



DEPARTMENT OF PLANNING & ZONING
COMPREHENSIVE PLANNING | LAND PRESERVATION | FOREST CONSERVATION | GIS

AGENDA

WASHINGTON COUNTY PLANNING COMMISSION PUBLIC REZONING INFORMATION MEETING AND REGULAR MEETING

January 8, 2018, 7:00 PM

WASHINGTON COUNTY ADMINISTRATION BUILDING
100 WEST WASHINGTON STREET
2ND FLOOR, PUBLIC MEETING ROOM #2000

CALL TO ORDER AND ROLL CALL

PUBLIC REZONING INFORMATION MEETING

1. RZ-17-010 and CP-17-001 – Application submitted by the Washington County Department of Planning & Zoning to rezone the following properties from PI (Planned Industrial) to A(R) (Agricultural Rural): 13229, 13237, 13245 and 13253 Dusty Lane and 17009 Broadfording Road and a proposed adjustment to the Urban Growth Area Boundary to exclude these five parcels from the Urban Growth Area; Planner: Steve Goodrich *

REGULAR MEETING

MINUTES

1. December 4, 2017 regular Planning Commission meeting minutes *

OTHER BUSINESS

1. RZ-17-010 and CP-17-001 Recommendation – Steve Goodrich
2. Update of Staff Approvals – Tim Lung
3. Comprehensive Plan Update Progress Report – Jill Baker *

ADJOURNMENT

UPCOMING MEETINGS

1. Monday, February 5, 2018, 7:00 p.m., Washington County Planning Commission regular meeting, Washington County Administration Building, 100 W. Washington Street, 2nd Floor, Public Meeting Room #2000, Hagerstown, Maryland

**a t t a c h m e n t s*

The Planning Commission reserves the right to vary the order in which the cases are called.

Individuals requiring special accommodations are requested to contact the Washington County Planning Department at 240-313-2435 Voice/TDD, to make arrangements no later than ten (10) days prior to the meeting. Notice is given that the Planning Commission agenda may be amended at any time up to and including the Planning Commission meeting.

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Washington County

MARYLAND

FOR PLANNING COMMISSION USE ONLY
Rezoning No. RZ-17-010 & CP-17-001
Date Filed: _____

WASHINGTON COUNTY PLANNING COMMISSION ZONING ORDINANCE MAP AMENDMENT APPLICATION

Washington Co. Dept. of Planning & Zoning

Applicant

100 W. Washington St., Ste. 2600,
Hagerstown, MD 21740

Address

Stephen Goodrich

Primary Contact

Address

☐ Property Owner

☐ Attorney

☐ Other: _____

☐ Contract Purchaser

☐ Consultant

Phone Number

E-mail Address

Property Location: 13229, 13237, 13245 & 13253 Dusty Lane and 17009 Broadfording Road

Tax Map: 23 Grid: 23 Parcel No.: 551 (lots 1-4) and 385 Acreage: 8.46

Current Zoning: PI - Planned Industrial Requested Zoning: A(R) - Agricultural Rural

Reason for the Request: ☐ Change in the character of the neighborhood
☐ Mistake in original zoning

PLEASE NOTE: A Justification Statement is required for either reason.

Applicant's Signature

Subscribed and sworn before me this _____ day of _____, 20_____.

My commission expires on _____

Notary Public

FOR PLANNING COMMISSION USE ONLY

- ☐ Application Form
- ☐ Fee Worksheet
- ☐ Application Fee
- ☐ Ownership Verification
- ☐ Boundary Plat (Including Metes & Bounds)

- ☐ Names and Addresses of all Adjoining & Confronting Property Owners
- ☐ Vicinity Map
- ☐ Justification Statement
- ☐ 30 copies of complete Application Package



Washington County

M A R Y L A N D

DEPARTMENT OF PLANNING & ZONING

COMPREHENSIVE PLANNING | LAND PRESERVATION | FOREST CONSERVATION | GIS

December 21, 2017

RZ-17-010 & CP-17-001

APPLICATION FOR ZONING MAP AMENDMENT AND COMPREHENSIVE PLAN LAND USE PLAN MAP AMENDMENT STAFF REPORT AND ANALYSIS

| | | |
|---|---|--|
| Property Owner(s) | : | Tyler A. Hoffman, 13229 Dusty Lane Joshua E. & Sierra N. Hoffman, 13237 Dusty Lane Kenneth E. Stewart & Donna Certain, 13245 Dusty Lane Charles L. & Jane E. Prince, 13253 Dusty Lane Seth M. & Lorraine M. Eby, 17009 Broadfording Road |
| Applicant(s) | : | Washington County Department of Planning & Zoning |
| Location | : | South side of Broadfording Road and east side of Dusty Lane |
| Election District | : | #13 – Maugansville |
| Current Comprehensive Plan Designation | : | Urban Growth Area - Industrial Flex |
| Proposed Comprehensive Plan Designation | : | Rural Area - Agricultural |
| Zoning Map | : | 23 |
| Parcel(s) | : | Parcel 551-Lots 1-4 and Parcel 385 |
| Acreage | : | 8.46 acres (P. 551, Lot 1-1.79 ac., Lot 2-1.77 ac., Lot 3-1.64 ac., lot 4-1.41 ac., Parcel 385-1.85ac.) |
| Existing Zoning | : | PI - Planned Industrial |
| Requested Zoning | : | Agricultural (Rural) |
| Date of Hearing | : | January 8, 2018 |

LOCATION AND PHYSICAL FEATURES

The rezoning site consists of 5 parcels located on the south side of Broadfording Road about 2.5 miles west of Hagerstown. The Eby parcel at 17009 Broadfording Road fronts on the south side of the road and the other 4 lots have frontage on Dusty Lane which is a private lane that extends southward from its intersection with Broadfording Road. These 4 lots are immediately south of the Eby parcel. The Eby, Prince and Stewart parcels have existing dwellings on them. The remaining 2 parcels owned by Tyler Hoffman and Joshua Hoffman are currently vacant. Dusty Lane also provides access to a farm complex located further south of Broadfording Road on the parcel of land (Parcel 72, 75 acres \pm) which was subdivided to create all five lots that are the subject of this application. The parcels were subdivided in 1995, 2002 and 2012. The intent of lot 3

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owners Joshua and Sierra Hoffman to build a dwelling has brought to light the conflict between the previously documented intention to build a home and the limitations of the existing Planned Industrial zoning.

As might be expected, the 3 parcels that contain existing dwellings have yards with a variety of residential landscaping including tree buffers between them. The Eby parcel fronts on Broadfording Road and has a separate driveway. Lots 1 and 2 each have panhandles to Broadfording Road but utilize private Dusty Lane which meanders across the panhandles and the adjacent farm parcel. The vacant parcels (lots 3 and 4) have most recently been included in the farmed areas of the adjacent farm but they also include patches of trees that mark rock outcroppings that are not suitable for crops. These parcels have residential building sites, septic areas and private well locations shown on an approved and recorded subdivision plat. They have no public road frontage but have approved access to Broadfording Road through an easement over Dusty Lane. The large parcels that surround the 5 lots proposed for rezoning are farmed and are occupied by fields for crops or pasture.

Soils in the area are of the Hagerstown and Swanpond varieties which were formed from limestone parent material. The three series' located on the rezoning site are in agricultural capability class 2, well suited for farming. The most prominent type, symbolized as HaB has only slight limitations for septic systems while the HdB and SpA varieties have limitations characterized as somewhat to very limiting due to restricted permeability and limited depth to saturation. The underlying geologic formation is labeled Rockdale Run, a dolomite and limestone material. There is no mapped floodplain on the parcels. The topography is slightly sloping (less than 2%) to the south sending surface water flow to an unnamed tributary of the Conococheague Creek. The general vicinity is characterized by large farm parcels and scattered residential lots cut from those farm parcels. The residential parcels are usually clustered along the road frontage and road intersections.

POPULATION ANALYSIS

Table 1

| Population Trends 1980 - 2010 | | | |
|-------------------------------|-------------|------------|-------------------------------|
| Year | Area | Population | % change from previous decade |
| 1980 | District 13 | 5030 | |
| | County | 113086 | |
| 1990 | District 13 | 5351 | 6.4% |
| | County | 121393 | 7.3% |
| 2000 | District 13 | 5698 | 6.5% |
| | County | 131932 | 8.7% |
| 2010 | District 13 | 6154 | 8.0% |
| | County | 147430 | 11.7% |

Source: US Census Bureau

Population trends are evident in the chart above. The Maugansville Election District (#13) has seen a 22.3% increase in its population between 1980 and 2010. Washington County has experienced a 30% increase in population in the same 30 year time period. The district continues to hold about 4% of the County's total population over the time period shown.

AVAILABILITY OF PUBLIC FACILITIES

Water and Sewerage

The adopted Water and Sewerage Plan for Washington County establishes the policies and recommendations for public water and sewer infrastructure to help guide development in a manner that promotes healthy and adequate service to citizens and to implement the adopted growth and preservation policies of the Comprehensive Plan. The stated purpose of the Plan is "... to provide for the continued health and well-being of Washington Countians and our downstream neighbors." This is achieved through implementing recommendations in the Comprehensive Plan and the Water and Sewerage Plan to provide for services in a timely and efficient manner and in locations where needs exist or where growth is encouraged . The Water and Sewer Plan is also an inventory of existing and programmed services. Public water and sewer services are specifically discouraged in rural areas to limit development, except to resolve health issues.

Four of the five parcels that are the subject of this rezoning case have a water service priority classification of W-5 meaning that public water is planned to be available in the future but there is no specified time frame. These four lots have existing on-site wells serving the existing dwelling or a designated well location on the subdivision plat for the two lots that have yet to be developed. The remaining parcel, 17009 Broadfording Road, has a service priority designation of W-1 indicating that public water service is currently available. This parcel is also within a public water service district that is designated as Restricted, indicating that the service is being provided to mitigate a documented public health issue for existing development. Future connections or extensions of this service line are limited. This parcel is immediately adjacent to the public right of way where the water main is located. A W-1 and W-5 service priority designation is expected since the properties are currently within the Urban Growth Area and public health facilities are appropriate for use in areas where development is encouraged.

If the rezoning and Comprehensive Plan Land Use Plan map are amended the Eby parcel would retain its W-1 designation because the site is currently served by the public system. The other four parcels could retain the W-5 designation and be connected to the restricted use water line or be changed to W-7 indicating the continued use of the existing and proposed private wells on-site. The lines that serve the parcel are already designated as Restricted because the line was installed to resolve a public health issue outside of the Urban Growth Area. There are many other existing dwellings on the north side of Broadfording Road, outside the UGA connected to this same restricted water line. It

would be a Health Department decision to determine if future development on these parcels would be required to connect to the public water line.

There are also fire hydrants along a portion of Broadfording Road connected to this water line.

All five parcels that are the subject of this rezoning request are not served by any public sewer facilities and have a service priority designation of S-5 indicating that public sewer service is planned in the future but there is no specified time frame. This status is the result of the parcels' current location within the Urban Growth Area where public utility connections are desirable and expected to allow urban densities and to make full use of the investments in public sewer infrastructure. The three parcels that have dwellings on them utilize on-site septic systems. The remaining 2 undeveloped parcels have had successful percolation tests and areas designated on the respective subdivision plat for septic system installations and repairs. Use of septic systems is permitted as an interim measure in areas where public facilities are planned for the future (S-5).

If the rezoning and Comprehensive Plan Land Use Plan maps are amended these parcels should and would be reassigned to the S-7 Service Priority designation during the next Water and Sewerage Plan amendment since public facilities are not planned outside of the Urban Growth Area.

Emergency Services

The rezoning site is located in the service area of the Maugansville volunteer fire company. The station is located 2 miles north and east of the rezoning site although actual vehicle travel distance is approximately 3 miles. The Community Rescue Service substation that provides emergency medical and rescue services operates from the same station in Maugansville.

Schools

The rezoning site is located within the attendance districts of Maugansville Elementary School, Western Heights Middle School and North Hagerstown High School. The current zoning of Planned Industrial would not permit any future residential development and therefore no additional students are expected. However, 3 of the 5 parcels have existing dwellings. They could be sending students to the schools now and the number of students from these units could increase or decrease for a number of reasons. If the zoning is changed to Agricultural (Rural), residential development could occur on the two vacant parcels. Washington County currently uses a projected pupil yield per single family unit figure of 0.82 to evaluate school adequacy for new development that exceeds 7 new dwelling units. The 2 vacant parcels are already approved lots and not subject to a school adequacy test. However, using established factors, the two new dwellings that could be built after a zoning change to Agricultural (Rural) could generate 1.64 additional students in addition to the current or future students from the existing dwellings. An additional 1.64 students spread among three schools would not be expected to create

capacity issues. An equal or greater number of additional students could result from a change in family size in any one of the existing dwellings.

Public Transportation

This area is not served by the Washington County Transit System.

PRESENT AND FUTURE TRANSPORTATION PATTERNS

The 5 parcels that are the subject of this rezoning application are located on the south side of Broadfording Road. The Eby parcel has approximately 470 feet of frontage on the road and a driveway connecting directly to the road. The remaining four parcels are “stacked” behind the Eby parcel with their front yards oriented toward Dusty Lane which runs on the west side of Eby from Broadfording Road in a southerly direction. Lots 1 and 2, immediately behind Eby, each have a panhandle extending from the western end of the lot to Broadfording Road. The panhandle to Lot 1 is 51 feet wide and the Lot 2 panhandle is 25 feet wide. There is a third panhandle that is also 25 feet wide that leads to the farm parcel south of these five lots. Lots 3 and 4 do not have panhandles to the public road. They front on Dusty Lane and use it for access to the public road by virtue of an easement. Dusty Lane intersects Broadfording Road on the panhandle for the farm parcel and then meanders across the panhandles for lots 1 and 2 before it straightens out and heads in a southerly direction adjacent to the frontage of lots 1-4 and eventually to the complex of farm buildings.

Lots 3 and 4 are undeveloped at this time. It is expected, if the rezoning is approved that each will construct its future driveway to Dusty Lane for access to Broadfording Road and the subdivision plat for these lots was approved based on that arrangement. There would be no new access points onto the road.

Broadfording Road is a County public road, classified as a Minor Collector. It is intended to provide connections between villages and neighborhoods. It also collects traffic from local roads and individual properties and funnels it on to other locations on the transportation network. The road has a hard paved surface and is in good condition. It can be winding or hilly in some locations which is reflective of the 35 mph speed limit. The shoulders are very narrow and in many places, nonexistent. Along its route between the western fringes of the urban area surrounding Hagerstown and MD Rt. 63 (Greencastle Pike) on the west, it serves scattered rural residential development and many large farm parcels.

If the parcels were to be developed under the current Planned Industrial zoning it would be difficult to predict the type of access needed because the district allows a wide variety of industrial uses but the small parcels could be restrictive. Many uses could overwhelm the existing residential driveway and would be subject to increased scrutiny and design standards based on information provided on a site plan. Traffic studies may be required before additional access could be permitted. Road improvements, which could be significant depending on the type of use, could become the burden of the site developer.

Industrial development on the larger farm parcels surrounding this rezoning site would require site plan approvals where access and traffic concerns would be addressed through traffic studies and design standards for new access to public roads. Broadfording Road would be the least desirable point of access for new industrial development. MD Rt. 63 and US Rt. 40 are more suitable for industrial traffic.

Average Daily Traffic counts (ADT) are not available for a location on Broadfording Road near the rezoning site. 2008 and 2016 figures are available for the eastern end near its intersection with Garland Groh Boulevard and a location west of the intersection with MD Rt. 63. They are shown in the table below. These counts may or may not create an accurate picture of traffic near the rezoning site but they are all that is available. The counts shown below are consistent with the Typical Mean Traffic expected and noted on the County's Functional Road Classification map contained in the Comprehensive Plan. Minor Collectors are expected to have a typical mean ADT of 500-1500 in a rural setting and 1000-3000 in urban areas. New points of access onto Broadfording Road would have to provide a minimum separation of 100 feet from existing points.

AVERAGE DAILY TRAFFIC (ADT) – BROADFORDING ROAD

| YEAR | ADT - EAST | ADT - WEST |
|------|------------|------------|
| 2008 | 1582 | 2791 |
| 2016 | 1540 | 2404 |

COMPATIBILITY WITH EXISTING AND PROPOSED DEVELOPMENT IN THE AREA:

If the zoning were to remain Planned Industrial and these parcels were to remain inside the Urban Growth Area nothing would change until these properties and adjacent farmland would be proposed and approved for development. The existing single family dwellings on three of the parcels included in this case do not present a conflict for the industrial use but the relationship would likely not work in the opposite direction and residents may not enjoy their industrial neighbors. The surrounding area is open farmland and similar single family dwellings. The construction of two additional dwellings on the vacant lots would not be permitted. It's not known if these two currently vacant parcels would be included in any industrial development proposal. They are only a little more than an acre each. An industrial user looking for a site of less than 2 acres would be unique.

If the zoning and growth area boundary was changed to Agricultural (Rural) the three existing dwellings could and probably would remain. The two vacant lots would be permitted to have dwellings constructed on them Based on information from the current owners that is very likely to happen in the near future. These

two new dwellings present no conflict with the current surrounding uses which are virtually the same, scattered residences and farmland. If industrial development were to occur on the surrounding industrially zoned land it is unlikely that two additional dwellings will present more conflict than those that currently exist.

As noted previously, 3 of the five parcels that are the subject of this application have existing dwellings on them. The other two parcels are vacant and were created by approval of a subdivision plat for residential development in 2012. The area surrounding the rezoning site is typical of many other locations in Washington County, a mix of rural residential lots clustered along the public road frontage and at crossroads with larger farm parcels behind them. The residential lots are usually one acre or larger. There is very little obvious commercial or industrial development until an observer travels approximately 2 miles in any direction. Two miles to the east one would find the edge of the urbanizing area around Hagerstown in evidence by the several commercial strip centers containing Best Buy, Wal-Mart, Home Depot, etc. Two miles to the south and west, a commercial/industrial area is emerging containing a Sheetz mixed retail use, a liquor store and a Pilot truck stop further to the south. Two miles to the north and east is the village of Maugansville with substantial denser residential development and accompanying commercial services.

The immediate vicinity is unusual when looking at the question of compatibility with existing and proposed development. The current development is clearly agricultural and rural residential. However, the UGA boundary is concurrent with Broadfording Road and MD Rt. 63. All of the area south of Broadfording and east of MD Rt. 63 is in the growth area and zoned for industrial uses. This was intentional, following recommendations of the Comprehensive Plan to apply that zoning in order to reserve the large tracts of undeveloped land for future industrial and employment generating land uses. The area is served by State highways with connections to the interstate system and within the planned service area of the County's Conococheague Wastewater Treatment plant with capacity for such development. The land area on the north side of Broadfording Road is outside of the Urban Growth Area and zone Agricultural (Rural) where retention of rural character and preservation of agricultural land is the priority. The area west of MD Rt. 63 is zoned Environmental Conservation, also outside of the growth area due to the corridor created by the meandering Conococheague Creek.

Historic Inventory Sites

There are three Historic Inventory sites within ½ mile of this rezoning site

WA-I-334 is the identification number for the H.H. Martin House and property approximately ½ mile to the northwest on the north side of Broadfording Road, near the intersection with the Greencastle Pike. It is a 19th century, 3 part log, frame and brick house. WA-I-314 is the second inventory site, located ½ mile to the southeast and is known as the Miller-Conrad house. It is a 19th century log house covered with wood

siding. It was a tenant house to the dwelling on the third and adjacent site, WA-I-322, known as the Tice-Eby farm. This farm complex is an 18th century two story log house with a stone bank barn containing a date tablet inscribed with "1774".

RELATIONSHIP OF THE PROPOSED CHANGE TO THE ADOPTED PLAN FOR THE COUNTY:

A timeline of major land use decisions in Washington County can explain how and why this land is included in the Urban Growth Area and how this industrially zoned property came to include existing dwellings and two lots approved for residential development.

Washington County adopted a Comprehensive Plan in 1981 that contained a generalized Growth Area boundary that did not follow property lines. If scaled from a map the boundary was 1500 feet wide on the actual ground surface. It was intended to be general in nature to allow flexibility in interpretation. In the years that followed the Comprehensive Plan adoption, study committees evaluated each growth area specifically and those boundaries were further refined based on studies of each unique area and how the area would, could or should be affected by policies encouraging or limiting growth. Eventually, growth area boundaries for the Urban Growth Area (Hagerstown, Williamsport and Funkstown), Boonsboro, Smithsburg, Hancock and Clear Spring were adopted and mapped. However, Planning staff and the Planning Commission often spent an unnecessary amount of time explaining the purpose and benefit of this broad and general boundary and debating its effect when it came time to make a decision about whether a parcel was inside or outside the boundary.

The next iteration of the Comprehensive Plan adopted in 2002 was built in part on the lessons learned from the general and sometimes vague growth area boundaries. The updated versions of growth area boundaries frequently, but not always, followed property lines or physical features on the landscape such as roads, waterways, etc. Subsequent to the 2002 plan adoption, the growth area boundaries were further refined and defined in the 2005 Rural Area and 2012 Urban Growth Area rezonings. Today there is an exact demarcation between urban and rural zoning districts which is how the UGA boundary came to be drawn along Broadfording Road, placing the subject five parcels inside the UGA and land on the opposite side of the street outside the UGA.

Furthermore, the growth area boundary of the 1980's ran parallel and west of McDade Road, parallel and north of US Rt. 40 out to Huyett's Crossroads (US 40 & MD 63) and then south towards Williamsport. The location of the subject rezoning was **not** included in the growth area. During development of the 2002 Comprehensive Plan it was recognized, with the assistance of the County's Economic Development department and Commission that there was not enough industrially zoned property to meet the employment needs of the future. The County needed to make decisions about where it desired and intended for new development to occur in order to provide and sustain employment security in the future. The Urban Growth Area **was expanded** to include all of the land between US Rt. 40 and Broadfording Road, bounded on the west by MD Rt. 63. Now the rezoning site was inside the UGA.

During the Rural Area rezoning approved in 2005 that boundary was solidified by new rural zoning designations on the outside (north and west) of the UGA boundary along Broadfording Road. The final step in preparing land to be available for future economic development and employment for County citizens came when the Urban Growth Area, now including the subject 5 parcels, was comprehensively rezoned in 2012 and the entire area north of US 40, east of MD 63 and west of McDade Road, more than 1500 acres, was purposely rezoned from Agricultural to PI-Planned Industrial. The acreage was large but the number of parcels was small. Any one parcel may be large enough to support industrial development and assembly of several to create an even larger area could be simpler due to only a few owners to negotiate with. That decision was made with the knowledge that there were some small scattered parcels with residential uses within that Planned Industrial area. The action was purposeful and meant to stem any further residential development so the area would be preserved for industrial or employment providers that typically need large acreage. Existing residential uses are permitted to continue under the standard zoning doctrine of legal non-conforming uses.

That is how the subject parcels came to be zoned Planned Industrial even though three of them contained existing dwellings. The two vacant parcels did not exist at the time the comprehensive rezoning of the Urban Growth Area was approved. They were still part of the adjacent farm that they were subdivided from. The Urban Growth Area rezoning was initiated in October 2010 by virtue of the date of the first advertisement of the first public hearing. Additional hearings were held in July 2011 and December 2011. All property owners that would receive a changed zoning on their properties, including the Hoffmans, Princes, Stewarts and the Ebys received notice of the rezoning and the October and July hearings and were invited to ask questions and make comments. The final decision was made by the Board of County Commissioners on April 17, 2012 with an effective date of July 1, 2012. The Planning and Zoning Department and the Planning Commission prepared the rezoning materials and managed the process.

The subdivision plat for the two additional lots, now owned by Joshua Hoffman and Tyler Hoffman was submitted to the County's Plan Review Department on December 12, 2011. It was processed by the Plan Review Department at the same time that the Urban Growth Area rezoning was being shepherded by the separate Planning and Zoning Department. The plat was approved on May 23, 2012.

That is how and why these five parcels, three with existing dwellings and the other two planned for dwellings, came to be zoned Planned Industrial. The zoning on these parcels is consistent with the Comprehensive Plan because it was applied as a direct result of the plans recommendations. The creation of the two additional lots is not directly contrary to the Plan but the use that was approved on the subdivision plat for the two lots clearly is not consistent with the Plans intent for this area to be reserved for industrial development. Mr. Hoffman's intent to build a dwelling on lot 3 has led to the discovery of this conflict.

CHANGE OR MISTAKE

In Maryland, traditional euclidean rezoning must follow the “Change or Mistake” rules. Maryland’s Land Use Article of the code specifies this rule as the required basis for zoning changes outside of comprehensive zoning or rezonings initiated by the local government. There is an extensive history of court cases setting and reinforcing criteria that must be met to uphold or overturn or remand zoning decisions based on the “Change or Mistake” rule.

Zoning can be changed if it can be shown that there has been a *change* in the character of the neighborhood since the last comprehensive rezoning so that the zoning applied at that time may no longer be appropriate. A neighborhood boundary must be defined, the events that have caused change must be identified and the before and after character must be explained. This application does not claim that there has been a change in the character of the neighborhood.

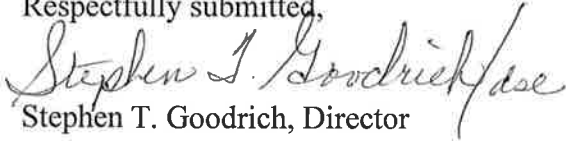
A second basis for rezoning in Maryland is the claim that there was a *mistake* in the original zoning or the zone that was assigned in the most recent comprehensive rezoning. In this case that would be the Comprehensive Urban Growth Area rezoning approved in 2012. The legal definition of mistake for the purpose of supporting a rezoning is not necessarily choosing the wrong district by way of bad judgement. Mistake is more about making a decision when all of the information or facts are not known or have not been considered. A mistake in zoning can occur if information relied upon by the legislative body during the decision making process is later shown to be incorrect or invalid. A mistake can also be supported if it can be shown that decision makers failed to consider existing facts at that time or there was information unknown and couldn’t be considered at the time of the decision. All of these situations could lead to a decision that is later shown to be a mistake.

Mistake is the basis upon which this case is presented. The decision to zone this area Planned Industrial was made without knowing that two additional residential lots were under review and would soon come into existence. That would be contrary to the purpose of the PI district. The property owners’ plans were approved by the County and then negated by County.

The corrective measure proposed here, adjusting the Urban Growth Area boundary to exclude the five parcels and changing the zoning from Planned Industrial (an urban designation) to Agricultural (Rural) will more closely align the zoning with the existing and intended uses on the parcels (residential). The zoning and growth area boundary change needs to include all five parcels so an island will not be created. The Eby, Stewart and Prince parcels need to be included in order to connect the Hoffman properties to the rural agricultural area on the north side of Broadfording Road. This change will not seriously impair the ability of the land area that remains inside the UGA boundary and zoned Planned Industrial to be developed in the same manner as before the change. It will be necessary to consider setbacks and buffering for these parcels when

industrial development is reviewed. Owners of these parcels must be aware of the type of development that will occur nearby.

Respectfully submitted,

A handwritten signature in cursive script, reading "Stephen T. Goodrich", followed by a diagonal slash and the letters "ase".

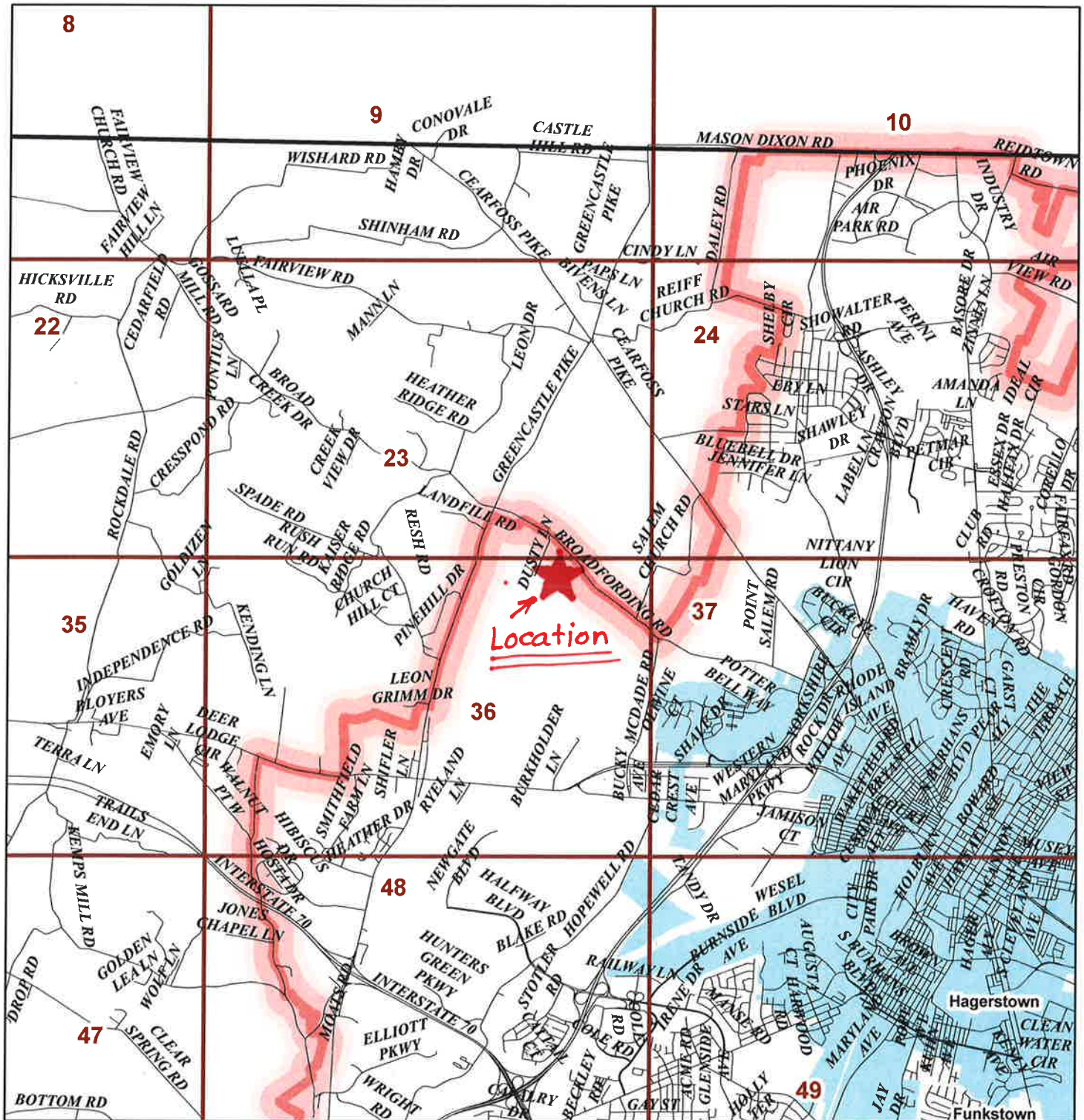
Stephen T. Goodrich, Director

Washington County Department
of Planning and Zoning

RZ-17-010 LOCATION MAP

Planned Industrial to Agricultural (Rural)

5 parcels = 8.46 acres

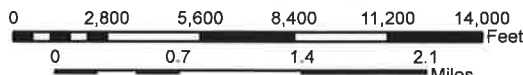


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The parcel lines shown on this map are derived from a variety of sources which have their own accuracy standards. The parcel lines are approximate and for informational purposes ONLY. They are not guaranteed by Washington County Maryland or the Maryland Department of Assessments and Taxation to be free of errors including errors of omission, commission, positional accuracy or any attributes associated with real property. They shall not be copied, reproduced or scaled in any way without the express prior written approval of Washington County Maryland Planning and Zoning Department. This data DOES NOT replace an accurate survey by a licensed professional and information shall be verified using the relevant deeds, plats and other recorded legal documents by the user.

Legend

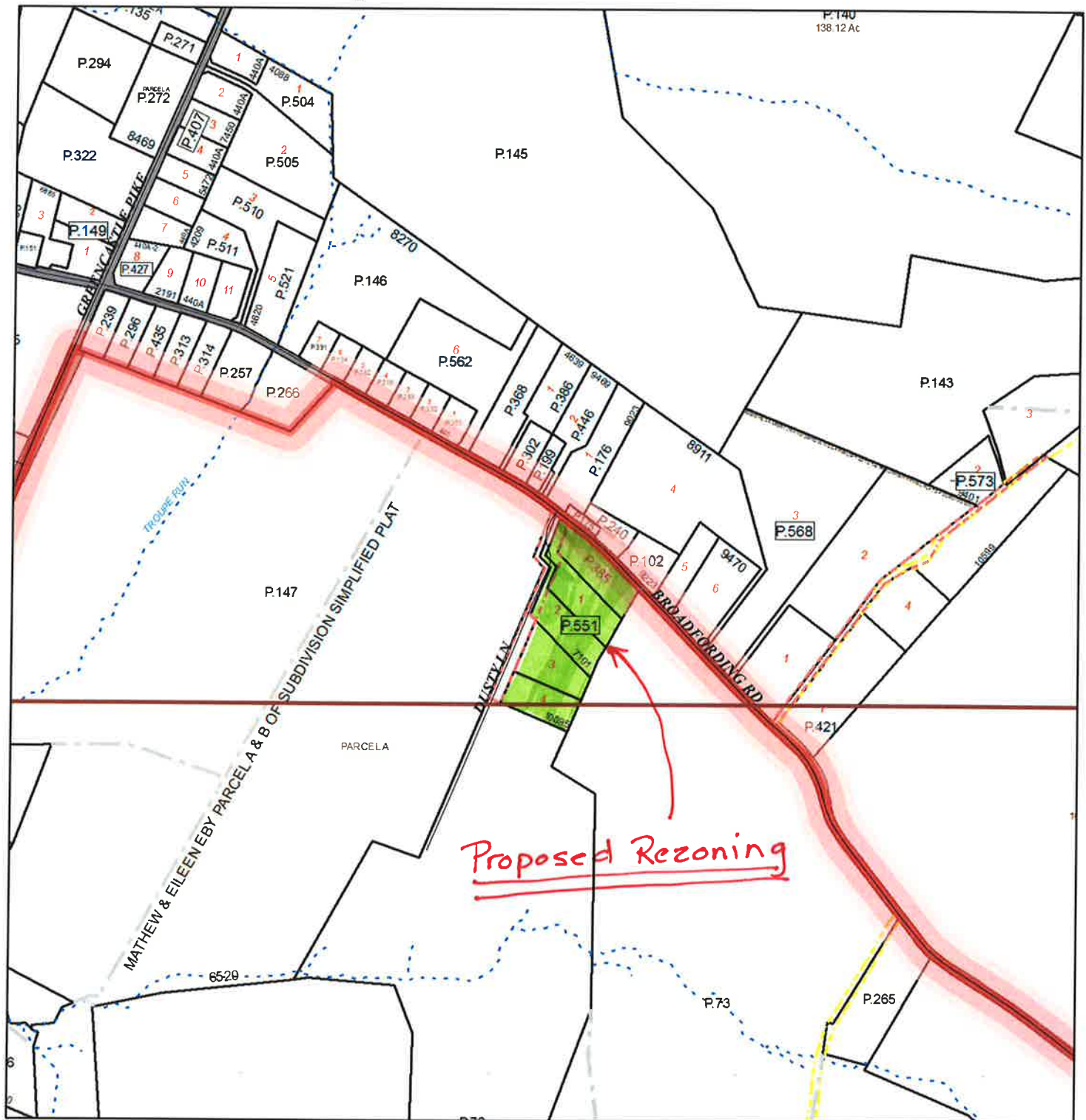
- █ Growth Area Boundaries
- █ Town Boundaries



RZ-17-010 SITE MAP

Planned Industrial to Agricultural (Rural)

5 parcels = 8.46 acres



Proposed Rezoning

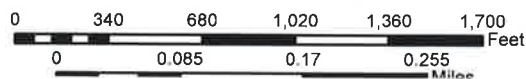
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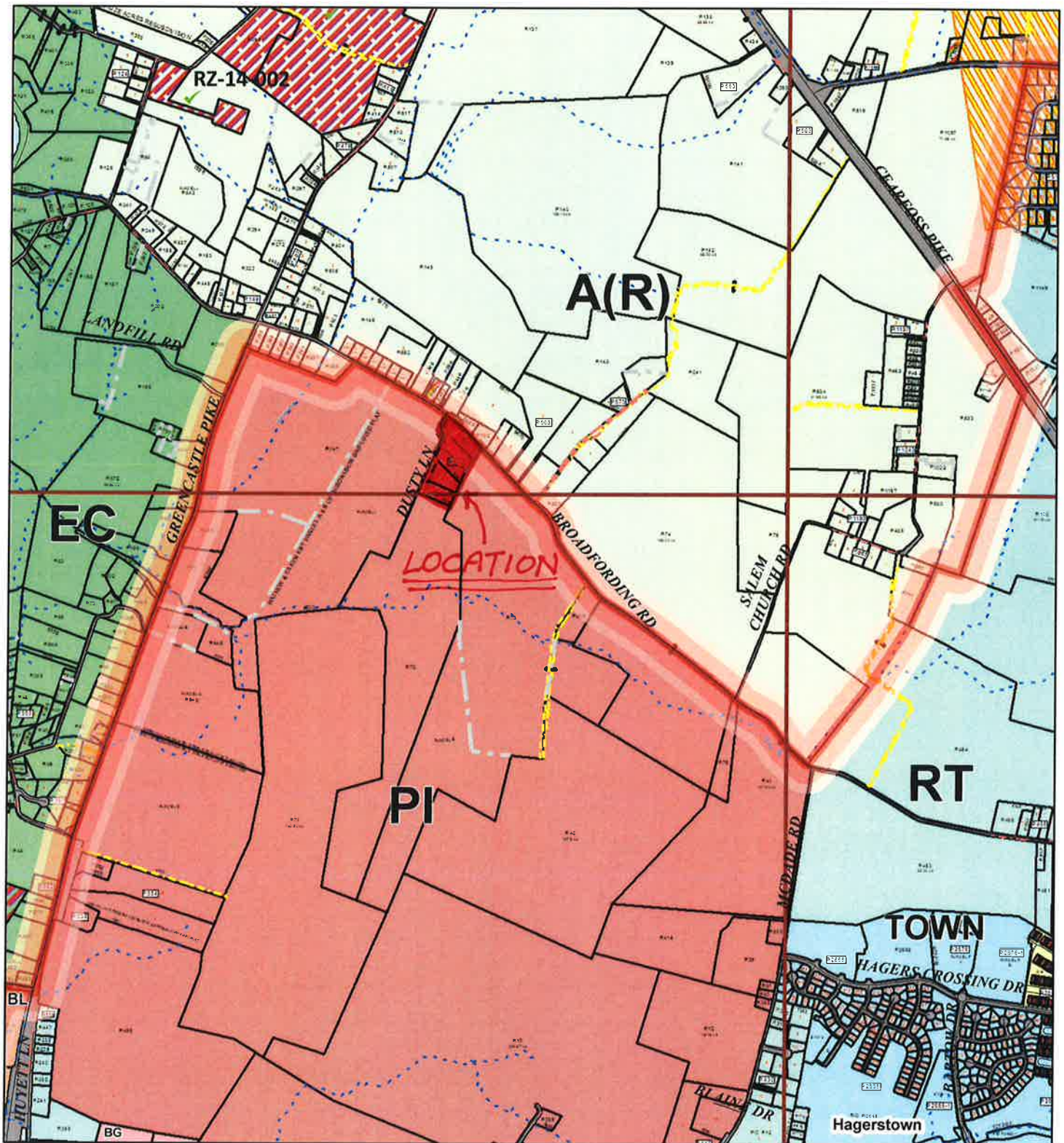
Legend

- Growth Area Boundaries
- Tax Parcel
- Road



RZ-17-010 & CP-17-001

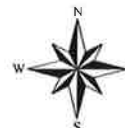
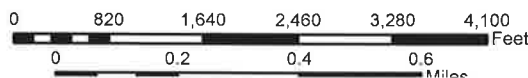
Existing zoning and Growth Area location



- Legend**
- Zoning Floating/Overlay Zones**
- A(R)
 - BG
 - BL
 - EC
 - PI
 - RT
- Overlay Type**
- Rural Business
 - Account Unknown
 - Open Space
 - Tax Parcel
 - Road
 - Water
 - Town Boundaries
 - Airport Overlay
- TOWN**
- Growth Area Boundaries

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**WASHINGTON COUNTY PLANNING COMMISSION
REGULAR MEETING
December 4, 2017**

The Washington County Planning Commission held a regular monthly meeting on Monday, December 4, 2017 at 7:00 p.m. at the Washington County Administration Building, 100 W. Washington Street, Room 2000, Hagerstown, Maryland.

Commission members present were: Chairman Clint Wiley, B. J. Goetz, Jeremiah Weddle, Denny Reeder, Drew Bowen, David Kline, and Ex-Officio Commissioner Leroy Myers. Staff members present were: Washington County Department of Planning & Zoning - Stephen Goodrich, Director; Jill Baker, Chief Planner; and Debra Eckard, Administrative Assistant; Washington County Department of Plan Review & Permitting – Tim Lung, Director; and Cody Shaw, Chief of Plan Review.

CALL TO ORDER

The Chairman called the meeting to order at 7:00 p.m.

MINUTES

Motion and Vote: Mr. Bowen made a motion to approve the minutes of the November 6, 2017 regular meeting as presented. The motion was seconded by Commissioner Myers and unanimously approved.

NEW BUSINESS

SUBDIVISIONS

The Villas at Gateway (PP-17-001)

Mr. Shaw presented for review and approval a preliminary plat for The Villas at Gateway located along the south side of Arnett Drive. The property is currently zoned RU – Residential Urban. The developer is proposing 24 semi-detached residential units. Total parking spaces required is 48 spaces; 72 parking spaces will be provided. The site will be served by public water from the City of Hagerstown and public sewer from Washington County. Storm water management will be handled through an existing pond at Walmart with filterra inlet structures and grass swales. Forest Conservation Ordinance requirements are proposed to be met using the payment-in-lieu option in the amount of \$10,663.50. Approvals are pending from the City of Hagerstown Water Department, the Health Department and the Washington County Department of Water Quality.

Motion and Vote: Mr. Reeder made a motion to grant staff the authority to approve the site plan after approvals have been received from the City of Hagerstown Water Department, the Health Department, and the Washington County Department of Water Quality. The motion was seconded by Mr. Goetz and unanimously approved.

SITE PLANS

Rosewood PUD, Phase IIB, Lots 17B, 17C, 18 and 20 (PSP-17-002)

Mr. Shaw presented for review and approval a preliminary plat/site plan for Rosewood PUD Phase IIB, Lots 17B, 17C, 18 and 20). The property is located along the north side of Robinwood Drive and is currently zoned RS/PUD – Residential Suburban with a Planned Unit Development overlay. The developer is proposing the following:

- Lot 17B will be developed with a total of 72 apartments in two buildings with a community center and office space. Parking spaces required is 192 spaces and 192 spaces will be provided. There will be a total of 10 employees for the office space with hours of operation from 8:00 a.m. to 5:00 p.m. Trash will be collected in dumpsters and removed by private haulers. The site will be served by public water and public sewer from the City of Hagerstown

- Lot 17C will be developed with a fast food restaurant with drive thru. The number of employees will be a total of 12 (5 employees per shift). The hours of operation will be 6:00 a.m. to 11:00 p.m., 7 days per week. The total required parking is 30 spaces and 30 parking spaces will be provided. Deliveries will be one box truck per week. The site will be served by public water and public sewer from the City of Hagerstown.
- Lot 18 will be developed with a total of 32 apartments on 1.44 acres of land. Total parking required is 74 spaces and 79 parking spaces will be provided including 8 RV spaces. Trash will be collected in dumpsters and removed by private haulers. The site will be served by public water and public sewer from the City of Hagerstown.
- Lot 20 will be developed with 3 apartment buildings containing 118 units on 6.34 acres of land. The total number of parking spaces required is 272 spaces and 273 spaces will be provided. Trash will be collected in dumpsters and removed by private haulers. The site will be served by public water and public sewer from the City of Hagerstown.

Forestation was previously addressed and forest planting areas 8, 11 and 12 will be platted with this plan.

Motion and Vote: Mr. Bowen made a motion to grant staff the authority to approve the site plan after approvals have been received from all reviewing agencies. The motion was seconded by Mr. Kline and unanimously approved.

Bowman North LLC (SP-17-021)

Mr. Shaw presented for review and approval a site plan for two commercial buildings on a 9.28 acre parcel located along the west side of Precision Place. The property is currently zoned HI – Highway Interchange. The developer is proposing to remove the middle section of a currently vacant building to create two 14,000 square foot commercial buildings. The hours of operation will be 10:00 a.m. to 8:00 p.m. Total required parking is 140 spaces and 161 parking spaces will be provided. The site is served by public water from the City of Hagerstown and public sewer from Washington County. Storm water management quality will be handled via ESD micro scale practices and is exempt from quantity requirements due to being a re-development. The site is exempt from Forest Conservation Ordinance requirements because this is a re-development. Approvals are pending from the City of Hagerstown Water and Sewer Department, the Health Department and the Washington County Department of Water Quality.

Motion and Vote: Mr. Reeder made a motion to grant staff the authority to approve the site plan after approvals have been received from the City of Hagerstown Water and Sewer Department, the Health Department and the Washington County Department of Water Quality. The motion was seconded by Mr. Weddle and unanimously approved with Commissioner Myers abstaining from discussions and the vote.

Solar Gaines (SP-17-024)

Mr. Shaw presented for review and approval a site plan for Solar Gaines for a proposed solar energy generating system (SEGS) on 35.9 acres located along the south side of Leitersburg-Smithsburg Road. The property is currently zoned A(R) – Agricultural Rural. An appeal was granted by the Board of Zoning Appeals on July 12, 2017 to establish a solar energy generating system with the following conditions: (1) the system does not exceed ½ acre in land area and (2) that it be situated in the general location as presented to the Board. The hours of operation will be 24 hours per day, 7 days per week. There will be no employees and no parking is required. The height of the solar panels will be 5 feet. Screening will be achieved using existing forested area on site and a security fence that will be opaque on certain sides. The site is exempt from storm water management due to being less than 5,000 square feet of disturbance. The site is also exempt from Forest Conservation Ordinance requirements due to having less than 20,000 square feet of disturbance. All agency approvals have been received.

Discussion and Comments: Mr. John Hankins, representative from Solar Gaines, explained that this is a pilot program for a community system whereby neighboring property owners can buy into the system. Mr. Weddle asked what is currently on the ag property. Mr. Schreiber of Frederick, Seibert & Associates stated that the field is currently being used for crops. Mr. Weddle expressed his concern regarding the use of ag land for this type of use. He clarified that he is in favor of solar energy, but he believes that productive agricultural land is not where these systems should be placed. Mr. Schreiber reiterated that

the A(R) district allows SEGS as a special exception use, which was approved for this property by the BZA in July.

Mr. Kline gave a brief explanation of how pilot programs like this one will work and some of the requirements associated with these types of programs. Mr. Bowen recommended that the Planning Commission and staff further discuss the issue of placing SEGS on agricultural land during future discussions for the Comprehensive Plan. Mr. Goodrich stated that staff has already determined the need to address this issue in the Comprehensive Plan update.

Mr. Goetz made an inquiry regarding the screening to protect neighboring properties specifically the use of a fence. He expressed his opinion that low shrubbery or other vegetation should be used to help buffer the site. There was a brief discussion regarding the use of a fence around the SEGS. Mr. Weddle expressed his opinion that fences can be a hazard to wildlife. He explained that deer can jump the fence to get into the area of the solar panels but have difficulty getting back out thereby getting injured and possibly damaging the panels. Mr. Lung stated that a fence is required around the perimeter of the solar energy generating system and the electrical equipment per the Zoning Ordinance. Mr. Schreiber stated that the developer intends to use a fence with green slats between the chain link in order to blend in with the surrounding vegetation.

Motion and Vote: Mr. Reeder made a motion to approve the site plan as presented. The motion was seconded by Mr. Bowen. The motion passed on a 5-1 vote with Mr. Weddle voting No.

FOREST CONSERVATION

Eastern Panhandle Expansion Project (GP-17-015)

Mr. Shaw presented a request for approval of the forest mitigation proposal for the Eastern Panhandle Expansion Project in Washington County. The applicant's forest conservation professional provided an analysis describing how they arrived at the proposed mitigation of off-site retention. Mr. Shaw provided brief background information for this project stating that Columbia Gas is proposing the installation of approximately 3.4 miles of a new greenfield, 8 inch natural gas pipeline equipped with a launcher and receiver at each end. The pipeline will tie into the existing 20 inch and 24 inch pipelines located in Fulton County, PA. The project will require a Certificate of Public Convenience and Necessity to be issued by the Federal Energy Regulatory Commission for construction, operation and maintenance of the project. A grading and sediment and erosion control plan (GP-17-015) has been submitted to Washington County Department of Plan Review & Permitting and is currently being reviewed. There is a Forest Conservation Plan associated with the project. The grading plan will be reviewed per the guidelines of the Washington County Storm Water Management, Grading, Soil Erosion and Sediment Control Ordinance. The Washington County Soil Conservation District will review the Soil Erosion and Sediment Control plan. The applicant is proposing off-site mitigation in the form of a protective easement on 59 acres of existing forest on lands owned by the Town of Hancock.

Motion and Vote: Mr. Bowen made a motion to approve the forest mitigation as presented. The motion was seconded by Mr. Kline and unanimously approved.

-OTHER BUSINESS

Emerald Pointe PUD Commercial Area (SP-16-014)

Mr. Lung presented for review and approval a request from the developer of the Emerald Pointe PUD a change in the maximum height requirement established as part of the approved final development plan for the commercial area in Emerald Pointe PUD. Per the Zoning Ordinance, building spacing and height requirements shall be the same as those for the different types of development provided for in the district where PUDs are permitted. The Planning Commission may waive or modify the height and other design requirements for the different types of development if such modifications will increase the amenities of the development. The underlying zoning of the subject property is RS (Residential Suburban) where the maximum building height is 35 feet. Commercial uses in a PUD are based on the uses allowed in the BL zoning district where the maximum height is 25 feet. The approved development plan and the commercial

area site plans call for a maximum building height of 36 feet to accommodate two story buildings. The applicant is requesting a change in the maximum building height from 36 feet to 46 feet to accommodate three story buildings. This would require a revision to the site plan and re-calculation of parking requirements. Mr. Poffenberger of Fox & Associates, Inc. stated that the request does not include Building A, which will remain a two story building.

Discussion and Comments: There was a brief discussion regarding the number of parking spaces that would be required if the request is approved. Mr. Bowen clarified that the developer does not have any additional acreage for additional parking. Commissioner Myers questioned what would happen if a tenant moves out and the developer would want to change the use of the space. He noted that it could be a problem if the new use cannot meet the parking requirements. Mr. Poffenberger of Fox & Associates, Inc. stated that he will pass along the comments and concerns of the Commission to the developer.

Motion and Vote: Mr. Bowen made a motion to approve the request as presented. The motion was seconded by Mr. Goetz and unanimously approved.

Amended Motion and Vote: Mr. Bowen amended his motion that the additional maximum height of 46 feet would be for Buildings B and C only. The motion was seconded by Mr. Goetz and unanimously approved.

Update of Staff Approvals

Mr. Lung reported the following for the month of November: Land Development/Permit review – 9 entrance permits; 1 flood plain permit; 13 grading permits; 1 non-residential electrical permit; 2 non-residential addition permits; 2 non-residential construction permits; 5 utility permits; Land Development Plan Review – 3 subdivision replats, 3 preliminary/final subdivision plat minor residential subdivision, 1 site plan, 1 site specific grading plans, 3 standard grading plans, and 1 standard storm water management plan, 2 public works agreements, 2 modifications, 1 forest conservation plan, 1 storm water concept plan, 1 Town plan for storm water, 1 APFO road adequate review for Hopewell Station; Approvals issued: 3 site plan for St. James Fine Arts Center, Hopewell Station and an expansion for the Long Meadow Fire Department building, 1 red line revision, 2 simplified plats for subdivision, and 1 forest stand delineation.

Land Preservation, Parks & Recreation Plan

Ms. Baker presented the draft Land Preservation, Parks & Recreation Plan for Washington County. The preparation and update of this plan is a pre-requisite for the County's participation in the State of Maryland's Program Open Space Local Side Program. The County is required to have an up-to-date Plan in order to receive funding for Program Open Space projects. The Plan is broken up into three different sections: Parks and Recreation, Natural Resources, and Land Preservation. Ms. Baker gave a brief overview of each section. The County owns and maintains 872 acres of recreation areas included in 18 parks and recreational facilities. Park pavilion rentals in 2016 was 1,076 rentals with approximately 83,000 participants. Ms. Baker briefly discussed a park usage analysis survey that was completed and the results of that survey, which is shown in the Plan. There is approximately 40,000 acres of State and Federally owned park and forested land within Washington County, which includes over 100 miles of bike routes, 40 miles of the Appalachian Trail and the C & O Canal Towpath that is used as a multi-modal trail. There are several areas for swimming, boating, kayaking and other related water activities. Watershed management has also been included in the update of the Plan. The Plan discusses the protection and preservation of ag resources through a long-term goal of preserving 50,000 acres of land in the County. Currently, there are approximately 25,000 acres of ag land that have been protected through the various programs offered in Washington County.

Commissioner Myers made an inquiry regarding the timelines for adopting the Plan. There was a brief discussion regarding the timeline for this Plan as well as the Comprehensive Plan update. Staff noted that a draft of the Plan was sent to the State prior to the July 1st deadline and the State had numerous comments and changes due to new regulations that were being implemented. Staff has kept the State informed of our progress.

Consensus: The Planning Commission, by consensus, has given staff the authority to forward this Draft to the State for review and approval.

Solar Energy Generating Systems Discussion

As additional information related to the previous discussion about solar energy operating systems, Mr. Goodrich explained that SEGs are not permitted, even by special exception, in Priority Preservation Areas, Rural Legacy Areas or permanently preserved agricultural easement areas. SEGs are permitted on some agricultural land. He also explained that local government does not have review authority and cannot deny SEGs [depending upon size] because they are regulated by the Public Service Commission. However, the County does have regulations in place and therefore continues to monitor these issues because it soon may be possible to have local concerns included in PSC approvals. New legislation may make changes to local review and regulation in the future.

Mr. Kline briefly discussed the viewpoint of the utility company with regard to local approving authorities. Mr. Goetz reiterated his concern with regard to the hazards to wildlife.

UPCOMING MEETINGS

1. Monday, January 8, 2018, 7:00 p.m., Washington County Planning Commission regular meeting, Washington County Administration Building, 100 W. Washington Street, Room 2000, Hagerstown, Maryland

ADJOURNMENT

Commissioner Myers made a motion to adjourn the meeting at 8:45 p.m. The motion was seconded by Mr. Goetz and so ordered by the Chairman.

Respectfully submitted,

Clint Wiley, Chairman

MINERAL RESOURCES

Goals and Objectives

I. Goals

- i. Promote the use of best management practices as part of reclamation activities.
- ii. Conserve major accessible mineral resource deposits for future extraction.
- iii. Safeguard the public by minimizing environmental impacts resulting from extraction and transport of resource deposits.
- iv. Evaluate opportunities for reuse of deep pit mining operations for potable or non-potable water resources.
- v. Continue to analyze impacts of mineral resource operations on other water resources such as wellhead protection areas.

II. Objectives

- i. Encourage interim reclamation activities to improve the soil quality and potential for vegetative growth during the life of the mining operation rather than after mining operations have ceased.
- ii. Develop policies that support reclamation through re-mining to abate any negative impacts from legacy mines in the County.
- iii. Identify and utilize any programs which can support reclamation or reforestation of older mined sites which were not subject to reclamation requirements established by Maryland's Surface Mining Law.
- iv. Maintain land use policies and regulations that discourage the preemption of known mineral extraction areas by other uses.
- v. Require an inventory and impact assessment of sensitive areas located on proposed new Industrial, Mineral zoning districts.
- vi. Consider the impact on sensitive area resources in applicable areas during development review before extending any new Industrial, Mineral (IM) Zoning Districts.
- vii. Assure that all available measures are taken to protect the natural environment and adjacent communities from spillover effects resulting from active mineral extraction activities.
- viii. Ensure that post-excavation uses for mined sites are identified during development and are consistent with existing or planned adjacent uses.
- ix. Coordinate with other County agencies to more accurately track low volume mineral extraction operations.

I. Introduction and Purpose

As described in the Sensitive Areas Element, the County is underlain with a diverse geologic foundation. The minerals found within underlying geologic formations such as sand, lime, shale, and quartz play a pivotal role in creating and sustaining our built environment. These are non-renewable resources so it is important to plan for the efficient extraction and utilization of these resources to ensure availability in the future. The Annotated Code of Maryland's Land Use Article specifies that a Mineral Resources element is to be included as a part of a county's Comprehensive Plan. The Code states that the element shall identify: (1) undeveloped land that should be kept in its undeveloped state until the land can be used to assist in providing a continuous supply of minerals, and (2) appropriate post-excavation uses for the land that are consistent with the County's land use planning process. The element is meant to consider land use policies and regulation recommendations: (1) to balance mineral resource extraction with other land uses, and (2) to the extent feasible, to prevent the preemption of mineral resources extraction by other uses.

Types of Minerals

Typically, minerals fall into one of two broad forms of classification; fuel or non-fuel minerals. Coal and natural gas are examples of fuel minerals found in Maryland. Non-fuel minerals, also referred to as non-coal minerals, are defined as "... *any solid material, aggregate, or substance of commercial value, whether consolidated or loose, found in natural deposits on or in the earth, including clay, diatomaceous earth, gravel, marl, metallic ores, sand, shell, soil, and stone* [not including coal]."¹ Non-fuel minerals are secondarily classified as metallic or non-

¹ Annotated Code of Maryland, Environment Article §15-801

metallic. Mineral resources in Washington County tend to fall into the non-fuel category and be of a bulk nature.

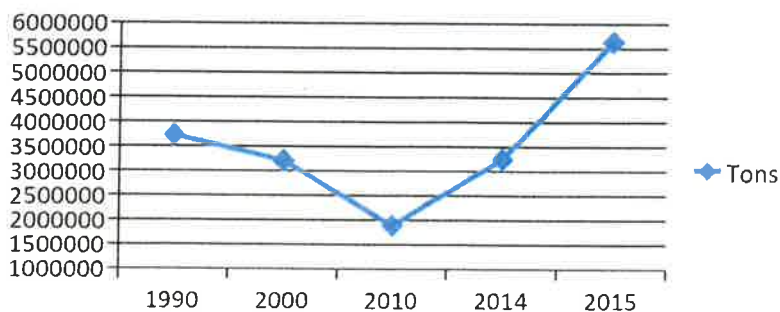
The economic value derived from mineral resources stems from either from their bulk (such as building stone), or for specific mineral element or elements contained in the material (such as iron ore). Mineral resources therefore denote an economic commodity that can be profitably extracted under current conditions with the available technology.

II. Mineral Resource Inventory

Present Mineral Resource Production

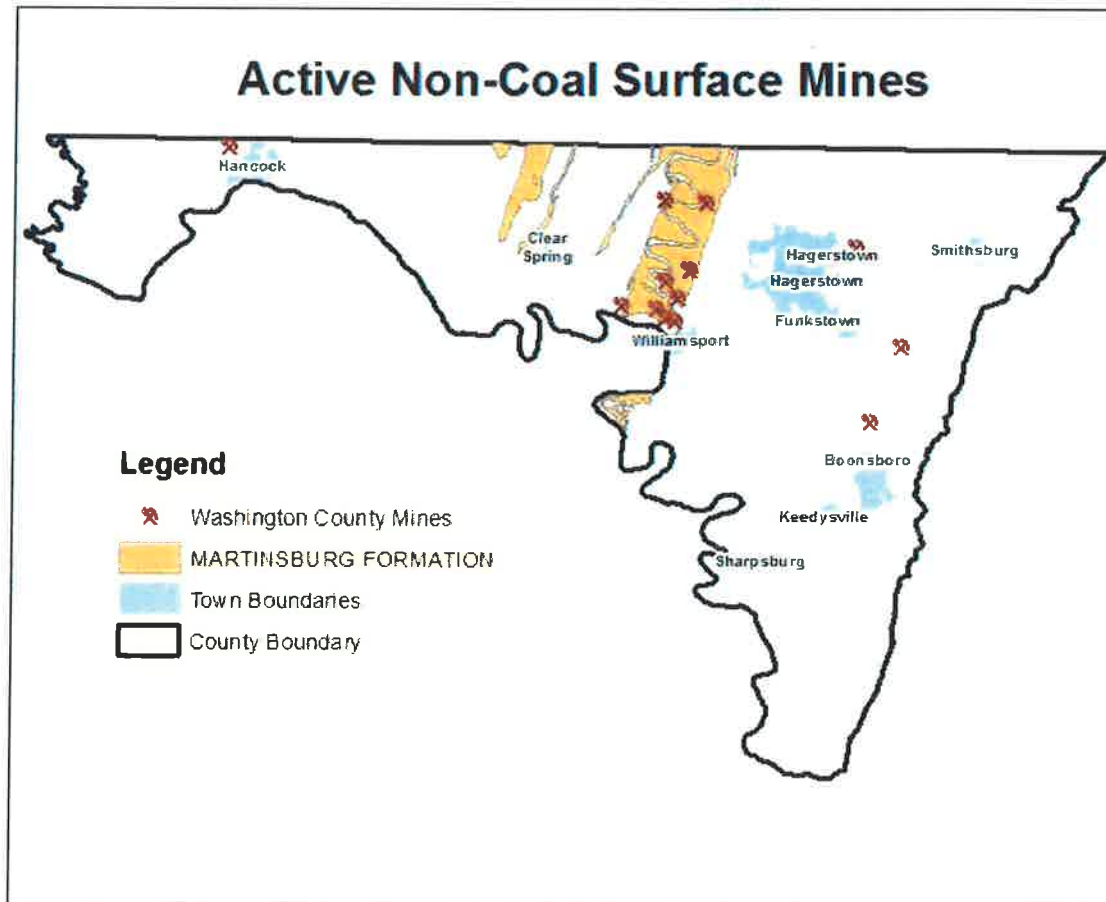
Mineral resource production in Washington County is presently limited to surface mining operations for non-fuel minerals. While used as a commodity locally, there are currently no coal or natural gas mining operations occurring within the County. Active mining operations within the County include limestone and shale quarries that produce crushed stone, cement, and shale. Shale clay is extracted for brick production. Much of this material is put to use for various construction-related purposes locally. Thirteen active surface mines are in operation in Washington County according to GIS data retrieved from the Maryland Department of the Environment (MDE). Non-coal surface mines produced 5.6 million tons of non-fuel minerals in Washington County in 2015, which was a 73.5% increase in production over the 3.2 million tons produced in 2014, according to data obtained through internal communications with MDE

**Washington County Non-Coal
Surface Mine Production 1990-2015**



representatives. Mining operations cover 1,729.8 acres at present in the County.

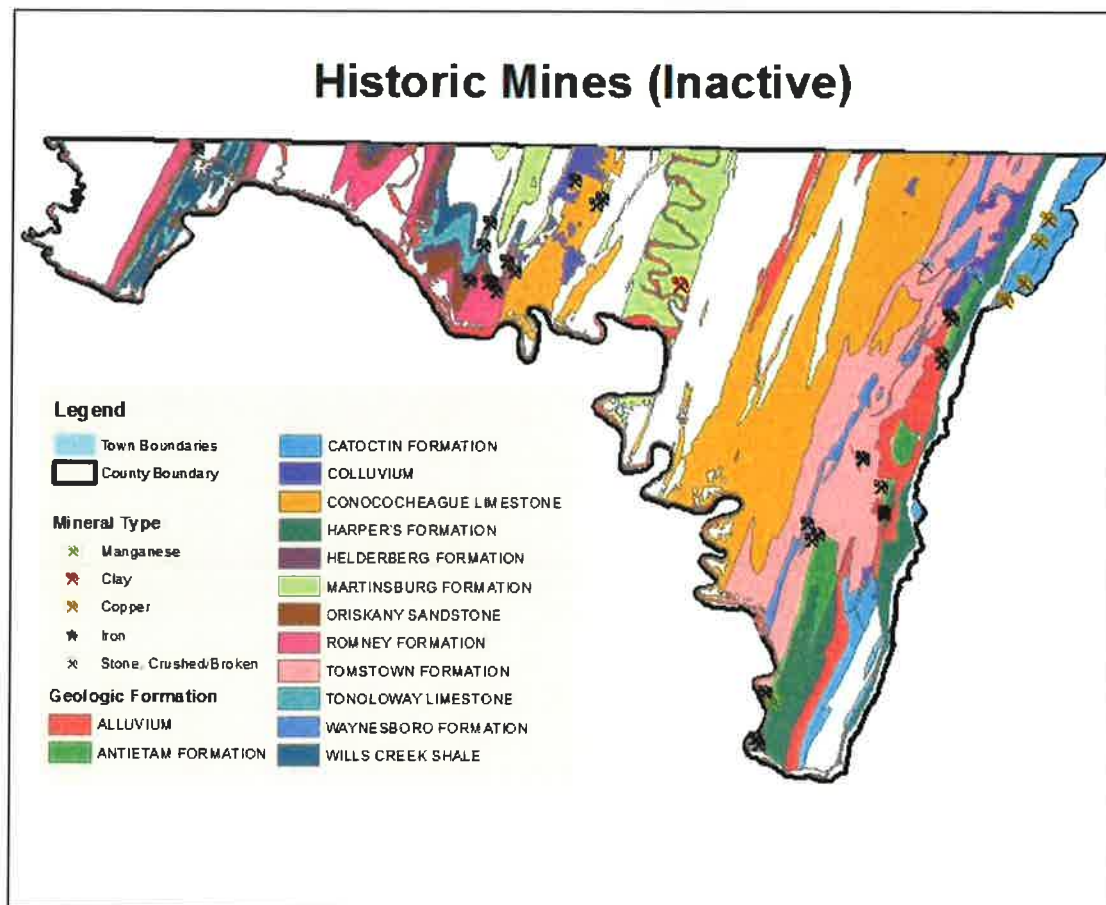
The vast majority of these active mining operations are located in the Martinsburg Formation and the alluvial deposits adjacent to Conococheague Creek in the central portion of the County. Non-coal surface mine tonnage produced in Washington County between 1990 and 2015 is displayed in the table above. The map below displays the locations of active permitted non-coal surface mining operations in the County since 2011.



Historic Mineral Extraction Operations

Based upon information extracted from USGS and MDE historic permitting data, there have been numerous mineral extraction operations that have occurred in Washington County since the early 1800s. In addition to limestone, shale, and clay operations that continue into present day, minerals such as Manganese, Copper, and Iron were also extracted from various

parts of the County. For reference purposes, the location as well as the associated geologic formation where mining has historically occurred in the County is shown on the Historic (Inactive) Mines map below. These mines are no longer active, but they do give an indication of other mineral resources that have occurred previously in large enough quantities to be economically worth commercial exploration. It also provides some insight into which geologic formations are predisposed to specific mineral types.

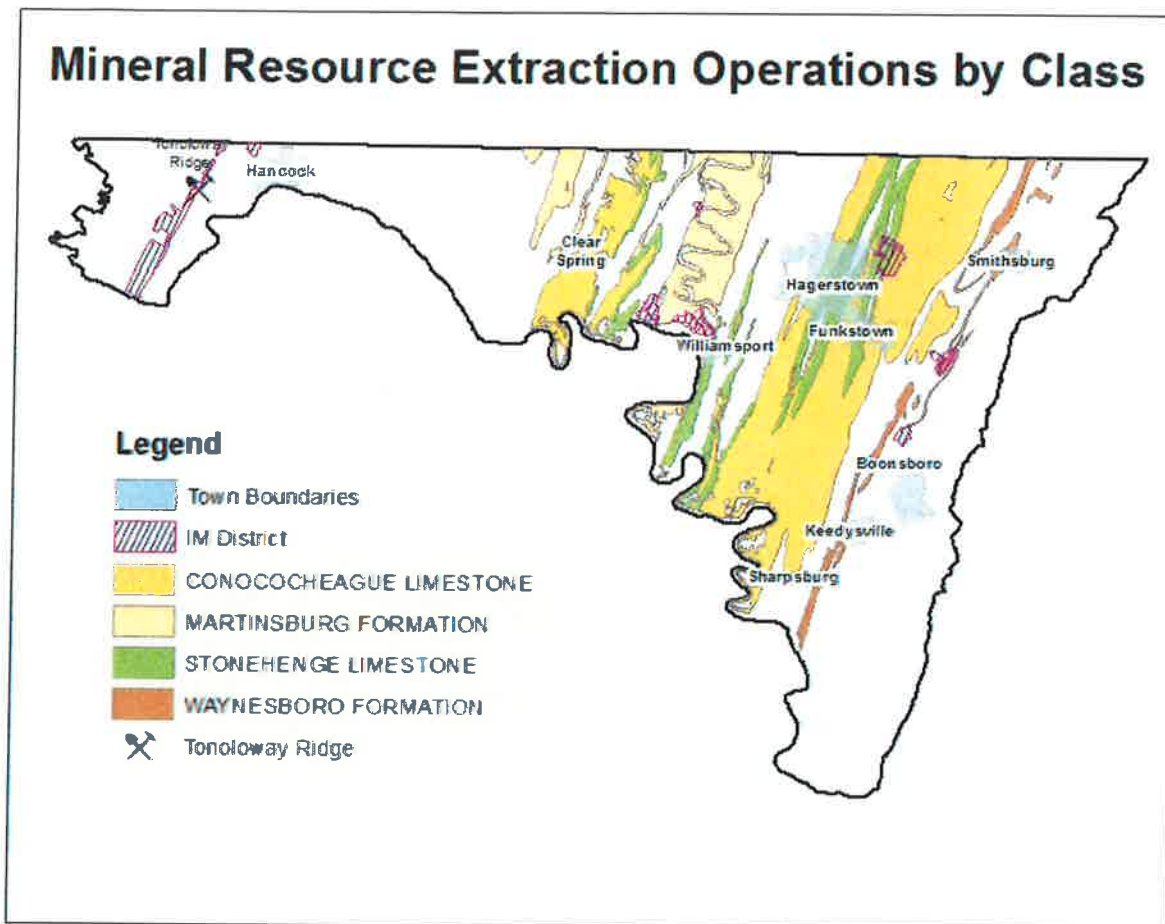


Potential Non-Fuel Mineral Reserves

Evaluation of historic and existing mining operations can give insight into potential mineral resource areas. Potential mineral reserves in Washington County are most likely to be explored in areas adjacent to existing IM Districts. As shown on the active mining operations

map there is a predominance of mining operations occurring within the Martinsburg Formation. Mining operations will almost certainly continue along the belt of the Martinsburg Formation bordering Conococheague Creek as the resource is abundant and easily extracted. Another area that shows extraction potential is within the Waynesboro Formation located along the eastern edge of the Hagerstown Valley. This is a limestone formation that currently contains two active mines and has shown potential for continued crushed stone production. The final active mining operation in the County is located in the Stonehenge and Conococheague geologic formations. This operation is primarily involved in mining for potash and limestone products for cement production.

The U.S. Silica holding on Tonoloway Ridge represents the only currently permitted, but inactive, mineral reserve of notable size already zoned Industrial, Mineral in Washington County. U.S Silica, which extracts quality silica sand in nearby Berkeley Springs, West Virginia, also has an open permit for Tonoloway Ridge south of Hancock that is not currently in production. Tonoloway Ridge is part of the same Oriskany Sandstone formation being mined to the south in West Virginia. The location of the IM Districts, the rough location of the Tonoloway Ridge area permitted for mining, and the corresponding mineral formations where extraction is taking place are shown on the map below.

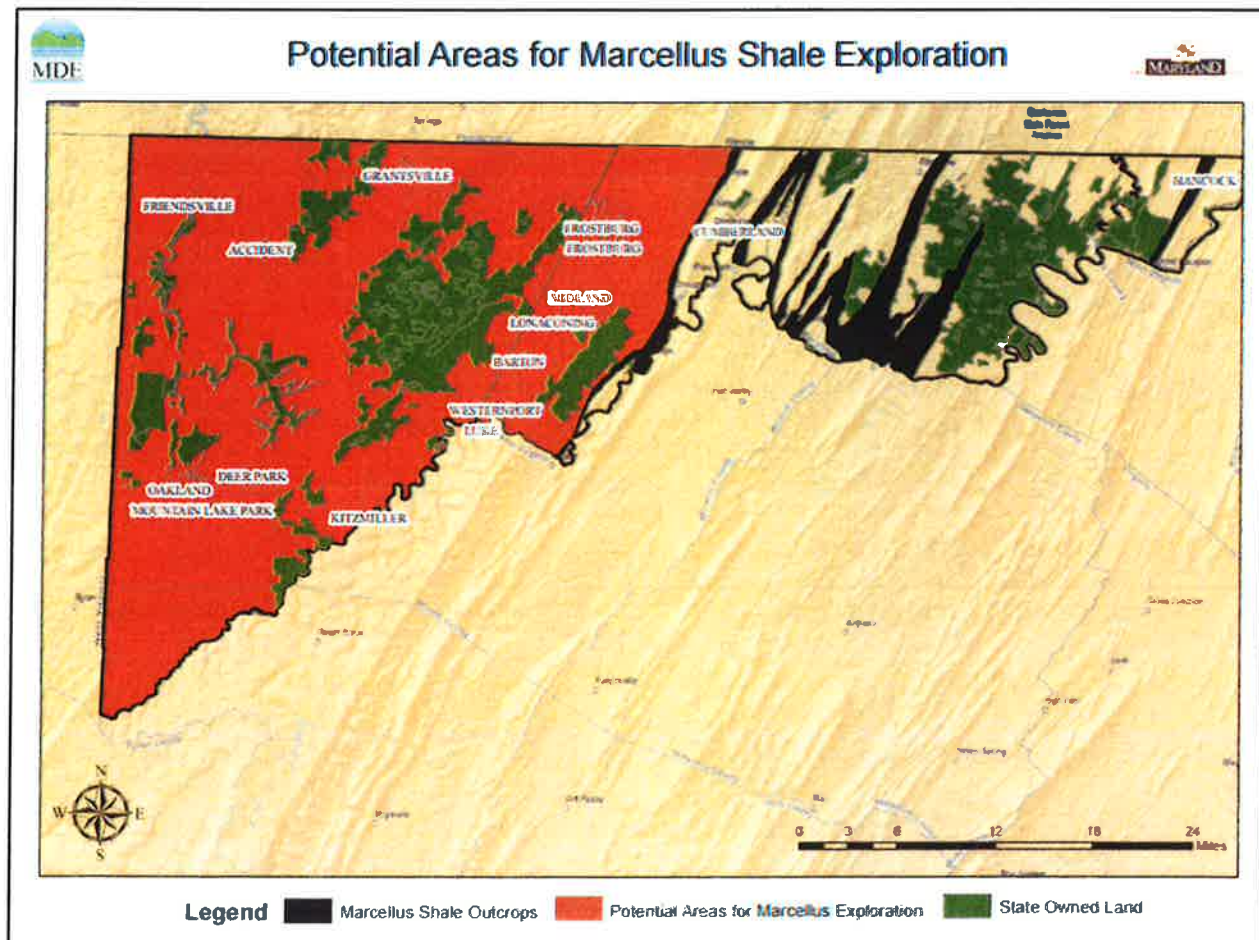


Potential Fuel Mineral Resources

As stated previously, there are currently no active fuel mineral extraction operations within Washington County. Mining of fuel minerals such as coal and natural gas occurs primarily in neighboring Garrett and Allegany Counties. The Marcellus Shale Formation, where much of the natural gas exploration is taking place throughout the region, underlies New York, Pennsylvania, Ohio, West Virginia and Western Maryland at depths ranging from 3,500 to 7,000 feet.² In 2009, the Department of Energy estimated 262 trillion cubic feet of natural gas exists in

² Maryland Department of the Environment, *Facts About Marcellus Shale in Maryland*. (Baltimore: Maryland Department of the Environment), 2016.

the Marcellus Shale, making it the largest onshore Natural Gas Reserve in the United States.³ As shown on the map below Marcellus Shale formations are found in Garrett and portions of Allegany and Washington Counties. Specific to Washington County, the Romney and Oriskany Formations are included within the Marcellus shale grouping. Only Western Allegany and Garrett Counties are presently anticipated as production areas in Maryland, as shown in the graphic above.



Source: Maryland Department of the Environment

³ Maryland Department of the Environment, *Marcellus Shale*, <http://mde.maryland.gov/programs/Land/mining/marcellus/Pages/index.aspx>, 2016.

III. Mineral Resource Regulation

Mineral resource regulation attempts to balance the need for retaining the ability to extract valuable mineral resources with the protection of adjacent communities from the impacts of these intensive operations. Washington County strives to offer its citizens choices in where they wish to live. With this choice, there must be an acceptance by adjacent landowners that less desirable uses may occur on undeveloped lands, especially in rural areas. Mineral extraction operations represent an intensive example of a land use, which is lawfully authorized and specifically regulated to occur only in the rural areas of the County. Recognizing the potential for conflicts in land use on adjoining properties is, therefore, a fundamental part of short and long-term planning for the needs of the County.

Surface mining is currently the preferred method used for the extraction of non-coal minerals in Washington County. The extraction and processing of minerals is an intensive activity that has the potential for significant impacts upon local infrastructure, nearby communities and natural ecological systems within the operation's sphere of influence if not properly managed. These potentially significant impacts can include erosion, landslides, water quality and aquatic ecosystem impacts, subsidence, adjacent well failures, acid mine drainage, degradation of wildlife habitat and more.

Local, state and national regulations are designed to eliminate or minimize the environmental, aesthetic and reclamation issues that may accompany mineral extraction operations. Effective long-range planning can avoid direct adverse impacts on communities by separating mineral extraction from incompatible adjacent land uses. Finding ways to balance the needs of different user groups while mines are in operation and planning for re-use of mined

lands after operations cease are essential to comprehensive planning for mineral resource lands in Washington County.

While mineral resource operations inherently involve extractive activities that modify the natural character of the affected landscape, proper regulation of this type of land use can strike a balance between economic and conservation-focused interests. From an economic perspective, the profitability of mineral resource operations is greatly influenced by the proximity of the producer and the marketplace. When buyer and seller are within close proximity of one another, transportation costs for the seller are reduced which, in turn, brings down the cost paid by the buyer. Additionally, reduced distances between mineral sources and their marketplace tends to mitigate negative externalities, such as traffic congestion and air quality impacts that can result from transporting heavy, bulk materials overland for considerable distances. The suitability of specific locations for mineral extraction is also influenced by other factors, including the chemical quality and physical properties of the minerals, topography and groundwater conditions, the presence of historic or environmentally sensitive areas, existing surface development and the value of land for alternative uses.

The establishment of mineral extraction districts is necessary to prevent preemption of incompatible activity by other land uses and thereby ensure opportunities for future mining operations. If valued mineral resources are holistically mapped and inventoried, it enables decision-making bodies to head off such conflicts by reserving such areas for future exploration when economically and technologically feasible. In the process, larger issues related to water supply, water quality and the protection of sensitive species and their habitats can be addressed in site planning and in later remediation efforts that enable the careful balance of natural resource use and conservation to remain intact.

Federal Mining Regulation

The General Mining Law of 1872, and its subsequent amendments, regulate mining activities on federal lands open to mineral extraction. The federal land holdings within Washington County, however, are generally managed solely for land preservation and recreational purposes, not multiple use activities such as mineral extraction. Numerous federal environmental laws such as the National Environmental Policy Act (NEPA), Federal Land Policy and Management Act, Clean Air and Water Acts, Endangered Species Act, and many other legislative acts also indirectly govern mining activities on federal lands. The Surface Mine Control and Reclamation Act passed by Congress in 1977 spurred the creation of individual state programs for mining land reclamation, particularly for abandoned coal mines. The Act helped to create uniform standards across state lines for regulation and reclamation that would ensure mining operations would have to meet minimum safety, health and environmental standards no matter which state they chose to locate in.

State and Federal Mining Regulation

Maryland's first mining law was established by the General Assembly in 1876.⁴ Like much of the State's early regulation of the industry, the law sought to improve the conditions of the coal mines and mitigate their external impacts. This first law established the Inspector of Mines position (now Chief Mine Engineer) in order to ensure the health and safety of coal and clay mining operations in Allegany and Garrett Counties, and to prepare an annual report detailing the volume output, working conditions and number of people employed in the industry. Further regulation occurred in 1922, when the Bureau of Mines was created in order to provide a code of laws protecting the health and safety of coal miners, protect property connected to the

⁴ Maryland Department of the Environment. *Maryland Bureau of Mines Annual Reports*.
<http://mde.maryland.gov/programs/Land/mining/Coal%20Mining/Pages/BureauofMinesAnnualReports.aspx>, 2016

mines, keep a record of inspections and enforce laws and regulations under its authority pertaining to the industry.⁵ Additional State legislative controls on the coal industry occurred in 1955, 1967 and 1974, with 1967 being notable as the first time licenses, permits and land reclamation was required by law in Maryland for any type of mining operation.

The regulation of non-coal surface mines first occurred in 1977 when Maryland enacted comprehensive regulations for the extraction of non-coal minerals.⁶ These regulations required mining operations to maximize environmental protection and to ensure public safety. The program also emphasized reclamation of both active and abandoned mining sites, employing the logic that mining is an inherently temporary land use and remediation should therefore be ongoing throughout a mine's life cycle. Permits became required for non-coal surface mines, and their issuance was contingent upon the approval of mining and reclamation plans by the State so that it could ensure safety and environmental controls were in place during the mine's working lifespan. The County's review and approval process for extractive operations is designed to work concurrently with the State process. Oil and gas well drilling and production were included among the non-coal mineral reserves regulated by this act.

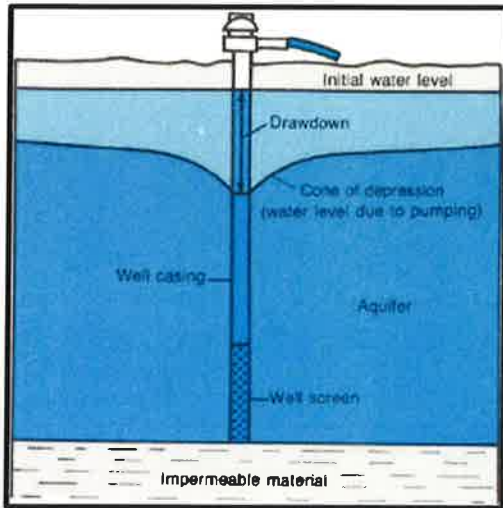
i. Effects of Mine Dewatering

More recently in 1991, the State of Maryland provided property owners with protection from damages resulting from limestone quarry dewatering in Baltimore, Carroll, Frederick, and Washington Counties. These counties were specified because portions of each are underlain by porous bedrock known as karst terrain that is highly susceptible to water quality and land subsidence issues.

⁵ Frank T. Powers, *Annual Report of the Mining Inspector of the State of Maryland*. (Baltimore: King Bros., Inc., Printers), 1921-1922, 59-104.

⁶ Maryland Office of Planning and Maryland Department of Natural Resources. *Managing Maryland's Growth: Models and Guidelines Volume II* 60.

Cone of Depression Caused by Pumping



Source: United States Geological Survey

Dewatering is an intentional process in mining operations in which groundwater is pumped or physically excluded from the mine to allow excavations for construction or mining projects to be carried out in workable dry conditions. Dewatering has the potential to create a cone of depression which results in a variety of impacts on adjacent surface lands and subsurface groundwater regimes including land subsidence, water contamination, effects to surface water habitats, and well failures. The effect of pumping on the groundwater table is shown on the figure at left. Generally speaking, deep pits mines that operate below the water table, or operations that pump large amounts of groundwater for extended periods of time (several months or longer) may have the potential to lower regional groundwater levels in the aquifer, thereby reducing the water available to third party users on the surface.⁷ In karst terrain, the potential for the myriad impacts noted above to occur may be greater, due to porous and complex nature of the bedrock where mining is occurring. The Environmental Article of the Annotated Code of Maryland asks counties to delineate “zones of dewatering influence” around quarries and assigns damages to be remedied by the quarry operators within the zones (15-812-813).

Various divisions within the Maryland Department of the Environment are in charge of regulating mining activities in the State. Maryland’s mining laws and regulations are in COMAR Title 26, Subtitles 19-21.

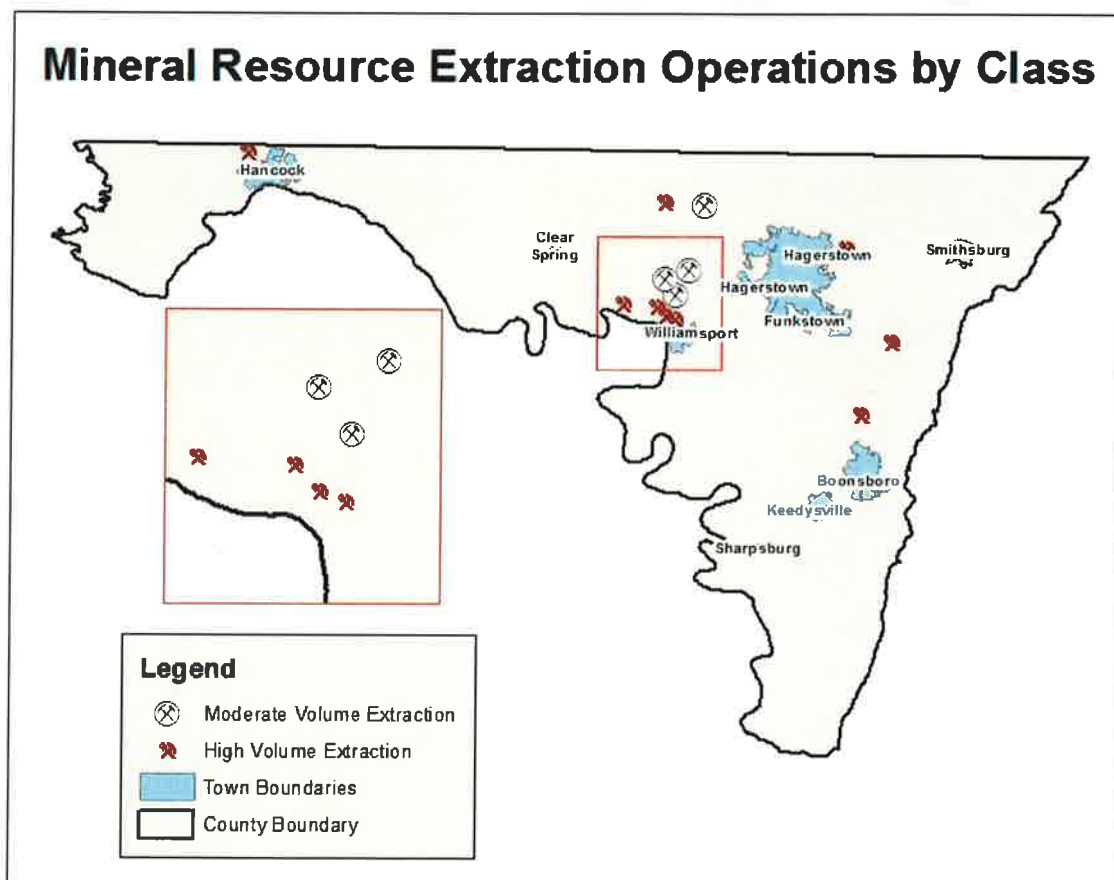
⁷Groundwater Engineering Limited, Managing Environmental Impacts of Dewatering. <http://www.groundwatereng.com/blog/2014/02/managing-environmental-impacts-of-dewatering>, February 16, 2014.

County Mining Regulation

Washington County's Zoning Ordinance is the primary land use control tool governing mineral resource extraction locally. When zoning was first enacted in Washington County in 1973, approximately 5,000 acres of land were classified as Industrial Mineral (IM). Most of the lands zoned IM at that time were in the ownership of companies either actively engaged in mineral extraction, or in the mineral extraction business with apparent plans for removing minerals on their property. Mineral extraction was also permitted as a Special Exception on land with other zoning classifications.

Following an exhaustive study of the aspects of mineral extraction operations and the regulations in effect at the time, a completely new IM section of the Zoning Ordinance was adopted in 1983. The new text divided mineral extraction into three categories based on the amount of area disturbed and the length of operation time. These three categories were labeled Low, Medium and High Volume Mineral Extraction. Low volume operations are presently defined in Article 28A as those in which the land area disturbed by extraction is less than or equal to one acre and contains no temporary or permanent structures. Moderate volume operations correspond to those where the amount of disturbed land falls between one and five acres. High volume operations disturb greater than five acres. High volume mineral extraction operations were only permitted outside the Urban Growth Area beginning in 1983. They are now also restricted from Town Growth Areas and Rural Villages as well. The volume classification also delineates which districts allow application of the IM floating zone, with fewer districts allowing IM designations with higher volume extraction areas. Areas designated as High Volume operations, for example, are permitted only in IM districts. Four moderate volume mines exist in the County, covering 14.28 acres. Nine high volume mines have been designated

as IM districts, which cover 1,715.52 acres of land in Washington County. Low volume mines (one acre or less in size) are regulated only within Washington County, as the Maryland Department of the Environment (MDE) only regulates mineral extraction *greater* than one acre in size. Accordingly, low volume mines do not presently show up on GIS data sets provided by MDE that display active mines in the County, as can be noted from their absence on the map below. The County will need to ensure that low volume operations are more accurately tracked in the future in order to pinpoint their geographical location, to avoid potential conflicts from adjacent land uses, and to address the gap between State and County oversight of small mine operators.



The Industrial, Mineral District was also changed from a traditional zoning district classification to a “floating zone” during this review process. Unlike an overlay zone, which

layers additional land use controls on top of those associated with the underlying zoning classification, floating zones render the existing zoning inert while permitting only pre-specified uses, setback requirements and other development standards.

Present IM Districts are designed solely to provide for high volume mineral extraction in the Rural Policy Area of the County. The Zoning Ordinance aims to protect IM Districts from encroachment by incompatible land uses and ensure that new or expanded IM Districts are compatible with existing adjacent land uses. New IM District approval occurs through the rezoning process, but does not require meeting the “Change or Mistake” burden inherently placed upon applicants in a typical rezoning case.

In deciding whether or not to apply the IM designation to a land area, the Planning Commission is also instructed, by the Ordinance, to consider the effect of mineral extraction operations on public roadways. Impacts on County roadways, which are not always designed to handle either the volume or weight of truck traffic typically associated with a commercial scale mining operation, can be considerable. To safeguard against excessive impacts, the County requires IM applicants to identify and adhere to hauling routes along County roads adequately designed to bear the burden associated with an IM operation in the concept plan. Applicants must also estimate average daily truck traffic and be prepared to post a performance bond if the Planning Commission determines, during the site plan approval process, that the resulting vehicular traffic may damage County roads.

Additional development review procedures for IM District applicants require noting the location of adjacent geologic or environmentally significant features. Ways to minimize visual, auditory, air quality (dust) and vibration impacts are considered. In keeping with State law, the applicant must consider what impacts their operation will have on groundwater supply and

quality within the zone of dewatering influence, and make contingency plans for well replacement of public water supplies that fall within this State designated zone. Excavation setback requirements and designated hours of operation are enforced by the Zoning Ordinance to minimize impacts on adjacent properties.

Other County regulatory documents also affect mining activities in Washington County. The County's Forest Conservation Ordinance has regulatory application to new IM Districts. Agricultural and resource areas require minimum forest cover of 20% in afforestation areas (presently not forested) and 50% in reforestation areas (previously existing forest removed as a result of regulated activity). Legacy mines in existence before the passage of the Forest Conservation Ordinance are not bound by these requirements.

Additionally, a variety of water quality related documents and regulations indirectly affect the placement and operational limits of mining activities in the County. These indirectly related regulatory documents and policies include the County's Water and Sewerage Plan (which addresses water and sewer quality and capacity for present and future needs), waterborne pollutant limitations like Total Maximum Daily Load (TMDLs) and Watershed Implementation Plans (discussed at greater length at the end of this chapter) and the Water Resources Element of the County's Comprehensive Plan. These items sometimes carry the weight of law, while in other cases merely serve as guidance tools for pursuing best management practices for improving overall water quality in the County by mitigating the impacts of a variety of different land use types.

IV. Mining Reclamation

Reclamation efforts in Maryland, and elsewhere around the country, were spurred by the passage of the Surface Mine Control and Reclamation Act (SMCRA) by Congress in 1977. The

Act recognized the need to uniformly regulate the increasingly prevalent technique of using surface mining to extract coal, which became more widespread as the 20th century wore on, and to focus more attention on mine reclamation, particularly for abandoned coal mines. SMCRA excluded surface mining from certain lands, established more stringent industry performance standards, required pre-excavation permitting, the posting of bonds for reclamation purposes, and authorized governmental regulators to inspect and enforce violators of the Act's provisions. SMCRA created minimum performance standards for mining operations that states had to adhere to in the creation of their own individual surface mining regulations.

While mineral resource extraction is a type of land use that inherently creates significant disturbance to the natural surface of the land, its temporary nature provides opportunities to reclaim the site for productive use after operations have ceased. State law requires that areas affected by mining shall "...be restored in a timely manner to: (1) Conditions that are capable of supporting the uses which they were capable of supporting before any mining; or (2) Equal or better uses..." Like other brownfield sites, mined lands have the ability to be reclaimed for purposes that benefit the public interest if such objectives are pursued by regulatory bodies. Once initial land disturbance occurs, natural factors influence future land and water utility for reclamation purposes. The method of mineral extraction and subsequent abandonment (if applicable) strongly influences the limits of any individual reclamation plan. Economic constraints also influence the range of projects that can be considered feasible, cost-effective reclamation uses. Projects that are both economical and ensure long-term land and water quality should gain the highest priority. Potential categories for re-use of reclaimed mineral resource lands include: agriculture, pasture, forestry, wildlife habitat, recreation or open space uses, industrial or commercial uses, residential development, or as a reservoir. Within Washington

County previous forms of reclamation have been within the realm of agriculture and forestry uses.

Washington County currently requires applicants applying for an IM rezoning to provide a plan for reclamation after active mining operations have ceased. Reclamation plans are to be designed to identify appropriate re-uses for the affected land that are compatible with the surrounding area. Water filled pits, for example, can be considered for remediation in areas suitable for public water supply. Reclamation plans are essential to retaining productive use of County lands in the aftermath of extraction, thereby ensuring its economic utility while minimizing long-term environmental impacts to people and wildlife in and around the disturbed area.

Reclamation through Re-mining

The considerable cost of remediating hazardous, abandoned mines remaining from the State's 19th and 20th century industrial legacy has led Maryland to pursue reclamation through re-mining.⁸ Modern technology has enabled economical extraction of remaining reserves at various sites of many abandoned mines around the State. This practice offers another option for County lands disturbed by mineral resource options that may be difficult to convert to another type of land use.

MDE is the primary entity which both permits (for land disturbance removing earthen material greater than 1 acre in size) and is in charge of reclamation efforts for mineral resource operations which disturb more than one acre of land. Depending on whether it was a coal or

⁸ Maryland Department of the Environment, *Maryland Abandoned Mine Lands Reclamation Section*. <http://www.mde.maryland.gov/programs/Land/mining/abandoned/Pages/AbandonedMineLandsUnit.aspx>, 2016.

non-coal mine, or a legacy mine now abandoned, various divisions within MDE are responsible for each type's reclamation.

Pre-planning for Water Quality

Watershed-level planning studies, which inventory and take stock of the overall health and abundance of sensitive environmental resources within a given watershed, could help provide guidance as to what land uses would be appropriate choices in the development pre-mining reclamation plans. If environmental quality in a watershed has been compromised to a significant degree by mining operations, or by any other development related impact, retaining the reclaimed land for conservation purposes would help address overall watershed health. Additionally, due to the unique nature of the County's subsurface geology, much of which is underlain by porous karst terrain that is highly susceptible to water contamination and the development of sinkholes, it may be necessary to more carefully consider the suitability of reclaimed land in some karst areas for intensive land uses such as mineral resource extraction in the future.

A significant effort in this regard is the ongoing work of the County to complete and implement its contribution of the Chesapeake Bay's Watershed Implementation Plan (WIP). Due to State and regional concern for the health of the Chesapeake Bay and its tributary waterways, formerly voluntary efforts by states and counties to reduce pollutants entering the Bay have become mandatory through the creation of the Total Daily Maximum Load's tool. A TMDL establishes the maximum amount of an impairing substance or stressor that a waterbody can assimilate and still meet water quality standards. This load limit is allocated among pollution contributors, who represent State and County entities throughout the Bay's broad upstream watershed. Phase II of the Watershed Implementation Plan focused on more detailed

pollution reduction strategies to achieve overall cleanup goals, including County level watershed restoration plans. The heightened focus on water quality Statewide resulting from the WIP, the Water Resources Element of the County's Comprehensive Plan, and other regulatory tools provide useful guidance in where and how mining land reclamation efforts could benefit water quality improvements that, in turn, provide additional benefits to the public interest.

Sensitive Areas Goals and Objectives

Goals:

- Limit the disturbance of steep slopes in order to minimize impacts to adjacent lands and their communities.
- Preserve and protect streams, wetlands, and buffers to maintain high quality water and ecologically rich areas.
- Continue to minimize disturbance to the floodway and floodplain of all county surface waters.
- Continue to monitor and improve the protection of the County's rare, threatened, and endangered species and their habitats whenever possible.
- Consider additional protection of on-site and adjacent land use activities in Special Planning Areas.
- Identify and evaluate significant surface and subsurface geologic features.
- Continue to identify and conserve scenic viewsheds in order to maintain the visual appeal of the County's heritage resources.
- Ensure environmental stewardship is valued by future generations of County residents through educational programs and services.

Recommendations:

- Consolidate existing data to develop a Natural Resources Inventory that includes a priority ranking of resources.
- Analyze and develop strategies to target protection of priority resources.
- Use existing ordinances and program to reinforce protection of natural resources and incentivize.
- Create outreach programs for public, private, and non-profit groups to educate people on the importance of environmental stewardship.
- Continue to support environmental site design to the maximum extent possible.
- Work with local organizations to develop a Scenic Resources Inventory.

- Update Floodplain Ordinance to include updated FEMA Floodplain maps.
- Coordinate with local jurisdictions regarding wellhead protection areas and other water quality incentives.
- Continue to support use of best management practices for agricultural operations.
- Continue to promote technological services such as County web maps to assist the public in land use decision making.
- As part of the WIP, evaluate the contribution of sensitive area protections in meeting water quality standards set by TMDLs.

SENSITIVE AREAS

A. Introduction and Purpose

Sensitive Areas represent natural resources of various types that provide integral ecological functions necessary for the maintenance and coexistence of human and natural communities. Sensitive areas provide a contribution to the quality of life in Washington County that is difficult to quantify but immensely important. Maryland's Economic Growth, Resource Protection and Planning Act of 1992 required local governments to adopt a "Sensitive Areas" element, among other requirements, within the framework of the Comprehensive Plan. The Land Use Article of the Annotated Code of Maryland simply states that the Sensitive Areas element "shall include goals, objectives, principles, policies and standards designed to protect sensitive areas from the adverse effects of development." In lieu of specifically defining the term "Sensitive Areas," the Act instead names four overarching categories of Sensitive Areas to be considered for protection as a part of comprehensive planning. These four categories include: streams and their buffers, 100-year floodplains, habitats of threatened and endangered species, and steep slopes. The 1992 Planning Act also provided flexibility to local jurisdictions by suggesting that locally identified areas of special interest could also be made part of the element. As part of the development of the Sensitive Areas element, the County identified three (3) Special Planning Areas to be included as sensitive resources. They include the Appalachian Trail Corridor, Beaver Creek Watershed, and the Edgemont Reservoir.

Twenty additional sub-categories of Sensitive Areas were illuminated in the Maryland Department of Planning's Models and Guidelines #18: Sensitive Areas, Volume II, a publication associated with the 1992 legislation, in order to provide guidance to local governments in further protecting these sensitive resources. These additional categories were included to expand the network of metrics that would ensure broad natural resource protection that benefited both citizens and nature alike. Not all of the Sensitive Area sub-categories are applicable to the

varied landscapes of Maryland as one travels from its coastal shores to its interior mountains and valleys, however. Accordingly, only additional Sensitive Areas such as non-tidal wetlands, vernal pools, trout stream watersheds, springs and seeps, caves, scenic vistas and geological features are numerous enough in Washington County to warrant individual attention. Others, such as groundwater and wellhead protection, are discussed in passing in this chapter, but are given greater attention in the Water Resources element of the Comprehensive Plan. For purposes of organization and because of their interrelated subject matter, these subcategories have been grouped under related subject headings in the analysis that follows.

The underlying objective of the Sensitive Areas element is “to integrate environmental protection into comprehensively planned growth and economic development in Plan-designated growth areas.”¹ The multiplicity of Sensitive Area metrics is aimed at creating overlapping policies, land use controls and regulations at various levels of government in order to reinforce and facilitate this comprehensive protection both inside and outside targeted growth areas. Local legislative bodies must find a balance between sensitive area resource protection and targeted development. Ultimately, there is an underlying recognition that a healthy environment is essential to the long-term stability of the local and regional economy.

B. Analysis

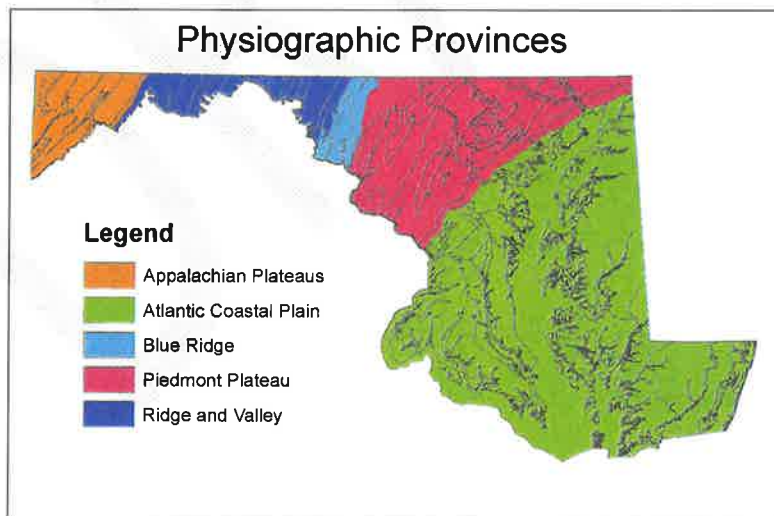
The four primary Sensitive Area categories, as well as their associated subcategories are discussed in the following sections. Each Sensitive Area category is defined, its value to the community is illuminated, local protection efforts are highlighted and the resource is mapped in order to visually describe its prevalence in Washington County. A variety of existing local ordinances factor into the protection of Sensitive Areas, including the Subdivision, Zoning, Forest Conservation, Adequate Public Facilities, Floodplain Management, Stormwater Management and Grading, Soil Erosion and Sediment Control Ordinances. Sensitive Areas

¹ Maryland Office of Planning and Maryland Department of Natural Resources. *Managing Maryland's Growth: Models and Guidelines Volume 1*. (Baltimore: Maryland Office of Planning), 1993, 1.

protection is also referenced in the County's most recent Water and Sewerage Plan and in the Land Preservation, Parks and Recreation Plan under the Natural Resource Conservation goals. These documents require a comprehensive review of proposed development and its impacts on local resources; and in some cases, mechanisms to reduce negative impacts such as building setbacks, easements, and tree planting.

I. Geologic Setting

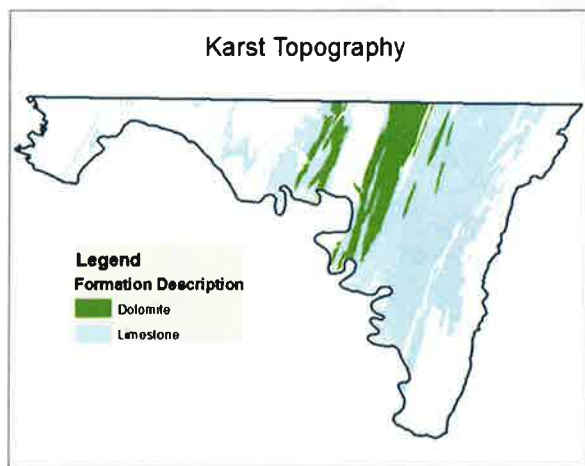
To provide context for the types of Sensitive Areas which occur in Washington County, it helps to have an understanding of the underlying geology which has created the conditions necessary to support life, in its various forms, on the earth's surface locally. The Maryland Geological Survey (MGS) describes Washington County as being primarily located in two physiographic regions: the Blue Ridge Province and the Ridge and Valley Province. These regions are displayed in the map below. These regions range in elevation from 250 feet near Harper's Ferry on the Potomac River to 2,145 feet at Quirauk Mountain in northeastern Washington County to.



The Blue Ridge Province, shown above in light blue, is located in the area of South Mountain and Elk Ridge along the eastern border of the County. The Maryland Geologic Survey characterizes this region as consisting of "two prominent ridges (South and Catoclin

Mountains) that merge northeastward into a single mountainous area.”² It is composed primarily of metamorphic rock types such quartzite, gneiss, and Catoctin metabasalt, a regionally significant exposure sometimes known as Greenstone. Some formations within the Blue Ridge Province of Maryland are as much as 1.1 billion years old, among the oldest in the entire Appalachian Mountain chain.³

The Ridge and Valley Province encompasses the rest of Washington County and stretches from the foot of South Mountain to the western boundary of the County at Sideling Hill Creek. The Maryland Geologic Survey describes the topography of the Ridge and Valley Province as being “accordion-like, composed of alternating subparallel ridges and valleys resulting from differential erosion of various folded and faulted (rock types).”⁴ The Hagerstown Valley (the Maryland part of the Great Valley) occupies the bulk of this Province. It extends from the foot of South Mountain to the foot of Powell and Fairview Mountains west of Clear Spring.



Sedimentary rocks, such as limestone and dolomite underlie much of the Hagerstown Valley. These formations generally date between 440 and 530 million years of age.⁵ Porous and permeable rocks such as these are highly subject to weathering and the formation of solution channels and defined as being Karst geology. These channels result in unusual

surface and subsurface features such as rocky outcrops, sinking streams, fissures, caves and sinkholes. More than 70 caves are reported in the Hagerstown Valley alone and more than 190

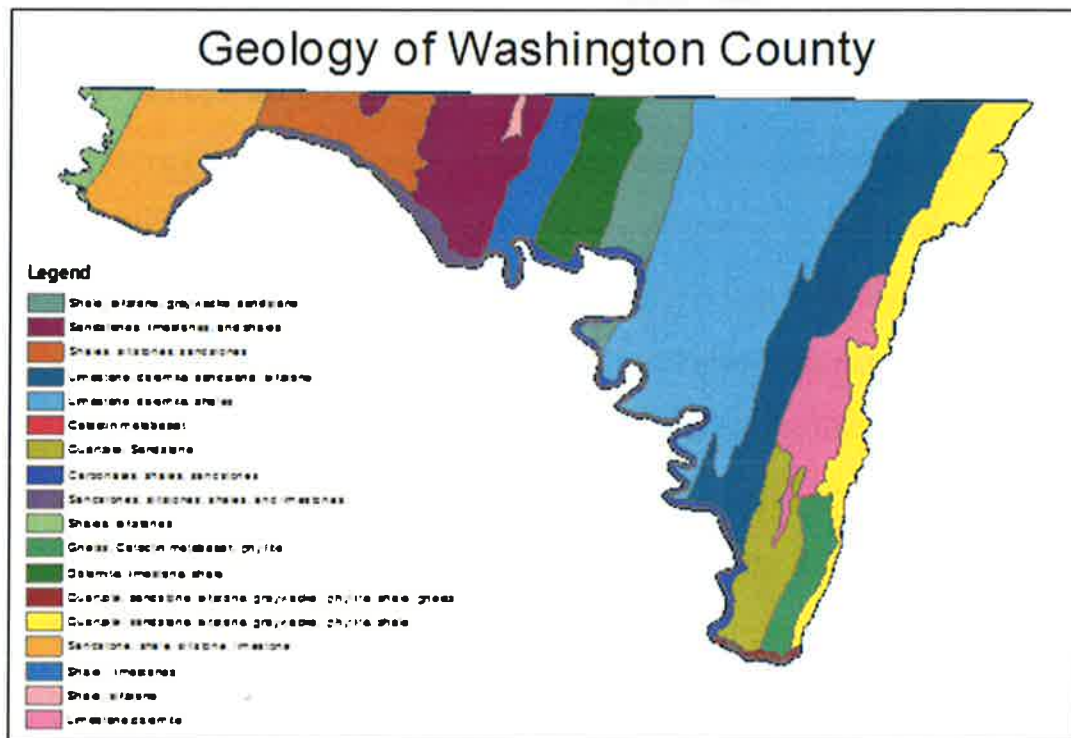
² James P. Reger and Emery T. Cleaves, *Physiographic Map of Maryland*. (Baltimore: Maryland Geologic Survey), 2008.

³ Natural Resource Conservation Service. *Soil Survey of Washington County, Maryland*. (Washington D.C: United States Department of Agriculture), 2003, 16.

⁴ Reger and. Cleaves, *Physiographic Map of Maryland*.

⁵ Natural Resource Conservation Service. *Soil Survey of Washington County, Maryland*. 16.

springs are point discharge-sites for groundwater.⁶ Due to the porous nature of this bedrock type, these rocks can also serve as conduits for groundwater contaminants. As a result, certain areas of limestone bedrock in the Hagerstown valley are considerably more environmentally sensitive than areas with other types of bedrock. Various sedimentary rocks such as sandstone, shale, dolomite and others compose the remaining part of the Ridge and Valley Province in addition to limestone. The map below displays the underlying geology of Washington County.



II. Steep Slopes

Steep slopes are one of the four major sensitive areas elements mentioned in the Sensitive Areas Models and Guidelines series related to Maryland's 1992 Planning Act. The behavior of steep slopes when it comes to the impact of development is very much influenced by the underlying geology, the type of soil produced by that parent material, the magnitude of

⁶ Mark Duigon, *Karst Hydrogeology of the Hagerstown Valley, Maryland*. (Baltimore: Maryland Geologic Survey), 2001, 1.

the disturbance, and the overall severity (or lack thereof) of the prevailing topography. Both public safety and environmental quality are at risk in places where sensitivity to underlying conditions is not respected by disturbance resulting from either human activities or naturally occurring events, such as weather related incidents.

The modification of a steep slope by clearing and/or grading land often produces a ripple effect on the downslope and potentially downstream communities from the area of disturbance. Slopes barren from the removal of vegetation can expose soils to repeated erosion and movement from rainfall. Rainfall carries the sediment into the nearest waterway, altering stream behavior and character, ultimately resulting in a wider and shallower watercourse. Over time, sedimentation into both natural waterways and into man-made water diversion devices such as culverts reduces their capacity to carry floodwaters and the results can be catastrophic. If watercourses have been channelized to divert water around the urbanized area, downstream communities can be put at risk where the water is finally released.

Potential harm to water quality and aquatic habitat is also a concern resulting from steep slope modification. Aside from the changes to stream topography described above, excess sedimentation into waterways alters the delicate balance of streamflow, sunlight, temperature, and oxygen that sustains aquatic communities and maintains their habitats. As a result of sedimentation, water becomes turbid, blocking out sunlight and decreasing the amount of dissolved oxygen available as algal blooms form. This process is known as eutrophication and can often lead to conditions which make it nearly impossible for fish and other aquatic vertebrates to survive. This is of concern to outdoor recreation enthusiasts and aquaculture industries because native aquatic species such as brook trout are very sensitive to changes in their breeding habitats. Sedimentation can cause egg mortality through suffocation by coating the egg thereby reducing oxygen flow.⁷ The ecological and economic impact fostered by this

⁷ Maryland Office of Planning and Maryland Department of Natural Resources. *Managing Maryland's Growth: Models and Guidelines Volume 1*, 42.

particular type of outdoor recreation and industry locally is significant, making any threats to its delicate balance concerning.

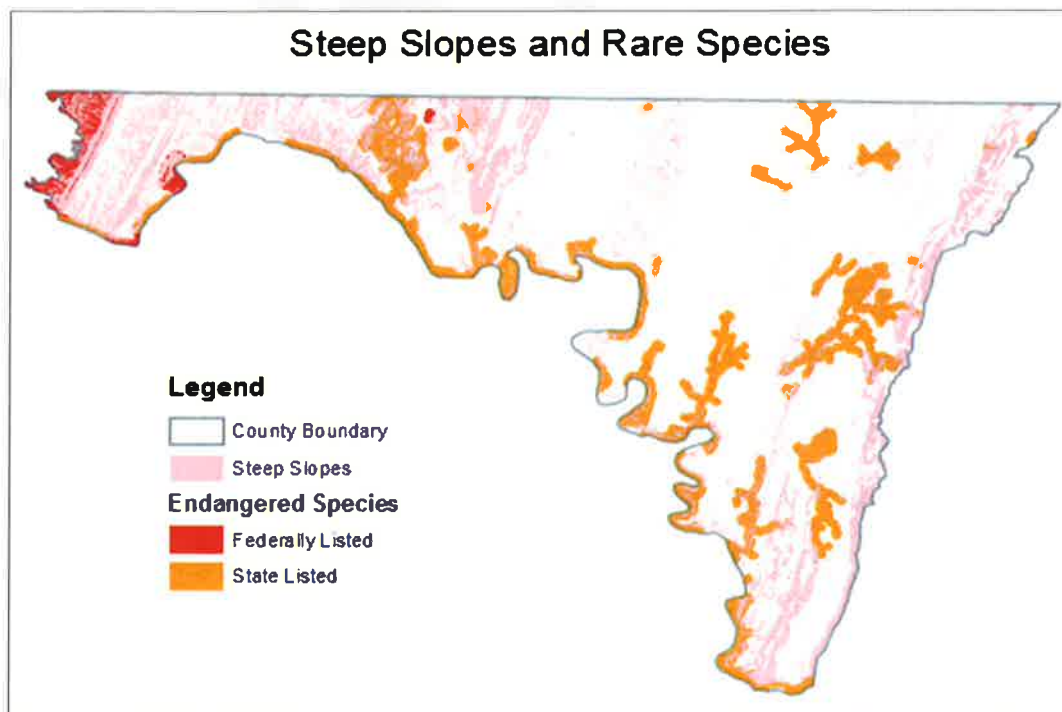
Water quality is threatened not just by sedimentation, but also by the downslope movement of pollutants from various sources such as upslope roads, lawns, septic systems, agricultural runoff, and general soil leaching along steep slopes. This runoff moves pollutants into local waterways and ultimately to the Chesapeake Bay where the cumulative effect has been highly detrimental to Bay health, requiring expensive mitigation efforts throughout the state to remedy – a process which has been ongoing for decades. Proactively protecting steep slope health by maintaining vegetative cover and properly siting development reduces both mitigation costs and downstream impacts, thereby avoiding remediation costs later.

In addition to the environmental impacts of disturbing steep slope areas, there are physical hazards that can occur. Slope failure, a process more commonly known as a landslide, is a potential threat to public safety often resulting from improper development on steep slopes. Volume One of the Models and Guidelines notes the primary natural and human factors that contribute to potential slope failure. Natural factors include water (soil saturation), slope (the steeper the slope, the more susceptible it is to failure), and geology (underlying rock types). Man-made factors that can cause landslides include changes in slope (such as road building), excess loading (construction or filling land), changes in vegetative cover, and shocks and vibrations.⁸ Many of these factors can result from both human and natural processes. Due to the severity of the topography and the nature of the underlying geology, Washington County has a high potential for slope failure. Relatively low population densities in the areas where steep slopes occur in Washington County mean that the incidence of significant property damages or bodily injury resulting from landslides is much lower than the potential. The drainage capacity of the soils underlying developed parts of the County also aids in lowering the incidence of losses due to landslides.

⁸ Ibid, 43

Steep slopes are also places that support biodiversity by creating a range of unique microhabitats that don't occur in more uniform terrain. Some of these species may have been protected from past disturbance due specifically to the severity of the terrain, allowing rare species to survive and perhaps even thrive to a degree that wouldn't be possible in a habitat with a greater incidence of disturbance. The protection of steep slope areas is, therefore, of paramount importance to ensuring the long-term survival of these rare species. This topic will be discussed in greater detail in the section on Habitats of Threatened and Endangered Species later in this chapter.

Steep slopes are located in the Ridge and Valley Physiographic Province in the western part of Washington County as well as in the vicinity of major creeks such as the Conococheague, Licking, and Antietam Creeks, and along parts of the Potomac River. There are also steeply sloped areas in the Blue Ridge Province along South Mountain and Elk Ridge. The map below shows the location of steep slopes throughout the county. Habitats of state or federally listed threatened and endangered species have also been included in this map to demonstrate the incidence of microhabitats in these environments.



Steep Slope Regulation

Steep slopes are recognized and regulated in a number of ways by state and local ordinances. Washington County defines steep slopes as greater than 25%, and slopes greater than 15% where the erodibility coefficient (K Value) is greater than 0.35. This definition carries through all the County Development Ordinances including the Subdivision, Zoning, and Forest Conservation Ordinances. The Forest Conservation Ordinance specifically targets steep slopes as priority locations for the retention or planting of forest cover.

Maryland regulations also govern the installation of septic systems by limiting them to areas of less than 25% slope. Septic reserve areas required by health regulations may not be located on steep slopes and the Planning Commission may impose appropriate Best Management practices where development is proposed on steep slopes.

Restricting intense land use on steep slopes may often be unnecessary due to the impracticality and high costs associated with engineering and construction in such an environment. Such projects require elaborate design for stable structures and often dictate a move to a more friendly terrain. Still there are uses that can overcome the limitations or occasions where the slope is an advantage for aesthetic reasons. These land uses should provide for the protection of the slope against damage during construction and continued site use. Methods of protection could include enforcement of sediment and erosion control measures and the use of Best Management Practices (BMP). Regulatory documents such as the Forest Conservation Ordinance also aid in protection of these areas through prioritization of vegetative cover in steeply sloped areas.

i. Soils

The underlying geology of Washington County is both the literal and figurative bedrock upon which Sensitive Area resources are able to gain a foothold and reach their unique local expression. One element of this expression is the breakdown of the geologic parent material, through natural processes such as weathering and erosion, which ultimately results in soil

formation. Soil, therefore represents a ceaselessly changing mix of minerals, water, air, organic matter, and other living organisms that communicates the past geologic processes which have shaped the land as we know it today. Soils perform essential ecological functions such as regulating the movement of water, sustaining plant and animal life, filtering and buffering pollutants, cycling nutrients and providing a physical medium of support.

Soils are an important resource to consider from multiple perspectives for local government. Whether their utility is for maintaining natural vegetative cover in service as an ecological buffer, as the host for agricultural commodity production or to provide a stable footprint in engineering urban development, soils have differing characteristics that make certain types more or less useful to different types of land uses. The potential issues that can stem from incompatible land use practices which might threaten Sensitive Area resources include load bearing failure, slope instability, erosion and siltation of streams and creeks. Soil identification is, therefore, a very important tool in long-range planning as knowledge of its suitability is vital to ensuring that the highest and best use of the land considers ecological limitations.

Soil Erodibility

| <u>Soil Texture</u> | <u>Soil Type</u> | <u>K-Factor</u> |
|---------------------|------------------|-----------------|
| Fine | Clay | .05 - .15 |
| Coarse | Sand | .05 - .20 |
| Medium | Loam | .25 - .40 |
| Silt | Silt | .40 or more |

One of the most important characteristics of soil for local governments to consider in spatially structuring land use is its erodibility. Soil erodibility (K factor) is the susceptibility of soil to erosion and the rate of runoff. As shown in the chart at

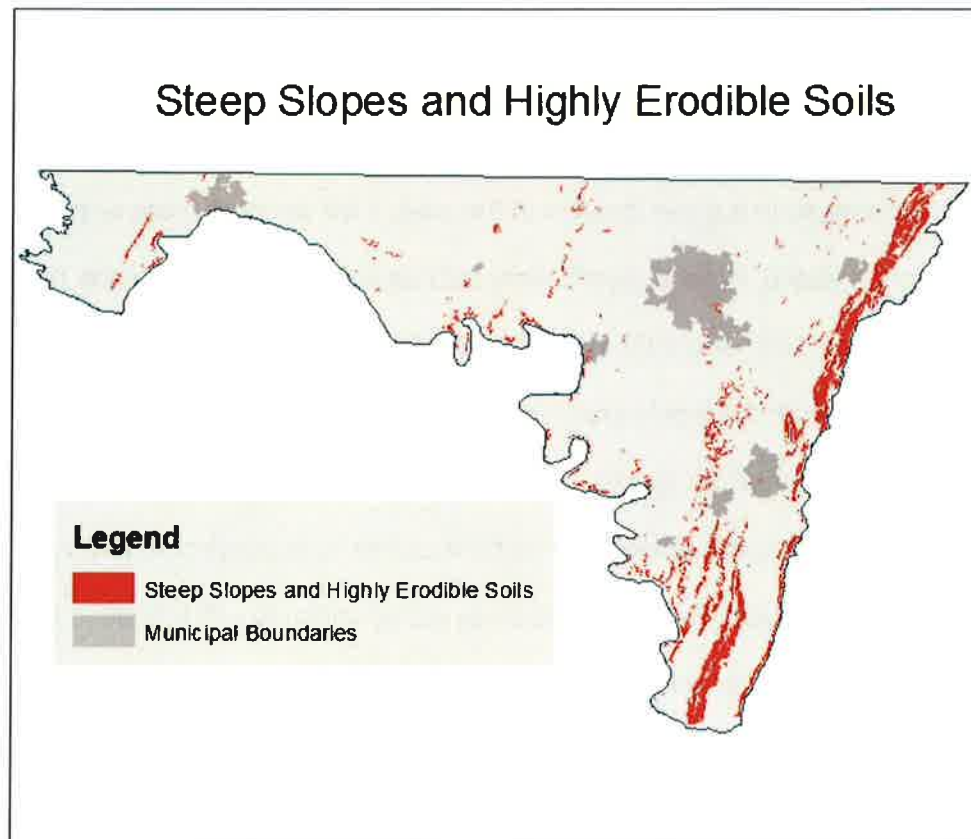
left, different types of soils have a higher susceptibility to erosion based upon their makeup.

The larger the K Factor the more susceptible the soil is to erosion. Soils high in clay have low K values (.05-.15) because they resist detachment. Coarse textured soils, such as sandy soils, also have low K values (.05-.2) because even though they are easily detached, they are less likely to runoff. Medium textured soils (silt loam) have moderate K values (.25-.4) that indicate a greater likelihood of detachment and runoff. Soils with a high silt content are the most erodible as they are both highly likely to detach *and* runoff. Their K factor is usually greater than .4.

Organic matter, soils structure, particle size, the presence of rock fragments, and permeability are among the most important characteristics which indicate a soil's erodibility factor. It is important to note that the K factor represents soil erodibility under natural conditions. If soil has been improperly managed in a given location in the past, it will become more erodible.⁹

As mentioned above, Washington County defines steep slopes as greater than 25%, and slopes greater than 15% where the erodibility coefficient (K factor) is greater than 0.35. The map below shows both the highly erodible soils (K factor greater than .35) and where steep slopes and erodible soils coincide (greater than 15% slope and K factor above .35). To a great extent, the areas with both steep slopes and highly erodible soils occur primarily in eastern Washington County, particularly in the mountainous terrain along South Mountain and Elk Ridge, and sometimes within proximity of stream and riverbanks. Given that much of this portion of the County has been conserved within protected state lands, or been assigned to very low density zoning districts by Washington County, the mapping of this GIS data indicates support for these protection measures already taken by State and Local regulatory bodies.

⁹ Institute of Water Research., *K Factor*, RUSLE: Online Soil Erosion Assessment Tool: <http://www.iwr.msu.edu/rusle/kfactor.htm>, 2002.



Soil surveys produced by the United States Department of Agriculture's Natural Resource Conservation Service in cooperation with state and local public institutions comprise one of the primary predictive tools for judging the potential and limitations of soil behavior for selected land uses in rural and urban environments. The topics included in the current soil survey include: Building Site Development, Construction Materials, Disaster Recovery Planning, Land Classifications, Land Management, Military Operations, Recreational Development, Sanitary Facilities, Soil Health as it relates to agricultural activity, Vegetative Productivity, Waste Management and Water Management. Accordingly, land use planners are but one of many professions who derive utility from these periodic surveys.

III. Streams and their Buffers

Streams are defined in the Washington County's Zoning Ordinance as "a perennial or intermittent stream identified in the (county's) most current soil survey and field verified when

necessary.” The character of a stream is determined by a complex mix of elements including bedrock type, climate, topography, vegetative cover on adjoining lands and the overall health of its upstream watershed. The value of streams is much more immediately known to the average County resident in comparison to that of steep slopes. Streams provide drinking water, water for irrigation and for industrial activity. Streams support a variety of outdoor recreational pursuits from fishing and hunting to paddlesports, bird watching, photography and more. Streams support diverse ecosystems which extend well beyond the boundaries of the waterway itself. Development above or nearby to streams requires a sensitivity to the nature of the resource, as well as its potential to threaten property and personal well-being during flooding events. Several map sources are available and commonly used to identify streams including U.S. Geological Survey topographic maps and Soil Conservation Service’s soil survey maps. Field surveys are also sometimes necessary for stream identification.

i. Watershed Planning and Stream Health

Overall stream and watershed health is a concern throughout the State due to a variety of man-made impacts including habitat loss, excess nutrients, pollution, and acidic precipitation. Numerous jurisdictions throughout the State depend upon surface waters such as streams, creeks, rivers, and reservoirs to supply drinking water; irrigate crops; power cities with hydroelectricity; support fish and other aquatic species; and provide countless recreational and commercial opportunities. Impairment of such surface waters can threaten numerous aspects of environmental and human health. To avoid these negative impacts, it is important for communities to evaluate watershed and stream health.

Watershed Planning

The largest geographic unit in watershed management is a basin. Drainage basins typically exceed several thousand square miles and include portions of a single state or potentially several states. As shown in the figure below basins are typically bounded by ridges

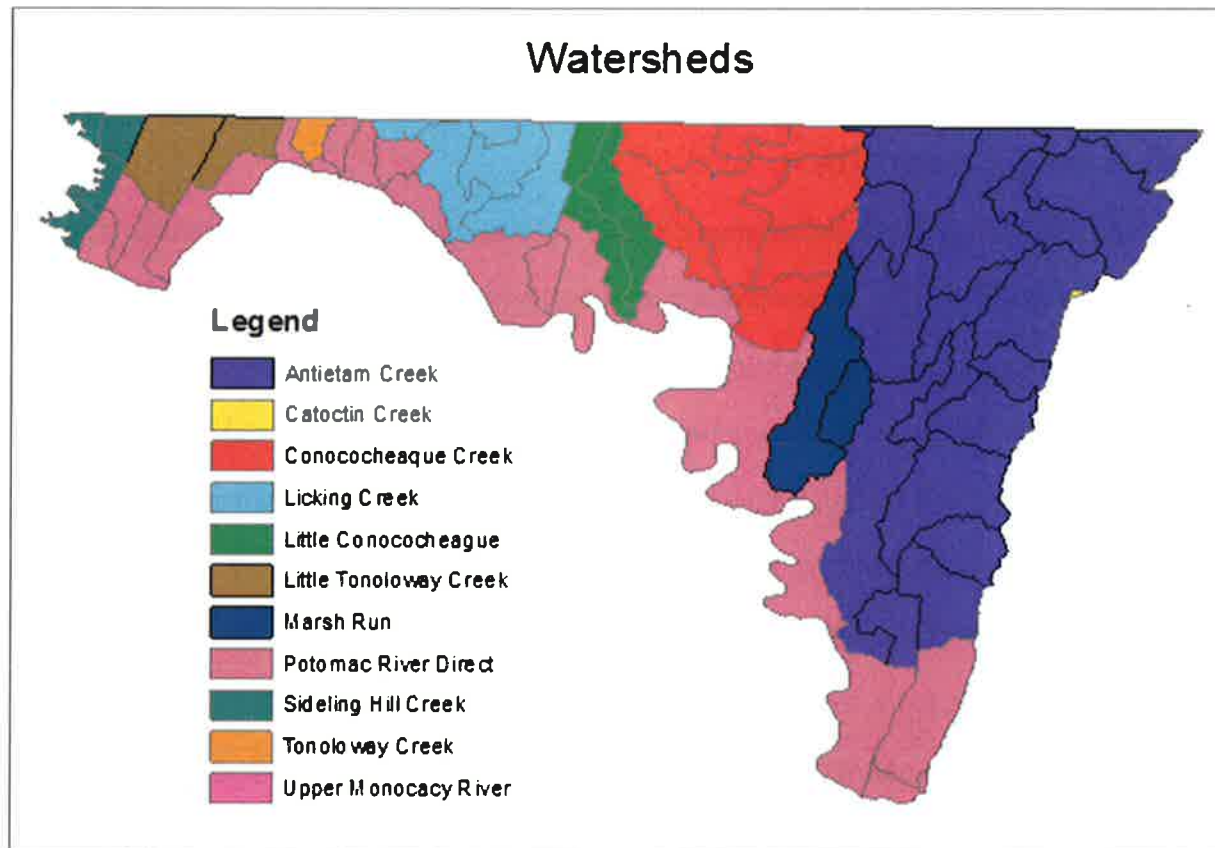
which capture precipitation before it drains into a surface or subsurface body of water at a lower elevation. Basins are typically comprised of many smaller sub-bases and watersheds that interconnect surface waters.



Washington County lies entirely within the Chesapeake Bay Drainage Basin that extends from New York to Virginia. Five major rivers feed the Chesapeake Bay Drainage Basin throughout this multi-state region, including the James, Potomac, Susquehanna, Rappahannock and York Rivers. The County is also located entirely within the Upper Potomac River sub-basin and contains nine sub-watershed areas. From this hierarchy, one can see how seemingly distant surface waters are interlinked and, accordingly, how impacts within a smaller watershed can affect the larger downstream whole.

The map below shows the major sub-watersheds of the Upper Potomac River sub-basin located within Washington County, including: Sideling Hill Creek, Tonoloway Creek, Little Tonoloway Creek, Licking Creek, Conococheague Creek, Little Conococheague Creek, Marsh Run, Antietam Creek and Israel Creek. Combined, these waterways drain approximately 342

square miles, with Antietam Creek draining 40 percent of the county alone.¹⁰ The watersheds of the Upper Monocacy River and Catoctin Creek are included in the map's legend also. These two bodies of water flow entirely outside Washington County, but fractional pieces of their watershed (which are barely visible at this scale) occur on the County's eastern border.



Watershed planning is not a new concept in Washington County or the State, however, there has been increased attention given to this concept as growth and development continue to occur and thereby impact surface water resources. The Clean Water Act, passed by Congress in 1972, recognized the environmental and public health impacts caused by the country's severely degraded water resources. The law strictly regulates pollutant discharge and gives the US Environmental Protection Agency (EPA) authority to implement pollution control programs. Initial implementation of this law focused on regulating sources of "point" or direct pollution into

¹⁰ Washington County Department of Planning and Zoning. *Comprehensive Plan for the County*. (Hagerstown: Washington County, Maryland, 1981).

the water system. Focus has now turned to sources of “non-point” or indirect pollution such as septic systems, agricultural runoff, and stormwater runoff.

As part of the Clean Water Act the US EPA required that States submit a list of impaired waters within their boundaries. The US EPA then assessed the impairments and began to development maximum thresholds for a pollutant (both point and non-point sources) that a body of water can receive while still meeting water quality standards. These standards are known as Total Maximum Daily Loads (TMDLs).

In late 2010 the US EPA established the Chesapeake Bay TMDL. This was the largest TMDL ever developed by EPA, encompassing a 64,000-square-mile watershed. The TMDL identifies the necessary pollution reductions from major sources of nitrogen, phosphorus and sediment across the Bay jurisdictions and sets pollution limits necessary to meet water quality standards. Bay jurisdictions include Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia.

The pollution limits were further divided by jurisdiction and major river basin based on state-of-the-art modeling tools, extensive monitoring data, peer-reviewed science and close interaction with jurisdiction partners. The TMDL is designed to ensure that all pollution control measures needed to fully restore the Bay and its tidal rivers are in place by 2025. The TMDL also calls for practices to be in place by 2017 to meet 60 percent of the overall nitrogen, phosphorus and sediment reductions.

In order to meet these water quality goals States and local jurisdictions have developed Watershed Implementation Plans (WIP) to analyze existing pollution levels and establish strategies to mitigate said pollution. In July 2012 the County released Watershed Implementation Plan - Phase II Report outlining strategies to curb pollution related to septic systems and stormwater runoff. Also included in the report is a financial accounting of the strategies needed to meet pollution milestones set by the Chesapeake Bay TMDL.

To assist in managing and implementing current and future phases of the County Watershed Implementation Plan, a new area of operations has been designated under the Division of Environmental Management dedicated to the planning and management associated with local TMDLs, Water Resources Element, and the Chesapeake Bay TMDL. The Staff of this Department shall be responsible for the integration of all these components into a unified watershed management approach for the County.

Stream Health

Watershed health is integral to and inseparable from the health of streams and other waterways. The amount of impervious surface cover in a watershed plays a large role in determining overall aquatic system health because of the cascading effects on water quality and hydrology that result from changes to the headwaters drainage basin. High amounts of impervious surface in watersheds has been shown to alter stream flows, degrade physical habitat, increase stream temperatures, speed up erosional processes, produce higher magnitude floods and result in waterways carrying higher pollutant and nutrient loads due to increased runoff and reduced ground infiltration of precipitation. As noted in the Water Resources Element impairment of surface waters is likely to occur when greater than ten percent of the total watershed acreage has been covered in impervious surface. For sensitive native species such as brook trout, populations are eliminated from streams with impervious surface coverages above four percent.¹¹

Comprehensive statewide stream surveys conducted by various federal, State and local entities support these water quality concerns. Using biological indicators such as fish and benthic macroinvertebrate health, the study concluded that 46% of Maryland's non-tidal stream miles were in poor condition, 42% were rated fair, and just 12% were rated as good according

¹¹ Maryland Department of Natural Resources. *Maryland Brook Trout Fisheries Management Plan*, (Baltimore, MD: MDNR Fisheries Service), 27, 2006.

surveys conducted throughout the State between 1995 and 1997.¹² Improvements in farm practices, cleaner energy sources and stream buffering have made noticeable improvements in lessening nutrient runoff and acid deposition throughout the State. The most recent surface water quality assessment conducted by the State however, in 2014, found that 42.99 percent of all 1st through 4th order (which are headwater or medium sized streams) non-tidal Wadeable streams in MD were found to be in non-attainment, based on both biological and conventional measures for water quality.¹³

A snapshot of Washington County's current stream health, taken from the Maryland Biological Stream Survey (MBSS), echo the results of the State's 2014 water quality assessment in the image below. MBSS was the State's "first probability-based or random design stream sampling program intended to provide unbiased estimates of stream conditions with known precision at various spatial scales ranging from large 6-digit river basins and medium-sized 8-digit watersheds to the entire state."¹⁴ It uses the same Combined Index of Biotic Integrity (CIBI) that combines fish and benthic macroinvertebrate health used in the 1990s stream study noted above. The numerical average generated from these two measures produces the CIBI, which classifies streams as Good, Fair or Poor. Streams have been color coded according to their health with those in red in poor condition; those in yellow are in fair condition, and streams in green classified as being in good condition. Not all stream miles occurring in Washington County have been sampled as a part of the MBSS survey, but the image below is a representative cross-section of County stream health. In this survey, 56 percent of County streams were judged as being in poor condition (53 of 94 sampled), 39 percent were in fair condition (37 of 94), and 4 percent were in good condition (4 of 94). The

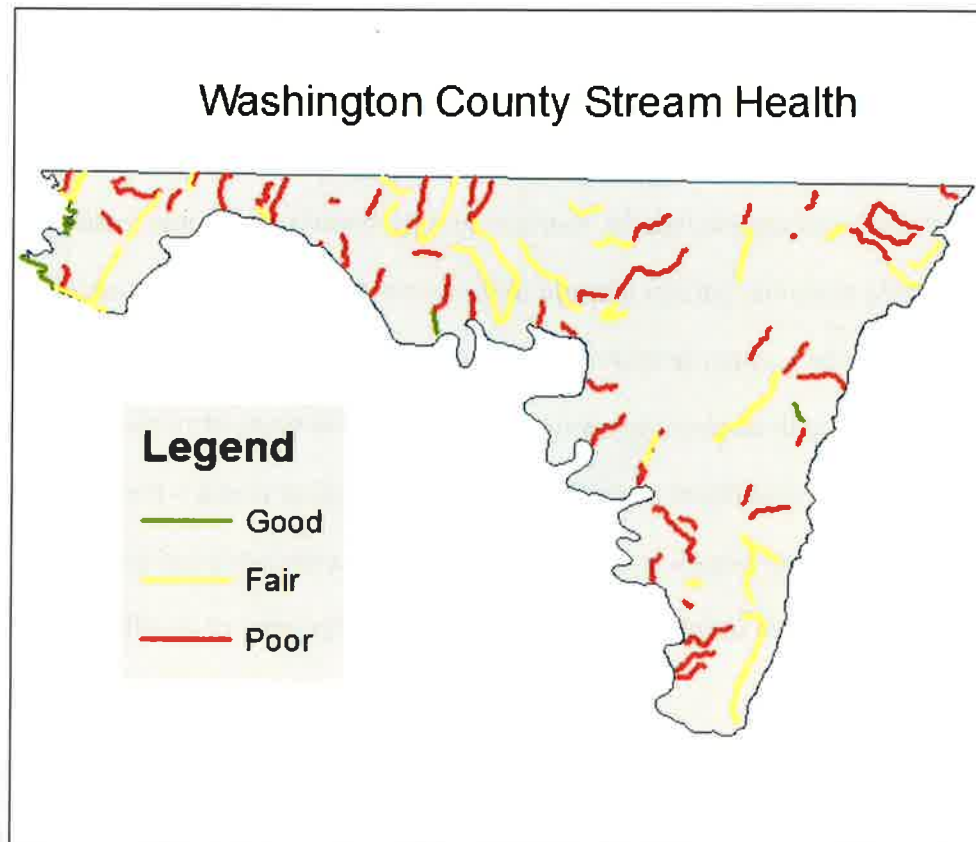
¹² Daniel Boward, Paul Kazyak et al., *From the Mountains to the Sea: The State of Maryland's Freshwater Streams*, (Washington D.C.: U.S. Environmental Protection Agency, 1999), 37.

¹³ Maryland Department of the Environment, *Maryland's Final 2014 Integrated Report of Surface Water Quality*. (Baltimore: Maryland Department of the Environment), 2014.

¹⁴ ArcGIS, *Maryland Stream Health - Stream Reaches*.

<https://www.arcgis.com/home/item.html?id=7810de23bb594af9acd5f78147ad3b78>, June 2010.

image shows that, generally, streams of all health grades are distributed uniformly throughout the County. Notably however, two of the four streams in good condition are found on the western border of the County, where there is a great deal of contiguous protected land, governed by the State of Maryland in various Wildlife Management Areas.



Stream Buffers

Since the health of a stream depends on a much wider area than merely the channel itself, Best Management Practices have led land managers to consider measures for resolving conflicting land use patterns. "The border between developed and natural areas is frequently characterized by "overflows" of disturbance from the developed land to the undeveloped. These "overflows" may take many forms: subsurface and surface water flow; increased sedimentation; atmospheric pollution; increases in noise and temperature; the introduction of toxins, bacteria, and viruses; more frequent, extensive, and intensive physical disturbances; and the introduction

of non-native plant and animal species. Buffer zones are used to protect natural areas such as streams, shorelines, steep slopes, and wetlands from these impacts.”¹⁵

Stream Buffers are defined in multiple County regulatory Ordinances as “an area on one or both sides of a stream that is designated for the purposes of protecting, preserving or improving water quality by providing for filtration and/or dissipation of the energy of flowing water or the maintenance of the stream bank to prevent erosion.” These buffers preserve both the biological and hydrologic integrity of the stream basin and offer many benefits including soil retention, the provision of wildlife habitat, nutrient cycling, filtering pollutants, holding stormwater, shading streams, carbon storage and much more. Models and Guidelines #18: Sensitive Areas, Volume I, importantly notes that “while a healthy stream is dependent on the many activities occurring throughout the watershed, a large measure of protection can be provided by insuring the integrity of the stream’s adjoining natural areas – particularly floodplains, wetlands, steep slopes and wooded areas.”¹⁶ These combined elements are what constitute the various pieces which are essential to the maintenance of an effective stream buffer.

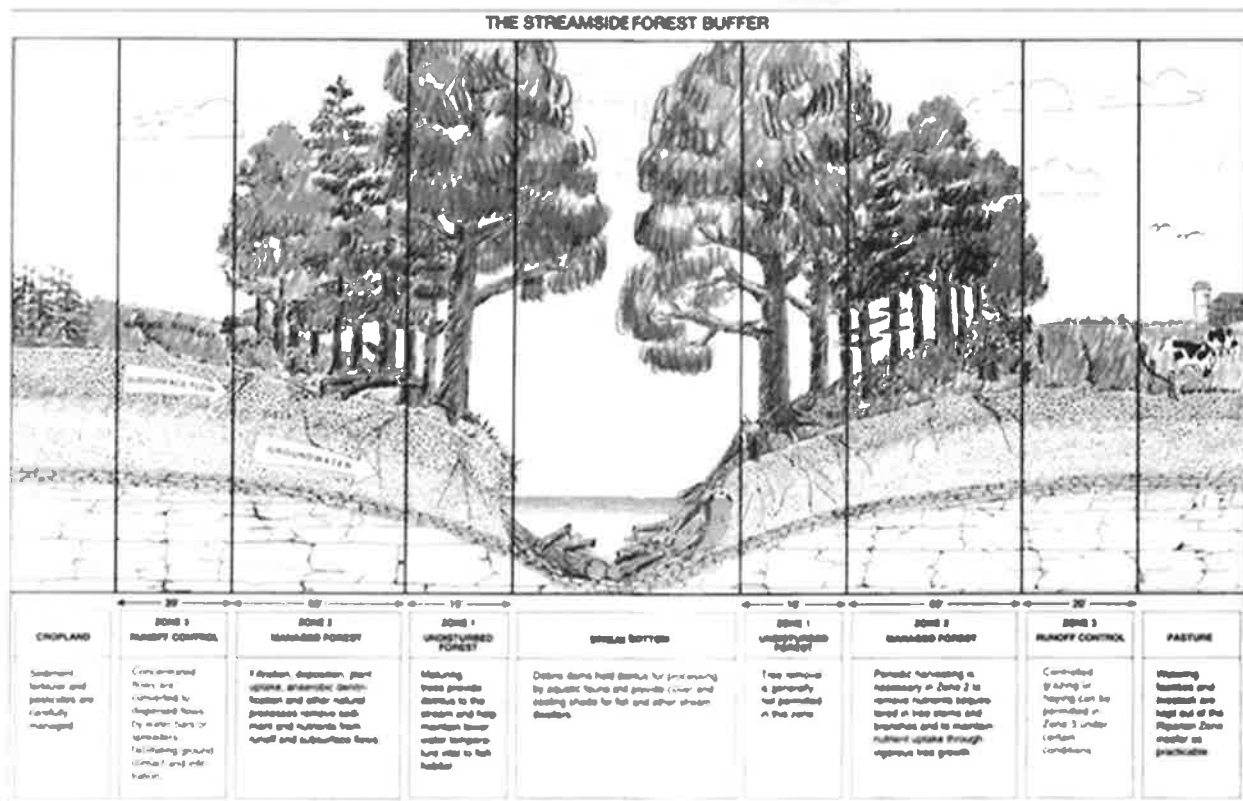
✓ The width of an effective buffer is a complex calculation that is based on factors such as soil types, degree of slope, vegetation type and the presence of floodplains, wetlands or stormwater management facilities.¹⁷ Ideally, not only should floodplains, wetlands, riparian forests, and upland steep slopes be included within the buffer, but land managers should also consider what uses should be permitted within the buffer. Some land uses, such as passive recreation or open space uses, cause little or no ground disturbance and can be permitted without additional controls. Other land uses, such as active recreational areas (e.g. - campgrounds), can be acceptable with mitigation. Still other activities, like intensive agricultural

¹⁵ Washington State Department of Ecology, *Wetland Buffers: Use and Effectiveness*, (Olympia: Washington State Department of Ecology), 1992.

¹⁶ Maryland Office of Planning and Maryland Department of Natural Resources. *Managing Maryland's Growth: Models and Guidelines Volume 1*, 20.

¹⁷ Ibid

operations, are inappropriate under any circumstances within the buffer zone. Community values, prevailing land use patterns, development pressures, administrative constraints, local topography and natural resource distribution are among the real life considerations that ultimately influence the level of protection afforded to streams and their buffers. The figure below shows a sample stream buffer cross section, with corresponding ecological functions assigned to three specific vegetative zones within the riparian area bordering the stream.



Source: Pennsylvania Department of Conservation and Natural Resources

Washington County is well-positioned to safeguard the future health of its streams because much of the County remains predominantly rural, with natural buffers still in place and watersheds largely intact along and above many drainages. The County also works closely with other local land use agencies such as the Agricultural Extension Office and the Soil Conservation District to encourage private landowners to better buffer and stabilize streams.

Stream Buffer Regulation

Stream buffer protections have been in place in Washington County since 1997. County regulatory ordinances provide consistent definitions for streams and buffers, including both perennial and intermittent streams identified in the most current County soil survey. They are required to be identified on development plans, have specific width requirements based on slope and must be maintained with vegetative cover at all times. Sediment and erosion control plans and permits are required for any soil disturbance exceeding 5,000 square feet. Permanent structures and septic systems or reserve areas are prohibited in the buffer. Water quality improvement structures or access limitations are permitted. The Subdivision Ordinance says that a stream buffer “shall be measured from and perpendicular to the top of the stream bank. The buffer shall be expanded to include any floodplain determined according to the Floodplain Management Ordinance, any non-tidal wetland areas identified on the Maryland Department of Natural Resources Non-Tidal Wetland’s Guidance Maps and field verified and/or any area of steep slope as defined in this Ordinance.” Buffer widths may be varied with Planning Commission approval in cases of undue hardship where the requirements severely limit the buildable lot area. The County’s slope-based stream buffer guidelines are shown in the chart below. You will notice that for each percentage increase in slope, the buffer width likewise increases in increments of 4 feet. The width applies to each side of the stream. Development is restricted on slopes steeper than 25%, or on highly erodible soils (greater than .35 K factor).

Washington County Stream Buffer Guidelines

| Slope (%) | Buffer Width |
|------------------|---------------------|
| 0-6 | 24 feet |
| 7-10 | 28-40 feet |
| 11-15 | 44-60 feet |
| 16-20 | 64-80 feet |

| | |
|-------|--------------|
| 21-25 | 84-100 feet |
| 26-30 | 104-120 feet |
| 31-35 | 124-140 feet |
| 36+ | 140 feet |

Outside of the development process, the Rural Legacy Program may also provide protections through stream buffers. It contains provisions for payments to landowners, in addition to the basic easement payments, for placing permanent 100-foot wide buffers adjacent to streams, rivers and springs. Additionally, the Conservation Reserve Enhancement Program (CREP) has been utilized to provide further permanent easement buffers to Washington County's waterways by working in conjunction with the USDA's Natural Resource Conservation Service's CREP Contract program.

ii. Non-Tidal Wetlands

Wetlands are defined by U.S. Fish and Wildlife Service as transitional lands between terrestrial and aquatic habitats where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands possess at least one or more of the following attributes: 1) at least periodically, the land supports predominantly hydrophytes (a plant that grows only in or on water); 2) the substrate predominantly undrained, hydric soil (saturated, flooded); and/or 3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.¹⁸

¹⁸ T.E. Dahl, *Status and Trends of Wetlands in the Conterminous United States 2004-2009*, (Washington D.C: U.S. Fish and Wildlife Service), 2011, 20.

Vernal Pool



Source: Pennsylvania Natural Heritage Program

Vernal pools are a subcategory of non-tidal wetlands which are filled with water from approximately early winter through mid-summer. Unlike typical non-tidal wetlands which may be in contact with free-flowing groundwater, vernal pools exist as a confined depression that captures a discrete water table perched atop what are typically clay deposits. These pools are fed purely by precipitation or inward surface drainage and have little or no outflow. Maryland's non-tidal wetland regulations stipulate that a vernal pool will have surface water at least two consecutive months during the growing season, be free of adult fish populations, provide habitat for amphibians and lack abundant herbaceous vegetation. The unique ability of vernal pool inhabitants to withstand the stress of periodic wet and dry cycles means that such creatures may be limited in number and/or distribution. Accordingly, these organisms are significantly impacted by changes to their habitat and may be unable to find suitable replacement elsewhere.

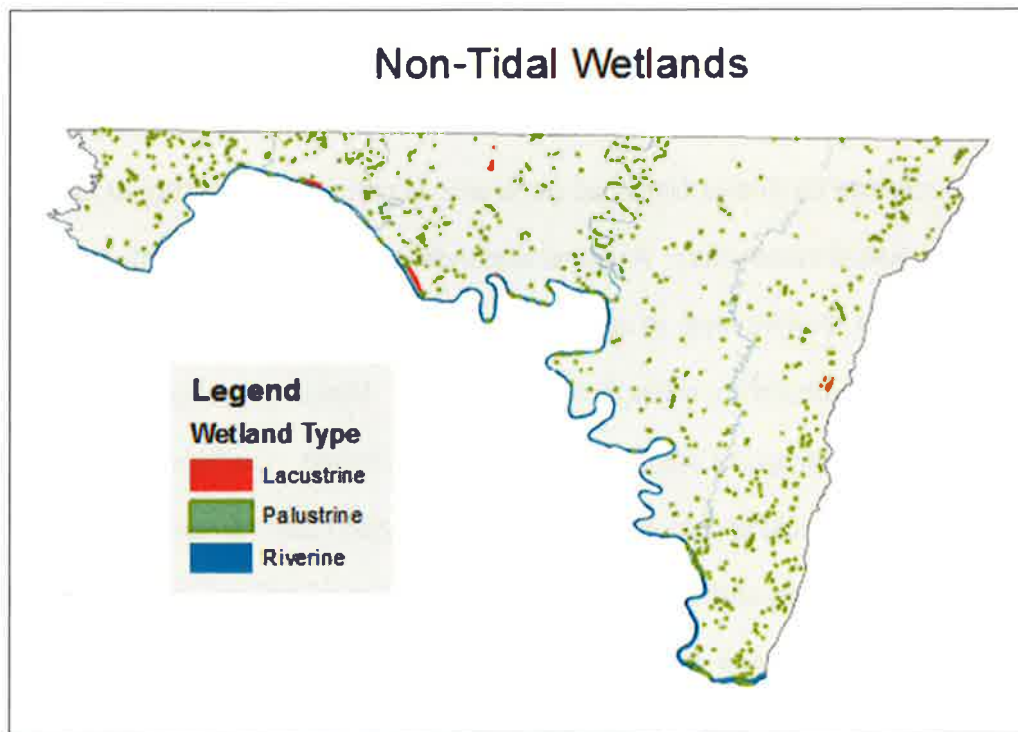
Wetland Types



Source: Maryland State Wetland Conservation Plan (2003)

Wetlands are broadly classified as either tidal or non-tidal, where the primary distinction is salinity versus freshwater habitats. Non-tidal, freshwater wetlands of the type that occur in Washington County can be further classified generally as palustrine (isolated) or lacustrine (associated with lakes or reservoirs). Riverine wetlands, those associated with rivers, can be either tidal or non-tidal. A third layer of classification for wetlands depends upon the type of vegetation (forested, scrub/shrub, emergent, aquatic bed). Due to its geographical location above the Fall Line, Washington County contains only freshwater, non-tidal wetlands. According to GIS analysis using data provided by the Maryland Department of Natural Resources and the U.S. Fish and Wildlife's National Wetlands Inventory, Washington County contains 2,297 acres of wetlands, the vast majority of which are classified as palustrine. The majority of the State's wetlands occur in the Eastern Shore of Maryland's Coastal Plain. Only 2% of the palustrine vegetated wetlands are found in the Appalachian Highlands of western Maryland.¹⁹ Non-tidal wetlands are found throughout Washington County, generally isolated from one another, but also in closer proximity along streams and the Potomac River. The map below shows the County's wetlands.

¹⁹ Ralph Finn and John Tinn, *National Wetlands Inventory: Status and Recent Trends of Wetlands in Five Mid-Atlantic State*, (Washington D.C.: U.S. Fish and Wildlife Service), 1986, 13.



Wetlands provide numerous benefits to human communities in addition to providing essential wildlife habitat for a variety of species, many of which are not widely distributed. The ecosystem services provided by wetlands to people include stream bank stabilization, water filtration, temporary storage of floodwaters and contributions to the maintenance of base flows of nearby streams. Wetlands also provide places for people to grow commercial crops and engage in active and passive recreational activities such as fishing, hunting, birdwatching and more.

Non-Tidal Wetlands Regulatory and Management Framework

Wetlands loss has been a significant concern worldwide, including in the State of Maryland. Wetland conversion due to development, forestry or agricultural activities has contributed to considerable losses of this ecosystem type compared to its historical distribution throughout the State and County. Approximately 45-65 percent of Maryland's original wetlands have been lost, most of which were drained for agricultural purposes. Washington County is estimated to have lost 60 percent of its historic wetlands, based on potential hydric soils

identified in Soil Conservation District mapping.²⁰ Concern over significant wetland losses nationally spurred extensive legislative action at various levels of government to safeguard what remained.

Federal Non-Tidal Wetlands Regulation

The Clean Water Act, first passed in 1956 and amended several times since then, is the primary Federal statute protecting the quality of the Nation's waters including wetlands. The U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE) cooperatively implement and enforce the statute under Section 404 which prohibits the discharge of dredged or fill material into "navigable waters" unless authorized by the Corps. State and local authorization is also required for the discharge of dredged or fill material into wetlands or other waters. "All states are required under the Federal Clean Water Act to consider the development of TMDLs (Total Maximum Daily Loads). A TMDL is an estimate of the maximum amount of an impairing substance or stressor (pollutant) that a waterbody will assimilate without violating water quality standards. Every four years, states must submit a prioritized list of water bodies that do not meet water quality standards or will not meet standards after all technology-based pollution controls are in place. No TMDLs will be developed for wetlands. However, wetland management and restoration may have a role in achieving TMDL goals."²¹

Maryland Non-Tidal Wetlands Regulation

Wetlands were protected in the State of Maryland for the first time in 1970. The Tidal Wetlands Act restricted construction and development activity in tidal wetlands at a time when over 1,000 acres of wetlands were being destroyed throughout tidewater Maryland every year.²²

²⁰ Maryland Department of the Environment, *Maryland State Wetland Conservation Plan*, (Baltimore: Maryland Department of the Environment), 2003, 26.

²¹ Ibid, 154.

²² Ibid, 129.

Tidal wetlands were mapped and inventoried in Maryland for the first time as a result of this legislation. Growing concern over the degradation of the Chesapeake Bay waters led to the signing of the regionally focused Chesapeake Bay Agreement in 1983, followed by Maryland's Non-Tidal Wetlands Protection Act in 1987.

The Act regulates and restricts all activities that could impact non-tidal wetlands; insures "no net loss" in wetlands acreage and function by requiring mitigation or compensation for wetland losses, and offers technical assistance to local governments to undertake non-tidal wetland management planning. Watershed management plans can be used as the basis for regulatory decisions when developed in accordance with this act and the Code of Maryland Regulations. Regulations stemming from the Act are very similar to Section 404 of the Clean Water Act in terms of the types of activities which are prohibited or require review. The Army Corps of Engineers and the Maryland Department of the Environment share jurisdiction over various regulatory elements of the program. The EPA also becomes involved in enforcement and compliance of wetlands regulations.

Agricultural and forestry activities are exempted from the Non-Tidal Wetlands Act, but are required to employ Best Management Practices to minimize wetland impacts, including the creation of a soil conservation and water quality plan and an erosion and sediment control plan. Assistance with these plans is available from Soil Conservation District personnel.²³ Permit tracking, mitigation reporting, and violation records are maintained by MDE and the Corps of Engineers.

Local Non-Tidal Wetlands Regulation

Non-tidal wetlands are recognized within a number of local ordinances. Washington County's Floodplain Management Ordinance states that "Encroachment by development into wetlands is not allowed without State and Federal permits" in Article V, which concerns

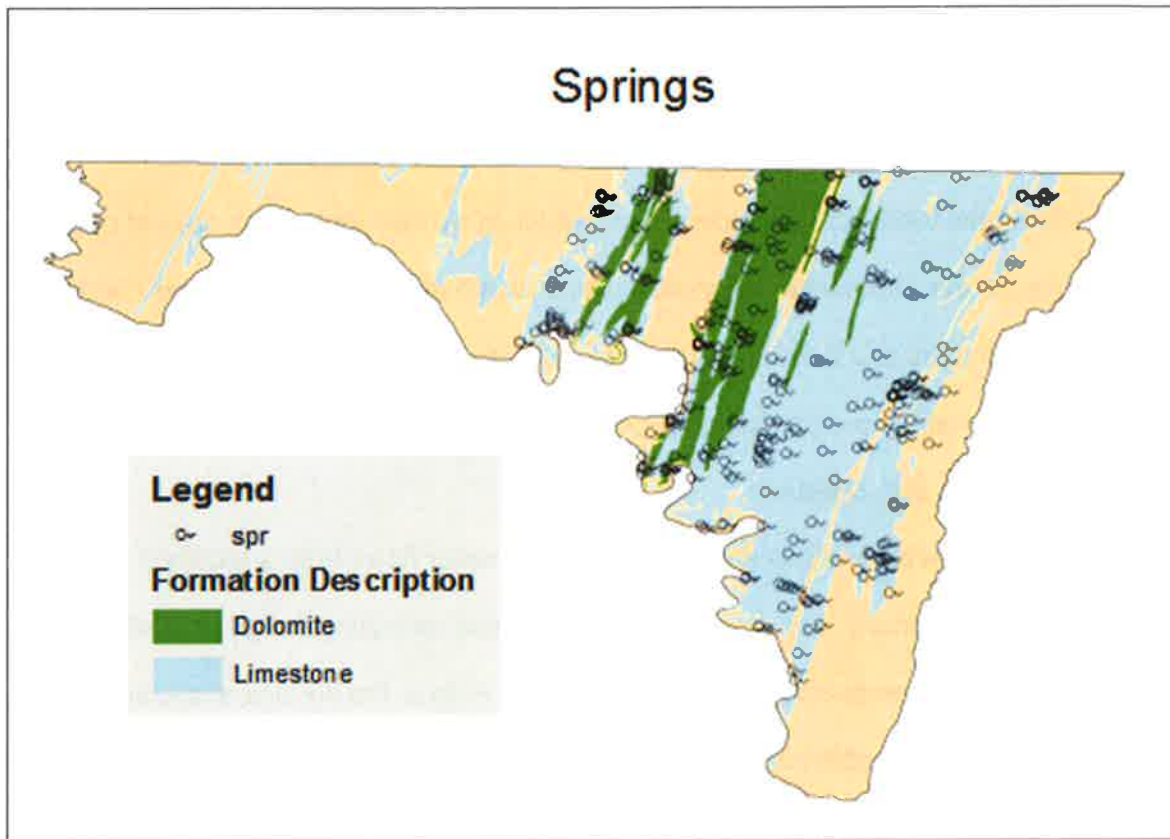
²³ Ibid, 140-141.

Development Regulations in Floodplain Zones. The County's Subdivision Ordinance makes provisions within its Design Principles and Standards to expand required stream buffers to include "any non-tidal wetland areas identified on the Maryland Department of Natural Resources Non-Tidal Wetland's Guidance Maps and field verified and/or any area of steep slope as defined in this Ordinance." Non-tidal wetlands are also defined within the Forest Conservation Ordinance and direction for their identification is described. Forest conservation has the corollary benefit of protecting non-tidal wetland habitats.

C, iii. Springs and Seeps

Springs and seepage areas are locations where water flows from a confined aquifer to the earth's surface. Typically, this results from precipitation infiltrating the ground, whereupon it travels through subsurface geology as groundwater and exits to the surface at a lower elevation location where an impermeable rock layer prevents deeper penetration. Springs occur throughout Washington County, producing anywhere from a few gallons per minute to several thousand gallons, depending on a variety of factors. According to the County's 2009 Water and Sewerage Plan, the most productive springs occur in the eastern part of the county, near the base South Mountain and Elk Ridge. Springs are generally less productive as one travels west through the county. The greatest number of springs occur in the Hagerstown Valley. According to Duigon, there are 191 known springs in the Hagerstown Valley where the porous and permeable Karst terrain creates a hydrologic regime that is constantly evolving.²⁴ In this region, while the output is more uncertain due to subsurface conditions, production rates can reach 2,000 to 3,000 gallons per minute. The location of springs in the Hagerstown Valley is depicted on the map below.

²⁴ Mark Duigon, *Karst Hydrogeology of the Hagerstown Valley, Maryland*, 1.



Springs provide sources of potable water which, historically, helped spur settlement of the region. While no longer relied upon as heavily as in the past, springs are still utilized by both private and public entities in the County for a variety of purposes. Fort Ritchie and the Boonsboro-Keedysville water system are examples of two public entities which still rely on springs to supply their water systems. Additionally, the Albert Powell State Fish Hatchery relies on a large nearby spring to feed its operations.

From the perspective of wildlife, springs provide both habitat for sensitive plant and animal species, some of which are limited in number or geographical distribution. The bog turtle, rock vole, and pearl dace are examples of Maryland species that are associated with spring or seepage-fed habitats.²⁵ Contributions to surface waters from cool springs are also part of the reason why the County can support native brook trout populations.

²⁵ Maryland Office of Planning and Maryland Department of Natural Resources. *Managing Maryland's Growth: Models and Guidelines Volume II* (Baltimore: Maryland Office of Planning), 54-55.

From the perspective of streams, the importance of spring protection is to ensure water quality and quantity for human and non-human users. Springs are susceptible to water contamination because of the porous nature of the bedrock that underlies much of the County, especially the more densely settled central and eastern portions. Springs in Washington County feed smaller tributaries that, in turn, aid in maintaining base flows of larger streams. Some streams may flow partially or entirely underground in Karst terrain, meaning that the above ground stream channel is only full during high water periods. Physical alterations to springs, streams or adjacent lands, whether by human intervention or natural forms of disturbance, have the potential to disrupt the delicate geologic conditions that foster the present quality of life for all organisms which reside in the County. Minimizing grading and impervious surface cover in groundwater recharge areas is an especially crucial step to maintaining the quality and quantity of surface and subsurface waters. Stormwater management facilities also need to account for linkages between surface runoff and groundwater systems in deciding where to discharge stormwater. Preliminary site investigation and innovative site design may be necessary to account for the much stronger connection between groundwater sources and surface activities in areas underlain by karst terrain. Wellhead protection areas can also serve to protect springs that serve as major feeders to public water systems.

d. **iv. Hydric Soils**

A related water quality issue that concerns streams is hydric soils. The National Technical Committee for Hydric Soils defines hydric soils as “a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.”²⁶ Most hydric soils show characteristics that result from repeated periods of saturation or inundation that last more than a few days. Saturation or inundation, when combined with microbial activity in the soil, causes the depletion of oxygen. This promotes

²⁶ Natural Resource Conservation Service, *Field Indicators of Hydric Soils in the United States*. (Annapolis: United States Department of Agriculture), 2010, 2.

certain biogeochemical processes, such as the accumulation of organic matter and the reduction, translocation, or accumulation of iron and other reducible elements.

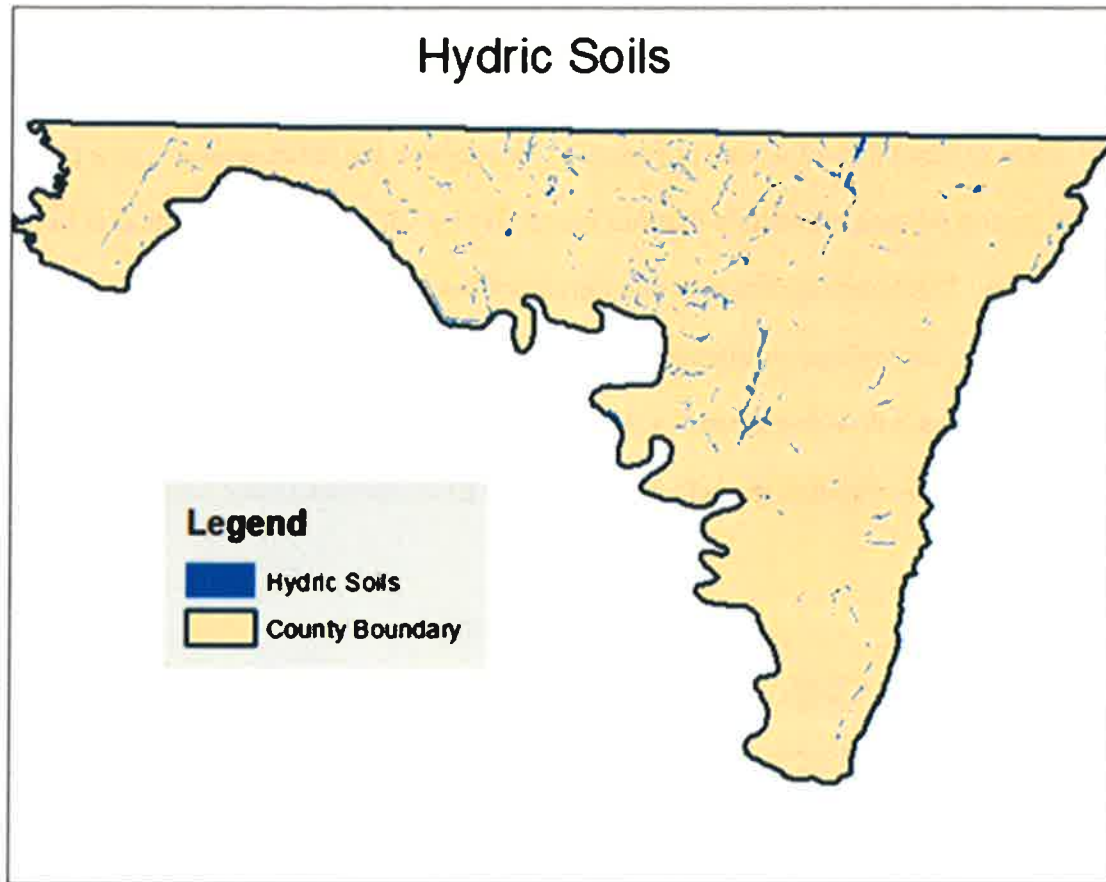
Hydric Soil Groups

| Soils Group | Infiltration Rate(in/hr) | Relative Runoff Potential |
|-------------|--------------------------|---------------------------|
| A | > .30 | Low |
| B | 0.15-.30 | Moderate |
| C | 0.05-0.15 | High |
| D | 0-0.05 | Very High |

Source: <http://www.esf.edu/ere/endreny/GICalculator/SoilInstruction.html>

Hydric soils are classified into four groups based on their runoff potential when saturated, labeled A-D. Groups A and B have a low runoff potential with a low clay content and a high sand, silt or loam content. Groups C and D are the opposite, with a high runoff potential, high clay content and low sand, silt or loam content. The runoff potential is more moderate in Group C and highest in Group D.

Runoff potential for hydric soils is particularly important in Washington County where many rural properties are not connected to public water and sewer systems, and instead employ on-site septic systems. The combination of steep slopes and hydric soils produces a high likelihood of septic system failure that can ultimately result in ground or surface water pollution. It is for this reason that the County prohibits septic systems in steep slopes greater than 25 percent and in stream buffers as part of the On Site Sewage Disposal Ordinance. The Subdivision and Zoning Ordinances also reference this standard. Septic systems must comply with State Health Department requirements in terms of location and construction to minimize impacts in floodplain areas. The hydric soils shown on the map below belong to Group D - soils which have the highest runoff potential when saturated.



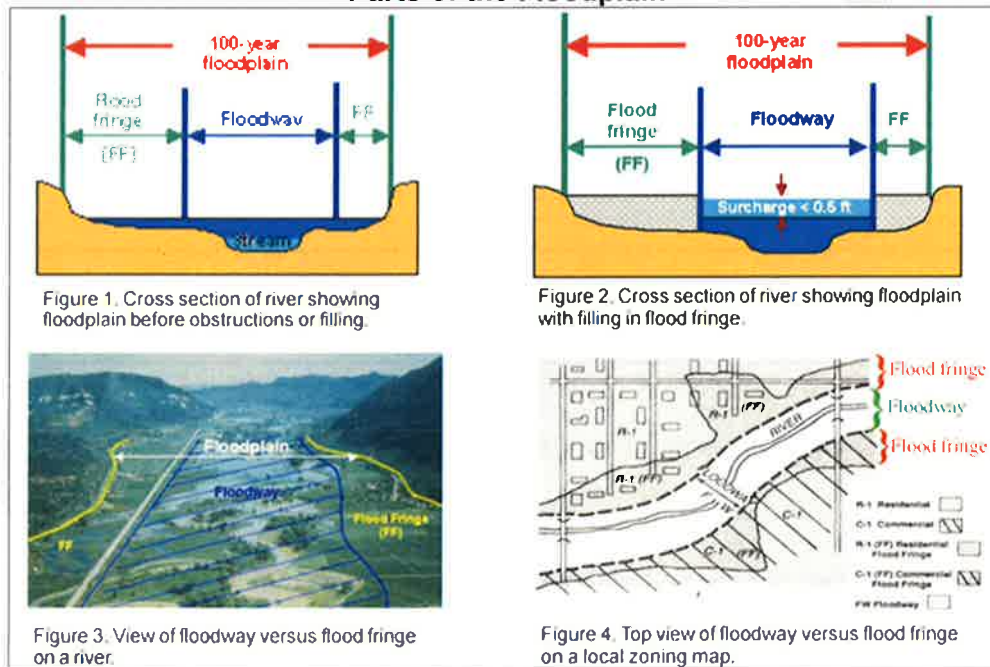
IV. 100-Year Floodplains

Historically, people's interest in identifying floodplains has mostly been confined to protection from bodily injury or personal property damage during flooding events. When considering their value to Sensitive Areas, it is possible to see that floodplain protection offers additional benefits to both people and nature. Natural floodplains moderate and store floodwater and reduce sedimentation that results from stream bank erosion. Wetlands and stream buffers are often found within the boundaries of a floodplain and as such, provide essential ecological services such as water quality maintenance, groundwater recharge, terrestrial and aquatic habitat provision and other benefits already highlighted in previous sections of the Sensitive Areas element.

To grasp the utility or danger of floodplains, it is important to understand the terminology referenced when describing the parts of the stream or waterway that are involved in flooding

events. The *floodway* is defined as the channel of a river or stream and the parts of the floodplain adjoining the channel that are reasonably expected to efficiently carry and discharge the flood water or flood flow of a river or stream. *Floodplains* are lands adjacent to a body of water with ground surface elevations that are inundated by 100-year flood events due to upland rainfall or runoff. The *floodway fringe* is that portion of the floodplain outside the floodway. These basic terms are defined in Washington County's Floodplain Management Ordinance. The series of images below describes the differences between these pieces of the stream or river channel and demonstrates the effect of floodplain development on the height of floodwaters.

Parts of the Floodplain



Source: Minnesota Department of Natural Resources, Floodplain Information Sheet 2 (2006)

Floodplain regulation often deals with protection from "100-year floods." Contrary to popular belief, a *100-year flood* is **not** a flood that is likely to occur once per century. Instead, scientist use statistical data to observe how frequently different sized floods occur and the average number of years between them. This analysis provides a probability of how often different sized floods will occur. So in the case of the 100 year floodplain, scientist have

postulated that there is a 1-in-100 chance (1%) of floodwaters reaching a specified elevation in any given year. The 100-year flood line is the line used for regulatory purposes in Washington County's Floodplain Management Ordinance. The County uses the term *base flood* in place of 100-year flood within the language of the Ordinance. The Federal Emergency Management Agency (FEMA) maps this as well as other hazard areas of concern to regulatory agencies on its Flood Insurance Rate Map (FIRM). The 100-year flood depicted on the FIRM map depicts a statistical average, not a precise interval of years that will elapse before a flood of that magnitude will occur. The average is based on historic and present data about the watercourse in question, such as rainfall and stream stage. Real-time factors affect the actual probability that a significant rainfall event will produce a "100-year flood," such as the soil saturation before the storm, the extent of rainfall in the watershed, and the relationship between watershed size and storm duration (e.g. - smaller watersheds runoff more quickly).²⁷

✓ As depicted in Figure 2 above, human activities have the ability to significantly alter the flood regime of a waterway. A large amount of impervious cover adjacent to a stream or river can increase both the amount of precipitation that runs off into the water body and the rate at which water travels to reach said waterway. Unnatural changes in stream morphology, such as the placement of fill in the flood fringe, the use of dams, or channelization can reduce the capacity of the floodway to carry floodwaters. The effects can be catastrophic to downstream communities if proper mitigation devices such as stormwater facilities or stream buffers are not utilized to safeguard these locations from these anticipated hazards. Improper floodplain development can also result in less physically damaging but equally costly effects such as contaminated water and long-term impacts to the integrity of aquatic and riparian stream communities.

²⁷ United States Geologic Survey, *Floods: Recurrence intervals and 100-year floods (USGS)*, United States Geologic Survey, <http://water.usgs.gov/edu/100yearflood.html>, 2016.

Floodplain Regulation

Washington County has recognized these potential hazards and addressed the protection of floodplains primarily through its Floodplain Management Ordinance. While the Ordinance does not entirely restrict new development in the floodplain, it does substantially limit the number of permitted uses. Existing structures in the floodway must also meet certain safety requirements. The Ordinance, first adopted in 1992, defines its purpose as follows:

“... to minimize property damage, encourage appropriate construction practices to minimize future damage, protect water supply, sanitary sewage disposal, and natural drainage. The prevention of unwise development in areas subject to flooding will reduce financial burdens to the community and the State, and will prevent future displacement and suffering of its residents. This protection is achieved through the review of all activities proposed within identified floodplains and by the issuance of permits for those activities that comply with the objectives of this Ordinance.”

The Ordinance excludes all new development from the floodway, outside of roads, bridges and essential utilities. New development in the flood fringe is generally limited to water dependent activities (e.g. – marina), or small, uninhabited accessory structures of limited use (e.g. - garages). These flood fringe structures must be elevated above the level of the 100-year flood (called the *Flood Protection Elevation*) and be equipped with water equalizing vents. Existing structures in the floodway generally cannot be improved beyond their current footprint and must be relocated out of the floodplain in the event of substantial damage. Permitted but restricted new construction in the floodway fringe generally has anchoring and material specification requirements. Variances are granted only in cases where the applicant has demonstrated exceptional hardship. The County's Subdivision and Zoning Ordinances note that 100-year floodplains must be identified during development review, but leave regulation to the Floodplain Management Ordinance. These regulatory requirements are on par with what is

required by FEMA's National Flood Insurance Program (NFIP), which also permits limited development in the floodplain with implementation of certain flood protection measures.

The FEMA Flood Insurance Rate Maps are utilized to set the parameters of the floodplain. The FIRM maps are most specific about the base flood line in places where detailed engineering studies have been performed. The line is more approximate where such studies have not been carried out.

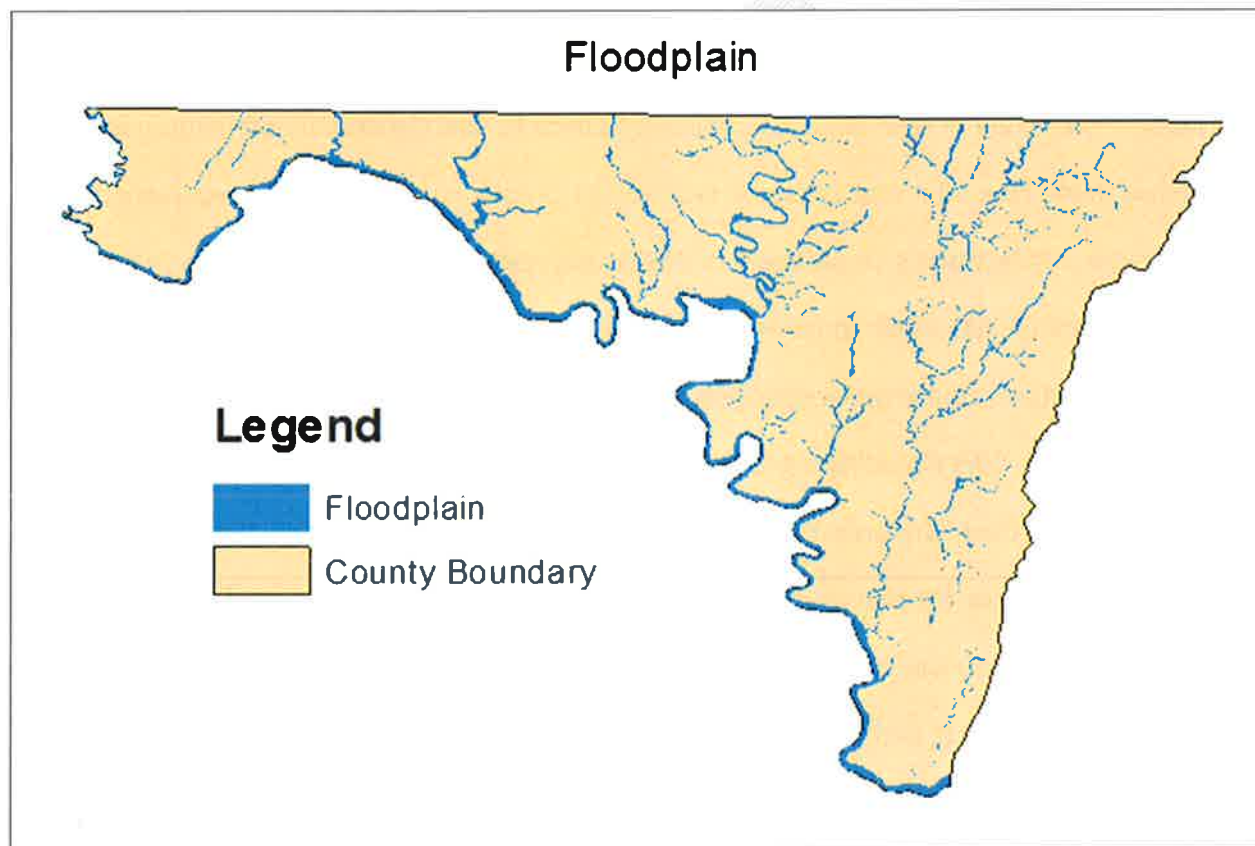
The State of Maryland developed a Model Floodplain Management Ordinance in connection with the 1992 Planning Act which serves as the basis for County floodplain regulation. The State of Maryland's Coordinating Office for the National Flood Insurance Program is in the Non-tidal Wetlands and Waterways Division in the Water Management Administration of Maryland's Department of the Environment. In order to participate in the NFIP, local communities must adopt and enforce a floodplain management ordinance containing minimum requirements specified by Federal law, which apply in floodplain areas mapped by FEMA. The Coordinating Office assists communities in adopting, interpreting, and properly enforcing their floodplain management ordinances under the Community Assistance Program and facilitates the coordination of Federal, State, and local programs.²⁸

All of Maryland's counties, cities, and most towns participate in the NFIP which requires local jurisdictions to issue permits for all development in the 100-year floodplain, as depicted on maps issued by FEMA. Development is broadly defined to include any man-made change to land, including grading, filling, clearing, dredging, extraction, storage, subdivision of land, and construction and improvement of structures and buildings. For any development to take place,

²⁸ Maryland Department of the Environment, *Floodplain Permitting in Maryland*. Maryland Department of the Environment, http://mde.maryland.gov/programs/Water/FloodHazardMitigation/FloodPlainPermitting/Pages/Programs/WaterPrograms/Flood_Hazard_Mitigation/permitting/index.aspx, 2016.

all necessary permits must be obtained, which may include Federal and State permits, as well as the local permit.²⁹

The Antietam, Conococheague, Licking and Little Tonoloway Creeks, their runs and tributaries and the Potomac River all have extensively mapped 100 year floodplains. There are many other areas associated with unnamed streams that are also prone to flooding. The map below shows the floodplain areas throughout Washington County.



V. Habitats of Threatened and Endangered Species

A habitat of a threatened or endangered species is defined in Volume One of Models and Guidelines as:

²⁹ Ibid.

“An area which, due to its physical or biological features, provides important elements for the maintenance, expansion and long-term survival of threatened and endangered species. This area may include breeding, feeding, resting, migratory, or overwintering areas. This area may need special management or protection because of its importance to conservation of the threatened or endangered species.”

Human activities have, both currently and historically, had an undeniable impact on species habitat globally and locally. Since the time of European colonization in the 1600's, more than 500 species and subspecies of native animals and plants have become extinct in North America.³⁰ In Maryland, over 200 species have been documented as being extinguished over the past 350 years.³¹ While some local species, such as Gray Wolves, were intentionally targeted for eradication when the role of predators in the overall ecosystem function was poorly understood nationally, most threatened and endangered species have become rare simply from large scale habitat destruction as wildlands were converted to lands suited to human purposes. In Maryland, this has resulted in the permanent loss of locally unique habitats such the prairie-like grasslands of the Hagerstown Valley, and the near extinction of others such as the Delmarva Bays of the Coastal Plain.

Habitats, and the species that reside in them, have immense benefits to natural and human communities. Fundamentally, the resiliency of an ecosystem is dependent on protecting its species biodiversity. Biodiversity is a direct outcome of habitat protection and the maintenance of the core ecological processes which provide the conditions for habitation in general. Where natural communities find food, shelter, travel corridors and places to rear young in protected habitats, human communities retain access to essential resources valuable to

³⁰ Maryland Department of Natural Resources, *Endangered Species - Plants and Animals*, Maryland Department of Natural Resources, http://dnr.maryland.gov/wildlife/Pages/plants_wildlife/rte/espaa.aspx, 2016.

³¹ Maryland Office of Planning and Maryland Department of Natural Resources. *Managing Maryland's Growth: Models and Guidelines Volume 1*, 36.

agriculture, medicine, and many other activities which sustain our society. Artificially created habitats, such as zoos, are no substitute for natural habitats where species have evolved to meet their own needs without assistance or expense from mankind.

Threatened and Endangered Species Regulation

State Endangered Species Regulations were enacted in the State through the Maryland Endangered Species Act of 1971. This Act prohibited the taking, transportation, possession, processing, or sale within the State of Maryland of any wildlife appearing on the Federal lists of endangered, foreign or native fish and wildlife. Secondly, it mandated the Secretary of DNR to develop a list of fish and wildlife deemed to be threatened with statewide extinction in Maryland. This provides for full protection from taking and possession of those species. The DNR list includes all of the Federally listed species, and lists of species which are threatened or endangered within their range in Maryland.

In 1979, the State of Maryland established the Natural Heritage Areas Program, to fulfill the second requirement of the 1971 legislation. This program is responsible for identifying, ranking, protecting and managing Rare, Threatened and Endangered (RTE) species throughout the State. The Maryland DNR restores degraded habitats, conducts field surveys, performs research, and conducts public outreach and education efforts in service of its responsibilities for the Natural Heritage Areas Program.

The Natural Heritage Areas Program has established review areas throughout the State. Whenever there are proposed development projects within these review areas, DNR will examine the proposal to ensure that they do not negatively affect sensitive plant and animal species habitat. In select circumstances, the Program will cooperate with local non-profit organizations to acquire land that encompasses RTE species. The Maryland Department of Natural Resources is the primary agency responsible for establishing criteria for the protection

and preservation of RTE plant and animal species. The County defers to the recommendation of the State and Federal agencies in establishing the appropriate buffers to these habitats³².

The Wildlife and Heritage Service Natural Heritage Program tracks the status of over 1,100 native plants and animals that are among the rarest in Maryland and most in need of conservation efforts as elements of our State's natural diversity. Of these species, the Maryland Department of Natural Resources officially recognizes 607 species and subspecies as endangered, threatened, in need of conservation, or endangered to the point of local extinction. Only 37, or 3% of the total tracked species, are listed by the U.S. Fish and Wildlife Service as nationally endangered or threatened.³³ The Maryland DNR lists 86 animal and 88 plant species in its Current and Historical Rare, Threatened, and Endangered Species for Washington County as of 2010. The primary State law that allows and governs the listing of endangered species is the Nongame and Endangered Species Conservation Act (Annotated Code of Maryland 10-2A-01). This Act is supported by regulations (Code of Maryland Regulations 08.03.08) which contain the official State Threatened and Endangered Species list. Secondly, DNR's Fisheries Service maintains an official list of game and commercial fish species that are designated as threatened or endangered in Maryland (Code of Maryland Regulations 08.02.12).

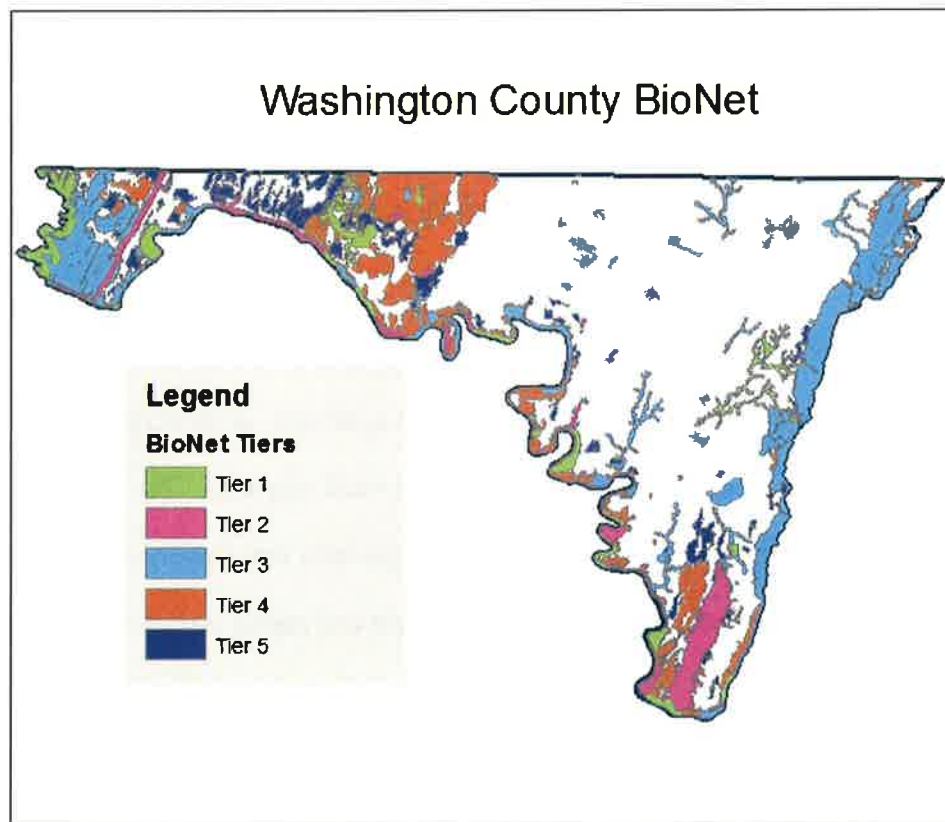
A significant GIS mapping effort conducted by the Maryland Department of Natural Resources to comprehensively identify priority lands for threatened and endangered species conservation is the Biodiversity Conservation Network (BioNet). BioNet is a GIS data layer that was developed primarily to aid DNR, other government agencies, and non-profit conservation organizations determine where conservation efforts are most needed. This layer can be used to help focus a wide array of conservation activities, such as land acquisition and easements, land planning, and management actions. Prioritization criteria are based on the relative rarity and

³² Anne Arundel County, *Anne Arundel County General Development Plan*. (Annapolis: Anne Arundel County) 2009, 80.

³³ Maryland Department of Natural Resources, *Endangered Species - Plants and Animals*, 2016.

conservation value of the species and habitats present: the most critically significant areas contain the rarest habitats and species, as well as the largest concentrations of these, statewide. These lands include State Natural Heritage Areas, Critical Area Habitat Protection Areas, Ecologically Significant Areas, and Sensitive Species Project Review Areas. The areas are prioritized into a 5-tiered system, with Tiers I and II being the most significant for biodiversity conservation. Ranking criteria focuses on both the most irreplaceable species and habitats, as well as on the habitats that concentrate large numbers of rare species.

Washington County has 27,168 acres of Tier I and II lands, and 147,907 acres of Tier III through V, according to the GIS data contained within the BioNet layer. Many of these Tier I and II lands are concentrated along select stream and river corridors dispersed through the County, outside of the Urban and Town Growth Areas where development has been intentionally concentrated. All BioNet designated habitats within Washington County are shown on the map below.



The U.S. Fish and Wildlife Service's Office of Endangered Species publishes a list of Federally-designated threatened and endangered species, as well as those species considered to be candidates for official listing. A species can be listed under the Endangered Species Act two different ways: through the petition process or through the candidate assessment process. The ESA provides that any interested person may petition the Secretary of the Interior to add a species to, or to remove a species from, the list of endangered and threatened species. Through the candidate assessment process, FWS biologists identify species as listing candidates. This office is the primary Federal partner responsible for administering the Federal Endangered Species Act, the bedrock law governing threatened and endangered species protection nationally. The Office engages in a variety of activities designed to identify, protect and monitor threatened and endangered species and their habitat, making plans to ensure their recovery and long-term survival where necessary. The table below summarizes Federal and State threatened and endangered species occurring in Maryland according to their general classification.

Species of Concern in Maryland

| Summary of Federal Listed Species | | |
|-----------------------------------|---------------|----------------|
| <u>Category</u> | <u>Plants</u> | <u>Animals</u> |
| Endangered | 5 | 21 |
| Threatened | 4 | 6 |
| Total | 9 | 27 |
| Summary of State Listed Species | | |
| <u>Category</u> | <u>Plants</u> | <u>Animals</u> |
| Endangered | 271 | 91 |
| Threatened | 74 | 19 |
| In Need of Conservation | n/a | 29 |
| Endangered Extirpated | 100 | 28 |
| Total | 445 | 167 |

Source: Maryland Department of Natural Resources

Due to the clear regulation of threatened and endangered species provided at the Federal and State level, the jurisdictional overlap makes it unnecessary for Washington County

to develop its own listings. Subdivision (408-411) and Zoning Ordinance (4.21) amendments adopted in 1997 utilize existing tools already in place. It's also required to be identified in Forest Stand Delineations required by the Forest Conservation Ordinance, Section ?? Development plans require the identification of any habitat of a threatened or endangered species documented by the U.S. Fish and Wildlife Service as specified in a review under the Federal program initiated by the applicant. The applicant must demonstrate that the proposed activity will not disturb the habitat area. Provisions for any additional setbacks or use limitations as required by the U.S. Fish and Wildlife Service must also be shown on locally approved development plans. Efforts have been made to form a cooperative working relationship with the U.S. Department of the Interior and the Maryland Natural Heritage Program to access information those agencies maintain regarding threatened and endangered species. Washington County can now identify an area that may contain species habitat at the earliest stages of development review and advise property owners of the necessary input from the U.S. Fish and Wildlife Service or the Maryland Natural Heritage program.

Listed Species in Washington County



Indiana bat

Credit: Ann Froschauer / USFWS



Harperella.

Credit: USFWS

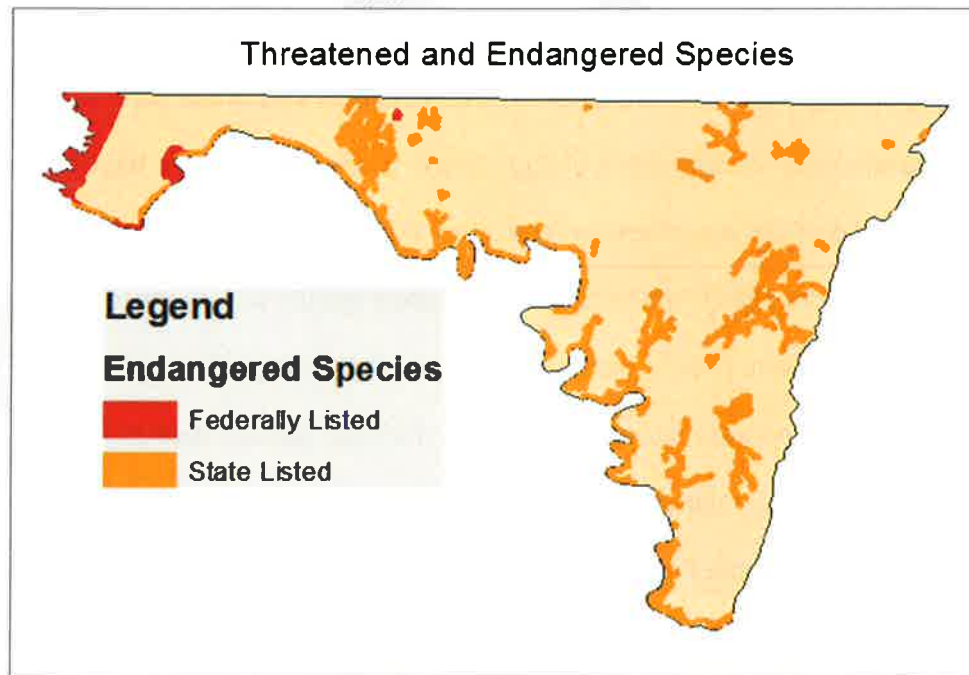


Northeastern bulrush.

Credit: Kristen Lundh / USFWS

Three Federally listed threatened or endangered species are located in Washington County: the Indiana bat and two plants (*Harperella*, *Northeastern Bullrush*). The Indiana bat is a hibernating bat which resides in caves or abandoned mines. The Indiana Bat primarily resides within its namesake state, but smaller numbers of the species do reside in Maryland. As a hibernating bat, it has the potential to be affected by introduced diseases like White Nose

Syndrome. The Maryland DNR confirmed in March of 2010 the presence of the disease during a survey of a cave near Cumberland in Allegany County, where several deceased bats were found infected. Since 2006, biologists across the Northeastern U.S. have reported as much as a 100% decline in hibernating bats in affected caves. More than a million bats are suspected to have died from the disease in the Northeast.³⁴ *Harperella* is a perennial herb found near the margins of streams or other bodies of water. *Northeastern Bullrush* is a sedge which grows in wet areas with seasonally fluctuating water levels, including small wetlands, sinkhole ponds or wet depressions. These Federally listed species are found in the westernmost extremity of the County, in protected lands owned by the State. The State listed species are distributed throughout the County, often located within close proximity of streams or rivers. Both State and Federally listed species are shown on the map below.



When threatened and endangered species habitat is found on private land proposed for development, species conservation options are available to a landowner from either an

³⁴ Maryland Department of Natural Resources, *Bats and Diseases*. Maryland Department of Natural Resources, http://dnr2.maryland.gov/wildlife/Pages/plants_wildlife/bats/nhpbatdisease.aspx, 2016.

approved list of choices or through negotiation and compromise. Options might include clustering, transfer of development rights, inclusion in forest retention or reforestation areas, or acquisition through mutual agreement. The Rural Legacy Program also contains a provision for the protection of endangered species habitat. Specific language targeted toward species protection can be included in the easement documents that restrict land development and are purchased from land owners in the nearly 43,000 acre Mid-Maryland Washington County Rural Legacy Area that surrounds Antietam National Battlefield.

i. Wildlife Corridors

Wildlife corridors are defined in Models and Guidelines #18 as “undeveloped linear stretches of land connecting larger patches of wildlife habitat.”³⁵ Wildlife corridors can occur in many settings both natural (such as rivers, riparian forests, along undeveloped ridgelines) and manmade (e.g. - along power lines or railroads). The importance of these corridors to people and nature has gradually become more clear to both scientists and urban planners over time. From a natural perspective, conservation biologists and other experts have begun to view plant and wildlife preservation from a systems perspective. What has come into clearer focus is the need for contiguously connected habitat parcels that allow wildlife to fully meet their fundamental needs of obtaining food, water, shelter, and for raising offspring. Isolated and disconnected protected lands are often insufficient to maintain genetic diversity among species, particularly among those that migrate or range widely throughout their life history. Accordingly, wildlife corridors serve to enable both common and threatened or endangered species to obtain the full range of resources that they need to maintain their populations by allowing free movement.

At the same time, it is not just wildlife that benefits from protecting contiguous pieces of land. Greenways are an urban planning and land conservation tool that seeks to protect these

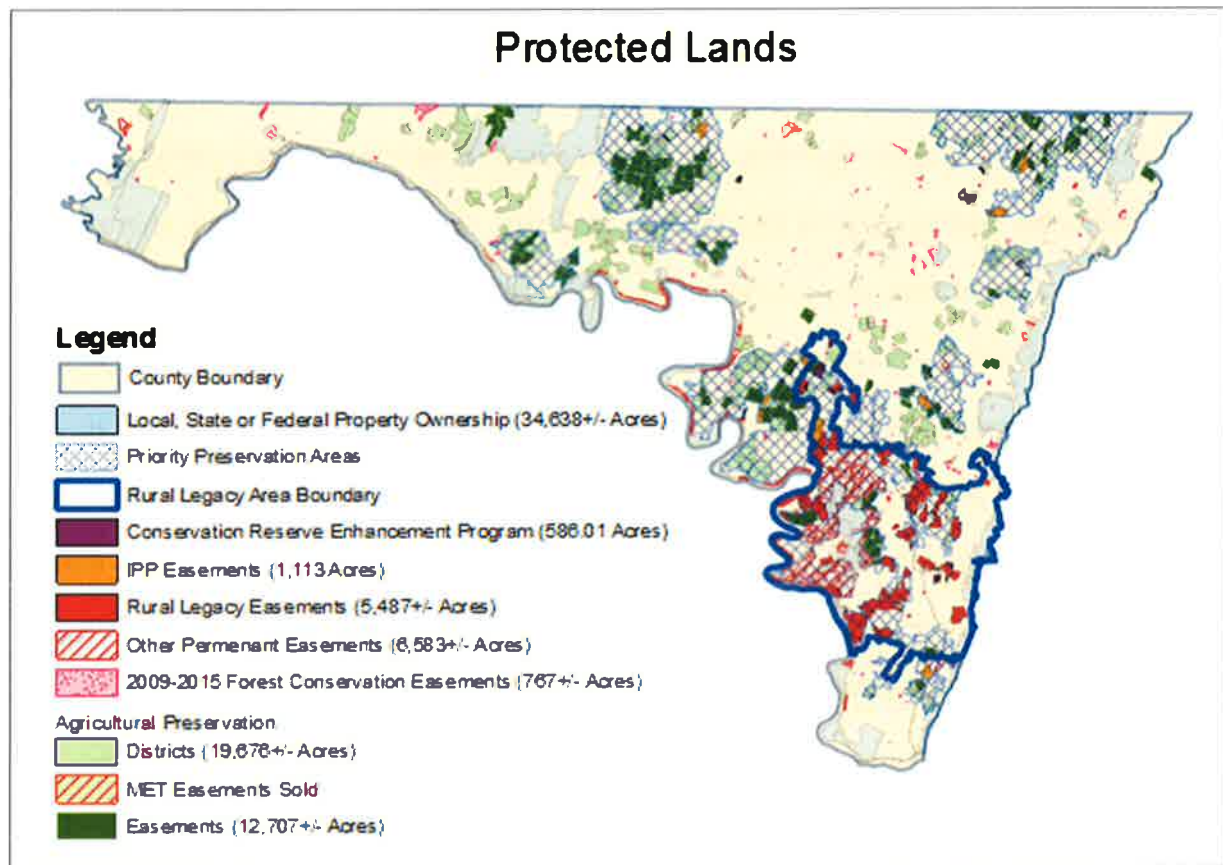
³⁵ Maryland Office of Planning and Maryland Department of Natural Resources. *Managing Maryland's Growth: Models and Guidelines #18: Sensitive Areas Volume II* (Baltimore: Maryland Office of Planning), 63.

contiguous, linear open spaces in order to provide recreational opportunities and water quality benefits, in addition to setting aside land for sensitive species. Greenways are often targeted by land use planners as places to provide long-distance multi-use paths. In urban areas, such corridors provide a buffer from the stress of the city and facilitate contact with open spaces that feel more wild than a typical urban park. In this way, local residents as well as visitors can gain respite from the stresses of modern life, and sensitive land and aquatic species are given more room to roam.

In order to be effective for either purpose however, these corridors or greenways must be of an adequate width to provide their intended benefits. As with stream buffers, there is no exact distance that automatically fits the definition of a perfect corridor. Instead, the width of the corridor needs to take into account the needs of the wildlife species residing within it as well as human factors such as adjacent land use patterns. For conservation purposes in general, corridors should be wide enough to provide for the needs of both edge species (crows, raccoons, jays) and forest interior species (reptiles, amphibians). Corridors that are too narrow are often too bright, dry or open and contain insufficient cover from predators to allow interior species to survive in large numbers. A wider buffer may also be necessary to mitigate stormwater runoff, and to prevent pollutants from entering ground or surface water systems in urban areas, thereby ensuring increased water quality benefits to people. Professional ecologists and urban planners should work collaboratively to determine both the size and location needed to make such corridors effective for their intended purposes.

Washington County has done an excellent job to date in preserving contiguous corridors of land and water. Collectively, between its various agricultural land preservation programs and forest conservation lands, more than 47,000 acres has been permanently set aside by the County. Additionally, another 34,000 acres are held in various state and federal lands throughout the County. These figures were obtained from GIS data maintained by Washington County Department of Planning and Zoning. The C&O Canal, Antietam National Battlefield,

Maryland Rail Trail, and the network of State parks along South Mountain and Elk Ridge in the eastern portion of the County are among the many state and federal lands enjoyed by residents, visitors and wildlife. In total, these protected lands comprise approximately 27 percent of the County's total acreage, a substantial figure by any measure. The protected lands of Washington County are shown on the map below.

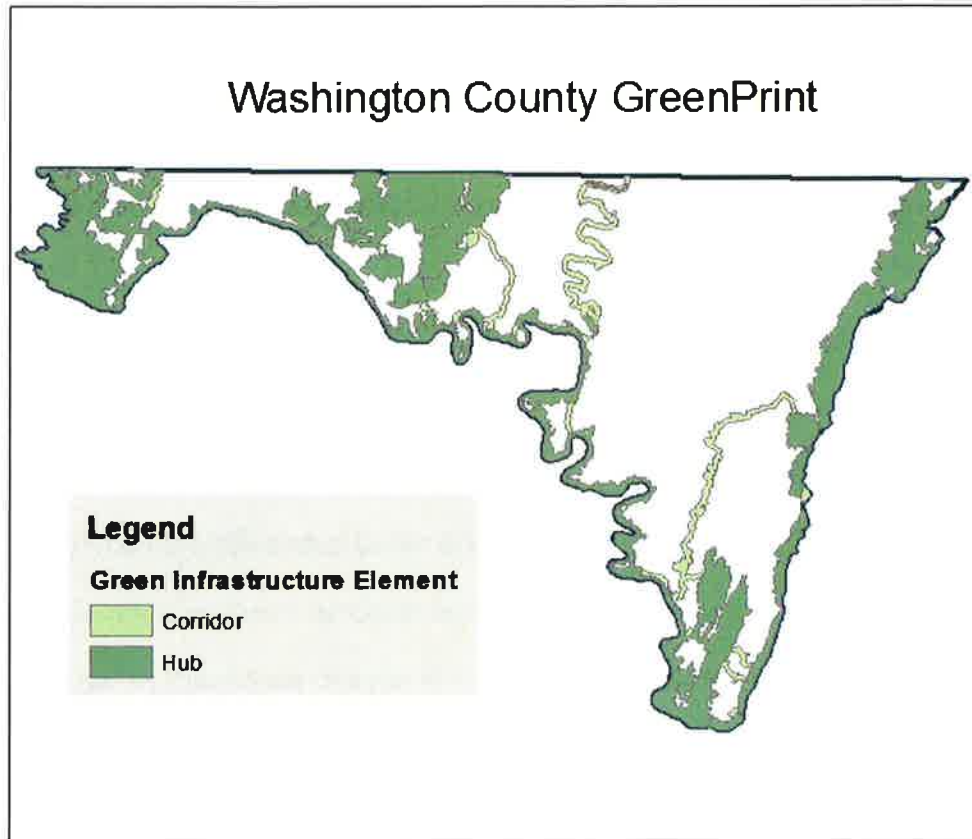


Thus, with so much land protected, the job of the County going forward will be to strategically target remaining sensitive lands by maintaining consistency between the aforementioned County land preservation programs, its Land Preservation, Parks and Recreation Plan and State of Maryland tools such as the Department of Natural Resource's GreenPrint. Targeting and acquiring such lands will require balancing the needs of species conservation and the right of private landowners to use their land to meet their needs under existing laws and regulations. The County has considered the creation of a Transfer of

Development Rights program in the past, an effort which could serve to achieve the balance described above between public and private interests. Other tools such as cluster development, and restrictive zoning categories such as Environmental Conservation and Preservation districts also serve as useful tools to ensure the protection of wildlife corridors by limiting the scale of development.

In the meantime, the County will continue to pursue agricultural land and forest conservation opportunities where they present themselves while enforcing the existing regulations that protect sensitive areas during development review described throughout this element. The presence of many sensitive features is noted before site plan approval already, and this information could be used to create a natural resource inventory at the County level that would help guide land preservation objectives that seek to specifically safeguard sensitive species in contiguous, protected corridors.

For reference purposes, the DNR's GreenPrint, which identifies targeted ecological areas, is shown below. These areas represent lands and watersheds of high ecological value that have been identified as conservation priorities by the Maryland Department of Natural Resources. This Green Infrastructure Network of priority lands is comprised of ecological "hubs" and "corridors." Hubs are large, ecologically significant, natural areas that provide habitat for native plants and wildlife. They may include protected areas such as County, State, or National parks that are managed for preservation purposes as well as private lands where natural features and ecological processes are protected or restored. Corridors are linear features that tie the hubs together and serve as biological conduits for native plants and wildlife. Corridors often follow streams and their adjacent upland areas, which provide cross watershed connections. Greenway is a term often used interchangeably with corridors, within this model of ecological preservation. These lands represent contiguous areas in the County worth considering for new or additional sensitive resource protection in the future.



VI. Special Planning Areas



The 1992 Maryland Planning Act permitted and encouraged local jurisdictions to identify additional sensitive areas that were unique and locally important. They are Sensitive Areas with special focus that requires additional attention. The Special

Planning Areas were included in the 1981 Comprehensive Plan for Washington County and were recognized as Sensitive Areas in the 1996 amendment. They are geographic areas of

unusual or significant importance for which definitions, special policies and land use techniques were proposed and adopted in the 1996 amendments to the Subdivision and Zoning Ordinances. The Special Planning Areas in Washington County, shown on the map below, include the Edgemont and Beaver Creek Watersheds and the Appalachian Trail Corridor.

i. Trout Stream Watersheds/Upper Beaver Creek Watershed

Maryland's water quality standards have three components: designated uses, water quality criteria and antidegradation policy. Of these three components, designated uses have the most direct application to the Sensitive Areas element for Trout Stream Watersheds as well as the Upper Beaver Creek Special Planning Area. Designated uses are goals for water quality based on a particular intended use for humans or aquatic life which have been organized into four classes. These uses generally include recreation, shellfish harvesting, water supply and/or aquatic life habitat. The Use Class designations are as follows:

- Class I: Water Contact Recreation and Protection of Non-tidal Warmwater Aquatic Life
- Class II: Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting
- Class III: Non-tidal Cold Water
- Class IV: Recreational Trout Waters
- P: Public Water Supply – can be applied to all Use Classes

While all except Class II Uses apply to waters within Washington County, it is Classes III and IV that apply specifically to the Beaver Creek Watershed Special Planning Area. The main stem of Beaver Creek within the Antietam Creek Watershed is a Class III stream. Marsh Run, also within the Antietam Creek Watershed, is Washington County's only other Class III stream. Beaver Creek originates on the Western slope of South Mountain and supports habitat for brook trout, the only native species of trout in the Eastern United States. Wild trout are an indicator species for water quality and overall watershed health. They have strict water temperature requirements and are highly susceptible to habitat degradation. Therefore, upstream

disturbance from human activities must be kept to a minimum if the County is to continue supporting a self-sustaining population of brook trout.

Albert Powell Fish Hatchery



Source: Maryland DNR

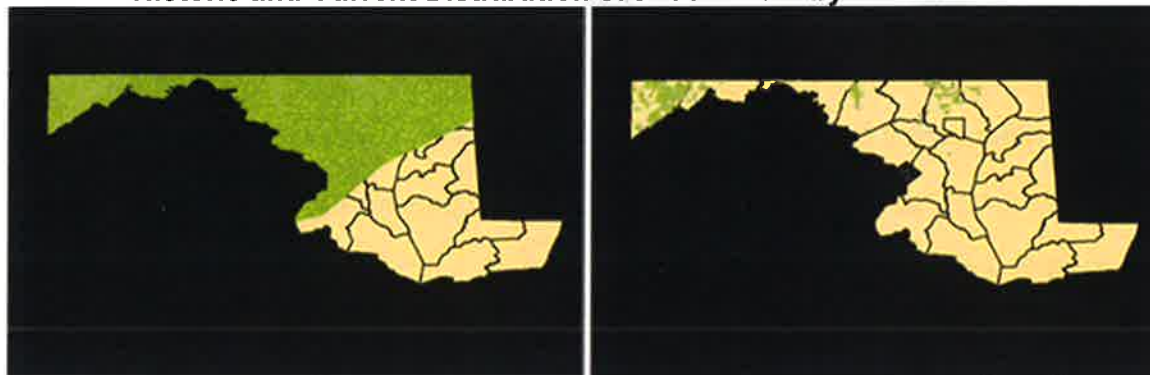
Beaver Creek is also the site of the Albert Powell Fish Hatchery. This hatchery raises rainbow trout which are used for stocking Class IV waterways throughout the State of Maryland and to supplement other State hatchery operations. Sideling Hill, Tonoloway, Licking and Conococheague Creeks are the other Class IV streams within Washington County that receive stock from the hatchery. The facility is fed by a nearby spring, whose waters it is able to recirculate when use exceeds output. The spring feeds both hatchery operation and the baseflow of Beaver Creek itself. The Hatchery, therefore, represents an important operation economically and biologically for both the County and the State.

Attention is given to the Upper Beaver Creek Drainage Basin in both the County's Subdivision and Zoning Ordinances because of their identification as Special Planning Areas. The Ordinances reserve the right for the Planning Commission to require a hydrogeologic study for new developments that propose the use of on-site wells and septic systems based on information gathered by the County Health Department and Soil Conservation District during preliminary consultation. The goal of the study is to determine if there will be a negative impact on ground or surface water resources from the proposed development. The presence of springs, caves and sinkholes in the nearby region make water quality impacts a particular concern for the Upper Beaver Creek Watershed. Residential density has been limited within the Watershed through amendments made to the Zoning Ordinance in 2005.

The Washington County Soil Conservation District has been the lead agency in the Beaver Creek-Antietam Creek targeted watershed project. In 1992, Little Antietam Creek and Marsh Run sub-watersheds were selected to be in this program which was expanded in 1996 to include the Beaver Creek watershed. A Soil Conservation Planner was hired to complete a

watershed assessment and to begin educational efforts in the targeted sub-watersheds. This was funded by an Environmental Protection Agency (EPA) Nonpoint Source grant from Section 319 of the Clean Water Act and was obtained through the Maryland Department of Agriculture. A conservation technician was hired to help install Best Management Practices (BMP) identified by the planner in Soil and Water Conservation Programs. This program has continued in the Beaver Creek and Marsh Run sub-watersheds.. These documents require a comprehensive review of development and its impacts on local resources, and in some cases, mechanisms to reduce negative impacts such as setbacks, easements, and tree planting.

Historic and Current Distribution of Brook Trout by Sub-Watersheds



Source: Maryland DNR 2014 Fishery Management Plans Report to the Legislative Committees

At the State level, the precipitous decline in both brook trout populations and stream health throughout much of the State since the time of European colonization has led the Maryland DNR to list brook trout as a “Species of Greatest Need of Conservation” and prepare a Fisheries Management Plan in 2006. The images above demonstrates this decline in brook trout abundance by showing the historic (left) and current (right) distribution of brook trout across the sub-watersheds of the State. Best Management Practices encouraged by the DNR in Class III tributaries to address these declines include protection of stream buffers, restriction of development on steep slopes, stormwater infiltration devices, minimization of impervious surfaces, stormwater detention basins that don’t hold water longer than 12 hours and the use of watering troughs for livestock on pasture land. Many of these practices are already in use in

Washington County to safeguard stream and watershed health. Water Quality Criteria Specific to Designated Uses are provided in COMAR Section 26.08.02.03-3.

ii. Edgemont/Smithsburg Reservoir Watershed

Edgemont Reservoir



Source: Herald Mail Media

The Edgemont Reservoir is located along the eastern slope of South Mountain, a few miles above the Town of Smithsburg, near the Washington and Frederick County border. The reservoir collects water from a watershed that is approximately 6 square miles of mixed forested and agricultural land, potentially supplying up to 750,000 gallons

of water per day.³⁶ The Smithsburg Reservoir, built in 1881 and located in Smithsburg, was the original source water supply for the City of Hagerstown. A dam, fed by Little Antietam Creek, was constructed in 1902 to create Edgemont Reservoir to supplement the Smithsburg Reservoir during seasonal shortages.

The use of both reservoirs was curtailed in 1987 after passage of the Safe Drinking Water Act required filtration in addition to the chlorination already done at the plant. Improvements were made to the dam and spillway in 1992-93. In 1997, the William Breichner Water Treatment Plant was constructed on the site of the Smithsburg Reservoir to treat water from the Edgemont Reservoir and again became a second drinking water source for the City of Hagerstown. The Edgemont Reservoir, along with the Potomac River serves 75,000 people in Hagerstown, Smithsburg, Funkstown, and Williamsport.³⁷ Accordingly, the County treats both the reservoir and the overall health of the watershed as a Special Planning Area.

³⁶ Dave McMillion, *Memo: City reservoir near Smithsburg a 'high-hazard dam'*. Herald-Mail, http://www.heraldmillmedia.com/news/local/memo-city-reservoir-near-smithsburg-a-high-hazard-dam/article_0f7943c4-d50d-11e5-acac-03919fa4e6af.html, 2016.

³⁷ Maryland Department of the Environment, *Source Water Assessment for the City of Hagerstown, MD: Edgemont Reservoir*, (Baltimore: Maryland Department of the Environment), 2004.

Similar to the concerns which necessitate special plans for Beaver Creek, the City and County are concerned with water quality degradation in the watershed. A 2004 source water assessment of the Edgemont Reservoir conducted by the Maryland Department of the Environment for the City of Hagerstown noted a variety of potential threats to the source water. These included non-point sources such as agriculture and forestry operations, on-site septic systems, runoff from developed land or unpaved roads, and a shooting range at the head of the reservoir. Little Antietam Creek also supports natural trout populations as a Class III waterway, adding an extra layer of sensitivity. Unlike the Beaver Creek Watershed, where sinkholes and caves characteristic of Karst topography occur, the Edgemont and Smithsburg Watershed is generally underlain by the harder metamorphic rocks of the Blue Ridge Physiographic Province which are less susceptible to the type of natural breakdown that can provide conduits for contaminants.

The Edgemont Reservoir is given special consideration in Washington County's Zoning and Subdivision Ordinances. Section 4.21 of the Zoning Ordinance notes that the location of the subject property within the watershed boundaries of the Edgemont or Smithsburg Reservoirs shall be noted on scale drawings, where applicable.

In 2005, the Board of County Commissioners adopted new rural area zoning districts that reduced the amount of potential development allowed outside of designated Growth Area boundaries. Four primary zoning districts are now designated in the rural areas of the County, including Agricultural Rural, Environmental Conservation, Preservation and Rural Village. The Edgemont Reservoir falls within a Preservation district, where density allowances were reduced from one (1) dwelling unit per three (3) acres to one (1) dwelling unit per thirty (30) acres of land owned.³⁸

³⁸ [1] Washington County Department of Planning and Zoning. *Land Preservation, Parks and Recreation Plan*. (Hagerstown: Washington County Department of Planning and Zoning), 2013, 46.

The Subdivision Ordinance stipulates that the Soil Conservation District and Hagerstown Water Department shall have the opportunity to review all subdivision proposals located in the watershed and make recommendations for appropriate Best Management Practices. The Planning Commission determines if BMPs are required as a condition of subdivision approval. Forest conservation, agricultural land preservation, and other easement types help safeguard the integrity of the Edgemont, Smithsburg, and Beaver Creek watersheds as well.

iii. **Appalachian Trail**



Annapolis Rock
Source: Shutterstock

The Appalachian Trail (AT) is a Federally managed National Scenic Trail that stretches more than 2,100 miles through the Appalachian Mountains from Maine to Georgia. Forty miles of the AT run through Maryland between the Potomac River and the Pennsylvania state line, all of them inside Washington County. From a management perspective, the Trail is unique in that

a variety of actors from Federal, State and local governments, non-governmental organizations and volunteers cooperatively work together to ensure the trail's upkeep.

As one of those partners, Washington County's role is to ensure that the trail is buffered from development and that viewsheds are preserved for trail users by considering the appropriate arrangement of land uses surrounding the trail corridor. The AT is regulated during development review by both the Zoning and Subdivision Ordinances. The Zoning Ordinance states that any proposed development within 1000 feet of the AT is to be noted on the sketch plan during preliminary consultation. The Subdivision Ordinance (Section 411) applies the following regulation to development near the Trail:

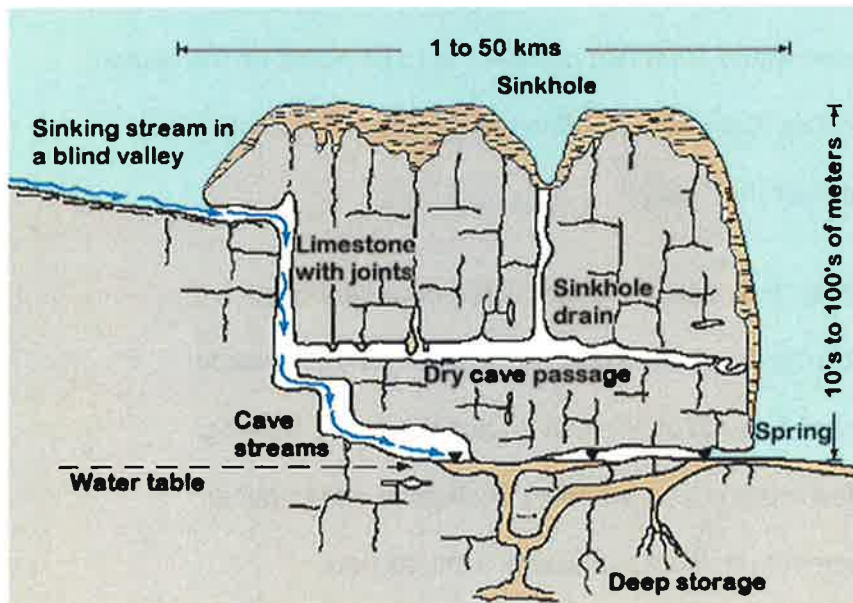
"Any portion of the Appalachian Trail within 500 feet of the boundary of a proposed subdivision shall be shown on the subdivision plat. The trail location shall be field verified and noted as such on the plat. In addition to the building setbacks required by the Washington County Zoning Ordinance and to buffer visibility of the new development from the Appalachian Trail, all new development shall maintain a minimum distance of 300 feet from the trail. The Planning Commission may approve a planted buffer as a substitute for the 300 foot setback where it can be demonstrated that maintaining the 300 foot setback will cause the subdivision to be non-compliance with other subdivision design requirements or where it can be demonstrated that a permitted use could not be established anywhere on the new lot in conformance with the 300 foot setback."

Because the Trail came into existence after many existing uses were already in place, lands or easements often had to be acquired throughout the Trail's length in Maryland and elsewhere, which required negotiations or cooperative arrangements with landowners to facilitate footpath connectivity and preservation of the wilderness-type atmosphere expected by trail users. These negotiations occurred between private, non-governmental and public entities

at various levels of government. This unusual arrangement has led to a delicate balance between existing and current land uses in some places and ultimately led Washington County to codify the buffer requirements in 1996 amendments to the Subdivision and Zoning Ordinances.

VII. Geologic Features

i. Karst Topography

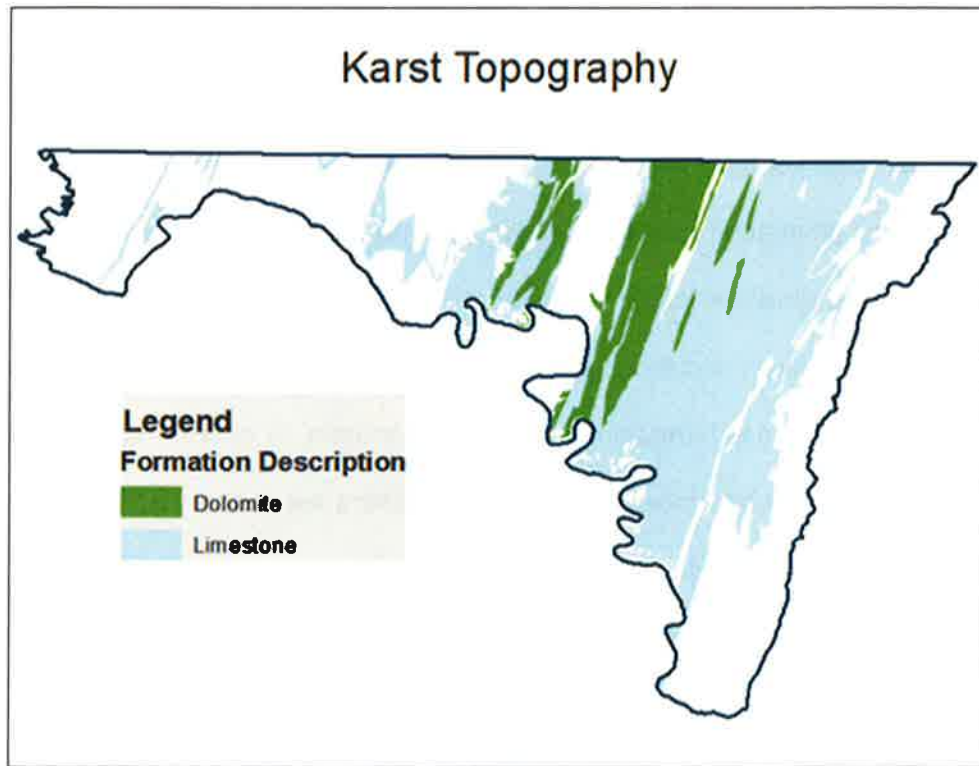


Source: Maryland Geological Survey

such as limestone and dolomite.³⁹ The caves, sinkholes, sinking streams, springs and other unusual subsurface features that characterize this terrain offer many engineering and environmental concerns that require development to proceed with a greater sensitivity than in more uniform terrain. A cross section of the sub-surface features of Karst landscape is shown above. The extent of Washington County's Karst topography is noted on the map below, and a couple of the unique features associated with this geology are elaborated on in the proceeding sections.

As noted in this chapter's geologic overview, Washington County is most uniquely characterized by an underlying Karst topography, particularly in the Hagerstown Valley. Karst terrain reflects the influence of water as an agent of solutional erosion of bedrock

³⁹ Mark Duigon, *Karst Hydrogeology of the Hagerstown Valley, Maryland*. 2001, 2.



ii. Caves and Sinkholes

Caves are important from engineering, hydrological and ecological perspectives. The presence of caves can affect foundation suitability and the movement of groundwater. Caves are used by wildlife seasonally or year round as nesting or hibernation sites, sometimes creating unique ecosystems where outside disturbance can have a major impact on the subterranean microclimate contained within.

Crystal Grottoes



Source: roadtrippers.com

More than 70 caves are reported in the Hagerstown Valley according to Duigon.⁴⁰ Several more can be found in western Washington County, and others without natural entrances may not have yet been discovered. All of the known caves are found within the carbonate formations (limestone and dolomite) that characterize much of the County, where circulating groundwater enlarges joints and fractures in the rock. The natural acidity of rainwater, the force of gravity, and thousands of years of time combine forces to enlarge the fractured spaces between rock formations into larger chambers, or caves. Some caves continue to be involved in subsurface hydrology, while others are now dry as the movement of groundwater has shifted over time. A selection of caves found on public lands can be found on the Maryland Geological Survey's website under "Maryland Geology" and "Caves."

Small Sinkhole



Source: Maryland Geological Survey

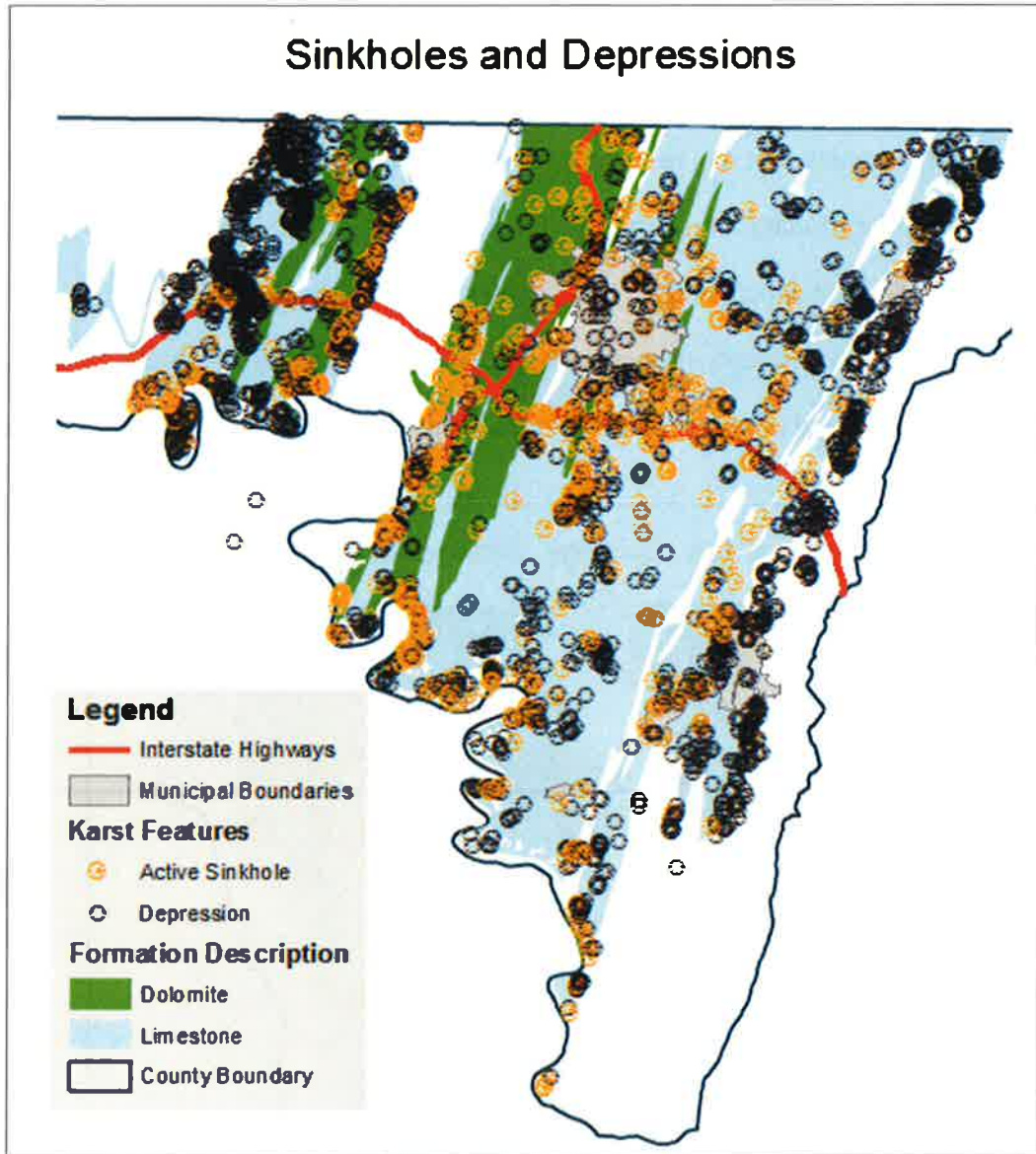
Sinkholes are another characteristic feature worth consideration within Washington County's karst landscape. While active sinkholes can sometimes appear and collapse suddenly, this is not always the case. In the absence of human activities, sinkholes tend to be circular depressions with gently sloping, not sheer-sided, boundaries. Sinkholes can merge and lengthen along permeable bedrock fissures, producing a variety of shapes. They vary in depth from a few feet to several tens of feet. The longest sinkhole in Washington County noted by the Maryland Geological Survey was more than 1,000 linear feet and the smallest was less than 100 linear feet.⁴¹

According to GIS analysis of data provided by the Maryland Geological Survey, 922 active sinkholes (shown in orange below) occur within the Karst formations of the County, the vast majority located in the Hagerstown Valley. Many occur peripheral to larger streams, [at some remove] such as the Antietam, Conococheague and Little Conococheague Creeks. Many active sinkholes also occur beneath the Interstate highway corridors that traverse the County

⁴⁰ Ibid, 13.

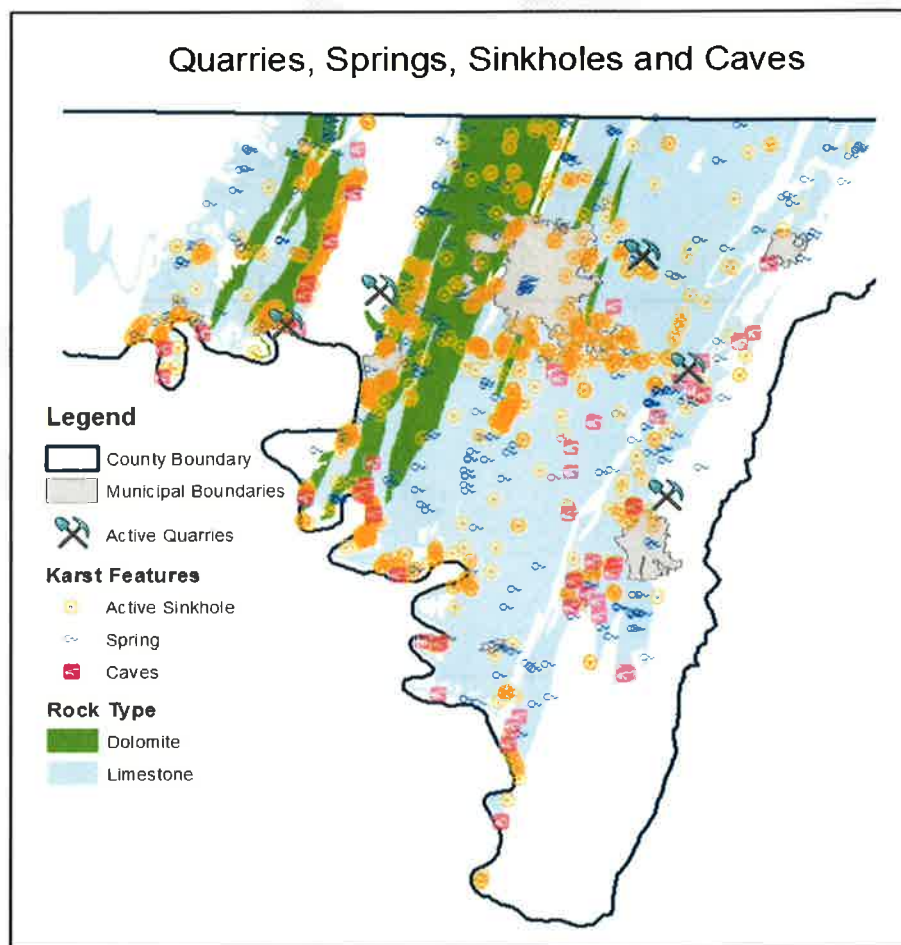
⁴¹ Ibid.

from east to west and north to south (shown in red). There are an equally large number of depressions (shown in black) within the Karst topography, some of which may have at one time been active sinkholes.



The unique nature of Washington County's subsurface geology demands consideration of appropriate land uses adjacent to features such as caves and sinkholes. Mineral extraction is an active land use in several parts of the County. Washington County has a number of active limestone quarries that produce crushed stone and cement, and shale is also extracted for brick and cement production. As shown on the map below, which depicts a select number of active

Hagerstown Valley quarry operations, the close proximity of these land uses to caves, active sinkholes or springs creates the potential for impacts to Sensitive Area resources. Additionally, typical development activities and the use of wells and on-site septic systems within the Karst terrain add further demands upon a fragile landscape. Accelerating sinkhole development, groundwater pollution, altering groundwater regimes and/or sensitive species habitats are a few of many significant impacts that can result in land use activities of various intensities in Karst topography. Short of excluding any further development in the entire Hagerstown Valley however, the County must simply find ways to balance conflicting adjacent land uses in a way that doesn't threaten the long term integrity of Sensitive Area resources. Careful consideration in where new intensive land uses are allowed to occur may be one way to address this balance.



Fortunately, Washington County has taken some steps to safeguard these resources during development review. The hydrogeologic study that may be required for new development proposing on-site wells and septic systems in the Upper Beaver Creek Special Planning Area during preliminary consultation has to address the relationship between the proposed use and springs, sinkholes and caves within underlying limestone formations. Identification and protection of streams, steep slopes and threatened and endangered species habitat within both the Subdivision and Zoning Ordinances extends de facto protection to many subsurface Karst features as well. Additionally, the State of Maryland has given property owners protection from damages resulting from limestone quarry dewatering in Baltimore, Carroll, Frederick, and Washington Counties. The Environmental Article of the Annotated Code of Maryland, Title 15, Subtitle 812, asks counties to delineate “zones of dewatering influence” around quarries and assigns damages to be remedied by the quarry operators within the zones.

VIII. Scenic Viewsheds

With its meandering stream valleys, historic stone bridges and buildings, picturesque farms, and forested mountains, Washington County has an abundance of scenic features that, in combination, provide clues to the natural and cultural forces which have shaped the place that its residents call home. As a result of the of the predominantly rural nature of the County, even developed regions such as the 20-mile wide Hagerstown Valley retain much of scenic character that attracted its initial settlement many generations prior.

Bloody Lane at Antietam Battlefield



Source: National Park Service

Scenic viewsheds are specifically recognized within the County's Zoning Ordinance in the case of Antietam Battlefield. Well known to County residents as well as Civil War history buffs, Antietam was the bloodiest one day battle in American history, with 23,000 casualties occurring in the twelve hour engagement on September 17, 1862.⁴² The Battle of Antietam ended the Confederate Army of Northern Virginia's first invasion into the North and led to Abraham Lincoln's issuance of the preliminary Emancipation Proclamation.

The significance of this battle led Washington County to utilize agricultural preservation and scenic easement tools to create a buffer in the approach to and from the battlefield, as well as to preserve vistas of Red Hill. The Ordinance notes that the parameters of the Antietam Viewshed were determined from a National Park Service technical study conducted in 1988 titled *Analysis of the Visible Landscape: Antietam*. The purpose of the Antietam Overlay District within the Washington County Zoning Ordinance was defined as follows:

"... to provide mechanisms for the protection of significant historic structures and land areas by requiring development and land subdivision to occur in a manner that 1) preserves the existing quality of the viewshed of the Antietam Battlefield, and 2) ensures that development of certain lands adjacent to the major roads which provide public access to the Antietam Battlefield (i.e., Maryland Routes 34 and 65) is compatible with the agricultural and historic character of the area. The "AO" District is an overlay zone meant to enhance, not substitute for the existing underlying zoning designation, which regulates land use."

⁴² National Park Service, *Antietam National Battlefield*. National Park Service, <https://www.nps.gov/anti/index.htm>, 2016.

Easements of various types, including scenic easements, also protect farmland, forests and Civil War sites lands adjacent to the C&O Canal National Historic Park, Washington Monument State Park, South Mountain Battlefield State Park and around the historic town of Sharpsburg nearby the Antietam Battlefield. As noted under the "Wildlife Corridors" subsection of this chapter, more than 80,000 acres of land have been protected by County, State or Local entities through various land preservation programs. Additionally, the Appalachian Trail; which travels atop South Mountain on the eastern border of Washington County, is buffered up to 500 feet on each side of the footpath in order to minimize visual and auditory intrusion for trail users and nearby property owners alike while simultaneously conserving habitat for sensitive plant and animal species.

The visual impact of commercial communication towers is regulated through Washington County's Zoning Ordinance. The intent of Section 4.22 is to "minimize the visual impact of towers and equipment, to minimize the number of towers through shared use and co-location, to encourage utilization of technological designs that will either eliminate or reduce the need for new towers to support equipment and to ensure that all towers and equipment are compatible with surrounding land uses while ensuring wireless communications service to the citizens of Washington County."

Heritage Tourism promotes recognition and, in some cases, retention of the existing character of scenic roadways in Washington County. The Federal National Scenic Byway designation has been applied to one route through Washington County - the Historic National Road (US-40 and US ALT. 40). Roads given the Scenic Byway designation possess one or more of six "intrinsic qualities": archeological, cultural, historic, natural, recreational, and/or scenic. The program was established by Congress in 1991 with the passage of the Intermodal Surface Transportation Efficiency Act to promote tourism and economic development while conserving heritage resources along these roadway corridors. The designation requires the

preparation of corridor management plans, with public involvement, to conserve the roadways intrinsic qualities and aid in regional economic development.

Other national heritage tourism initiatives such as Civil War Trails, also promote visitation of scenic routes that link historic sites dating to that period of American history. Washington County is part of a larger Heritage Area; The Heart of the Civil War Heritage Area (HCWHA), that also includes parts of Frederick and Carroll Counties. The County has received recognition for its Civil War Heritage Areas and Civil War Heritage routes, which encompass a significant area of the County, and includes a number of the municipalities. A rail to trail route has been identified and may provide a connection to those sites near the abandoned railroad bed which runs through the Great Valley from Hagerstown to Weverton. The HCWHA received certification and approval of a management plan in 2006, which created eligibility to receive funding for development of a detailed plan to increase heritage tourism and preservation opportunities.

The County is home to many other unique natural and scenic features besides those already mentioned, a large number of which are open to the public. These places include mountain viewpoints such as High Rock, Annapolis Rock, and Weverton Cliffs. More than 70 caves, including Crystal Grottoes, the only commercially operated cave in Maryland, are found in Washington County. More than 190 springs occur in Washington County. Mount Briar Wetland Preserve safeguards one of the County's largest remaining wetlands. Fort Frederick State Park preserves a restored military fort dating to the French and Indian War of the mid-18th century. The Sideling Hill Road Cut, resulting from the construction of Interstate-68 through the Allegheny Mountains west of Hancock, is one of the best rock exposures in the Northeastern United States displaying 810 feet of strata comprising hundreds of millions of years of geologic history. All of the named features above are in preservation lands under various jurisdictions.

The Washington County Convention and Visitors Bureau provides information and brochures on the wide variety of County, State and Federal parks and private natural

resource/recreation areas in the County. An update of the County Bicycle Tourism Map was completed in FY 2006. Bicycle tour routes guide the cyclist through areas of the County that are adjacent to or within view of various scenic natural areas such as the Woodmont area, Blair's Valley, South Mountain and historic sites such as Antietam Battlefield, among others. All told, tourism contributes more than \$250 million into the local economy, supporting 6,500 jobs in Washington County.⁴³

⁴³ C.J. Lovelace, C, Report: Tourism a 'powerhouse' for Washington County.
http://www.heraldmillmedia.com/news/local/report-tourism-a-powerhouse-for-washington-county/article_d793fe81-65d8-5af1-9cf0-eebc84a2ac8.html, August 23, 2016.

