

LANDS FOR POTENTIAL MINERAL RESOURCE DEVELOPMENT
IN CARROLL COUNTY
1983

by
Karen R. Kuff and Martha W. Sushko
Maryland Geological Survey
Department of Natural Resources

This text is to be used in conjunction with the Maps of Lands for Potential Mineral Resource Development in Carroll County by Karen R. Kuff, et. al., 1981. Prepared in cooperation with Lands Information and Analysis Office of the U. S. Geological Survey.

As part of the continuing effort to supply Maryland's consumers with construction materials, the mineral industry must expand or relocate surface operations when deposits at existing sites become depleted. New locations will become increasingly difficult to establish due to:

- (1) the need to locate near the market in order to minimize transportation costs of the high tonnage consumed,
- (2) the lack of opportunity to mine in some areas due to urbanization, ownership, unfavorable zoning, or legal restrictions,
- (3) conflicting attitudes concerning surface mining,
- (4) the environmental problems associated with surface mining, and finally,
- (5) the variable nature of the quantity and quality of mineral resource deposits.

All of these factors contribute to serious conflicts over new sites for surface mining. Many of these conflicts can be minimized by identifying potential areas for mineral extraction and anticipating associated environmental problems.

The accompanying map at a scale of 1:62,500 shows lands for potential mineral resource development in Carroll County. The map delineates areas underlain by various mineral resources, lands where mining cannot occur, and lands where mining could ultimately occur in the future. Potential resources shown on the map include: sources of crushed stone and shale for bricks. Similar maps were prepared in 1979 for Anne Arundel, Baltimore, Cecil, Harford, Howard, and Prince George's Counties, and in 1981 for Allegany, Frederick, Garrett, Montgomery, and Washington Counties. A special map dealing only with coal in Garrett and Allegany Counties was made in 1981.

The mining industry provides basic raw materials for building and road construction, concrete aggregate, bricks, cement, and agricultural limestone manufacture, among other products, but it does so at the cost of exploiting a non-renewable resource. By documenting the location of potential mineral resources in Carroll County, this map will enable local, County, regional, and State planners to devise a rational plan for preservation and extraction of these resources. Such a plan will hopefully allow for efficient utilization of these resources and help insure an economically viable supply of construction materials for the future. A second purpose of this map is to outline the sites where future mining is likely to occur, thereby indicating areas where potential environmental management problems could arise. The early identification of environmental concerns for these areas will help prevent delays in the application process for a mining permit. A third purpose is the distribution of information to the public, including mining companies, in order to narrow the choices for future operations, or to individuals who may wish to lease the mineral rights on their property. The map cannot replace an onsite mineral resource analysis, but it can show areas for further investigation into the quality of the unmined material.

The information presented here was compiled from field and office research. Data were obtained from Maryland's Department of Assessments and Taxation, Department of State Planning, Maryland Agricultural Land Preservation Foundation, Maryland Historical Trust, Department of Natural Resources (Maryland Environmental Trust, Water Resources Administration, Legal Department, Capital Programs Administration, and the Maryland Geological Survey), Carroll County Department of Public Works, Carroll County Department of Planning and Development, and the Planning and Zoning Commissions of the towns of Hampstead, Manchester, Mount Airy, New Windsor, Sykesville, Taneytown, Union Bridge and Westminster. The authors acknowledge all agencies and individuals who gave assistance and responded to the authors' inquiries. This study was funded by the Lands Information and Analysis Office of the U. S. Geological Survey.

This map shows the lands remaining in Carroll County where mining may occur. The information is based on a series of quantifiable factors (shown in solid color on the map) that effectively eliminate land from consideration for mineral resource development. These factors can be divided into four basic categories which may be considered permanent site selection restraints placed on the mining industry. They are: statutes, government ownership, pre-emptive land use, and depleted resources. A fifth category, zoning, was considered separately because it can be changed by political action (horizontal line pattern on map). The vertical line pattern on the map shows a collection of secondary limiting factors. This pattern defines areas where environmental or other considerations may deter but not prohibit the use of the land for mining. A final, but critical, category is the presence or absence of known mineral resources. The information in each category was outlined on separate maps and then compiled for the final report. The following is a description of each limiting factor used to determine lands for potential mineral resource development in Carroll County:

STATUTES - No laws, regulations or legal restrictions have been found that strictly prohibit the establishment of a mining operation in Carroll County or in any of the incorporated towns. Therefore, no lands were eliminated by this category from consideration for potential mineral resource development. Some laws, such as the State Wetlands Law, were not considered here because they do not strictly deny mining, even though they may deter an operator due to the difficult, time-consuming, costly procedures required to obtain the necessary permits. This and similar laws would be treated as secondary limiting factors.

As of January 1, 1977, all surface mining operations (non-coal) are required by the Surface Mining Act of 1975 (Annotated Code of Maryland, Natural Resources 7-6A01 to 7-6A31) to obtain permits from the Surface Mining Division of the Resource Management Program, Water Resources Administration. This act supercedes any County surface mining law. Under this act, all mineral producers must obtain an operator's license. The issuance of permits is based primarily on the compliance by the mining company with all necessary regulations and restrictions. The Surface Mining Act does not restrict the location of an operation as long as all other relevant permits have been obtained. It does, however, establish an overall standard for environmental protection measures. Reclamation is required.

GOVERNMENT OWNERSHIP - This category contains all local, County, State and Federal government land holdings. Government ownership is assumed to preclude mining by private individuals and companies because (1) the government has other uses for the land, (2) any mining done would be for governmental purposes and therefore exempt from the Surface Mining Law and (3) generally, governmental policy does not allow surface mining on public lands. The boundaries of government properties shown were obtained from the Carroll County Topographic Map and 1980 tax maps. Included in this category are the larger Board of Education properties, natural resource and wildlife management areas, Springfield State Hospital, water reservoirs, Carroll County Farm Museum, parks, and all other government holdings.

PRE-EMPTIVE LAND USE - This category identifies all lands that have been pre-empted from mining due to urban development. Included are: dense residential developments (greater than one house per 15,000 square feet), industrial parks, cemeteries, airport runways, transportation networks, landfill sites, large buildings, parking lots, golf courses, gas pipelines, permanent private institutions, e. g., Western Maryland College, Boy Scouts of America, River Valley Ranch, and other land whose present use effectively precludes mining. Both aerial photographs (1970 and 1977) and tax maps (1980) were used to determine pre-emptive land uses.

DEPLETED RESOURCES - For this category an assumption was made that sites of current and former mining operations do not constitute a potential source of mineral resources. A literature search was combined with aerial photographs (1937-1938, 1963, 1970, and 1977), field mapping and Surface Mining Law's permit information to establish areas where prior mining has depleted mineral resources. All types of mining operations were included.

ZONING - Zoning was put into a separate category because it is subject to change. The zoning pattern (horizontal lines) on the map shows only those areas where mining was strictly prohibited in 1981. In Carroll County, mining is allowed as a conditional use in A, Agricultural; T, Transitional; BL, Business Local; BG, Business General; IR, Industrial Restricted; and IG, Industrial General Districts. The mining of limestone is a principal permitted use in an AE, Agricultural Extraction District. This can only be established in an Agricultural District. All other zoning districts prohibit mining. Incorporated towns have individual zoning regulations that do not prohibit mining within their boundaries. Carroll County has developed a mineral resource overlay zone which could be implemented into their zoning ordinance in the near future. All zoning information was obtained from the Carroll County Department of Planning and Development, and the town offices of the incorporated towns.

SECONDARY LIMITING FACTORS - This category includes lands which have certain restrictions on mining but which are not permanent site selection restraints for the mining industry. These factors (vertical line pattern on the map) are superceded by any of the preceding categories. They are: floodplains, Department of Natural Resources acquisition lands, easements, and historical sites and districts.

- (a) Floodplains - These sites are environmentally sensitive areas, and while mining is not prohibited in these areas, recent conservation practices may make it difficult to obtain mining permits. Boundaries were taken from flood-prone area maps by the U.S. Geological Survey and from geologic maps.
- (b) Department of Natural Resources Acquisition Lands - Under the Annotated Code of Maryland, Natural Resources, 5-208, "Eminent Domain - Forests and Parks", the Department of Natural Resources can obtain an injunction prohibiting any change in land use on the properties within its acquisition boundaries if mining conflicts with planned use in any of these areas. The Land Planning Services of Capital Programs Administration provided information on these areas.
- (c) Easements - Three types of easements are included in this category: agricultural, conservation and historical easements. Lands covered by these easements are, in most cases, owned by private individuals, but the Foundation or Trust in charge of these easements has acquired the right to restrict any activities which would alter the present characteristics of the land. Agricultural districts were not included because they restrict changes in land use for only five years. The organizations providing information on easements were: Maryland Historical Trust, Maryland Environmental Trust and the Maryland Agricultural Land Preservation Foundation of the Department of Agriculture.
- (d) Historic Sites and Districts - Sites of historical value listed in the National Register of Historic Places fall in this category. Before these areas can be altered, a public hearing must take place which could result in either delay or denial of mining. Information was obtained from the Maryland Historical Trust and the Division of Archeology, Maryland Geological Survey.

RESOURCES - The dashed pattern on the map reflects the deposits of marble, limestone, ultramafic rocks and shale that, within the limits of this study, are lands for potential mineral resource development. The boundaries of those deposits which have a high probability of containing economic resources were determined from literature descriptions and from various geologic maps. Included in the resource grouping of industrial mineral deposits are the following geologic units: Wakefield Marble, Cockeysville Marble, some Silver Run Limestone, marble lenses in Bachman Valley, ultramafic rocks including chlorite-amphibole schist, talc schist and serpentinite, the red beds of the New Oxford Formation and the Gettysburg Shale. These units were selected primarily by noting the presence of prior and current mining operations or by field observations and literature descriptions. Not all lands for potential mineral resource development necessarily contain mineral resources of equal economic value, because the deposits are not uniform and the market demand for the different types of resources is variable. Potential resources not shown on the map because of lack of current demand and a favorable economic climate are deposits of copper, cobalt, some smaller lenses of marble and quartzite; and the Sykesville Formation, a granitic gneiss that may be a source of crushed stone.

Certain "unmeasurable" factors reduce the availability of mineral resources which could not be included in this study. These are:

- (1) prohibitive property values,
- (2) public attitude,
- (3) informal public policy toward mining which results in denial of special exception requests by the zoning boards,
- (4) individual property owner's denial of access,
- (5) overall economic conditions and constraints,
- (6) percentage of a deposit that is economically useable, and
- (7) changes that will occur with the passage of time.

Therefore, the lands for potential resource development shown on the map represent the maximum area available in 1981. However, when the "unmeasurable" factors are applied on a case-by-case basis, they will considerably reduce the extent of the potential resource areas. For example, the impact of spreading urban development or environmental and aesthetic regulations will be to greatly decrease the availability of resources in the years ahead.

The demand for mineral resources in building construction, public works, and highways will continue unless substitute materials are found. The quantity required will vary depending upon the market and the general economic situation but the basic need will still exist. Carroll County, while it does not have a large amount of potential resources, is located close to the Baltimore-Washington Metropolitan market. The County has also undergone a change from primarily rural to suburban/rural. As a result, it is very likely that the lands remaining with a potential for mineral resource development will be subject to competition for mining rights from the mining industry in the County. The County Department of Planning and Development is currently working on devising a means to promote mining in the County as an equally viable land use. The mineral resource overlay zone would encourage mining within environmental constraints only where the resources are. At the same time, it faces the fact that resources are non-renewable and easily pre-empted and therefore should be preserved for future supplies.

Maryland's Surface Mining Law of 1975 is designed to eliminate or minimize the environmental, aesthetic and reclamation problems that may accompany the development of the remaining lands in Carroll County. Now that reclamation is required, the advantage of having a locally derived resource could be further enhanced by using rational resource planning and sequential land use techniques. The practice of

permitting the removal of economic mineral deposits in areas where development is taking place would help insure a continuing supply of industrial minerals to the consumers. Rational resource planning involves the establishment of mineral resource zones where sufficient geological information indicates that mineral extraction should be a priority land use for a specific number of years. It may also be possible to reserve areas containing industrial minerals for future consumption. Whatever the method chosen, the non-renewable nature and limited supply of construction aggregate resources combined with the effects of the Surface Mining Law in Carroll County suggest that lands for potential mineral resource development is wisely an integral element in planning for the future.

References

- BITLER, J. R., 1975, *Construction-mineral aggregate availability in the Baltimore, Maryland, metropolitan area*: U.S. Bur. of Mines, Inf. Cir. 8697, 24 pp.
- EDWARDS, J., Jr., 1969, *Mineral commodities of Maryland: in: Ground-water aquifers and mineral commodities of Maryland*: Md. State Dept. of Planning, p. 15-36.
- EDWARDS, J., Jr., and WEAVER, K. N., 1971, *Mineral resources -- supply, availability and environmental effects: a report to the Legislative Council, State of Maryland*: Md. Geol. Survey, 70 pp.
- HENDERSON, G. V., and KATZMAN, H., 1978, *Aggregate resources vs. urban development and multiple use planning, San Gabriel Valley, Calif.*: paper presented at 1978 AIME annual meeting, Denver, Colorado, 4 pp.
- HEYL, A. V., and PEARRE, N. C., 1965, *Copper, zinc, lead, iron, cobalt and barite deposits in the Piedmont upland of Maryland*: Md. Geol. Survey, Bull. 28, 65 pp.
- JONAS, A. I., and STOSE, G. W., 1938, *Geologic map of Frederick County and adjacent parts of Washington and Carroll Counties*: Md. Geol. Survey, scale 1:62,500.
- KUFF, K. R., 1979, *Directory of mineral producers in Maryland - 1979*: Md. Geol. Survey, Inf. Cir. 30, 28 pp.
- _____, 1982, *Mineral resources and mined land inventory of Carroll County, Maryland*: Md. Geol. Survey, 1 map, scale 1:62,500.
- _____, 1982, *Mineral resources of the New Windsor Quadrangle*: Md. Geol. Survey, M.R.Q. 1, 1 map, scale 1:24,000.
- _____, 1982, *Mineral resources of the Union Bridge Quadrangle*: Md. Geol. Survey, M.R.Q. 2, 1 map, scale 1:24,000.
- _____, 1982, *Mineral resources of the Finksburg and Sykesville Quadrangles*: Md. Geol. Survey, M.R.Q. 3, 1 map, scale 1:24,000.
- MATHEWS, E. B., 1898, *An account of the character and distribution of the Maryland building stones, together with a history of the quarrying industry*: Md. Geol. Survey, Vol. 2, Pt. 2, p. 125-241.
- MATHEWS, E. B., and GRASTY, J. S., 1909, *Limestones of Maryland with special reference to their use in the manufacture of lime and cement*: Md. Geol. Survey, Vol. 8, Pt. 3, p. 255-477.
- MATHEWS, E. D., 1969, *Soil survey of Carroll County, Maryland*: U.S. Dept. of Agr., Soil Cons. Serv., in coop Md. Agr. Expt. Sta., 92 pp., illus.
- MCCARL, H. N., 1969, *The mineral aggregate industry in the vicinity of Baltimore, Maryland*: unpub. Ph.D. thesis, Penn. State Univ., 233 pp.
- RIES, H., 1902, *Report on the clays of Maryland*: Md. Geol. Survey, Vol. 4, Pt. 3, p. 203-505.
- SINGEWALD, J. T., 1946, *Mineral resources of Carroll County*: in: *Carroll and Frederick Counties*, Md. Dept. of Geol., Mines and Water Res., p. 132-162.

U. S. BUREAU OF MINES, 1963-1980, *The mineral industry of Maryland: Md. Geol. Survey, Inf. Cir. 1, 2, 5 - 8, 10, 14, 15, 17, 18, 24, 25, 31, 34, 35, 37.*

U. S. DEPARTMENT OF THE INTERIOR, 1971-1974, *Quadrangle maps of flood-prone areas: U.S. Geol. Survey, scale 1:24,000.*

, 6 February 1979, *National register of historic places: Federal Register, Vol. 44, No. 26, Bk. 2, p. 7415-7649.*

WATER RESOURCES ADMINISTRATION, 1978, *A field reconnaissance investigation of sanitary landfills in Maryland with respect to impact on surface waters, 27 pp.*