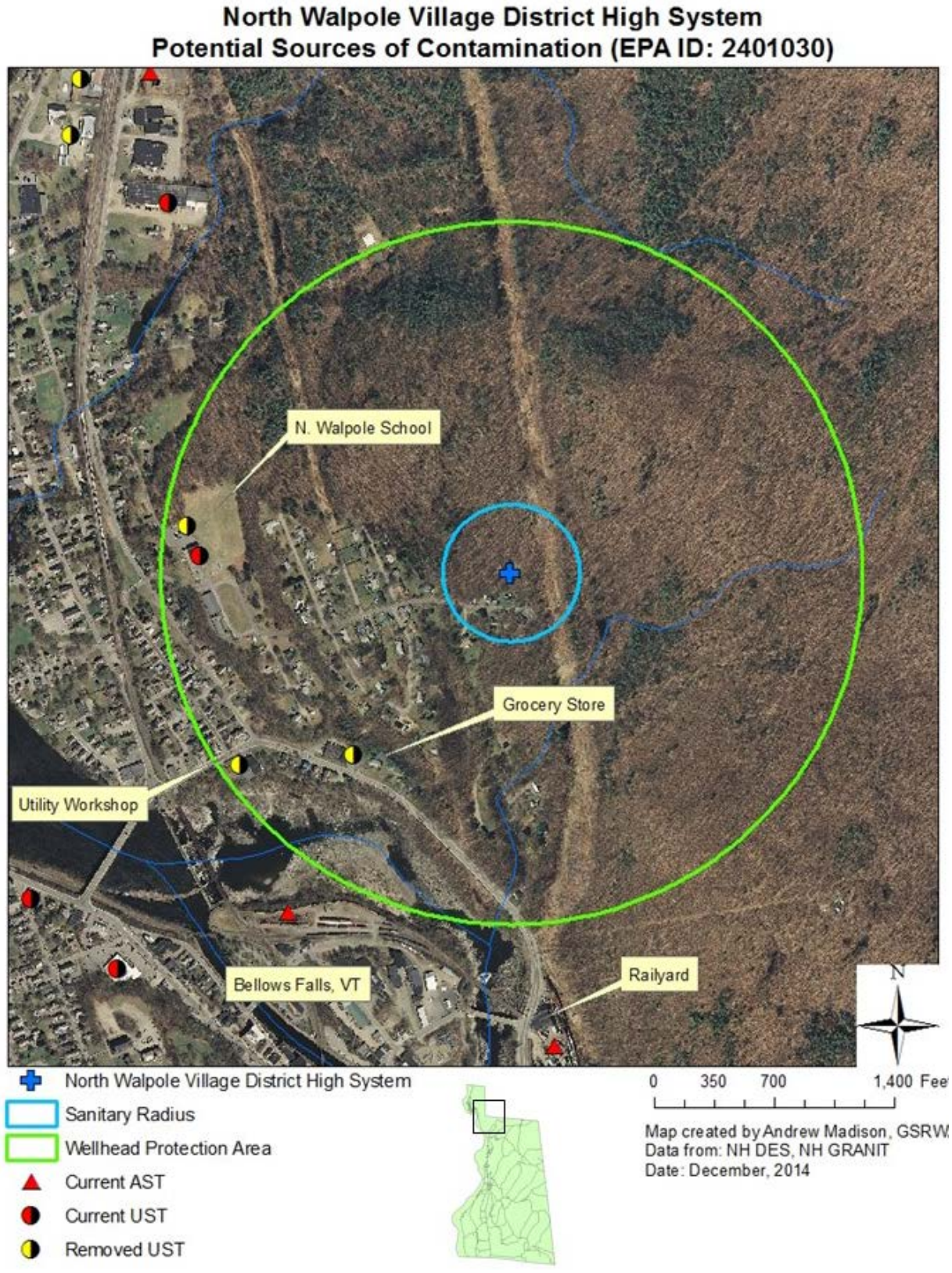

Figure 9. Potential source of contamination in the North Walpole Village District High system area. Data from NH DES and NH GRANIT.

7. Risk Management for the North Walpole Village District Systems

In order to reduce potential risks of contamination to the North Walpole Village District Low and High Systems' wells, and to continue to properly steward these resources, the following measures should be implemented:

- Develop a System Connection Contact List
- Conduct an Education and Outreach Campaign
- Develop a Wellhead Protection Ordinance

7.1 Develop a System Connection Contact List

In North Walpole, many residents reside in apartments, or in multi-family homes with property owners who live either out of town or even out of state. Important information regarding boil-orders, service interruptions, water quality reports, and educational materials may not reach actual system users, and instead just go to property owners. A list of system users could be developed from a list of physical addressed, working under the premise that at each address is a system user, if not a property owner or an individual connection. Having a more accurate contact list for system users will help the Village District distribute time sensitive information such as boil orders and details regarding system interruptions, or useful information such as educational materials and water quality reports.

7.2 Conduct an Education and Outreach Campaign

Public education and outreach is central to this plan because increased awareness by homeowners and businesses leads to better management of contamination risks within the wellhead protection areas. After developing a system contact list, the North Walpole Village District should conduct a campaign that will include, but not necessarily be limited to the following activities:

- Distribute a notice highlighting the schedule for Walpole's Household Hazardous Waste Collection Days to foster increased use of this service.

- Distribute informational brochures on the ways residents can help to protect Walpole's groundwater resources. Examples of these informational materials can be found in Appendix 4.

- Post signs at the well houses and storage tanks which read "Tampering with this Facility is a Federal Offense".

- Example Letter #1, or a similar letter, should be sent to North Walpole Village Residents, since almost all North Walpole Residents reside within, or adjacent to one of the wellhead protection areas. The purpose of this letter is to notify owners that their property is located within a Wellhead protection area for North Walpole's Water Supply. This letter should be sent within three months of receiving State approval of this

plan. A Factsheet on topics such as septic system maintenance, and heating oil storage, and a copy of the wellhead protection area maps will be included with the notification letter. A sample letter is provided in Appendix 4.

- Sample Letter #3, or a similar letter, should be sent to commercial properties in North Walpole. The purpose of this letter is to address water quality concerns specific to industries and commercial properties in North Walpole.

- Distribute Example letter #2 along with appropriate maps to the following entities: Southwest Regional Planning Commission, Walpole Police Department, Walpole Fire Department, New Hampshire Department of Transportation District 4, Walpole Highway Department, Town of Rockingham, VT, US EPA Region 1, Vermont Department of Environmental Conservation, and Railway Operators. This is to increase institutional awareness of the wellhead protection areas and to encourage these entities to consider the sensitivity of the wellhead protection areas to contamination while executing their respective duties.

7.3 Develop a Wellhead Protection Ordinance

One of the most effective ways to protect groundwater is by controlling land uses that occur within a wellhead protection area. Since acquiring land to protect the system may not be feasible in North Walpole, adopting a wellhead protection ordinance may provide a sufficient alternative for protecting groundwater quality. The Walpole Drinking Water Committee has drafted a Wellhead Protection Overlay District Ordinance for the River Well and Watkins Hill wellhead protection areas. This ordinance may serve as a template, and as a model for the North Walpole Village District to follow if it is decided to address potential contamination sources with a zoning ordinance. North Walpole faces unique challenges however, and a zoning ordinance drafted for the Village District will need to consider the dense residential areas, industrial areas, and transportation corridors all in close proximity to each other.

Part III

Walpole Transient and Non-Community Non-Transient Systems

PWS ID: 2408010 (Hooper Golf Course System)

PWS ID: 2406010 (Benson Woodworking System)

PWS ID: 2405010 (Drewsville Carriage House System)

8. Hooper Golf Course System

8.1 Description of Source

The Hooper Golf Course System is a transient system serving at least 25 individuals at a restaurant and golf course through two service connections. The system is supplied by a bedrock well drilled in June, 2000. The well has a total depth of 300 ft and a bedrock depth of 74 ft with a steel casing that extends to 86 ft and a test yield of six gallons per minute. The system is operated and maintained by the Town of Walpole, which also owns the property, however a sale is pending. The property was donated to the town in 1926 by Mr. and Mrs. George L. Hooper and developed into a golf course in 1927. There are no current detects from anthropogenic sources including volatile organic chemicals, synthetic organic chemicals, or metals.

8.2 Description of Wellhead Protection Area

The Hooper Golf Course System and its wellhead protection area are located near the junction of Prospect Hill Rd. and Maple Grove Rd. in Walpole. The Hooper Golf Course System has a wellhead protection area delineated by GSRWA for the purposes of this study using a fixed radius of 500ft. This radius was chosen based on guidance from the NH DES Drinking Water Source Assessment Program guide for non-community transient system (NHDES 2008). Since this well serves a non-community transient system 500ft is considered sufficient for a protective radius due to the low usage of the system and the well being drilled into bedrock. The wellhead protection area is approximately 50% golf course, 25% forest and the remaining 25% open water (small pond) or agriculture. The well sits adjacent to the golf course pro-shop and restaurant as well as a putting green and is approximately 250ft from a small pond. The wellhead protection area includes private residences, a commercial lot and a small pond with a draining stream and is zoned for Rural-Agricultural uses. The well and the wellhead protection area are located in an area of well-drained Pootatuck fine sandy loam at an elevation of approximately 700 ft. A small pond and a draining stream are located 300 ft northeast of the well.

8.3 Potential Contamination Sources

8.3.1 Potential Impacts from Former or Historic Land Uses

The Hooper Golf Course was formerly a farm and residence and the land surrounding it has historically been used for either light residential or agricultural land uses. Therefore, historic land use activities are limited, as are associated impacts.

A steel 750 gallon #2 heating oil tank closed and removed from the property in June, 2009. Contaminated soils were found surrounding the tank during the removal and as a result 20 tons of oil-contaminated soils were removed as well. This site was approximately 450ft from the Hooper Golf Course Well. The NH DES file was closed that same year and no further contaminants have been detected in monitoring wells or the drinking water well.

8.3.2 Potential Sources of Contamination from Current Land Uses

Existing land use activities in the Zone of Contribution which may have an impact on groundwater sources include:

- Transportation corridors
- Pesticide and fertilizer application
- Residential land use (i.e. septic systems, oil heat, household hazardous waste)
- Above and underground storage tanks
- Vehicle service and repair shop

1). Transportation Corridors
The well is located 320ft from Prospect Hill Rd and 10ft from the driveway to the restaurant. Both of these roads are lightly traveled local routes. Roadways increase the risk of accidental releases of petroleum and automotive products reaching the source and are also a significant non-point source of pollution. The risk to the Hooper Golf Course System from transportation corridors is considered "Low".

2) Pesticide and Fertilizer Application
The well is located on a golf course and nearly half of the wellhead protection area consists of golfing fairways. Golf courses frequently use large quantities of pesticides to maintain grass-covered golf features. These fairways also require chemical fertilizers to support the growth of high-quality grasses. Frequent watering increases the likelihood of these chemicals leaching into groundwater. Contaminants of concern include nitrates and toxic pesticides. Golf courses rarely use animal waste as fertilizer, therefore fertilizer application in the context of a golf course, is not a likely source of bacteria and viruses. The risk to the Hooper Golf Course System from pesticide and fertilizer application is considered "High".

3) Residential Land Use
There are two private residences along with the restaurant and pro-shop within the wellhead protection area. Residential land use is associated with the presence of septic systems, oil heat, and lawn care products. Some residences may have the presence of automotive chemicals due to home automotive work. On-site septic systems represent potential sources of nitrates, chlorides, bacteria, and viruses. If septic systems are improperly used for disposal of household hazardous wastes such as paints and solvents, septic systems can also be a source of synthetic organic compounds. Oil heat is the most common form of household heating in the area and tanks are located either below ground in basements or above ground and adjacent to the house. Most of these do not have protective containment structures. The risk to the Hooper Golf Course System is considered "Low".

4) Above and underground storage tanks
There are currently no above or underground storage tanks registered with NHDES within the wellhead protection area of the Hooper Golf Course System.
Two aboveground storage tanks are currently present at the grounds-keeping shop at the golf course. These are one 500 and one 300 gallon gasoline tanks located on a small, concrete pad in a wooded area. A windshield survey did not notice any containment structures or an impervious pad for vehicles to park on while being fueled. Both tanks appeared to be new and in good condition.
The risk to the Hooper Golf Course System due to underground or aboveground storage tanks is considered "High".

5) Vehicle service and repair shop
There is one vehicle service and repair shop servicing maintenance vehicles on the site of the golf course. Vehicles serviced at this shop are likely to be small, maintenance

performed is likely minor, and the shop is likely operational on a seasonal basis. The shop is approximately 300ft from the well. Volatile organic chemicals, petroleum products and heavy metals are contaminants of concern, however they are likely kept in small, household quantities (< 5 gallons). This facility does not possess a hazardous waste generator permit. The risk to the Hooper Golf Course System due to the vehicle service and repair shop is considered "Medium".

8.3.3 Potential Impacts from Future Land Uses

The Hooper Golf Course System wellhead protection area is currently zoned for rural-agricultural uses. Future commercial development is large dependent on the conditions of the upcoming sale of the property by the Town of Walpole. The rural-agricultural zoning, along with the conditions of the trust that granted the land to the town, largely protects the property from intensive commercial or residential development. Conservation of the golf course has been suggested as a condition of any potential sale of the land.

8.3.4 Potential Impacts from Outside the Wellhead Protection Area

The area surrounding the wellhead protection area is a lightly populated, residential and agricultural area with few roads, little traffic, and no industry. A review of land uses as well as a windshield survey of the area did not identify any potential threats to the system from outside the wellhead protection area.

8.4 Current and On-Going Management Activities

Given the Hooper Golf Course System's status as a transient system, operating seasonally, management activities have been small in scale and scope. The system owners own most of the wellhead protection area and all of the sanitary radius, currently fertilizer application is controlled in these areas to prevent over application and potential contamination.

8.5 Risk Management for the Hooper Golf Course System

In order to reduce potential risks of contamination to the Hooper Golf Course System, the following measures should be implemented.

- Secure and Contain Small Aboveground Storage Tanks.
  Aboveground storage tanks under 660 gallons in volume are not regulated by NH DES, however the owners of the Hooper Golf Course system should consider spill prevention and containment measures for their storage tanks. These can include 110% capacity containment vessels, double-walled tanks, leak detection kits, concrete fueling pads, and secured access.

- Reduce Lawn Care Product Usage.
  Golf courses can implement measures to reduce the use of chemical pesticides and fertilizers without major course modifications or impacts to turf. Nutrient management plans can match fertilizer application with turf need and can be an effective way to reduce fertilizer use. Pest management plans can also match natural pest control methods with the types of pests present, this can reduce the need for toxic pesticides.

Figure 10. Potential sources of contamination in the Hooper Golf Course System area. Data from NH DES and NH GRANIT.

9. Benson Woodworking Water System

9.1 Description of Sources

The Benson Woodworking System is a non-transient, non-community system serving approximately 60 employees through two service connections at a woodworking shop along Route 12 in South Walpole. The system is supplied by a 530 ft deep well with a steel casing to 100 ft and supplying approximately 160 gallons per day. The woodworking shop it services produces pre-fabricated homes in a minimal waste facility that works to limit, if not eliminate, the use of environmentally hazardous or toxic materials. There are no current detects from anthropogenic sources including volatile organic chemicals, synthetic organic chemicals, or metals.

9.2 Description of Wellhead Protection Area

The wellhead protection area of the Benson Woodworking System was delineated by NH DES based upon a fixed radius of 1,300 ft and considering usage as a non-transient, non-community system. The wellhead protection area covers the Benson Woodworking Shop property, a flea market and adjoining corn field across Route 12, a small residential area, a small portion of a pasture, and approximately 15 acres of the industrial area opposite of Houghton Creek. The wellhead protection area covers 122 acres, with 88% (107 acres) being zoned for rural-agricultural uses and the remaining 12% (15 acres) being zoned industrial. The system is located at an elevation of 380 ft above mean sea level with the highest located at 420 ft and the lowest being the Houghton Brook ravine at 340 ft. Soils in the Wellhead protection area range include well-drained Agawam and Windsor find sandy loam, and poorly-drained Raynham and Rippowam-Saco silt-loam.

9.3 Potential Sources of Contamination

9.3.1 Potential Impacts from Former or Historic land Uses

The area surrounding the Benson Woodworking System wellhead protection area has historically been agricultural with a few residences. Some industries were present in the Walpole Industrial Park located 1,000 ft south of the well however. A facility producing table-top tennis tables operated in the industrial park until 1999, waste solvents and paints were produced at this facility without any reported releases. Three underground storage tanks were removed from a freight terminal, in the Walpole Industrial Park, in 1995 and 1997. Two, 20,000 gallon fiberglass diesel fuel tanks were removed in August 1997 and one 2,000 gallon #2 heating oil that was removed in July 1995. Field and laboratory analyses did not detect any evidence of a release.

9.3.2 Potential Sources of Contamination from Current Land Uses

Existing land use activities in the Zone of Contribution which may have an impact on groundwater sources include:

- Transportation corridors
- Pesticide application
- Residential land use (i.e. septic systems, oil heat, household hazardous waste)
- Agricultural land use
- Urban land cover
- Above and underground storage tanks
- Hazardous Waste Facilities

1). Transportation Corridors
The well is located on the wood shop site adjacent to Route 12 and Blackjack Crossing Rd and is approximately 400ft from each. Route 12 is a heavily traveled state highway that sees a high volume of both passenger car traffic, and commercial trucking while Blackjack Crossing is a small, rural throughway. Roadways increase the risk of accidental releases of petroleum and automotive products, they are also a significant source of chlorides from road salt and other de-icing materials. Both roads cover approximately 0.5 miles within the wellhead protection area. The risk to the Benson Woodworking System from transportation corridors is considered "Medium".

2) Pesticide Application
Although there are four active fields located within the wellhead protection area, only one, two-acre plot consists of cultivated crops. Private residences in the area may also use pesticides in lawn care products. The risk to the Benson Woodworking System is considered "Low".

3) Residential Land Use
Residential land use is associated with the presence of septic systems, oil heat, and lawn care products. Some residences may have the presence of automotive chemicals due to home automotive work. On-site septic systems represent potential sources of nitrates, chlorides, bacteria, and viruses. If septic systems are improperly used for disposal of household hazardous wastes such as paints and solvents, septic systems can also be a source of synthetic organic compounds. Oil heat is the most common form of household heating in the area and tanks are located either below ground in basements or above ground and adjacent to the house. Most of these do not have protective containment structures. There are 10 residences along with two commercial properties all east of Route 12, the two commercial properties are separated by a shallow ravine and a third order stream. The total volume of waste going through these systems is likely low therefore the risk with regard to residential land use is considered "Low".

4) Agricultural Land Use
Approximately 8% of the wellhead protection area is occupied by agricultural land, the majority of which being comprised of pasture/hay or alfalfa, which are low-intensity crops. Although agricultural land can promote source water protection, by permitting infiltration and recharge, nitrates are often a common concern in extensive agricultural areas from fertilization and animal waste. Grazing activities are limited in the wellhead protection area. The risk to the Benson Woodworking System from agricultural land use is considered to be "Low".

5) Urban Land Cover
The wellhead protection area is rural in nature and only a few impervious surfaces are present. These include the two roads previously mentioned, the Benson Woodworking Shops and a small warehouse at the southern edge of the WHPA. Both facilities have gravel parking areas and limited impervious surfaces. Permeable surfaces such as gravel

parking areas can aid in recharge and help prevent non-point sources of pollution. The risk to the Benson Woodworking System due to urban land cover is considered "Low".

6) Above and Underground Storage Tanks
There are three aboveground storage tanks, each containing diesel gasoline, registered with NHDES within the wellhead protection area of the Benson Woodworking System. Tank 1 is a carbon-steed/iron tank, built in 1999, holding 10000 gallons. Tank 2 is a fabricated steel tank built in 2006, holding 500 gallons. Tank 3 is an indoor steel tank holding 250 gallons and constructed in 1999. All three tanks are within 1,000ft of the two wells and as such have spill controls such as double walls, containment vessels, and routine monitoring.
Three underground storage tanks were removed from the site of the former Yellow Freight Systems Freight Terminal, in the Walpole Industrial Park, in 1995 and 1997. Two, 20,000 gallon fiberglass diesel fuel tanks were removed in August 1997 and one 2,000 gallon #2 heating oil that was removed in July 1995. Field and laboratory analyses did not detect any evidence of a release.
Although the aboveground storage tanks present at the Benson Woodworking facility are well managed, maintained, and have multiple spill control measures, they can still present a risk to the system. This report considers the risk of aboveground storage tanks to be "High".

7). Hazardous Waste Sites
Entities which generate hazardous waste are regulated by NH DES under the Resource Conservation and Recovery Act (RCRA). The woodworking shop located on-site currently possesses an inactive NH DES hazardous waste permit. The business owners have worked to decrease the quantity of hazardous waste produced at the facility by using less hazardous chemicals in their processes. The risk to the Benson Woodworking System from RCRA permitted facilities is considered "Medium".

9.3.3 Potential Impacts from Future Land Uses

The Benson Woodworking System Wellhead Protection Area is primarily zoned rural-agricultural with the lower portion south of Houghton Creek zoned as industrial. Future commercial development is possible in the areas zoned industrial. Increased industrial development could increase the area of impermeable surface in the wellhead protection area, thus reducing recharge and increasing non-point pollution. Increased residential development in the forested parts of the wellhead protection area could increase the risk of contamination from faulty septic systems, household chemicals, lawn chemicals, or fuel oil tanks. Currently the wellhead protection area is not protected by an aquifer overlay zone in the Town's zoning.

9.3.4 Potential Impacts from Land Uses Outside the Wellhead Protection Area

The Walpole Industrial Park is located south of the wellhead protection area and includes workshops, freight terminals and automotive sales and service facilities.

A freight terminal is located 1,000ft south of the Benson Woodworking Well where semi-trailers are transferred and contents transferred. Previously, this site had been a registered hazardous waste generator and an underground storage tank was located on-site. Since a change

in ownership in 2005, the site is no longer listed as a hazardous waste producer and no above or underground storage tanks are reported to be present at the facility

An excavation contractor facility is located within the industrial park where equipment and backfilled soils are stored. NH DES' One-Stop database reports the presence of two, 10,000 gallon aboveground storage tanks containing diesel at this facility, however a windshield survey was not able to verify the presence of these tanks.

An auto sales and service facility is located in the industrial park. This facility sells used cars and parts salvaged from autos. This facility is currently a declassified hazardous waste generator with former waste streams comprising of waste oils, solvents, oils, and hydraulic fluids. A windshield survey revealed many cars, in various states of repair are present at this facility, and although this facility is not a registered auto salvage yard with NH DES, it may be serving in that capacity unofficially. Leaking automotive fluids and heavy metals contamination from auto parts are contaminants of concern at this facility.

A propane storage facility is present on the corner of Industrial Park Dr. and Route 12, however this facility is not considered a threat to the Benson Woodworking well due to propane's nature as a gas. Other facilities in the industrial park include offices, vacant workshops and lots, and facilities where no environmental hazards are present.

Outside of the industrial park, the areas surrounding the wellhead protection area for the Benson Woodworking system include agriculture, forest and rural-residential land uses.

9.4 Current and On-Going Management Activities

The owners of the Benson Woodworking system have currently own a 10.75 acre lot surrounding the well which encompasses the entire 150-ft sanitary radius. On this lot the property owners have minimized impervious surfaces by maintaining gravel roads and open, grassy areas. The system owners have also worked to limit the quantity of hazardous waste used in their woodworking processes as well as the quantities kept on site. Options for managing land uses off the system owner's property lot are limited however, given the private ownership of the surrounding lands.

9.5 Risk Management for the Benson Woodworking System

In order to reduce potential risks of contamination to the Benson Woodworking System, the following measures should be implemented:

- Waste Reduction.
  The Bensonwood Facility is already implementing steps to reduce or eliminate hazardous materials used at their facility. These strategies should continue and practices should be reviewed regularly to identify where additional changes could be made.

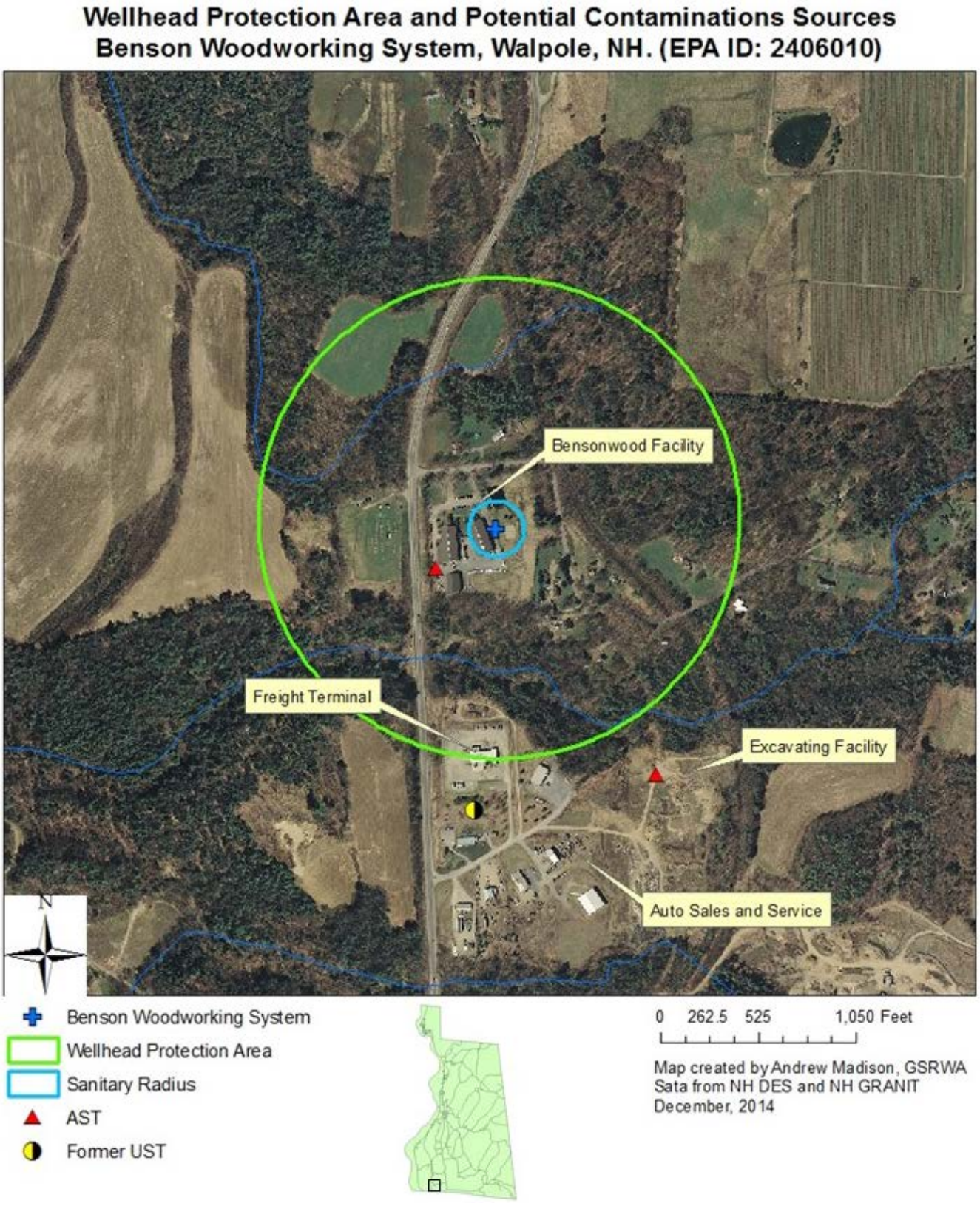

Figure 11. Wellhead protection area, sanitary radius and potential sources of contamination within the Benson Woodworking system area. Data from NH DES and NH GRANIT.

10. Drewsville Carriage House Water System

10.1 Description of Sources

The Drewsville Carriage House System is a non-community non-transient system that serves approximately 31 individuals through six connections at an apartment building in Drewsville Center. The Drewsville Carriage House System is supplied by an 800 ft deep bedrock well drilled on 10/21/1996 and has been permitted to operate since 2011. The well has a bedrock depth of 118ft and a casing depth of 130ft with a static water level of 60ft and a tested yield of 5 gallons per minute. The well itself is located in a wooded lot next to a small pond and a cemetery. The system is owned by Southwest Community Services and operated by an independent contractor. The Drewsville Carriage House provides affordable housing to low-income families, a small pre-school with a "Head-Start" program is also on site and served by this system. There are no current detects from anthropogenic sources including volatile organic chemicals, synthetic organic chemicals, or metals.

10.2 Description of Wellhead Protection Area

The wellhead protection area of the Drewsville Carriage House System was delineated by NH DES in 2011 based upon a fixed radius of 1,300 ft and considering usage as a non-transient, non-community system. The wellhead protection area covers 122 acres including the Village of Drewsville Center on Route 123 and the surrounding forests and fields. Approximately 33% (40 acres) of the wellhead protection area is zoned for timberland uses, 25% (30 acres) zoned for residential land uses, 2% (2 acres) zoned for commercial land uses, and the remaining 41% (50 acres) is zoned for rural-agricultural uses. Most of the wellhead protection area exists at an elevation of approximately 500ft, this increases to 600 ft at the eastern edge of the wellhead protection area on the slope of a hill. There is a 7.3 acre pond adjacent to the apartment building and school which is drained by a first-order stream. The Cold River flows immediately north of the boundary of the wellhead protection area. Soils in this area consist of Pootatuck, Agawam, and Windsor fine sandy loams, which are well-drained and the result of alluvial deposits, likely from the Cold River.

10.3 Potential Contamination Sources

10.3.1 Potential Impacts from Former or Historic Land Uses.

Drewsville has historically been a rural village with few businesses, some residences concentrated in the center of Drewsville, and limited agriculture given the rocky, nutrient-deprived soil there. The area surrounding the Drewsville Carriage House system has historically been used for residential land uses, with some gardening and a church. A service station and general store is located in Drewsville Center along Route 123. Four deactivated underground storage tanks were removed from this facility in October 1989, these included; two gasoline tanks of 10000 and 3000 gallons, a 1000 gallon diesel gasoline tank and a 1000 gallon kerosene tank. In June, 2003, contaminated soils were found in the vicinity of one of the removed diesel gasoline tanks. Napthelene was detected at 12.0 ppm in soils at the former diesel tank site that same month, this is in exceedance of the EPA soil standard of 5.0 ppm. No petroleum products were detected in groundwater however contaminated soils were observed as deep as 40 ft. The volume of petroleum leaked to the soils is unknown but it believed to be small. Monitoring wells were installed in 2003 and 900lbs of contaminated soils were removed in May, 2005. The

monitoring wells were monitored until October, 2006 when no contaminants were detected and the site was closed.

10.3.2 Potential Sources of Contamination from Current Land Uses

Existing land use activities in the Zone of Contribution which may have an impact on groundwater sources include:

- Transportation corridors
- Residential land use
- Agricultural land use
- Urban land cover
- Above and underground storage tanks
- Hazardous Waste Facility
- Cemetery

1). Transportation Corridors

The well is located on site approximately 700ft from the center of Drewsville where Route 123 intersects with Old Cheshire Turnpike and Alstead Center Rd. Route 123 travels through the wellhead protection area for approximately 1,400 ft. Although this is a numbered state highway, traffic on it is typically light. The other two roads in the wellhead protection area include Alstead Center Rd. and Old Cheshire Turnpike, both of which are lightly used local roads. The three roads meet at an intersection on a sharp curve, which may increase the risk of accidents. Roadways increase the risk of accidental releases of petroleum and automotive products reaching the source and are also a significant non-point source of pollution. The risk to the Drewsville Carriage House System from transportation corridors is considered "Medium" due to the low volume of traffic, but the increased risk of an accident at the curve.

2). Residential Land Use

Residential land use is associated with the presence of septic systems, oil heat, and lawn care products. Some residences may have the presence of automotive chemicals due to home automotive work. On-site septic systems represent potential sources of nitrates, chlorides, bacteria, and viruses. If septic systems are improperly used for disposal of household hazardous wastes such as paints and solvents, septic systems can also be a source of synthetic organic compounds. Oil heat is the most common form of household heating in the area and tanks are located either below ground in basements or above ground and adjacent to the house. Most of these do not have protective containment structures. Sewer service is unavailable in Drewsville. There are approximately 30 private residences, including the five apartments within the Drewsville Carriage House wellhead protection area with septic systems. The risk to the Drewsville Carriage House System from residential land use is considered "High".

3). Agricultural Land Use

A small pasture is the only agricultural operation within the wellhead protection area. Although agricultural land can promote source water protection, by permitting infiltration and recharge, nitrates are often a common concern in extensive agricultural areas from

fertilization and animal waste. This area, however, likely uses minimal fertilization as the only crop grown is hay. The risk from agricultural land use is considered to be "Low".

4). Urban land cover
Less than 10% of the wellhead protection area is occupied by urban land uses such as buildings, residences, roads, and parking lots. Many of the parking area and roads in the wellhead protection area are dirt or gravel covered permeable surfaces, which can aid in recharge and help prevent non-point sources of pollution. The risk to the Drewsville Carriage House System due to urban land cover is considered "Low".

5). Above and underground storage tanks
There are four underground storage tanks within the wellhead protection area of the Drewsville Carriage House System located at a service station and general store. Two contain 5000 gallons of gasoline each, and were installed in October, 1989, replacing four that were removed that same month. The two other tanks each contain 1000 gallons of diesel gasoline and were also installed in October, 1989. All four tanks are of a composite construction with spill and overflow protection. There are no aboveground storage tanks registered with NH DES within the wellhead protection area. The risk to the Drewsville Carriage House from above or underground storage tanks is considered "High".

6). Hazardous Waste Facility
There is one permitted hazardous waste generating facility within the Wellhead protection area, located at the intersection of Route 123 and Alstead Center Rd. and approximately 900 ft from the well. This facility is a service station and general store which sells groceries as well as gasoline and diesel. Hazardous wastes generated at this facility include waste oils and oil-contaminated soils from the removal of a leaking underground storage tank. The permit for this facility is currently active, indicating that waste oils are still being generated at this facility, likely from fuel pumps and minor automotive work. The risk to the Drewsville Carriage House System from this facility is considered "High".

7). Cemetery
The Drewsville Cemetery is located approximately 150 ft north of the well near the Drewsville Carriage House and pond. This is a historic cemetery with few, if any burials occurring recently. Landscaping appears to be limited to basic upkeep and mowing. Fertilizers and lawn care products are often contaminants of concern at cemeteries. The risk to the Drewsville Carriage House System from this cemetery is considered to be "Low".

10.3.3 Potential Impacts from Future Land Uses

The Drewsville Carriage House System wellhead protection area is currently zoned for agricultural, commercial, and residential uses. Future commercial development is possible since there are two acres of commercially zoned land, currently occupied by a gas station. Increased residential development is also possible since 25% of the wellhead protection area is zoned for residential land use. Increased residential development in the Wellhead protection area could

increase the risk of contamination from faulty septic systems, household chemicals, lawn chemicals, or fuel oil tanks. Currently the wellhead protection area is not protected by an aquifer overlay zone in the Town's zoning. The harvesting of timber from the areas zoned for timberland use could also increase non-point source pollution as well as impacts from logging trucks and equipment.

10.3.4 Potential Impacts from Land Uses Located Outside the Wellhead Protection Area

The area surrounding Drewsville Center and the rest of the wellhead protection area is rural, lightly populated, and mostly forested. There is limited land available for agriculture and residences that are present are widely spaced, single-family homes. Any commercial activity in the area is likely limited to home-offices, or light contracting work. A review of land use activities and a windshield survey of the area did not identify any major threats to the system from outside the wellhead protection area.

10.4 Current and On-Going Management Activities

The Drewsville Carriage House System Owners currently own an 8-acre lot surrounding the well that includes approximately 60% of the sanitary radius as well as the adjacent pond. The owners have kept the well site and the portion of the sanitary radius located on their property forested. There are many lots with different property owners in Drewsville Center, which limits what steps the system owners can take to protect their source outside of their own property.

10.5 Risk Management for the Drewsville Carriage House System

In order to reduce the potential risks of contamination to the Drewsville Carriage House System, the following measures should be implemented:

- Education and Outreach:
  An outreach campaign to neighbors and residents within the Drewsville Center area could prove useful in addressing water quality concerns as well as establishing relationships. Sample letters 1&2 should be sent to residents within the wellhead protection area and to local entities such as the Town of Walpole and any Drewsville-located businesses. These sample letter can be found in Appendix 4.

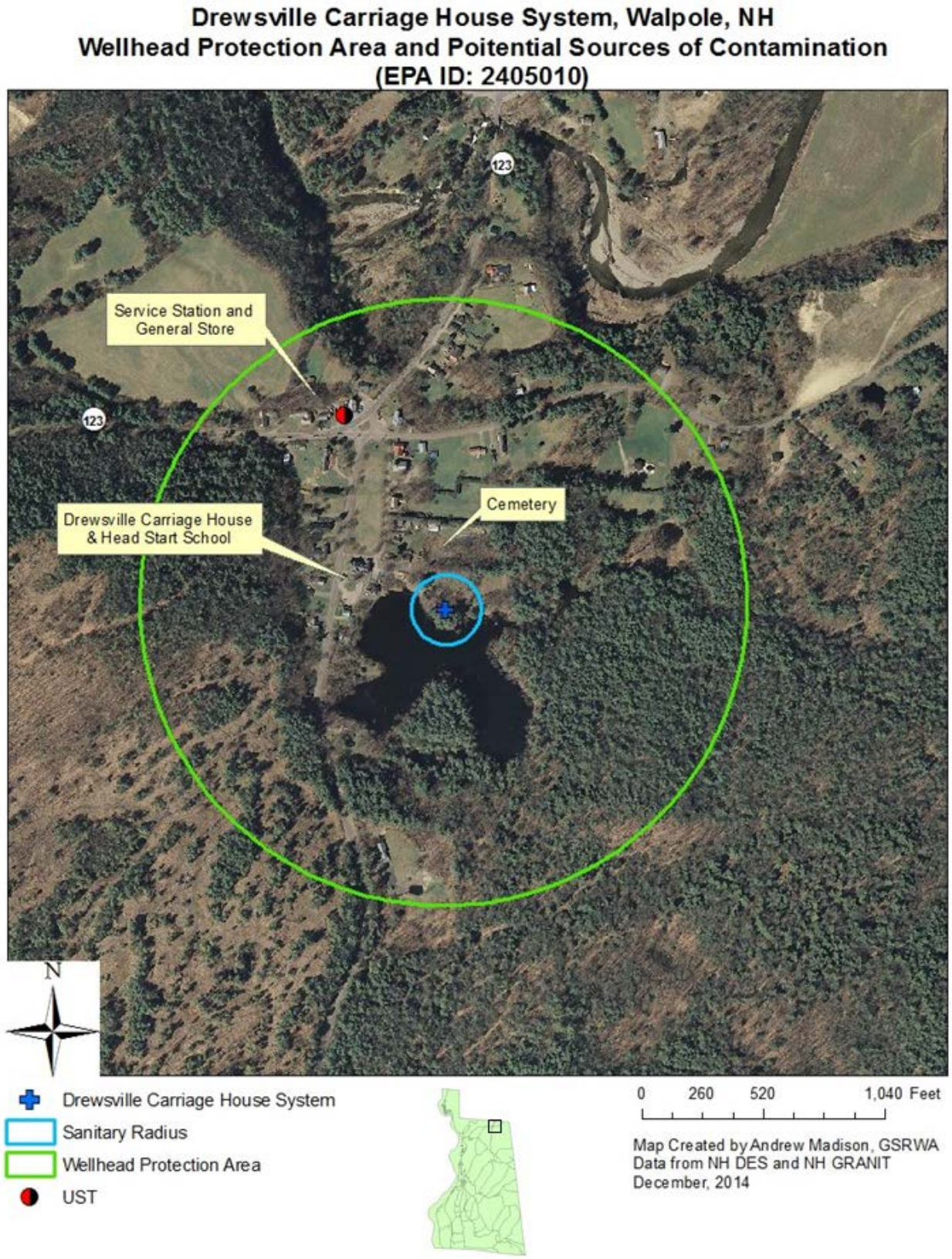

Figure 12. Wellhead protection area, sanitary radius and potential sources of contamination for the Drewsville Carriage House System. Data from NH DES and NH GRANIT.

11. Conclusion

Water resources in Walpole are primarily dependent on the Stratified Drift Aquifer located along the Connecticut River, Cold River, and Great Brook. This resource is a high-quality, high-yielding source which should serve Walpole's needs well into the future. However this service is dependent on the stewardship and vigilance of system operators, town officials, business leaders, land owners, and town residents alike. Community systems in Walpole and North Walpole face unique challenges from residential and commercial land use as well as current, and potential future development. Wise development, guided by well-crafted zoning ordinances, supported by an informed public, and backed by sound research and data will help meet these challenges.

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River Well, Walpole, NH. Potential Sources of Contamination

Type of Facility	Location	Site Tax-Lot Number	Distance from well (ft)	Contaminants of Concern	Risk Level
Vehicle sales, service, repair	-72.42949, 43.10554	12-11	2600	Waste oils, solvents, fuels, petroleum hydrocarbons	High
Pharmacy, photographic processing	-72.42895, 43.10635	12-11-4	2800	Pharmcuticals, heavy metals, photographic processing chemicals	Low
Agriculture - Poultry	-72.43184, 43.10355	12-4	2000	Nitrates, bacteria, viruses	Medium
Agriculture- Cultivated Crops, Conservation Land	-72.43547, 43.10463	12-12-4	620	Nitrates, bacteria, viruses, pesticides	Medium
Agriculture-Cultivated Cro	-72.43789, 43.10093	12-2	400	Nitrates, bacteria, viruses, pesticides	Medium
Retail Stores, Parking Lot	-72.42701, 43.10642	12-55-1/2	3300	Impervious Surfaces, non-point runoff, automotive chemicals, road salts	Medium
Route 12	-72.42821, 43.10377	N/A	3000	Impervious Surfaces, non-point runoff, automotive chemicals, road salts	Medium
Manufacturing/Industrial	-72.43140, 43.10292	12-4-1	2400	Solvents, Waste Oils, Heavy Metals	High
Deerborn Cir	-72.42512, 43.10681	12-55-(6-20 Multiple Lots)	4000	Septics, lawn chemicals, heating oil, automotive chemicals	Low
Sporting Complex	-72.42453, 43.10342	12-56/57	3300	Pesticides, Lawn Chemicals Impervious Surfaces, Automotive Chemicals, Underground Injection Control	Medium
Hardware Store	-72.42641, 43.10845	12-55-4	3600	Solvents, Lawn Chemicals, Impervious Surfaces	Low
Railroad	-72.44259, 43.10502	Westminster, VT	1000	Petroleum products, Tank cars, VOC's	High

Watkins Hill Well, Walpole, NH. Potential Sources of Contamination					
Type of Facility	Location	Site Tax-Lot Number	Distance from well (ft)	Contaminants of Concern	Risk Level
Agriculture-Cultivated Crops and Livestock	-72.40994, 43.05974	8-102/3/4,	Variable	Nitrates, Bacteria, Viruses, Petroleum Products from small AST's	Medium
Residential Land Use	Scattered	N/A	Variable	Lawn Chemicals, Oil Heat, Septic Systems	Low
Watkins Hill Rd.	-72.40736, 43.05149	N/A	250	Road Salts, Automotive Chemicals, Petroleum Products	Low
Farnum Rd.	-72.40689, 43.04984	N/A	750	Road Salts, Automotive Chemicals, Petroleum Products	Low
Vehicle Service Facility (Outside WHPA)	-72.40074, 43.06659	9-11	6000	Petroleum products, automotive chemicals	Low

N. Walpole Village District Lower System Potential Sources of Contamination

Type of Facility	Location	Site Tax-Lot Number	Distance from well (ft)	Contaminants of Concern	Risk Level
Industrial	-72.44884, 43.15159	27-3	2800	Former UST, waste oils, VOC's, Petroleum Products	Medium
Industrial	-72.44767, 43.14948	27-7	2200	VOC's, waste oils, waste paints, UST's	High
Industrial	-72.44760, 43.14846	30-56	2000	Former UST's, current UST, petroleum products, VOC's	High
Industrial (Currently Vacant)	-72.44733, 43.15033	27-8	2600	Former UST's and AST's. petroleum products in soils, VOC's.	High
Industrial	-72.45219, 43.14784	27-1	1600	Printing chemicals, VOC's, former UST's without closure report.	High
Industrial/Warehouse	-72.45026, 43.14954	27-2	2100	Chemical fertilizers, pesticides in bulk, petroleum products (from truck traffic), former UST without closure report	High
Route 12	-72.45049, 43.14401	N/A	200	Impervious Surfaces, non-point runoff, automotive chemicals, road salts	High
Railroad	-72.43140, 43.10292	N/A	600	Tank cars, VOC's, petroleum products	High
Residential Areas	Throughout SWPA	Multiple Lots	<100	Septics, lawn chemicals, heating oil, automotive chemicals	High
Industrial	-72.44977, 43.15027	27-3	2500	VOC's, former AST.	Medium
School	-72.44578, 43.14295	28-128	1300	UST, petroleum products.	Medium
Historic Landfill	-72.44321, 43.22379	Rockingham, VT	5 Miles	Hazardous Wastes, Heavy Metals	High
Industrial Dr.	-7245342, 43.16563	Rockingham, VT	1.5 Miles	Waste Solvents, VOC's, Petroleum Products	Medium

N. Walpole Village District High System Potential Sources of Contamination					
Type of Facility	Location	Site Tax-Lot Number	Distance from well (ft)	Contaminants of Concern	Risk Level
Residential Areas	Throughout SWPA	N/A	200	Septics, lawn chemicals, heating oil, automotive chemicals	Medium
Route 12	-72.44167, 43.13847	N/A	1600	Impervious Surfaces, non-point runoff, automotive chemicals, road salts	Low
Grocery Store	-72.44391, 43.13958	28-154	1500	Former UST	Medium
Industrial/Workshop	-72.44733, 43.15033	26-1	1800	Former UST, underground discharge of Ground Water	Low
School	-72.44578, 43.14295	28-128	1300	UST, petroleum products.	Medium
Rail Yard	-72.43897, 43.13527	26-11	2,500 ft	AST, petroleum products, automotive chemicals, rail tanker cars, waste oils, waste solvents, VOC's	High

Hooper Golf Course System, Walpole, NH. Potential Sources of Contamination

Type of Facility	Location	Site Tax-Lot Number	Distance from well (ft)	Contaminants of Concern	Risk Level
Residential Areas	-72.41762, 43.06741	8-62/71	500	Septics, lawn chemicals, heating oil, automotive chemicals	Low
Prospect Hill Rd.	-72.44167, 43.13847	N/A	350	Impervious Surfaces, non-point runoff, automotive chemicals, road salts	Low
Golf Course	-72.44391, 43.13958	8-61	1500	Chemical pesticides, fertilizers, nitrates, bacteria, viruses	High
Groundskeeping Workshop	-72.41669, 43.06597	8-61	100	AST's containing petroleum products, former UST, stored fertilizers/pesticides, VOC's	High
Pro-Shop and Resturant	-72.41669, 43.06597	8-61	10	Septic system, heating oil.	Low

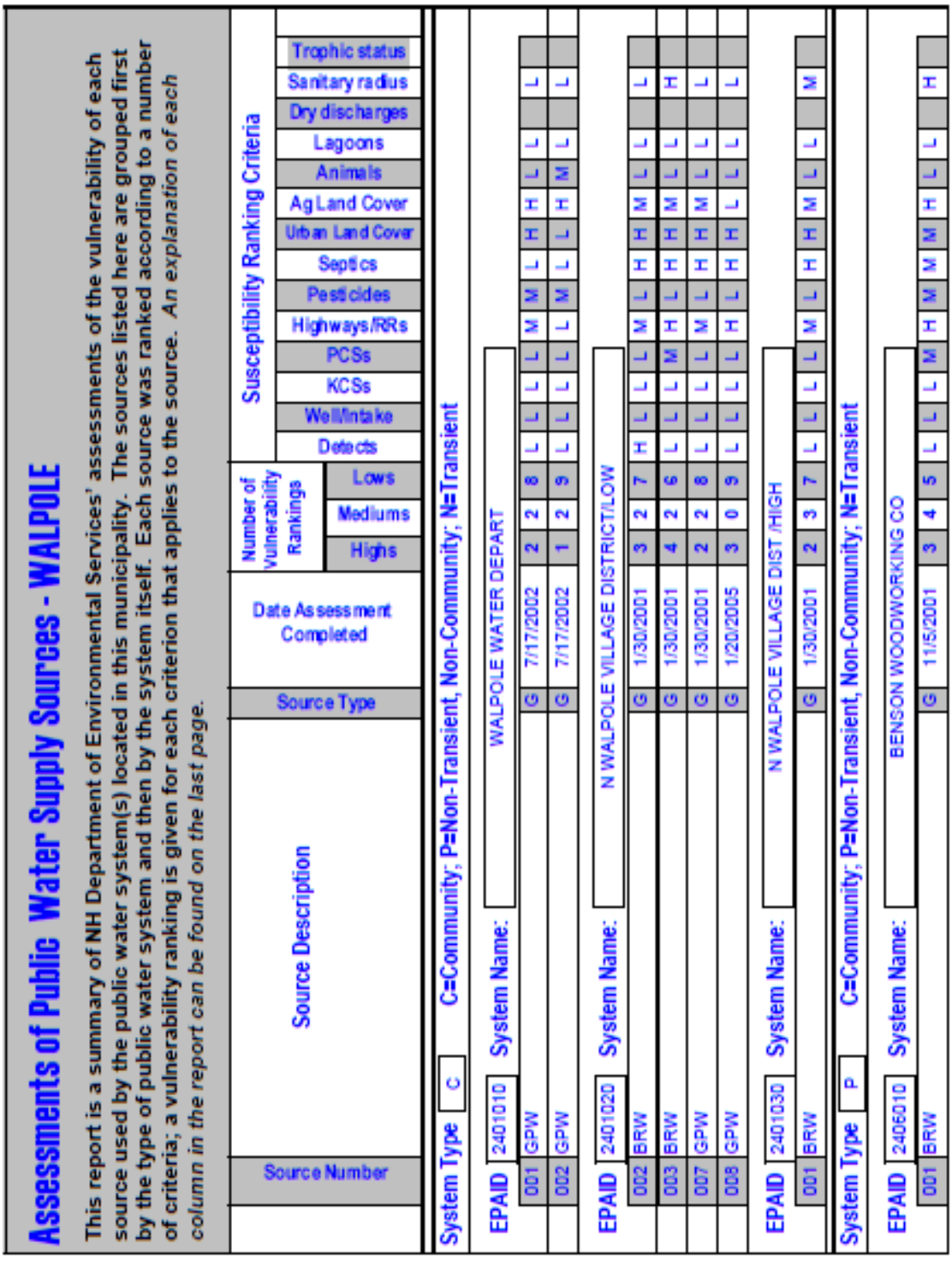
Benson Woodworking System, Walpole, NH. Potential Sources of Contamination

Type of Facility	Location	Site Tax-Lot Number	Distance from well (ft)	Contaminants of Concern	Risk Level
Residential Areas	Throughout SWPA	Various Lots	450	Septics, lawn chemicals, heating oil, automotive chemicals	Low
Route 12	-72.440808, 43.02634	N/A	450	Impervious Surfaces, non-point runoff, automotive chemicals, road salts	Medium
Industrial Woodworking	-72.44391, 43.13958	1-4	50	AST's containing petroleum products, VOC's	High
Agricultural Areas	Throughout SWPA	4-3/42/43	1000	Nitrates, bacteria, viruses, chemical fertilizers, pesticides	Low
Freight Terminal	-72.43975, 43.02336	1-3-1	1200	Former UST, Impervious surfaces, petroleum products and automotive chemicals from truck and vehicle traffic.	Low
Industrial Park	-72.43975, 43.02336	1-3-(1-7)	1,500 ft	Petroleum Products, AST's, Automotive Chemicals, Heavy Metals	High

Drewsville Carriage House System, Walpole, NH. Potential Sources of Contamination

PCS Site Name	Location	Site Tax-Lot Number	Distance from well (ft)	Contaminants of Concern	Risk Level
Drewsville Center Residential Area	Throughout SWPA	Various Lots	250	Septics, lawn chemicals, heating oil, automotive chemicals	High
Route 123	-72.39219, 43.12858	N/A	850	Impervious Surfaces, non-point runoff, automotive chemicals, road salts	Medium
General Store/ Gas Station	-72.39275, 43.12867	25-8	50	UST's containing petroleum products, waste oils, former UST, petroleum contaminated soils	High
Agricultural Areas	-72.39395, 43.12907	25-7	1200	Nitrates, bacteria, viruses, chemical fertilizers, pesticides	Low
Drewsville Cemetery	-72.43975, 43.02336	25-CEM	150	Nitrates, bacteria, viruses	Low
Residential/ School	-72.39236, 43.12666	25-28	350	Oil Heat, septic system, parking areas	High

Appendix 2. NH DES SWAP Report for Walpole, NH.



Assessments of Public Water Supply Sources - WALPOLE

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: Highs	Mediums	Lows	Susceptibility Ranking Criteria: 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 2401010	System Name: WALPOLE WATER DEPART																			
001	GPW	G	7/17/2002	2	2	8	L	L	L	L	M	M	L	H	H	L	L		L	
002	GPW	G	7/17/2002	1	2	9	L	L	L	L	L	M	L	L	H	M	L		L	
EPAID 2401020	System Name: N WALPOLE VILLAGE DISTRICT/LOW																			
002	BRW	G	1/30/2001	3	2	7	H	L	L	L	M	L	H	H	M	L	L		L	
003	BRW	G	1/30/2001	4	2	6	L	L	L	M	H	L	H	H	M	L	L		H	
007	GPW	G	1/30/2001	2	2	8	L	L	L	L	M	L	H	H	M	L	L		L	
008	GPW	G	1/20/2005	3	0	9	L	L	L	L	H	L	H	H	L	L	L		L	
EPAID 2401030	System Name: N WALPOLE VILLAGE DIST /HIGH																			
001	BRW	G	1/30/2001	2	3	7	L	L	L	L	M	L	H	H	M	L	L		M	
System Type P	C=Community; P=Non-Transient, Non-Community; N=Transient																			
EPAID 2406010	System Name: BENSON WOODWORKING CO																			
001	BRW	G	11/5/2001	3	4	5	L	L	L	M	H	M	M	H	M	H	L	L		H

Appendix 3. Walpole Source Protection Committee Meetings

Date	Attendees	Topics Discussed
May 20, 2013	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Ernie Vose, Zoning Board Gary Speed, Conservation Commission Tom Beaudry, Conservation Commission Bob Miller, Planning Board Steve Dalessio, Planning Board Laura Palmer, Resident, SWPC Secretary Vinnie Malnatti, Land Owner Dennis Marcom, Planning Board Larry Britton, Land Owner	• Update of land use and ownership. • Antioch University Water Resources Report • Conservation Commission role in enforcement • Need for a part-time code enforcement officer. • Existing Wellhead protection ordinance.
June 10, 2013	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Bob Miller, Conservation Commission Chas Street, Select Board Tom Beaudry, Conservation Commission Vinnie Malnatti, Land Owner Larry Britton, Land Owner Laura Palmer, Resident, SWPC Secretary Gary Speed, Conservation Commission Dennis Marcom, Planning Board	• Antioch Drinking Water Report. • Creation of working groups for well source protection, education, BMP surveys, land ownership, water resource plan, and future water needs.
July 30, 2013	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Vinnie Malnatti, Land Owner Laura Palmer, Resident, SWPC Secretary Gary Speed, Conservation Commission Dennis Marcom, Planning Board Steve Dalessio, Planning Board	• Inventory of property owners. • Review of town well source protection ordinance.

August 28, 2013	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Ernie Vose, Zoning Board Laura Palmer, Resident, SWPC Secretary Gary Speed, Conservation Commission Dennis Marcom, Planning Board Steve Dalessio, Planning Board Chas Street, Select Board Bob Miller, Conservation Commission Vinnie Malnatti, Land Owner Larry Britton, Land Owner	• Inventory of property owners. • Review of town well source protection ordinance.
September 25, 2013	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Tom Beaudry, Conservation Commission Ernie Vose, Zoning Board Dennis Marcom, Planning Board Steve Dalessio, Planning Board Chas Street, Select Board Bob Miller, Conservation Commission Larry Britton, Land Owner	• Inventory of property owners. • Review of town well source protection ordinance.
October 23, 2013	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Ernie Vose, Zoning Board Laura Palmer, Resident, SWPC Secretary Gary Speed, Conservation Commission	• Discussion of 2004/2008 well source protection ordinance with NH DES.

	Dennis Marcom, Planning Board Steve Dalessio, Planning Board Chas Street, Select Board Bob Miller, Conservation Commission Vinnie Malnatti, Land Owner Tom Beaudry, Conservation Commission Pierce Rigrod, NHDES Larry Britton, Land Owner	
November 20, 2013	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Laura Palmer, Resident, SWPC Secretary Gary Speed, Conservation Commission Chas Street, Select Board Bob Miller, Planning Board Vinnie Malnatti, Land Owner Tom Beaudry, Conservation Commission Dennis Marcom, Planning Board	• Update on inventory of property owners in wellhead protection areas. • Continued review of town well source protection ordinance.
December 18, 2013	N/A	• Update on inventory of property owners in Wellhead protection areas. • Town Well Source Protection Ordinance Update
February 19, 2014	Jen Palmiotto, Resident, GSRWA Laura Palmer, Resident, SWPC Secretary Chas Street, Select Board Steve Dalessio, Planning Board	• Update on inventory of property owners within the Wellhead Protection Areas. • Town Well Source Protection Ordinance:

	Bob Miller, Planning Board Vinnie Malnati, Land Owner Tom Beaudry, Conservation Commission Dennis Marcom, Planning Board Larry Britton, Land Owner	Comments from SWRPC; Next Steps. • Wellhead Protection Plan update. Meeting with North Walpole.
April 9, 2014	Jen Palmiotto, Resident, GSRWA Laura Palmer, Resident, SWPC Secretary Steve Dalessio, Select Board Bob Miller, Planning Board Vinnie Malnati, Land Owner Tom Beaudry, Conservation Commission Dennis Marcom, Planning Board Gary Speed, Conservation Commission Mark Houghton, Water/Sewer Superintendent	• Update on inventory of property owners within the Wellhead Protection Areas. • Town Well Source Protection Ordinance Update. • Wellhead Protection Plan Update.
May 14, 2014	Jen Palmiotto, Resident, GSRWA Laura Palmer, Resident, SWPC Secretary Steve Dalessio, Select Board Mark Houghton, Water/Sewer Superintendent Bob Miller, Planning Board Dennis Marcom, Planning Board	• Town well source protection ordinance discussion. • Wellhead protection plan update. • Meeting with North Walpole • Old Home Day
June 11, 2014	Jen Palmiotto, Resident, GSRWA Laura Palmer, Resident, SWPC Secretary Steve Dalessio, Select Board Mark Houghton, Water/Sewer Superintendent	• Presentation from SWRPC regarding GIS mapping services

	Brian Vose, Consultant	
September 10, 2014	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Andrew Madison, GSRWA Bob Miller, Conservation Commission Tom Beaudry, Conservation Commission Vinnie Malnatti, Land Owner Laura Palmer, Resident, SWPC Secretary Steve Dalessio, Select Board Dennis Marcom, Planning Board	• Edits and questions on draft Wellhead protection ordinance. • New edits and final draft of Wellhead protection ordinance.
October 1, 2014	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Andrew Madison, GSRWA Gary Speed, Conservation Commission Bob Miller, Planning Board Steve Dalessio, Select Board Dennis Marcom, Planning Board	• Edits on revised draft Wellhead protection ordinance. • Update on Wellhead protection plan. • Update on potential sources of contamination inventory.
October 24, 2014	Mark Houghton, Water/Sewer Superintendent Jen Palmiotto, Resident, GSRWA Andrew Madison, GSRWA Bob Miller, Planning Board Dennis Marcom, Planning Board Chas Street, Select Board	• Presentation to Planning Board

Appendix 4. Sample Letters

Sample Letter 1.

DATE

Official Business/Village/Town Letterhead

Dear _____: (Customer, Neighbor, Homeowner – fill in appropriate term)

The Purpose of this letter is to ask for your cooperation in ensuring safe drinking water. If we are all careful, we can protect our source of drinking water from contamination.

Your property has been identified as being located within the area from which water flows to one of the Town wells (see map attached). As such it is important that you are aware that what you do on your property could affect the quality of the groundwater that serves the Town well. If you are not on Town water, you should be aware that the activities that occur on your property may affect the water quality of your private well.

No one wants to drink polluted water. Who would pour gasoline, motor oil, paint, garden chemicals, or household chemicals into their drinking water? Yet, the equivalent is done when someone pours any of these products down their toilet, sink drain, or onto the ground. By following the "Do's and Don'ts" on the attached flyer, your household can avoid activities that could threaten water quality.

Please take the time to review and follow the flyer's instructions. We need your help to protect this valuable source of drinking water!

We appreciate your cooperation.

Sincerely,

Contact Person's name

Sample Letter 2.

DATE

Official Business/Village/Town Letterhead

Chairperson's name

Appropriate Town/City Governing body's name

Address

Dear Local, Regional and State Officials:

Enclosed is a map showing the Wellhead protection area for the water sources which serve the Town of Walpole, New Hampshire. A Wellhead protection area consists of the surface and subsurface area from or through which contaminants are likely to reach a water supply source. Land use activities in the wellhead protection areas have the potential to adversely impact water quality of the Town wells. If the ground water that supplies our wells becomes contaminated, it may be impossible to eliminate the contamination so that the source can continue to be used for drinking water. We are proactively trying to protect are water sources by implementing a source protection plan of which this letter of notification is a part.

We are contacting you to request your assistance in protecting this supply. There are a number of ways in which your agency may be able to help with protection that can help reduce the possibility of contamination of the water supply. For example, please keep us informed of any related land use decisions or permitting issues and involve us in the planning and decision process where it is deemed appropriate.

On behalf of the Business/Village/Town, I would like to thank you for your attention to this matter. If you have any questions or if I can be of some assistance please feel free to call me at (603) XXX-XXX.

Sincerely,

Contact Person

Encl. Maps of Wellhead protection areas

Sample Letter 3.

DATE

Official Business/Village/Town Letterhead

Dear _____: (Business Name)

The Purpose of this letter is to ask for your cooperation in ensuring safe drinking water. If we are all careful, we can protect our source of drinking water from contamination.

Your facility has been identified as being located within the area from which water flows to one of the Town wells (see map attached). As such it is important that you are aware that what you do on your property could affect the quality of the groundwater that serves the Town well. If you are not on Town water, you should be aware that the activities that occur on your property may affect the water quality of your facility's well.

No one wants to drink polluted water. Who would pour gasoline, motor oil, paint, garden chemicals, or household chemicals into their drinking water? Yet, the equivalent is done when someone pours any of these products down their toilet, sink drain, or onto the ground. By following the guidelines on the attached flyers, your facility can avoid activities that could threaten water quality. Every business wants to be a positive force in their community, being a good neighbor to the community water system is a perfect start.

Please take the time to review the attached information. We need your help to protect this valuable source of drinking water!

We appreciate your cooperation.

Sincerely,

Contact Person's name

Is Gasoline Contaminating Your Drinking Water?

Gasoline is one of the most dangerous products commonly found around the home, yet people often store and use it with little care. Some of the chemicals in gasoline have been found in drinking water with increasing frequency, including benzene, toluene and MtBE (Methyl t-Butyl Ether), which is *easily dissolved in water* and is a possible carcinogen. Even a gasoline spills as small as a gallon can contaminate your drinking water wells or a public water supply.

To Protect Your Drinking Water From Gasoline

Avoid Spilling Gasoline on the Ground, Especially Near Wells

- Don't drain gasoline from lawn mowers, snow blowers, etc. onto the ground.
- Don't burn brush with gasoline.
- Don't top off your fuel tank.
- Keep refueling and engine work away from water supply wells, and if possible, over a concrete floor or similar barrier. Immediately clean up any gas or oil spills.

Avoid Spilling Gasoline in Lakes, Ponds, and Rivers

- Keep special gasoline-absorbing pads on your gas-powered boat and know how to use them.
- If you own a larger boat, make sure it has no-spill tank vents.
- Fill portable tanks from outboard boat engines on shore.
- Refuel snowmobiles and ice augers on shore; do not take gasoline storage tanks onto ice-covered ponds.

Store Gasoline Properly

- Use a clearly labeled container made for gasoline and with a spout to avoid spills.
- Keep gasoline containers in a dry, well ventilated shed or detached garage away from water supply wells. Don't keep metal gasoline cans on a dirt floor for extended periods.

Dispose of Waste Gasoline Properly

- Handle old or dirty gasoline as hazardous waste. Bring it to a household hazardous waste collection center in a proper gasoline container.

If a spill occurs: For *any size* spill that is not immediately cleaned up, first contact your local 911 responder or fire department, then call the DES emergency spill number at (603) 271-3899 (Mon-Fri, 8-4), or weekends and evenings at (603) 223-4381 (NH State Police).

Revised August 2011

Got Clean Drinking Water?

It's up to you!

The DOs and DON'Ts for maintaining clean Drinking Water

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

For more information please contact the Drinking Water Source Protection Program at (603) 271-7061 or visit our website: http://des.nh.gov/organization/divisions/water/dwgb/dwspp/index.htm.

Where does your drinking water come from?

Your drinking water comes from either groundwater or surface water. Groundwater is the water that flows through the spaces between soil particles and through fractures in rock. It comes from rain and snowmelt percolating through the ground. Surface water comes from rainfall and snowmelt running over land and from *groundwater* seepage into lakes, rivers and reservoirs.

Why should you be concerned?

While some pollutants, such as bacteria, viruses and phosphorus, can be reduced by passing through soil under certain conditions, groundwater can be easily contaminated by chemicals and oils. Surface water is also affected by soil and pollutants picked up as water flows over land.

Keep Household Hazardous Wastes Out of your Drinking Water! Such as …

Automotive Fluids • Auto Batteries • Used Motor Oil
Oil-Based Paint • Paint Thinner • Antifreeze
Pesticides • Cleaning products • Gasoline

DO –

- Use non-toxic and less-toxic alternatives to pesticides and household chemicals.
- Take leftover household chemicals to your town's household hazardous waste collection day.
- Follow package directions on pesticides, fertilizers and other household chemicals.
- Check your underground fuel storage tank (UST) frequently for leaks. If a UST is more than 20 years old, replace it with an aboveground storage tank that has a concrete slab underneath it, a cover and secondary containment.
- Take care of your septic system. Inspect it every year and get it pumped out every 3-5 years.
- Avoid damage to your leach field and distribution lines by keeping vehicles, livestock and other heavy objects off of them.
- Test soil every two years to determine existing nutrient levels and pH before applying fertilizers.
- Use slow or controlled release nitrogen sources of fertilizer.
- Measure the area of your lawn to be fertilized to determine how much to use and calibrate or adjust spreader settings to match the recommended rate for fertilizers.
- Use drip pans large enough to contain motor vehicle or power equipment fluids being replaced or drained.
- Fully drain oil over a drip pan or pail before disposal. Most solid waste transfer stations accept used oil filters for recycling. Store and transport used oil filters in a covered leak-proof container until disposal.
- Keep absorbent materials such as rags, pads, "Speedi-Dry" or kitty litter near the work area and clean up all spills as soon as they occur.
- Dispose of all used absorbents immediately in a leak-proof container.
- Refuel or repair engines over an impervious surface, such as a concrete floor or tarp.
- Drain all fluids from motor vehicle parts before removing them from the vehicle.
- Follow medicine disposal guidelines described at www.nh.gov/medsafety.

DON'T –

- Buy more pesticides or hazardous chemicals than you need.
- Dispose of hazardous chemicals by pouring them down the drain or onto the ground.
- Over-use pesticides or household chemicals. More is not necessarily better.
- Have your UST removed by a contractor who is not familiar with state guidelines for UST removal.
- Overload your septic system with solids by using a garbage disposal, unless the system is specifically designed for one.
- Pour chemicals down the sink or toilet.
- Use septic system cleaners or additives containing acids or chemical solvents such as trichloroethylene (TCE).
- Use fertilizers if heavy rains are anticipated as the nutrients will be flushed from the lawn into drains and low areas.
- Apply fertilizers within 25 feet of most lakes and streams.

Green Grass & Clear Water

Water quality friendly lawn care and fertilizer recommendations for northern New England

According to a recent survey, it's likely that you and your neighbors believe having a lawn that is safe for the environment is very important.* However, some lawn care practices can create water quality problems. Excess nutrients (including nitrogen and phosphorous found in fertilizers) that run off our properties into local waterbodies can trigger algal blooms that cloud water and rob it of oxygen.

Many of us enjoy the time we spend working on our lawns and are willing to try new practices as long as our lawns continue to look good.* Here are some easy practices for creating and maintaining a truly healthy lawn – attractive and safer for the environment.

For additional resources, please visit:

www.extension.unh.edu/Sustainable-Landscapes-and-Turf

Simple Recommendations for Every Lawn

1. Choose the Right Grass Seed

- Consider limiting lawn area to locations where grass will grow easily and will actually be used for outdoor activities.
- Choose grass varieties that require less maintenance. For northern New England, choose seed mixes with higher percentages of turf-type tall fescues, compact-type fall fescues and/or fine fescues. Choose mixes with smaller percentages of Kentucky bluegrass and/or perennial ryegrass.
- In shaded areas, select shade-tolerant turf grasses like fine-leaf and tall fescues.
- Up to 10% of total seed mix can be white clover to help fix nitrogen in soil naturally. Avoid clover if anyone in the household is allergic to bee stings.

2. Don't Overwater

- If irrigating, one inch of water per week is typically enough. Overwatering can lead to runoff and leaching of contaminants into groundwater.

3. Test Your Soil

- Sometimes adjusting the soil pH or organic matter are the only treatments needed to improve a lawn. If the soil test results come back as acceptable but your lawn is not, then check for other problems like pest infestations. Learn more at: bit.ly/Home-Soil-Test

4. Mow Smart

- Mow grass 3" or higher. Cut no more than 1/3 of the blade to encourage longer, stronger turf grass roots. Leave the clippings after mowing to provide a source of low release nutrients.

Recommendations for Lawns that Need Fertilizer

1. Determine How Much to Apply

- Measure the dimensions of the area where you plan to apply. The square footage of the area will determine how much fertilizer to purchase and use.
- Only use what you need. Nearly half of homeowners mistakenly use the entire bag whether it is needed or not.* Seal and store opened fertilizer bags in an airtight container or share excess with others.
- Lawns older than 10 years usually need less nitrogen than newer lawns, especially if the clippings are left, so apply only half of the amount directed on the bag. Only apply more if there's no improvement over time in turf color and density. Staying under four applications per season at this reduced rate helps keep the overall application at the recommended level† for water friendly practices.
- Lawns less than 10 years old may need the full amount of nitrogen as indicated on the fertilizer instructions. Apply less than four times per year.

2. Know When & Where to Apply

- Avoid applying fertilizers mid-summer when turf growth naturally subsides or before a big rain when it can run off into nearby waterways or leach into ground water.
- In northern New England, apply no earlier than spring green-up and no later than mid-September to ensure the proper soil temperature for grass to take up the nutrients.
- Know your local and state laws related to fertilizer application. For example, do not apply any fertilizers within 25 feet of water bodies in New Hampshire.

3. Choose the Right Fertilizer

- Avoid combination products that include both pesticide and fertilizer unless confident you need both. Unnecessary applications of fertilizers and pesticides can lead to soil and water contamination.
- Select lawn fertilizers with low or no phosphorus unless your soil test indicates otherwise. The fertilizer formula (e.g., 20-0-15) tells the relative percentages of nitrogen (N), phosphorous (P) and potassium (K).

3. Choose the Right Fertilizer, cont.

- Slow release formulations (>50% water insoluble nitrogen – WIN) are generally preferable. Only use quick release products when there is a need to grow turf very quickly, for example to prevent erosion of bare soil during a new seeding. Check the product label to see what type of nitrogen it contains.
- Organic fertilizers are typically slow release and contain micronutrients that are beneficial to soil. They are not petroleum-based like most synthetic fertilizers. Overapplying any type of fertilizer or over-irrigating fertilized turf can lead to water quality problems.

For more information:

www.extension.unh.edu/Sustainable-Landscapes-and-Turf

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†Recommendations adapted from:
New England Regional Nitrogen and Phosphorus Fertilizer and Associated Management Practice Recommendations for Lawns Based on Water Quality Considerations. 2008. Karl Guillard (ed.). *Turfgrass Nutrient Management Bulletin 0100*. College of Agriculture and Natural Resources, University of Connecticut. USDA CSREES project # 2006-51130-03656.

*Survey references from:
Eisenhauer, B.W. and B. Gagnon. 2008. "Changing homeowner's lawn care behavior to reduce nutrient losses in New England's urbanizing watersheds: the report of findings from social science research." USDA CSREES project # 2006-51130-03656.

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under Agreement No. 2006-51130-03656. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Designed by: Rebecca Zelber, NHSG science writer. Publication #: UNHMP-IS-SG-13-27

Appendix 5. Emergency Action Plans

The State of New Hampshire requires that all Community Public Drinking Water Systems have, on-hand, a formal Emergency Action Plan to address system needs in the event the source is no longer viable due to contamination or damage (ENV-WS 360.15). This is also recommended for transient and non-community non-transient systems, but is not required. At a minimum these plans must contain the following:

- A chain of command identifying who is responsible for what during an emergency.
- A notification procedure outlining who is to be contacted and in what order from emergency responders to system users.
- An accurate description of the system.
- Alternative water sources.
- Alternative power supplies.
- Water use restrictions.
- A plan on how to return to normal operations.
- A readiness and training plan.

These Emergency Action Plans are required to be updated and submitted to NH DES every six years, reviewed internally by the system annually, and whenever the system undergoes a sanitary survey. Vulnerability assessments are not required, but are recommended as a part of any Emergency Action Plan. As community systems, both the Walpole Water Department, and the North Walpole Village District have Emergency Action Plans. The other three systems in Walpole do not have Emergency Action Plans, or did not have one available.

Town of Walpole Water Emergency Plan

Section 1. System Identification

System EPA Identification Number	2401010	
System Name	Walpole Water Department	
Town	Walpole	
Source ID/Type/Description/Well Yield from DES records	Watkins Well, #20333-SO1	150 gpm
Source ID/Type/Description/Well Yield from DES records	River Well, #20333-SO2	350 gpm
Source ID/Type/Description/Well Yield from DES records		gpm
Source ID/Type/Description/Well Yield from DES records		gpm
Population Served/# Service Connections from DES records.	922 people	369 connections
Date of most recent emergency plan in DES records.	2009	
Name, Title, and Phone Number of person responsible for maintaining this emergency plan.	Mark Houghton, Superintendent	603-756-3372

Section 2. Chain-of-Command

See attachment EAP#2

Section 3. Emergency Notification Procedures

Local Notification List

Fire Dept day 352-1100	Fire Dept night 352-1100
Police Dept day 445-2058	Police Dept night 352-1100
Ambulance service day 352-1100	Ambulance service night 352-1100
Emergency Management Office day 756-3672	Emergency Management Office night 352-1100

Health Office day 756-3960 (Clinic)	Health Office night 354-5400 Cheshire Medical
Local Newspaper day 352-1234 (Keene Sentinel)	Local Newspaper night 352-1234 Sentinel
Local Radio Station day 352-9230 (WKNE)	Local Radio Station night 352-9230 (WKNE)
Local Radio Station day 358-1065 (WHDQ)	Local Radio Station night 358-1065

State Notification List

State Police day 1-800-525-5555	State Police night 1-800-525-5555
Water Supply Engineering Bureau day 271-3139 or 271-3503	Water Supply Engineering Bureau night 271-3139 or 271-3503
Office of Emergency Management day 271-2231 or 1-800-852-3792	Office of Emergency Management night 271-2231 or 1-800-852-3792
Public Health Services day 271-4496	Public Health Services night 271-4496

Service/Repair Notification List

Electrician day 756-3372 (Everett E. Houghton Co.)	Electrician night 756-9683 (Everett E. Houghton Co.)
Electric Utility day 1-800-322-3223 (GSE)	Electric Utility night 800-322-3223
Plumber day 756-3372 (Everett E. Houghton Co.)	Plumber night 756-9683 (Everett E. Houghton Co.)
Pump Specialist #1 day 756-3372 (Everett E. Houghton)	Pump Specialist #1 night 756-9683 (Everett E. Houghton)
Pump Specialist #2 day 800-339-2506 (RH White)	Pump Specialist #2 night 588-6253 (Stuart Bennion)
Soil Excavator #1 day 445-5655 (Highway Dept)	Soil Excavator #1 night 756-9033 (Jim Terrell)

Soil Excavator #2 day 399-9922 (Steve's Equipment)	Soil Excavator #2 night 756-3757 (Steve Galloway)
Hydrogeologic Consultant day 603-358-6011 (Steve Brackett)	Hydrogeologic Consultant night 358-6011 (Steve Brackett)
Equipment Rental day 399-9922 (Steve's Equipment)	Equipment Rental night 756-3757 (Steve Galloway)
Laboratory: 603-862-5032 Fall Mountain Water Testing	

Section 3A. Boil Orders / Do Not Drink Orders
See DES Fact Sheet WD-WSEB-4-8 Boil Water Advisories, and section #EAP5.

Section 3B. Critical Users

See section #EAP3.

Section 4. System Components

Section 4A. System Equipment & Chemicals
See section #EAP4 & 4a.

Section 4B. System As-Built Plan

See section #EAP4.

Section 4C. System Demand
Include a brief description of this system's ability to isolate sections of the distribution system and how this system could utilize demand reduction and excess capacity during an emergency. See section #EAP4.

What is the total production capacity of this system?	Gallons per day = 720,000
What is the total storage capacity of this system?	Gallons = 300,000
What is the average daily demand of this system?	Gallons per day = 108,000
What is the maximum daily demand of this system?	Gallons per day = 250,000

Estimated Available Water (divide total storage capacity by average daily demand)	Days = 2.77

Section 5. Alternate Water Source
Include descriptions of how this system would utilize the following alternate water sources during an emergency.

Section 5A. Bulk and/or Bottled Water

This is not a feasible option for the Walpole Water department, however bottled water is available locally for purchase.

Section 5B. Interconnections with Adjacent Water Systems
Not Feasable.

Section 5C. New Source / Reactivation
Not applicable.

Section 6. Alternate Power Supply
See section #EAP4.

Section 7. Water Use Restrictions
The Walpole Water Department will implement the following water conservation measures as necessary in the event of a water system emergency.

1. Watering gardens, lawns or other landscaped areas will be restricted at a minimum or banned entirely.
2. Washing cars, trucks, boats, RV's, ect., will be restricted at a minimum or banned entirely.
3. Using water from a hose to rinse or clean sidewalks, driveways, decks, ect. will be restricted at a minimum or banned entirely.
4. Filling swimming pools will be restricted at a minimum or banned entirely.
5. Residents will be required to follow indoor water use restrictions adopted from NH DES fact sheet #WD-WSEB-26-2 that lists water efficiency practices for indoor water use.
6. In a prolonged or dire emergency, rationing will be implemented.

Section 8. Return to Normal Operation
See section #EAP5.

Section 9. Vulnerability Assessment (optional)
Env-Dw 503.21 does not require you to submit a vulnerability assessment as discussed in this section. Vulnerability assessments were required for community systems that

serve 3,300 people or more back in 2003/2004 per the Bioterrorism and Response Act (H.R. 3448).

Section 10. Plan Readiness and Training

Include a list of people that have a copy of the plan, plan locations, a schedule for rehearsals and a plan for discarding outdated plans. You should also include any special certifications/training that system staff has such as National Incident Management System (NIMS) or Incident Command System (ICS) training.

This Plan is kept on file at both the Watkins Hill and River Well Houses, Town Hall, and EE Houghton Co. office.

This version of the plan (2015) shall supersede and replace all previous versions.

Section 11. Signatures

The owner and operator of the system must sign and date below.

Other system representatives who assisted in the completion of this plan are recommended to sign and date below. The signatures attest that all information provided is true and accurate and that both the owner and primary operator have read and understand this plan.

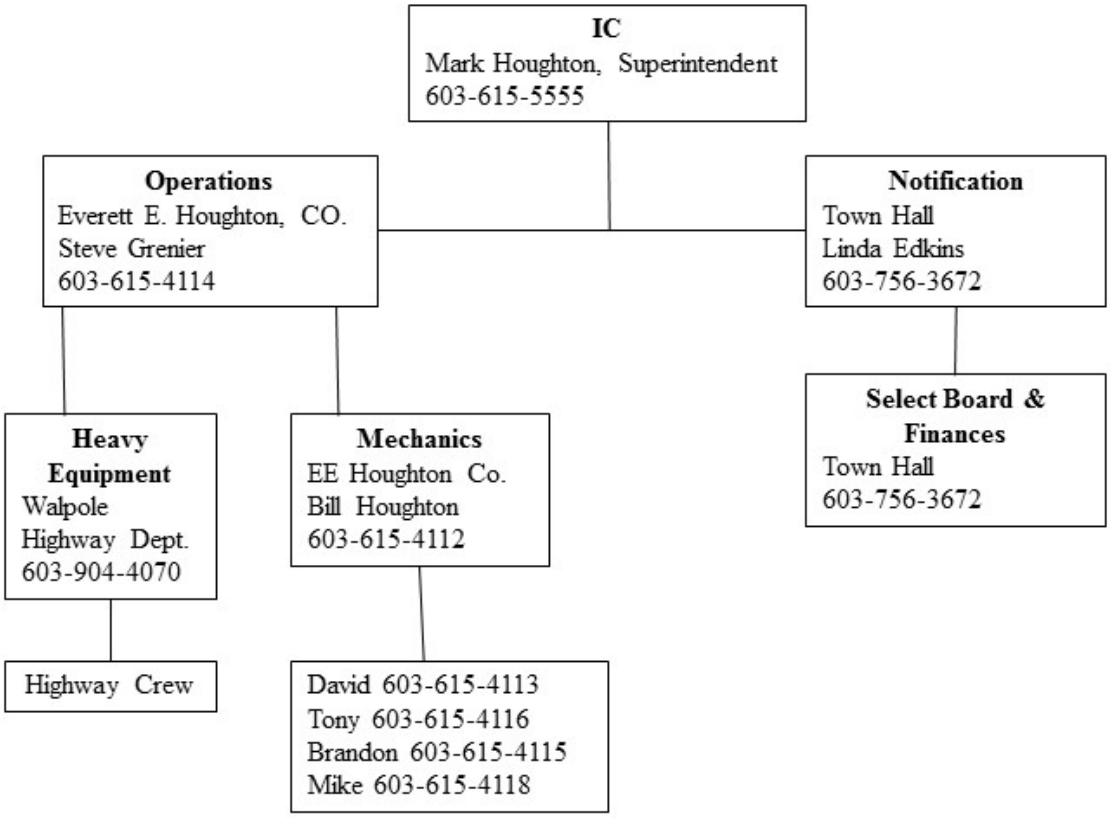
Owner Signature	Date
Operator	Date
System representative signature/title	Date
System representative signature/title	Date

Town of Walpole, NH

-Water Department-

Emergency Action Plan Chain of Command

Attachment #EAP2



Town of Walpole, NH

-Water Department-

Emergency Action Plan Special User Contact List

Attachment #EAP3

1.) *Hubbard Farms Day: 603-756-3311 Night: 603-756-3662 (Dale Woodward)

- a) Office
- b) Pomroy Farm
- c) B Farm
- d) Site Services
- e) Hatchery

2.) Walpole Inn 603-756-3320 (Tom Webber)

3.) Burdick's Chocolates 603-756-3701 (Larry Burdick)

4.) Murray's Restaurant 603-756-3426 (Tom Murray)

5.) Dartmouth Clinic 603-756-3969

6.) Town Hall 603-756-3672

7.) John Gascoyne 603-756-4713

8.) Les Hubbard 603-756-3306 (Red Smith)

9.) Walpole Village Salon 603-756-3000

10.) Fire Department 603-352-1291 (Mutual Aid)

11.) Walpole School 603-7564728 (Sam Jacobs)

12.) Walpole Tavern 603-756-3703

13.) Britton Farm 603-756-3620

14.) Applewood 603-352-9105 (Emily Legere)

15.) Dennis Pelligrino 603-756-3440

16.) Larry Martin 603-756-4719

*Emergency water supply responsibility of owner due to value of product

Town of Walpole, NH

-Water Department-

Emergency Action Plan List of Active Wells, Storage Sites, and Emergency Equipment

Attachment #EAP4

The Walpole water system consists of two (2) wells; Watkins Hill Well on Watkins Hill Rd, and River Well located on the access road behind Pinnacleview Equipment on Route 12.

1. The Watkins Hill Well is a 35' deep gravel packed well with a Gould's 200L25 wet end and Gould (Franklin) S15971 25hp 3-phase motor and VFD drive control with a Raco alarm dialer. There is a 7.5 hp submersible on hand at the pump house for temporary replacement purposes. This well runs 100% of the time and feeds water to the upper system and the distributor (see line 3).
2. The River Well is a 66' deep gravel packed well that is capable of producing 350 gallons per minute at 200PSI. It is powered by a Texas Turbine 50hp 3-phase pump with no alarms in place. This pump is operated manually from the fire station or automatically using a "Safe-Mark" level controller located at the distributor. No back-up pumps is on hand for this location.
3. The distributor is a 300,000-gallon below grade storage tank located at the top of Prospect Hill. The Watkins Hill Well pumps directly to this facility where the water is partially diverted to a 4" pit cast main that feeds the upper portion of Prospect Hill. The upper portion of North Rd. and 2 houses on Reservoir Rd. as well as the Reservoir facility (see line 4). The remaining water is dumped into the distributor to maintain an adequate level for the Village system. When this amount is not sufficient the "Safe-Mark" control starts the River well to supplement demand. A 25GS5 pump is housed at the facility as a back-up to the Watkins Hill well and is placed in the distributor to back feed the upper system and can be run on a generator. The water level is monitored by a Raco Verbatim dialer and a 4-20ma transducer, the alarm activates if the level drops below 2' below the start level of the River Well of a temperature below 40 degrees is reached in the control room of this facility.
4. The reservoir facility is located 300' up from North Rd. on Reservoir Rd. and houses the end of the 4" pit cast from the distributor. It houses 2 WX456 pressure tanks, a Golden Anderson altitude valve and a Raco alarm dialer. The Altitude valve releases at 40psi and commonly spills at a rate of 2-gallons per minute. If the Watkins Hill pump fails the storage at this facility lasts 22 minutes under normal demand. The alarm activates upon loss of pressure (>20psi) increase in pressure (<42psi) of loss of power or temperature below 45 degrees.

All mechanical supplies are stored at the Water Department garage on High St. (see attached list of minimum inventory (#EAP4B). All bulk water main is stored at the Highway Department garage on Valley Rd. There is a generator switch located in the control panel at the River Well for use however the upper system is more susceptible to long term power outages due to its 22-minute storage time in this part of the system.

Town of Walpole, NH

-Water Department-

Emergency Action Plan, Water Department Minimum DI & MJ Inventory

Attachment #EAP4A

2-4" Hymax Couplings

4-6" Hymax Couplings

4-8" Hymax Couplings

4-10" Hymax Couplings

1-4" Met 250 Valve

4-6" Met 250 Valve

2-8" Met 250 Valve

2-10" Met 250 Valve

8-5' Valve Box

2-6' Valve Box

1-4" x ¾" Tapping Saddle

1-6" x ¾" Tapping Saddle

1-6" x 1" Tapping Saddle

1-8" x ¾" Tapping Saddle

1-8" x 1" Tapping Saddle

1-10" x ¾" Tapping Saddle

1-10" x 1" Tapping Saddle

1-6"x6" Hydrant Tree

1-8" x 6" Hydrant Tree

1-10" x 6" Hydrant Tree

1-6" x 4" Red Coupling

1-8" x 6" Red Coupling

1-10" x 8" Red Coupling

2-6″ MJ 45

2-6″ MJ 22-1/2″

2-8″ MJ 45

2-8″ MJ 22-1/2″

2-10″ MJ 45

2-10″ MJ 22-1/2″

1-6″ MJ Tee

4-4″ Mega Lug

8-6″ Mega Lug

8-8″ Mega Lug

8-10″ Mega Lug

36′-4″ Ductile class 52

54′-6″ Ductile class 52

36′-8″ Ductile class 52

36′-10″ Ductile class 52

Town of Walpole, NH

-Water Department-

Emergency Action Plan, Boil Order Procedure

Attachment #EAP5

If a boil order is necessary for the Walpole Water System (see DES Fact Sheet WD-WSEB-4-8), public notification will proceed as follows:

1. Contact all persons on Emergency contact list.
2. Contact NH DES Water Supply Bureau @ 603-271-2513
3. Contact Keene Sentinel by phone @ 603-352-1234 and fax @ 603-352-9700. Contact Eagle Times by phone @ 603-543-3100 and fax @ 603-542-9705.
4. Contact WKNE Radio Station @ 603-352-9230 and WHDQ Radio @ 603-358-1065
5. Contact Fall Mountain Water Testing @ 603-826-5032
6. Identify the problem (i.e. well, contaminated sample, distribution, ect..)
7. Start corrective action
    a.) Contaminated Sample
        1. Re-take sample twice at contaminated site, take sample from sampling taps at both Watkins Hill and River Wells
        2. If problem shows at a well, proceed to "b", if problem shows at only at initial sampling site proceed to "c".
    b.) Well Issue
        1. Identify contamination source
        2. Take well off-line and correct problem
        3. Re-sample site
        4. Consult with NH DES
        5. Put well back on-line when compliance is met
    c.) Distribution Issue
        1. Take samples at all locations listed on #EAP3 Contact List with the following exception: Do not take samples at Hubbard Farms, Burdick's Chocolates, Dartmouth Clinic, and Walpole Tavern; Do take samples at the sampling hydrant at Alan Johnson's, Upper Walpole Rd., Prospect Hill Distributor, Robin Fernsells, Last House on Winchester St.
        2. Locate problem area
        3. Add 0.75 Gallon of 11.5% Sodium Hypochlorite solution to the distributor on Prospect Hill if the tank is between the 18ft and 22ft mark, if it is less then use accordingly.
        4. Start hydrant flushing of affected section.
        5. Re-sample and repeat flushing as necessary.
        6. Take follow-up samples every 24-hours until deemed unnecessary.
        7. Consult with NH DES
        8. Lift boil order when compliance is met.

North Walpole Village District Water Emergency Plan

Section 1. System Identification

System EPA Identification Number	High: 2401020 Low:2401030	
System Name	North Walpole Village District	
Town	North Walpole, NH 03609	
Source ID/Type/Description/Well Yield from DES records	007GPW#1 50ft E. River	120 gpm
Source ID/Type/Description/Well Yield from DES records	008GPW#2 100ft N. River	120 gpm
Source ID/Type/Description/Well Yield from DES records	001BRW/1PM	40 gpm
Source ID/Type/Description/Well Yield from DES records		gpm
Population Served/# Service Connections from DES records.	1,000 people	304 connections
Date of most recent emergency plan in DES records.	None on file	
Name, Title, and Phone Number of person responsible for maintaining this emergency plan.	Barbara S. O'Brien Chair, Commissioners of Village	603-445-2453

Section 2. Chain-of-Command See attachment EAP2

A water system must have and maintain an up-to-date organizational "chain-of-command" that identifies who is responsible for making decisions during an emergency. **The first response step** in an emergency is to inform the person at the top of your chain-of-command. This will reduce confusion and optimize response speed and effectiveness. Your emergency plan must include a flow chart listing names, titles, and day/night phone numbers. Additionally, the system must determine the responsibilities of each key person during an emergency, i.e., what each person's role will be. Please attach your chain-of-command flow chart and a brief description of each person's responsibilities during an emergency.

Section 3. Notification

It may be necessary to quickly notify other parties during an emergency situation. Other parties might include your water system users, health officials, safety officials, regulatory personnel, the media, and service/repair providers. Please list names plus day and night telephone numbers for the following groups. The following lists are not intended to be inclusive – they may be adapted to your local needs, but they must be thorough. Attach any additional listings that you consider appropriate.

Local Notification List

Fire Dept day: Work: 603-756-3311 Edward Hasselmann Home: 802-289-2253	Fire Dept night: 603-352-1291 Mutual Aid
Police Dept day: 603-445-2058 Michael Paquette	Police Dept night: 603-352-1291 Mutual Aid
Ambulance service day: 802-463-3726 Golden Cross	Ambulance service night: 1-800-439-6555
Health Office day: 603-756-3672 Selectman's Office	Health Office night
Neighboring Water System day: Bellows Falls VT: 802-463-1232	Neighboring Water System night: Fire Station: 802-463-4343
Local Radio Station day 352-9230 (WKNE)	Local Radio Station night
Local Radio Station day	Local Radio Station night
Other: Falls Area TV 802-463-1613	Other

State Notification List

State Police day: 1-800-525-5555	State Police night: 1-800-525-5555
Water Supply Engineering Bureau day 603-271-2513 or 603-271-7017	Water Supply Engineering Bureau night 603-271-2513 or 603-271-7017
Office of Emergency Management day 603-271-2231 or 1-800-852-3792	Office of Emergency Management night 603-271-2231 or 1-800-852-3792
Public Health Services day Keene: 603-352-5440 State:603-271-4496	Public Health Services night Keene: 603-352-5440 State:603-271-4496
Other	Other

Service/Repair Notification List

Electrician day: 802-463-3656 Crowley Electric	Electrician night: 802-463-3656 Crowley Electric
Electric Utility day: 1-800-465-1212 (Liberty)	Electric Utility night: 1-800-465-1212 (Liberty)
Plumber day: 802-463-3166 Stephen L. James	Plumber night: 802-463-3166 Stephen L. James
Pump Specialist #1 day: 1-800-831-8883 Cushing and Sons	Pump Specialist #1 night: 1-800-831-8883 Cushing and Sons
Pump Specialist #2 day: 1-800-427-6086 Tri-State Water Systems	Pump Specialist #2 night: 1-800-427-6086 Tri-State Water Systems
Soil Excavator #1 day: 603-445-2400 Hodgkins & Sons	Soil Excavator #1 night: 603-445-2400 Hodgkins & Sons
Soil Excavator #2 day:802-463-9093 Pine Line	Soil Excavator #2 night: 802-463-9093 Pine Line
Hydrogeologic Consultant day:603-433-6120 SS Hydrogeological Environmental Consultants	Hydrogeologic Consultant night: 603-433-6120 SS Hydrogeological Environmental Consultants
Emergency Response Consultant day	Emergency Response Consultant night
Equipment Rental day:	Equipment Rental night:
New England Instruments: 603-736-8337	Granite State Rural Water: 603-336-7595
Other	Other

Unique Water System Users

In an emergency your water system may have to provide priority notification to users with unique or special water needs. Unique or special users would include nursing homes, elderly housing facilities, and hospitals. Water systems must identify and maintain an up-to-date list of service customers with unique water needs and make provisions for safe and adequate water supply to them.

Does this system have service customers with unique water needs?	Yes see attachment EAP3

If you circled "Yes" above, please attach your list of unique service customers and a brief description of how you will notify them and provide for their water needs.

Section 4. System Components

It is essential that a water system have accurate up-to-date information about its facilities, equipment, and design. This information will help facilitate repair in case of an emergency and will also be valuable in assessing system vulnerability to an emergency.

System Plan

Please attach an up-to-date, accurate, plan of your system that shows at least the locations of all individual wells (active and inactive), water treatment facilities, storage tanks, major distribution lines, and key shutoff points for isolating sections of your distribution system. The plan must be easily legible and drawn in a manageable scale. DES has well and distribution system locations in its geographic information system database and could provide you with maps or electronic data. Some systems may be concerned with providing this information to DES since it becomes available to the public once it has been submitted. If you have this concern, please do not submit your plan. Instead provide an explanation regarding the status of your plan and DES will review the plan during sanitary surveys. If you do decide to submit a plan for our review, DES will review the plan and return it to the system.

System Equipment

Please attach an up-to-date list of your facilities and major equipment. List at least each active well, each operable inactive well, total production capacity of each active and operable inactive well, each storage tank, capacity of each storage tank, each treatment facility, each pump house, and important repair equipment. Few water systems serving 501 or more people have atmospheric storage tanks. However, if you do, indicate whether or not it is equipped with a capped and lockable fill pipe to accommodate tank truck water delivery. Please note that Env-Ws 372.23 requires that all atmospheric storage tanks be equipped with a capped and lockable fill pipe by January 01, 2007.

Does this system have an atmospheric storage tank? If yes, how many?	Yes No 1 # tanks
Are your atmospheric storage tank(s) equipped with a fill pipe for supplied water?	Yes No n/a

If you answered "No" above, please indicate in the box below when your atmospheric storage tanks will be equipped with fill pipes for tank truck water delivery.

Hydraulic Connection Between Sources

A contamination event may not impact all your production wells. However, contamination in one well could impact another well if they are hydraulically connected, i.e., contaminated water is drawn into an uncontaminated well when it is pumped. Knowing the hydraulic connection between your production wells (if any) enables you to assess the extent that contamination in any single well will impact total production capacity. If pumping a single well results in drawdown in other wells, hydraulic connection exists between those wells. Pumping rates can also influence hydraulic connection. Attach a description of the hydraulic connection between your producing wells. A detailed hydrogeologic evaluation is not necessary; you may base your description on existing information.

System Demand

During an emergency, a water system may need to reduce its demand or utilize its excess capacity to continue to provide safe water to its users. Please attach a discussion of how this system could utilize demand reduction and excess capacity during an emergency. Please answer the following questions.

What is the total production capacity of this system?	High:50,000 Low:144,000 gallons per day
What is the total storage capacity of this system?	High:110,000 Low:500,000 gallons
What is the average daily demand of this system?	High:10,000 Low:70,000 gallons per day
What is the maximum daily demand of this system?	High:20,000 Low:150,000 gallons per day
Divide total storage capacity by average daily demand.	High: 11 Low: 7.14 days

Section 5. Vulnerability Assessment (Optional)

Env-Ws 360.14 does not require you to submit a vulnerability assessment as discussed in this section. However, we encourage you to consider such an assessment as a valuable management/planning tool for your system. Consequently, we ask that you voluntarily submit the information requested in this section with your completed emergency plan. We also ask that you update this information in conjunction with your entire emergency plan.

Unpreventable Emergencies

Some emergencies are caused by reasons beyond the control of the water system. Floods, sabotage, ice storms, earthquakes, droughts, power outages, truck accidents, train derailments, and labor problems are examples. Each system should assess its potential susceptibility to unpreventable emergencies. To do this, first think about unpreventable scenarios that could impact your system. For example, if a major highway, an active railroad track, and a geologic fault zone are located within your wellhead or surface water protection area, then accidents, derailments and earthquakes should be included in your vulnerability assessment. Next consider the possible impact of each scenario to the supply, storage, and distribution components of your system. Extensive detail is not necessary. Instead, our recommendation is to rate the likelihood of occurrence (most likely to least likely), briefly discuss the estimated impacts of each scenario to the supply, storage, and distribution components of your system, and then set forth the generic response actions of the system staff.

Preventable Emergencies

Other emergencies may be preventable. Age and obsolescence of equipment, lack of equipment, poor maintenance, poor system design, lack of spare parts, high risk or ill advised land usage near your source(s) of water, and lack of source protection efforts are all preventable factors that can cause water system emergencies. By identifying and managing preventable causes of emergencies, you can reduce the likelihood of an occurrence. Please list and briefly describe any vulnerable areas of your system that need correction or improvement. Include a discussion of source protection efforts undertaken by this system.

Does this system have a formal equipment maintenance schedule?	Yes	No
Does this system participate in the sampling waiver program?	Yes	No
Would this system benefit from improved knowledge of available grant programs?	Yes	No

Section 6. Alternate Water Source

An emergency may necessitate obtaining water from an outside source, or modifying your current treatment capabilities, to meet your basic water needs. Please attach discussions of how this system could utilize the following during an emergency.

Tank Trucks and/or Bottled Water

It is essential that all water systems plan for the contingency of having to provide water from an outside source during an emergency. A list of bottled and bulk water suppliers in the general vicinity of this system is enclosed. Due to high volume needs, tank trucks and bottled water may not be viable alternate water source options for the largest water systems in New Hampshire. Please answer the following options.

Is tank truck/bottled water a viable alternate water source for your system?	Yes	No	
If you answered "Yes" above, have you discussed your potential water needs with at least 2 suppliers?	Yes	No	N/A
If you answered "Yes" above, approximately how long will it take for alternate water to reach this system?			hours

Water Supply Treatment

Discuss how this system could utilize its treatment capabilities during an emergency. Two separate water systems that we can pump from one to the other ~ can treat trucked in bulk water through area well and treat with chlorine

Tie-in to Adjacent Water Supply System

Discuss the feasibility of connecting to an adjacent water supply system for use as an alternate water source during an emergency. DES has provided Drinking Water Resource Maps to every municipality in New Hampshire. These maps show the location of all public water systems in a town. Sampling waiver maps are also good tools for locating nearby water systems. Please answer the following questions.

Does this system have a copy of the Drinking Water Resource Map for its town?	Yes	No
Are any water systems situated adjacent to this system?	Yes	No
Is it feasible for this system to connect to an adjacent system?	Yes	No
Have you discussed the feasibility of connecting to another system(s) with representatives of that system(s)?	Yes	No

New Source

An emergency may necessitate that your system develop a new source of water or use an inactive source. Briefly describe this system's contingency plan for developing a new source or using an inactive source.

Section 7. Boil Order

An emergency could occur if your drinking water source has been contaminated with microbiological pathogens. The presence of certain pathogens in drinking water is a significant health concern. If coliform monitoring indicates a pathogen risk, it may be necessary to implement a boil order. Include a brief discussion of how this system would implement a boil order. See DES Fact Sheet WD-WSEB-4-8 Boil Water Advisories.

Section 8. Water Conservation

Water conservation can be an effective means of coping with minor losses of source capacity. Attach an assessment of how this system could use conservation measures during an emergency. The assessment should include a quantification of unaccounted for water usage, the potential of this system to save significant quantities of water through conservation measures, and a prioritization of categories of water use that are marginal or nonessential in times of water shortage.

Section 9. Return to Normal Operation

Include a description of the follow-up actions and staff responsibilities that this system would undertake to return to normal operation.

Section 10. Plan Readiness

In order for this plan to be useful, people must know the plan exists, they must know where to quickly find the plan, and they must understand their role during an emergency. Please answer the following questions.

Do the key representatives of this system know about this emergency plan?	Yes	No
Does this system have a specific location where an up-to-date copy of its emergency plan is stored at all times?	Yes	No
Has this system clearly defined for each key person what his or her responsibilities will be during an emergency, i.e., does each key person clearly understand their role?	Yes	No
Has this system rehearsed its emergency plan?	Yes	No

Section 11. Signatures

Representatives of this water system must sign and date below. The signatures attest that all information provided herein and on the complete plan is true and accurate. **At least two signatures are required.**

Barbara S. O'Brien, Commissioner/Chair	1/7/2014
Patrick Kiniry, Commissioner	1/7/2014
Cheryl Mayberry, Commissioner	1/7/2014

Section 12. Emergency Plan Requirements

Env-Ws 360.14 requires that community public water systems serving over 500 people have a formal emergency plan. The plan must be reviewed annually by the water system and an updated plan submitted to the DES at least every 6 years. The plan should be updated locally as needed. Additionally the plan will be subject to review during the sanitary survey and it will be necessary to have a plan to participate in the sampling waiver program. We suggest that the plan have the same organizational format as this guide. This guide is available through the DES website at www.des.state.nh.us/wseb. Every system will be different in terms of the resources that will be needed to develop or update their plan. Grant funding is available each fall for this and other source water protection activity.

Return This Filled-in Guide and Your Complete Emergency Plan By Your Submittal Deadline To:

Johnna McKenna 603-271-7017 or jmckenna@des.state.nh.us

Department of Environmental Services

6 Hazen Drive Concord, New Hampshire 03302-0095

Checklist of Items to Return (check the box next to each attached item)

Completed and Signed Emergency Plan Guide		Vulnerability Assessment – Voluntary submittal (Section 5)	
Chain-Of-Command Flow Chart and List Of Responsibilities (Section 2)		Discussion of Alternate Water Source Options (Section 6)	
Filled out Notification Lists and List of Unique System Users (Section 3)		Boil Order Discussion (Section 7)	
		Assessment of Water Conservation (Section 8)	
System Plan, List of Equipment, and Description of Hydraulic Connection (Section 4)		Description of Return to Normal Operation (Section 9)	

North Walpole Village District Emergency Plan

Chain of Command Flow Chart (Section 2 of Guide)

North Walpole Village District Commission Chair
BARBARA S. O'BRIEN
603 445-5454 Day-Night

North Walpole Village District General Manager
Patrick Kiniry

Cell: 1-603-381-2385

***North Walpole Village District* Water System Operator**
Robert McQuirk
603 313 5422 Day/Night
802-463-3166 Work
603-756-3057 Home

North Walpole Village District *Commission*

Cheryl Mayberry
1-603 445-2249 Day/Night
Cell:1-603-313-2599

NORTH WALPOLE VILLAGE District Water System Users

Chain of Command Responsibilities (Section 2 of Guide)

NORTH WALPOLE VILLAGE DISTRICT Commission Chair

1. **Overall responsibility for managing a water emergency at NORTH WALPOLE VILLAGE District .**
2. **Immediately notify the NORTH WALPOLE VILLAGE DISTRICT General Manager and Water System Operator of the existence of a water emergency.**
3. **If necessary, immediately notify local and state emergency agencies, such as police, fire, ambulance, health, and DES Water Supply Engineering Bureau. See Emergency Plan, Page 2 for Telephone numbers.**
4. **Be available as contact person for local and state emergency agencies.**

NORTH WALPOLE VILLAGE DISTRICT General Manager

1. **Instruct NORTH WALPOLE VILLAGE DISTRICT Commission members to implement system user notification procedure.**
2. **Immediately notify the Water Systems Operator of the existence of an emergency.**
3. **Oversee service/repair efforts.**
4. **Implement service/repair notification procedure.**
5. **If necessary, oversee and implement boil order and alternate water procedures plus water conservation measures.**

NORTH WALPOLE VILLAGE DISTRICT Water System Operator

1. **Be available as necessary to provide hands-on knowledge of system components.**
2. **Be available (or designated person) as necessary to take water samples and to transport them to a certified laboratory for analyses.**
3. **Oversee and coordinate the return to normal operation.**

4. **Make available and coordinate use of system equipment such as keys, maps, tools, spare parts, vehicles, and backhoe during an emergency. Water System Operator needs to call for equipment.**
5. **Assist as necessary with service/repair efforts.**
6. **Assist as necessary water system operator with return to normal operation procedures.**
7. **We will call Bellows Falls (VT) water Department for back up if needed by Water Operator.**

NORTH WALPOLE VILLAGE DISTRICT Commission members

1. **Implement and oversee system user notification procedure.**
2. **Implement unique system user notification procedure.(Len-Tex, Bakery, School)**
3. **Implement notification of abutting public water system. (Bellows Falls, Vermont)**
4. **Be responsible for and maintain up-to-date notification lists and notification tree contacts.**
5. **If necessary assist General Manager with boil order, alternate water efforts, and/or water conservation measures.**

NORTH WALPOLE VILLAGE DISTRICT Water System Users

1. **Immediately notify the Commission Chair of the presence of a water emergency. Commission Chair will follow chain of command.**

NOTIFICATION PROCEDURES

Water System Users

The NORTH WALPOLE VILLAGE DISTRICT Commission members are responsible for implementing notification to the water system users. NORTH WALPOLE VILLAGE DISTRICT has approximately 304 service connections, or one connection per household. Notification will be accomplished through utilization of a telephone list or door to door posting.. According to prior arrangement, the Vice Commission Chair will notify the members of the Board of Commissioners. The Commissioners will in turn notify a pre-set list of other households using telephone/mail until all 304 households and commercial building businesses have been notified. Each household and business will be responsible for notifying all other people who reside in that home. For households that cannot be reached by electronic communication, a notice will be posted on their door no more than 5 hours after notification begins. Notices will also be posted in common areas of the NORTH WALPOLE VILLAGE DISTRICT including the mailbox cluster. The Commission members are responsible for updating and maintaining the notification tree system.

Unique Water System Customers

NORTH WALPOLE VILLAGE DISTRICT has no water system users at the time of the preparation of this Plan who require potable water for medical reasons. The District recognizes special requirements for three (3) users: Lintex, Bellows Bakery, and the Elementary school. These users will be notified by a Commission member as a priority.

Service/Repair

The NORTH WALPOLE VILLAGE DISTRICT General Manager is responsible for implementing notification to service/repair contractors. A list of service/repair contractors and phone numbers is part of this emergency plan. The General Manager will use this list to telephone appropriate contractors. If necessary, the System Operator will assist. The District Commission members

are responsible for maintaining an up-to-date service/repair contractor list.

Local and State Agencies

The NORTH WALPOLE VILLAGE DISTRICT Commission Chair is responsible for implementing notification to local and state agencies. A list of local and state agencies and phone numbers is part of this emergency plan. The Commission Chair will use this list to telephone appropriate agencies. If necessary, the General Manager will assist. The Commission members are responsible for maintaining an up-to-date local and state notification list.

Abutting Public Water Systems

NORTH WALPOLE VILLAGE DISTRICT has one (1) abutting public water system. If necessary, the District Commission members will notify the abutting Bellows Falls system using telephone or email. The telephone number of the system is part of this emergency plan. This notification will be done after the water system user notification is completed.
Will use hydrant on Rockingham Street at end of Arch Bridge in Bellows Falls, VT to hook up fire hose to lay over bridge side walk to connect with hydrant on Killeen Street (end of Bridge over Connecticut River) to supply water to Village. This hydrant was set up with valves for emergency needs. It would be necessary to negotiate with the Bellows Falls, Vermont Trustees at the time of an emergency because this is an interstate situation with laws and regulations that dictate the allocating of emergency water at that particular event. Also put into effect boil orders because of water being transported by fire hose.

System Components (Section 4 of the Guide)

General Description: Currently there are approximately 304 service connection on the water system in North Walpole. The service area is divided into two distinct zones, a high service zone (High Water System) and a low service zone (Lower Water System). The High Water System provides water to the Mountain View Development Area and all residences above the elevation of 365 feet. The Lower Water System services the rest of the Village (approximately 80% of the service) along the Connecticut River.

System Equipment

Lower Water System:

1. **#1 Gravel Packed Well is located approximately ;70 feet from the Connecticut River in back of the Fire Station and Treatment Plant on 70 Church and 3 Russell Street respectively. Within the Village of North Walpole, NH. This #1 Gravel Packed Well is the primary source of water for the Lower Water System. The pump for this well will produce up to maximum 150,000 gallons per a 24 hour period. This 10 horsepower pump was installed by Cushing and Sons of Keene, NH 603-352-8866**
2. **#2 Gravel Packed Well is located approximately 100 feet north of Gravel Packed Well #1 as stated in Item 1 above. This pump is necessary when pump #1 is not in service. The same pumping capacity and installation as stated in above Item 1.**
3. **Water Treatment Plant is located behind Fire Station, 70 Church Street. The actual address is 3 Russell Street. This Treatment Plant houses the following equipment:**
   a. Iron/Manganese Filtration System.
   b. Control Room for chemical feed system(Chlorine and potassium permangate).
   c. Contact tanks for chemical as stated in item b. above
   d. Electrical and electronic systems
   e. Computer hardware and software equipment for automatically operating entire Treatment Plant components housed in electrical panel adjacent to the filtration tanks
   f. Clearwell drinking water (10,000 gallons) and backwater settling tank (6,100 gallons) capacity

discharged into the Water Sewer System
g.Two centrifugal pumps and motors 7.5 hp each for pumping water from clearwell to reservoirs (Lower Water System only)
h. All above equipment housed in Treatment Plant building along with other necessary chemicals and extra parts. (Items a through g above).
I. Outside equipment near Treatment Plant consists of Emergency Generator and two propane tanks. One fueling generator and one for fueling heat for Treatment Plant
j. Computer for retrieving operating information pertaining to Treatment Plant status is housed at Commissioners' Office on west side of Fire Station at 70 Church Street.

4. Reservoirs (two) are off the east end of East Street. Both reservoirs together work in tandem and have a storage capacity of approximately 500,000 gallons. These reservoirs provide water to approximately 240 businesses, homes and apartments along with a Fire Hydrant System for lower water system.

System Equipment (High Water System)

5. The high water system consists of approximately 60 homes.
Which consists of the following:
a. New booster pump back up system to connect Lower System to Upper System in an emergency.
b. New glass fused to steel reservoir on the end of M.V.R, (North Walpole Village land), 110,000 gallon tank. (Atmospheric)
c. New control building
d. Pressure sensor tank (pneumatic)-Used to supply water to upper four homes on Mountain View Road.
e. Stand by chlorination equipment
f. Radon gas stripper
g. Related electrical/mechanical equipment.

Water Distribution System:

6. From the two reservoirs and hydropneumatic tank drinking water flow to users in the Village's two water systems via a system of distribution mains ranging from 4 inch to 12 inch diameters, consisting of a variety of pipe materials. All together there is approximately 32,000 feet of water main providing approximately 304 service connections.
System reservoirs/above ground tank could supply the Village with water for 8 to 14 days, if needed.

System Plan

This plan is in the Commissioner's Office and is reviewed yearly for changes. It is easily accessible to Water Operator or Commissioners as needed.

Boil Order (Section 5 of the Guide)

Manager under instruction by the District Commission Chair will implement a boil order notification at NORTH WALPOLE VILLAGE District. If necessary, all Commissioners will assist Manager. NORTH WALPOLE VILLAGE DISTRICT will refer to the DES and/or the Town Health Officer to make decisions requiring or canceling a boil order. NORTH WALPOLE VILLAGE DISTRICT will use the same telephone/email tree and notice posting system described earlier to implement a boil order and also to cancel a boil order. Priority notification will be given to our unique system customer by door to door posting of notices.

Section 5: Vulnerability Assessment ~ We have one available to Water Operator and Commissioners when needed.

Alternate Water Source (Section 6 of the Guide)

High and Low Systems

The NORTH WALPOLE VILLAGE DISTRICT maintains two separate sources; one, deep bed rock well, for the upper village, and one(consisting of two deep gravel pack wells) for the lower. because we do not have any inactive sources to potentially reactivate and because our three current wells are more than adequate to meet our water supply needs.
With booster pump on Mountain View Road, water can be pumped from low system to high system if needed.

Bottled and Bulk Water

NORTH WALPOLE VILLAGE DISTRICT will utilize bulk truck water delivery (pending supplier) to provide drinking water during a prolonged emergency. Trucked in bulk water will be pumped into clear well in the Water Treatment Building at 3 Russell Street and treated as needed. Delivery trucks could not access small roadways to upper system storage tank, on Mountain View Road or lower system two reservoirs off East Street.

Abutting System

Bellows Falls Water Company abutts NORTH WALPOLE VILLAGE DISTRICT to the west. The NORTH WALPOLE VILLAGE DISTRICT Commission Chair will, at the time of an emergency, contact Bellows Falls, VT. to discuss the feasibility of providing a connection point between the two systems as an emergency standby. The details would need to be worked out and an agreement reached, as necessary at that time.

NEW SOURCE: Having just added new source (GPW#2) and upgrading water system in 2000-2005, Village has no new plans for further development of system at present.

Water Conservation (Section 7 of the Guide)

NORTH WALPOLE VILLAGE DISTRICT will implement the following water conservation measures as necessary in the event of a water system emergency:

1. **Watering gardens, lawns and other landscaped areas will be restricted at a minimum or banned entirely.**
2. **Washing cars, trucks, boats, RVs, etc., will be restricted at a minimum or banned entirely.**
3. **Using water from a hose to rinse or clean sidewalks, driveways, decks, etc. will be restricted at a minimum or banned entirely.**
4. **Filling swimming pools will be restricted at a minimum or banned entirely.**
5. **Residents will be required to follow indoor water use restrictions adopted from DES Fact Sheet #WD-WSEB-26-2 that lists water efficiency practices for indoor domestic water use. These restrictions are listed on page 9.**

6. **In a prolonged or dire emergency requiring reliance on bulk water, rationing will be implemented.**

If an emergency necessitates shutting down one of our wells, the excess capacity in the remaining well will be used to supply our system. Similarly, with both wells operational our *excess capacity allows us to meet average daily demand while absorbing significant reduction* in pumping volumes. Despite our excess capacity, NORTH WALPOLE VILLAGE DISTRICT will implement at its discretion water conservation measures during an emergency. For most emergencies, it will be adequate to implement conservation measures 1, 2, 3, and 4 as restrictions. The Commission Chair of the District will decide whether measures 1 through 4 will be restrictions or bans. System demand at NORTH WALPOLE VILLAGE DISTRICT is greatest in the summer months with an average daily summer demand of approximately *90,000* gallons. Consequently, we estimate that if an emergency occurs in the summer, by implementing measures 1 through 4 as bans, average daily summer demand would immediately be reduced by approximately 20 to 30 percent. This would reduce our average daily summer demand to approximately *63,000 to72,000* gallons, below the capacity of either of our wells and well below the total production capacity of our system. Additional demand reductions would be achieved by implementing step 5. Water conservation options are more limited during a winter emergency although this is balanced by the lower overall daily demand. In accordance with step 5, by the end of 2009 NORTH WALPOLE VILLAGE DISTRICT will establish a set of Guidelines for domestic indoor water use conservation that could be implemented in the event of a water emergency. The NORTH WALPOLE VILLAGE DISTRICT encourages the use of water conservation practices at all times.

In the event of a severe emergency necessitating the use of bulk truck delivery of water, measures 1 through 4 will be instituted as bans, and measure 6 will be put into effect. If that happens, measure 6 will supercede measure 5. Rationing per household will be computed to *reduce our daily demand to less than 6,000 gallons (average truckload of water).* At that rate, when full our total storage capacity would provide for over 4 days of consumption, which more than doubles our average number of storage-days. NORTH WALPOLE VILLAGE DISTRICT will establish a set of Guidelines for indoor water rationing by the end of 2009.

The General Manager under instruction by the District Commission Chair will implement water conservation notification at NORTH WALPOLE VILLAGE DISTRICT. If necessary, the District Commissioners will assist the General Manager. NORTH WALPOLE VILLAGE DISTRICT will use *the same telephone/email tree and notice posting system described earlier to implement and* cancel water conservation measures.

Return to Normal Operation (Section 9 of the Guide)

The decision when to return to normal system operation will be made by the District Commission Chair. The Commission Chair will make this decision with input from the DES if contamination is the cause of the emergency event. NORTH WALPOLE VILLAGE District 's Certified Operator will have the responsibility of overseeing the return to normal operation of the system components. The Certified Operator will do any additional water sampling that may be necessary to assess system conditions before returning to normal operation. All water system users will be notified using the same telephone list and notice posting system

described earlier when the system has been returned to normal operation.

Plan Readiness (Section 10 of the Guide)

NORTH WALPOLE VILLAGE DISTRICT has taken the following steps to ensure plan readiness:

1. **Each person listed on our chain-of-command will keep a copy of this, and each annually updated plan in their residence.**
2. **A copy of our most recent plan will be kept in the District meeting room.**
3. **A copy of our most recent plan will be kept in our treatment building.**
4. **The cover of our plan is brightly colored to make it easy to find.**
5. **An article about our plan will be placed in our annual Village report so all our customers know it exists.**
6. **In all cases, earlier plans will be discarded after receipt of a newer plan.**
7. **Each successive group of District Officers will be briefed on all aspects of our emergency plan.**
8. **NORTH WALPOLE VILLAGE DISTRICT will rehearse the plan once every 2 years.**

Issued and approved this 10th **day of** February **2009.**

North Walpole Village District

Barbara S. O'Brien

Barbara S. O'Brien, Chair

Patrick M Kiniry

Patrick Kiniry

Cheryl Mayberry

Cheryl Mayberry

Robert McGuirk

OPERATOR

Hooper Golf Course Contingency Plan

As a transient system, the Hooper Golf Course System does not currently have a contingency plan for its water system. Since the Hooper Golf Course does not serve daily, residential needs, but only needs for a restaurant and golf course water fountains, a temporary water supply could be brought in via tanker truck. Golfers could also be required to bring their own drinking water, and the restaurant closed in the event that a temporary, portable supply was not possible. The Hooper Golf Course system is currently operated by the Walpole Water Department, who would be responsible for addressing a system emergency.

Benson Woodworking System Contingency Plan

In the event that the primary bedrock well was to become unavailable for use, a second bedrock well is located on the premises and is available for use by the system. This second well has a total depth of 600ft with a bedrock depth of 58ft and a casing depth of 81ft. This well can provide a tested yield of 3 gallons per minute and should be sufficient to supply the drinking water needs of the facility. In the event that this second well is also unavailable, potable water could be brought in via a temporary supply tank. Given that average daily usage for this system is 160 gallons/day, a temporary water tank should be able to supply the system on a temporary basis.

Drewsville Carriage House System Contingency Plan

The Drewsville Carriage House does not currently have a back-up well drilled or a back-up supply identified. Although the system is a non-community non-transient system, it does provide the daily water needs for 5 apartments (Aprox. 10 people) in addition to 21 individuals at the “Head-Start” school. Water usage at the school is likely low, at an estimated 10 gallons/day per person for a non-community non-transient system (US EPA 2014), for 21 individuals results in 210 gallons/day for the “Head-Start” school. With average daily residential water consumption at 100 gallons/person (US EPA), and an estimated 10 residents, results in an average estimated water use of 1,000 gallons per day. In the event of an emergency shut-off of the well, the system operators will need to provide an estimated 1,200 gallons per day.

Without a reserve well available, the most feasible way to supply the system would be to truck in water using a temporary potable water tank. Mandatory water conservation measures such as installing low-flow fixtures, turning off taps in the laundry room, and restricting total consumption could cut use to as much as half, resulting in a need of approximately 600 gallons per day. This amount could be supplied via temporary tank until a new well was dug. It may also be useful for the system to contact private well owners in the wellhead protection area and inquire if one could act as a temporary water source in the event of an emergency.

Appendix 6. Town of Walpole Draft "Wellhead Protection Overlay District Ordinance"

ARTICLE XVIII

Natural Resource Overlay Districts

A. Purpose

Natural Resource Overlay Districts comprise those areas with characteristics that require protection and land management practices which minimize environmental degradation. The restrictions within each district are designed to permit uses appropriate to the area while protecting health, safety, and general welfare of the Town of Walpole and its citizens, now and in the future.

B. Conflict with Other Ordinances and Laws

The regulations in this Article overlay and supplement the provisions on the underlying zoning districts. Where any provisions of these overlay zoning districts are in conflict with provisions of the underlying zoning district regulations, other ordinances of the Town of Walpole, or the State of New Hampshire, the more restrictive provisions shall apply.

C. Overlay Districts and Boundary Lines

1. Natural resource overlay districts and boundary lines are defined on the current version of the Official Zoning Map of the Town of Walpole and include but are not limited to:

   A. Floodplain Overlay District (Article XVIII, Town of Walpole Zoning Ordinance)

   B. Wellhead Protection (Article XVIII, Section 4, Town of Walpole Zoning Ordinance)

SECTION I. AUTHORITY

Pursuant to the authority granted under RSA 674:16, in particular RSA 674:16, II relative to innovative land use controls, the Town of Walpole hereby adopts the following regulation.

SECTION II. PURPOSE

The purpose of the Wellhead Protection Overlay District is to balance the value of groundwater as an important source of drinking water for the Town of Walpole with the economic impact of restricting a variety of uses within the Wellhead Protection Overlay District.

The purpose is to be accomplished by regulating land uses which could contribute pollutants to designated public drinking water wells.

A. Intent of the Wellhead Protection Overlay District:
   1. To promote public health, safety and general welfare of the community
   2. To protect, preserve and maintain existing and potential groundwater supplies,

groundwater recharge areas, and wellhead protection areas within known aquifers.

3. To protect the groundwater and wellhead protection areas of the Town from adverse development, inappropriate land use practices and depletion.

SECTION III. DEFINITIONS

A. Aquifer: A geologic formation composed of rock, sand or gravel that contains significant amounts of potentially recoverable water.

B. Biosolids: Biosolids is the term used for any sludge derived from a sewage wastewater treatment facility that meets the standards for beneficial reuse, that is or has received a Sludge Quality Certification or SQC.

C. Bulk Storage of Deicing Materials: Deicing materials that are ordered, stored, issued and sold by weight is known as bulk material.

D. Groundwater: Water in the sub-surface zone at or below the water table in which all pore spaces are filled with water.

E. Impervious: Not readily permitting the infiltration of water.

F. Impervious Surface: A surface through which regulated substances cannot pass when spilled. Impervious surfaces include concrete unless unsealed cracks or holes are present. Earthen, wooden, or gravel surfaces; or other surfaces which could react with or dissolve when in contact with the substances stored on them are not considered impervious surfaces.

G. Junkyard: An establishment or place of business which is maintained, operated, or used for storing, keeping, buying, or selling junk, or for the maintenance or operation of an automotive recycling yard. The word does not include any motor vehicle dealers registered with the director of motor vehicles under RSA 261:104 and controlled under RSA 236:126.

H. Leachable Wastes: Waste material, including solid wastes, sludge and agricultural wastes that are capable of releasing contaminants to the surrounding environment.

I. Mining: The activities performed in the extraction of minerals including the excavation of pits, removal of mineral, removal of dimension stone, disposal of overburden and the construction of roads for the haulage of mining materials.

J. Non-Contact Cooling Water: Water which flows through a heat exchanger providing a physical barrier between the water and the process being cooled.

K. Positive Limiting Barrier: A depression (e.g. groove) in the surface of an otherwise level impervious area designed to impede the flow and contain spilled substances with the

perimeter of the impervious area.

L. Process Water: Wastewater from an industrial process.

M. Public water system: 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.

N. Regulated Substance: Substances listed under 40 CFR 302, 7-1-05 edition or most current, excluding the following substances: (1) ammonia, (2) sodium hypochlorite, (3) sodium hydroxide, (4) acetic acid, (5) sulfuric acid, (6) potassium hydroxide, (7) potassium permanganate, and (8) propane and other liquefied fuels which exist as gases at normal atmospheric temperature and pressure.

O. Sanitary Protective Radius: The area around a public water supply well which must be maintained in its natural state as required by Env-Dw 301 or 302 (for community water systems); Env-Dw 373.12 and Env-Dw 372.14 (for other public water systems) or most current versions.

P. Seasonal High Water Table: The depth from the mineral soil surface to the upper most soil horizon that contains 2% or more distinct or prominent redoximorphic features that increase in percentage with increasing depth as determined by a licensed Hydrogeologiest, Soils Scientist, Wetlands Scientist, Engineer or other qualified professional approved by the Planning Board.

Q. Secondary Containment: A structure such as a berm or dike with an impervious surface which is adequate to hold 110 percent of the volume of the largest regulated-substances container. (See Env-Wq 401.03(i) for reference).

R. Snow Dump: For the purposes of this ordinance, a location where snow, which is cleared from roadways and/or motor vehicle parking areas, is placed for disposal.

S. Solid Waste: Any discarded or abandoned material including refuse, putrescible material, septage, or sludge, as defined by New Hampshire Solid Waste Rules He-P 1901.03 or more current version. Solid waste includes solid, liquid, semi-solid, or contained gaseous waste material resulting from residential, industrial, commercial, mining, and agricultural operations and from community activities.

T. Surface Water: Streams, lakes, ponds, and tidal waters, including marshes, water courses and other bodies of water, natural or artificial.

U. Wellhead Protection Area: The surface and subsurface area surrounding a water well or wellfield supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield.

V. Hazardous Waste Facility: Any location at which hazardous waste is subjected to

treatment, storage or disposal and may include a facility where hazardous waste has been generated.

SECTION IV. WELLHEAD PROTECTION OVERLAY DISTRICT

The Wellhead Protection Overlay District is an overlay district which is superimposed over the existing underlying zoning and includes within its boundaries the Wellhead Protection Areas for the River Well and the Watkins Hill Well, sources for the public drinking water system for the Town of Walpole. The wellhead protection area for the River Well is depicted on a map entitled "Wellhead Protection Area for River Well, Walpole, NH (EPA ID 2401010-001) and dated January 2003. The wellhead protection area for Watkins Hill well is depicted on a map entitled Wellhead Protection Area for Watkins Hill Well, Walpole, NH (EPA ID 2401010-002) and dated January 2014. The Wellhead Protection Overlay District encompasses the surface and subsurface areas surrounding the aforementioned public water system wells through which contaminants are reasonably likely to move toward and reach such wells.

SECTION V. DETERMINATION AND ADJUSTMENT

A. Determination

Where the boundary of the Wellhead Protection Overlay District, as delineated, is doubted or disputed by the owner, applicant, or abutter of the land in question, the burden of proof shall be upon the disputing party or parties to show where it should be properly located. At the request of the Planning Board, the Town of Walpole may engage services of a professional such as a geologist, soil scientist, or staff from a state or federal agency to determine more accurately the location and extent of the resource in question at the scale of the subdivision plat or site plan, at the expense of the disputing land owner, applicant, or abutter. The Planning Board shall have the authority to make the final determination as to the location of a disputed boundary.

B. Adjustment

The Planning Board may, based upon appropriate findings and evidence, recommend an adjustment of the boundary or area designation of the Wellhead Protection Overlay District, including reducing or expanding the designation area to more correctly define the location and the extent.

SECTION VI. APPLICABILITY

This Ordinance applies to all uses in the Wellhead Protection Overlay District, except for those uses exempt under Section XIII (Exemptions) of this Ordinance.

SECTION VII. PERFORMANCE STANDARDS

The following Performance Standards apply to all uses in the Wellhead Protection Overlay District unless exempt under Section XIII:

A. For any use that will render impervious more than 15 percent or more than 2,500 square feet of any lot, whichever is greater, a stormwater management plan shall be prepared which the Planning Board determines is consistent with the current revision of the "New Hampshire

Stormwater Manual, Volumes 1-3".

B. Conditional uses, as defined under Section XI shall develop stormwater management and pollution prevention plans and include information consistent with "Developing Your Stormwater Prevention Plan: A Guide for Industrial Operators" (US EPA, Feb 2009) or more current edition. The plan shall demonstrate that the use will:

1) Meet minimum stormwater discharge setbacks between water supply wells and constructed stormwater practices as found within the "Innovative Land Use Planning Techniques: A Handbook for Sustainable Development, Section 2.1 Permanent (Post-Construction) Stormwater Management", (DES, 2008 or later edition).

2) Minimize the release of regulated substances by developing and implementing a source control plan that identifies pollution prevention measures.

3) Stipulate that the expansion or redevelopment activities shall require an amended stormwater plan and may not infiltrate stormwater through areas containing contaminated soils without completing a Phase I Assessment in conformance with the most current version of ASTM E 1527-05, also referred to as All Appropriate Inquiry (AAI).

4) Maintain a minimum of four feet vertical separation between the bottom of a stormwater practice that infiltrates or filters stormwater and the average seasonal high water table as determined by a licensed hydrogeologist, soil scientist, engineer, or other qualified professional as determined by the Planning Board.

C. Animal manures, fertilizers, and compost must be stored in accordance with the manual Best Management Practices for Agriculture in New Hampshire, NH Department of Agriculture, Markets and Food, July 2008, and any subsequent revisions.

D. All regulated substances stored in containers with a capacity of five gallons or more must be stored in product-tight containers on an impervious surface designed and maintained to prevent flow to exposed soils, floor drains, and outside drains;

E. Facilities where regulated substances are stored must be secured against unauthorized entry by means of a door and/or gate that is locked when authorized personnel are not present and must be inspected weekly by the facility owner;

F. Outdoor storage areas for regulated substances, associated material or waste must be protected from exposure to precipitation and must be located at least 50 feet from surface water or storm drains, at least 75 feet from private wells and outside the sanitary protective radius of wells used by public water systems.

G. Secondary containment must be provided for outdoor storage of regulated substances in regulated containers and the containment structure must be constructed in such a way to

minimize the accumulation of water in the containment area and contact between precipitation and storage container(s).

H. Containers in which regulated substances are stored must be clearly visibly labeled in accordance with local state, and federal regulations and must be kept closed and sealed when material is not being transferred from one container to another.

I. On any property within the wellhead overlay district, where land-disturbing activities are to take place, all inactive wells not in use or properly maintained at the time the site work plan is submitted, shall be considered abandoned and must be sealed by the well owner in accordance with the most current version of the New Hampshire Water Well Board Rules (We 604).

J. Blasting activities shall be planned and conducted to minimize groundwater contamination. Excavation activities should be planned and conducted to minimize adverse impacts to hydrology and the dewatering of nearby drinking water supply wells;

K. All transfers of petroleum from delivery trucks and storage containers over five gallons in capacity shall be conducted over an impervious surface having a Positive Limiting Barrier (PLB) at its perimeter.

SECTION VIII. SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN (SPCC)

Conditional uses, as described under Section XI, Part (A), using regulated substances shall submit a spill control and countermeasure plan (SPCC) to the Walpole Fire Chief or other official designee who shall determine whether the plan will prevent, contain, and minimize releases from ordinary or catastrophic events such as, spills, floods, or fires that may cause large releases of regulated substances. It shall include at a minimum:

1. A description of the physical layout and a facility diagram, including all surrounding surface waters and wellhead protection areas.

2. Contact list and phone numbers for the facility response coordinator or official designee, cleanup contractors, and all appropriate federal, state, and local agencies who must be contacted in case of a release to the environment.

3. A list of all regulated substances in use and locations of use and storage;

4. A prediction of the direction, rate of flow, and total quantity of regulated substance that could be released where experience indicates a potential for equipment failure.

5. A description of containment and/or diversionary structures or equipment to prevent regulated substances from infiltrating the ground.

SECTION IX. PERMITTED USES

A. Permit Required:

All site plan proposals located within the Wellhead Protection Overlay District shall be reviewed by the Planning Board and/or Zoning Board of Adjustment and shall conform to the provisions of this ordinance. No conditional uses shall be conducted within the Wellhead Protection Overlay District unless a Conditional Use has been approved by the Planning Board. The Planning Board is hereby authorized to attach any reasonable conditions to such approval regarding construction and operation.

Procedure on Application: The Planning Board shall act upon the applications in accordance with the procedural requirements of the Site Plan Review Regulations and NH RSA 676:4 Boards Procedures and Plats.

SECTION X. PROHIBITED USES

The following uses are prohibited in the Wellhead Protection Overlay District. (See Table 1).

A. Disposal of solid waste (Brush and stumps are acceptable only if generated from clearing land and buried on the same site. A copy of the site plan which is required to be filed with the Commissioner of the Department of Environmental Services, in accordance with RSA 149-m for on-site burial of stumps, must be submitted to the Planning Board for its files).

B. Subsurface storage of petroleum and other hazardous materials.

C. Aboveground storage of petroleum and petroleum products in quantities greater than 660 gallons for a single tank or 1320 gallons for multiple tank systems.

D. Disposal of liquid or leachable wastes are prohibited, except from a single or multi-family residential subsurface disposal systems, spreading of animal manure using Best Management Practices or approved commercial or industrial systems which discharge human waste only.

E. Industrial uses which discharge contact type process waters on site. Non-contact cooling water is permitted.

F. Bulk outside storage of road salt or other deicing materials.

G. Snow dumps comprised of snow which has been brought from outside of the Wellhead Protection Overlay District.

H. Mining except for earth excavation carried out in compliance with the Town of Walpole's Regulation Governing Earth Excavation including any subsequent amendments and a Conditional Use issued under Section 4 of this Ordinance and RSA 155-E.

I. All on site handling, disposal, storage, processing or recycling of regulated substances in greater than household quantities (e.g. five gallons).

J. Automotive service and repair shops, fuel sales, junk yards and salvage yards.

K. Concrete, asphalt, and tar manufacturing.

L. Fueling and maintenance of large earthmoving equipment.

M. Sewerage/wastewater treatment system

N. Hazardous Waste Facility

SECTION XI. CONDITIONAL USES

The Planning Board may approve a Conditional Use for a use which is otherwise permitted in the underlying district if the permitted use is involved in one or more of the following:

A. Storage, handling, and use of regulated substances in quantities exceeding 100 gallons or 800 pounds dry weight at any one time, provided that an adequate spill prevention, control and countermeasure (SPCC) plan, in accordance with Section VII, is approved by the Walpole Fire Department;

B. Any use that will render impervious more than 15 percent or 2,500 square feet of any lot, whichever is greater.

C. Any activities that involve blasting of bedrock.

D. To receive approval for a Conditional Use, the proposed use must either be permitted by right or by special exception in the underlying zoning district.

E. All uses permitted by right or by special condition in the underlying zoning district which are neither prohibited ("P") nor require an approved Conditional Use (CU") under this Section shall be assumed permitted by right or by Conditional Use in the Wellhead Protection Overlay District.

In granting such approval the Planning Board must first determine that the proposed use is not a prohibited use (as listed in Section X of this Ordinance) and will be in compliance with Performance Standards in Section VII as well as all applicable local, state, and federal requirements. The Planning Board may, at its discretion, require a performance guarantee or bond, in an amount and with surety conditions satisfactory to the Board, to be posted to ensure completion of construction of any facilities required for compliance and Performance Standards.

The Planning Board may require that the applicant provide data reports prepared by a professional engineer or qualified groundwater consultant to assess any potential damage to the

Town's public drinking water sources that may result from the proposed use. The Planning Board may engage such professional assistance as is required to adequately evaluate such reports and to evaluate in general, the proposed use. Costs of any of the above mentioned services shall be paid by the applicant.

In the Wellhead Protection Overlay District, the requirements of the underlying districts continue to apply, except that uses are prohibited where indicated by "P" in Table 1. Uses indicated by CU require a conditional use approval from the Walpole Planning Board.

Table 1. List of Prohibited Uses and Conditional Uses which require approval by the Planning Board in the Wellhead Protection Overlay District, Walpole, NH ("P" Prohibited; "CU" Conditional Use).

A. Disposal of Solid Waste	Brush and stumps are acceptable only if generated from clearing land and buried on the same site. A copy of the site plan which is required to be filed with the Commissioner of the Department of Environmental Services, in accordance with RSA 149-m for on-site burial of stumps, must be submitted to the Planning Board for its files.	P
B. Subsurface storage of petroleum and other hazardous materials.		P
C. Aboveground storage of petroleum and other hazardous materials in quantities greater than 660 gallons in a single tank or 1320 gallons for multiple tank systems.	Spill prevention measures must be implemented including: A 110% secondary containment vessel, covered tank housing areas, routine monitoring, corrosion prevention measures, and the creation of a Spill Prevention, Control, and Countermeasure (SPCC) plan.	CU
D. Disposal of liquid or leachable wastes	Except from a single or from a multi-family residential subsurface disposal systems, spreading animal manure using Best Management Practices or approved commercial or industrial systems which discharge human waste only.	P
E. Industrial uses which discharge contact type process waters on site. Non-contact cooling water is		P

permitted.		
F. Bulk Storage of salt/deicing materials		P
G. Snow Dump	Specifically a snow dump comprised of snow and materials brought from outside the Town Wellhead Overlay District Protection Districts.	P
H. Mining	Except for earth excavation carried out in compliance with the Town of Walpole's Regulation Governing Earth Excavation including any subsequent amendments and a Conditional Use is approved under Section 4 of this Ordinance and RSA 155-E.	P
I. Regulated Substance(s)	Substances listed under 40 CFR 302, 7-1-05 edition, excluding the following substances: (1) ammonia, (2) sodium hypochlorite, (3) sodium hydroxide, (4) acetic acid, (5) sulfuric acid, (6) potassium hydroxide, (7) potassium permanganate, and (8) propane and other liquefied fuels which exist as gases at normal atmospheric temperature and pressure.	P

J. Automotive service and repair shops,		P
K. Junk Yards		P
L. Fuel Sales		P
M. Salvage yards		P
N. Concrete, asphalt, and tar manufacturing		P
O. Permanent facilities for fueling & maintenance of large earthmoving equipment		P
P. Sewerage/wastewater treatment system	Excluding domestic septic systems	P
Q. Hazardous waste facility		P
R. Industrial, commercial, institutional and governmental uses	(That are not otherwise prohibited by this Overlay District).	CU
S. Stormwater infiltration pond and leaching basin		CU
T. Cleaning Service (i.e. laundry, auto)		CU
U. Food processing plant		CU
V. Wood preserving & furniture stripping		CU
W. Excavation/grading		CU
X. Electronic circuit assembly		CU
Y. Metalworking Shop		CU
Z. General Service and Repair shop		CU
A1. Manufacturing facility		CU
B2. Laboratory		CU

SECTION XII. EXISTING NONCONFORMING USES

Existing nonconforming uses may continue without expanding or changing to another nonconforming use, but must be in compliance with all applicable state and federal requirements, including Env-Wq 401, Best Management Practices Rules.

When any existing non-conforming use of land or building has been discontinued for one year the land and building shall thereafter be used only in conformity to this Ordinance, except that the Board of Adjustment, after public hearing, may permit the resumption of said non-conforming use.

SECTION XIII. EXEMPTIONS

The following uses are exempt from the specified provisions of this ordinance as long as they are in compliance with all applicable local state, and federal requirements:

A) Any private residence is exempt from all the Performance Standards;

B) Any business or facility where regulated substances are stored in containers with a capacity less than five gallons is exempt from Section VII, Performance Standards, section E through H;

C) Storage of heating fuels for on-site use or fuels for emergency electric generation, provided that storage tanks are indoors on a concrete floor or have corrosion control, leak detection, and secondary containment in place, is exempt from Section VII Performance Standard E;

D) Storage of motor fuel in tanks attached to vehicles fitted with permanent fuel lines to enable the fuel to be used by that vehicle is exempt from Section VII Performance Standards E through H;

E) Storage and use of office supplies is exempt from Section VII Performance Standards E through H;

F) Temporary storage of construction materials on a site where they are to be used is exempt from Section VII Performance Standards E through H if incorporated within the site development project within six months of their deposit on the site;

G) The sale, transportation, and use of pesticides as defined in RSA 430:29 XXVI are exempt from all provisions of this ordinance;

H) Household hazardous waste collection projects regulated under the NH Code of Administrative Rules Env-Wm 401.03(b)(1) and 501.01(b) are exempt from Section VII Performance Standards E through H.

I) Facilities with aboveground petroleum and petroleum product storage tanks with a capacity of 660 gallons or less for a single tank or 1320 gallons or less for multiple tank systems shall be exempt from inspections under Section XV of this ordinance.

SECTION XIV RELATIONSHIP BETWEEN STATE AND LOCAL REQUIREMENTS
Where both the State and the municipality have existing requirements the more stringent shall govern.

SECTION XV. MAINTENANCE AND INSPECTION

A. For uses requiring Planning Board approval for any reason, a narrative description of maintenance requirements for structures required to comply with Section VII Performance Standards shall be recorded so as to run with the land on which such structures are located, at the Registry of Deeds for Cheshire County. The description so prepared shall comply with the requirements of RSA 478:4-a.

B. Inspections may be required to verify compliance with Performance Standards. Such inspections shall be performed by the Board of Selectmen or designee at reasonable times with prior notice to the landowner.

C. All properties in the Wellhead Protection Overlay District known to the Board of Selectmen or designee as using or storing regulated substances with a capacity of five or more gallons , except for facilities where all regulated substances storage is exempt from this Ordinance under Section XIII, may be subject to inspections under this section.

D. The Town of Walpole may require a fee for compliance inspections. The fee shall be paid by the property owner. A fee schedule shall be established by the Town of Walpole as provided for in RSA 41-9:a.

SECTION XVI. ENFORCEMENT PROCEDURES AND PENALTIES
Any violation of the requirements of this ordinance shall be subject to the enforcement procedures and penalties detailed in RSA 676 or RSA 485-C.

SECTION XVII. SAVING CLAUSE
If any provision of this ordinance is found to be unenforceable, such provision shall be considered separable and shall not be construed to invalidate the remainder of the Ordinance.+

SECTION XVIII. APPEALS

Any person who is aggrieved of an administrative decision made under the provisions of this ordinance may appeal to the Zoning Board of Adjustment, under the provisions of RSA 674:33. The Zoning Board of Adjustment shall also have the power to authorize such variance from the terms of the Ordinance as will not be contrary to the public interest, if, owing to special condition, a literal enforcement of the provisions of this Ordinance will result in unnecessary hardship so that the spirit of the Ordinance shall be preserved and substantial justice done. The Zoning Board of Adjustment shall request from the Planning Board and the Conservation Commission an advisory decision before rendering any decision on a request for a variance under this Section.

SECTION XIX. LIABILITY

Nothing in this ordinance shall be construed to imply that the Town of Walpole has accepted any of an owner/developer's liability if a permitted facility or use contaminates groundwater in any aquifer.

SECTION XX. EFFECTIVE DATE

This ordinance shall be effective upon adoption by the legislative body.