# Source Water Protection Plan for Swanzey, New Hampshire



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**Cover Photo:** Ashuelot River in Swanzey. Credit: Beverly Bernard

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## Executive Summary

Groundwater is a vital resource for any community, and protecting this source of clean, pure drinking water should be a priority for town governments whether their residents rely on public drinking water supplies or privately-owned residential wells. Swanzey, New Hampshire is fortunate to have a highly productive stratified-drift aquifer within its town, capable of supplying ample quantities of clean drinking water. This aquifer is the product of glacial deposits dating back to 10,000-20,000 years ago.

Swanzey is unique among New Hampshire communities in that despite having a population of approximately 7,500 individuals, the town does not supply drinking water by means of a municipally-owned public water system. Drinking water in Swanzey is supplied by a combination of private residential wells, and 25 public water suppliers. Approximately 1/3 of Swanzey residents rely on a public drinking water supplier. Swanzey's groundwater resources are susceptible to contamination from commercial and industrial development. Leaking underground storage tanks, abandoned and disassembled vehicles, the accidental release of hazardous chemicals from aboveground storage tanks are a few of the most pressing concerns facing the preservation of Swanzey's drinking water sources.

Swanzey is also unique among New Hampshire communities in that the town has not enacted an ordinance specifically to protect its source of drinking water. With proper stewardship, Swanzey's groundwater resources should be able to fulfill the town's drinking water needs well into the future. To ensure this, the town should take action to protect this resource including enacting an ordinance to govern land uses and activities near the aquifers, educating land owners on how they can help protect ground water resources, and maintaining a drinking water protection committee.

This plan serves as a guide to town officials, residents, business leaders, and water suppliers to assist with decision making with regards to drinking water resources. It is designed to serve as a reference for the town to utilize when evaluating developments, or planning for the future. This plan is the collaborative effort of elected officials, town committees and boards, drinking water suppliers, residents and local experts. This plan is a living document and in order to remain viable as a resource for the future it will need to be periodically reviewed and updated, ideally every three years.

## Swanzey, NH Drinking Water Protection Committee

**Jane Johnson-** Conservation Commission
**Glenn Page-** Planning Board
**Jim McConnell-** Planning Board
**Beverly Bernard-** Conservation Commission
**Stephen Stepenuck-** Conservation Commission
**Sylvester Karasinski-** Board of Selectmen
**Barbara Skuly-** Ashuelot River Local Advisory Committee
**Roberta Visser-** Local Resident

# 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 (NHDES) 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 and 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 of contaminants, such as MtBE (methyl*tertiary*butylether), in groundwater strongly correlates 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 importance of protecting groundwater resources in the Town of Swanzey is well recognized. A 1990 underground storage tank leak contaminated groundwater resources for hundreds of Swanzey residents and was the catalyst the a New Hampshire state law banning the gasoline additive MtBE, as well as a recently settled lawsuit between the State of New Hampshire and a major petroleum corporation. The 2003 Swanzey Master Plan Update addressed protecting groundwater resources by providing an update to Swanzey's 1990 Water Resource Management and Protection Plan. In the update, the first recommended management action was the adoption of an aquifer protection overlay district, designed to regulate land uses within the boundaries of Swanzey's stratified drift aquifers (Town of Swanzey, 2003). The 2003 Master Plan Update also recommended that an education and outreach campaign be established to educate homeowners whose properties are located near sensitive water resources, and that an inventory of underground storage tanks be created and periodically reviewed. The 2014 Southwest New Hampshire Natural Resource Management Plan also recommended that towns in southwest New Hampshire adopt aquifer protection ordinances to protect groundwater resources that supply both public and private wells (SWRPC, 2014). As of 2014 seven communities within Cheshire County had adopted aquifer protection ordinances.

The primary goal of this Source 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 Swanzey, New

Hampshire. This plan provides data, maps, guidance, priorities and actions to protect Swanzey's groundwater aquifers and public drinking water sources from contamination. It is the result of a collaborative process that involved town officials, water system managers, regional planners, and residents and serves as a guide for them to use in future planning efforts. This plan is a working document that should be reviewed annually and updated every three years to remain current, active, and viable.

### *1.2 Definitions*

**Wellhead Protection Area (WHPA)-** Sometimes also called a "source 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 and the Zone of Contribution. For Community Drinking Water Systems, the Sanitary Protective Area is a buffer surrounding the well where no potential contaminants should be present. The Zone of Contribution comprises the remainder of the wellhead protection area.

**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.

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

**Stratified Drift-** A geologic formation comprised of fine and coarse material deposited by glacial melt water.

**UST-** Underground Storage Tank

**AST-** Aboveground Storage Tank

**LUST-** Leaking Underground Storage Tank

**UIC-** Underground Injection Control, any discharge of wastewater into the ground.

**VOC-** Volatile Organic Compound, an organic chemical with a low boiling point. These can include industrial solvents, fuels, and other petroleum products.

**SOC-** Synthetic Organic Compound, organic chemicals with a higher boiling point than VOC's. These are often found in chemical pesticides.

**Hazardous Waste Generator-** Any facility producing wastes which is corrosive, toxic, reactive, or flammable. Hazardous Waste Generators are divided into two categories:

- **Small Quantity Generators** produce 220lbs or less of hazardous waste each and every month.
- **Full Quantity Generators** produce greater than 220lbs of hazardous waste each and every month.

# 2. Methods

To determine what potential contaminants were present and to evaluate their risk, 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 (NHDES, 2016). 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 communication with drinking water system operators, the Town of Swanzey, local residents, and boards and committees of the Town of Swanzey. Land cover was determined using the 2015 USDA National Cropland Dataset. 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).

Guidance on evaluating the risk presented potential sources of contamination was provided by The DES Guide to Ground Water Protection (NHDES 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 source protection committee 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.

# 3. Town of Swanzey, New Hampshire

## *3.1 Town of Swanzey, NH Demographics*

The Town of Swanzey is a rural-residential community covering 45 square miles in Cheshire County, New Hampshire, along NH Routes 10, 12, and 32. Swanzey is bordered by the Towns of Chesterfield, Winchester, Troy, Marlborough, Richmond, and the City of Keene. Swanzey has a population of 7,230 with 2,919 households and a median household income of approximately $54,355 per year (US Census Bureau, 2016).

## *3.2 Zoning and Land Uses in Swanzey*

*Land Use*

Swanzey is a rural-residential community with some industrial and commercial development. Forest cover makes up over 80% of the land cover within Swanzey, however it is important to note that much of this forest land includes rural residences. Another 8% of the land in the town is developed for residential, commercial, or industrial use. Open water such as lakes and rivers, and wetlands account almost 6% of the land area in Swanzey. The remaining land in the town includes agricultural land use (crops and pasture), vacant land, and pasture (USDA, 2015).

Table 1. Land uses in Swanzey, NH. Data from USDA National Agricultural Statistics Service.

| Land Cover Type | Acres | Percent of Coverage |
|---|---|---|
| Agriculture/Cultivated Crops | 297 | 1.0% |
| Hay/Pasture | 972 | 3.4% |
| Water | 335 | 1.2% |
| Developed Open Space | 1102 | 3.8% |
| Developed Low Intensity | 890 | 3.1% |
| Developed Med. Intensity | 310 | 1.1% |
| Developed High intensity | 67 | 0.2% |
| Vacant | 142 | 0.5% |
| Deciduous Forest | 7420 | 25.6% |
| Coniferous Forest | 14013 | 48.3% |
| Mixed Forest | 2083 | 7.2% |
| Shrub land | 92 | 0.3% |
| Wetlands | 1263 | 4.4% |
| **Total** | **28985** | **100.0%** |

*Zoning*

The Town of Swanzey has enacted a zoning ordinance to regulate land use within the town limits (Town of Swanzey, 2016). This ordinance was originally adopted in 1947, and has most recently been amended in 2016. Swanzey's zoning ordinance provides for 11 zoning districts and overlay districts to cover commercial, residential, industrial and business uses. Additional ordinances dictate shoreline regulations, and protections for wetlands. A map depicting the location of Swanzey's zoning districts is available in Appendix C.

**Rural-Agricultural District:** The Rural-Agricultural district allows for residential and agricultural uses including forestry, low-density residential, recreation, open space, and water-supply protection.
**Residential District:** The Residential District includes more densely developed transition areas between the Rural-Agricultural District and the Commercial district. This district allows for residences, churches, some light commercial activity, and essential services.
**Village Business District I:** This district covers most of West Swanzey Village and provides for commercial development, primarily for community use.
**Village Business District II:** This district is located in West Swanzey Village along California, West, and S. Winchester Streets. This district provides a compact area for business and commercial development.
**Business District:** The Business District includes the more densely developed areas along Routes 10, 12, and 32, and allows for commercial development, specifically to the traveling public.
**Commercial/Industrial District:** The Commercial/Industrial zone is located along the northern half of Route 10 and is designed to encourage commercial and industrial development off of Route 10.
**Shoreland Protection District:** The Shoreland Protection Overlay District includes properties abutting protected shoreland including the Ashuelot River; South Branch River; Ash Swamp Brook; Martin Brook; Ashuelot River Dam; Swanzey Lake; Wilson Pond. This district stipulates special requirements for properties abutting these water bodies.
**Floodplain District:** The Floodplain district includes properties located in a designated flood hazard area and stipulated additional building and land use requirements related to flood hazard mitigation.
**Wetlands District:** This district includes identified wetlands in Swanzey and prevents development within them, so as to protect surface and groundwater resources.
**Airport District:** The Airport District includes the Dillant-Hopkins Airport, its surrounding properties, and its approach zone. It stipulates structure heights and other aviation-related land uses.
**Industrial Park District:** This district is located along Safford Dr. between Routes 32 and 12. The Industrial Park District allows for industrial development in an area where municipal water and sewer are available. Minimum building sizes are stipulated so as to preclude individual small businesses and offices.

### *3.3 Topography, Geology, and Soils*

Much of Swanzey is covered with rolling hills and small mountains, many of which are currently protected as conservation lands. The highest point in Swanzey is Franklin Mountain at 1,423 ft above sea level. Other significant topographic features in Swanzey include: Rattlesnake Mountain (1,345ft), Mount Caesar (1,115ft), Marcy Hill (1,050ft), and Hewes Hill (1,020ft). The lowest point in Swanzey is along the Ashuelot River at the Winchester town line at 426ft above sea level. Bedrock geology in Swanzey is dominated by granitic rock types dating to the Ordovician Era (500-440 MYA). Other bedrock types include schist and quartzite deposits dating to the Silurian Era (440-416 MYA) in the Route 32 area in eastern Swanzey. Sand and

Gravel deposits, left by the glacial Lake Ashuelot 10,000-20,000 years ago, contribute to Swanzey's abundant groundwater resources. Soils in Swanzey consist of fine sandy loams of the Berkshire, Peru, Marlow, Monadnock, and Sunapee series representing 47% of the soil coverage in the town. Stony loams, of the Tunbridge-Berkshire and Monadnock series, and granitic rock outcroppings each account for 15% of the soils in Swanzey. Loamy sands of the Caesar, Suncook, and Pootatuck account for 14% of the soil coverage. The remaining nine percent of soils in Swanzey consist of hydric soils associated with wetlands (4%), silt loams (2%), impervious surfaces (2%), and water (1%). Soils data obtained from the USDA Natural Resource Conservation Service Web Soil Survey (NRCS, 2016).

### *3.4 Surface and Groundwater Resources*

*Surface Water Resources*

Swanzey has four major surface water resources including the Ashuelot River, South Branch Ashuelot River, Wilson Pond, and Swanzey Lake. The Ashuelot River travels approximately 10 river miles south through the Town of Swanzey from the Keene Dillant-Hopkins Airport, through West Swanzey and into Winchester. The Ashuelot River is a tributary of the Connecticut River and the entire Town of Swanzey lies within the watershed of the Ashuelot River. Other streams within Swanzey include Ash Swamp Brook, California Brook, Forbrush Brook, Martin Brook, Perry Brook, Falls Brook, and Bridge Brook. None of the above named streams are used as drinking water supplies.

Swanzey Lake is a 50ft deep, mesotrophic lake located in southern Swanzey along Swanzey Lake Road. The lake covers 108 acres and hosts a number of private homes used for both year-round and seasonal use. Additionally there are several camps located around the lake, which is a popular recreation spot during the summer. Wilson Pond is a shallow, warmwater, pond located across Route 32 from the Keene Dillant-Hopkins Airport. The pond covers 72 acres and has a maximum depth of 15 ft. A number of private residences are located around the pond along with some conservation land along the northern shore of the pond. Neither water body is used as a drinking water supply.

*Groundwater Resources*

Swanzey has abundant groundwater resources located within the glacial deposits left by Lake Ashuelot 10,000-20,000 years ago. These aquifers were delineated by the US Geological Survey in 1994. Stratified drift deposits, associated with high groundwater transmissivity, cover 12.3mi$^2$ in Swanzey and largely consist of coarse-grained material covered with fine-grained silt and clay lake-bottom deposits (Moore, 1994). Saturated thickness for the aquifers in Swanzey is up to 120ft and is likely thickest in the segment along the Ashuelot River where it travels between Sawyers Crossing Rd. and Eaton Rd. (Moore, 1994). A pluton, which is an intrusion of igneous rock, is likely responsible for the distinctive "U" shape of the aquifers in Swanzey as they transit around Swanzey Lake (Moore, 1994). Transmissivity for stratified drift aquifers in Swanzey ranges from zero to slightly more than 4,000 feet per day (Moore, 1994).

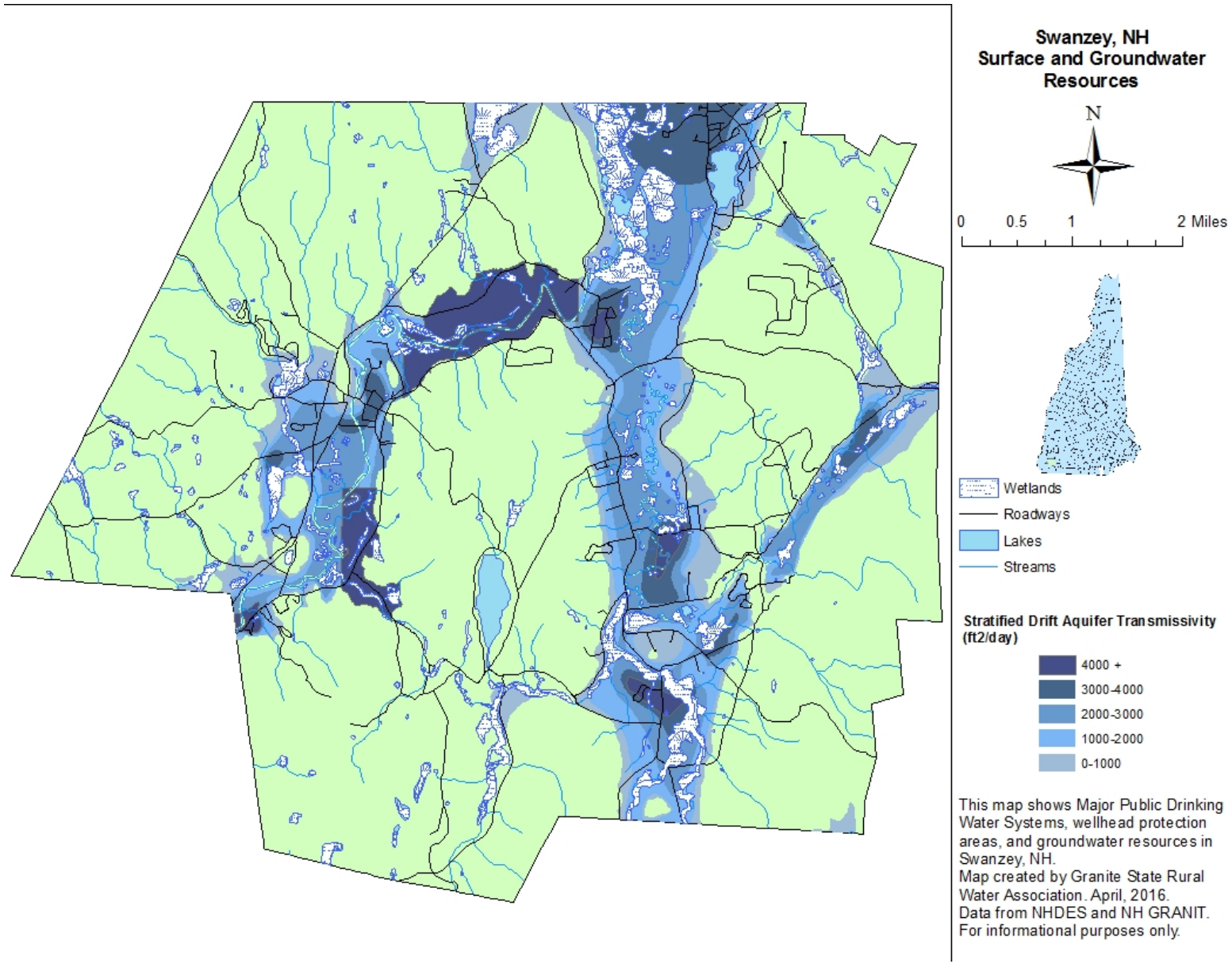



Figure 1. Surface and groundwater resources in Swanzey, NH. Data from NHDES and NH GRANIT.

### *3.5 Drinking Water Supplies in Swanzey*

As of 2016, the Town of Swanzey does not provide drinking water to most town residents by means of a municipally owned community water system. The North Swanzey Water and Fire Precinct supplies 1250 individuals with drinking water transferred from the City of Keene. Most Swanzey residents rely either on private wells, or privately-owned community water systems. A small portion of Swanzey, namely West Swanzey and North Swanzey, have sewer access, however the majority of town residents are dependent on residential septic systems.

There are 25 active public drinking water systems in Swanzey including seven community drinking water systems, 15 transient systems, and three non-community non-transient systems. The seven community public drinking water systems provide domestic drinking water for approximately 2,400 individuals through 858 service connections. An estimated 4,830 individuals rely on private, residential wells for their daily water needs.

Table 2. Community public water suppliers in Swanzey, NH. Data from NHDES

| System Name | EPA ID | Location | Number of Connections | Population Served |
|---|---|---|---|---|
| North Swanzey Water and Fire Precinct | 2301010 | 31 Walnut Pl. | 498 | 1250 |
| West Swanzey Water Co. | 2301020 | Winchester St. | 81 | 203 |
| Ashuelot River Apartments. | 2302010 | 57 Riverside Ln. | 40 | 100 |
| Eastfield Crossing | 2302040 | Bellview Ave. | 45 | 113 |
| Forest View Estates | 2302050 | Owens Dr. | 72 | 180 |
| Pine Grove Mobile Home Park | 2303010 | 935 W. Swanzey Rd. | 122 | 305 |
| View Point Co-Op | 2303020 | Pond View Dr. | 99 | 248 |

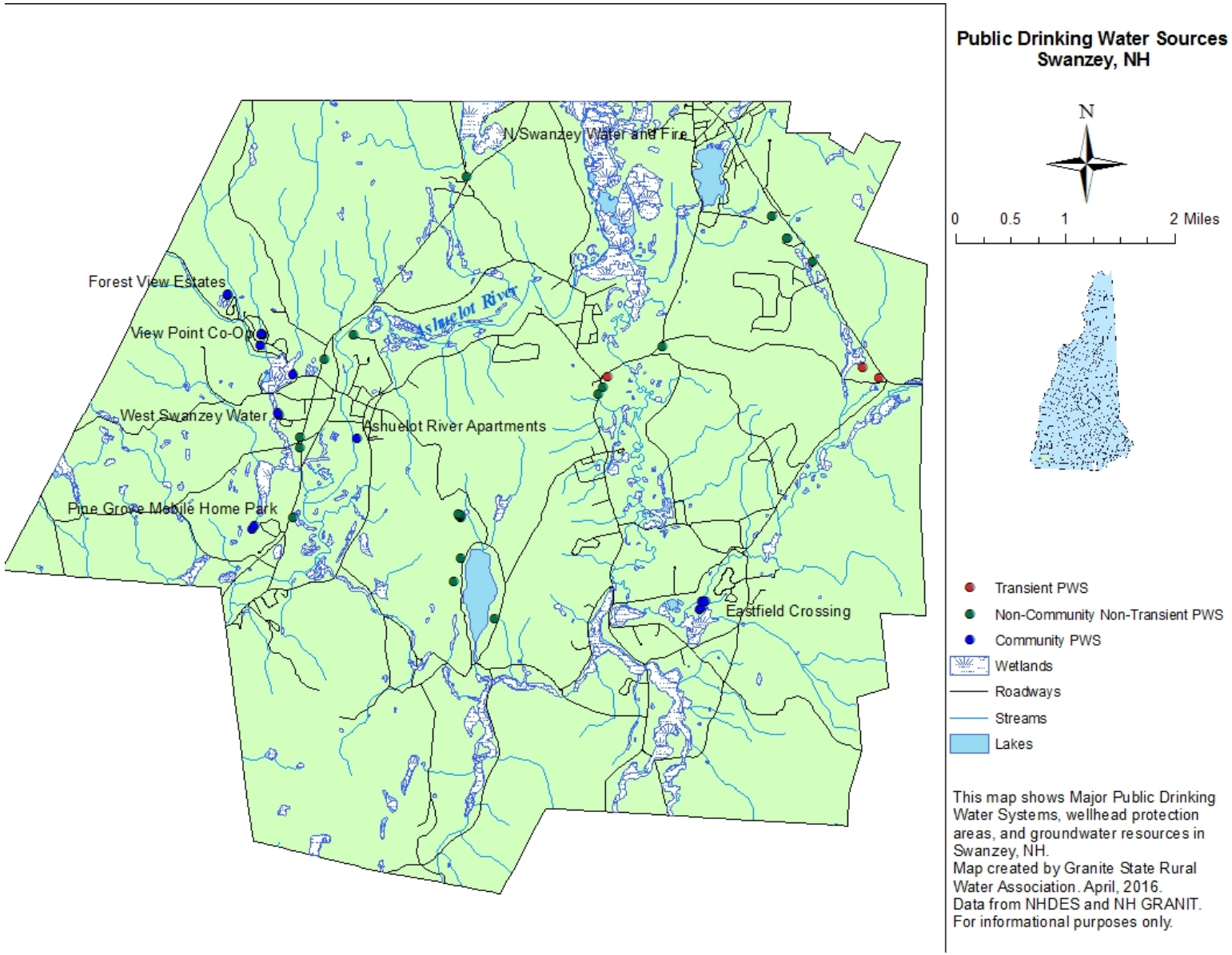



Figure 2. Public Drinking Water Sources in Swanzey, NH. Data from NHDES and NH GRANIT.

# 4.0 West Swanzey Water System

## *4.1 System Description*

The West Swanzey Water System (PWS ID: 2301020) is a privately-owned community drinking water systems supplying approximately 203 customers through 81 service connections and has been in operation since 1986. The system is supplied by a wellfield located on West Street in West Swanzey, average daily water usage for the system ranges from a minimum of 26,000 gallons per day in 2016 to a maximum of 88,000 gallons per day in 2013 (NHDES, 2016) The system provides water for domestic use along NH Route 10 in West Swanzey.

The wellfield suppling the system consists of three gravel packed wells, two active and one inactive. The two active wells (sources 001 and 002) are located off of West St. near Perry Ln, while the one inactive well (source 003) is located off of California Brook Rd. All three wells are located within a stratified drift aquifer with an estimated transmissivity of 1,000-2,000 $ft^2$/day. Water pumped from the two active West Swanzey wells is disinfected and then stored in a 10,000 gallon underground storage tank located between the two wells. Water from this system is not treated for corrosion control.

Table 3. West Swanzey Water Sources. Data from NHDES.

| Source ID | Source Type | Status | Well Depth | Estimated Yield |
|---|---|---|---|---|
| 2301020-001 | Gravel Packed Well | Active | 77ft | 350 GPM |
| 2301020-002 | Gravel Packed Well | Active | 76ft | 300 GPM |
| 2301020-003 | Gravel Packed Well | Inactive | 35ft | 725 GPM |

## *4.2 Description of Source Protection Area*

The wellhead protection area (WHPA) for West Swanzey Water Company's two active sources covers an area of approximately 443 acres along Route 10, and California Brook Rd. in West Swanzey. The WHPA was delineated by NHDES using a Phase I delineation derived from a combination of a fixed radius of 4,000 ft to the north, and stratified drift aquifer mapping to the south and east. Advanced hydrological investigations such as pump tests were not used in delineating West Swanzey Water Company's WHPA. A sanitary protective radius of 300ft has been delineated for the system based upon the system's maximum average daily usage and recommendations from NHDES.

Land use within the WHPA is predominantly forest (230 acres), with 131 acres currently occupied by residences, 33 acres covered by commercial businesses, 29 acres occupied by a wetland near where the wells are located, and 20 acres utilized as hayfields or pasture. The WHPA is located west of the Ashuelot River, however California Brook and Bailey Brook transect the WHPA north to south. A 29 acre wetland is located approximately 1,200ft north of wells 001 and 002, well 003 is located along the wetland. NH Route 10 transects the WHPA on the eastern side of the delineation with approximately 43 acres of the WHPA being located east of Route 10. Other major roadways within the WHPA include West St., California St., Perry Ln, and California Brook Rd. Soils in the WHPA consist of fine sandy loams of the Berkshire and Sunapee series (27%), loamy sands of the Colton and Windsor series (52%), stony soils and rock outcroppings (11%) and hydric soils associated with wetlands (10%).

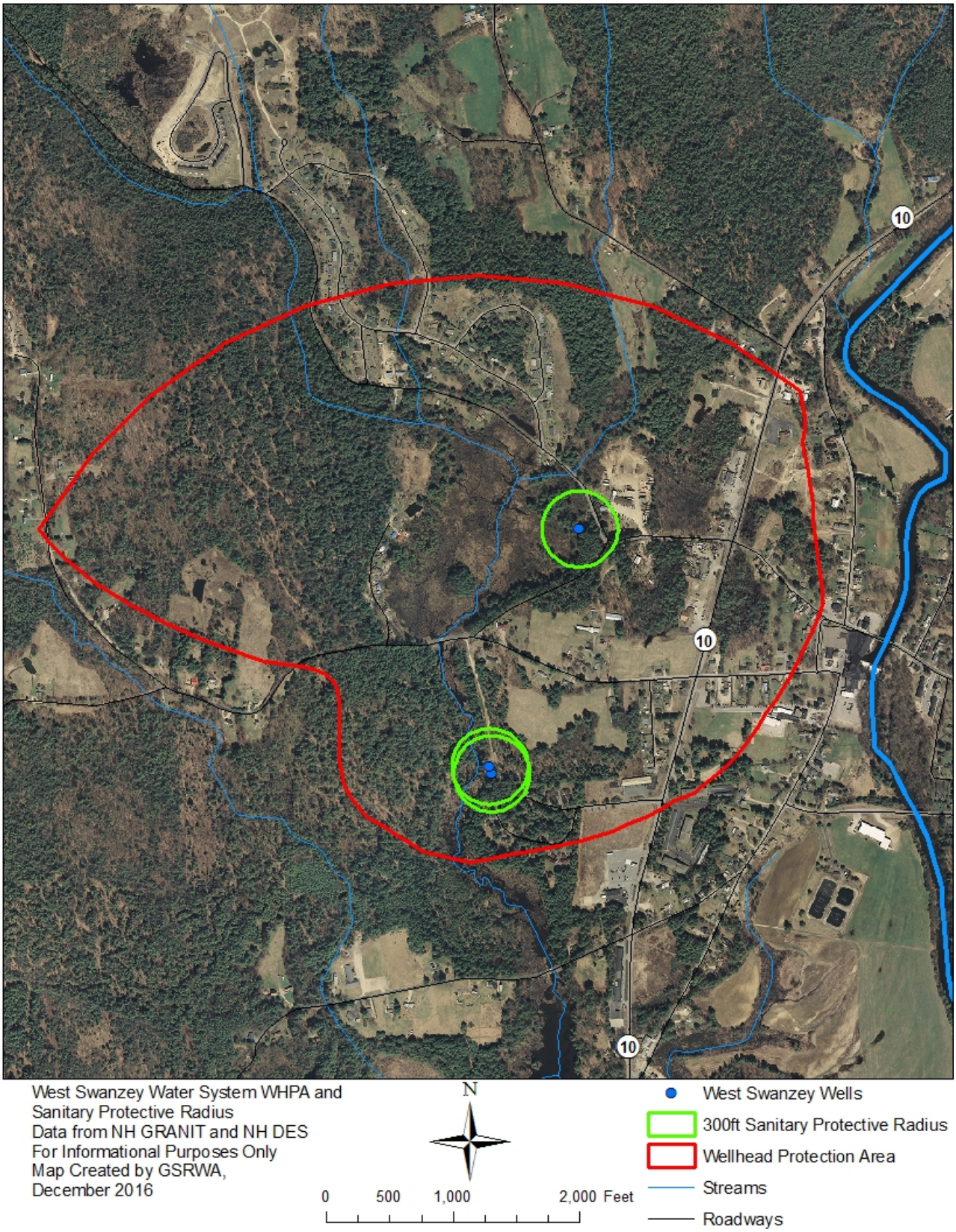



Figure 3. Wellhead protection areas and sanitary protective radii for West Swanzey Water Company wells. Data from NHDES and NH GRANIT.

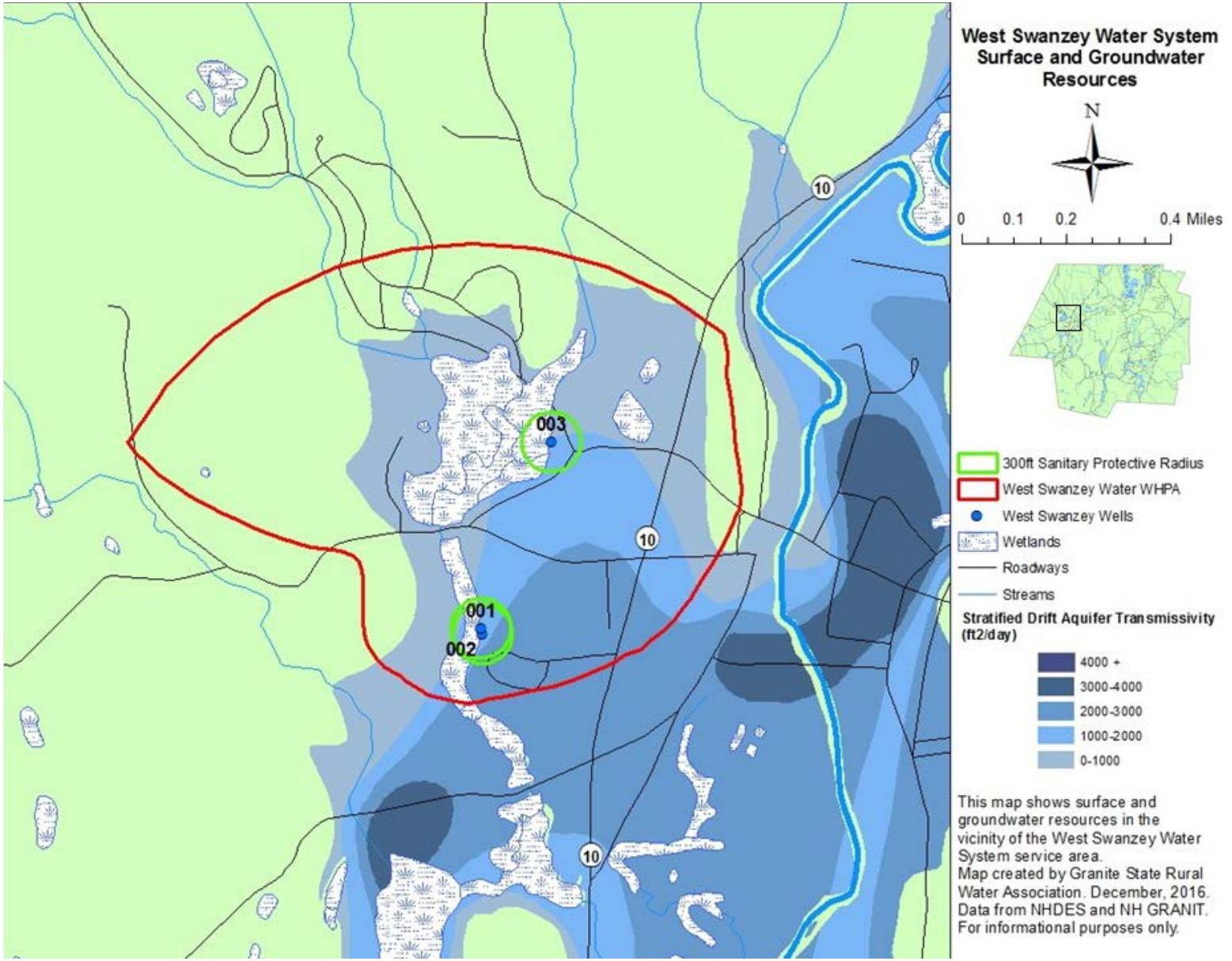



Figure 4. Surface and groundwater resources within the West Swanzey Water System WHPA. Data from NHDES and NH GRANIT.

### *4.3 Potential Sources of Contamination*

**Automotive Service Stations and Salvage Yards-**

Automotive service stations include any facility where vehicles are serviced, repaired or sold. These facilities may have vehicles stored on-site while waiting to be repaired or salvaged. Salvage yards, often called junkyards, are facilities where vehicles are stored outside and gradually disassembled as usable parts are removed. Vehicles may be stored at salvage yards for years or even decades.

Six salvage years/automotive service facilities exist within the wellhead protection area of the West Swanzey Water System. Additionally, one more facility is located immediately outside of the wellhead protection area. Automotive service stations often store petroleum products (such as motor oil and lubricants), as well as VOC's such as solvents and cleaners in bulk quantities on-site. The accidental release of these products, even in small quantities, can impact near-by drinking water wells. This risk is magnified when these products are stored in bulk quantities in aboveground storage tanks. Auto salvage yards often have dozens or even hundreds of derelict vehicles stored outside in various states of disassembly or repair. These vehicles can often leak automotive chemicals including gasoline, oil, solvents, and heavy metals over time. Improperly disposed of car parts such as catalytic converters, brakes, and engines can leach heavy metals into soils and groundwater while corroding and buried. The number of registered and unofficial salvage yards within the wellhead protection area present a high risk to the West Swanzey water system.

Table 4. Auto service stations and salvage yards within and near the West Swanzey WHPA. Data from NHDES.

| Facility Name | Address | Coordinates | Facility Type | NHDES Permits | Distance From Wells |
|---|---|---|---|---|---|
| Unnamed | 76 California St. (estimated) | 42.87363 72.33520 | Unofficial Salvage Yard | None | 2050ft- 001/002 570ft- 003 |
| YBA Muffler and Brake | 67 California St. | 42.87489 72.33556 | Auto Repair Facility; Possible Salvage Yard | None | 2430ft- 001/002 450ft- 003 |
| Route 10 Auto | 665 W. Swanzey Rd | 42.87357 72.33322 | Used Car Dealership; Auto Repair; Salvage Yard | Auto Salvage; Haz. Waste Generator; Solid Waste Facility; Underground Injection Control | 2330ft- 001/002 1100ft- 003 |
| Bill's Trading Post/ WM Auto Sales | 919 W. Swanzey Rd | 42.87726 72.33093 | Auto Sales; Possible Salvage Yard; Possible Auto Repair | None | 3800ft- 001/002 2000ft- 003 |
| Bob's West Swanzey Garage | 90 N. Winchester St | 42.87858 72.32995 Outside of WHPA | Auto Repair | Haz. Waste Generator | 4350ft- 001/002 2500ft- 003 |
| Larry's Homestead Garage | 655 W. Swanzey Rd. | 42.87444 72.33298 | Auto Repair | None | 2,600ft- 001/002 1,100ft- 003 |
| Swanzey Truck and Auto | 639 W. Swanzey Rd. | 42.87565 72.33242 | Auto Sales and Repair | None | 3100ft- 001/002 1300ft- 003 |

**Transportation Corridors-**

One major roadway, NH Route 10, travels through the wellhead protection area of the West Swanzey water system. Route 10 travels approximately 3,500ft through the eastern part of the WHPA. There are other residential feeder streets including West St, California St, and California Brook Rd. Other smaller residential streets include Perry Ln, Aylward Ln, Pondview Dr, and Mountainview Dr. There are approximately 4 miles total of roadways within the West Swanzey WHPA.

Roadways can present a few hazards to nearby drinking water wells, particularly from road salts and accidental chemical releases. Heavy road salt application can result in chlorides from salts or other deicing chemicals leaching into groundwater and traveling to surface waters, especially during snowmelt or other runoff events. Automobile accidents, even relative minor ones, can release petroleum products or other automotive chemicals into soils or storm drains. More seriously, an accident with a large tanker could release hundreds or thousands of gallons of product. Serious tanker accidents are rare, and products spilled during passenger car accidents are usually in small quantities. The risk to the West Swanzey water system from transportation corridors is low.

**Underground Petroleum Storage-**

Aside from residential heating oil tanks, there are no above or underground petroleum storage tanks within the wellhead protection area for West Swanzey's wells. There are two facilities located shortly outside of the WHPA however. These include a heating oil tank at an elementary school, and three underground gasoline storage tanks at a gas station. All of these tanks are located outside of the WHPA and downgradient of West Swanzey's wells. The 10,000 gallon heating oil tank located at Cutler Elementary is doubled hulled and equipped with leak detection equipment and most recently passed an inspection in May, 2016. The three UST's located at the Route 10 gas station were installed in May, 2016 and replaced four tanks that were removed at that time. The three new tanks are double-walled, fiberglass tanks equipped with leak detection systems. Sampling was conducted after the removal of the old tanks and no released petroleum product was detected in either soils or groundwater. Even though the UST's located at the gas station on Route 10 are located outside of the WHPA, and are equipped with modern safety features such as double-walls and leak detection, they present a high risk to the West Swanzey Water system due to their proximity to the system wells. The UST located at Cutler Elementary is likely downgradient of the system and is far enough away to present a low risk to the West Swanzey System.

Table 5. Underground petroleum storage tanks near the West Swanzey Water system WHPA. Data from NHDES

| Site Name | Address | Size of Tanks | Products Stored | Distance from Wells |
|---|---|---|---|---|
| Cutler Elementary School | 31 S. Winchester St | 1 x 10,000 gal | #2 Heating Oil | 2500ft- 001/002<br>2400ft- 003 |
| Gomarlos Food Mart | 765 Route 10 | 1 x 12,000gal<br>1 x 6,000 gal<br>1 x 4,000 gal | Gasoline<br>Diesel<br>Gasoline | 1200ft- 001/002<br>2600ft- 003 |

**Residential Land Use-**

Several dozen residences are located within the wellhead protection area for the West Swanzey Water System, primarily along Perry Ln, West St, Mountainview Rd, and Pondview Rd. Overall however, the area is rural in character with low housing density. 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 available for much of the wellhead protection area, but isn't available everywhere. Municipal sewers can help protect groundwater by treating wastewater by removing harmful pathogens and nitrates. Lawn chemicals such as pesticides, herbicides, and chemical fertilizers, when used in excess, can leach into ground water and impact nearby wells. Furthermore, if chemicals from home auto repair are improperly disposed of, they can also potentially contaminate near-by drinking water sources. The closest residences to the West Swanzey wells are located along Perry Ln. and are located approximately 250ft from the wells. The risk to the West Swanzey Water System from residential land use is high given the large number of residences, and their proximity to the wells.

**Agricultural Land Uses-**

There are approximately 17.5 acres of agricultural land within the wellhead protection area for the West Swanzey Water System. This land is largely utilized for hay production. Agricultural land use can be beneficial for near-by drinking water well by protecting the wells from urban development or other hazardous land uses and by promoting recharge. However fertilizer and pesticide application can introduce pathogens from manure, and SOC's from pesticides into groundwater. Fertilizers and pesticides are rarely used for the production of hay however, so the risk to the West Swanzey Water System from agriculture is low.

**Hazardous Waste Producers-**

There are two registered hazardous waste producers within the wellhead protection area for the West Swanzey Water System wells. One is a manufacturing facility located on the corner of Route 10 and Perry, Ln., the other is an automotive facility located on Route 10. Two more facilities are located shortly outside of the wellhead protection area

One facility, located within the WHPA, produces industrial liquid chillers and is a registered small quantity hazardous waste producer with the NH Department of Environmental Services. Typical waste streams reported include solvents such as naphtha, paints, waste oils, and isocyanates (used in the production of enamel coatings) in quantities typically less than 20 gallons. Another facility, also located within the WHPA is a previously mentioned automotive sales and service facility that is also a registered small quantity generator with NHDES.

Table 6. Hazardous waste producers within the West Swanzey Water Service area. Data from NHDES.

| Site Name | Address | Generator Size | Waste Streams Reported | Distance from Wells |
|---|---|---|---|---|
| Turmoil | 735 W. Swanzey Rd. | Small Quantity Generator | Paints, solvents, waste oils, Naphtha, Isocyanate | 1200ft- 001/002<br>2000ft- 003 |
| Route 10 Auto | 665 W Swanzey Rd. | Small Quantity Generator | Solvents | 2330ft-001/002<br>1100ft- 003 |

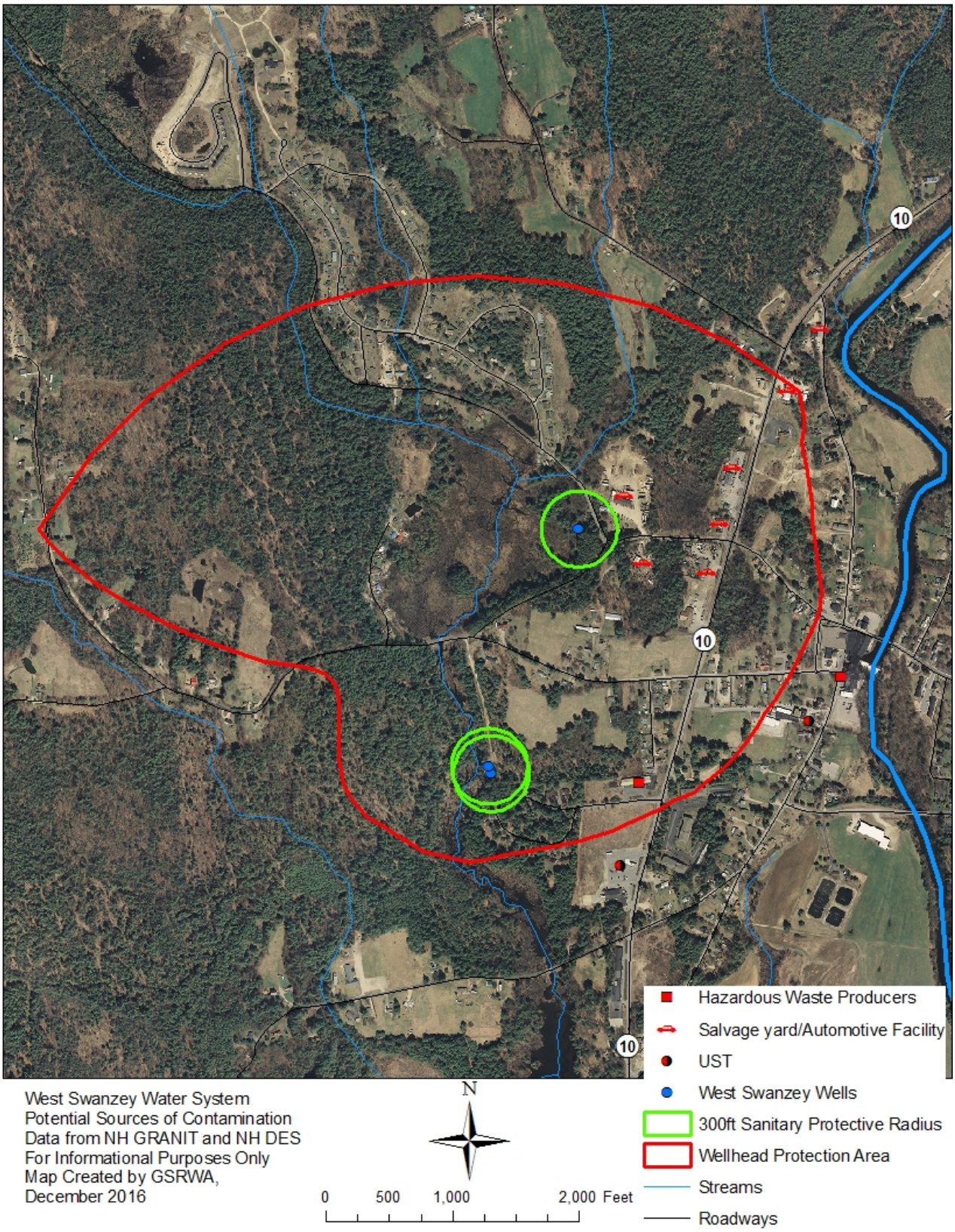



Figure 5. Potential sources of contamination within the West Swanzey Water System WHPA. Data from NHDES and NH GRANIT.

# 5. Eastfield Crossing System

## *5.1 System Description*

The Eastfield Crossing System (PWS ID: 2302040) is a privately-owned community public water system serving the community of Eastfield Crossing in Swanzey, NH. The system serves approximately 113 individuals through 45 service connections, and has been in operation since 1988. The system is supplied by two gravel packed wells that provide water for domestic home use. Average daily use is unavailable but is estimated to be between 7,500 and 8,000 gallons per day, based on a national average daily household use of 176 gallons per day for 45 service connections. The system does not provide fire protection, however water for firefighting is supplies by means of a fire pond, the South Branch of the Ashuelot River, and a 10,000 gallon storage tank. Sewer service is provided by means of several shared septic system, each serving a cluster of five homes.

The wells supplying the system are comprised of two gravel packed wells located approximately 350ft apart, and near the South Branch of the Ashuelot River. The wells are located in a stratified drift aquifer with an estimated transmissivity between 1,000-2,000 $ft^2$ per day. Source 005 is a gravel packed well with a depth of 18ft and an estimated yield of 22 gallons per minute. Source 006 is also a gravel packed well, with a depth of 22ft and an estimated yield of 20 gallons per minute. Water is disinfected and stored in two underground storage tanks, located near the wells and then distributes to homes through a 4" PVC water main. A booster pump provides pressure for the system.

Table 7. Eastfield Crossing active water sources. Data from NHDES

| Source ID | Source Type | Status | Well Depth | Estimated Yield |
|---|---|---|---|---|
| 2302040-005 | Gravel Packed Well | Active | 18ft | 22 GPM |
| 2302040-006 | Gravel Packed Well | Active | 21ft | 20 GPM |

## *5.2 Description of Wellhead Protection Area.*

The wellhead protection area (WHPA) for Eastfield Crossing's two active sources covers an area of approximately 46 acres along Belleview Drive in East Swanzey. The WHPA was delineated by NHDES using a Phase I delineation using basic hydrologic methods including the Uniform Flow Equation taking into account the elevation of the surrounding landscape (NHDES, 2005). Advanced hydrological investigations such as pump tests were not used in delineating the WHPA for the Eastfield Crossing system. A sanitary protective radius of 150ft has been delineated for the system based upon the system's maximum average daily usage and guidelines from NHDES.

Land use within the WHPA is predominantly forest (24 acres), with 13.5 acres currently occupied by residences, 3 acres of undeveloped open land around the wells, and 2.5 acres of wetlands. The WHPA is located between the South Branch of the Ashuelot River and Bridge Brook, an unnamed intermittent brook runs through the WHPA to the west and drains into Bridge Brook. The wetland is located in the southwest corner of the WHPA. Soils in the WHPA are predominantly loamy sands of the Caesar and Windsor series, with stony soils along the South Branch Ashuelot River

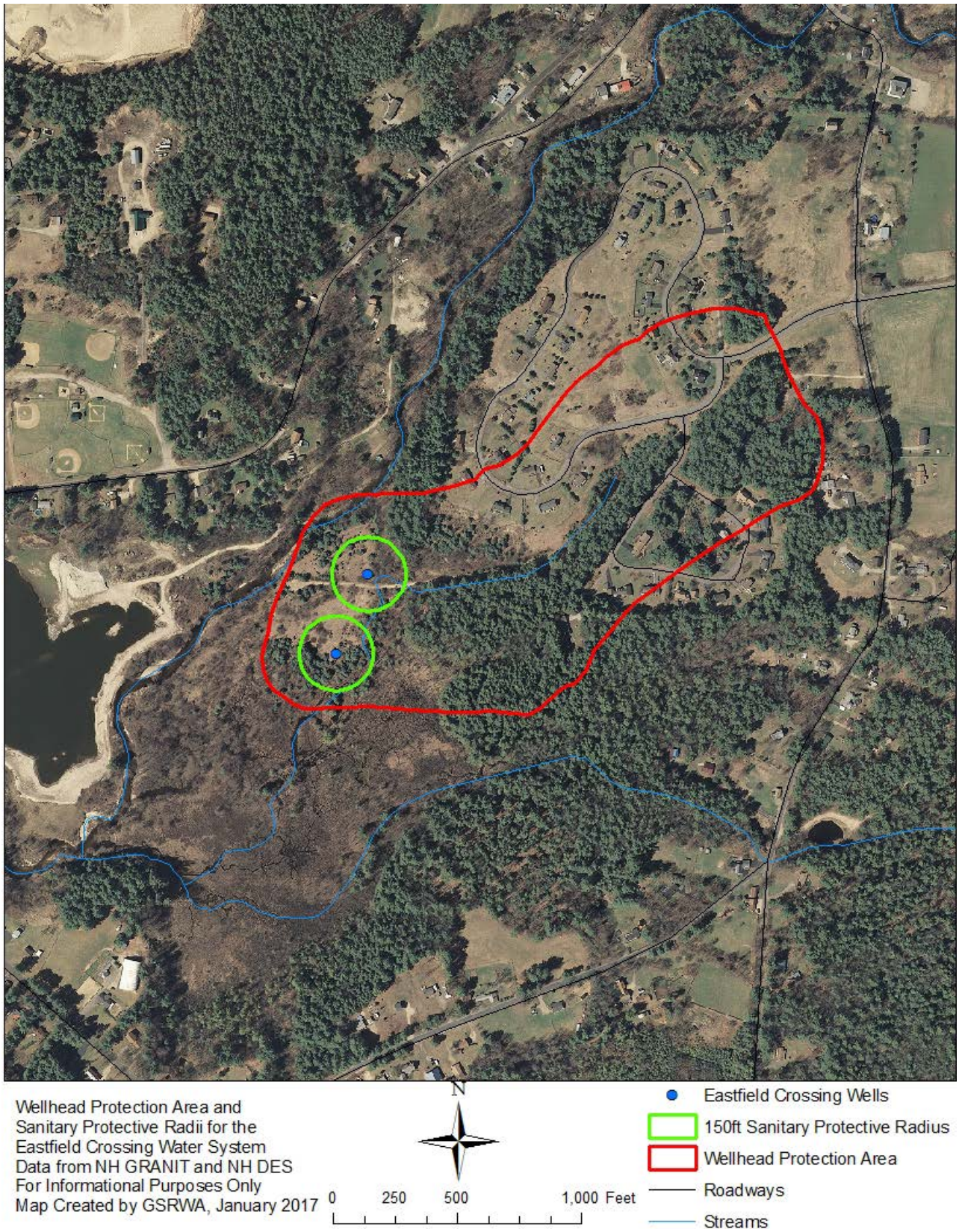



Figure 6. Wellhead protection area and sanitary protective radii for the Eastfield Crossing Water System. Data from NHDES and NH GRANIT.

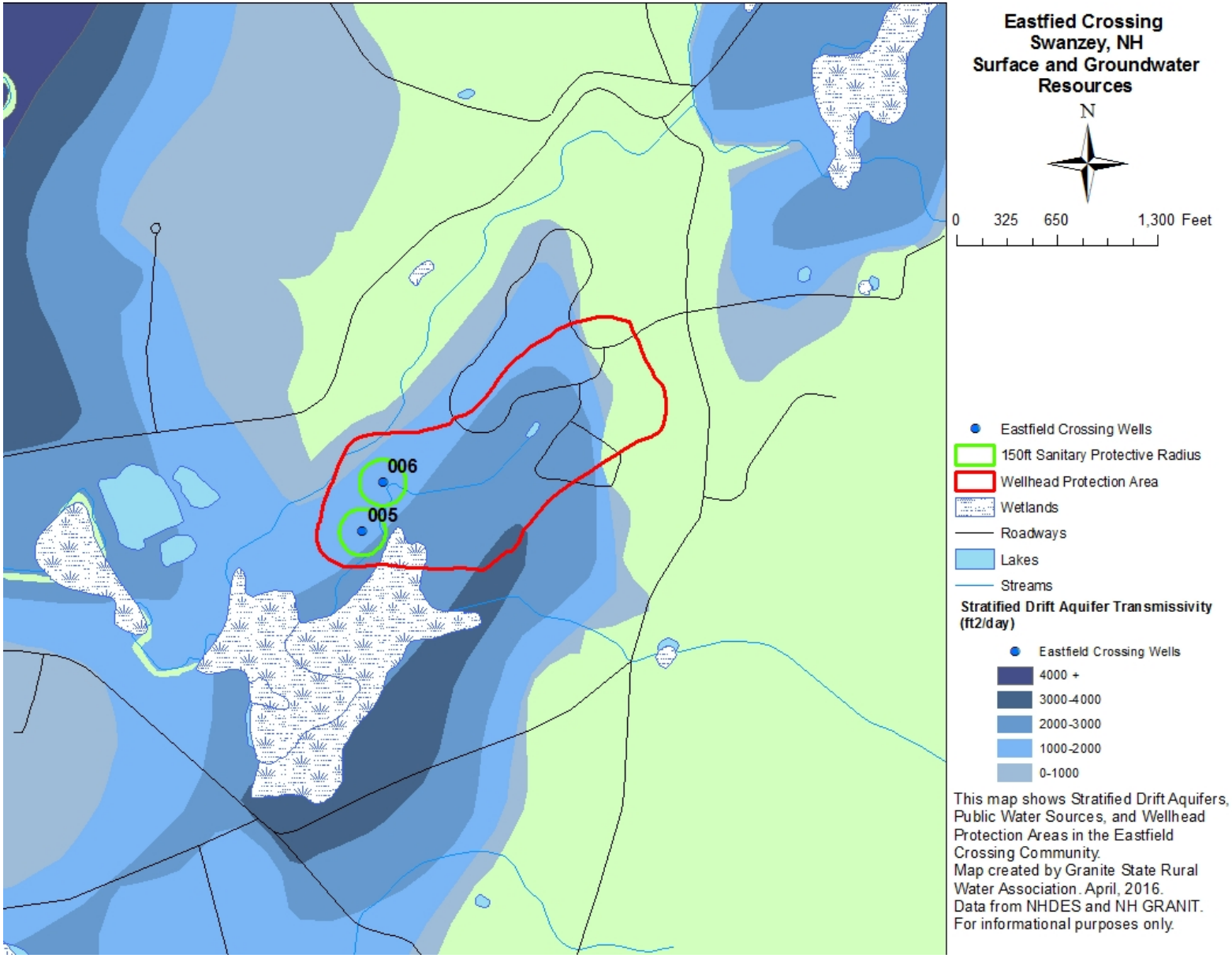



Figure 7. Surface and groundwater resources for the Eastfield Crossing Water System. Data from NHDES and NH GRANIT.

### *5.3 Potential Sources of Contamination*

**Residential Land Uses-**

Approximately 16 residences are located within the wellhead protection area for the Eastfield Crossing Water System. Overall however, the area is rural in character with low housing density. Residential land use is associated with the presence of septic systems, oil heat, and lawn care products. The Eastfield Crossing community relies on shared septic systems for wastewater disposal and treatment. Each shared septic tank and leach field serves five homes, there are a total of five shared septic systems within the community (Eastfield Crossing, 1989). When properly maintained, residential septic systems are highly efficient at removing pathogens and nitrates from wastewater. However when not regularly pumped, overused, or when used to improperly dispose of household hazardous wastes, they can become a hazard to near-by drinking water wells. Additionally, lawn chemicals such as pesticides, herbicides, and chemical fertilizers can also present a hazard to near-by drinking water supplies. When used in excess, these chemicals can leach into ground water and impact nearby wells. Finally, household hazardous wastes such as paints and solvents, petroleum products from home auto repair or landscaping equipment, and cleaning chemicals can also impact near-by drinking water sources when improperly disposed of. Heating oil tanks, located outside or in basements, can leak fuel oil in the event of an accident or mechanical failure. These tanks typically contain 275 gallons or more of #2 fuel oil, and rarely have secondary containment or leak-detection equipment. Residential land use presents a medium risk to the Eastfield Crossing system wells due to the number of residences grouped together, the presence of shared septic systems, and their proximity to the well.

**Transportation Corridors-**

There is approximately 3,400ft of roadways within the wellhead protection area largely comprised of Belleview Dr. and Barden Cir. Both of these roadways are lightly traveled residential streets. Roadways can present a hazard to nearby drinking water wells through the over-application of road salts during winter, petroleum releases from automobile accidents, or the loss of recharge to impervious surfaces. Since the roadways traveling through the wellhead protection area of the Eastfield Crossing system are small and lightly traveled, they present a small risk to the system's wells.

**Automotive Service Facility-**

There is one business advertising automotive repair, in addition to excavation services, located on Old Richmond Rd. approximately 2,000ft from the well. The business is a small, home-based operation and likely does not keep large quantities of petroleum on-site. Since the automotive services offered are limited, and it does not appear that junked vehicles are kept on site, the risk to the Eastfield Crossing system from this business is low.

**Agricultural Land Uses-**

Although there is no agricultural land within the wellhead protection area for the Eastfield Crossing system, there is some pasture land nearby on Old Richmond Rd. This land is pasture used for equine activities and only a few animals are kept on site. Additionally, this agricultural land is down gradient, and at a lower elevation than the Eastfield Crossing system wells. Nearby agricultural land presents a low risk to the Eastfield Crossing system wells.

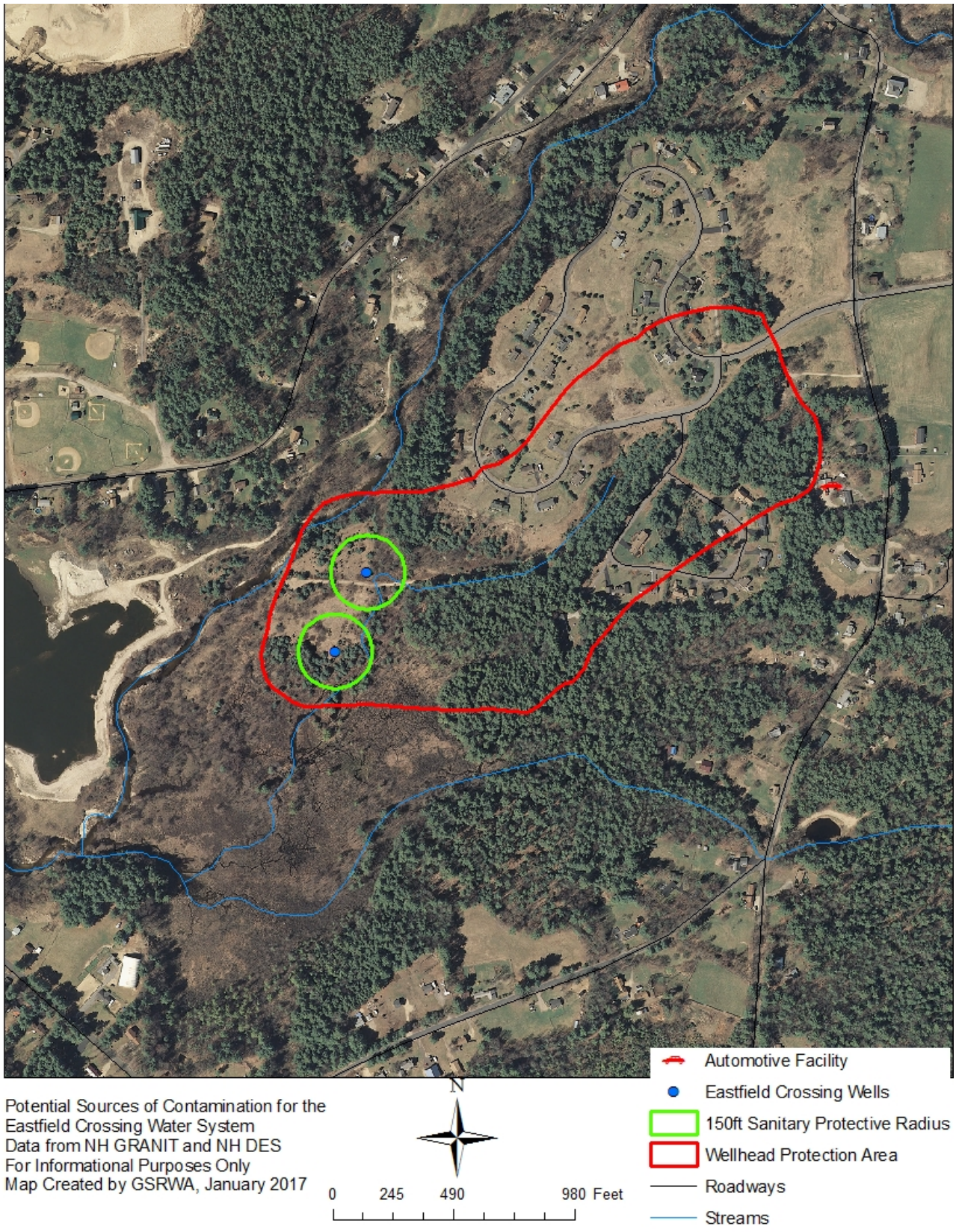



Figure 8. Potential Sources of Contamination for the Eastfield Crossing System. Data from NHDES and NH GRANIT.

# 6. Pine Grove Co-Op System

## *6.1 System Description*

The Pine Grove Co-Op System (PWS ID: 2303010) is a community public water system serving the residents of the Pine Grove Co-Op mobile home park. The system serves 305 individuals through 122 service connections and has been in operation since 1963. The system is supplied by two gravel packed wells located on Co-Op property and supply an average of 21,500 gallons per day based on a national daily average of 176 gallons per household for 122 households. The system does not provide fire protection, and wastewater disposal is provided via shared septic systems, many of which were replaced during the early 2000's.

The two gravel packed wells supplying the system are located in a forested area west of the primary residential area of the park. Source 006 is a 32ft deep gravel packed well with an estimated yield of 46 gallons per minute, the well is located adjacent to a small wetland and in an area where estimated aquifer transmissivity is between 1,000-2,000 $ft^2$ per day. Source 007 is also a gravel packed well with a depth of 22ft and an estimated yield of 10.5 gallons per minute, this well is located approximately 200ft away from Source 006 and in an area with aquifer transmissivity estimated to be up to 1,000$ft^2$ per day. Water from the system is disinfected and treated for corrosion control.

Pine Grove is a cooperative, resident-owned, mobile home community located along Route 10 in Swanzey, NH. The community has 122 homes.

Table 8. Pine Grove Co-Op active water sources. Data from NHDES

| Source ID | Source Type | Status | Well Depth | Estimated Yield |
|---|---|---|---|---|
| 2303010-007 | Gravel Packed Well | Active | 22ft | 10.5 GPM |
| 2303010-006 | Gravel Packed Well | Active | 32ft | 46 GPM |

## *6.2 Description of Source Protection Area*

The wellhead protection area for the Pine Grove Co-Op system covers an area of approximately 48 acres west of Route 10 in Swanzey. The wellhead protection area was delineated by NHDES using a Phase I delineation using basic hydrologic methods including the Uniform Flow Equation taking into account the elevation of the surrounding landscape (NHDES, 2005). Advanced hydrological investigations such as pump tests were not used in delineating the WHPA for the Pine Grove Co-Op system. A sanitary protective radius of 175ft has been delineated for the system based upon the system's maximum average daily usage and guidelines from NHDES.

Land use within the wellhead protection area is predominantly forest (33 acres) with 15 acres currently occupied by residences and roadways. There are approximately 50 residences within the WHPA. An unnamed, intermittent stream drains wetlands located near the wells to the north. Elevation within the WHPA ranges from 150ft to 170ft. NH Route 10 transects the source protection area from north to south, other roadways within the WHPA include Lat Ln, and Diana Dr, both of which are roads within the Pine Grove Co-Op. Soils in this area are predominantly loamy fine sands of the Colton and Windsor series, with some rocky outcroppings in the northwest corner of the WHPA and hydric soils near the wells.

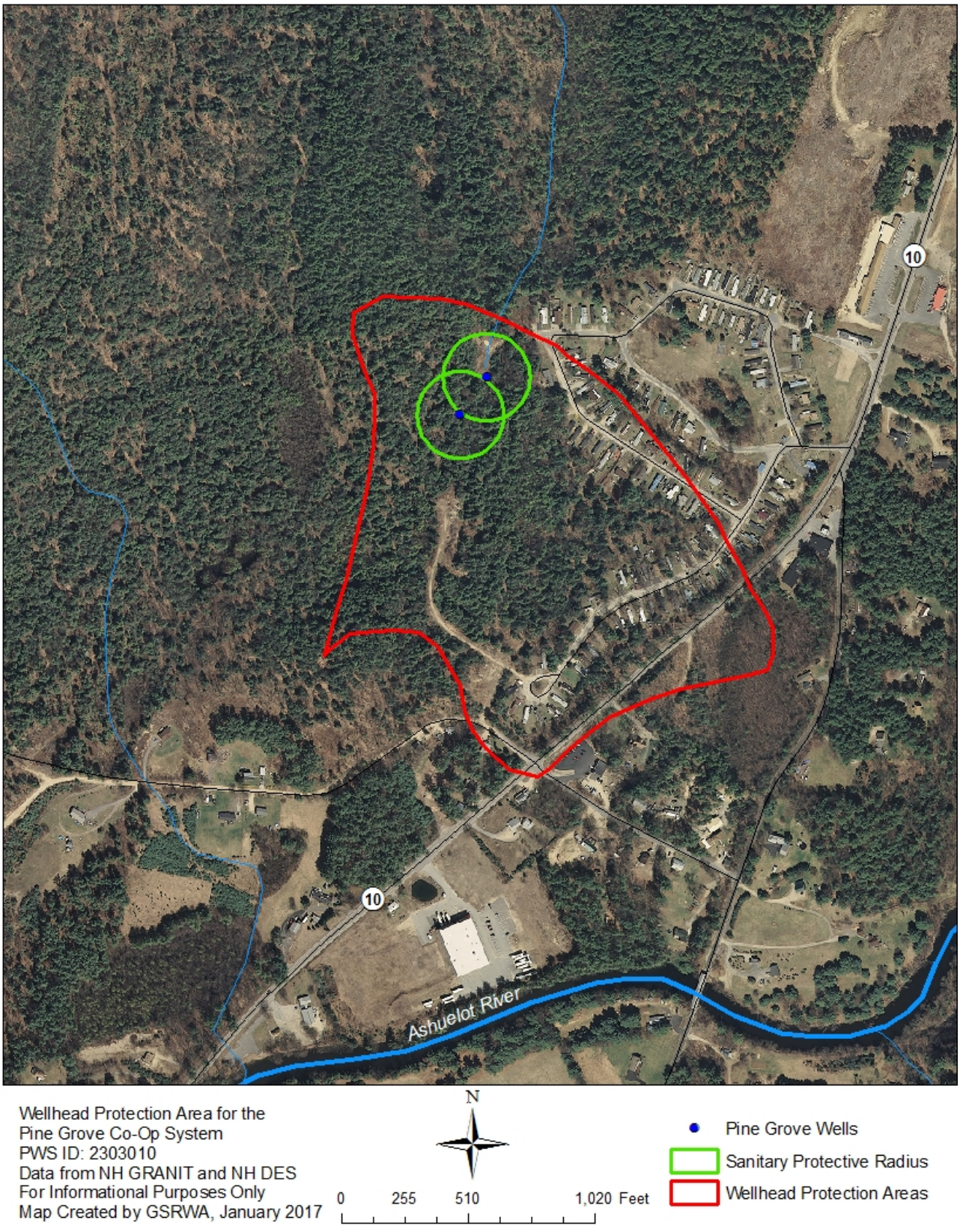



Figure 9. Wellhead protection area and sanitary protective radii for the Pine Grove Co-Op Water System. Data from NHDES and NH GRANIT.

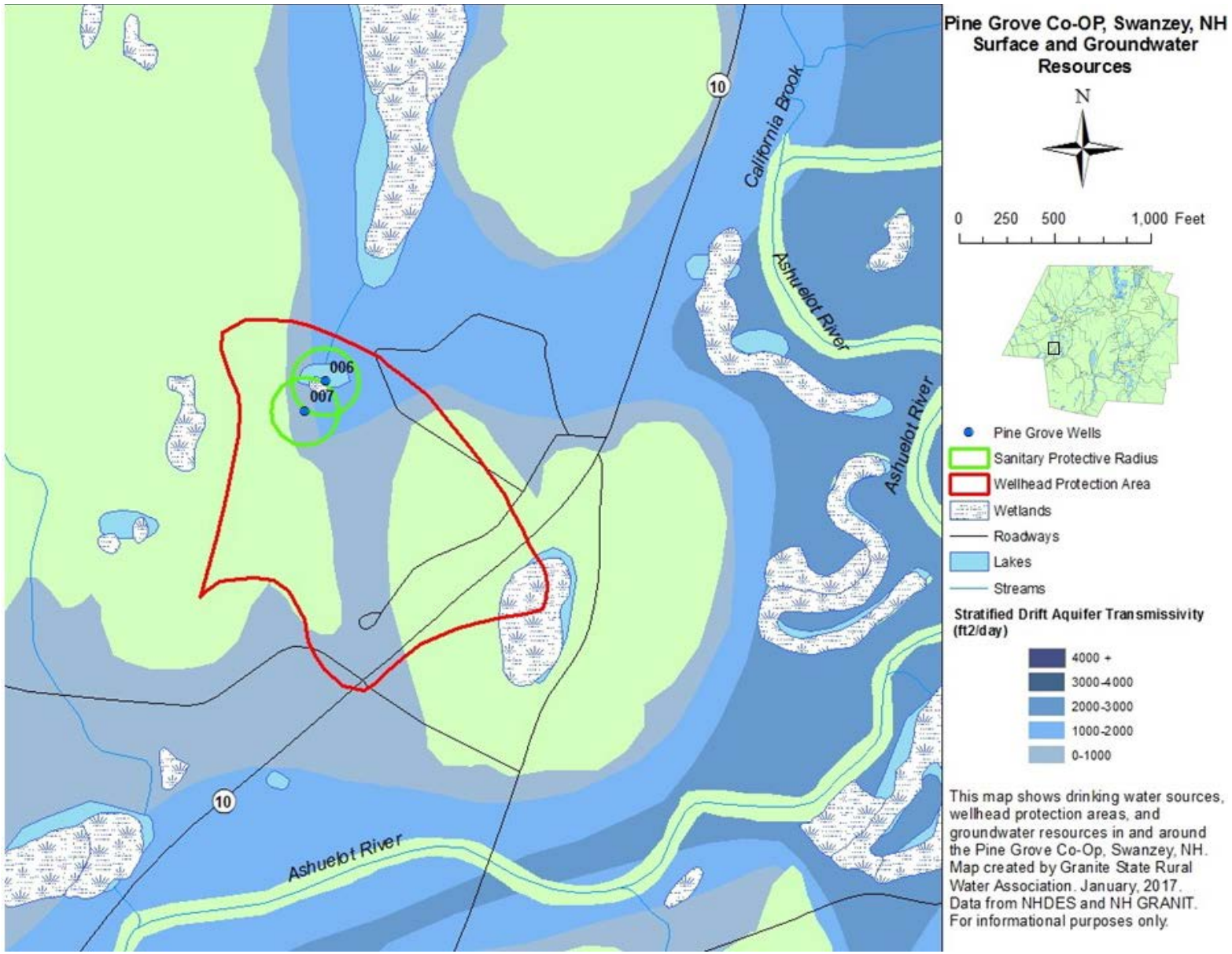



Figure 10. Surface and groundwater resources for the Pine Grove Co-Op Water System. Data from NHDES and NH GRANIT.

### *6.3 Potential Sources of Contamination*

**Underground Petroleum Storage-**

There is one facility housing underground petroleum storage tanks located across Route 10 from the Co-Op, and approximately 1,500ft away from the wells. This facility is a vehicle service station with five, 4,000 gallon underground storage tanks. Three of these tanks store gasoline, one stores kerosene, and one stores diesel. The three gasoline, and one diesel tanks were installed in 1998 and are made of double walled composite material with plastic piping and were equipped with leak detection and overfill protection devices. The kerosene tank was installed in 1990 and is made of corrosion resistant steel of double-walled construction. Since the installation of these tanks, this facility has failed compliance requirements eight times and was red tagged (prohibited from operating) once in 2009 (NHDES, 2017). These four tanks were installed in 1998 and replaced two 10,000 gallon gasoline, one 10,000 gallon diesel, and one 4,000 gallon kerosene underground storage tanks which were removed at the same time. During the 1998 tank removal the tanks appeared to be in good condition and did not have any obvious signs of leaks or released product. Soil and groundwater samples were taken at the site of the removal, soil samples exceeded standards for naphthalene and toluene, while all groundwater samples met state groundwater standards (Handex, 1998).

Four underground storage tanks were removed from this site in 1990 including three 4,000 gallon gasoline tanks and one 1,000 gallon diesel tank. At the time of removal the tanks were reported to be in good condition with no odors indicating a release (Hidell-Eyster, 1993). Approximately 25 cubic yards of stockpiled, excavated soils from around the underground storage tanks was sampled and analyzed for petroleum products during the removal. Elevated levels of MtBE, toluene, ethylbenzene, and xylene were detected in the excavated soils indicating a release. Additionally, a gasoline-water mixture was discovered in two catch basins located near the property. Samples taken in 1991 from gravel-packed monitoring wells located on the Pine Grove Co-Op property indicated the presence of elevated levels of benzene, toluene, ethylbenzene, and xylene. Additionally, MtBE was detected in bedrock drinking water wells and monitoring wells in properties adjacent to the Pine Grove Co-Op (Geoinsight, 2003). Groundwater was not monitored between 1992 and 1998, a supplemental site investigation was completed for the site in 2000 and citing significant decreases in petroleum products in groundwater samples taken from the area, NHDES opted natural attenuation as the preferred remediation option (Geoinsight, 2003). A groundwater monitoring permit was issued for the site in 2002 that required bi-annual monitoring of five wells located on site and three wells located off site at adjacent properties. Additional monitoring wells were installed on-site in 2008 to further study the movement of VOC's from the site and eight additional residential water wells were sampled during 2011 and 2012. As of October 2016, petroleum products including MtBE, ethylbenzene, xylene, benzene, toluene, and naphthalene continue to be identified in groundwater samples taken from monitoring wells located on-site at the Route 10 mini mart. Additionally, MtBE continues to be found in samples taken from residential drinking water wells on properties located across Westport Village Rd. from the site. MtBE along with tetrachloroethene continues to be discovered in bedrock monitoring wells located at a property immediately north of Pine Grove Co-Op. Furthermore, an unidentified non-aqueous phase liquid (NAPL), often associated with petroleum products has been observed in a monitoring well located on the Pine Grove Property near the corner of Eastview Circle and Anthony Drive (Geoinsight, 2014). The NAPL was discovered during sampling events in 2007, 2010, 2011, 2012, 2014, and 2016 and was treated through the application of an absorbent sock regularly

changed out during each sampling event since. Due to the substance's brown and weathered appearance it is believed to originate for a historic, unknown release (Geoinsight, 2016).

This site continues to present a risk to any nearby drinking water wells both through the movement of previously released product and the presence of existing underground storage tanks. The fact that these tanks have failed compliance tests and inspections on multiple occasions magnifies this risk. Although modern safety measures such as leak detection alarms, double-walled tanks, and regular inspections have helped decrease the risk these tanks present to nearby drinking water systems, these are mechanical devices and can fail. Another product release could potentially further impact already affected wells, and potentially impact wells even further away depending on hydrologic conditions. Any new source developed between Lat Lane and Anthony Drive could be impacted either by the historic release, or any potential future release. It is important to note that no product has been detected in Pine Grove Co-Op's active wells 006 and 007. This facility presents a high risk to any near-by drinking water wells.

Another, smaller release occurred in 2004 at the Pine View Co-Op. Approximately 10 gallons of #2 Fuel Oil leaked from a 275 gallon underground storage tank that was located on a black poly surface and was in the process of being removed from the park. A small quantity of soil was impacted and removed, no product was detected in in nearby groundwater wells. No further action was deemed necessary by NHDES.

Table 9. Route 10 Mini-Mart UST Violations since 1998. Data from NHDES

| Violation Type | Violation Date | Return to Compliance Date | Notes |
|---|---|---|---|
| Compliance Inspection Fail | 8/21/2002 | 10/05/2002 | Permit Not Displayed;<br>Leak Detection Monitor Not Functioning |
| Compliance Inspection Fail | 2/22/2005 | 04/04/2005 | Vapor Recovery Drop Tube not 12" from bottom of tank;<br>Overfill Protection not at 90% Alert and 95% Shut-Off Levels;<br>Leak Monitor for Tank 13 in Alarm Mode;<br>Annual Leak Detection Tests Not Performed;<br>Piping Leak Detection Test Not Performed. |
| Compliance Inspection Fail<br>(Red-Tagged 9/21-9/29/2009)<br>IRT-09-011 | 12/19/2008 | 9/29/2009 | Overfill Protection not Functioning in 5 Tanks;<br>Annual Leak Detection Tests not Performed for 5 Tanks;<br>Stage I Records Not Maintained for 3 Tanks;<br>Piping Leak Detection Tests Not Performed for 3 Tanks;<br>Corrosion Control Documentation not Submitted for 1 Tank. |
| Compliance Review Fail | 07/18/2011 | 08/01/2011 | Leak Detection Tests for Tanks and Piping Overdue. |
| Compliance Inspection Fail | 09/06/2011 | 09/20/2011 | Overfill Prevention Device, and Hose on Dispenser in Need of Replacement. |
| Compliance Review Fail | 10/23/2012 | 01/29/2013 | Operator Training Requirement Not Met |
| Compliance Inspection Fail<br>(WMD 16-027)<br>(IRT 16-030) | 09/04/2014 | 04/18/2016 | Operator Certificate Not Displayed;<br>Emergency Response Guidelines Not Displayed;<br>Operator Training Overdue;<br>Monthly UST Inspection Not Performed for 4 Tanks;<br>Spill Containment Devices Not Maintained for 5 Tanks;<br>Overfill Protection Device Not in Working Order for 5 Tanks;<br>Leak Monitor Not in Working Order for 2 Tanks;<br>Liquid Discovered in Interstitial Space for 1 Tank. |

Table 10. Underground storage tanks at the Route 10 Mini-Mart. Data from NHDES.

| Tank Number | Product Stored | Volume (Gallons) | Construction Material | Date Installed | Date Removed |
|---|---|---|---|---|---|
| 1 | Gasoline | 10,000 | Steel-Galvanized | 1983 | 9/30/1998 |
| 2 | Gasoline | 4,000 | Steel-Galvanized | 1973 | 12/06/1993 |
| 3 | Gasoline | 4,000 | Steel-Galvanized | 1973 | 12/06/1993 |
| 4 | Gasoline | 4,000 | Steel-Galvanized | 1973 | 07/01/1990 |
| 5 | Kerosene | 4,000 | Steel-Galvanized | 1973 | 09/30/1998 |
| 6 | Gasoline | 10,000 | Steel-Galvanized | 1983 | 09/30/1998 |
| 7 | Diesel | 10,000 | Steel-Galvanized | 1983 | 09/30/1998 |
| 8 | Diesel | 1,000 | Steel-Galvanized | 1973 | 07/01/1990 |
| 9 | Kerosene | 4,000 | Steel-Corrosion Protected | 08/01/1990 | N/A |
| 10 | Diesel | 4,000 | Composite | 10/01/1998 | N/A |
| 11 | Gasoline | 4,000 | Composite | 10/01/1998 | N/A |
| 12 | Gasoline | 4,000 | Composite | 10/01/1998 | N/A |
| 13 | Gasoline | 4,000 | Composite | 10/01/1998 | N/A |

**Automotive Sales and Service Facility-**

There is one facility providing automotive repair and sales located just outside the southeast corner of the WHPA. The facility is located on the corner of Kempton Rd. and Route 10 and is approximately 1,500ft from the wells. Automotive service stations often store petroleum products (such as motor oil and lubricants), as well as VOC's such as solvents and cleaners in bulk quantities on-site. The accidental release of these products, even in small quantities, can impact near-by drinking water wells. This risk is magnified when these products are stored in bulk quantities in aboveground storage tanks. No junked or salvaged cars are kept on-site at this facility, and the only vehicles kept at this facility are either for sale or actively being repaired. This facility does not possess a Hazardous Waste Generator permit. A second facility advertising auto body repair services is located across Route 10 from the entrance of Pine Grove and is approximately 1,900ft from the Pine Grove system wells. Waste solvents and paints are commonly found on-site at auto-body facilities.

Both of these facilities are small-scale operations and likely do not have hazardous materials and wastes in large quantities on-site. Small spills and accidents can still impact near-by wells however. Give the small scale of both of these businesses, and the fact that hazardous substances are not kept on-site in large quantities, the present a low risk to Pine Grove's wells.

**Transportation Corridors-**

One major roadway, NH Route 10, travels approximately 1,200ft through the WHPA for the Pine Grove Co-Op. Additionally 1,800ft of local streets exist within the Pine Grove Co-Op. Roadways can present a few hazards to nearby drinking water wells, particularly from road salts and accidental chemical releases. Heavy road salt application can result in chlorides from salts or other deicing chemicals leaching into groundwater and traveling to surface waters, especially during snowmelt or other runoff events. Automobile accidents, even relative minor ones, can release petroleum products or other automotive chemicals into soils or storm drains. More seriously, an accident with a large tanker could release hundreds or thousands of gallons of product. Serious tanker accidents are rare, and products spilled during passenger car accidents are usually in small quantities. The risk to Pine Grove Co-Op's water system from transportation corridors is low.

**Residential Land Use-**

Approximately 50 residences are located within the wellhead protection area for the Pine Grove System, primarily within the Pine Grove Co-Op. Overall however, the area is rural in character with low housing density. 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 Sewer service is not available in this area, and most residences within the Co-Op utilize single or shared residential septic systems. Lawn chemicals such as pesticides, herbicides, and chemical fertilizers, when used in excess, can leach into ground water and impact nearby wells. Furthermore, if chemicals from home auto repair are improperly disposed of, they can also potentially contaminate near-by drinking water sources. The closest residences to the Pine Grove wells are located along Lat Ln. and are located approximately 250ft from the wells. The risk to the Pine Grove System from residential land use is high given the number of residences, and their proximity to the wells.

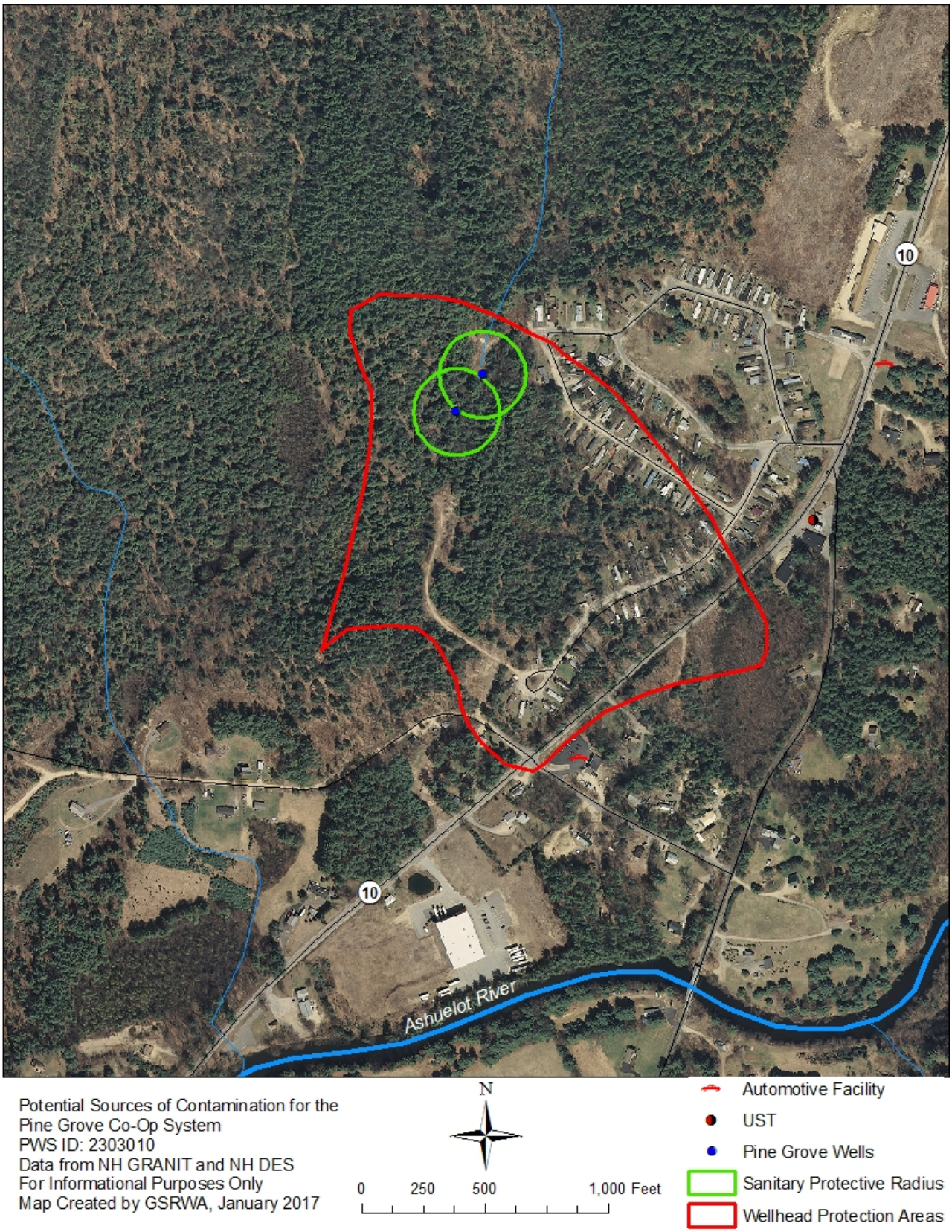



Figure 11. Potential sources of contamination for the Pine Grove Co-Op system. Data from NHDES and NH GRANIT.

# 7. Management of Risk

The most pressing water quality concerns facing drinking water sources in the Town of Swanzey include the introduction of heavy metals, VOC's, and heavy metals from salvaged automobiles, and the accidental release of hazardous substances into groundwater from underground petroleum storage. To address these concerns, the Town of Swanzey should undertake the following actions:

- Restrict or prohibit hazardous land uses through a municipal zoning ordinance.
- Educate property owners near public water sources.
- Maintain a Source Water Protection Committee

### *7.1 Adopt a Groundwater Protection Ordinance*

The land uses mentioned in Chapters 4-6 of this report can negatively impact groundwater resources utilized by both public water suppliers, and private residential well users. These land uses can be controlled through the implementation of ordinances to restrict the locations of these activities, or to set conditions for their use. New Hampshire municipalities are empowered to regulate land uses and activities near drinking water sources under RSA 674:16 and RSA 674:21. Other New Hampshire communities have enacted such ordinances and regulations, including municipalities in Cheshire County.

The Town of Winchester enacted an aquifer protection ordinance in 2004. This zoning district is designed to protect the town's wells and covers areas in the town where stratified-drift aquifers have been delineated. The Town of Walpole enacted in 2002, and updated in 2015, a source protection overlay district ordinance that governed land uses within the wellhead protection areas for the town's two wells. The Town of Hinsdale, NH adopted an aquifer/wellhead protection overlay ordinance in 2009 that stipulates land use regulations within the wellhead protection areas for that town's municipal wells. Additionally, the New Hampshire Department of Environmental Services has a model ordinance available for municipalities to utilize.

Swanzey is unique among New Hampshire communities in that it has no central, municipally-owned public drinking water system. Although most Swanzey residents rely on private wells for their daily domestic water needs, some rely on privately-owned public water systems. Other, similar New Hampshire communities without municipally-owned community public drinking water systems have also enacted ordinances to protect groundwater resources for both private water wells, and privately-owned water systems. Moultonborough, NH is a Lakes Region community of approximately 4,500 individuals without a municipally-owned public water supplier, and several privately-owned water systems. In 2007 the community enacted a groundwater protection ordinance that regulated land uses in wellhead protection areas for privately-owned public water suppliers, and delineated stratified-drift aquifers. Furthermore, the Town of Swanzey's 2003 Master Plan Update lists the consideration of an aquifer protection overlay district as one of its first recommended action items for protecting drinking water supplies. The Southwest Regional Planning Commission, in their 2014 Southwest New Hampshire Natural Resource Management Plan, recommended that all southwest New Hampshire communities adopt aquifer protection overlay district ordinances.

The Town of Swanzey should enact a similar ordinance to govern land uses in areas where stratified-drift aquifers are known to exist, and within wellhead protection areas. Ideally, this ordinance should establish prohibited land uses, conditions for some exempted land uses, and performance standards for permitted land uses. The list of prohibited land uses should include:

- Underground petroleum storage
- Large Aboveground Hazardous Materials Storage
- Disposal of solid or leachable wastes
- Auto Salvage Yards
- Storage, processing, use, disposal, or recycling of regulated substances
- Bulk storage of road salt or snow dumps
- Excavation into bedrock or below the water table

This is an important step for the Town to take, as increased commercial and industrial development along Route 10 could potential lead to the increased presence of hazardous land uses and activities. An ordinance will help guide developers and business owners into operations that present a minimal risk to groundwater resources, or encourage industrial development in areas within the town without sensitive groundwater resources. The purpose of a groundwater protection ordinance is not to prohibit or impede commercial development and growth, but rather to guide it in a manner so that it does not negatively impact water resources. The importance of developing regulations governing land uses near sensitive drinking water resources should be highlighted by historic events such as releases from underground gasoline storage tanks. A draft ordinance is available in Appendix B.

### *7.2 Education and Outreach*

Public education and outreach is central to protecting drinking water resources because increased awareness by property owners, consumers, and local businesses leads to better cooperation with stakeholders and water suppliers. The Town of Swanzey and Swanzey's drinking water system owners should conduct the following activities:

- Distribute Example Letter #1 to property owners located within the wellhead protection areas. The purpose of this letter is to notify owners that their property is located within a wellhead protection area for a public water supply. A factsheet on topics such as septic system maintenance, and heating oil storage, and a copy of the source protection map (with well locations omitted) should be included with the notification letter.
- Distribute example letter #2 to businesses located within or near wellhead protection areas, along with the associated fact sheets.
- Distribute a notice highlighting the schedule for Swanzey's Household Hazardous Waste Collection Day, to foster increased use of this service.
- Maintain signs at the well houses which read "Tampering with this Facility is a Federal Offense". Additionally, signs should be placed along roadways passing through well head protection areas alerting motorists

These materials will help inform residents on what actions they can take to help keep groundwater resources used for drinking water clean and pure. By highlighting the tangible benefits homeowners receive from being stewards of communal drinking water supplies, an outreach campaign is more likely to encourage and obtain support and action. Furthermore, these types of campaigns can also generate support for protecting surface water resources not used for drinking water. The Town of Swanzey's 2003 Master Plan Update recommended an education and outreach campaign to inform property and business owners on how they can protect drinking water resources. Example education and outreach materials are available in Appendix C.

### *7.3 Maintain a Source Water Protection Committee*

The Town of Swanzey should maintain a source protection committee either as a sub-committee of an existing town commission, or as a stand-along committee. This committee should be tasked with reviewing and updating any source protection plans on an annual basis, and to provide comment and guidance to other town departments and commissions with regard to drinking water related issues. At a minimum, the source protection committee should consist of:

- Water System Operators
- A Selectboard Member
- Conservation Commission Member
- Planning Board member
- Zoning Board of Appeals
- Local Resident
- Local Farmers and Land Owners
- Local Business Owners
- Private Community Board of Directors

In addition to discussing drinking water quality issues, this committee can also help address the mutual concerns of both drinking water quality and surface water resources. The committee should also consider including local scientists, as well as environmentally based non-profits who may be able to lend expertise in communicating the relationship between surface and groundwater quality.

# 8. Contingency Planning

The New Hampshire Department of Environmental Services requires community public drinking water systems to have emergency plans outlining what to do in the event of a long or short term emergency. These plans are required to outline emergency notification procedures, interconnections with neighboring systems, plans for distributing bulk water, and plans to resume normal operations once the emergency has passed. Additionally, these plans contain contact information for system operators, local emergency responders, contractors and vendors, local elected officials, and local media outlets. These emergency plans are required to be updated every three years. West Swanzey Water Company, Eastfield Crossing, North Swanzey Water and Fire Precinct, and Pine Grove Co-Op have developed extensive emergency response procedures and all above listed systems updated their emergency operating plans in 2015.

Emergency operating plans are a strong tool for planning for, and responding to an emergency such as a chemical spill. However these plans work best when shared with partnering agencies and are practiced regularly. Community drinking water systems should share their emergency operating plans not only with their local fire department, but with upstream departments as well. Additionally, water suppliers should rehearse these plans through drills and table-top exercises with other involved agencies. These types of exercises can help reinforce roles held by different agencies, identify deficiencies, and improve communication between agencies and between neighboring communities. Water systems should also consider sharing these plans neighboring communities as well.

### *8.1 Potential Municipal Well*

This report was tasked with identifying lands where a municipal well could be developed in the event the Town of Swanzey deemed it necessary or desirable. Conservation land, owned by the Town of Swanzey, would be a preferred option since the land is already in municipal ownership and already protected from development.. Swanzey currently owns six conservation lots located with associated aquifers. These include adjoining three lots along Route 32 near Sawmill Rd where aquifer transmissivity is estimated to be between 1,000 and 3,000 $ft^2$/day (Tax Lot #'s 24/2-3, 33/19). Other lands owned by the Town of Swanzey include the Matthews Rd. lot located near the Dillant-Hopkins Airport, and the West Swanzey Muster Team lot located on Pine St.

Table 11. Town-owned conservation lands with associated aquifers. Data from NH GRANIT.

| Tax Lot Number | Lot Size (acres) | Lot Name | Aquifer Transmissivities (ft2/day) |
|---|---|---|---|
| 24/2 | 14 | Town of Swanzey Land | 1,000-3,000 |
| 24/3 | 24 | Town of Swanzey Land | 1,000-3,000 |
| N/A | 13 | West Swanzey Muster Team | 1,000-2,000 |
| 38/23 | 7.5 | Matthews Rd. Lot | 0-1,000 |
| 33/19 | 17 | Conservation Land, Sawmill Rd. | 1,000-3,000 |

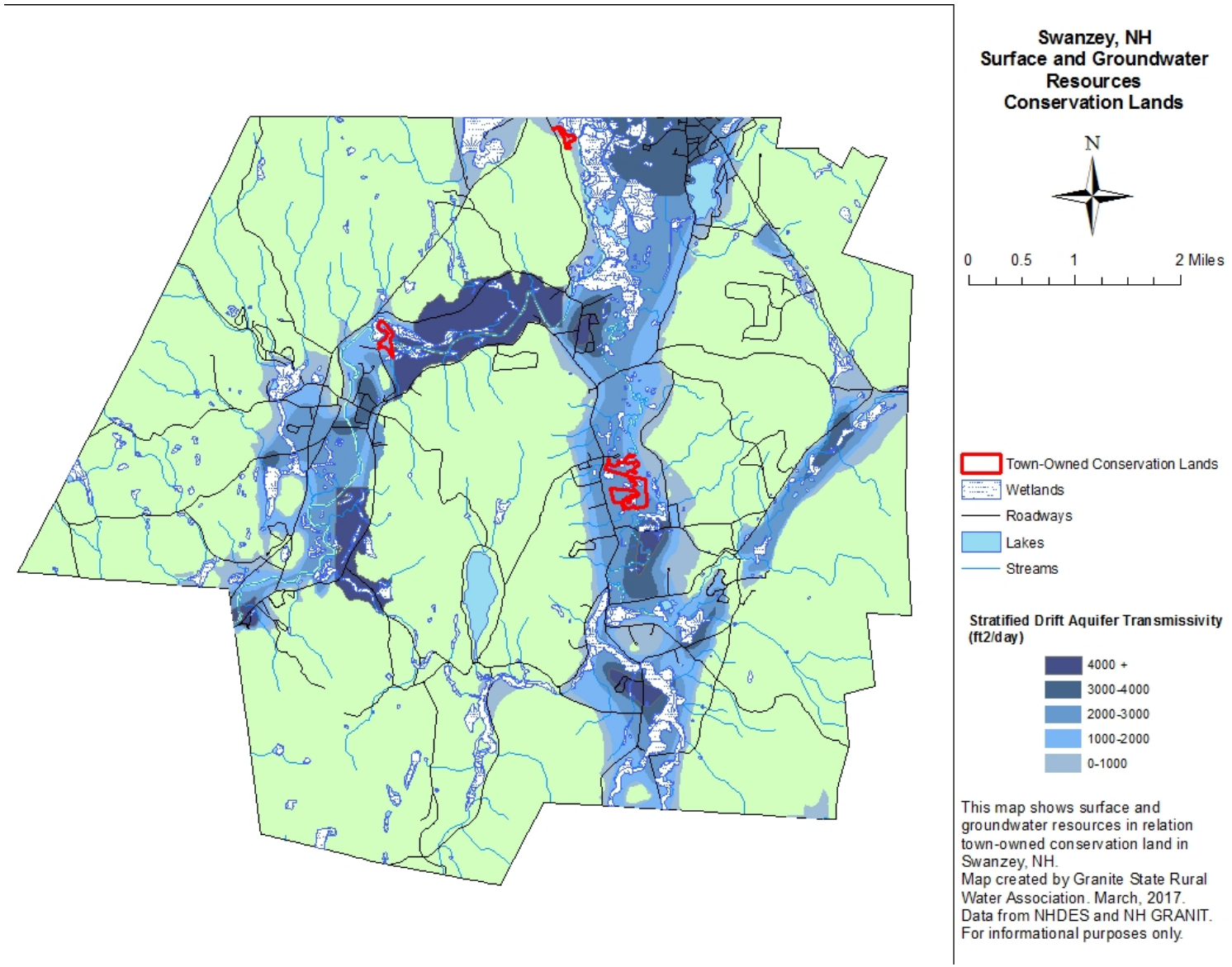



Figure 12. Town-owned conservation lands located over aquifers. Data from NHDES and NH GRANIT.

## 9. Conclusions

Swanzey is unique among New Hampshire communities in that it has no single municipal drinking water system, but 25 separate public drinking water suppliers to serve 7,230 residents. However the responsibility to protect these resources still requires the support and involvement of the town government, residents, system operators, and business owners. Education and outreach is the key to involving these entities to encourage action on their part to protect drinking water resources. With the intelligent cooperation of land-owners, system owners and operators, and public officials these water supplies should be viable for many years. The regulation of smart growth, by the town, through zoning ordinances is also important as it guides potentially hazardous land uses away from groundwater resources without negatively impacting economic growth. Although the primary purpose of this plan is to protect public drinking water supplies, the action items contained within, especially the education and outreach components, have tangible benefits for surface water resources that are not used as drinking water supplies. To remain viable, this plan should be periodically reviewed by relevant stakeholders.

## Resources

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# Appendix A. Potential Sources of Contamination Inventory

Table 12. Potential sources of contamination near the West Swanzey System Wells. Data from NHDES, NH GRANIT.

**West Swanzey Water Company, Swanzey, NH. PWS ID 2301020, Potential Sources of Contamination and Action Items**

| Contaminant Source | Location | Street Address | Distance from Sources (ft) | Contaminants of Concern | Risk Level | Action Item |
|---|---|---|---|---|---|---|
| Unnamed Salvage Yard | 42.87363, 72.33520 | 76 California St | 2050ft- 001/002<br>570ft-003 | Automotive chemicals, petroleum products, heavy metals | High | Ordinance, education and outreach |
| YBA Muffler and Brake | 42.87489, 72.33556 | 67 California St | 2430ft-001/002<br>450ft-003 | Automotive chemicals, petroleum products, heavy metals | High | Ordinance, education and outreach |
| Route 10 Auto | 42.87357, 72.33322 | 665 W. Swanzey Rd. | 2330ft-001/002<br>1100ft-003 | Automotive chemicals, petroleum products, heavy metals | High | Ordinance, education and outreach |
| Bill's Trading Post/WM Auto Sales | 42.87726, 72.33093 | 919 W. Swanzey Rd | 3800ft-001/002<br>2000ft-003 | Automotive chemicals, petroleum products, heavy metals | High | Ordinance, education and outreach |
| Bob's West Swanzey Garage | 42.87858, 72.32995 | 90 N. Winchester St. | 4350ft-001/002<br>2500ft-003 | Automotive chemicals, petroleum products, heavy metals | High | Ordinance, education and outreach |
| Swanzey Truck and Auto | 42.87565, 72.33242 | 639 W. Swanzey Rd. | 3100ft-001/002<br>1300ft-003 | Automotive chemicals, petroleum products, heavy metals | High | Ordinance, education and outreach |
| Cutler Elementary School UST | 42.87040, 72.33055 | 31 S. Winchester St | 2500ft-001/002<br>2400ft-003 | Petroleum Products, MtBE, VOC's | Low | Education and Outreach |
| Gomarlos Food Mart UST | 42.86706, 72.33533 | 765 Route 10 | 1200ft-001/002<br>2600ft-003 | Petroleum Products, MtBE, VOC's | High | Education and Outreach |
| Roadways | Throughout | N/A | 250ft-001/002<br>175ft-003 | Pathogens, petroleum products | Low | Signs Along Roadways |
| Residential Land Use | Throughout | N/A | 250ft-001/002<br>175ft-003 | Pathogens, Nitrates, Petroleum Products | Low | Education and Outreach |
| TurmOil | 42.86888, 72.33503 | 735 W. Swanzey Rd. | 1200ft-001/002<br>2000ft-003 | VOC's, Paints, Solvents | Low | Education and Outreach |
| Agriculture | Throughout | N/A | 450ft-001/002<br>750ft-003 | Pathogens, Nitrates | Low | Education and Outreach |

Table 13. Potential sources of contamination near the Eastfield Crossing System Wells. Data from NHDES and NH GRANIT.

| **Eastfield Crossing System, Swanzey, NH. PWS ID 2302040, Potential Sources of Contamination and Action Items** | | | | | | |
|---|---|---|---|---|---|---|
| Contaminant Source | Location | Street Address | Distance from Sources (ft) | Contaminants of Concern | Risk Level | Action Item |
| Roadways | Throughout | N/A | Source 005- 950ft<br>Source 006- 625ft | Impervious Surfaces, non-point runoff, automotive chemicals, road salts | Low | Signage along roadways |
| Residential Land Use | Throughout | N/A | Source 005- 900ft<br>Source 006- 600ft | Septics, lawn chemicals, heating oil, automotive chemicals | Medium | Education and Outreach letters to Homeowners |
| Vehicle Service Station | 42.84563, 72.25509 | 81 Old Richmond Rd. | Source 005- 2100ft<br>Source 006- 1900ft | Petroleum Products, MtBE, VOC's | Low | Education and Outreach letter to Business |
| Agriculture | Throughout | N/A | Source 005- 2400ft<br>Source 006- 2300ft | Nitrates, pathogens, pesticides, SOC's | Low | Education and Outreach letters to Property Owners |

Table 14. Potential sources of contamination near the Pine Grove Co-Op

| Pine Grove Co-Op System, Swanzey, NH. PWS ID 2303010, Potential Sources of Contamination and Action Items | | | | | | |
|---|---|---|---|---|---|---|
| Contaminant Source | Location | Street Address | Distance from Sources (ft) | Contaminants of Concern | Risk Level | Action Item |
| Roadways | Throughout | N/A | Source 006- 400ft<br>Source 007- 400ft | Impervious surfaces, non-point runoff, automotive chemicals, road salts | Low | Signage along roadway |
| Residential Land Use | Throughout | N/A | Source 006- 250ft<br>Source 007- 400ft | Septics, lawn chemicals, heating oil, automotive chemicals | High | Edu. And Outreach Mailings |
| Green Light Auto | 42.84993, -72.34128 | 23 Kempton Rd. | Source 006- 1600ft<br>Source 007- 1500ft | Petroleum Products | Low | Edu. And Outreach Mailings |
| Bedard's Auto | 42.85259, -72.33863 | 956 W. Swanzey Rd. | Source 006- 1600ft<br>Source 007- 1800ft | Petroleum Products | Low | Signs at well houses |
| Underground Petroleum Storage | 42.85259, -72.33863 | 968 W. Swanzey Rd | Source 006- 1500ft<br>Source 007- 1550ft | Petroleum Products, MtBE | High | Edu. And Outreach Mailings, Compliance Inspections, Monitor Wells |

**NHDES Source Water Assessment Reports**

# Assessments of Public Water Supply Sources - SWANZEY

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.*

System Type: C — C=Community; P=Non-Transient, Non-Community; N=Transient

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EPAID 2301010 System Name: N SWANZEY WATER AND FIRE PRCT** | | | | | | | | | | | | | | | | | | | | |
| 001 | KEENE WATER DEPT | E | 12/3/2001 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| **EPAID 2301020 System Name: WEST SWANZEY WATER CO** | | | | | | | | | | | | | | | | | | | | |
| 001 | GPW | G | 1/22/2002 | 4 | 2 | 6 | H | L | M | L | M | L | H | H | H | L | L | | L | |
| 002 | GPW | G | 1/22/2002 | 4 | 2 | 6 | H | L | M | L | M | L | H | H | H | L | L | | L | |
| **EPAID 2302010 System Name: ASHUELOT RIVER APTS** | | | | | | | | | | | | | | | | | | | | |
| 001 | BRW | G | 8/3/2001 | 2 | 2 | 8 | L | L | L | L | L | L | H | L | H | L | M | | M | |
| **EPAID 2302040 System Name: EASTFIELD CROSSING ASSOC** | | | | | | | | | | | | | | | | | | | | |
| 005 | GPW | G | 1/16/2001 | 1 | 0 | 11 | L | L | L | L | L | L | L | L | H | L | L | | L | |
| 006 | GPW | G | 1/16/2001 | 0 | 2 | 10 | L | L | L | L | L | L | L | M | M | L | L | | L | |
| **EPAID 2303010 System Name: PINE GROVE MOBILE HOME PK COOP** | | | | | | | | | | | | | | | | | | | | |
| 006 | GPW | G | 10/25/2002 | 1 | 2 | 9 | L | L | L | L | M | L | H | L | M | L | L | | L | |
| 007 | GPW | G | 10/25/2002 | 1 | 2 | 9 | L | L | L | L | M | L | H | L | M | L | L | | L | |
| **EPAID 2303020 System Name: CALIFORNIA BROOK ESTATES** | | | | | | | | | | | | | | | | | | | | |
| 001 | BRW | G | 10/4/2001 | 1 | 0 | 11 | L | L | L | L | L | L | L | L | H | L | L | | L | |
| 002 | BRW | G | 10/4/2001 | 1 | 0 | 11 | L | L | L | L | L | L | L | L | H | L | L | | L | |
| 003 | BRW | G | 10/4/2001 | 1 | 0 | 11 | L | L | L | L | L | L | L | L | H | L | L | | L | |

| | Source Number | Source Description | Source Type | Date Assessment Completed | Number of Vulnerability Rankings | | | Susceptibility Ranking Criteria | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Highs | Mediums | Lows | Detects | Well/Intake | KCSs | PCSs | Highways/RRs | Pesticides | Septics | Urban Land Cover | Ag Land Cover | Animals | Lagoons | Dry discharges | Sanitary radius | Trophic status |
| | 004 | BRW | G | 10/4/2001 | 1 | 0 | 11 | L | L | L | L | L | L | L | L | H | L | L | | L | |

**System Type** N — C=Community; P=Non-Transient, Non-Community; N=Transient

**EPAID** 2305040 **System Name:** WILCOX ATHLETIC FIELD

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BRW | G | 7/25/2001 | 2 | 0 | 7 | L | L | L | H | H | L | L | | | L | L | | | |

**EPAID** 2306030 **System Name:** KNOTTY PINE ANTIQUES MARKET

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BRW | G | 9/5/2001 | 1 | 0 | 8 | L | L | L | H | L | L | L | | | L | L | | | |

**EPAID** 2307010 **System Name:** SWANZEY LAKE CAMPING AREA

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BRW | G | 9/5/2001 | 2 | 0 | 7 | L | L | L | H | L | L | H | | | L | L | | | |

**EPAID** 2307020 **System Name:** PILGRIM PINES

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BRW | G | 9/19/2000 | 1 | 0 | 8 | L | L | L | H | L | L | L | | | L | L | | | |
| 002 | BRW | G | 9/21/2000 | 1 | 0 | 8 | L | L | L | H | L | L | L | | | L | L | | | |

**EPAID** 2307030 **System Name:** CAMP SQUANTO

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BRW | G | 7/25/2001 | 1 | 0 | 8 | L | L | L | H | L | L | L | | | L | L | | | |

**EPAID** 2307050 **System Name:** PILGRIM PINES CAMPGROUND

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BRW | G | 7/25/2001 | 1 | 0 | 8 | L | L | L | H | L | L | L | | | L | L | | | |
| 002 | BRW | G | 7/25/2001 | 1 | 0 | 8 | L | L | L | H | L | L | L | | | L | L | | | |

**EPAID** 2307060 **System Name:** CHESHIRE FAIRGROUNDS

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BRW | G | 7/25/2001 | 3 | 0 | 6 | L | L | L | H | H | L | L | | | H | L | | | |
| 002 | BRW | G | 7/25/2001 | 3 | 0 | 6 | L | L | L | H | H | L | L | | | H | L | | | |
| 003 | BRW | G | 7/25/2001 | 2 | 0 | 7 | L | L | L | H | H | L | L | | | L | L | | | |

**EPAID** 2308010 **System Name:** SWANZEY DINER

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BRW | G | 7/25/2001 | 2 | 0 | 7 | L | L | L | H | H | L | L | | | L | L | | | |

**EPAID** 2308020 **System Name:** THE ALPS RESTAURANT

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BRW | G | 9/19/2000 | 2 | 0 | 7 | L | L | L | H | H | L | L | | | L | L | | | |

| | Source Number | Source Description | Source Type | Date Assessment Completed | Number of Vulnerability Rankings | | | Susceptibility Ranking Criteria | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Highs | Mediums | Lows | Detects | WellIntake | KCSs | PCSs | Highways/RRs | Pesticides | Septics | Urban Land Cover | Ag Land Cover | Animals | Lagoons | Dry discharges | Sanitary radius | Trophic status |
| EPAID 2308040 System Name: NICKS RESTAURANT | | | | | | | | | | | | | | | | | | | | | |
| | 001 | BRW | G | 7/25/2001 | 3 | 0 | 6 | L | H | L | H | H | L | L | | | L | L | | | |
| EPAID 2308060 System Name: NEIGHBORS CONVENIENCE STORE | | | | | | | | | | | | | | | | | | | | | |
| | 001 | BRW | G | 7/25/2001 | 2 | 0 | 7 | L | L | L | H | H | L | L | | | L | L | | | |
| EPAID 2309020 System Name: SWANZEY TOWN HALL | | | | | | | | | | | | | | | | | | | | | |
| | 001 | BRW | G | 9/19/2000 | 2 | 0 | 7 | L | L | L | H | H | L | L | | | L | L | | | |
| System Type P C=Community; P=Non-Transient, Non-Community; N=Transient | | | | | | | | | | | | | | | | | | | | | |
| EPAID 2305050 System Name: MONADNOCK REGIONAL HIGH SCHOOL | | | | | | | | | | | | | | | | | | | | | |
| | 001 | BRW | G | 8/18/2000 | 3 | 2 | 7 | L | L | L | M | H | L | M | L | H | L | L | | H | |
| EPAID 2306020 System Name: MVS FULFILLMENT SVS INC | | | | | | | | | | | | | | | | | | | | | |
| | 001 | BRW | G | 1/30/2001 | 1 | 3 | 8 | L | L | L | M | L | L | M | L | H | L | L | | M | |

# Appendix B. Sample Groundwater Protection Ordinance

## Section IXX- SAMPLE

## Groundwater Protection Overlay District

**A.** The Groundwater Protection Overlay District comprises of lands overlying sensitive drinking water aquifers that require protection and land management practices to minimize the risk of contamination. The purpose of the Groundwater Protection Overlay District is to balance the value of groundwater as an important source of drinking water for the Town of Swanzey with the economic impact of restricting a variety of uses within the Groundwater Protection Overlay District. The purpose is to be accomplished by regulating land uses which could contribute pollutants to both public and private drinking water wells. Pursuant to the Authority granted under RSA 674:16, the Town of Swanzey hereby adopts the Groundwater Protection Overlay District

**B.** The regulations in this Article overlay and supplement the provisions on the underlying zoning districts. This ordinance shall apply to all uses within the Groundwater Protection Overlay District except for uses exempt under Item IX of this ordinance. 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 Swanzey, or the State of New Hampshire, the more restrictive provisions shall apply. 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

**C.** The Groundwater Protection Overlay District is an overlay district superimposed over existing zoning districts. The overlay district is comprised of: (1) Wellhead Protection Areas as defined in Item I of this ordinance and supported by the New Hampshire Department of Environmental Services. (2) Stratified Drift Aquifers as defined in Item I of this ordinance and supported by the US Geological Survey report “Geohydrology and hydrology of stratified drift aquifers in the Lower Connecticut River Basin, Southwestern New Hampshire”. The boundaries of this overlay district are shown on a map titled Groundwater Protection Overlay District, Swanzey NH, Dated TBD.

### ITEM I. DEFINITIONS

Aquifer: A geologic unit or formation containing a useable amount of water.

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.

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

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

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.

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.

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

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.

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

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.

Process Water: Wastewater from an industrial process.

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.

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.

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.

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.

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).

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.

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.

Stratified Drift: A geologic formation comprised of sand, gravel, and silt particles transported and deposited by glacial melt waters.

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

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.

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.

**ITEM II. DETERMINATION AND ADJUSTMENT**

A. Determination

Where the boundary of the Groundwater 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 Swanzey may engage services of a professional such as a geologist, soil scientist to determine more accurately the location and extent of the resource in question. 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 Groundwater Protection Overlay District, including reducing or expanding the designation area to more correctly define the location and the extent.

**ITEM III. PERFORMANCE STANDARDS**

The following Performance Standards apply to all uses in the Groundwater Protection Overlay District unless exempt under Item IX:

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 Item VII 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.

**ITEM IV. SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLANS (SPCC)**

Conditional uses, as described under Item VII, Part (A), using regulated substances shall submit a spill control and countermeasure plan (SPCC) to the Swanzey 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.

**ITEM V. PERMITTED USES**

A. Permit Required:

All site plan proposals located within the Groundwater 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 Groundwater Protection Overlay District unless a Conditional Use permit 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 on Plats.

**ITEM VI. PROHIBITED USES**

The following uses are prohibited in the Groundwater 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 Groundwater Protection Overlay District.
H. Blasting of bedrock or excavation into the water table.
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. Fueling and maintenance of large earthmoving equipment.
L. Hazardous Waste Facility.
M. New large groundwater withdrawals within the Groundwater Protection Overlay District, except as preempted by state statute. If permitted by state statute, the Town of Swanzey requires any and all optional requirements, including, but not limited to a Pre-Testing Conference and Revised Withdrawal Testing Design.

**ITEM VII. 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 Item IV, is approved by the Swanzey 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. Mining or earth excavation.
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 Item VI of this Ordinance) and will be in compliance with Performance Standards in Item III 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 also require, at its discretion, the recipient of a conditional use exemption acquire a liability insurance policy to cover any remediation costs resulting from the release of any substance on the property.
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 groundwater aquifers 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 Groundwater Protection Overlay District, the requirements of the underlying districts continue to apply for permitted and conditional uses. Uses that are prohibited are indicated by "P" in Table 1. Uses indicated by CU require a conditional use approval from the Swanzey Planning Board.

Table 1. List of Prohibited Uses and Conditional Uses which require approval by the Planning Board in the Groundwater Protection Overlay District, Swanzey, 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. | | P |
| 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 permitted. | | P |
| F. Bulk Storage of | | P |

| | | |
|---|---|---|
| salt/deicing materials | | |
| 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 sand and gravel removal where excavation does not extend into bedrock or into the water table, and where petroleum products are not stored on-site. | CU |
| 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. Junkyards and salvage yards | | P |
| L. Fuel Sales | | P |
| M. Concrete, asphalt, and tar manufacturing | | P |
| N. Permanent facilities for fueling & maintenance of large earthmoving | | P |

| | | |
|---|---|---|
| equipment | | |
| O. Hazardous waste facility | | P |
| P. Industrial, commercial, institutional and governmental uses | (That are not otherwise prohibited by this Overlay District). | CU |
| Q. Stormwater infiltration pond and leaching basin | | CU |
| R. Cleaning Service (i.e. laundry, auto) | | CU |
| S. Food processing plant | | CU |
| T. Wood preserving & furniture stripping | | CU |
| U. Excavation/grading | | CU |
| V. Electronic circuit assembly | | CU |
| W. Metalworking Shop | | CU |
| X. General Service and Repair shop | | CU |
| Y. Laboratory | | CU |

**ITEM VIII. 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 Zoning Board of Adjustment, after public hearing, may permit the resumption of said non-conforming use. If an existing non-conforming use presents a direct and immediate threat of contaminating the aquifer, the Board of Selectmen shall issue a cease and desist order to stop the offending activity or process.

**ITEM IX. 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 Item III, 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 Item III 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 Item III Performance Standards E through H;
E) Storage and use of office supplies is exempt from Item III Performance Standards E through H;
F) Temporary storage of construction materials on a site where they are to be used is exempt from Item III 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 Item III Performance Standards E through H.

**ITEM X. 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.

**ITEM XI. 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.

**ITEM XII. LIABILITY**
Nothing in this ordinance shall be construed to imply that the Town of Swanzey has accepted any liability if a permitted facility or use contaminates groundwater in any aquifer.

**ITEM XII. EFFECTIVE DATE**
This ordinance shall be effective upon adoption by the Town of Swanzey.

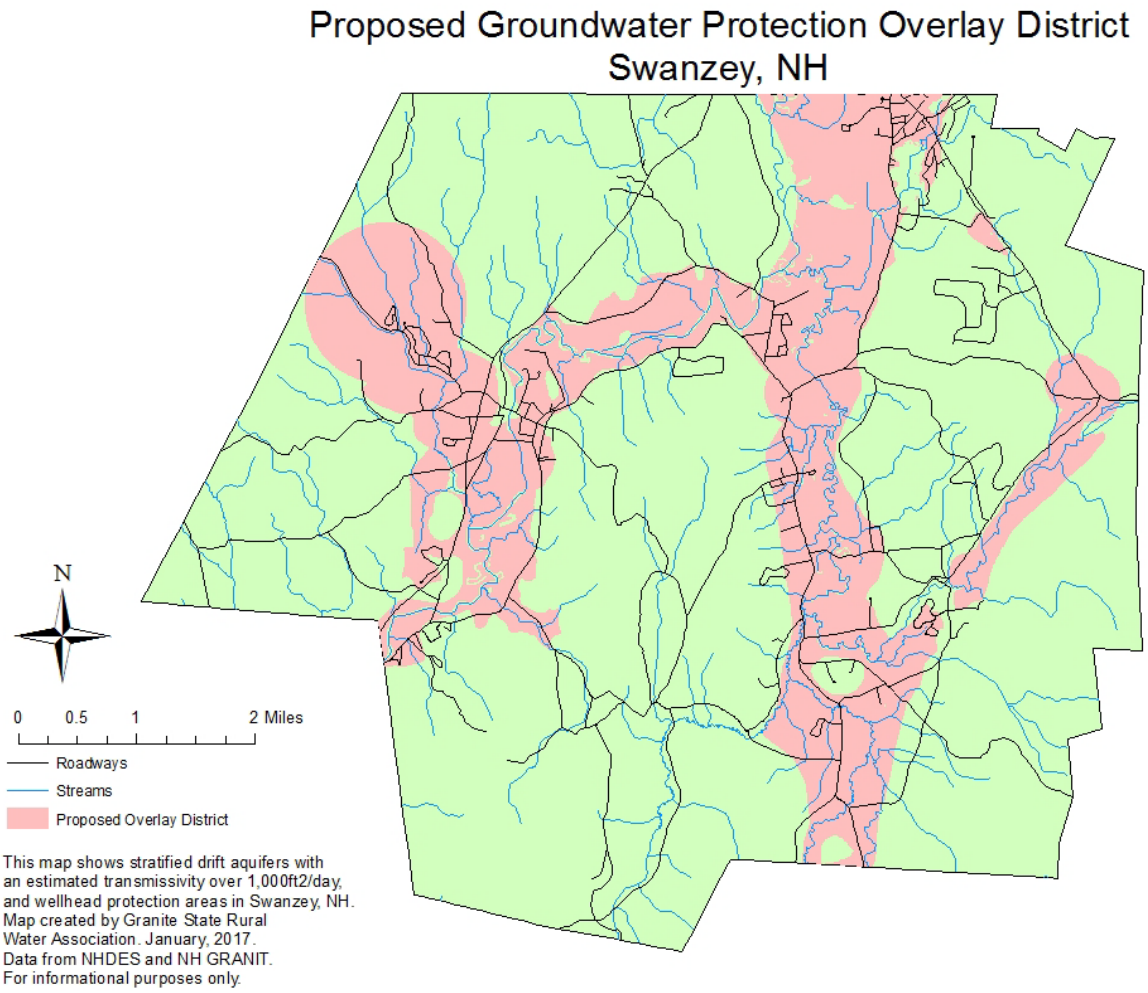



Figure 13. Swanzey Groundwater Protection Overlay District Boundaries. Data from NHDES and NH GRANIT.

# Appendix C. Town of Swanzey Zoning Map

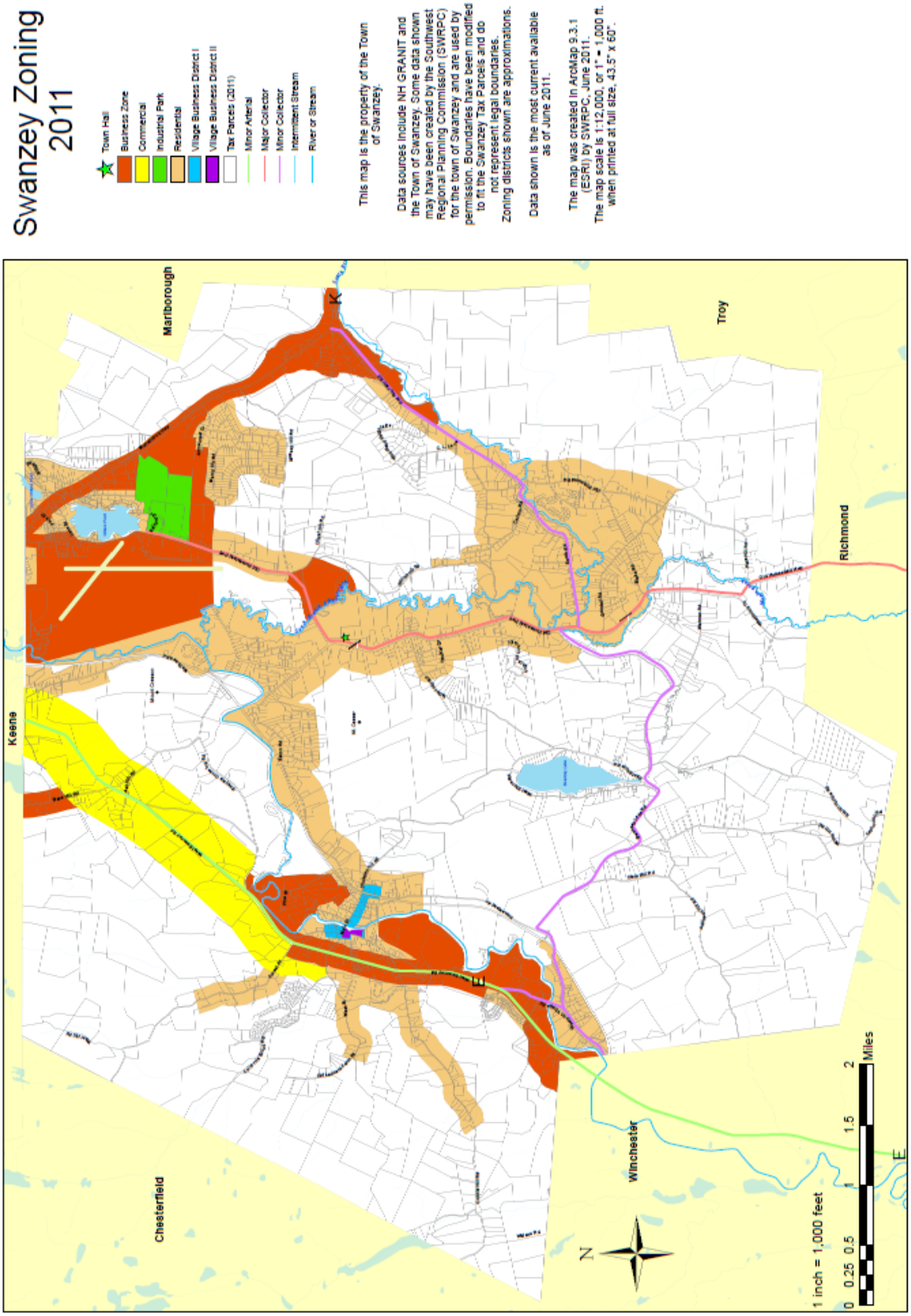



Figure 14. Town of Swanzey Zoning Map.

# Appendix D. Example Outreach Materials

**Sample Letter #1**

DATE

Official Town of Swanzey Letterhead

Dear _____: (Homeowner)

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 wells serving the _____ system (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 _____ system wells. If you are not served by this water system, 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 Town of Swanzey 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 _____ system 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 supplies these wells. If you are not on _____ system 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.

ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

WD-SSB-13 2011

# You and Your Septic System

*A Homeowner's Guide to Septic System Maintenance*

Your septic system is a highly efficient biological system that can effectively digest and disperse your household sewage and other organic wastes. Properly designed, installed and maintained, it should give you many years of trouble-free service, **but only if it is properly maintained.** The key to the life and service of any septic system is proper maintenance.

**How Does Your Septic System Work?**

A septic system is designed to condition untreated liquid household waste (sewage) so that it can be readily dispersed and percolated into the subsoil. Percolation through the soil accomplishes much of the final purification of the effluent, including the destruction of disease-producing bacteria.

Your septic tank is the first step in the process of sewage conditioning. Without it, the untreated sewage would quickly clog the receiving soil and prevent the purification process of leaching and soil percolation. Septic tanks serve three functions:

- Removal of solids.
- Bacterial action.
- Sludge and scum storage.

In the first step, as sewage enters the septic tank, its rate of flow is reduced so that the larger solids sink to the bottom or rise to the surface. These solids are retained in the tank, and the clarified effluent with suspended and dissolved solids is discharged.

Bacterial action is the second function. The solids and the liquids in the tank are partially decomposed by bacteria and other natural processes. These bacteria are called anaerobic because they thrive in the absence of free oxygen. This decomposition of sewage under anaerobic conditions is termed "septic," hence the name of the system (and the cause of the odor).

Storage is the third function of your system. Sludge is the accumulation of solids at the bottom of the tank, while scum is a partially submerged mat of floating solids that may form at or near the surface. Space must be provided in the tank to store the residues during the intervals between cleaning. Otherwise, the sludge and scum will eventually be scoured from the tank and will clog the leach field and receiving soil. PERIODIC CLEANING OF YOUR TANK IS ESSENTIAL TO ITS PROPER FUNCTION.

Finally, the treated effluent from the septic tank is discharged to the leach field where it percolates through suitable gravel and finally into the subsoil for further purification.

**Remember**: A properly maintained septic system will adequately treat your sewage. A septic system failure is unhealthy, illegal if not corrected and a nuisance. Also, replacing an existing system can be costly! The life of the system can be prolonged by proper maintenance and frequent tank pumping.

**What You Can Do to Properly Maintain Your Septic System**

First and foremost, inspect your septic tank every year. If the sludge and surface scum combined are as thick as 1/3 the liquid depth of your tank, have the tank pumped out by a licensed pumper. Your tank should be pumped out **at least every two to three years**.

Do not flush bulky waste or grease into the system. It can plug the sewer and/or distribution lines.

Do not flush toxic materials into the system. Paint thinner, gasoline, pesticides, chlorine, drain cleaners and other caustic or toxic substances can kill the naturally-occurring bacteria in the tank and impair its function. If in doubt, don't flush it.

Conserve water. Too much water can overload your system and adversely affect its function.

Don't allow vehicles or livestock on your leach field. The weight can compact the soil and/or break pipes.

Any soggy areas around the system, or disagreeable odors, could indicate system failure. Have it checked.

**Additional Suggestions**

Minimize or eliminate use of kitchen "disposal" units, which grind up food wastes and place a burden on the septic tank, especially if the original septic design did not accommodate one.

If water treatment system backwash has been directed into the home septic system, check to make sure that the additional volume from the discharge can be accommodated by your septic system. Unfortunately the majority of treatment systems are installed after the home and septic system are built. The additional water to the septic tank and leaching field may cause problems with septic system operation or may overload the existing leaching area and result in premature failure. Additionally, some experts believe that the brine from backwashing may have detrimental effects on bacteria growth and may influence the soil's ability to infiltrate water.

**Maintaining a Record**

On the next page, is a template for creating a permanent maintenance record of your septic system for your files.

**For More Information**

For more information, please contact the DES Subsurface Systems Bureau at (603) 271-3501 or go on-line at http://des.nh.gov/organization/divisions/water/ssb/index.htm for detailed information.

**Septic System Maintenance Record for:** _____

First, in the space below, make a sketch of the location of your septic tank in relation to your house. Measure and record on your sketch the distances from the house foundation to the septic tank or cesspool cover, to the distribution box, leaching system and to other permanent features such as nearby trees or rocks.

Date System Installed: _____ Installer: _____

| Record of Pumping Service/Maintenance | |
|---|---|
| **Date** | **Septic Service Provider** |
| | |
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**For More Information**
For more information, please contact the DES Subsurface Systems Bureau at (603) 271-3501 or go on-line at http://des.nh.gov/organization/divisions/water/ssb/index.htm for detailed information. Subsurface Systems Bureau; 29 Hazen Drive, PO Box 95; Concord, NH 03302-0095.

# Appendix E. Drinking Water Protection Committee Meeting Minutes

**Swanzey Source Water Protection Committee**

**Thursday, July 14th 2016. 4:00PM-5:00PM**
**Swanzey Town Hall**
**Prepared By: Andrew Madison, GSRWA**

**Minutes**

**Present**
Glenn Page- Planning Board
Jane Johnson- Conservation Commission
Beverly Bernard- Conservation Commission
Jim McConnell- Planning Board
Andrew Madison- Granite State Rural Water Association

1. West Swanzey Water
   -System owner indicated that while she understood the goals behind a drinking water protection plan, she felt she didn't have the time to be involved in the planning process. She also mentioned that she felt the best thing the town could do to protect her system would be to acquire the system.
   -Andrew Madison asked committee members if they would be willing to approach West Swanzey Water and ask them to reconsider joining the initiative.
   -The Water Study Committee recommended against the town acquiring the system unless funding could be found to make necessary system upgrades.
   - NHDES met with the Swanzey Water Study Committee to discuss what upgrades would be needed in order for the town to acquire the system. They will be looking into options for financing an engineering study to determine what exactly will be needed with regard to system upgrades. Funding from federal sources or the MtBE remediation fund are being considered, Jim McConnell will be following the issue closely.
   -The idea of applying for funding from USDA Rural Development was discussed. Funding would come in the form of grants or low-interest loans. Andrew Madison said he would find more information for the committee.

2. Additional stakeholders/systems
   - Currently Eastfield Crossing is the only system that has signed onboard with the plan. West Swanzey Water Co. indicated that they weren't interested, and the remaining four systems that develop water in town (Pine Grove, View Point, Ashuelot River Apartments, Forest View Estates) have not yet joined the effort. North Swanzey Water will not likely be included since they receive transferred water from Keene.

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-Andrew Madison will work on reaching out to the remaining systems to invite them into the process, however if any committee members have personal contacts at these systems, those could be useful.
- Statistics were given for the community public drinking water systems in Swanzey:

| PWS ID | System Name | Address | Population | Connections |
|---|---|---|---|---|
| 2301020 | WEST SWANZEY WATER | WINCHESTER ST | 203 | 81 |
| 2302010 | ASHUELOT RIVER APTS | 57 HOMESTEAD AVE | 100 | 40 |
| 2302040 | EASTFIELD CROSSING | BELLVIEW RD | 113 | 45 |
| 2302050 | FOREST VIEW ESTATES | OWENS DR | 180 | 72 |
| 2303010 | PINE GROVE MOBILE HOME PARK | 935 W SWANZEY RD | 305 | 122 |
| 2303020 | VIEW POINT COOP | POND VIEW DR | 248 | 99 |

3. Next Meeting: August 30th, 2016. 4:00PM at the Swanzey Town Hall

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**Swanzey Source Water Protection Committee**

**Tuesday, August 30th 2016. 4:00PM-5:45PM**
**Swanzey Town Hall**
**Prepared By: Andrew Madison, GSRWA**

**Minutes**

**Present**
Glenn Page- Planning Board
Jane Johnson- Conservation Commission
Beverly Bernard- Conservation Commission
Stephen Stepenuck- Conservation Commission
Sylvester Karasinski- Board of Selectmen
Roberta Visser- Local Resident
Stephen Runcy- Local System Operator
Barbara Skuly- Ashuelot River Local Advisory Committee
Andrew Madison- Granite State Rural Water Association

1. West Swanzey Water

-Andrew spoke with David McClain (GeoInsight) and Scott Clang (Granite State Rural Water) regarding West Swanzey Water Co. The system has received funds from the State's MtBE remediation fund to perform an engineering study and evaluation of the distribution system. Dave has encouraged the system to support this effort.

2. Swanzey Water Resources

- Maps were distributed showing the extent of Swanzey's high-yield groundwater aquifers. They were divided into north, east, south and west for clarity. The aquifer boundaries were delineated by NHDES.
-Mr. Karasinski mentioned that some homeowners along Route 12 likely obtain their drinking water from aquifers located under Mt. Huggins.
- The aquifer boundaries, along with delineated source protection areas could serve as the boundaries of any potential groundwater protection overlay district. Mr. Madison mentioned that some communities used aquifer boundaries as the boundaries of their overlay districts while others used pre-delineated wellhead protection areas, and some communities used both. Both private well-owners and public water suppliers would benefit.
- The plan would include Transient and Non-Community Non-Transient water suppliers such as school and campgrounds.
- Ms. Visser asked if the plan and ordinance would address water quantity. Mr. Madison stated that the primary focus of a groundwater protection ordinance was to protect groundwater quality. Protecting quantity from large withdrawals is largely the responsibility of NHDES. The ordinance would not have any jurisdiction beyond

Swanzey's Town Line, however drought guidance could be included in the source protection plan.

3. Next Steps

-Andrew will provide members of the committee with example ordinances from similar communities around the state.
-Mr. Madison will also begin the land-use analysis

3. Next Meeting: September 27th, 2016. 4:00PM at the Swanzey Town Hall

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**Swanzey Source Water Protection Committee**

**Tuesday, September 27th 2016. 4:00PM-5:30PM**
**Swanzey Town Hall**
**Prepared By: Andrew Madison, GSRWA**

**Minutes**

**Present**
Glenn Page- Planning Board
Jane Johnson- Conservation Commission
Beverly Bernard- Conservation Commission
Stephen Stepenuck- Conservation Commission
Sylvester Karasinski- Board of Selectmen
Roberta Visser- Local Resident
Jim McConnell- Planning Board
Barbara Skuly- Ashuelot River Local Advisory Committee
Tim Joyal- Eastfield Crossing
Ed Kaufmann- Eastfield Crossing
Andrew Madison- Granite State Rural Water Association

1. Updates from last meeting
    -Mr. Madison has not had much time in the last month to work on the Swanzey plan due to other commitments. However with those commitments now being satisfied, Swanzey will become his priority project.
    -Mr. Madison explained the purpose behind the source protection plan, what it entailed, and the goal of an aquifer protection ordinance.

2. Land Uses and Zoning
    -Much of the delineated aquifer in East Swanzey is rural/residential and zoned for residential land uses with the exception of a few areas.
    -Much of the aquifer in West Swanzey is covered zoned for commercial and business.
    -Individual source protection areas are largely residential, rural, or forested.
    -Mr. Madison gave a quick description of the soils and geology of the Swanzey area, explained how the stratified-drift aquifers were formed, and explained where the recharge for these aquifers comes from. The impacts of the drought were also discussed.

3. Example Ordinances
    -Example ordinances were provided to committee members, these ordinances came from Walpole, Winchester, and Moultonborough, all in New Hampshire.
    -Walpole's source protection ordinance covers only delineated source protection areas around the town's two wells. It was asked why this did not cover a larger area. Mr.

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Madison indicated that the town had a good relationship with property owners near the wells and did not feel it needed to expand the radii of the source protection areas. The town also had concerns about balancing wellhead protection with economic needs along NH Route 12.
-Winchester's aquifer protection ordinance covers the delineated stratified-drift through the center of town along NH Route 10.
-Moultonborough's Drinking Water Protection ordinance covers both delineated stratified-drift aquifers, and wellhead protection areas. Moultonborough is similar to Swanzey in that it does not have a municipally owned public water source, but instead has a number of small, privately-owned systems.
-Ms. Visser asked whether an ordinance could be used to regulate land uses beyond Swanzey's Town Limits, with regard to commercial activity and construction along Rte. 10 in Keene. Mr. Madison explained that a town zoning ordinance in Swanzey would not have any jurisdiction outside of the Town of Swanzey.
-Mr. Madison mentioned that many communities in NH adopted aquifer or source water protection ordinances since inspection and enforcement staff are limited within NHDES, so many communities have taken it upon themselves to protect their water supplies.
- Mr. Stepenuck mentioned that the concern regarding a water bottling plan drawing down the aquifer and potentially drying up wells was serious and should be addressed by any ordinance.
-Road salts were discussed as a water quality issue. Mr. Madison indicated that some communities along I-93 have had issues with regard to chlorides in groundwater as a result of road salts. It was mentioned that the committee could work with the DPW, state DOT, and private committees to implement reduced-salt areas to protect sensitive water supplies.
-It was noted that the airport is located above an aquifer and is subject to frequent salting and de-icing. Mr. Karasinski informed the committee that this was due to FAA regulations that the runway be kept open and free of snow/ice in all but the most severe weather. Mr. Madison added that the FAA regulations, being a federal mandate, would likely preempt any local zoning ordinance, however a conversation could be started with the airport to look at salt alternatives and that NHDES may have more information available on the subject.
-A few committee members mentioned that a list of definitions related to drinking water quality and drinking water rules and regulations may be useful.

4. Next Steps

-Some committee members will meet separately in October to review ordinances from other communities to find a format suitable for Swanzey, and will present their recommendations to the full committee in November
-Mr. Madison will be conducting the land use analysis within the source protection areas and will be working on the plan as a priority project.

5. Next Meeting: November 1st, 2016. 4:00PM at the Swanzey Town Hall

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**Swanzey Source Water Protection Committee**

**Tuesday, October 25th 2016. 12:00PM-2:30PM**
**Mt. Caesar Library**
**Prepared By: Andrew Madison, GSRWA**

**Minutes**

**Present**
Beverly Bernard- Conservation Commission
Stephen Stepenuck- Conservation Commission
Sylvester Karasinski- Board of Selectmen
Jim McConnell- Planning Board
Barbara Skuly- Ashuelot River Local Advisory Committee
Andrew Madison- Granite State Rural Water Association

1. Zone Boundaries
    -Some ordinance boundaries extend only to wellhead protection areas, while others include delineated aquifers, and some include both.
    -Aquifers were delineated by NHDES and were classified as GA2, meaning they are potentially high-yielding aquifers with no active management (see WD-DWGB-22-2).\
    -Some questions were raised about the aquifer boundaries, including why some areas such as the fairgrounds were included but Marcy Hill was not. Mr. Madison said he would discuss the boundaries with NHDES to get some clarification.
    -The group decided any potential ordinance should include both wellhead protection areas and the delineated GA2 aquifers. The group also decided that any ordinance should also protect potential future municipal sources such as Marcy Hill.

2. Grandfathered Uses
    -Existing land uses are typically allowed to continue after the adoption of an ordinance even though they may be non-conforming.
    -The group felt that existing land uses should be grandfathered even if the property ownership changes so long as the use is continuous.
    -Properties and uses should lose their grandfathered status if the use or non-conforming activity is discontinued for at least one year.
    -A clause should be included stating that: If a grandfathered non-conforming use presents a direct hazard to the aquifer, the Board of Selectmen shall issue an immediate cease and desist order to stop the offending activity or process.

3. Prohibited and Conditional Uses
    -Proposed prohibited and conditional uses are in attached table.
    -The list of prohibited and conditional uses should follow the tabular format from the Walpole example.

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4. Other Clauses within the Ordinance

-Best management practices should be required for any AST/UST facility anywhere in town.

-Stormwater management plans should be required for any property with impervious surfaces covering more than 15% of the property or 2,500 sq ft, whichever is less.

-Liability insurance (in case of a spill or release) should be required for any conditional use.

-Minimum lot sizes should not be required.

-Any ordinance should include a saving clause similar to the clause found in the Moultonborough example (attached).

-An appeals process for discontinued uses should be established that includes input from the Conservation Commission, Planning Board, and Zoning Board of Appeals.

-Pesticide use with regard to agriculture could be address, however there is limited agricultural activity within the town and near the aquifer zones.

5. Time Frame for Ordinance

-Ordinance is currently planned for the 2018 Town Meeting and will not be on the 2017 docket.

-Mr. Madison will work with the committee to have a proposed ordinance created by March 31, 2017. The committee will be responsible for moving forward with the ordinance after that date.

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**Swanzey Source Water Protection Committee**

**Tuesday, November 15th 2016. 4:00PM-5:00PM**
**Swanzey Town Hall**
**Prepared By: Andrew Madison, GSRWA**

**Minutes**

**Present**
Beverly Bernard- Conservation Commission
Stephen Stepenuck- Conservation Commission
Sylvester Karasinski- Board of Selectmen
Jim McConnell- Planning Board
Sally Brown- West Swanzey Water
Roberta Visser- Resident
Glenn Page- Planning Board
Jane Johnson- Conservation Commission
Andrew Madison- Granite State Rural Water Association

1. Minutes and New Participants
    -Minutes were reviewed from the last meeting and the October 25th Ordinance Review Meeting
    -Sally Brown, owner of the West Swanzey Water System, was updated on the purpose behind this project and the objectives of the committee.

2. October, 25th Workshop
    -The committee was provided with the minutes of the October 25th ordinance workshop and they were reviewed.
    -The boundaries of the district were discussed. The committee that met on Oct. 25th decided that they should extend to the delineated aquifer boundaries as well as source protection areas. Mr. Madison stressed that even though groundwater movement is fluid and aquifer boundaries are typically based on estimations, the district boundaries will need to be legally defensible and clearly defined for the ordinance to be effective.
    -Mr. Madison met with NH DES to discuss the work of the committee and to seek clarification on stratified drift aquifer boundaries. NHDES sent him a map detailing highly transmissive and moderately transmissive areas within Swanzey immediately before the meeting, Mr. Madison will forward this map to committee members.
    -Mr. Madison gave a brief explanation of transmissivity and of how groundwater moves through stratified drift aquifers in the region.
    -The committee reviewed land use regulations discussed during the October Meeting and derived from other, similar ordinances.
    -The disposal of sludge or the spreading of manure on agricultural lands located within the district was discussed. Some committee members mentioned concerns regarding

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bacteria that could be introduced into the aquifer from manure. Mr. Madison said he would look into what best management practices are recommended by NHDES and CCCD for agricultural lands located near water sources. Mr. Madison also said he would reach out to NHDES to look into regulations regarding the bulk storage of salt and deicing materials.

-Conditional uses were discussed and conditions were decided on for those uses. These include: Planning Board Approval, Spill Prevention, Containment, and Countermeasure requirements, and liability insurance specifically for the event of a spill. Conditions for the operation of a wastewater treatment plant will include the installation of test wells and their regular monitoring. Mr. Madison will add these items into the draft ordinance.

3. Next Steps

-The ordinance is currently planned to be on the 2018 town warrant, Mr. Madison will work with the committee to have a complete draft of the ordinance along with the source protection plan complete by March 31, 2017. After that date it will be up to the committee to build support for the ordinance and see that it makes it onto the docket.

-Mr. Madison has not had much time lately to complete a full land-use analysis, however he will be working on completing it for the next meeting.

4. Next Meeting

-TBD, Mr. Madison will send out a Doodle poll along with the aquifer map from NHDES.

-Mr. Madison will keep Sally Brown appraised of the next committee meeting.

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**Swanzey Source Water Protection Committee**

**Tuesday, December 20th 2016. 4:00PM-5:00PM**
**Swanzey Town Hall**
**Prepared By: Andrew Madison, GSRWA**

**Minutes**

**Present**
Beverly Bernard- Conservation Commission
Sylvester Karasinski- Board of Selectmen
Jim McConnell- Planning Board
Roberta Visser- Resident
Glenn Page- Planning Board
Jane Johnson- Conservation Commission
Andrew Madison- Granite State Rural Water Association

1. Minutes and New Participants
   -Minutes were reviewed from the last meeting.

2. Land use survey
   -No existing study of land uses in Swanzey could be found, Mr. Madison estimated town-wide land use from the 2015 National Cropland Data Set from the US Department of Agriculture. Mr. Madison stated that although the focus of the data set is agricultural types, it does differentiate between human development types, and forest types.
   -Mr. Madison also estimated soil types in Swanzey using the Natural Resource Conservation Service's Web Soil Survey. Mr. Madison briefly explained the geology and soil types in Swanzey.
   -Mr. Madison stated that Swanzey has a high proportion of privately owned forest land (74%) including the Yale Forest. Forest land helps protect groundwater quality, Mr. Madison stated that the loss of forest land to development is a major cause of groundwater recharge loss, and of contamination. He stated that policies that encourage private forest owners to keep land as forest will do much to protect groundwater resources.
   -Some committee members expressed concern that the Yale Forest might be sold to developers, however other committee members stated that there was nothing to indicate that would happen in the foreseeable future.
   -It was mentioned that only one percent of land in Swanzey is currently protected under conservation easements. Mr. Madison indicated that he felt the proportion is higher.
   -Mr. Madison stated that increased development pressure on Swanzey could result in the loss of forest land. Mr. McConnell stated that growth has been approximately 1% a year in Swanzey, so it may be many years before major development pressure is seen.

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-Ms. Visser expressed concern about major groundwater withdrawals in Keene and asked whether an ordinance could address that. Mr. Madison stated that Keene depends on a surface water reservoir for its municipal supply and only uses wells as a backup and that those wells were located in North Keene, and near the Monadnock Marketplace and should not present a concern to Swanzey. Mr. Karasinski stated that any potential major water user would have to prove that their operation would not impact downgradient users as a part of the state permitting process. He added that a municipal ordinance in Swanzey could not govern land uses in another town.
-Mr. Karasinski asked Mr. Madison if he could investigate potential sites where a Swanzey Town Well could hypothetically be developed. Mr. Madison said he would look into it.

3. Next Steps

-Mr. Madison stated that would begin looking at specific land uses and activities that have the potential to impact drinking water resources. He will also work on completing a first draft of the aquifer protection ordinance.

4. Next Meeting

-TBD, Mr. Madison will send out a Doodle poll for the next meeting. The next meeting will be during the daytime and will likely take more than two hours.

Land Cover in Swanzey, Data from USDA Agricultural Statistics Service

| **Land Cover Type** | **Acres** | **Percent of Coverage** |
|---|---|---|
| Agriculture/Cultivated Crops | 297 | 1.0% |
| Hay/Pasture | 972 | 3.4% |
| Water | 335 | 1.2% |
| Developed Open Space | 1102 | 3.8% |
| Developed Low Intensity | 890 | 3.1% |
| Developed Med. Intensity | 310 | 1.1% |
| Developed High intensity | 67 | 0.2% |
| Vacant | 142 | 0.5% |
| Deciduous Forest | 7420 | 25.6% |
| Coniferous Forest | 14013 | 48.3% |
| Mixed Forest | 2083 | 7.2% |
| Shrub land | 92 | 0.3% |
| Wetlands | 1263 | 4.4% |
| **Total** | **28985** | **100.0%** |

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**Swanzey Source Water Protection Committee**

**Monday, January 30th 2016. 2:00PM-4:45PM**
**Whitcomb Hall**
**Prepared By: Andrew Madison, GSRWA**

**Minutes**

**Present**
Barbara Skuly- Ashuelot River Local Advisory Committee
Sylvester Karasinski- Board of Selectmen
Stephen Stepenuck- Conservation Commission
Roberta Visser- Resident
Glenn Page- Planning Board
Jane Johnson- Conservation Commission
Andrew Madison- Granite State Rural Water Association

1. Minutes and New Participants
   -Minutes were reviewed from the last meeting.

2. Land use survey
   - Mr. Madison has completed the potential sources of contamination inventory for West Swanzey and Eastfield Crossing and is currently working on an inventory for Pine Grove Co-Op.
   -West Swanzey Water: The group reviewed the source protection area and the sanitary protective radius for West Swanzey's Wells. Mr. Madison noted that during his review of land uses along Route 10, the most concerning was the number of junkyards and auto repair shops within the WHPA. Permits, including autos salvage yard, and hazardous waste generator permits, could not be found for many of these facilities. Mr. Madison stated that he felt these salvage yards represented the biggest concern for the water system. The underground storage tanks at the gas station were installed in the last year and are fully equipped with leak detection and spill containment measures, and are likely down gradient of the system wells.
   -Eastfield Crossing: The group reviewed the source protection area for the Eastfield Crossing system including aquifers supplying the system. Mr. Madison noted that the system is located in a rural area with minimal residential development, no industrial or commercial development, and pasture-based agriculture. A small business near Eastfield Crossing advertised auto care services, but likely does not perform those services on a large-scale basis. Mr. Madison stated that he felt that residential septic systems presented the greatest concern to the Eastfield Crossing system, however he felt given the low housing density in the area, they still presented a minimal risk. Mr. Madison also noted that well maintained, properly sized septic systems often do not present a risk to near-by drinking water wells.

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-Pine Grove Co-Op: Mr. Madison spoke with Jimmy Tempsta from the community to discuss their interest in participating. Mr. Madison is currently working on the Pine Grove Co-Op chapter of the plan.

3. Proposed Ordinance

-The group was sent the first draft of the ordinance the previous week and asked to review the document and bring their comments.
-A discussion on overlay district boundaries was had and Mr. Madison showed several maps displaying what the boundaries would look like with wellhead protection areas and aquifers of differing estimated transmissivity. Ms. Skuly noted that there was a significant difference in the area covered between the transmissivity zones. It was agreed that the boundaries of the district should include all wellhead protection areas and aquifers with an estimated transmissivity greater than 1,000 $ft^2$/day.
-There was a discussion on how the ordinance would affect the Keene Airport. Mr. Karasinski indicated that the rules would apply to private operations at the airport, but not to property owned by the airport itself.
-Concrete and asphalt manufacturing was discussed. Mr. Karasinski asked what the major water quality concerns were regarding concrete and asphalt manufacturing, which Mr. Madison indicated were the use of petroleum products and the manufacture of cement, which can cause issues with hard water and a rise in pH. Mr. Karasinski asked if a concrete or asphalt plant would remain a hazard if natural gas was used in lieu of oil, and if cement was not manufactured on-site. Mr. Madison indicated that that would address the most pressing concerns, but concerns regarding large groundwater withdrawal and excavation to the water table would remain an issue. Mr. Karasinski indicated that concrete and asphalt manufacturing could be a conditional use provided that petroleum was not kept on-site, there was no excavation to the water table, and cement was not produced on site. Other committee members indicated that this would be acceptable.
-The committee discussed the number of auto repair shops and salvage yards in West Swanzey and whether they could be considered a conditional use to accommodate businesses in West Swanzey. It was discussed that conditions should include best management practices for the storage of hazardous materials and restrictions on the storage of junked or derelict vehicles.
-Mr. Stepenuck expressed his concern regarding large groundwater withdrawals and the risk of a water bottling plant moving into Swanzey and cited the case in Nottingham as an example. This concern was echoed by Ms. Skuly and Ms. Visser, who added that a bottling plant could also move into Keene. Mr. Madison indicated that large groundwater withdrawals are regulated by the state through NH DES since groundwater is considered a “shared resource”. The committee expressed an interest in adding a clause into the ordinance that would prohibit large groundwater withdrawals and specifically drinking water bottling plants.
-Mr. Madison clarified that Item IX-A exempted private residences from all performance standards, so homeowners would not be impacted by Item III-K.

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4. Future of Committee

-Mr. Madison mentioned that his full-time involvement with the committee would end on March 31st, although he would try to make himself available occasionally. Mr. Madison added that it is the committee's responsibility to move forward with the proposed ordinance and to take ownership of the ordinance and the report. He urged the committee to begin thinking about its long-term future and to begin planning to meet regularly to discuss how it can continue to protect drinking water in Swanzey.
-Ms. Skuly mentioned that she would like to see more frequent meetings leading up to March 31st, Mr. Madison indicated that he would be willing to accommodate that and would follow up with the committee with some new meeting dates.

5. Next Meeting: TBD

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**Swanzey Source Water Protection Committee**

**Thursday, February 23rd 2017. 2:00PM-4:45PM**
**Whitcomb Hall**
**Prepared By: Andrew Madison, GSRWA**

**Minutes**

**Present**
Sylvester Karasinski- Board of Selectmen
Beverly Bernard- Conservation Commission
Glenn Page- Planning Board
Jane Johnson- Conservation Commission
Andrew Madison- Granite State Rural Water Association

1. Minutes and New Participants
    -Minutes were reviewed from the last meeting.

2. Draft Source Protection Report
    -Mr. Madison completed the draft source protection report and submitted it to the committee for review on 2/14/17. He has not received any comments back yet.
    -Mr. Karasinski indicated he had some minor street name corrections for the report.
    -The committee discussed the Route 10 Mini-Mart MtBE issue as it is discussed in the report. Mr. Madison indicated that he considers the site to remain a risk to near-by wells, especially since it has had eight violations since the new tanks were installed in 1998. Ms. Bernard asked what the nature of the violations were, Mr. Madison said he would look into it but from what he recalled they involved vapor testing and piping tightness. Mr. Madison added that he would include a table of the violations in the report. There was a discussion on the oversight of underground storage tanks in New Hampshire. Mr. Madison stated that NH DES oversees the enforcement of UST rules and inspections, but has a limited staff to accomplish this. Town Code Enforcement Officers could assist by enforcing local ordinances regarding underground petroleum storage. Mr. Madison stated that Gomarlos had installed tanks in 2016 that were double walled and equipped with leak detection.
    -The NHDES Source assessment reports prepared by NHDES were included in the Source Water Protection Plan. Mr. Madison stated that NHDES performed its assessments during the late 1990's and early 2000's and that these assessments may differ from his.

3. Proposed Ordinance
    -The committee reviewed edits made to the proposed ordinance. Mr. Madison indicated that he would make corrections to the asphalt/concrete section of the ordinance.
    -Mr. Karasinski asked how the ordinance would impact businesses in North Swanzey between Routes 32 and 12. Mr. Madison indicated that area is congested and does

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possess a large number of businesses that could be impacted by the ordinance. Mr. Karasinski asked if Mr. Madison could look into the prospect of changing overlay district boundaries to include only the portions of the business and industrial zones with estimated transmissivities greater than 2,000$ft^2$/day. Mr. Madison said he would look into it to see if any other communities have adopted similar ordinances and would obtain the shapefiles needed to amend the maps.
-Mr. Madison stressed that it would be the committee's responsibility to move forward with the ordinance after March 31st. He also advised the committee to consult with the Town Attorney regarding the ordinance.

4. Next Meeting: TBD

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