

7. WATER RESOURCE MANAGEMENT & PROTECTION PLAN

INTRODUCTION

This component of the Town of Newton Master Plan addresses the guidance requirements established by the New Hampshire Office of State Planning under the authority of RSA 4-C:20,I, for the preparation of local water resource management and protection plans.

The goals of this document are to:

- Identify and evaluate the adequacy of existing and potential water supply sources to meet the current and future needs of the community;
- Identify existing and potential threats to surface and groundwater resources;
- Evaluate existing local programs, policies and regulations as they relate to water resources; and
- Identify regulatory and non-regulatory programs that would benefit the Town in its water resource management and protection efforts.

The protection and wise use of water resources are of critical concern to the Town of Newton. Every resident in the Town is dependent on groundwater from private wells. This requires that the Town act to protect the quantity and quality of this resource from excessive depletion and contamination.

In general, there is a direct relationship between land use and water quality. Uses in areas with poor suitability can degrade and contaminate both surface and groundwater resources, increase flood hazards, destroy water-based wildlife and interfere with scenic and recreational values. It is the responsibility of the Town to take reasonable precautions to protect all water resources from incompatible uses and, in so doing, protect the health and general welfare of the community.

Regarding the source information (both data and maps) used to describe and map the surface water resources of Newton, the municipality considers such information to be, at a minimum, as detailed and as accurate as the maps or information available. The municipality considers the source information to be the best available information existing at this time.

Sources of information that have been utilized in the completion of this plan are cited throughout the plan. These citations are enumerated within sections of text, accompanying tables, and indicated upon individual maps.

These sources are described below.

- USGS topographic quad maps
- USGS Aquifer Delineation Study (1990)
- Southeastern NH Water Resources Study (U.S. Army Corps of Engineers, 1982)

Various reports and information from the Water Resources Department of the New Hampshire Department of Environmental Services

Newton Prime Wetlands Report, 1993.

The content, origin and potential usefulness of these sources is summarized as follows:

1. USGS topographic quad maps

These standard USGS quad maps of the region include updates dated from 1972-1989. These maps are the basis for the USGS Aquifer Delineation Study and for the information provided to GRANIT. They form the basic information for the location of waterbodies and topography in Newton.

2. USGS Aquifer Delineation Study (ADS)

In 1985, the NH Legislature approved a \$2 million bond issue to pay for the detailed mapping of significant aquifers statewide. Under the study, managed by the NH Water Resources Board (WRB) the USGS has preformed the study in phases over a five (or more) year period.

The phased study areas are defined by major watershed areas. The program is designed to complete mapping in the fast growing southern portions of the state first. The RPC region is divided by two of the project's study areas: the Lamprey & Exeter River Watersheds and the Coastal/Lower Merrimack Watersheds. Newton lies in the Coastal/Lower Merrimack Watershed. These studies are now the primary source of stratified drift aquifer information available for the region.

The Aquifer Delineation Study (ADS) is an expansion of the USGS Groundwater Availability mapping and is modeled after a pilot delineation study performed in the Nashua region from 1983-1985. The study uses the hydrogeologic information supplied in the Groundwater Availability mapping as a starting point. To that, other existing hydrogeologic information is used (principally the surficial geology maps described below). Additional field mapping, well borings, material sampling and seismic profiling are done to complete the picture. Due to the unpredictable nature of till and bedrock aquifers, and the cost of exploring them geographically, they were not included in the study.

The type of groundwater mapping being used reveals extremely valuable information about stratified drift aquifers. This study provides the following detailed aquifer information:

- a. the location and extent of the stratified drift material, (both surface area and depth);
- b. water table elevation;
- c. saturated thickness of stratified drift deposits;
- d. individual aquifer characteristics including type of material, transmissivity and direction of groundwater flow; and
- e. groundwater quality sampling results.

The maps that accompany the study are prepared at the scale of 1:24,000 to match the 7.5' USGS topographic base maps, with contour elevations at 10 feet. This scale is close to that used in most local master plans and zoning maps, so the aquifer boundaries can be easily used for local planning and zoning purposes.

3. Southeastern NH Water Resources Study: Groundwater Assessment

In 1980 the U.S. Army Corps of Engineers published a two-volume report with the above title which identified aquifers that COE believed to have yield potential high enough for use as a municipal water supply.

The aquifer delineation made by COE was based largely on existing data, including USGS Groundwater Availability maps, well drilling data, seismic and topographic mapping and review on engineering reports. The report includes aquifers that were unconsolidated deposits (i.e. stratified drift) containing at least 20 feet of saturated material which would yield significant quantities of water to wells for public usage (generally in the range of 150 gallons per minute or more).

The aquifer locations identified are generally consistent, though smaller in size and fewer in number than those shown on the USGS Groundwater Favorability Maps. Much of the difference in size can be attributed to the minimum thickness and yield criteria used in the study.

The study cited the following twelve communities within the region which had the potential to develop and/or use groundwater for municipal supply purposes: Brentwood, East Kingston, Epping, Fremont, Hampton Falls, Kensington, Kingston, Newton, Plaistow, Sandown, Stratham and Windham.

4. Water Resources Department

The Water Resources Department of the New Hampshire Department of Environmental has provided many reports for the completion of this report; they are cited to where they have been included.

Data Inconsistencies

Rockingham Planning Commission also has access to information digitally stored by the Office of State Planning and Complex Systems. This digital information is a direct transfer of the digital information used by USGS in the preparation of their maps. However, this data is not completely consistent with the actual maps. Discrepancies also exist when the various sources are compared to each other.

This report addresses these inconsistencies by noting the nature of the differences and completing the analysis noting the nature and extent of the assumption.

DESCRIPTION OF SURFACE WATER RESOURCES

Surface water systems are any type of water resource located above ground on the earth's surface. Examples of surface water systems include: streams, rivers, marshes, ponds, bogs, lakes, wetlands, etc. Surface water systems are more dynamic than groundwater, in that they are influenced by the effects of wind, rain, and temperature. They are also subject to varying rates of flow, such as the difference between the flow rate of a river as opposed to that of a pond.

Since surface water systems flow over the land's surface, they are more susceptible to pollution caused either by hazardous materials located in close proximity to the system, or by pollutants discharged directly into the water. There are two types of pollution source categories: non-point sources and point sources. A non-point pollution source travels over or under the land to the water resource, whereas a point pollution source discharges directly into the water resource, for example, a malfunctioning sewage treatment plant.

Surface waters function as holding areas for flood waters and seasonal high waters. In addition, they serve as recharge areas and discharge points for groundwater resources. The point of discharge is where the surface water and groundwater are hydrologically connected. Most commonly, surface waters will act as discharge points for groundwater. However, during the spring months surface waters help to recharge groundwater resources, which in turn replenish shallow domestic water wells. It should be noted that prolonged dry periods can result in an overall lowering of the water table.

Regional Watersheds

The watershed is the principal focus in describing a surface water system. It is the land area within a series of connecting higher ridges that drain surface water to the lowest point, which is where a stream or river flows out of the watershed. The network formed by rivers, streams, lakes, and ponds is known as the drainage system of the watershed.

Newton forms a portion of three regional watersheds: the Powwow River Watershed, the Little River Watershed and East Meadow River Watershed. The accompanying Map 3 (Regional Watersheds Map) depicts Newton's location within the regional watersheds. The watershed boundaries were delineated by the Rockingham Planning Commission using 7.5 minute topographic maps from the U.S. Geological Survey.

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The following paragraphs provide a general description of each regional watershed.

Data inconsistencies are also included to alert the reader of inconsistent data reported in the various sources used to compile this report. The data chosen to be represented in this plan is the best available to the Town during the preparation period.

- a. **Powwow River watershed:** This watershed consists of approximately 31,360 acres in portions of Hampstead, Sandown, Danville, Plaistow, Kingston, Newton, East Kingston, Kensington, South Hampton, Seabrook, and several northern Massachusetts communities. Newton's portion consists of roughly 4225 acres. Surface water from Newton's portion of this watershed drains in a westerly direction into Gus Lock's Brook and then into Country Pond, and easterly into the Back River and Kimball Brook, both ultimately joining with the Powwow River and Tuxbury Pond and Lake Attitash in Merrimac Massachusetts. Significant waterbodies: Country Pond, Ice House Pond, Back Pond, Marden's Pond, and a large number of unnamed ponds. Significant watercourses: Back River, Gus Lock's Brook, Kimball Brook, Bartlett's Mill Brook, and Unnamed Stream #2.

Data inconsistencies. 1) The USGS quad map of Kingston 1989 shows an intermittent stream that flows north through the northeastern section of Newton, this intermittent stream is not present in the digital information from GRANIT. However, this intermittent stream drains a significant area. 2) The digital information from Granit also failed to indicate the complete distance of Unnamed Stream #2, this area, south of Amesbury Road has been added as indicated upon the USGS quad map of Haverhill and the ADS maps. 3) The digital information included a stream located east of Bear Hill Road, this stream was not present upon any other map as perennial or intermittent, the stream remains on Map 4, however no data concerning it is available.

- b. **Little River watershed:** This watershed consists of approximately 13,580 acres in portions of Hampstead, Atkinson, Kingston, Newton, Plaistow, and several northern Massachusetts communities. Newton's portion consists of roughly 1481 acres. Surface water from this area drains in a westerly direction into the Little River and Unnamed Stream #1 which eventually empties into the Merrimack River. Significant waterbodies: None. Significant watercourses: Little River and Unnamed Stream #1.

Data Inconsistencies. A small stream located south of Bartlett's Mill Brook and Thornell Road is indicated on Map 4. This stream does not lead to any other body of water and was included in the digital information from GRANIT. There is no other indication of the existence of this watercourse on any other source material used for this report. There is no information on this stream provided in the plan.

- c. **East Meadow River watershed:** This watershed covers areas in portions of Newton, Plaistow, and Massachusetts. Newton's portion consists of roughly 630 acres. Surface water from this area drains in a south-easterly direction into the East Meadow River which eventually empties into the Merrimack River. Significant waterbodies: none. Significant watercourses: East Meadow River (also named Neal Pond Brook).

Data Inconsistency. A small stream located east of Fernwood Drive is indicated on Map 4. This stream does not lead to any other body of water and was included in the digital information from GRANIT. There is no other indication of the existence of this watercourse on any other source material used for this report. There is no information on this stream provided in the plan.

Watersheds Within Newton

The Newton portions of the East Meadow River and the Little River watersheds are so small that they have no sub-watersheds. Map 4 (Watersheds and Surface Waters Map) depicts the watershed divides within Newton, as well as the location of all waterbodies and streams within the Town.

The Powwow watershed portion which lies in Newton has been divided into two significant sub-watersheds for purposes of this plan, the Country Pond/Powwow River sub-watershed and the Kimball Brook sub-watershed. The characteristics of the sub-watersheds are described below. Information is provided regarding the watershed's geographic area, general direction of surface flow, number of waterbodies, number of watercourses, and other communities within the watershed.

- a. Country Pond/Powwow River Sub-watershed: This sub-watershed includes the northeastern portion of Newton and southern portion of Kingston. Within this sub-watershed there are 2 watercourses and 1 significant waterbody as well as two smaller waterbodies. The watercourses are Bartlett's Mill Brook, and Gus Lock's Brook. The significant waterbody is Country Pond, the smaller two are Back and Ice House ponds. Detailed information on the watercourses is provided in Table 16. Information on the ponds are in Table 17. The characteristic of surface water flow results in a westerly flow toward Country Pond from the topographical divide bisecting the Powwow River watershed within Newton.
- b. Kimball Brook/Back River sub-watershed: This sub-watershed includes the eastern portion of Newton, South Hampton and Northern Massachusetts. Within Newton the only significant watercourses is Kimball Brook and the Back River, both of these are described in Table 16. The characteristic of surface water flow results in a easterly flow toward the Powwow River in South Hampton from the topographical divide bisecting the Powwow River watershed within Newton.

In terms of perennial streams, Newton contains 5 named streams and 2 unnamed streams for a total of 7 watercourses. The general locations of the Town's watercourses can be seen on Map 4. The unnamed streams are shown on the map as Unnamed Streams #1 and #2. The vital statistics of the Town's perennial streams are presented in Table 16.

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Table 16: Newton Watercourses Geographic Information

Watercourse	Length (miles)	High/Low Elevation (feet)	Watershed Location	Impounded or Free Flowing
Gus Lock's Brook	1.5	150/116	Powwow/Country Pond	Free
Kimball Brook	2.1	186/111	Powwow/Kimball Brook	Free
Neal Pond Brook/ East Meadow River	0.6	108/88	East Meadow River	Free
Little River	1.5	115/95	Little River	Free
Back River	0.8	155/125	Powwow River	Free
Unnamed #1	0.8	108/100	Little River	Free
Unnamed #2	0.4	141/110	Powwow/Kimball Brook	Free

Note: All information in Table 16 is based on the watercourses within Newton. Sources: USGS topographic maps, Water Resources Division dam records, and RPC analysis.

There is one "significant" waterbody within Newton: Country Pond. The term "significant" refers to those ponds which are named and appear on the topographic maps of the US Geologic Survey (USGS). According to the USGS maps, Country Pond is 254.8 acres in size with 87.5 acres located in Newton. It is a natural pond, with one functioning dam on the northern perimeter of the pond- where Folly Brook enters the pond. Additionally, there is an outlet dam that regulates the height of the Pond in extreme cases of lowered water.

There are two other named ponds associated with Country Pond, these are Back Pond and Ice House Pond, they have been included in Table 17. There are several smaller ponds scattered throughout the Town, none of which are over seven acres in size. Several of the more noteworthy smaller ponds include several ponds at Rowes Corner, and a large pond off of Thornell Road in Newton Junction. Throughout Newton there is also a number of very small natural ponds that are not described for the purposes of this plan.

Table 17: Newton Waterbodies Geographic Information

Waterbodies	Surface Area (acres)	Elv (feet)	Watershed Location	Impounded or Free Flowing
Country Pond	87.5 (254.8)	116	Powwow River	Dam (Height control)
Back Pond	1.8	117	Powwow River	Natural
Ice House Pond	6.9	116	Powwow River	Free Flowing
Bartletts Mill Pond	2.2	155	Powwow River	Free Flowing
Marden's Pond	1	182	Powwow River	Dam

Newton Surface Water Quality

In New Hampshire, each surface waterbody and watercourse has been given a legislative water quality classification of A or B as identified in RSA 485-A:8. The classifications are defined below.

Class A Waters - These waters are of the highest quality and must not receive any discharge of sewage or wastes. These waters are considered as being potentially acceptable for public water supply sources after adequate treatment. RSA 485-A:8,I.

Class B Waters - These waters are of the second highest quality and contain no objectionable physical characteristics. No sewage or waste may be discharged into these waters unless adequately treated. These waters are acceptable for fishing, swimming and other recreational purposes and, after treatment, for use as public water supplies. RSA 485-A:8,II.

Currently, all of Newton's surface water resources have received Class B status from the State legislature.

There are several governmental entities involved in monitoring and enhancing the Town's various surface water resources. These organizations and their efforts are described below.

1. Municipal Monitoring: Health Officer addresses health concerns of water and septic systems and provides information to citizens, as in 1993 when many wells went dry due to the low rainfall. State and local controls and inspections which relate to the drilling of wells also have an indirect effect on water quality by overseeing the effects of drilling.
2. 305(b) Water Quality Report: A comprehensive source of regional water quality information can be found in the 1992 publication NH Water Quality Report to Congress 305 (b), prepared by the Water Supply and Pollution Control Division of the NH Department of Environmental Services. The report describes broad water quality parameters for the major river basins in the State, including the Piscataqua and Coastal basins. The report identifies surface waters which do not meet the standards for their legislative classification.

Wetlands

The Zoning Ordinance for the Town of Newton defines wetlands as follows: "Any area falling within the jurisdictional definitions in accordance with the provisions of State Law." (Section 10-102: Definitions). Newton has a local wetlands ordinance, and completed a prime wetlands report in November of 1992, conducted by Gove Environmental Services, Inc. However, the report was not adopted by the Town for the purposes of preparing a Prime Wetlands Designation scheme.

The Town's Wetland Map is included in this document as Map 5. The map comes from the Soil Survey of Rockingham County, New Hampshire. The map was created by digitizing the County soil survey sheets onto the Rockingham Planning Commission's Geographic Information System (GIS). The document, Soil Potentials for Development: New Hampshire Seacoast Area, prepared by the Rockingham and Strafford County Conservation Districts in 1985, was used to evaluate Newton's soils. Along with

identifying soil properties found within the two counties, this publication rates soils in terms of three development categories: soil suitability for on-site septic systems, dwellings with basements, and road construction. The ratings for these three soil categories were then combined to form an overall development rating for every soil property identified in both counties.

The soil rating matrix used in the above publication is presented in the rear of this document as Appendix A, along with a brief description of each soil type found within Newton.

The amount of wetland soils within Newton was calculated from the Town's Wetlands Map (Map 5) by Commission personnel using the calculation function of the RPC's Geographic Information System (GIS). Wetland soils were broken down by the number of acres of poorly drained and very poorly drained soils.

Table 18 below shows the number of acres of wetland soils within the Town of Newton. The table indicates that Newton contains roughly 1,543 acres of wetlands. This accounts for 25% of the Town's land area of 6,336 acres.

Table 18: Newton Wetland Soils

	<i>Acres of Very Poorly Drained Soils</i>	<i>Acres of Poorly Drained Soils</i>	<i>Total Wetland Soils</i>
Total Acres of Wetlands	923	620	1,543

Source: Soil Survey of Rockingham County, New Hampshire, Soil Conservation Service.

There are 1,543 acres of wetland soils in Newton. Wetlands comprise approximately 25% of the entire Town, with approximately 10% being poorly drained soils, approximately 15% being very poorly drained. Development should be located away from wetlands. The filling of wetlands for building construction not only destroys wetlands and their benefits, but may also lead to groundwater contamination.

Extensive treatment of this issue can be found in the Prime Wetlands Report by Gove Environmental Services, Inc.

FLOODPLAINS

Newton is not a member of National Flood Insurance Program (NFIP), sponsored by the Federal Insurance Administration in July of 1974. Flood Insurance Rate Map (FIRM), commonly prepared by the Federal Emergency Management Agency (FEMA) are not found for Newton.

The Town of Newton does not have a "Flood Hazard Boundary Map" developed by either the Department of Housing and Urban development or the Federal Emergency Management agency. An unofficial map of potential flood prone areas was developed using SCS soil interpretations and the Newton N. H. Soil Survey. The potential flood prone areas delineated on this map are those which meet the following criteria: 1. Are underlain by a soil which is interpreted by SCS to have some flood hazard and 2. To have a close proximity to a discernable stream channel.

Based on this map of flood prone areas only one structure was determined to be flood prone. The assessed value of this residential property is currently 34,000, is located on Pond Street near Country Pond (near the town line) and is identified as the property on Map 1, lot 24 of the local assessor's maps. The attached map and survey form note specify information about the structure and its location. In all 26 building sites were viewed in the field. These sites were indicated on 1981 aerial photos to be possibly located within flood prone areas.

Field observations suggest that the map of flood prone areas prepared in house reflects wetlands and narrow stream bottoms that are composed of either poorly or very poorly drained soils. Therefore no readily developable land exists within the areas mapped.

WITHDRAWAL AND DISCHARGE INFORMATION

In accordance with the NH Code of Administrative Rules (Wr 700), the Water Resources Division (WRD) of the NH Department of Environmental Services (DES) compiles data on all water users throughout the State which withdraw or discharge more than 20,000 gallons of surface water per day. According to the latest records of the WRD, there are no withdrawals or discharges of this magnitude from or to any rivers in Newton.

POTENTIAL SURFACE WATER SUPPLIES

Currently surface waters within the bounds of the Town are not used as sources of drinking water.

In order to assess the feasibility of using surface water resources as potential public water supplies, all surface waters in Newton would have to be evaluated. In all likelihood no river would have enough volume to serve as a municipal water supply. The small water flows of the Town's surface water resources are the disqualifying factor in terms of their utilization as public water supply sources. Treatment costs and the lack of infrastructure would also limit the utility of the various other surface water resources.

This determination does not mean that the protection of these rivers should be foregone. Many of these watercourses play an important role in the maintenance of the health of the ecosystems, and recreational opportunities found in Newton. Furthermore, these rivers through direct infiltration to groundwater, or downstream flow contribute to the drinking water supplies of Newton's residents and residents of the entire region.

As for Newton's public water supply the groundwater resources are much more likely to be utilized as these sources. These resources will be described in the next section.

DESCRIPTION OF GROUNDWATER RESOURCES

Regarding the source information (both data and maps) used to describe and map the groundwater resources of Newton, the municipality considers such information to be, at a minimum, as detailed and as accurate as the maps or information required to be used by the administrative rules. The municipality considers the source information used in this section to be the best available information existing at this time.

GROUNDWATER RESOURCES

Groundwater is a concentration of subsurface water, occurring in saturated soils and geological formations. It is resupplied through precipitation and surface water discharge. The water infiltrates the ground through an aerated zone where impurities are filtered out. The water then moves to a saturated zone where the pore spaces between soil particles are filled by the water. These saturated zones are called aquifers. It is very important that the earth's surface be able to transmit water so that a certain percentage can be stored underground as "groundwater". If excessive compaction or extensive covering of the earth's surface occurs, the amount of water that can reach the saturated zone and become groundwater is reduced.

Aquifers (concentrations of groundwater) are found where saturated layers are permeable and the storage and transmission of water can take place. Aquifers having medium to

high potential to yield groundwater occur in the New Hampshire seacoast area as alluvial deposits of sand and gravel (unconsolidated deposits) or in bedrock fractures (consolidated deposits). The major source of recharge to the aquifers of the seacoast area is through precipitation directly onto the aquifer's surface. In terms of the hydrologic cycle, approximately one-half of the average annual precipitation in the seacoast area is returned to the atmosphere as evapotranspiration. The other half is split between surface water discharge and groundwater storage.

The unconsolidated deposits, also called stratified drift deposits, contain sorted layers of gravel, sand, silt and clay. They are found primarily along valley bottoms. These materials have abundant pore space to store water, in fact, these pore spaces can account for more than 30% of the deposit's total volume. Consequently, these stratified drift deposits of sand and gravel have become good sources of medium to high volume aquifers.

Bedrock fractures normally do not yield the same quantity of ground-water that stratified drift deposits do, however, they cannot be overlooked in terms of contributing to a community's water supply needs. Bedrock fractures are more productive when the bedrock has a layer of sand and gravel over it. This allows recharge to occur directly from above. Bedrock fractures are usually adequate for domestic wells serving a small population. In contrast, a till aquifer is usually lower yielding and can have a short well life. This is due to a mixture of clay, silt, gravel and boulders which tends to compact due to the different soil particle sizes. The transmission and storage of water is greatly reduced in this type of aquifer.

The most common types of aquifers occur in two conditions, confined and unconfined. Confined aquifers have a layer of impermeable material over them such as clay. Unconfined aquifers have a layer of permeable material so that recharge occurs directly from above. The water table (the top of the saturated zone) fluctuates depending on the volume of the water stored within this zone. The confined system is under pressure due to the surface layer of clay on top and is resupplied where this layer is interrupted or terminates. See **Water Resources Figures 1 and 2**.

STRATIFIED DRIFT AQUIFERS

The groundwater resources of Newton have been investigated by the Army Corps of Engineers (hereafter, the Corps) and the US Geological Survey (USGS). The various investigatory efforts are described below.

A summary of the various ground-water reports completed by the USGS and the New Hampshire DES states that 40% of the Town of Newton is underlain by stratified-drift aquifers

The Corps study completed in March 1981, Southeastern New Hampshire Water Resource Study Groundwater Assessment, identified three locations as potential future water supplies. These locations and the information determined by the Corps can be found in the descriptions of the aquifers.

In 1990 the USGS completed the most thorough and accurate study of the region's groundwater resources to date. The report is entitled, Geohydrologic, Ground Water Quality, and Streamflow Data for the Stratified Drift Aquifers in the Lower Merrimack

and Coastal River Basins, Southeastern NH. The report identifies one major system of hydrologically interconnected stratified drift aquifer partially located within Newton. This aquifer is geographically centered on Country and Great Ponds. The entire coverage of the aquifer system extends from south into Massachusetts north through Exeter toward the Great Bay. Within Newton the aquifer is located in the north, center, and west regions of town. See Map 6. The report also indicates another aquifer which is hydrologically connected to the major system in northern Massachusetts centered upon the Merrimack basin, this aquifer is located in the southeastern portion of the town. Finally, there is one small aquifer standing alone in the south-central area of town, however, for purposes of this management plan this aquifer should be considered as part of the larger Country/Great Pond Aquifer since it is most likely hydrologically connected. A brief description of the identified aquifers follows, and their geographic locations can be found on Map 6. Map 7 depicts a copy of the base data USGS maps utilized, showing the direction of flow and elevation of the aquifers.

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1. **Country/Great Pond Aquifer:** This large and complex system of interconnected stratified aquifer is located along the northern, central, and southern areas of Newton. The geographic size of this aquifer is depicted on Map 6.

The saturated thickness of this aquifer, which is defined as the thickness of an aquifer below the water table, ranges from 5 feet at its outer edge, with some portions along the western edge of town at 20-25 feet, to over 40 feet thick in the area south of Ice House Pond, this area of 40+ feet in thickness is situated along the same boundary as the high (2,001-4,000) transmissivity.

The transmissivity of an aquifer is the rate at which water is transmitted through a unit width of the aquifer under a unit hydraulic gradient, and is expressed in units of feet squared per day. The transmissivity (T) of an aquifer is equal to the horizontal hydraulic conductivity (K) of the aquifer multiplied by its saturated thickness (b); thus $T = Kb$. Transmissivity is indicated upon Map 6. Throughout the majority of the Country/Great Pond Aquifer the transmissivity is less than 1,000. However in the northeast section of town, along Country, Back and Ice House Ponds, and Bartlett's Brook there is an area of 1,001-2,000. There are also two areas of 2,001-4,000, one is mentioned above, south of Ice House Pond and the other in the very northeastern section of the Town.

The elevation and groundwater contours of the aquifer range from 125' along the edges of the aquifer in the north and central part of town and at a peak just to the south of Newton Junction along an east-west line bisecting the intersection of Whittier and Main Streets down to 116' at the surface of Country Pond and 105 feet in the south west corner of Town. A more detailed representation of the contours and flow direction is indicated on Map 7.

No water quality problems were detected by USGS. The aquifer is coarse-grained stratified drift and coarse-grained stratified drift overlying fine-grained stratified drift, with materials consisting principally of medium sand to cobble gravel and medium to coarse sand overlying significant thicknesses of clay, silt, and fine sand.

2. **Merrimack Basin Aquifer:** This medium sized aquifer is also part of a larger and more complex system of interconnected stratified aquifer which is located in the eastern portion of Newton. The geographic size of this aquifer is depicted on Map 6.

The saturated thickness of this aquifer, which is defined as the thickness of an aquifer below the water table, ranges from 5 feet at its outer edge, to 20 feet along the center of the aquifer, to over 40 feet and even sixty feet in the areas of high transmissivity indicated on Map 6. In the small portion on the southern border of Town the thickness of 40 feet is located along the same boundary as the medium (1,001-2,000) transmissivity. The sixty foot thickness is in the same location as the high (2,001-4,000) transmissivity location. Along the eastern border of Town there is another area of medium transmissivity. This area contains a 40 foot thickness boundary, the center of which is 60 feet thick, lies directly under the intersection of Amesbury Road and Fox Hill Lane.

The transmissivity of an aquifer is the rate at which water is transmitted through a unit width of the aquifer under a unit hydraulic gradient, and is expressed in units of feet squared per day. The transmissivity (T) of an aquifer is equal to the horizontal hydraulic conductivity (K) of the aquifer multiplied by its saturated thickness (b); thus $T = Kb$. Transmissivity is indicated upon Map 6. Throughout the majority of the Merrimack Aquifer the transmissivity is less than 1,000. However in the southwest section of town, two areas of transmissivity of 1,001-2,000. There is also one area of 2,001-4,000, it is mentioned above as located on the southern border of Town.

The elevation and groundwater contours of the aquifer range from 135' along the western most edges of the aquifer in the central part of Town, and descending to 130' and finally 120' at the Town boundary. A more detailed representation of the contours and flow direction is indicated on Map 7.

No water quality problems were detected by USGS. The aquifer is a coarse-grained stratified drift with materials consisting principally of medium sand to cobble gravel.

A detailed discussion of existing potential threats located above these aquifers is presented in the Potential Threats section of this document. A discussion of potentially hazardous land uses allowed by zoning above these aquifers is presented in the Management of Potential Threats section of this plan. A strategy for mitigating the existing potential threats and possible hazardous land uses above these aquifers is also presented in the Management of Potential Threats section.

WITHDRAWAL AND DISCHARGE INFORMATION

Information regarding withdrawal and discharge rates from water wells is to be filed with the Water Resources Division (WRD) of the NH Department of Environmental Services in accordance with the provisions of the NH Code of Administrative Rules Wr 700. Major groundwater users are defined by the State as those operations which use more than 20,000 gallons of water per day.

According to the latest records of the WRD, there are no major groundwater users registered with the State which are located within the stratified drift aquifer areas.

WELL LOG DATA

The sources used for this section include the "Summary of Well Completion Report Data for the Town of Newton" dated 6/6/96, and the well site field verification maps prepared by the Water Resources Division. The WRD started keeping records on new water well construction in January, 1984, and an inventory has been maintained ever since. According to the Town's "Well Completion Report Data", a total of 264 newly drilled wells were reported between January 1984 and June 1996. The names and addresses of well owners are listed in Appendix B. The accuracy and completeness of the data in this list is entirely dependant on the well drillers. By law, the well drillers are required to send a data sheet for each newly drilled well to the WRD, however, many do not, and many of the submitted data sheets are inaccurate or incomplete. Thus, the information presented in the "Well Completion Report Data" would be used with extreme caution.

The majority of these wells are bedrock wells. There are 10 gravel wells, 6 driven point wells, 1 differential, 2 dug wells, and 8 classified as other, these wells are all wash wells.

Map 6 shows 9 Non-transient Community well locations, 5 Public well locations, and 4 Community well locations. These water systems are located throughout Newton and 4 Non-Transient, 3 Public, and 1 Community wells are located in the Country/Great Pond aquifer. 2 of the Non-transient wells on Amesbury Road are located in the Merrimack Basin Aquifer. The remaining 3 Non-Transient wells, 2 Public wells, and 3 Community wells are not located in the stratified-drift aquifers.

BEDROCK AND TILL AQUIFERS

Because the data concerning geology is only in the preliminary stage, the State Geologist has informed the Rockingham Planning Commission that publication of this data is inappropriate and premature.

The state of New Hampshire does not have an official 'Bedrock Geology' map. This is currently work in progress by the USGS. An individual has been working on this data collection throughout his entire career and will publish the data and map once the state is completed. According to the USGS, data can't be pre-released for any part until the state is finished. This is for fairness to everyone utilizing geologic data.

The planning commission has been instructed to not display this data in any form from sources we currently possess. Until the entire state is finished, we'll have to forgo any mapping. When the data becomes available, we can provide a map.

Radon contamination in water has recently become a concern throughout the nation. Radon is a colorless, odorless, cancer-causing gas that is produced as uranium (typically occurring in trace amount) decays. This gas escapes from water once it is brought up from the ground. For example, when a shower is used in a home with water containing radon, radioactive gas diffuses into the air. Hydro-geologists at the University of New Hampshire's Department of Earth Sciences report that water from deep, bedrock wells is more likely to carry radon than water from shallow wells or those located in gravel deposits.

Appendix B includes a list of well log data for Newton. Each of these wells are drilled in bedrock at total depths ranging from 20 to 800 feet. Bedrock was encountered at depths ranging from 4 to 143 feet. Yield test discharges from these wells ranged from .25 to 100 gallons per minute.

WITHDRAWAL AND DISCHARGE INFORMATION FOR GROUNDWATER USERS LOCATED OUTSIDE OF THE STRATIFIED DRIFT AREAS

In accordance with the NH Code of Administrative Rules (Wr 700), the Water Resources Division (WRD) of the NH Department of Environmental Services (DES) compiles data on all water users throughout the State which withdraw or discharge more than 20,000 gallons of surface water per day. According to the latest records of the WRD, there are no withdrawals or discharges of this magnitude in Newton.

POTENTIAL GROUNDWATER SUPPLIES

Newton does not have a municipal water system, yet indications are present that the Town may plan to utilize its groundwater resources for such a purpose within the planning period (approximately ten years). This indication was mentioned in the Master Plan completed in 1986. However, there was no action toward this goal in the last ten years. As mentioned above, the Master Plan is currently being rewritten. All of the Town's existing development is served by on-site water systems.

In terms of water delivery capability and the feasibility of serving the Town's major population clusters, both aquifers could potentially supply water for a municipal water supply. The stratified drift material underlying these two areas of high transmissivity in the northeastern and northwestern sections of town would be adequate to supply a small municipal well. The potential yield of these areas was determined to be 0.5 million gallons per day according to the U.S. Army Corps of Engineers study.

Several sampling wells were drilled into the aquifers' stratified drift material as part of the recent USGS groundwater mapping study, and no serious water quality problems were detected.

The following is an assessment of the potential for development above the surface areas of the Town's aquifers. This assessment will be based on the existing land uses above the aquifers, the existing zoning of their surface areas, and the existing and future land use sections of the Town's most recent Master Plan. The latest Master Plan for Newton was prepared in 1986, but an update is currently in progress.

As of this date, there is no water quality data available for Newton's aquifers. With no community or public water systems located within the aquifers, the normal sources for water quality information are not available.

Information regarding land use above the Newton portion of this aquifer comes from the existing land use map prepared as part of the ongoing 1992 Master Plan update. Currently, there are only a few single family homes located above Newton's aquifers, with the majority of the surface area being open and undeveloped. As stated above, there are no public water supplies located above Newton's aquifers.

In terms of the Town's existing zoning scheme, the aquifers fall within the Residential - A zoning district. This district, which includes the majority of town, is primarily low density residential and agricultural, with a few businesses scattered throughout the Town. The minimum lot size is based upon soil type. The potential for development of any land use other than low-density single-family homes is unlikely for these areas of town.

Furthermore, the threat of large scale commercial and industrial development is limited by the zoning and market forces that would lead such development closer to Route 125 and other major corridors outside of Newton.

In the event that Newton would wish to utilize any of its aquifers as potential water supply sources, a detailed water study would be needed. Items to address in this study should include:

- the aquifer's potential water delivery capability;
- the aquifer's existing water quality;

- the cost of water treatment;
- the potential threats posed by existing land uses;
- the potential threats posed by the existing zoning scheme;
- how to regulate land uses above the aquifer;
- the direction of groundwater flow within the aquifer; and
- options for water storage and water distribution.

It is unlikely that the Town of Newton will create a municipal water supply in the foreseeable future, this is especially true for the planning period of ten years.

IDENTIFICATION OF POTENTIAL THREATS TO WATER RESOURCES

Regarding the source information (both data and maps) used to describe and map the potential threats to water resources in Newton, the municipality considers such information to be, at a minimum, as detailed and as accurate as the maps or information replaced. The municipality considers the source information to be the best available information existing at this time.

The sources used for this section are given below. It should be noted that these sources were verified and updated by Rockingham Planning Commission personnel in December 1992 with the assistance of local municipal officials. The primary sources used for this section include:

Inventory of Groundwater and Surface Water Potential Nonpoint Pollution Sources, compiled by the Strafford-Rockingham Regional Council in February 1982. This will be referred to as the RPC Nonpoint Inventory.

Waste Site Inventory, maintained by the Waste Management Division of the New Hampshire Department of Environmental Services, dated September 1987. This will be referred to as the WMD Waste Site Inventory.

The State of New Hampshire has delineated two general types of pollution sources: nonpoint and point. The NH Office of State Planning defines nonpoint pollution sources as those sources which are diffuse in nature and discharge pollutants over an area into the environment. Typically, nonpoint sources of pollution include urban and rural runoff, leachates from land disposal of solid and liquid wastes, agricultural runoff, sediment due to timber harvesting activities and road salt applications. Nonpoint sources can be difficult to pinpoint since some are of a short-lived nature, induced by storm events or activities occurring over a brief period of time. Some nonpoint sources, such as leachate from landfills and failed septic systems, are more easily located.

Point pollution sources, on the other hand, are defined as any discernible, confined or discrete conveyance from which pollutants are or may be discharged, including but not limited to: pipes, ditches, channels, tunnels, conduits, wells, containers, rolling stock, concentrated animal feeding operations or vessels.

The most important information in regards to analyzing pollution sources is land use information. Therefore, this section also includes the following maps: Existing Land Use Map (Map 1), Zoning (Map 2), and Future Land Use (Map 8).

POTENTIAL THREATS - EXISTING AND FUTURE LAND USE

This section will address sections 501.01 (c), and 501.04 (a) of the Rules for Local Water Resource Management and Protection Plans (NH Administrative Rules, adopted August 20, 1990).

Existing Land Use

Information regarding existing land use was obtained from the Existing Land Use chapter and Existing Land Use map of the Master Plan, which was prepared in 1986, and recent updating efforts by the Newton Master Plan Update Committee. A copy of the text is not included in this chapter, but is included elsewhere in the Master Plan. The Existing Land Use Map is depicted as Map 1.

Residential Development - Newton does not really have a significant population center, the development of the Town is consistent with residential bedroom community development. Newton is rural in nature, without a true Town Center. There is some density near the Town Hall, the Newton Junction area, and Rows Corner. The majority of new development is characterized by the changing of large parcels of open land to subdivisions, these subdivisions are then developed in a relatively short period of time. This manifestation of development results from the rapid growth in the area. This growth drives up taxes on land, as well as the value. This pressure in turn fosters sale and development.

As the Existing Land Use map shows, the residential pattern is quite dispersed. This is still true in 1996, with the majority of development located along the frontage of roadways and the above mentioned subdivisions. There is one section of the town located in the Northwest corner next to Country Pond that has a very dense residential development. This area is of considerable concern. These houses have converted from seasonal development to continual use. The resulting burden upon the water resources, for both water supply and septic systems has impacted upon the water quality of the pond and the groundwater. According to 1994 estimated figures from the NH Office of State Planning, the latest count for the Town of Newton is 1,074 single family homes, 175 multi-family dwellings, and 63 mobile homes (manufactured housing).

Commercial and Industrial Development - Newton does not have a substantial commercial base. There is a large tract of land in the southern portion of the Town that has been zoned Commercial/Light Industrial, however, no serious inquiries have been made into the use of the land within this zone. There are a few small-scale commercial businesses located throughout the Town in areas zoned Commercial. Also, located throughout the Residential district are located various home occupations which may present the same issues as Commercial and Light Industrial uses.

EXISTING ZONING ARRANGEMENT

Currently, there are six zoning districts in Newton: Residential A, B, C, Commercial, Light industrial/Commercial and Senior Citizen Housing Zone. Below is a description of the Town's zoning districts, including a discussion of the permitted uses which could potentially threaten the community's water resources. Zoning is depicted as Map 2.

Residential A: This district is limited to low density residential uses, public buildings, agricultural use, churches, educational and nonprofit recreational purposes. There is no maximum lot coverage, but no building shall be within 65 feet of the centerline of the street. Each lot shall have not less than 150 continuous frontage. The potentially hazardous land uses allowed in this district are agricultural operations which engage in excessive pesticide use or manure spreading, home occupations which utilize chemicals (such as beauty shops, art studios, and antique shops which engage in furniture stripping), outdoor manure storage, and poor soil management resulting in erosion. Additionally, typical residential uses may present hazardous situations through home-use of lawn chemicals, pesticides, improper fertilization techniques, and improperly operating residential septic systems.

Residential B: The permitted uses include any use allowed in Residential A plus two family dwellings. The regulations are the same as those in Residential A, with the addition of an area of not less than 90,000 square feet for two family dwellings. The same potential hazards exist in this district.

Residential C: This district allows the use of mobile home parks, with home occupations; and a central recreational building. With a central sewage treatment facility, each lot shall have not less than 100 feet frontage on a street and an area not less than 10,000 square feet. There is no maximum lot coverage. The potentially hazardous land uses allowed in this district are similar to those hazardous activities found in the Residential A Zone.

Commercial District: Most of this zone is located off of Route 108, with a small commercial zone located on Amesbury Road. The permitted uses include any use allowed in the Residential A and B District plus a wide variety of retail business or service and office buildings. The area regulations for residential uses in the commercial district are the same as the regulations in Residential A and B. For the other uses in this district, no lot shall have less than 200 feet contiguous frontage and an area not less than 60,000 square feet. No more than 60% of any lot shall be covered in this district. Potentially hazardous land uses permitted in this district include those listed in Residential A and B.

Light Industrial/Commercial: This District is intended for use by research laboratories, office buildings, selected light industries, warehousing, service or utility businesses. No building shall be within 75 feet of the street and within 30 feet of any lot line. No more that 60% of any lot shall be covered. Potentially hazardous land uses permitted in this district include those found in Residential A and any number of activities that may be initiated in this zone.

Senior Citizen Residential District: This district allows multi-family dwellings by senior citizens only. There shall be a minimum of 40,000 square feet of lot area. The

potentially hazardous land use for this district are similar to those found in Residential A, with the attendant effect of having a higher than usual density.

FUTURE LAND USE

The 1986 Master Plan contains a chapter that discusses future land use. The plan discusses the creation of two residential districts; one would allow for single family low density or cluster development, while the other district would allow for single family, duplexes and multi-family development. Neither of these have come to pass. The future land use recommends that the depth of the commercial district be increased, so the accessibility is still available. The light industrial is recommended to be limited to the areas currently zoned industrial along the Boston & Maine railroad. Future Land Use is Map 8.

With any type of development, there must be a consideration for potentially hazardous land uses. It is important to look at what type of commercial or industrial facilities come in to the town. When dealing with residential development, a main concern is the improper use of septic systems. Many of the potential hazards are discussed above. Otherwise, future development should comply with the current regulations and zoning ordinance in order to adequately protect the use of Newton's water resources for future use.

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POTENTIAL NONPOINT POLLUTION SOURCES

The potential nonpoint sources in Newton are identified on the accompanying Potential Pollutant Sources Map (Map 9). A nonpoint pollution source has the mobility to travel over or under the land and pollute water resources along the way. In short, nonpoint pollution sources include situations where the pollution sources are not readily confined to, or identifiable as, a specific, discernible location. In Newton, examples of existing nonpoint pollution sources include:

1. **Salted Roads:** All paved roads receive some type of road salt application. Testimony received during the preparation of this plan from citizens, and experiential documentation from members of the Conservation Commission states that State road maintenance practices are careless and potentially highly destructive. Occurrences where a ½ inch thick layer of salt has been deposited on the surface of State Roads in Newton are replete. This has been a long-time concern and issue for the Town of Newton. There are no monitoring wells along these roads, and water quality data is not available to quantify the true effect of these practices. The Town uses a salt-sand mixture for maintenance of Town roads. Sources: RPC Nonpoint Inventory, Town Highway Agent, and Conservation Commission.

State Roads where heavy salt use has occurred:

Route 108, Peaslee Crossing, Highland, Bear Hill, Whittier (from Highland to West Main), Amesbury Road and West Main Street.

2. **Highway Salt Contamination Sites:** Well sites in Newton that have been contaminated by highway salt, and documented exist along Route 108, Bear Hill Road, and Highland Street. Source: Conservation Commission
3. **Pesticide Application Sites:** According to the Potential Pollution Sources Map (Map 9), there is one pesticide application site off of Highland St. Pesticides are no longer being used in this area, and there is no documentation of contamination. Newton does not participate in the Seacoast Area Mosquito Control (SAMC) program.
4. **A Groundwater Hazard Inventory List** states that there is one old dump located on Dugway Rd. It was originally used as the open Town dump and for burning. It is now being used as the Town transfer station.
5. **New Projects:** Other than effects which result from typical residential and non-residential development, there are no projects contemplated that would have a direct effect on water resources. However, the continuing conversion of seasonal homes to permanent homes in the Country Pond area has burdened the natural ecosystem to the point that septic systems in the area have caused substantial pollution situations in Country Pond. Continuation of this process or future development, with septic systems, near Country Pond will exacerbate the pollution problem. Source: Records of the Newton Planning Board.

Included in this discussion are other recognized sources of pollution for groundwater as detailed in the USGS-NH DES and literature on groundwater resources. These sources are described below, it would be very difficult to quantify the source or proportionate the effect of these sources, but discussion is appropriate. The current practice for analyzing the potential for groundwater contamination is to look to the land-use for the area. When contemplating further development and human activity near any groundwater and especially the aquifers, due consideration must be given to these sources:

1. Road Salting: aside from the description above, private application of salt for ice and snow clearance will occur and must be contemplated in residential and commercial activities.
2. Fertilizing: private application of fertilizer to lawns and for agricultural uses may also contribute to the contamination of ground waters, surface waters, and aquifers. If fertilizing is completed in a haphazard manner or a manner inconsistent with current agricultural practices, an excessive rate of fertilization can contribute to the levels of nitrate in ground-water.
3. Detergent Discharge: residential discharge of detergents into septic systems accounts for high levels of arsenic.
4. Septic Systems: Poorly designed or faulty systems themselves cause excessive presence of nitrates in ground-water.
5. Improper Disposals: Many household products contain chemicals that if used in a commercial or industrial fashion would be regulated under the provisions of RCRA. However, if used by consumers, they are exempt from these provisions. These chemicals, although small in quantity remain hazardous. As a result of their exemption, they are often disposed of improperly, leading to a potential contamination situation if continued over a long period of time or in a densely populated area. Despite participation in collection programs, this situation still represents a potential problem for Newton. Source: Household Hazardous Products and Wastes in New Hampshire, Prepared by The Center for Technology, Policy, and Industrial Development, MIT 1990.

POTENTIAL NONPOINT POLLUTION FROM UNDERGROUND STORAGE TANKS

Underground Storage Tanks: Underground storage tanks are a potential threat to water resources in that leaking can occur due to defects in tank construction, improper installation, and corrosion of older tanks. The State requires that all tanks with a capacity of 1,100 gallons or more be registered and the use reported to the Waste Management Division of the NH Department of Environmental Services, per NH Code of Administrative Rules WS 411.

Within Newton, there are 14 active underground storage tanks having capacities of close to 1,100 gallons or greater, at six locations scattered throughout Town. Regardless of size and age these tanks are very important considerations for protection of underground water resources. Seven of the fourteen underground tanks are located at the CBI site, located at 22 Whittier Street. Although municipal officials believe there are some

abandoned underground storage tanks within the community, a comprehensive inventory has not been compiled at this time.

The general locations of all known active underground storage tanks are shown on the Potential Pollutant Sources Map (Map 9). Details relative to tank location (by street address), owner's name, and number of active tanks is presented in Table 19.

Underground storage tank information was provided by the Waste Management Division of the NH Department of Environmental Services in a print-out dated September 18, 1995. A recent review of all development proposals currently before the Planning Board indicate there are no proposed developments planning to use underground storage tanks at this point in time.

Table 19: Underground Storage Tanks

<i>Site Name</i>	<i>Site Address</i>	<i>Number of Active Tanks</i>
Chester E Bearce	8 Merrimac Rd	One
Memorial School	178 Main St	One
Newton Greenhouse	30 Amesbury Rd	Two
CBI	22 Whittier St	Seven
Route 108 General Store	Route 108	Two
Sanborn Middle School	Whittier St Ext	One

Source: DES Waste Management Division.

POTENTIAL POINT POLLUTION SOURCES

Newton is relatively free of point pollution sources, i.e., those sources confined to a specific, discernible location. There are no CERCLA (Superfund) sites in Newton, nor are there any National Pollution Discharge Elimination System (NPDES) permit holders, or any facilities requiring a Groundwater Discharge Permit. However, there are several facilities regulated under the National Resource Conservation and Recovery Act (RCRA), six underground storage tanks (US) that are active facilities. There are also several sites that are identified by on the DES Groundwater Hazard Inventory List by project type.

Facilities Regulated Under RCRA and SARA

Although the RCRA and SARA program both deal with hazardous waste generation, there are some important differences. The RCRA program deals with the storage and disposal of hazardous wastes, whereas the SARA program deals more with emergency response planning in the event of a hazardous waste accident. Such planning is coordinated between state and local fire response officials. The NH DES reported that there are no SARA facilities currently within Newton. The establishments in Newton which are regulated under RCRA are described in Table 20.

Table 20: RCRA Facilities

<i>Site Name</i>	<i>Site Address</i>	<i>Generator Type*</i>
1. ALS State Line Store	97 Amesbury Rd	Provisional
2. Bearce Chester E Inc.	Merrimack Rd	Provisional
3. Boucher George	23 Chase Rd.	Provisional
4. Brown, Kevin Residence	14 Whittier St ext	Safety Kleen
5. Bush E K Trucking	83 North Main St	Provisional
6. Eveleth & Sons	9 Brimstone Circle	Provisional
7. Gordon, Richard Residence	90 So Main St	Provisional
8. Hill Graphics LTD ¹	6 Highland St	Provisional
9. Newton Chevrolet Inc	Rt 108	Provisional
10. Newton Chevrolet Inc	Rt 108	Permanent
11. Johns Auto Body	Peaslee Crossing Rd	Permanent
12. Mark One Services	70 Whittier Rd	Safety Kleen
13. Melvin Chas R Auto Body Repair	81 South Main St	Safety Kleen
14. Moulaison Tire Co	10 Amesbury Rd	Safety Kleen
15. Moulaison Tire Co	10 Amesbury Rd	Provisional
16. Newton Chevrolet Geo	185 South Main St	Permanent
17. CBI	Whittier St	Permanent
18. Town of Newton	Transfer Station, Dugway Rd	Provisional
19. Town of Newton/Transfer Station	Dugway Road	Safety Kleen
20. R & R Repair	81 South Corner Rd	Safety Kleen
21. Sanborn Reg Middle School. Dist	31A West Main St	Provisional
22. Veteran Affairs Department ²	61 South Main St	Provisional
23. Willowbrook Auto Care	85 South Main St	Safety Kleen

* Generator Type definitions:

- Permanent - Assigned to facilities which routinely generate waste.
- Provisional - One time or emergency clean-up. Occasionally it is interim until a permanent number is obtained.
- Safety Kleen - Self contained parts cleaner that is delivered and picked up on a regular basis.

¹ Although included in the reports from the DES this business no longer

- ² Although included in the reports from DES, there are no records of this entity's existence.

Source: DES Waste Management Division

Groundwater Inventory List

The New Hampshire DES maintains an Inventory List describing sites that represent potentially hazardous sites that are currently being monitored. This information is presented in Table 21.

Table 21: Groundwater Inventory List

Site Name	Site Address	Project Type
The Art of Hair	118 North Main St	UIC
Cheryl's Elegance	82 North Main Street	UIC
Estabrook's Garage	26 South Main Street	LUST
Gordon And Sons	South Main Street	LUST
Hair Review Plus	72-74 Whittier Street	UIC
Johnson Products	2 W. Main Street	LUST
Newton Abandoned Dump	Dugway Road	OLD DUMP
Steve Lourin	14 South Main Street	OPUF (DES action taken)

*** Project Type Key**

- UIC- Underground Injection Control: discharges of benign wastewaters not requiring a groundwater discharge permit or request to cease a discharge.
- LUST- Leaking Underground Storage Tank Project.
- Old Dump Old Open Dump Site (Non Landfill).
- OPUF - On Premise Use Facility.

Source: DES Waste Management Division

Master Plan Considerations

There are several sections of the Master Plan which have the potential to impact on the Town's water resources. A summary of these sections is presented below.

1986 Master Plan: Community Goals

- Goal - "Diversify and expand Newton's development base such that it does not adversely affect the quality of life." (p. 17)

2. Goal - "Protect water resources and areas affecting Newton's water supply." (p. 20)
3. Goal - "Develop comprehensive strategy for disposal of septage, solid and hazardous wastes." (p. 21)

1986 Master Plan: Natural Resources

1. "Protection of groundwater resources is particularly important to the Town of Newton since residents must rely on private wells for water supply." (p. 34)
2. "The relationship between land use and water quality is very important. Certain uses in the wrong area, or carried out in the wrong way, can degrade and contaminate both surface water and groundwater..." (p. 34)
3. "Both aquifers areas are partially urbanized, but the threat of groundwater contamination could be mitigated by careful planning and protection strategies." (p. 35)
4. "The potential of soils to handle septic systems will continue to be vital information and should continue to be the basis for determining the location and density of development." (p. 36)

1986 Master Plan: Summary of Recommended Actions

1. "Development should be directed away from areas which have natural development constraints or pose health and safety risks to residents." (p. 65)
2. "The Town must carefully plan to minimize the potential for pollution of its limited groundwater resources." (p. 65)
3. "Roughly one-third of Newton's land area is poorly or very-poorly suited to installation of septic systems. Development should, whenever possible, be directed away from such land." (p. 65)
4. "Aside from the importance of preserving wetlands, it is equally important to prevent building in such areas because of the potential impact on water quality and public health." (p. 66)

NEWTON PRIME WETLANDS REPORT CONSIDERATION

In November, 1992 the Newton Conservation Commission prepared a Newton Prime Wetlands Report. This Report was not adopted by the Town of Newton, but some of the information and figures can still be used as a resource. There are several sections in the Prime Wetlands Report that could potentially impact the Town's water resources. A summary of these are presented below.

1992 Prime Wetlands Report: Establishing a Wetland Management Program

1. "People came to realize that wetlands perform a vital role in natural life systems." (p. 76)
2. "The people of Newton are in the best position to effectively manage their own wetland resources." (p. 79)

3. "An enforceable local management program addressing the wetland alternation problem will benefit not only the town but the effectiveness of state and federal agencies as well." (p. 79)
4. "It makes little environmental sense to place controls on wetland alterations and ignore activities occurring at their boundaries." (p. 82)
5. "Residents could suffer the consequences of poor wetland management practices in any one of the bordering towns or vice versa." (p. 82)

Pollution Potential - Inside and Outside Newton

Within Newton, there is one area where there is a concentration of septic systems or dense development. This area is located on/near Country Pond. The densely populated area used to be summer homes, but are now year-round residences. Due to this over populated area, the water quality of Country Pond is threatened and the health of the residents are also threatened.

In the Town of Kingston, there exists a significant pollutant source. From the 1986 Kingston Master Plan:

"hazardous organic chemicals originating from the Ottati-Goss barrel reprocessing plant have been detected in groundwater adjacent to the site. Neither the precise extent nor long term consequences of this contamination are known."

Since the adoption of the above language by the Town of Kingston, the pollution plume has slowly moved with the flow of groundwater toward the Town of Newton and Country Pond.

The recently approved Fuel Transfer Facility over the aquifer in the south of town may also be a potential pollution source.

RECOMMENDATIONS:

- Newton should closely monitor the efforts to remediate the Country Pond site, and the continuing transmission of pollution. Newton should establish baseline data within and along Country Pond and in the aquifer area in order to adequately judge future effects of these sites.

ASSESSMENT OF GROWTH IN DEMAND FOR WATER

This section will provide an estimate of the existing and future demand for water in Newton. Since the Town is not served by a municipal water system, existing water demand is met by individual wells. None of the public water systems in Newton serve residential uses and all are relatively small systems.

EXISTING WATER DEMAND

The 1990 U.S. Census indicates that all of the households in Newton obtain their water from individual wells. Two households obtain their water from "some other source" according to the U.S. Census. The number of persons per housing unit in Newton in 1990 was 2.84, which was calculated by dividing the population in 1990 by the number of

housing units. The number of households was multiplied by 2.84 to determine how many people obtain water from the various sources. To determine the daily water demand per household, the standard of 65 gallons per person per day was used. This standard was obtained from a 1990 study titled, Water Supply Study for Southern New Hampshire, prepared by Roy F. Weston, Inc. for the Water Supply Task Force. The existing water demand figures are presented below in Table 22.

Table 22: Newton's Existing Water Demand

<i>Source of Water Supply</i>	<i>Population Served</i>	<i>Type of Public Water System</i>	<i>Water Demand (gal/day)</i>
On-site wells	3,558	Not applicable	231,270 gpd#

based on 65 gpd per capita

+ Water demand estimate based on WSPCD design standards.

The previous table indicates a total water demand of 231,270 gallons per day for the Town of Newton. This estimate includes the Town's residential uses, and the few commercial, and institutional uses. There are no industrial uses and only one agricultural use that consumes a significant amount of water. Newton Greenhouse uses about 3 million gallons per year.

FUTURE WATER DEMAND

This section will use the most recent population projections developed by the NH Office of State Planning. For the year 2000, Newton's population is projected at 3,707 residents. In an effort to reasonably project the Town's future water demands, certain assumptions were made:

- 1) The existing non-community water systems are not likely to expand due to site limitations. Therefore, their existing water demands are expected to remain constant. The one exception is the School, where the enrollment is expected to grow in proportion to the increase in population. Since the population is projected to increase by the year 2000, the same increase will be assumed for the school.
- 2) Although new non-community water systems may be established in the future, it is impossible to estimate how much of the Town's overall water demand they will be responsible for. Therefore, they cannot be factored into the equation.
- 3) Newton does not have a large commercial or industrial base, the Town might like to encourage more land uses of this nature. However, due to market factors and the Town's existing zoning scheme, it is more than likely that such development will be located in neighboring Town's along the more major roadways and in higher density population areas, or as part of large subdivisions of land.
- 4) Agriculture, as a land use, has been in decline throughout the region for quite some time now. Currently, Newton has very few large farming operations, and the Town is unlikely to be the site of any future large-scale farming operations. Therefore, the water demands of the Town's agricultural sector will not be factored into the equation.

Table 23 below projects the Town's future water demands for the year 2000. Once again, the number of people to be served by on-site water wells was derived by taking the Town's projected population. The water demand estimate for the population served by on-site wells is based on the same standards as the existing water demand calculation.

Table 23: Newton's Projected Water Demand

<i>Water User</i>	<i>Projected Population Served</i>	<i>Water Demand Projection - Year 2000</i>
On-site wells	3,707	240,955 gpd
On-site non-community public water systems	transient	0 gpd
TOTAL	3,707	240,955 gpd

The water demand projections are general in nature, and are intended as a guideline in terms of considering the Town's future water demands. They are not intended as scientific data for the purpose of evaluating the need for a municipal water supply.

DESCRIPTION OF THE INFRASTRUCTURE

Regarding the source information (both data and maps) used to describe and map the infrastructure of Newton, the municipality considers such information to be, at a minimum, as detailed and as accurate as the maps or information replaced. The municipality considers the source information to be the best available information existing at this time.

SEPTIC SYSTEM USAGE

Septic disposal in Newton is handled entirely by on-site septic systems and holding tanks. The Town does not have a municipal sewer system, nor are there any plans for the establishment of such a system within the planning period (approximately ten years). The 1990 US Census figures indicate that there were 3,473 residents in Newton, all of which are dependent upon on-site septic systems. According to 1994 estimates from the NH Office of State Planning, there were approximately 1,291 dwelling units utilizing on-site septic systems in Newton.

The more rural areas of Newton have a high percentage of soils which contain moderate to severe limitations for the placement of on-site septic systems. For a graphic depiction of these areas, as well as areas rated high in terms of septic system suitability, please review the accompanying Soil Suitability For Septic Systems Map (Map 10). Many of the environmental constraints can be mitigated through corrective measures taken by the developer.

According to the soil rating matrix prepared by the Rockingham and Strafford County Conservation Districts (see Appendix A), Newton's land area is fairly evenly divided between soils with very low suitability for the placement of on-site septic systems, and

soils with medium suitability. Soils with very low suitability were so designated because they had limitations due to steep slopes, high water tables, or depths to bedrock.

The soil properties of proposed development sites in Newton should be thoroughly evaluated during the subdivision and site plan review process before the installation of septic systems takes place. This is mainly done through the implementation of soil-based lot sizing. The Planning Board, through this process reviews all subdivision and site plans with respect to potential soil/septic system issues.

Under state law (RSA 149-M:13), each community must have its own septage disposal facility, or a formal agreement with another municipality to utilize their facility. Currently, there are no permitted septage disposal sites located within the Town. Septage disposal is handled by an assortment of private haulers who bring the material to the facility.

Newton is a member of the Southeast Regional Solid Waste District, however, the district does not have a regional septage management plan in place at this time. It is recommended that Newton address the requirements of RSA 149-M:13, either on its own or within a regional framework.

SOLID WASTE DISPOSAL

Reference to the document entitled, Southeast Regional Solid Waste District - Solid Waste Management Plan, prepared by the Rockingham Planning Commission in February 1991, and the Conservation Commission provides the following information. The Town contracts with a private hauler for delivery from the Town Transfer Station to Londonderry or Rochester for landfill. The Town's existing recycling program is voluntary. Materials collected in this program include: newsprint, glass, and aluminum cans.

The only solid waste disposal facility in Newton which has a permit from the state is the closed dump used as a transfer station. According to the DES Waste Management Division, there are no existing permit violations at the brush dump site. There are monitoring wells in place and water quality data is current unavailable from the DES. The Town does not have any plans to upgrade or expand the closed dump site at this time.

PUBLIC WATER SUPPLIES

As mentioned previously, Newton residents receive their water entirely from groundwater sources; exclusively through the use of on-site domestic water wells, and wells that are appropriate for commercial and transient use. There are, however, eleven wells in Newton which are considered "public water systems" as defined by RSA 485:1. According to the RSA, there are three types of public water systems: community water systems, non-community water systems, and non-community, transient water systems. These systems are defined as follows:

Community Water System: A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Community water systems are usually associated with residential developments.⁷

Non-Community Water System: A public water system which serves the same 25 people, or more, over six months per year. Examples of this type of system include: schools, government buildings, and large industries.

Non-Community, Transient System: A public water system which serves a transient population of 25 people, or more, over six months per year. Examples of this type of system include: restaurants and large commercial uses.

The above public water systems are periodically tested by state agency. The regulatory authority responsible for water quality testing is the Engineering Bureau of the Water Supply and Pollution Control Division within the NH Department of Environmental Services (DES). Starting in January 1992, the community and non-community water systems will receive an annual Safe Drinking Water Analysis (SDWA) which involves testing for the following items: iron, manganese and other metals, inorganics, volatile organic compounds, pH, and radon. Prior to January 1992, these systems received an SDWA every three years. The non-community, transient systems receive an SDWA every six years. Historically, community water systems are tested monthly for bacteria. Beginning in January 1992, the two types of non-community systems will be tested for bacteria every three months; however, it remains to be seen whether DES has the staff to comprehensively implement this new requirement.

According to the most recent records of the NH Department of Environmental Services, there are public water systems located in Newton. These systems are listed in Appendix C. All of the water systems are non-community, transient systems as defined by the NH Water Supply Engineering Bureau. Each of the water systems obtain their water from wells and serve only their businesses. Water demand is not expected to increase significantly in the future.

PUBLIC WASTEWATER TREATMENT FACILITIES

Currently, Newton does not have a municipal wastewater treatment facility. The Town is entirely served by on-site septic systems, therefore, there has not been a need for a municipal wastewater treatment plant. The Town does not plan to install a municipal sewer system or a wastewater treatment facility within the planning period or the next ten years.

DESCRIPTION OF EXISTING PROGRAMS AND POLICIES

The local ordinances and regulations of the Town of Newton were reviewed by Commission personnel for the purpose of identifying the elements of each which have the potential to impact water quality or quantity. The results of this review are summarized below.

ZONING ORDINANCE

In addition to the specific permitted uses described in the Description of Potential Threats chapter of this document, there are some other sections of the Newton Zoning Ordinance which relate to water resources. These sections include:

1. Section IV, 2. Requires soil-based lot sizing in the Residential A zone, this refers to the tables set up for soil suitability for subsurface septic systems. This type of lot sizing protects groundwater from pollution by preventing overburdened soils.
2. Section VI, 2. As above this requires soil-based in the Residential B zone. (See discussion at #1. above).
3. Section VIII, 1(a). For a mobile home park with both a central sewage treatment facility and central water supply, each lot shall have not less than 100 feet frontage on a street or way and an area not less than 10,000 square feet. The sewage treatment facility and water supply shall comply with all applicable federal and state regulations. This section refers to a relaxation in the lot size regulations where a central facility for water and sewage is present.
4. Section VIII, 1(b). For a mobile home park without both a central sewage treatment facility and central water supply, each lot shall have not less than 150 feet continuous frontage on a Class I, II, III, IV or V Highway. This section requires a larger frontage amount, and thus larger lots for individual lots with septic systems.
5. Section X, 7. No more than 60% of any lot in the Commercial Zone shall be covered. This requirement helps to ensure that a lot's surface is not completely devoured by paved parking areas, building footprints, storage areas, access ways, buildings, garages, and other secondary structures.
6. Section XI, 1(e). Light manufacturing enterprises, except biological and chemical manufacturing; provided that such activities will not be offensive, injurious, or noxious because of gas, dirt, sewerage and refuse, vibration, smoke, fumes, dust, odors, danger of fire, or explosion, or other characteristics detrimental or offensive that tend to reduce property values in the same or adjoining districts. This section limits uses that harmful to property values. Many of the harms listed as examples are related to water pollution issues.
7. Section XI, 3(j). Waste Disposal and Water Service: Water service and waste and refuse disposal methods shall comply with pertinent health regulations and shall be in accordance with the approved site plan. This section provides, as a reminder, that all such methods for water supply and waste disposal comply with health regulations and site plan review.
8. Section XI, 3(l). Special Studies: The Planning Board may require special investigative studies at the applicant's expense (Ref. RSA 674:4,I[g]) to demonstrate that adequate protective measures are taken and services/infrastructure will be provided (including but not limited to: water supply, waste disposal, traffic safety, runoff and sedimentation control, and noise level control). This section provides for extra studies in the case of development that may impact upon the environment, especially in the realm of water resources.
9. Section XII, 3. No more than 60% of any lot area in the Light Industrial/Commercial Zone shall be covered. This requirement helps to ensure that a lot's surface is not completely devoured by paved parking areas, building

footprints, storage areas, access ways, buildings, garages, and other secondary structures.

10. Newton's Wetland Zoning Ordinance. The first purpose of this ordinance is to promote the wise use of wetlands in order to prevent the need to construct central sewer and water treatment facilities. Other purposes include to permit proper recharge, protect and encourage environmental diversity, and preserve natural flood prevention. The Ordinance also has many provisions which have the potential to directly or indirectly impact the Town's water resources. Chief among them are:
 - Permitted uses in areas considered wetlands include: wildlife habitats, recreation areas, agriculture, forestry, conservation areas, water impoundments, drainage ways, conservation areas, open space, and any other use which does not involve the erection of a structure.
 - Under certain conditions, the Planning Board may allow the following uses as part of subdivision or site plan review for the construction of roads, pipelines, powerlines and other transmission lines within the district.
 - Poorly drained soils may be used for 25% of the calculation for lot size determination as required under the Zoning Ordinance and the Subdivision Regulations. However, this contradicts with the Subdivision regulations. Very poorly drained soils cannot be used for this calculation.
 - Septic systems must be located at least 75 feet away from poorly drained soils or very poorly drained soils. There is no restriction on building activity enumerated in the Ordinance.

BUILDING CODE

Newton has a Building Inspector, who enforces the 1988 version of the BOCA Code. Other codes enforced by the Town include: the 1988 version of the National Fire Protection Association Life Safety Code; and the 1987 version of the BOCA Fire Prevention Code.

SUBDIVISION REGULATIONS

Any discussion of these existing regulations is inappropriate as the Newton Planning Board has targeted a complete revision of these regulations for 1997.

EXCAVATION REGULATIONS

The Town of Newton has regulations that basically mirror the provisions of RSA 155-E. The effect of zoning however, seriously curtails any opportunity for excavations by permitting them only in non-residential zones. Newton Zoning Ordinance § XIII, 6. Treatment of excavations above aquifers and adjacent to water bodies should be addressed in wetlands and aquifer protection ordinances.

NON-RESIDENTIAL SITE PLAN REVIEW REGULATIONS

The Town of Newton has recently adopted new and comprehensive Site Plan Regulations which provide a significant improvement in treatment of this type of development. Particular attention has been given to erosion and sedimentation control and protection of natural resources.

SUMMARY OF LOCAL REGULATORY EFFORTS

The following discussion summarizes which local ordinances and regulations have the potential to impact specific water resource concerns, including: sedimentation and erosion control; surface water flows; groundwater recharge; managing existing and potential contaminants; flood storage; wetland encroachment; nutrient levels; and wildlife and fisheries.

In terms of sedimentation and erosion control - The grading, drainage, and erosion control measures set forth in the Non-residential Site Plan Review Regulations, roadway specifications, and Subdivision Regulations are helpful in this respect. Also, the regrading requirements for excavation operations are of benefit. Erosion can degrade water quality through the introduction of excessive sediments into the water resource. This can increase the water's turbidity, increase the intensity of biological activity, and displace oxygen within the water. The Town may want to consider adopting some or all of the provisions in the forthcoming model erosion and sedimentation control regulations recently developed by the Rockingham County Conservation District and the Office of State Planning. These model regulations are much more extensive and comprehensive than the existing regulations in place in Newton.

In terms of surface water flows - The grading, drainage, and erosion control requirements of the Subdivision Regulations, Non-residential Site Plan Review Regulations, and roadway specifications are helpful in this respect. The various provisions of the above mentioned regulations help to control the amount of surface water generated at a building site by channeling it in an environmentally safe manner. Problems associated with excessive surface water flows are flooding (in some cases), the transportation of surface pollutants into nearby surface water holding areas, plus erosion and sedimentation. Once again, adoption of the model erosion and sedimentation control regulations is recommended as a means to control surface water flows.

In terms of groundwater recharge - The surface water and erosion control measures specified in the Subdivision and Non-residential Site Plan Review Regulations are helpful in this regard. One zoning provision that the Town should consider adopting is lot coverage limitations, which many area communities have enacted to control the amount of impervious surface for each lot. Controlling erosion and surface water run-off allows the water to permeate the ground and recharge the aquifer, instead of rolling off the surface and heading elsewhere. Limiting a site's impervious area is helpful in the same manner. Through this type of requirement, open land is available for precipitation to seep into the ground and recharge the aquifer.

In terms of managing existing and potential threats - Within the Zoning Ordinance, limiting the permitted uses within wetland areas is also helpful. In a less direct manner,

the erosion and surface water control provisions of the Subdivision and Site Plan Review Regulations are beneficial. The Town may want to consider action regarding underground storage tanks that are below 1,100 gallons. Tanks larger than 1,100 gallons are regulated by the DES and are allowed in Town.

In terms of flood storage - The grading, drainage, and erosion control provisions of the Subdivision and Site Plan Review Regulations help to maintain flood storage by reducing and controlling the amount of surface water run-off which could eventually find its way to the floodplain, thus contributing to the overburdening of the floodplain.

In terms of wetland encroachment - The limited number of permitted uses within the Town's wetland areas helps to preserve their integrity. Newton may wish to develop wetland buffer zones that are extremely beneficial to preservation of this resource. Limiting development in close proximity to wetland areas helps to minimize land disturbance within the buffer, thus reducing the chance that erosion from development could find its way into wetland areas. The Town's existing wetland protection provisions are somewhat outdated. The Town may want to consider the new wetland definition and delineation standards and forthcoming model wetland ordinance which will be released in mid-1997 by the Office of State Planning so that there will be some consistency between the local and state level.

In terms of nutrient levels - Newton does not have any specific regulations which deal with this issue. However, in an indirect manner, the surface water and erosion control provisions of the Subdivision and Site Plan Review Regulations do help to control nutrient levels by reducing surface water run-off flows. Excessive surface water flows can carry nutrients across the land into surface water resources, thus exacerbating the problems associated with nutrient overloading. The adoption of more comprehensive erosion and sedimentation control regulations would be of benefit.

In terms of wildlife and fisheries - The Town does not have any specific regulations or ordinances which deal with these issues. Any existing impacts on wildlife and fisheries within Newton are an indirect result of the Town's regulatory efforts. No regulatory changes are proposed in this regard.

ANALYSIS

ANALYSIS REGARDING WATER SUPPLIES

Almost all of Newton is served by individual private wells and it is assumed that the situation will remain the same for the at least the next ten years. A detailed discussion of the Town's existing and future water demands is presented in the "Assessment of Growth in Demand for Water" section of this document. Even if commercial and industrial water demands dramatically increase in Newton, there should still be a surplus of water in Town.

Based on the Town's projected water demands for the next ten years, the establishment of a municipal water system will not be necessary.

ANALYSIS REGARDING OTHER WATER RESOURCE PURPOSES

This section addresses section 505.0 of the Administrative Rules for Local Water Resource Management and Protection Plans.

1. Groundwater and surface water discharges: No significant sources discharge wastes into the Town's groundwater or surface water. Accordingly, there is no current need to determine the "assimilative capacity" of Newton's water resources.

Detailed studies of the assimilative capability of groundwater and surface water would logically fall under the State's duties since it issues discharge permits and has greater technical and financial capacities than municipalities.

2. Recreation: Relative to inland towns in Rockingham County, Newton has many streams and rivers. The Town also contains an extensive shoreline along Country Pond. Fishing, boating, and swimming are the most common recreational uses of the rivers and streams in Newton.

Newton owns a boat landing located on the eastern shore of Country Pond which provides public access to the Pond.

The recreational opportunities, which are very valuable to Newton are outlined in detail in the Recreation Chapter of the Master Plan.

3. Wetlands: Wetlands are important, valuable, natural resources and worthy of protection from inappropriate use. They have been found, in general, to provide critical ecological functions. The filling of and use of wetlands for building construction not only destroys wetlands and their benefits, but may lead to groundwater contamination as well. Leaching fields constructed in filled areas are likely to be placed too near the seasonal high water table below and to have an inadequate receiving layer for proper treatment of the septic system's effluent.

There is an ongoing need to protect wetlands in Newton. Statewide, wetlands are under increasing development pressure due to the depletion of the most developable land. Although the State has laws and regulations in place to protect wetlands, they do not always provide the degree of protection needed. For these reasons, local control over the use of wetlands should remain in effect indefinitely. The Conservation Commission of Newton has recognized the importance of preserving wetlands, and has attempted to adopt a Prime Wetlands Report, however, this failed adoption. Efforts to protect these wetlands should continue in light of this setback.

4. Wildlife Habitat: River, stream, and wetland corridors provide the richest habitat for the greatest number of fish, wildlife, and flora. Fish and wildlife populations cannot succeed within limited habitat confines. Native wildlife must have travel lanes within their range, and waterfowl and other birds must have ground-level nesting habitat. Protection of these linear corridors is essential to the stability of wildlife populations.

Riparian corridors such as shorelands also provide a range of recreational benefits such as canoeing, hiking, fishing, birding, horse trails, cross-country skiing, picnicking, etc. Shorelands are also sensitive due to flooding, erodibility, and

proximity to open water. Moreover, soil type and percent slope typically limits the development potential of a shoreland area.

5. Hydropower: There are no hydropower producing dams in Newton, nor are there plans for any in the future. The hydropower market is not as strong as it was during the 1970's and early 1980's (during the height of the nation's energy shortage) because of uncertain markets for electricity, environmental restrictions, and alternative power sources which are more economical.

If any hydropower facilities are proposed in the future, no decision should be made by Town officials until a thorough site review and evaluation is performed. The cumulative impacts of hydropower dams along the river should also be considered.

6. Fire Protection: The Town of Newton has a volunteer fire department. There are no fire hydrants in Town, but there are numerous fire ponds equipped with dry hydrants located throughout the Town. Large developments are often required to construct fire ponds to provide adequate fire protection. The Planning Board sends all large development plans to the Newton Fire Department for their review and recommendations.

MANAGEMENT OF POTENTIAL THREATS

The previous section entitled, "Identification of Potential Threats to Water Resources", presents a full discussion of existing and permitted future land uses which pose threats to water resources within Newton. A summary of the mitigation measures designed to manage the potential threats to identified water resources is presented below.

In terms of existing threat sources, Newton has only a few businesses which pose potential threats to water resources due to their storage, use and disposal of hazardous substances. For these establishments, the proper storage and disposal of hazardous substances should be the Town's primary focus, whether through regulatory or non-regulatory efforts. The Planning Board could require a periodic inspection program as a condition of approval for some businesses. An inspection program could be arranged by the Town's Code Enforcement Officer or through the Fire Department. Such a program could be arranged as a condition of an occupancy permit.

Another way to deal with potentially hazardous uses permitted by right, would be to reclassify these uses as requiring a special exception within the Zoning Ordinance. This would give the Planning Board and Board of Adjustment more control in setting performance standards and other conditions of approval which would protect water resources.

The Town could also improve its management of potential threats by improving its database. There is a lack of water quality data for the Town's aquifers and surface waters. In order to adequately evaluate potential development projects and their impact on water resources, the Planning Board needs to obtain and review site specific water quality data.

Additional management and protection techniques for water resources are described in the following section.

RECOMMENDATIONS FOR NEW OR REVISED POLICIES AND PROGRAMS

In an effort to protect and wisely manage the water resources of Newton, the Town can pursue a number of regulatory and non-regulatory strategies. Reliance on a single method is not advised. Rather, it is recommended that the Town use a combination of strategies. While the following recommendations may not all be implemented by the Town, the items described below are an attempt to provide the Town with a variety of options for protecting and managing water resources in a sound, rational manner.

NONREGULATORY PROGRAMS

It is recommended that the Town of Newton employ the following nonregulatory programs in order to manage and protect its water resources:

1. Educational and informational programs should be developed in order to provide the general public with an understanding of the operation, proper use, and maintenance of septic systems and leach fields (i.e., regularly pumping out septic tanks, avoiding disposal of hazardous or harmful wastes, etc). This would likely prevent unnecessary system contamination and failures, thereby protecting surface and groundwater resources.

A pamphlet on the proper maintenance of septic systems and leach fields has been prepared by the Granite State Septic System Designers and Installers Association and the University of New Hampshire Cooperative Extension Service. The most feasible option for distribution would be to have the Town's Code Enforcement Officer distribute the pamphlet when inspecting new or replaced septic systems. For more information please contact the local Cooperative Extension Service in Brentwood.

2. The Town should investigate options for septage disposal as required in RSA 149-M:13. The law requires that every town either have its own septage disposal facility or a suitable disposal arrangement with another community. The Town could work within a regional framework as part of Newton's membership in the Southeast Regional Solid Waste District.
3. The Town should continue to participate in any regional or inter-community household hazardous waste collection programs, such as the recent collection effort in Kingston organized by the Southeast Regional Solid Waste District. Due to cost considerations, opportunities for household hazardous waste disposal have been infrequent in the region; in many cases, a citizen only has one opportunity per year to dispose of household hazardous wastes.

The Town needs to take a more pro-active course of action in terms of dealing with the household hazardous waste disposal problem, either on its own or as a member of the Southeast Regional Solid Waste District. Perhaps communities within the District could arrange to have a space within their solid waste disposal sites where citizens could drop off their household hazardous wastes for proper disposal at a later date. Another option would be for the District to establish a regional household hazardous waste drop-off site. This would vastly increase a

citizen's options for disposal of such wastes, even if this site were open only one day a week or one day a month. In the meantime, the number of household hazardous waste collection days need to be increased and the Town is encouraged to work towards this end.

Education programs on the proper storage and disposal of household hazardous waste materials should be considered by the Town. The pamphlet entitled, "Hazardous Materials in Your Home", prepared by the University of New Hampshire Cooperative Extension Service in conjunction with the Governor's Energy Office, could be distributed on a Town-wide level. Perhaps sending the pamphlet along with property tax bills would be the most feasible option of distribution. For more information please contact the local Cooperative Extension Office in Brentwood.

4. The Newton Conservation Commission should continue to work with owners of properties containing critical water resources to obtain such areas by gift, grant, or bequest, and/or obtain covenants or easements. This is a great way to protect environmentally sensitive lands at minimal cost to the community in terms of tax dollars. It is possible that the only costs associated with land protection efforts involving gifts, grants, bequests, and the establishment of covenants and easements would pertain to survey, legal, and recording fees.

Newton should make use of state and federal land acquisition programs as a means of protecting environmentally sensitive lands. Semi-public and regional organizations (such as the Society for the Protection of NH Forests, NH Audubon Society, and the Rockingham Land Trust) may also be helpful in this regard. As may be appropriate in certain circumstances, the Conservation Commission should consider including in the Capital Improvements Program recommended funding for acquiring land within critical resource areas. This strategy should be pursued when non-fee or easement acquisition efforts are unsuccessful.

5. Continue to appropriate money to the Conservation Commission's land acquisition fund to be used for the protection of land and water resource conservation areas. There are generally five different methods for protecting these areas:

- a) Land Purchase;
- b) Option of Right of First Refusal;
- c) Purchase and Resale;
- d) Bargain Purchase;
- e) Easements - Conservation Restrictions and/or Purchase of Development Rights

Conservation funds enable the Town to act on short notice when a valuable parcel of land is threatened. This land may be of critical importance for protecting significant wetlands, shoreland, wildlife habitat, or recreational areas.

6. The Conservation Commission should continue to work with people who own land having conservation potential by promoting the tax incentives associated with the donation of land or easement restrictions. The Current Use Assessment

- Program also provides tax abatements on parcels of 10 acres or more or on "natural preserves" of any size.
7. The Newton Planning Board should work with their counterparts in surrounding towns to promote land use planning practices which are mutually beneficial to protect common watersheds, wetlands, and aquifers. This is critical to the Country Pond area watershed and the developed areas around the Pond and the relationship with the Town of Merrimac, Mass and its well-field currently located very near the town of Newton, the protective radius crosses into the boundary of Newton. Newton may choose to develop inter-municipal agreements (pursuant to RSA 53-A) to protect these shared resources. RSA 4-C:23 authorizes agreements between municipalities to develop regional water resources management plans.
 8. Develop a program to reduce the amount of road salt used, especially in aquifer recharge areas. It should be recognized that the majority of this problem is from poor practices of the State in maintaining its roads within Newton. Thus, Newton should actively pursue changing the State practices in accordance within this plan. The following methods should be emphasized to the State and employed by the Town:
 - a) Emphasize mechanical snow removal;
 - b) Mix sodium chloride with calcium chloride and/or sand to reduce the total amount of sodium chloride applied;
 - c) Periodically re-calibrate salt spreaders so that they apply the correct amount of salt/sand mix; and
 - d) Post areas where reduced salting is practiced, encouraging drivers to reduce speeds and drive cautiously.
 9. Develop a program to inspect and maintain drainage control facilities, (e.g. catch basins and detention ponds, and culverts) throughout Town. If these devices become filled with sediment, they can no longer perform their function.
 10. The Town should consider developing an assistance program for the removal of underground storage tanks. Perhaps a pamphlet could be published which addresses the following items: tank placement and replacement, tank construction, leak detection methods, proper procedures for removal, and a description of the state program which offers limited financial assistance for tank removal and contamination remediation. The Town should coordinate its program with the Groundwater Protection Bureau of NHDES.
 11. In an effort to stay informed on the larger picture of overall watershed development, the Planning Board should ask to be put on the mailing lists for the agendas of the Plaistow, Merrimac (Mass), Kingston, South Hampton and East Kingston planning boards. In turn, the Newton Planning Board could send its monthly agenda to the above mentioned communities. This will help to keep the Planning Board informed on developments which may affect the Town's water resources. It will also go a long way towards inspiring inter-community communication and cooperation. Reviewing the agendas of abutting communities could be a monthly agenda item for the Planning Board.

12. Encourage farms to employ Best Management Practices (BMP's) as prescribed by the Soil Conservation Service. BMP's include storage of manure in concrete pits, and more efficient and better timed application of fertilizer and pesticides.
13. Develop a water quality data base for monitoring contamination events in both surface and ground waters throughout Town.
14. The Planning Board should be kept informed by the Rockingham Planning Commission regarding the availability and appropriateness of regional or State water resource data.

The costs of instituting these nonregulatory programs are expected to be variable, but relatively low. For example, any assistance provided by the Rockingham Planning Commission is either at reduced cost or no cost, as part of Newton's annual membership in the Commission.

Costs associated with land conservation efforts involving donations of land and easements would involve survey, legal, and recording fees. The outright purchase of these lands or the purchase of development rights would obviously entail substantially greater costs. Land conservation is discussed in greater detail in the Conservation and Preservation chapter of the Master Plan.

Household Hazardous Waste collection and disposal costs, which can be expensive even in a regional program, will likely be covered by the dues paid to the Southeast Regional Solid Waste District. Matching funds are available from the Waste Management Division of the NH Department of Environmental Services.

These nonregulatory programs could probably be carried out by existing voluntary and paid manpower. It should not be necessary to hire additional personnel to conduct or supervise any of these activities.

REGULATORY PROGRAMS

The Town of Newton enforces a zoning ordinance, a building ordinance (BOCA), excavation regulations, subdivision regulations, and site plan review regulations. All have been reviewed and found to contain provisions specifically pertaining to water resource protection.

All options for regulatory programs required by the Rules were considered, and the following new or revised regulatory programs are recommended in order to improve and/or enhance existing local water resource management and protection mechanisms. The first three are innovative land use controls as authorized by RSA 674:21.

1. An Aquifer Protection Ordinance should be adopted by Newton to protect aquifers identified on Map 6, "Aquifers and Wells". As explained in Section II, this information is from the USGS Aquifer Delineation Maps published in 1992.

The Planning Board, in consultation with the Conservation Commission, should decide which of the identified aquifer areas should be included in the overlay district.

The provisions of an aquifer protection ordinance could include a prohibition on potentially hazardous land uses, performance standards for compatible land uses, a limitation on the amount of a building site which could be covered by impervious surfaces (buildings, pavement, etc.), and provisions for retaining, treating and discharging of surface water runoff above the aquifer's surface. Assistance in preparing the ordinance can be obtained from the Rockingham Planning Commission.

2. As the Town has shoreland frontage, particularly along Country Pond, the Town should consider establishing a shoreland protection district and ordinance. In 1991, the State Legislature amended RSA 483-B to enable local communities to prepare and adopt shoreland protection districts. Such a district could include the Town's shoreland along its major watercourses and along other smaller brooks. Items to address in such an ordinance could include:

- a) Setbacks for buildings and septic systems;
- b) Cutting restrictions for timber removal;
- c) Minimum shoreland frontage requirements; and
- d) A prohibition on certain high risk land uses.

There are a variety of forms which a shoreland protection district could take. For more information on this subject, please contact the Rockingham Planning Commission, or obtain the "Model Shoreland Protection Ordinance" prepared by the NH Office of State Planning.

3. A Cluster/Open Space ordinance allows a development to concentrate a higher density of dwelling units in exchange for committing an adjacent area to be common open space in perpetuity. The Town could consider adopting a well-crafted ordinance so that development can be directed away from areas of high aquifer recharge, shorelands, flood zones and wetlands.
4. The Town's erosion and sedimentation control regulations in the subdivision regulations should be updated by the Planning Board to incorporate the provisions from the Rockingham County Conservation District's model ordinance. These regulations provide standards and guidelines for development planning, for the purpose of controlling erosion and preventing sediment transport to wetlands and streams.
5. Adoption of underground storage tank regulations under RSA 31:39 could be considered or amendments to the zoning ordinance, containing provisions on underground storage tanks. Newton should amend its zoning ordinance to contain a prohibition against installing underground tanks of less than 1,100 gallons that contain hazardous materials. The following requirements would be in addition to the State regulations for underground tanks larger than 1,100 gallons:
 - e) Require the removal of all abandoned tanks, regardless of size;
 - f) The Zoning Ordinance should be amended to require that underground storage tanks comply with relevant setback

requirements (especially the setbacks for wetlands and floodplains);

- g) Underground storage tanks should be prohibited as part of any aquifer protection district and ordinance.

The NH Water Resources Action Project has developed other such guidelines which Newton could use to develop and administer a local US regulatory program (source: "Guidelines for Controlling Underground Storage Tanks", Tools for Community Water Supply Protection, NH Water Resources Action Project, 1985, prepared by Sharon F. Francis, NH Natural Resources Forum, Sky Farm, Box 341, Charlestown, NH 03603).

6. A State septic system inspector will issue a permit for a system that has been evaluated (before covering) and found to operate properly. Newton should grant a certificate of occupancy only after this State permit has been received.
7. Amend the Zoning Ordinance to include a maximum coverage percentage for all lots. This would provide for surface runoff water to infiltrate into the ground and recharge local groundwater supplies.
8. Large subdivisions and the associated roads and drainage facilities can have a negative impact on the environment, including water resources. The Subdivision Regulations should be amended to require an environmental impact study for large subdivisions to insure that the damage to the environment is minimized.
9. During the planned comprehensive readoption, amend the Subdivision regulations as follows:
 - a) Promote the use of catch basins designed to trap oil and sediments;
 - b) Encourage road designs which require less use of de-icing chemicals (e.g. roads with minimal slope and/or turning radius, etc.);
 - c) Require that additional runoff created by a development be retained on-site and that no degradation of water quality shall occur. This will provide for groundwater recharge through the infiltration of retained water. This provision will also safeguard abutting properties from increased flows which can cause flooding and erosion damage.
10. The Newton Conservation Commission could consider presenting the already completed mapping and documenting of prime wetlands as authorized under RSA 483-A:7, and subsequently, recommend that their adoption as part of the Zoning Ordinance in accordance with RSA 675:3. The State of New Hampshire Wetlands Board is required to give special consideration to prime wetlands during their review of dredge and fill permit applications.
11. The Planning Board should consider amending the Wetlands Zoning Ordinance to incorporate the new wetlands delineation standards adopted by the NH Wetlands Bureau (in 1996) and federal agencies. Under this new method, wetlands are

delineated on the basis of hydrophytic vegetation, hydric soils, and wetlands hydrology, in accordance with the techniques outlined in the 1987 US Army Corps of Engineers publication Wetlands Delineation Manual, Technical Report Y-87-1 (January 1987), and the NEIWPC hydric soils book. Having a uniform wetland definition would eliminate the confusion that exists when there are two or three wetlands boundaries shown on a plan, each based on a different delineation method. The new method is widely accepted and is more scientifically defensible. Information about this new method is very new and available through the Office of State Planning (271-2155 - Francesca Latawiec). Newton may wish to wait until the OSP releases its new model ordinance to provide a starting point for this effort.

Generally, the cost of preparing proposed amendments to regulations and ordinances is minimal. Technical assistance can be provided at low or no cost by the Rockingham Planning Commission or the Rockingham County Conservation District. There would be some expense involved with complying with the statutory requirements for the publication of hearing notices. The Town should not need to hire any personnel for the preparation of the proposed amendments to regulations and ordinances.

Since the goal of the surface and groundwater portions of this Plan is to assure that local land use decisions resulting from this planning process are based upon the most comprehensive and reliable scientific and technical information available, it is important that all implementing ordinances and regulations should include:

- (1) a process which allows applicants for local approvals to present documented scientific and technical information which differs from the information used to prepare this Plan; and
- (2) the implementing ordinances and regulations should also include mechanisms which will enable local decision makers to consider the scientific and technical information submitted by the applicants prior to making a final decision.

SUBDIVISION REGULATIONS

If the Newton Subdivision Regulations undergo a comprehensive rewrite, particular attention should be paid across the board to water resource issues. There are many helpful documents to assist in this effort, from the Rockingham Planning Commission, Rockingham County Conservation District, and the Office of State Planning. Due to the extensive treatment of this issue throughout this plan and the scale of the revision any further comment is not appropriate.

SITE PLAN REVIEW REGULATIONS

These Regulations have recently undergone comprehensive rewrite, and are the most up to date in the entire region. This also includes issues of erosion and sediment control. Monitoring of trends and science should be done in order to maintain the quality of these regulations.

EXCAVATION REGULATIONS

The Excavation Regulations govern all mining and excavation operations and require a permit from the Planning Board prior to operation. Provisions of these regulations relating to the protection and management of water resources are summarized below:

HEALTH ORDINANCE

Although the Town of Newton does not have a separate health ordinance, there are ordinances and regulations for septic system design that pertain to public health. The Board of Selectmen or the Planning Board should study whether such an endeavor is necessary. Particular attention should be paid to the continuing safety and health of Country Pond.