



**Comprehensive Plan 2040**  
Your County. Your Vision. Your Future.

# Chapter 10

## Mineral Resources Element

# MINERAL Resources

## Introduction and Purpose

Washington County is underlain with a diverse geologic foundation where non-renewable resources such as sand, lime, shale, and quartz can be found. These minerals play a pivotal role in creating and sustaining our built environment. As these minerals are non-renewable, 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 states that the Mineral Resource chapter shall identify:

- 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
- appropriate post-excitation uses for the land that are consistent with the County's land use planning process.

This element will discuss the balance between mineral resource extraction and other land uses in the County. Through identification of historic and existing mineral operations, provided by the Maryland Department of the Environment, it will analyze the impacts that mineral extraction and their transport have on the environment and citizens to safeguard both. It will also provide a further look into the local land use policies which promote conservation of accessible mineral resource deposits for future extraction. Finally, the environmental factors specific to water resources have been analyzed to ensure impacts of mineral extraction can be mitigated through best management practices and land use policies such as wellhead protection areas.

Sideling Hill approximately 6 miles west of Hancock in Washington County.



## Types of Minerals

Minerals fall into one of two broad forms of classification; fuel or non-fuel minerals, the latter of which can be subclassified into metallic and non-metallic minerals.

The mineral resources in Washington County tend to be primarily non-fuel type minerals. Non-fuel minerals can be 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].”*

The economic value derived from mineral resources stems from either 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.

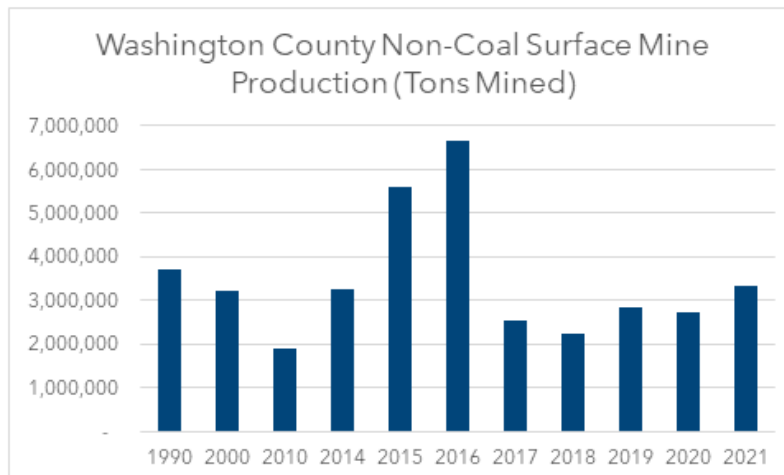
## Mineral Resource Inventory

### 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. Much of this material is used for various construction-related purposes in Washington County and throughout the region.

According to the Maryland Department of the Environment (MDE), there are 11 active surface mines reporting tons mined in Washington County as of 2021 (out of 13 active mining permits). Non-fuel surface mines produced 3.3 million tons of non-fuel minerals in Washington County in 2021, which is 50% less than the 2016 high of 6.6 million tons. Tons mined by year is displayed in Chart 10-1 below.

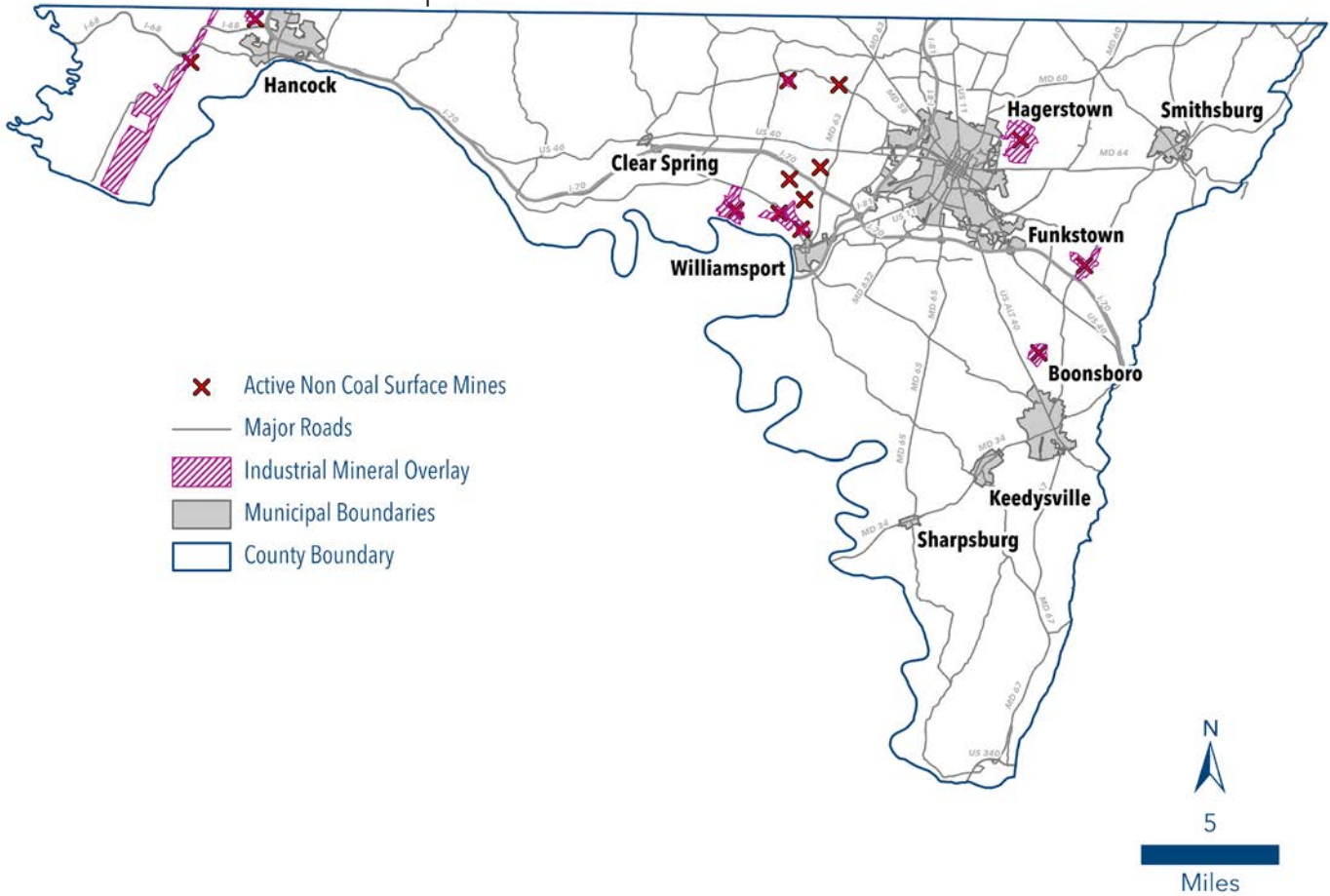
Chart 10-1



Source: Source: Maryland Department of the Environment, Minerals Oil and Gas Division Annual Report

The vast majority of these active mining operations are located in the Martinsburg Formation and the alluvial deposits adjacent to the Conococheague Creek in the central portion of the County. There are approximately 4,855 acres or 1.6% of the County’s area currently available or being actively mined according to the County’s Industrial Mineral Overlay land area. Map 10-1 displays the locations of active permitted non-fuel surface mining operations in the County as of 2021. Note the map includes locations which are permitted and not all are actively mined.

Map 10-1: Active Non-Coal Surface Mines



## Historic Mineral Extraction Operations

Based upon information extracted from United States Geological Survey (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, metallic minerals such as manganese, copper, and iron were also extracted from various parts of the County as shown in Map 10-2. Historically mined formations include Antietam, Catoctin, Colluvium, Harpers, Helderberg, Tomstown and more. While these mining operations are no longer active, they do give an indication of large quantities of other mineral resources that have been economically worthy of commercial exploration. They have potential to yield additional minerals in the future that were inaccessible due to technology during their active period. It should be noted that some of these historically mined formations include vast areas of State-owned recreational land today which limits their availability due to environmental and conservation best management practices.

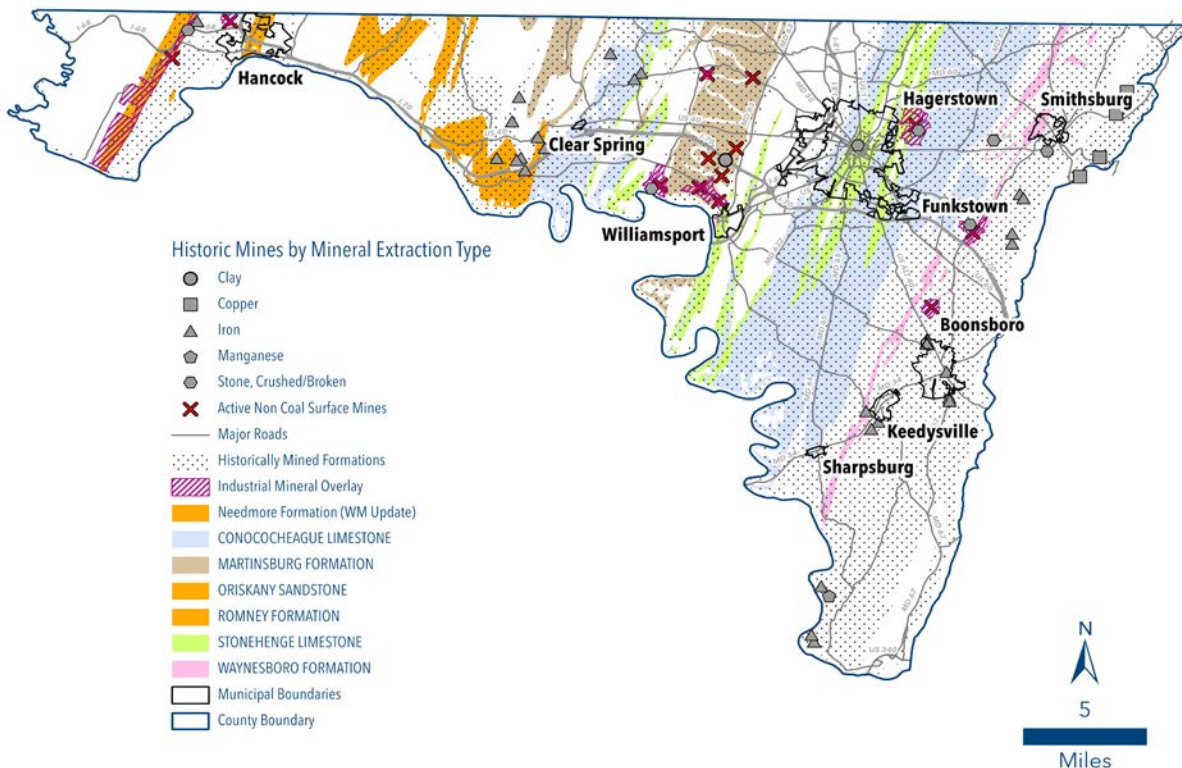
# Potential Non-Fuel and Fuel Mineral Reserves

## Potential Non-Fuel Mineral Reserves

Evaluation of historic and existing mining operations can give insight into potential mineral resource areas that may be extracted in the future. Current and past geologic formations used for mining as well as current Industrial Mineral Overlays in Washington County are shown on Map 10-2, below. Potential mineral reserves in Washington County are most likely to be explored in areas adjacent to existing Industrial, Mineral (IM) Districts. Areas of potential reserves and their geologic descriptions include:

- **Martinsburg Formation** – Shale | Siltstone | Sandstone – Bordering the Conococheague Creek, this is currently the most predominant mining area in the County. The resources are abundant and easily extracted.
- **Oriskany Sandstone Formation** – Sandstone | Conglomerate – Located along the Tonoloway Ridge, west of Hancock, this formation holds the only currently permitted, but inactive, mineral reserve of notable size already zoned IM in the County. It is owned by U.S. Silica which extracts quality silica sand in nearby Berkeley Springs, West Virginia.
- **Waynesboro Formation** – Siltstone | Shale | Sandstone – Located along the eastern edge of the Hagerstown Valley. This formation contains two active mines and has shown potential for crushed stone production.
- **Stonehenge/Conococheague Formations** – Limestone | Shale | Dolomite | Conglomerate - Centered in the Hagerstown Valley and occurring in the area around Clear Spring, these formations contain one current mining operation. This operation is involved primarily in the mining for potash and limestone products for cement production.

Map 10-2: Potential Non-Fuel Mineral Reserves



## Potential Fuel Mineral Reserves

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<sup>1</sup>. In 2009, the Department of Energy estimated 262 trillion cubic feet of natural gas exists in the Marcellus Shale, making it the largest onshore Natural Gas Reserve in the United States. The 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 and can be seen on Map 10-2. Only Western Allegany and Garrett Counties are presently anticipated as production areas in Maryland.

## 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. Mineral extraction operations represent an intensive land use which is directed, primarily through zoning, to occur only in the rural areas of the County. Recognizing the potential for conflicts in land use on adjoining properties to mineral extraction operations is, therefore, a fundamental part of short and long-term planning for the needs of the County.

The extraction and processing of minerals 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.

Federal, State and local 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.

The establishment of Industrial Mineral Zoning Districts is necessary to prevent the preemption of future mining operations by incompatible current land uses. If valued mineral resources are comprehensively 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 the protection of our water supply, water quality and of sensitive environmental resources can be addressed both during initial site planning and in later reclamation efforts.

<sup>1</sup> Maryland Department of the Environment, Facts About Marcellus Shale in Maryland. (Baltimore: Maryland Department of the Environment), 2016.

## Mining Regulations

### Federal Mining Regulations

The General Mining Law of 1872, and its subsequent amendments, regulate mining activities on federal lands open to 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.

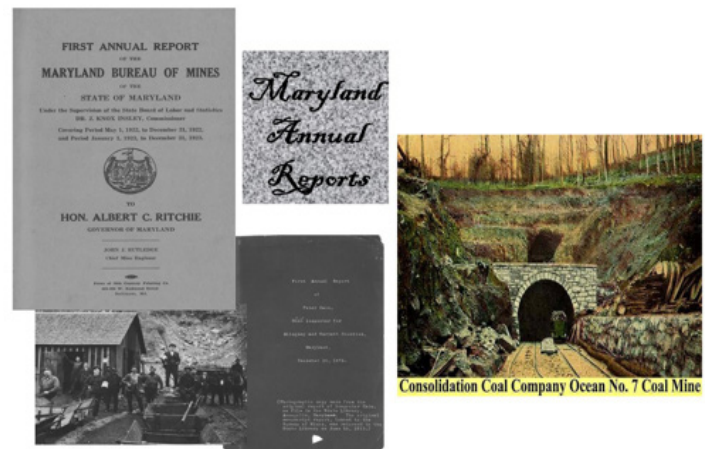
The Surface Mine Control and Reclamation Act passed by Congress in 1977 spurred the creation of individual state programs for mining land reclamation, particularly for abandoned coal mines. The Act helped to create uniform standards across state lines for regulation and reclamation that would ensure mining operations would have to meet minimum safety, health and environmental standards no matter which state they chose to locate in.

### State Mining Regulations

Maryland's first mining law was established by the General Assembly in 1876. 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) 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 to provide a code of laws protecting the health and safety of coal miners, protect property connected to the mines, keep a record of inspections and enforce laws and regulations under its authority pertaining to the industry. 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-fuel surface mines first occurred in 1977 when Maryland enacted comprehensive regulations for the extraction of non-fuel minerals. 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 were required for non-fuel 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.

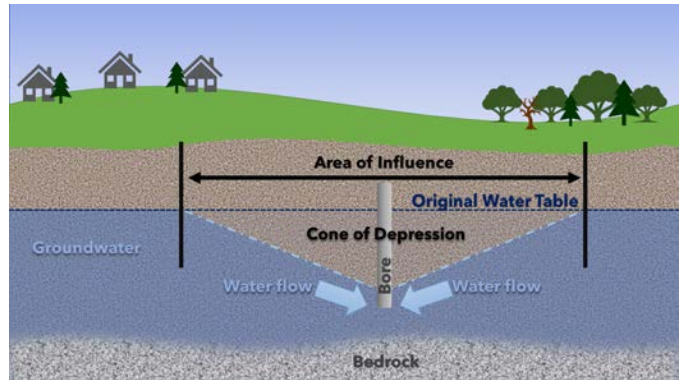


## Effects of Mine Dewatering

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.

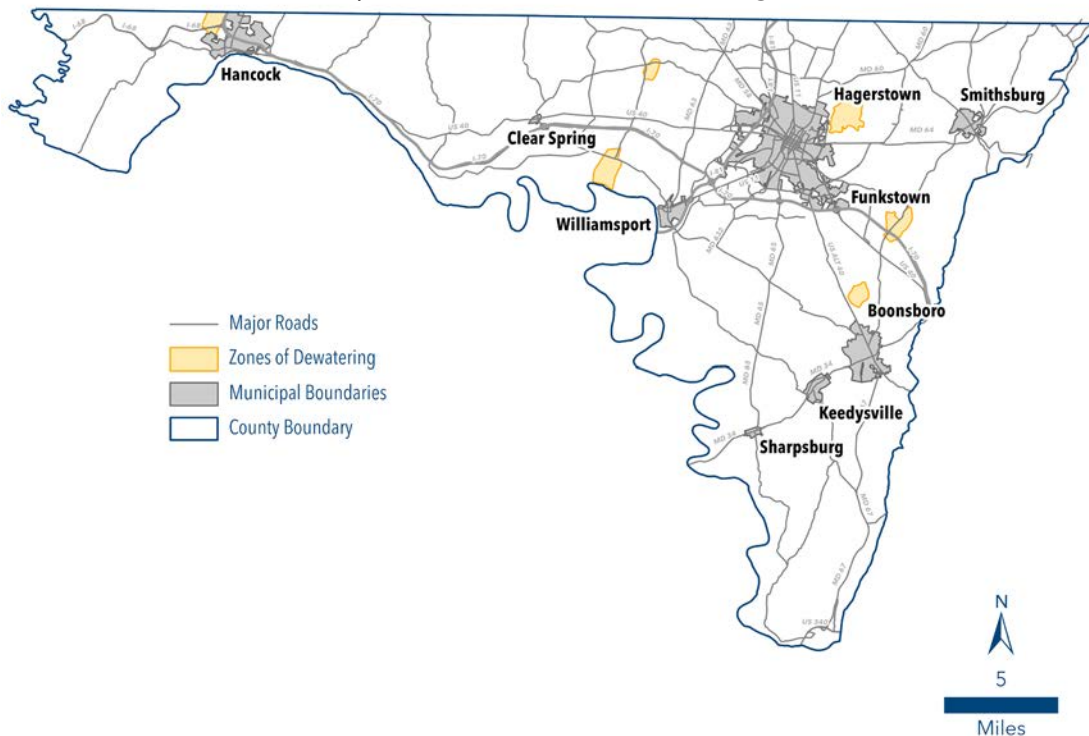
The Environmental Article of the Annotated Code of Maryland asks counties to delineate “zones of dewatering influence” around quarries and assigns damages to be remedied by the quarry operators within the zones.<sup>1</sup>

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.



In a continued effort to inform citizens of the issue of dewatering, in 2021 HB 399 requires sales contracts for land in the counties previously mentioned to include a notice that property is in a Maryland Department of Environment known zone of dewatering. These zones delineated by MDE are displayed in Map 10-3.

Map 10-3: Zones of Dewatering





## County Mining Regulations

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.

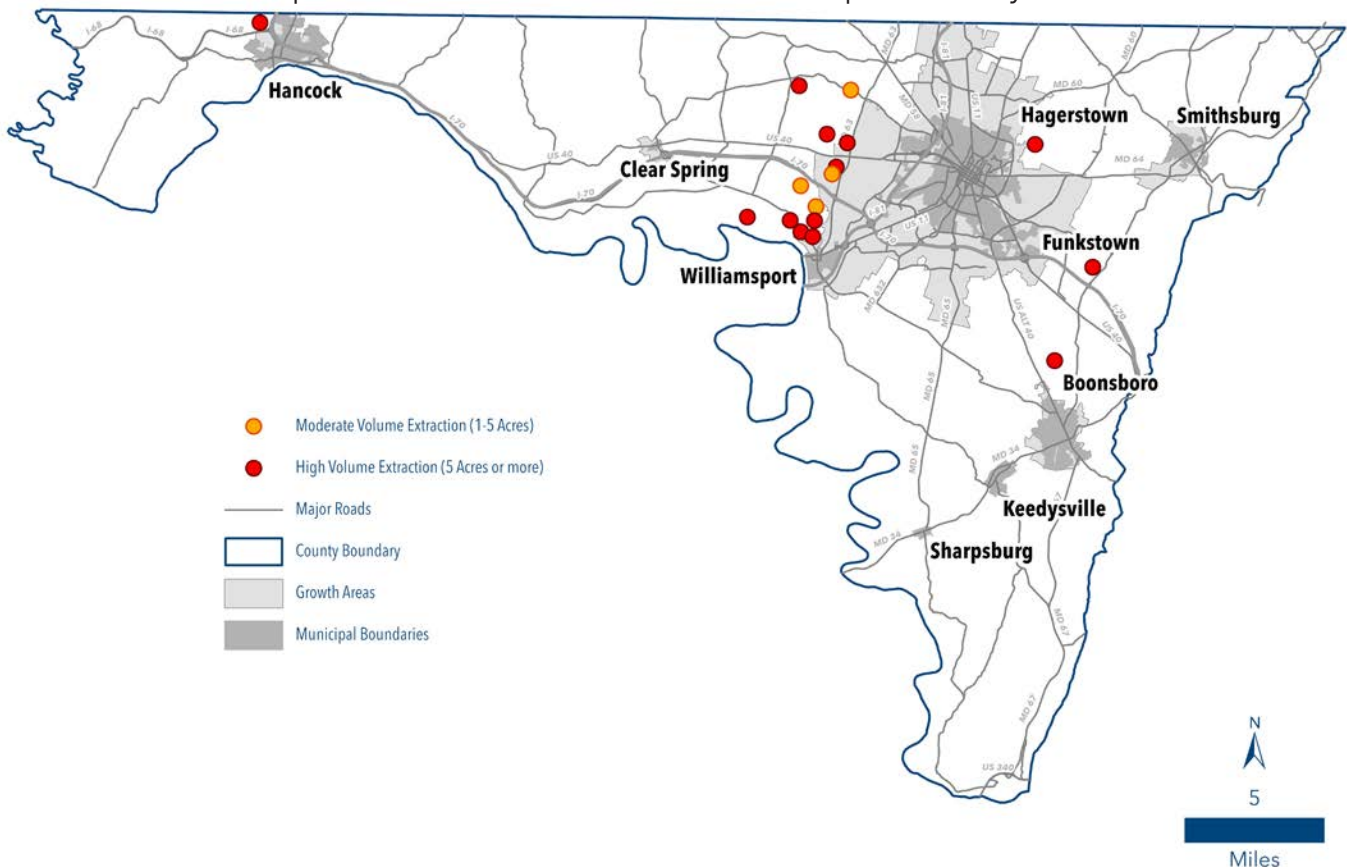
The Zoning Ordinance text was updated in 1983 and divided mineral extraction into three categories based on the amount of area disturbed and the length of operation time: Low Volume (LV), Medium Volume (MV), and High Volume (HV) Mineral Extraction. A summary of the key characteristics of each category is displayed in Table 10-1 below.

Table 10-1: Key Mineral Extraction Characteristics

EXTRACTION CATEGORY	DISTURBANCE ALLOWED (acres)	REQUIRES IM FLOATING ZONE (Art. 15)	ZONING DISTRICTS
Low Volume (LV)	≤1	No	All Except RT, RS, RU, RM, and RV
Medium Volume (MV)	1-5	No	A(R), EC, P and IG with Special Exception
High Volume (HV)	≥5	Yes	A(R), EC, P

Source: Washington County Zoning Ordinance

Map 10-4: Mineral Resource Extraction Operations by Class



As seen on Map 10-4, Washington County currently has four MV and thirteen HV mineral extraction operations. HV operations are only permitted outside of the UGA, TGA and Rural Villages. LV (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. Therefore, LV are not reflected on the map 10-4 of active permitted mining operations. 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.

As part of the 1983 Zoning Ordinance updates, a completely new Industrial, Mineral (IM) District section was adopted. Presently, the IM District is designed solely for HV operations in the rural areas of the County. The IM District was changed from a traditional zoning district classification to a "floating zone". 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. Applications for new IM District approval occur through the rezoning process, but do not require meeting the "Change or Mistake" burden inherently placed upon applicants in a typical rezoning case.

The Zoning Ordinance defines a few key objectives for the regulation of IM Districts. First, it aims to protect existing IM Districts from encroachment by incompatible land uses. Second, the ordinance seeks ensure that new or expanded IM Districts are compatible with existing adjacent land uses. The effects on public roadways are also a major consideration in the establishment of new IM Districts.

The Ordinance also defines a number of performance standards that must be accounted for in site planning development and review. IM applicants must identify and adhere to hauling routes along County roads adequately designed to bear the burden associated with an IM operations. 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. Applications must consider the location of geologic or environmentally significant features and identify ways to minimize visual, auditory, air quality (dust) and vibration impacts. Finally, 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 (see Map 10-3, Zones of Dewatering).

## **Mining Reclamation**

The Federal Surface Mine Control and Reclamation Act (SMCRA) of 1977 recognized the need to uniformly regulate the technique of using surface mining to extract coal and to focus more attention on mine reclamation, particularly for abandoned coal mines. 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 conditions that are capable of supporting uses equal to or better than previous conditions. Washington County currently requires applicants applying for an IM rezoning to provide a plan for reclamation after active mining operations have ceased.

The method of mineral extraction 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.

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. 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. 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.

Watershed level planning studies, which inventory 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 of the pre-mining reclamation plans. If environmental quality in a watershed has been compromised to a significant degree by mining operations, 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, such as the porous karst terrain underlying the Hagerstown Valley, less intensive land uses may be the most prudent choice to prevent groundwater contamination or the development of sinkholes.





## MINERAL RECOMMENDATIONS

- ★ 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.
- ★ Develop policies that support reclamation through re-mining to abate any negative impacts from legacy mines in the County.
- ★ 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.
- ★ Maintain land use policies and regulations that discourage the preemption of known mineral extraction areas by other uses.
- ★ Require an inventory and impact assessment of sensitive areas located on proposed new Industrial, Mineral zoning districts.
- ★ Consider the impact on sensitive area resources in applicable areas during development review before extending any new Industrial, Mineral (IM) Zoning Districts.
- ★ Ensure that all available measures are taken to protect the natural environment and adjacent communities from spillover effects resulting from active mineral extraction activities.
- ★ Ensure that post-excavation uses for mined sites are identified during development and are consistent with existing or planned adjacent uses.
- ★ Coordinate with other County agencies to track low volume (LV) mineral extraction operations more accurately.
- ★ Consider the adoption of regulations to address new innovative strategies.
- ★ Investigate implementation of buffers or other protective measures in mining overlay zones for watershed protection.