

## **Town of Wells 2021 Comprehensive Plan Update** **Chapter 3 Update – Natural Resource Policies and Strategies**

### **Appendix A Inventory and Analysis** **Section 2 Update – Water Resources**

#### **How to Read this Document:**

The consultants hired to work with the Town of Wells are committed to a transparent planning process and aim to comply with the Town of Wells Chapter 12 Ordinance and other state requirements. To clearly show what has been updated from the 2005 Comprehensive Plan, “tracked changes” was used to show what has been deleted from the 2005 section, new information that has been added, and clarifying questions and comments. New language and data are shown in **red**. Deleted language is shown with a **strikethrough in red**. Old tables are shown with a **red-strikethrough** and new tables of information were inserted. Questions and comments are shown in **purple**. Please note that the analysis sub-section at the end of each updated Appendix section will be reviewed again once all sections are updated. Cross-referencing sections will help the consultants better revise these analysis findings.

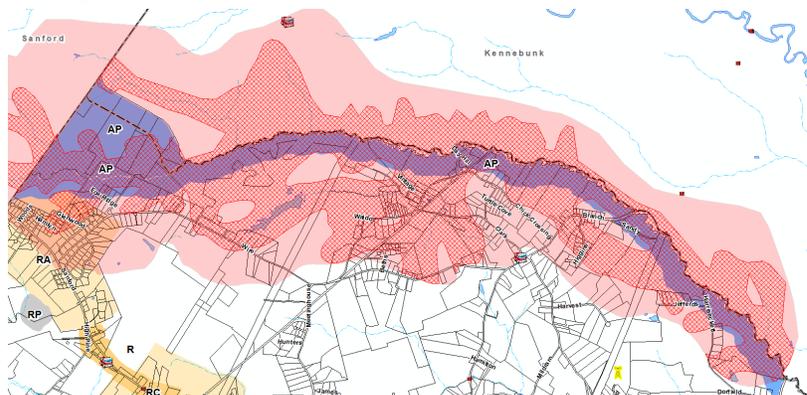
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### Key Findings:

- Reorganize chapter sections. Currently, "Water Resources" and "Marine Resources" are not included under "Critical Natural Resources". Recommend reorganizing to include these sections under "Critical Natural Resources" **OR** move "Flood Hazards" and "Marine Resources" into a "Water Resources" section with the current "Water Resources" included as "Freshwater Resources".
- Depot Stream, Pope Creek, and the Unnamed Stream at the I-95 Exit 19 tributary to Webhannet River are listed as threatened due to highway access-related development. The watersheds for these streams are not protected by the Town.
- Incorporate climate change, sea level rise, and groundwater inundation. No mention of climate change on water resources. Sea level rise will be addressed in the "flood hazards" section. Included a groundwater inundation section here.
- Extend aquifer protection zone around Branch Brook. In conversations with the Kennebunk-Kennebunkport Wells Water District, we were alerted to the need to extend the Aquifer Protection zone around the Branch Brook Aquifer. These should be updated using groundwater well modeling rather than a surface water buffer. Recommended buffers from the KKWWD are shown on the map below (100-day travel zone in the red hatch and 2500-day travel zone in the solid red).



# Chapter 3 - Natural Resources Policies and Strategies

## Introduction

The Comprehensive Plan’s Natural Resources Policies and Strategies describe goals, policies, standards, and implementation strategies related to the protection, conservation and development of Wells’ natural resources.

Natural resources contribute to defining a community’s unique character. Wells’ natural resources provide residents with a rich quality of life and many recreational opportunities. Natural resources are also an important consideration in estimating the Town’s capacity for growth and development potential. Natural resources can provide both opportunities and constraints for growth. For example, steep slopes and wetlands are inappropriate for development while better drained, flatter areas are generally considered more suitable for development. The natural resource base of Wells is an important factor in determining local land use decisions. See Appendix A for an analysis of Wells’ natural resources.

## Goals

### State Goal:

1. Protect the quality and manage the quantity of the State’s water resources, including lakes, aquifers, great ponds, estuaries, rivers, and coastal areas. (Growth Management Act)
2. Protect the State’s other critical natural resources, including without limitation, wetlands, wildlife and fisheries habitat, sand dunes, shorelands, scenic vistas, and unique natural areas. (Growth Management Act)

### Regional Goal:

Maintain and, where possible, improve the quality of our natural environment through actions that manage resources as a system rather than as local segments.

### Wells Goals:

1. Assure the Town's natural features, including the marshes and wetlands, beaches, aquifers, critical wildlife habitats, and floodplains, that are truly environmentally sensitive areas and create a truly outstanding, but fragile, environment are protected from damage and preserved for future generation.
- ~~2.~~ Enhance the Town’s programs for protecting sensitive, natural resources through regulatory and non-regulatory mechanisms.
- ~~2.3.~~ Identify areas susceptible to the negative effects of climate change such as sea level rise, storm surge flooding, etc., as well as areas of flood mitigation and floodwater storage.
- ~~3.4.~~ Support programs for acquiring key land areas of environmental concern to provide for the

protection of these resources, while compensating the property owner.

5. Work cooperatively with federal and state environmental regulators to enforce regulations that protect the Town and region's natural resources.
- 4.6. Develop land use controls that encourage these areas to be protected and permanently set aside as land development occurs.
- 5.7. Protect the Branch Brook aquifer from potential sources of contamination by controlling land use in this area and maintaining the availability and quality of other existing and potential water supplies.
- 6.8. Allow the removal of mineral resources such as sand and gravel in a manner which minimizes the impact on these areas and surrounding neighborhoods, provides for the reclamation of these sites, and protects the groundwater from contamination.
- 7.9. Protect, manage, and support natural ~~resource-based~~ resource-based enterprises such as agriculture, forestry, and mineral extraction.
- 8.10. Place high value on the protection and long-term management of and education about the Town's ecological systems including soils, surface and ground water, wetlands, beaches, natural vegetation, and wildlife. The natural environment should be used as a guide to manage future growth recognizing that Wells' natural systems provide opportunities and constraints for both conservation and development.
- 9.11. Assure ocean beaches continue to be a community resource.

## **Policies**

To achieve these goals, it is the policy of the Town of Wells to:

### **General**

1. Encourage the use of environmentally sensitive areas and critical habitats in a manner that does not jeopardize the environmental value of their resource.
2. Allow the removal of mineral resources such as sand and gravel in a manner that minimizes the impact on these areas and surrounding neighborhoods, provides for the reclamation of these sites, and protects the groundwater from contamination.

### **Beaches**

1. Assure public access to the beaches for both residents and tourists while protecting the livability of the beach neighborhoods.
2. Manage the beaches in cooperation with property owners to control overuse, provide necessary facilities, and promote a wholesome family environment.
3. Maintain and protect the physical quality of the beach systems through activities

such as cleaning, stabilization, and sand replenishment.

4. Improve pedestrian, bicycle, and local transit access to the beaches.
5. Create transportation links (e.g. ferries, bridges, etc) between the Harbor, Wells Beach, and Drakes Island.

### **Groundwater**

1. Protect the quality of the groundwater in the Branch Brook Aquifer and in the Town's other sand and gravel aquifer areas that can be used for high volumes of domestic use by implementing and enforcing regulations that control the use, handling, and storage of hazardous materials.
2. Protect the quality of the groundwater in areas not served by public water and sewer by ensuring existing nitrate standards set by the Maine Department of Environmental Protection are enforced and ensuring proper inspections of all septic system installations.

### **Surface Waters**

1. Protect surface water quality by aggressively managing point and non-point source pollution including stormwater discharge.
2. Cooperate with surrounding communities and environmental non-profit groups to minimize the potential for surface water pollution by inappropriate uses or activities.

2.3. Establish a long-term monitoring program of surface waters in the Town with monitoring sites along Branch Brook, Depot Brook, Green Brook, Merriland River, Stevens Brook, and Webhannet River

### **Wetlands**

1. Protect and maintain the valuable functions of tidal and freshwater wetlands by minimizing the impact of development and allowing appropriate uses such as low impact recreation, wildlife habitat and limited, controlled timber harvest.
2. Ensure protection of high value wetlands including vernal pools, through regulatory and non-regulatory implementation programs and place high value on these resources when designating growth and rural areas in Wells.

### **Soils**

1. Base the density of development in areas outside public water and sewer service on the assimilative capacity of soils to accommodate onsite waste water systems. No lot size shall be less than 20,000 square feet if not on sewer and water if the Maine State Code changes.

### **Wildlife and Fisheries**

1. Ensure the long-term protection and enhancement of Wells' valuable wildlife habitat and fisheries through the use of regulatory strategies and ~~out-reach~~ outreach to governmental and non-profit organizations involved with natural resource protection and management.

### **Floodplains**

1. Manage floodplain areas to ensure the safety and welfare of those individuals with properties in such areas.
2. Maintain and update comprehensive community flood hazard management policies and strategies. (See Chapter 15 and the Appendix).
3. Ensure the long-term protection and enhancement of Wells through the use of regulatory strategies and ~~out-reach~~outreach to governmental and non-profit organizations involved with natural resource protection and management.

### **Education**

1. Work with schools to promote education of environmental sciences and ecology.

### **Standards**

To achieve these policies, the following are Town of Wells' standards to guide development:

1. Existing Land Use, ~~and~~ Subdivision, Floodplain Management, Hazardous Waste, Septage Effluent Disposal, and Solid Waste Ordinances.

### **Implementation Strategies**

#### **Beaches**

1. Appoint a Committee to recommend specific implementation programs to assure public access to beaches, manage beach use, protect the physical quality and create transportation links.
2. Establish a graphic inventory of all sand dunes on the Town's Geographic Information System (GIS) and update as new data becomes available. Ensure that any landowner with property on a sand dune obtain any necessary State permits prior to obtaining any local permits.

#### **Groundwater**

1. Revise the Aquifer Protection District of the Land Use Ordinance to incorporate a two-tiered zone for the Branch Brook Aquifer based on maps prepared by the Kennebunk, Kennebunkport, and Wells Water District (KKWWD) and adopt use and quality standards as identified in the Aquifer Protection section of the Land Use Policies and Strategies.
2. Work with the KKWWD to acquire key parcels of land with high value for ground water protection and aquifer recharge through fee simple acquisition or conservation easement.
3. Review the Aquifer Protection provisions of the Town's Land Use Ordinance to determine whether or not there is sufficient protection of the groundwater in the Town's sand and gravel aquifer areas. Where appropriate implement and enforce regulations that control the use, handling and storage of hazardous materials in these areas.
4. Establish a program to ensure there is proper inspection of all septic system installations

and monitor the performance of septic systems in/or adjacent to Resource Protection and Conservation Areas.

5. Maintain the current buffer around surface water bodies and wetlands in the Land Use Ordinance to prohibit septic systems and other uses with the potential to contaminate both the groundwater and the groundwater/surface water interface.

~~5-6. Enact public wellhead and aquifer recharge area protection mechanisms as necessary.~~

### Surface Waters

1. Continually integrate the State of Maine Guidelines for Municipal Shoreland Protection, as may from time-to-time be revised, into the local land use regulations.
2. Revise local subdivision and site plan review regulations, where necessary, to require low impact development standards, stormwater management, erosion and sediment control and landscaping, ~~including a reference to a suitable guidance document that requires currently accepted Best Management Practices such as the *Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices* by the Cumberland County Soil and Water Conservation District, 1991 or *Better Site Design: A Handbook for Changing Rules in Your Community* by the Center for Watershed Protection, 1998. standards consistent with: (1) Maine Stormwater Management Law and Maine Stormwater regulations (Title 38 M.R.S.A. §420-D and 06-096 CMR 500 and 502). (2) Maine Department of Environmental Protection's allocations for allowable levels of phosphorus in lake/pond watersheds. (3) Maine Pollution Discharge Elimination System Stormwater Program"~~
3. Continue local subdivision and site plan review regulations to provide for municipal inspection and enforcement of:
  - Erosion and sediment control plans.
  - Post-construction maintenance and operation plans, particularly for major developments or developments deemed by the Planning Board to have potential negative impacts to valuable natural resource or Resource Protection Areas.
4. When and where applicable, develop an urban impaired stream watershed management or mitigation plan to promote continued development or redevelopment without further stream degradation.
5. Continue the cooperative relationship with the Wells National Estuarine Research Reserve to expand the water quality monitoring program with annual monitoring results and analysis made available to the Town.
6. Establish a process with adjacent communities to ensure the maintenance of water quality standards for surface waters that occur in more than one community such as Branch Brook, ~~and~~ the Merriland River, and the Ogunquit River.

7. Ensure that the water quality of Ell Pond is not degraded by working with the Town of Sanford to implement a consistent set of standards for water quality protection
8. Amend Town ordinances to require a timber-cutting plan and permit.
9. Work with the DPW to integrate water quality protection into their daily operations including the storage of sand and salt, culvert replacement, street sweeping, and garage operations.
10. Adopt or enhance water quality protection practices and standards for construction and maintenance of public and private roads and public properties that require their implementation by contractors, owners, and community officials and employees.
11. Obtain a description of each pond, river, and drinking water supply with the description of ecological value, threats to water quality or quantity with specific location(s) of threats, and documented water quality, a summary of present and past monitoring activities, and/or invasive species problems from the Department of Inland Fisheries and Wildlife and/or the Department of Environmental Protection.
12. Minimize pollution discharges through the upgrading existing public sewer systems and the wastewater treatment facility.
- 7.13. 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. Provide educational materials at appropriate locations regarding aquatic invasive species if applicable.

### **Wetlands**

1. Establish a committee to review and assess the quality of current wetland management within Wells and, if deemed appropriate, establish guidelines for a local wetland regulation. If appropriate, base the regulation upon a classification system that incorporates hydrology, vegetation and wildlife and a definition that is consistent with current state and federal wetland regulatory programs. Report findings to the Board of Selectmen within six months of establishing such committee. Wetland guidelines should ensure that any definition be consistent with current state and federal wetland regulatory programs.
2. Establish a program to identify, prioritize and protect high value freshwater wetlands and land containing vernal pools. Protection should occur through regulation, education and cooperation, purchase or conservation.

### **Wildlife and Fisheries**

1. Identify and protect through the timber harvesting plan and permit, site plan and subdivision approval process, those areas of land designated by the Maine Department of

Environmental Protection (MDEP) as “significant wildlife habitat. These areas should be revised based on MDEP updates and revisions of these habitat areas and performance standards.

2. Retain the currently designated buffers along rivers and streams in the Town’s Land Use Ordinance to maintain the quality of these areas for wildlife and fishery habitat.
3. Within areas of Wells designated as Rural Use, seek to maintain large parcels of unfragmented lands and to ensure that wildlife habitats are connected by travel corridors through both regulatory and non-regulatory means.
4. Require all applications for subdivision, site plan review and timber harvesting to investigate and map the presence of any significant wildlife habitat and habitat for state rare or endangered species that may not have been previously mapped, such as vernal pool areas of the Tatnic Hills that provide habitat for Blandings and spotted turtles and as established by the State of Maine on the site. Obtain necessary state approvals as a condition of subdivision plan and /or site plan approval.
5. Work cooperatively with Maine Inland Fisheries and Wildlife to manage and protect high value habitat and areas for significant habitat and rare and endangered species.
6. Work with landowners with high value habitats on their property to protect these areas through education and cooperation, conservation and easements or purchase through a land holding entity.

#### **Forest Resources**

1. Amend Town ordinances to ensure a timber-cutting permit is obtained prior to cutting.

#### **Floodplains --See Chapter 15-Flood Hazard Mitigation Policies and Strategies**

1. Continue to manage the use and development of the Town’s inland flood hazard areas in accordance with state and federal standards.
2. Update current flood hazard standards and maps to be consistent with federal guidelines and the recommendations of the Flood Hazard Mitigation Policies and Strategies.

## Section 2 – Fresh Water Resources

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**\*Consider reorganizing the layout of the Appendix A to place Freshwater resources and Marine Resources under “Critical Natural Resources” as well.**

### Watersheds

Wells is divided into four major watersheds, the Little River, The Webhannet, the Ogunquit and the Works. The Little River Watershed is made up of two sub-basins, the Branch Brook Watershed and the Merriland River Watershed. Similarly, the Ogunquit Watershed contains two sub-basins, the Ogunquit River Watershed and the Stevens Brook Watershed.

Watersheds and the watercourses within them represent the natural drainage pattern that carries precipitation from the land to the Atlantic Ocean. This natural drainage system can be affected adversely by the following:

- reduction in the ability to accommodate stormwater through filling, channelization or siltation; or
- creating higher than natural stormwater flows as the result of increased impervious surfaces.

The 1990 Comprehensive Plan fully describes the characteristics of each watershed. Below is an updated summary.

#### Little River Watershed

This watershed includes both the Branch Brook Basin and the Merriland River Basin, which drain the northern portion of Wells. ~~The~~ Branch Brook serves as the main water supply for the Kennebunk, Kennebunkport, and Wells Water District. Over the past ~~10-15~~25-30 years there has been residential development in this area. ~~There has also been a golf course approved in the Branch Brook Basin.~~ The Merriland Basin remains in low-density development, although there is continued pressure for additional residential development.

#### Great Works River Watershed

This watershed drains the west central portion of the Town and includes Perkins Brook and West Brook, both of which are ~~is a~~ tributaries of the Great Works River in North Berwick. The Heath is the headwater of this watershed. Much of the Town’s gravel extraction takes place within this watershed and there continues to be new residential development.

#### Webhannet River Watershed

This coastal watershed drains the east central portion of Wells through Depot Brook, Blacksmith Brook and other smaller tributary watercourses. This watershed includes most of the Town’s coastal marshes and is also the most intensively developed including the Route 1, Route 109 and Route 9 Corridors. The Webhannet River originates near Bear’s Den Road and continues about

three miles to its estuary. On its way to the estuary, the Webhannet River now flows to the south of a new residential development (built along Clubhouse Rd) and through the Old Marsh Country Club and golf course. The portion of river through the golf course contains a vegetated buffer. There is an approved but unbuilt golf course with frontage on both sides of the river. Also, the DEP has mandated significant protection in the area near the Wells Transportation Center and where the Turnpike crosses the Crediford Brook. Over 8% of the Webhannet watershed is covered with impervious surfaces, the greatest percentage of all watersheds within Wells.

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### Ogunquit River Watershed

This watershed incorporates two sub-basins, the Ogunquit River and Stevens Brook, and includes Green Brook and Bragdon Brook. It drains the southern portion of Wells. Much of the northerly divide is contiguous with Route 9/9B. The eastern part of the watershed is intensively developed along the Route ~~One~~ 1 Corridor, while the western portion is relatively undeveloped with a scattering of residential uses.

## Surface Waters

The streams and rivers identified in the watershed section comprise the major freshwater surface waters in Wells. Hobbs Pond, an impoundment in the Merriland River, is the only sizeable pond solely within the Town. The Hobbs Pond dam is privately owned and the owner would legally be able to remove the dam, though there are no plans to do so. A second pond, Ell Pond, is smaller and straddles the Wells-Sanford town line.

As described in the previous Comprehensive Plan, the State of Maine has established a system of classifying the waters of the state into water quality classes from Class AA (the highest water quality) to Class C (the lowest water quality). Marine waters are classified into three categories from SA (the highest) to SC. Based upon this classification system, each designated water body should meet the standards for each category. ~~The Maine Department of Environmental Protection monitors water quality throughout the state. In its *State of Maine 1994 Water Quality Assessment*, (the most recent available), no streams or ponds in Wells were listed as not attaining the standards of their water quality classification.~~

In Wells there are no Class AA water bodies. The freshwater sections of the Branch Brook and Merriland River are classified as Class A, meaning they are suitable for drinking water with proper treatment. The remaining streams and rivers are classified as Class B including the Webhannet River, Depot and Blacksmith Brooks, Stevens and Bragdon Brooks, the Ogunquit River and its tributaries including Green Brook and Perkins and West Brooks and their tributaries.

All of Wells marine and estuarine waters are Class SB including the tidal portions of the Webhannet and Ogunquit Rivers and the Blacksmith, Depot, Stevens and Bragdon Brooks.

The Maine Department of Environmental Protection (DEP) monitors water quality throughout the state although individual towns may opt to create their own long-term water quality monitoring programs to expand upon monitoring by the DEP. Streams that are classified as threatened by the ME DEP indicate the stream unimpaired, but is subject to potential impacts of non-point source pollution. Streams classified as impaired indicate the stream does not support its designated use due to the quality of its water.

In its *State of Maine 2016 Integrated Water Quality Monitoring and Assessment Report*, Stevens Brook (ME0106000303\_624R01, Class B) has been listed as impaired by pollutants other than those listed in 5-B through 5-D therefore requiring a TMDL (although listed as a low priority). Other impaired streams which contain unimpaired headwaters in Wells such as West Brook (North Berwick), the Ogunquit River (Ogunquit) to Webhannet River (Wells), Little River (Wells) to Cape Arundel (Kennebunkport), are listed as impaired for various reasons.

To achieve the goals of the Clean Water Act, the EPA and each state have implemented a variety of programs to establish surface water quality standards, assess the condition of water, control nonpoint source pollution, regulate point source discharges, and protect source waters, estuaries, oceans, and wetlands. The State of Maine DEP is responsible for administering the Nonpoint Source (NPS) Priority Watersheds Program that was enacted into law in 1997 (5 MSRA 3331(7)) to develop a comprehensive watershed protection program. As part of this program in 1998 DEP conducted a Unified Watershed Assessment with the NRCS as part of the federal Clean Water Act. This assessment grouped Maine's major watersheds into four categories: Category I—In Need of Restoration; Category II—Currently Meeting Water Quality Goals; Category III—Pristine/Sensitive Aquatic System Conditions administered by federal, state or tribal governments; or Category IV—Having Insufficient Data to Make and Assessment. The Piscataqua River Watershed, which includes the subwatersheds of Wells, has been ranked as a Category 1 Watershed in part because rivers and coastal estuaries are not attaining standards. Depot Stream, Pope Creek, and the Unnamed Stream at I-95 Exit 19 tributary to Webhannet River are all listed as threatened due to highway access-related development) (ME DEP, 2020). Highway access-related development indicates the stream is at high risk of future development within the watershed due to their proximal location to a highway exit (SMSWG, 2018). Specifically for Wells, although water quality standards are in attainment, the Ogunquit and Webhannet Estuaries are threatened. Based upon this designation watershed communities are eligible for funding to develop and implement watershed management programs.

Under the NPS Priority Watersheds program the Ogunquit and Webhannet River estuaries are priority water bodies due to elevated levels of bacteria, low dissolved oxygen, and areas closed to shellfish under certain conditions. In addition, Branch Brook is a priority stream because it is public drinking water supply that is threatened. Finally, the Great Works River below the Works River is in nonattainment and has low dissolved oxygen.

Based on US EPA funding, the Maine Healthy Beaches Program (MHB) was established to ensure that Maine's salt-water beaches remain safe and clean. The program brings together communities to preform standardized monitoring of beach water quality, notifying the public if health risks are detected and educating both residents and visitors on what can be done to help

keep Maine's beaches healthy. Maine has adopted the US EPA safety limit of 104 Enterococci per 100 millimeters of sample water. Enterococci is a type of bacteria which indicates fecal contamination and the possible presence of disease-causing microorganisms. When bacteria levels exceed this limit, there is an increased probability of contracting illness from the water. Wells' beaches have their water quality posted regularly on the Maine Healthy Beaches website. Beyond routine beach monitoring, MHB has supported analysis of samples collected intermittently to assess bacteria levels in sand, seaweed, and stormwater impacting Wells beaches. Each year, a report is compiled and issued to the US EPA on the state of Maine's beaches. In 2012, Wells Casino Square Beach had two advisory days, Crescent Beach had three, and Laudholm and Wells beaches each had one. Although these beaches contained swimming advisories, the water quality results did not trigger the beaches to close (ME DEP, 2018).

The percentage of impervious cover within a watershed may also be an indicator of expected water quality. Stormwater easily traverses impervious surfaces such as roofs, driveways, roadways, and parking lots and is quickly carried to adjacent surface waters rather than infiltrating into the ground. Studies have shown water quality degradation once impervious surfaces in a watershed exceed a 5-10% range (May et al., 1997; Center for Watershed Protection, 2003). Stormwater runoff from impervious surfaces can increase surface water temperature, increase sedimentation, and carry pollutants from the landscape such as bacteria, nutrients (from fertilizers and agricultural activities), and man-made substances (such as oils, greases, and soaps). Currently, all watersheds within Wells contain less than 10% impervious cover. It is noted that each stream and watershed are unique and other factors influence water quality besides sole impervious surfaces. Regardless, future development should follow low impact designs and contain stormwater management controls.

## Groundwater Aquifers

Groundwater is water existing within the pore spaces of the subsurface geologic material. These areas Areas of deep sand and gravel are geologically referred to as stratified drift deposits that are capable of yielding significant quantities of water. The highest yielding aquifers identified in Wells can produce ~~10 to 50~~ over 50 gallons per minute, which are rated as good to excellent potential by the Maine Geological Survey. There approximately ~~4,977~~ 5,346 acres of ~~this category~~ significant sand and gravel aquifers or ~~almost just over 141~~ 141% of the Town. ~~See attached map.~~

The most critical aquifer area in Wells is that associated with Branch Brook, the water source for the Kennebunk, Kennebunkport, and Wells Water District. This area extends from the Sanford town line almost to the Atlantic with an apparent break ~~slightly west of~~ the Meetinghouse Road/Route 9A area. This area has regulatory protection through the Aquifer Protection Overlay District in the Town Zoning Ordinance. It is likely that this feature is hydrologically connected to the brook and maintains its year-round flow. Additional aquifer areas in Wells are along ~~Route 9~~ the Wells-Sanford town line near, in the area along Roger Bragdon Road and ~~near~~ the Sanford line in the Quarry Road/Perry Oliver Road area.

Groundwater water level is recharged through precipitation and percolation. Climate change projections for Maine indicate precipitation is increasing in both frequency and intensity (Fernandez et al., 2020). Therefore, if infiltration of stormwater can be maintained (infiltration does not occur through impervious surfaces), it is expected that groundwater levels in Maine will either be maintained or increase with all other factors set aside (i.e. withdrawal rates, evaporation of surface waters, etc.).

## **Drinking Water Resources Private Wells**

As of the end of 2003, In June of 2021, there were a total of 3,296,071 year-round residential accounts and 1,493 seasonal residential accounts with the KKW Water District in the Town of Wells. With about 4,789 housing units served by municipal water, 4,400 year-round households in Wells as of 2004 (see Section 6 for estimate), this assumes there are roughly 4,197 2,300 permanently occupied homes in the Town that are on private well systems. As of April 2020, the Bedrock Well Database, housed by the Maine Department of Agriculture Conservation & Forestry, has record of 786 domestic wells reported to the Maine Geological Survey in the Town of Wells. This dataset is built on an original survey of well drillers in the 1970s, a voluntary well driller reporting program through the mid-1980s, and the existing mandatory reporting program where well drillers submit new well information. Of the 786 reported wells, 766 are bedrock wells, 14 are gravel wells, 1 is an overburden well, and 5 are unidentified. As such, it likely undercounts the extent of private wells in the Town. Since the overwhelming majority of these private wells do not draw their water from sand and gravel aquifers, there is no Town protection of the primary water source for more than half of its households.

Public Water Systems (PWS) in Wells can source water from either surface water or groundwater resources. There are currently 20 sources of PWS in Wells that are classified as one of three types: Community, Non Community, and Non-Transient, Non Community. There are 5 community PWS, 12 Non Community PWS, and 3 Non-Transient, Non-Community PWS. The risk of each groundwater source for containing acute contaminants can be determined by following the matrix table provided in the Maine Source Water Assessment Program Final Source Assessment Report (ME CDCP, n.d.)

Groundwater in wells is maintained when the rate of recharge is equal to the rate of withdrawal. During times of drought, when recharge is low, or times of overuse, when withdrawal rates are high, groundwater levels in wells decrease. These decreases must be monitored to avoid overuse of the aquifer, especially when close to the interface of fresh and salt water. Saltwater intrusion occurs when too much freshwater is withdrawn from the aquifer, saltwater within the ground is pulled landward to fill the deficit and then supplies saltwater to the well. Wells should keep this in mind for the safety of private well owners as the possibility of saltwater intrusion may increase as sea levels continue to rise from climate change.

**Question: Has Wells experienced any dry wells during the recent droughts?**

## **Analysis**

**This section will be revisited at the conclusion of the Existing Conditions Analysis phase.**

Wells has many surface water and groundwater resources that need to be managed to ensure the health and safety of Wells' residents. The following observations need to be considered for recommendations and strategies to achieve the Town's goals for water resources.

1. There are several mapped sand and gravel aquifers in Wells. The most important of these are the two aquifer areas associated with Branch Brook, the Town's municipal water supply. The Town should seriously consider if these aquifers need additional protection to preserve the quality and quantity of the groundwater. In addition, consideration should be given to proper management of the remaining aquifers.

2. Through the state's NPS program there are several threatened watersheds and associated rivers. The Town will need to consider strategies to enhance the quality of these surface water resources and to maintain the quality of the remaining surface waters. It will be necessary to minimize non-point pollution to the Town's surface waters. Wells should review the effectiveness of performance standards that control stormwater runoff and erosion in order to protect the Town's freshwater and saltwater resources.

3. Many existing homes and businesses in Wells, including a large share of recent and expected future development, are on private wells that draw water from groundwater sources that are not part of sand and gravel aquifers. The Town needs to look at ways to protect water quality and quantity on these individual systems. **Has the town started doing this?**

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4. The Ogunquit and Webhannet River estuaries have been identified by the Maine Department of Environmental Protection as priority water bodies, due to indicators that show water quality degradation. The Town needs to protect these two threatened estuaries.