Chapter 2: Topography, Soils, and Water

Goal: To protect the quality of water resources by management of the Town of Clinton's sources to include lakes, ponds, rivers, streams, aquifers, and public water supplies from vulnerability and degradation.

Purpose: To provide an overview of the current state of water resources inventory.

Overview: The Town of Clinton consists of approximately 24,746 acres or 38.67 square miles. The topography is characterized by gently rolling hills interspersed with numerous streams and wetlands and mostly forested. The Kennebec River forms the Town's western boundary. The Sebasticook River forms a portion of the Eastern boundary providing an important riverine environment. The Town does not contain any lakes or ponds, however, numerous streams and both open land and forested wetlands can be found throughout the community. Most development is located adjacent to existing town roads. Rear land areas provide habitat for wildlife.

The Topography: The topography of the town is a result of events that occurred during the last ice age. Ancient oceans extended over parts of the State and glaciers scraped, scoured, and coated other areas with glacial tills, sands, and clay. In Clinton, glaciomarine deposits that accumulated on the floor of the ancient ocean or that were deposited by glacial meltwater as it entered the ocean, are found in a wide band along the Kennebec River, Twelve Mile Brook, and the Sebasticook River. These areas are generally flat to moderately sloping except in areas deeply dissected by modern streams. The central and northeasterly portions of the town consist of glacial till which is a heterogeneous mixture of sand, silt, clay, stones, and sometimes boulders. The ridges in these areas have a north-south orientation which is a result of the flow of glacial ice. Two eskers, one associated with Twelve Mile Brook, and another extending along Gustafson Road, Hinckley Road, and the Tardiff Road dissect the Town. Eskers consist of individual or multiple ridges that were deposited by meltwater streams flowing in tunnels within or beneath the glacial sheet. See Map 2-3, Topography.

Soils: Knowledge of the types of soils which exist in a community helps in planning land use activities. The various characteristics of soil types present different limitations for development which can often be overcome through special planning, design, construction, and/or maintenance. See Map 2-1 obtained from Kennebec County Soil and Water Conservation District and Soil and Map 2-1-1 and Map 2-1-2 Survey Legend for Kennebec County, Maine from the USDA's Natural Resources Conservation Service.

According to the Soil Survey, there are five soil associations (major soil types) located in Clinton. Associations are groups of different soil types that usually occur together. Each association has major and minor soils within it. Table 2-1 describes each of Clinton's five associations.

Table 2-1
Soils Association and their Characteristics
Source: Soil Survey of Kennebec County, Maine, U.S.D.A.

Association Description	Uses/Limitations
Hollis-Paxton-Charlton-Woodbridge Association: Shallow and deep, somewhat excessively drained to moderately well drained, gently sloping to moderately steep, moderately coarse textured soils; on hills and ridges.	These soils are mainly in woodland, but many areas are farmed and used for other purposes. The well drained Paxton and Charlton soils are suited to cultivate crops, orchards, and other intensive uses. The Woodbridge soils have some limitations for both farm and non-farm uses. Many orchards and dairy farms are located on this soil association.
Buxton-Scio-Scantic Association: Deep, moderately well drained to poorly drained, nearly level to sloping, medium textured soils; in flat areas and near waterways.	The soils in this association are used mainly for hay, pasture, or woodland. Wetness and permeability are the major limitations to use for cultivated crops and septic tank absorption fields. Supplemental drainage and erosion control are the major concerns of management.
Hinckley-Windsor-Deerfield Association: Deep, excessively drained and moderately well drained, nearly level to moderately steep, coarse textured and moderately coarse textured soils; mainly on outwash terraces and plains.	Most of this association is woodland. Many areas are a source of gravel and sand which can be used for construction materials.
Scantic-Ridgebury-Buxton Association: Deep, poorly drained to moderately well drained, nearly level to sloping, medium textured soils in valleys and moderately coarse textured soils in flat areas or depressions on upland ridges.	Some areas of these soils are in grassland, but most of the association is in woodland.
Monarda Association: Deep, poorly drained, nearly level, medium textured soils; on smooth, low, upland ridges.	Most of this association is in woodland. Some areas have been cleared of surface stones and drained for use as hay land and pasture.

Soils and Development Constraints: Wetlands, as their name indicates, have water at or near the surface during all or most of the year. Wetlands have soils that are saturated or have very high seasonal water tables. Wetlands are protected resources and are not suited for development. Hydric soils are not suitable for development. Most of the hydric soils are located near wetlands, streams, and often are forested. Trees and plants growing in hydric soils are species that can survive with high water tables. Forested wetlands are often identified by the types of plants that can live in soils with low oxygen levels. Some pasture and hay fields can consist of hydric soils, however, they are often wet during the spring and after periods of heavy rainfall. Areas identified with hydric soils have severe development limitations. However, pockets of different soil types may be found within a hydric soil area. These pockets may be suitable for development depending upon their size and drainage characteristics.

Some of these below conditions may make construction difficult and expensive:

- Various soil characteristics, such as depth to water table, depth to bedrock, flooding potential and erosion potential can affect utilities and cellar foundations.

- Poorly drained soils (9-18 inches depth to water table) place severe limits on the use of the land. Frequent fluctuations in water level as well as frost heaving can be damaging to buildings, roads, and the proper functioning of septic systems. One of the most limiting characteristics is depth to water table. These limitations can, however, sometimes be overcome through special design and maintenance.

- Moderately well drained soils (18-30 inches to water table) have less severe limitations on land uses, and deep, well drained soils present few problems. The latter have a depth greater than 30 inches to water table.

- The Monarda Association is identified as poorly drained while the Buxton-Scio-Scantic and Scantic-Ridgebury-Buxton Associations are moderately well drained to poorly drained. The Hollis-Paxton-Charlton-Woodbridge Association is moderately well drained and the Hinckley-Windsor-Deerfield Association is excessively to moderately well drained.

- The depth to bedrock has limitation to construction. Areas with shallow depths to bedrock in Clinton are characterized by Lyman or Hollis soils. These soils generally have depths to bedrock that range from six to thirty inches. Utilities, roads, cellars and septic systems can be difficult and expensive to build when depth to bedrock is less than twenty inches.

Riparian Areas and Surface Water: Riparian Areas are areas adjacent to rivers, streams, and wetlands that provide valuable resources for wildlife and help to protect the waterbody. The trees and other vegetation along the water body help to buffer the resources from erosion. They provide a canopy to help keep the waters cool for many cold water fish species.

Associated Riparian Areas: The Kennebec and Sebasticook Rivers define the east and west boundaries of the town. The land area between the rivers consists mostly of a level plane that contains most of the town's development and agriculture operations. In the past, the rivers provided the town with many resources including fish, ice, transportation for logging, and power generation. Since the passage of the Clean Water laws, the water quality in both rivers has improved significantly and improvement should continue. Both water bodies are used for many recreational pursuits.

The Carrabassett Stream runs through the northwest and into the Kennebec River. Beaver Brook runs through the south to the Sebasticook River. Twelve Mile Brook runs through the center of Clinton to the Sebasticook River. The streams have many associated wetlands and provide a valuable habitat for waterfowl and other species. Each of these waterbodies provides a valuable environment for wildlife and plants. Surface waters travel to the larger waterbodies.

Wetlands: Wetlands are located throughout the town and can usually be found near waterbodies. Wetlands exist when an area is poorly drained and has a high water table at or near the surface, and can cover areas of open water, forests, or fields. The soils are saturated and are lacking in oxygen which in turn provides an environment for a special group of trees, shrubs, and grasses. Wetland identification consists of looking for the following three (3) conditions:

1. The presence of hydric soils; usually dark in color, consists of silt or muck.

2. The presence of mostly wetland type vegetation; plants that live in an environment lacking oxygen, saturated in water.

3. The presence of water of a high water table; water could be at the surface only seasonally.

Wetlands are essential breeding habitat for waterfowl, amphibians, fish, and some mammals. They also provide forage and protective cover for other wildlife species. Wetlands are home to many plant species that cannot be found anywhere else. They serve as a sponge retaining floodwaters and protect water quality by filtering pollutants out of aquifer recharge areas.
The Shoreland Zoning protects non-forested wetlands over 10 acres and the State regulates other wetlands from development. The Water Resource Map 2-2 shows wetlands greater than 10 acres. Other smaller wetlands can also be found throughout the town especially near streams.

Aquifers: Two significant aquifers lie at least partially within Clinton's borders. One crosses the Benton line in the south on the Sebasticook River. The other lies across the Kennebec River into Fairfield. The aquifers are shown on the Water Resources Map 2-2. The two sand and gravel aquifers were identified by the Maine Geological Survey. In Clinton, these aquifers have the potential for moderate to good ground water yield. Both the aquifers run north to south. One is located towards the east and one is located towards the west. Portions of the westerly aquifer are rated as having good to excellent potential ground water yields. The Clinton Water District's well heads are located in the south easterly aquifer.

Groundwater: Water, which saturates the soil and bedrock, is called ground water. The rate at which water percolates into the ground depends upon the porosity of both the soil and bedrock. Groundwater levels vary depending upon the season and precipitation. Groundwater flows similar to surface water and is influenced by the type of parent soil or bedrock. Groundwater resources are important for Clinton because the majority of the town's land area is dependent upon wells to supply portable water. Likewise, some of the town is also dependent upon subsurface wastewater disposal systems. Clinton can protect the Town's groundwater resources by some of the following:

- Protecting the Aquifers from inappropriate development.
- Monitoring well quantity and quality issues.
- Replacing malfunctioning subsurface wastewater systems.
- Protecting wetlands and other waterbodies from erosion and contamination.
- Continue to regulate extraction operations such as sand and gravel operations.
- Direct certain commercial operations into the parts of the town served by municipal water and sewer.

Watersheds: Clinton's watershed generally runs north to south and feeds three major north to south water bodies, the Kennebec River, Sebasticook River and Twenty Mile Stream. The Water Resources Map 2-2 shows the watershed areas.

Shoreland Zoning: The town has adopted a Shoreland Zoning and Subdivision Ordinance, which regulates certain waterbodies and the land surrounding these water sources The Code Enforcement Officer maintains a Shoreland Zoning map showing the Shoreland Zoning Districts in the town office. The current map, however, may be revised in the future to conform to State regulations and Town needs. Areas within 250 feet of the Kennebec River, Sebasticook River, Twenty Mile Stream, and non-forested wetlands greater than 10 acres are regulated. An area within 75 feet of brooks and certain other streams are also regulated.

The regulations impose water body setbacks and contain rules to protect water quality and control erosion. The Shoreland Zoning Ordinance does not regulate all waterbodies in town. Small streams, forested wetlands, and wetlands under 10 acres are not covered by the ordinance.

Wastewater Treatment Facility and Infrastructure: The Town of Clinton's public wastewater system consists of five pumping stations and mirrors the water system's coverage in the village area. The two lagoons, located on Old Leonard Wood Road, are operated in a series and cover approximately 26 acres and are approximately five feet deep. Rural private residential septic tank waste is pumped by local for hire vacuum trucks with a portion of the fee covering disposal at an approved site.
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Salt/Sand Pile: Clintons maintains a salt/sand pile storage building which is collocated with the transfer station located on Old Leonard Wood Road. This salt/sand pile is located more the Two miles from the nearest aquifer. The town contracts sweeping of roads, sidewalks, and public streets in the village area in the spring of each year.

Issues:

The railroad could be a potential source of pollution due to hazardous materials spills.

How do we address water conservation? Whose duties will conservation be? A significant part of the town depends upon wells for potable water.

There are a number of junk car violations throughout the town, which could pose a threat to the environment.

Take enforcement measures where appropriate and review our local ordinances to protect the town's water quality resources.

Policies: Minimum policies required to address state goals:

(1) To protect current and potential drinking water sources.

(2) To protect significant surface water resources from pollution and improve water quality where needed.

(3) To protect water resources in growth areas while promoting more intensive development in those areas.

(4) To minimize pollution discharges through the upgrade of existing public sewer systems and wastewater treatment facilities.

(5) To cooperate with neighboring communities and regional/local advocacy groups to protect water resources.

Strategies: Minimum strategies to meet state goals:

(1) Adopt or amend local land use ordinances as applicable to incorporate stormwater runoff performance standards consistent with:

a. Maine Stormwater Management Law and Maine Stormwater regulations (Title 38 M.R.S.A. §420-D and 06-096 CMR 500 and 502).

b. Maine Department of Environmental Protection's allocations for allowable levels of phosphorus in lake/pond watersheds.

c. Maine Pollution Discharge Elimination System Stormwater Program

(2) Consider amending local land use ordinances, as applicable, to incorporate low impact development standards.

(3) Where applicable, develop an urban impaired stream watershed management or mitigation plan that will promote continued development or redevelopment without further stream degradation.

(4) Maintain, enact or amend public wellhead and aquifer recharge area protection mechanisms, as necessary.

(5) Encourage landowners to protect water quality. Provide local contact information at the municipal office for water quality best management practices from resources such as the Natural Resource Conservation Service, University of Maine Cooperative Extension, Soil and Water Conservation District, Maine Forest Service, and/or Small Woodlot Association of Maine.

(6) Adopt water quality protection practices and standards for construction and maintenance of public and private roads and public properties and require their implementation by contractors, owners, and community officials and employees.

(7) Participate in local and regional efforts to monitor, protect and, where warranted, improve water quality.

(8) Provide educational materials at appropriate locations regarding aquatic invasive species. For response, see Section 2, Chapter 3 of this plan.

Chapter 2, Topography, Soils, and Water
Issues identified by the Comprehensive Planning Committee with Strategies:

Issue	Strategies	Responsibility	Action Party	Coordinator	Implementation
Issue 2-1 Take enforcement measures where appropriate and review our local ordinances to protect the town's water quality resources.	The Planning Board is responsible for drafting and proposing amendments to the Water Quality Resources Ordinances	Selectmen	Planning Board and Clinton Water District	Town Manager	Start 2025
Issue 2-2 Determine if railroad and highway transportation are possible sources of pollution.	Develop training for Police, Fire and Emergency Management Departments in response to Hazardous Materials spills.	Town Manager	Clinton Emergency Management Director	Kennebec County Emergency Management Director, Maine Department of Environmental Protection	Start 2022
Issue 2-3 Reduce the amount of junk car violations that post a threat to the environment	Enforce and/or review current ordinances to reduce risk	Selectmen	Code Enforcement Officer	Code Enforcement Officer	Ongoing