



Environment and Sensitive Areas

Preface

The amount, type, extent, and intensity of development on land are often constrained by the physical characteristics of the land itself. Brunswick is no different in this respect. The physical environment that Brunswick occupies contains the Potomac River, steep slopes in excess of 30 percent, and other characteristics that make development challenging. In addition to those challenges, wetlands and woodlands are also dotted throughout the City. These areas must be protected as to not damage the ecological processes that they house. Finally, the Potomac River and tributary stream channels that flow into Brunswick restrict all development in the floodplain due to hazards associated with floods or other natural disasters.

The purposes of this section are to: describe Brunswick's physical characteristics, identify the areas that constrain development, identify natural features that should be protected from development, and to state recommendations for the protection of sensitive environmental areas.

Topography

Brunswick's topography is the most significant feature in planning for future land use and development. A high plateau originates in the area of northern Brunswick. The area from MD Route 17 and U.S. Route 340 towards Little Catocin Creek in the east is defined by this plateau. The Village of Rosemont is also located on this plateau, adjoining the City along the northern Boundary. Many subordinate plateaus extend south from this main plateau and continue towards the Potomac River. The plateaus and their accompanying ravines define the shape of Brunswick's neighborhoods. Due to the topography, a grid system for streets was unachievable leaving some east to west streets disconnected. The north to south streets follow over these plateaus accompanied by steep grades in some sections of the streets. Steep grades can be found on Gum Spring Rd, Ninth Avenue, Second Avenue, Maple Avenue, and Petersville Road. All of those roads are associated with rolling hills that generally flow up towards the north. The Downtown Commercial Core is located in the southern section of town and is at the base of many of the hills in the City. Galyn Manor located to the far north east of the City is in an area which can be defined as a valley, and does not have slopes that are as steep as other areas of the City. Brunswick Crossing Planned Unit Development is located at the top plateau and development will not intrude into the steeply declining slopes.

The ravines that separate the plateaus change in characteristic from one side of the City to the other. The eastern side ravines have steeper slopes than those found generally on the western side. While the western ravines tend to stretch the entire length of the City, the eastern ravines taper off near the center of the City. These slopes have limited the road access in portions of the city and the only major roads that run east/west are Potomac Street and Souder Road.

The ravines that separate the plateaus also create development restraints. For the most part development is prohibited on the steeper slopes especially in areas of 35 degrees or

greater. In addition, the Design Manual prohibits roads which exceed 15 percent slopes. Many of the streets in the City that connect houses built on steep grades are greater than 15% grade. As a result, many streets that are in existence today would not be allowed to be constructed under present guidelines. With more land in the City being developed and less prime land not on steep grades available, the desire to build on the steeper grades will go up resulting in lots in areas which had previously been thought to be undevelopable.

Geology and Mineral Resources

Geologic data is important to land planning because depending on the types of underlying rock, and structures associated with them, this data can determine the landforms that make up the City as well as hydrology and other drainage patterns.

Brunswick is part of the lower Middletown Valley, which is a section of the Blue Ridge Province. The Blue Ridge Province and the lowlands portion of the Piedmont Province combine to make up Frederick County. The Blue Ridge Province is a small strip that is between the Catoctin and South Mountains.

The Blue Ridge Province is made up of primarily folded and faulted sedimentary rocks. In the Brunswick Region there is a large anticline fold, and the outer most portions of the folds are the Catoctin and South Mountains. A Cambrian Quartzite at the base forms these ridges, and the valley floor is composed primarily of Precambrian Gneiss.

Soils found in Brunswick and in the Middletown Valley tend to run deep due to the nonresistance of the underlying bedrock to weathering. Some of the more weather resistant bedrock slices through the soil and form out-croppings throughout the valley.

The geology associated with a region also determines the relative hydrology. Aquifers in the region are considered to be very limited due the bedrock gneiss surrounding the area. In 1994 it was reported that the average well yield was only 7 gallons per minute. The City of Brunswick not does rely on wells for its water supply given the proximity of the Potomac River and its ability to provide water. However, Brunswick does utilize springs in Washington County to provide additional water to the City. Refer to the Water Resource Element for a detailed analysis of the City of Brunswick water and sewer capacity.

Throughout Frederick County geologic resources are mined, none however are mined in Brunswick or the Brunswick Region. limestone, shale, and stone aggregate are mined in the Frederick Region. No mineral resources have been identified for mining in the Brunswick region and mining has not been recommended in the Brunswick Regional Plan.

Soils

Information related to soils indicates the area is suited for different land uses. Most soils in the area are classified as Myersville-Catoctin-Urban-Land, Mt. Zion-Rohrersville Complex, and Spoolsville-Burkittsville Complex. These soils are suited for agriculture due to their high productivity. These soils are also found to be suitable for residential and commercial development. Soil classifications were provided by the U.S. Department of Agriculture under the Soil Survey Geographic Database.

Streams and their buffers

The Potomac River is the most significant water resource in Brunswick. The Potomac formed the basis for Brunswick's economy as a trading center. With the C&O Canal, growth increased in Brunswick. As time went on the C&O Canal became less important as the railroad industry moved into town. As the transportation route declined, the area around the river and canal became more of a scenic park like it is today. Sound planning is required to ensure this natural resource continues to provide for the City and continues to thrive naturally.

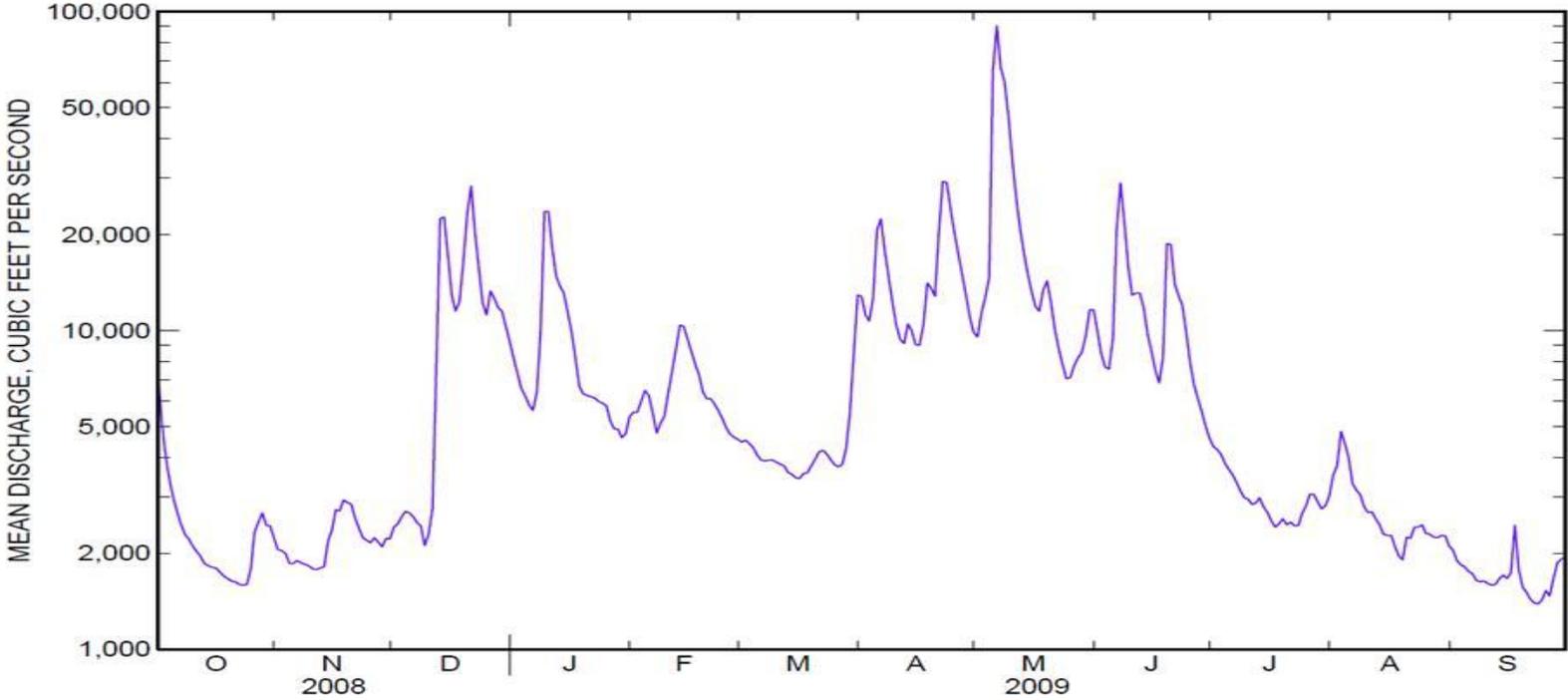
The southern boundary of Brunswick is the Potomac River, as well as the southern boundary for Frederick County and Maryland. The Potomac originates in West Virginia and continues to the Chesapeake Bay. The River has a drainage area of approximately 14,700 square miles and includes all of Frederick County and areas of Virginia, Pennsylvania, West Virginia, Washington D.C. and other counties in Maryland. Catoctin Creek and the Monocacy are the two main tributaries of the Potomac in Frederick County. In addition, smaller streams throughout Brunswick flow into the River.

Water discharge for the Potomac River is recorded at Point of Rocks, approximately six miles to the east of Brunswick. The average discharge in 2000 was 7,450 cubic feet per second. A maximum discharge was recorded in 1936 with approximately 480,000 cubic feet per second. A minimum discharge was recorded in 1966 at 530 cubic feet per second. The average width of the Potomac River in Frederick County is approximately 1,000 feet. The Potomac at one point in the 1960's was referred to as a national disgrace by President Lyndon B. Johnson, due to large amounts of fecal coliform bacteria and evidence of nutrient overloads in the form of algae blooms. Since then the Potomac has become much healthier and the effects of eutrophication have decreased significantly. In 1997 the river was added to the EPA's American Heritage Rivers.

As for the Potomac's recreational potential the river currently is used for boating, canoeing, kayaking, and fishing. The C&O Canal National Park and the Brunswick Campground provide recreational access to the river.

There are a number of streams that are found in Brunswick. Martin's Creek is the largest extending from Petersville Road through the Downtown Commercial Core. On the western side of Brunswick is Dutchman's Creek and its tributary.

Chart 4.1
October 2008 to September 2009
Discharge flow of the Potomac River at Point of Rocks Maryland



Source: United States Geological Survey

Several unnamed streams flow within Brunswick and can be found between Maple Avenue, Second Avenue, and Fifth Avenue, in Gum Springs Hollow, and between Ninth Avenue and the Woodside Station development. Little Catoctin Creek is to the east of the City limits, but has been included in the revised Master Plan Map. This Creek flows into the Potomac River and has been selected as a possible site for a Wastewater Treatment Plant. When the area around Little Catoctin Creek outlined in the Master Plan Map becomes part of the City this area should be studied to determine water flows and the impacts that will be involved with such a facility.

Floodplains and Wetlands

Floodplains and wetlands are areas of particular interest in planning. These areas represent potential flood hazards to development and human safety, and in addition they are environmentally sensitive to development. There are several definitions for the types of floodplains. The 100-year floodplain is an area that is prone to severe flooding with a 1% chance of happening every year. The Federal Emergency Management Agency (FEMA) delineates these floodplains for inclusion in flood insurance programs.

The largest floodplain areas in Brunswick are located near the Potomac River. FEMA delineated 100-year floodplains include the C&O National Park, the Brunswick Campgrounds, portions of Walnut Street, South Maple Avenue, South Virginia Avenue, South Dayton Avenue, South Georgia Avenue, South Florida, and portions of the CSX property. Structures in or elevated above the flood level include the Wastewater Treatment Facility, Water Intake and Pumping Station, Train Station, some housing and businesses on Walnut Street, South Virginia Avenue, South Maryland Avenue, South Maple Avenue, a CSX maintenance shed, and the better portion of the CSX rail yard.

A revised Draft Floodplain Mapping Study was completed by FEMA in 2006 for Frederick County. The new draft included more property than in previous drafts and many streams also had grown to encompass more properties in the event of a 100-year flood. Originally these smaller streams were noted as having smaller drainage areas and capacity to carry the large flows without flooding.

The City of Brunswick adopted a Floodplain Ordinance, which is administered by Frederick County. This Ordinance establishes Floodplain zones within the City. It also restricts development in the Floodplain to offset the damages that could occur in the event of a flood. The Ordinance has not been updated since 1994, and needs to be amended depending on new regulations and changes that have occurred since that time.

Non-tidal wetlands are important to maintain a local ecosystem. They control floodwaters, support wildlife, and filter sediments and other chemicals that enter ground and surface water. Federal and State regulations protect these non-tidal wetlands and control disturbances to them. These regulations also define what a non-tidal wetland is: an area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support a

prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

These non-tidal wetlands are located along the Potomac River in Brunswick. One of the small islands along the Potomac River has been identified as a wetland of special state concern because it is a habitat for an endangered plant species. Upland wooded wetlands are also associated with Dutchman's Creek in western Brunswick.

Habitats of Threatened & Endangered Species:

The Maryland Natural Heritage Program has identified a number of rare plant and animal species in Frederick County. Rare species which occur in Frederick County are often found in wetlands and rich forest lands. Some of the rare species are on the State's official threatened and endangered species list, and others are proposed to be added to it. According to the Maryland Department of Natural Resources, there are no known threatened or endangered plant or wildlife species in the Brunswick area.

Agricultural and Forest Lands

There are no parcels zoned agriculture within the City boundary. The City does have a Forest Resource Ordinance (FRO). The City requires compliance with the FRO with any development in the City Limits. The City also makes every effort to plant street trees, trees along streams banks, within the floodplain of the Potomac River and in sensitive areas owned by the City. If forest is being protected as part of a development project the area must be put into an easement for long term protection.

Basin Tributary Strategy Plan

Brunswick is part of the Upper Potomac River Basin. This Basin, along with all tributary basins in the Chesapeake, contributes to and is impacted by nutrient pollution. Nutrient pollution can be divided into two major categories: 1) point sources (pollution that comes from a single, definable location) 2) non-point sources (pollution that cannot be attributed to a clearly identifiable, specific physical location).

In the Upper Potomac watershed, forest and wetlands are the primary land use, and agriculture is the second largest land use. Forest and wetland land uses release fewer nutrients to rivers and the Chesapeake Bay than agriculture land uses that produce large amounts of nitrogen, phosphorus, and sediment. In Maryland approximately 33% of nitrogen loads come from atmospheric sources. However, nitrogen load sources vary from basin to basin and can be attributed to land based loads.

Point sources are the second largest contributor of phosphorus, and a relatively small portion of the nitrogen in the Upper Potomac, but are increasing as the population in the watershed area continues to grow.

Currently the State of Maryland is working through various agencies to help administer the Basin Tributary Strategy Implementation Plan. The Tributary Plan will involve Total Maximum Daily Load information, Water Monitoring, Basin Plans and other Water Quality Standards. With coordination and guidance from State agencies, it is the intent of the City to comply in conjunction with, and as part of, the Frederick County Basin Tributary Strategy Implementation.

Total Maximum Daily Load

Total Maximum Daily Load or TMDL is a value of the maximum amount of a pollutant that a body of water can receive while still remaining within Water Quality Standards. The Federal Clean Water Act provides a systematic framework for managing water resources. The framework is as follows:

- Water Quality Standards
- Water Quality Monitoring strategy for State-wide Water Quality Assessment
- Data Management and Analysis
- Water Quality Reporting
- Intensive Monitoring and Information collection to Support TMDL Development
- TMDL Development
- TMDL Implementation Planning and Execution
- Evaluation of implementation measures and the water quality response to those measures
- Continuous Planning Process

The State of Maryland is developing TMDL's for local water bodies. The TMDL is then utilized to improve impaired waters in areas where pollution may be found. The creation of this TMDL is mandated by Maryland State Law and Federal Law. The effect is to hold the pollutant load constant even through residential and commercial growth areas. This can be accomplished by more stringent wastewater treatment, onsite recycling/reuse, and/or a "trading of pollution", this is where cleaning up a less costly source of pollution to allow for continued growth is selected rather than the more costly removal of point source pollution to remain under the required cap. To comply, the City will have to work with other Jurisdictions, Frederick County, State Agencies, and Federal Agencies. Once a TMDL has been developed, it will have to be updated periodically to provide the most up

to date data on the waterways in Brunswick. Suitability of receiving waters cannot be assessed at this time due to the absence of TMDL for those receiving waters.

Goals, Objectives, and Policies for the Environment and Sensitive Areas

The City should maintain the environment and sensitive areas for the health, safety, and welfare of Brunswick citizens.

Goals:

- Determine the quality of waterways in Brunswick.
- Review Federal, State, and Environmental and Sensitive Area related regulations by City Staff for possible inclusion in City Ordinances, Regulations, and Policies.
- Evaluate the effects between infill development distribution and County Sediment and Erosion Control requirements for possible recommendation of change to the Sediment and Erosion Control Memorandum of Understanding.
- Obtain Developer and State Funding for the determination and placement a new Wastewater Treatment Plant.
- Implement conservation areas to control development in sensitive areas, such as along streams, to protect Environmentally Sensitive Areas.

Objectives:

- Revise the City Flood Plain Ordinance to include relevant data from historical information and mandate restrictions and setbacks accordingly.
- Conduct a Stream Study to determine any harmful effects to water supplies and the environment.
- Enter into a revised Memorandum of Understanding with Frederick County for Flood Plain Administration.
- Enter into a revised Memorandum of Understanding with Frederick County for Sediment and Erosion Control.
- In conjunction with Frederick County, develop a Total Maximum Daily Load Report, as mandated by Basin Tributary Strategy Implementation Plan and Maryland Water Quality Standards.
- Developers to conduct a study to determine the Hydrology of Little Catocin Creek for the future placement of a Wastewater Treatment Plant that will have minimal impact on the surrounding areas.

- Revise Development Requirements to address the Environment and Sensitive Areas.

Policies:

- The City will continue with their relationship with State and Frederick County Agencies and other jurisdictions, to identify processes, requirements and complete necessary background studies to complete a TMDL.
- The City will work with State Agencies and Frederick County to maintain, restore, and protect the water quality in the City.
- The City will work within the framework created by State Agencies for creation of the Basin Tributary Strategy Implementation Plan as part of the Frederick County Plan.
- Comply with State of Maryland Water Quality Standards.
- Coordinate with Frederick County to be included in their Basin Tributary Strategy Implementation Plan.

