MINERAL RESOURCES AND MINED LAND INVENTORY, PRINCE GEORGE'S COUNTY, MARYLAND

By
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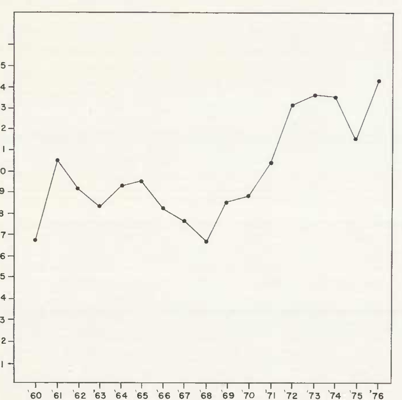
STATE OF MARYLAND
DEPARTMENT OF NATURAL RESOURCES
MARYLAND GEOLOGICAL SURVEY
Kenneth N. Weaver, Director

INTRODUCTION

This map is an inventory of past and present mineral operations and potential mineral resources in Prince George's County. The resources extracted today are primarily sand and gravel, the rest being construction sand, clay and fill material. Historically, iron ore, ocher (paint ore), marl and molding sands were mined in the County. Prince George's County has been the leading producer of sand and gravel in Maryland for over ten years. The following graph shows the value of mineral production in the County from 1960 to 1976:



Prince George's County Mineral Production
(from U.S. Bureau of Mines, Mineral Industry of Maryland, 1960-1976)

At present, there are thirty active pits in the County and twelve working plants or storage areas located on sites of former operations. The DESCRIPTION OF OPERATIONS below lists each active operation and includes the mineral producer's name (where known), operational status, and a location number keyed to the map. In all, over 8,700 acres have been disturbed by the mining industry and the products used for commercial, industrial, residential and governmental purposes. Approximately 14.2% of this area is currently being worked or utilized for plant and storage sites. About 47.1% of the disturbed land has been reclaimed. This total includes areas that have been graded, planted, developed, or otherwise utilized. The remaining 38.7% represents acreage that has not been reclaimed and is not currently being worked. However, these figures do not reflect the acreage involved in numerous small mineral operations whose dimensions and exact locations have been obliterated through time. The following chart gives a status report on disturbed land:

Inactive and Abandoned Acreage	Reclaimed Acreage	Working Acreage	Total Acreage
3,370.5	4,106.4	1,239.4	8,716.3

The information presented here was compiled from the literature and field investigations (1975-1979). Aerial photographs were used to help delineate the extent and location of the operations [Department of Agriculture, 1:20,000 photographs (1938, 1952, 1963, 1970); Photo Service, Inc. (1972); and LANDSAT-1 aircraft support photography (1974)].

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PRESENT AND POTENTIAL RESOURCES

The term "potential resources" is used here to indicate those deposits that have been worked or are currently being worked in the County and are therefore a proven economic resource. While some of the resources mentioned below are not currently being worked in the County, they have been extracted elsewhere. The chemical and physical nature of these deposits justify their consideration here as a viable economic resource for the future. For the locale and general description of units discussed but not shown on the map, please refer to the DESCRIPTION OF GENERAL GEOLOGY.

Sand and Gravel: Extensive deposits of sand and gravel valuable for use in the construction industry are found in portions of three geologic units in Prince George's County: (1) Potomac Group sand-gravel facies; (2) Upland Gravels, and (3) in the upstream Terrace Deposits along the Patuxent River. The sand-gravel facies of the Potomac Group is composed of interbedded layers of gravel, sand, silt and clay. Sand and gravel is the dominant lithology in the northwestern portion of the County. The percentage of gravel ranges from 20 to 70% with an average of 49%. Sands present range from 0% to 80% and averages 39%. Clay varies from 0% to 33% but averages 12%. This portion of the Potomac Group has been worked for many years; currently, there are seven active operations in this unit.

The Upland Gravels are the primary source of sand and gravel in Prince George's County and there are 20 active pits in this unit. In undissected areas, the sand-gravel portion of the unit is overlain by as much as 15 feet of sandy loam. Screen analyses (Schlee, 1957) indicate an average composition in Prince George's County of 63.4% gravel, 33.3% sand, and 3.3% of silt and clay. The percentage of gravel present decreases southeastward from Washington, D.C.

Although there are no current operations in the northern Patuxent River Terrace Deposits, sand and gravel was once actively removed from the unit in Prince George's County. In Anne Arundel County, the Terrace Deposits are the chief source of sand and gravel. However, the Terrace Deposits along the Patuxent River in Prince George's County tend to be thinner and more variable in composition with less gravel, particularly toward the south. Another source of sand and gravel (not shown on the map) was dredging the banks, tidal flats, and beds of the Potomac River and the mouths of confluent streams, Indian Creek, and the Patuxent River near Bowie. At one time, these areas provided the greatest production of sand and gravel in the County. The earliest recorded operation was begun in 1899.

Discontinuous Sand and Gravel, Sand: Those deposits consisting primarily of sand interbedded with gravel, silt, and some clay of variable thickness are included in this category. The probability of finding commercially valuable sand and gravel in this unit is not as high as in the preceding group. These deposits include: (1) portions of the sand-gravel facies of the Potomac Group, (2) the Terrace Deposits along the lower portion of the Patuxent River and adjacent to major creeks in the County. The southeastern portion of the sand-gravel facies of the Potomac Group consists primarily of quartz sand with variable amounts of gravel, silt, and clay with iron concretions. This unit has been mined for sand and gravel in some areas, and there is currently one active operation in these materials. Sand and gravel occurs in some places in the Terrace Deposits. The deposits are primarily sand, clayey sand, and pebbly sand with greater concentrations of gravel upstream. The thickness of economic sand and gravel beds in these Terrace Deposits is variable, as is the amount of silt present. Although there are no current operations in these deposits, they have been worked in the past and economically exploitable sand and gravel may remain. Another source of sand not shown on the map is the alluvial deposits. In 1903, large sand pits were developed east of Laurel in the alluvial deposits along the Patuxent River. The sand was used for making filter beds for the District of Columbia's water system. It also was used to build the artificial hill under Union Station.

Clays: Two sources of clay in the County are the silt-clay facies of the Potomac Group and the Marlboro Clay. Clays in the Potomac Group are lenticular and range in thickness from a few feet to 100 feet or more. Currently there is one active clay operation in the Potomac Group. The Marlboro Clay was extensively worked near Upper Marlboro. Both clays are suitable for brick and other structural clay products. In the past, these clays were used for common pottery, smoking pipes, tiles and bricks. Formerly, clay for bricks was dug extensively near Washington from the surficial loam present in some Terrace Deposits. This loam is of considerable areal extent but is only 3 to 4 feet thick.

Diatomite: Diatomite or diatomaceous silt is present in the lower Calvert Formation. The map pattern shown indicates deposits in outcrop or with minimum overburden. The diatomite ranges from 4 to 17 feet thick, thickening from north to south. It varies in purity from about 20% to a maximum of 65% diatoms. A chemical analysis of the diatomite three miles southwest of Upper Marlboro (Glaser, 1971) shows:

SiO_2	81.2%
Al_2O_3	3.7%
Fe_2O_3	2.5%
CaO	0.9%
MgO	0.4%
K_2O	0.9%
Na_2O	0.2%
TiO_2	0.7%
Ignition Loss	6.4%
	96.9%

Although diatomite has not yet been exploited in the County, it offers a potential source of material for filtration media, abrasives, insulation, absorbant, or filler material.

Other Potential Resources: Other resources in the County of potential use only with changes in either the economic situation or technology are glauconite and phosphorite. Glauconite is found in the greensand of the Aquia and Nanjemoy Formations. It makes up from 5% to 60% of the sediment with the greatest percentage occurring in the Nanjemoy Formation. It has been used primarily for soil conditioning, and secondarily as a water softener. Phosphorite or phosphate is found in the basal portion of the Calvert Formation, with proportions ranging from trace amounts to 75-85% of the sediments in a few places. The P_2O_5 content of the phosphate pebbles varies from 15% to 25%. It has potential use in the fertilizer industry. For more information on these resources, see Glaser, 1971.

HISTORICAL MINERAL RESOURCES

Historical resources are those deposits that were worked in the past for minerals, but which are no longer of commercial value due to changes in technology and demand. For the location and general description of geologic units discussed but not shown on the map, please refer to DESCRIPTION OF GENERAL GEOLOGY.

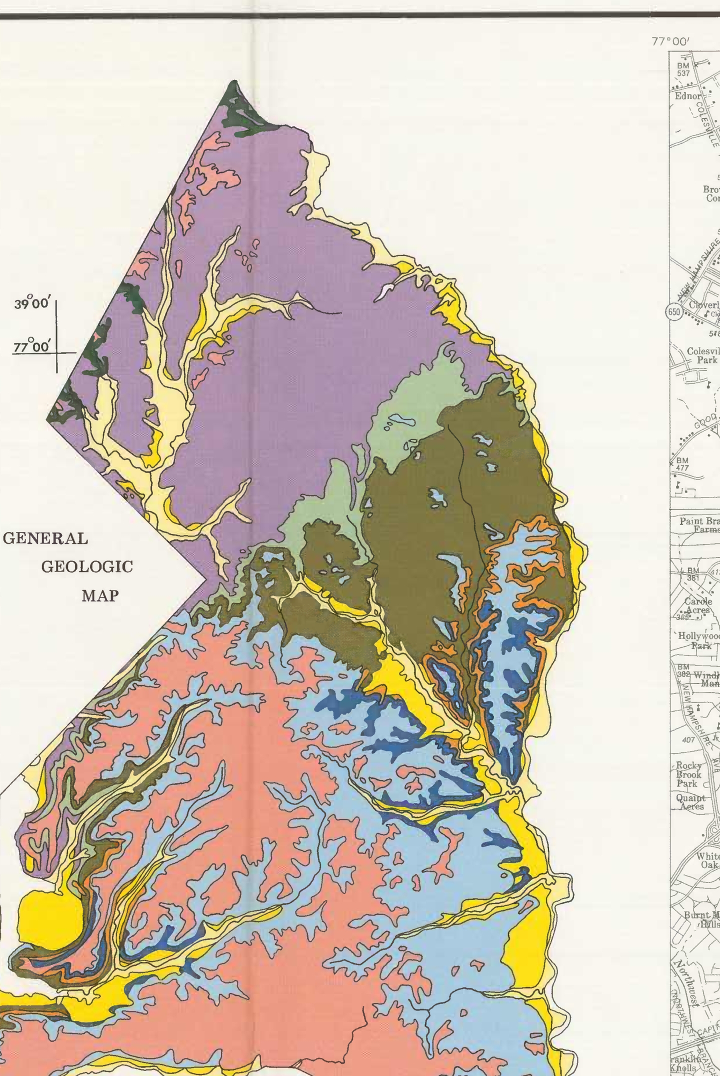
Iron Ore: Early in the 19th Century, iron ore was one of the County's most important mineral resources. The iron ore used was primarily siderite and secondarily limonite. The ore occurs as concretions and lenticular bodies of limited extent, primarily within the silt-clay facies of the Potomac Group. It is also found in the sand-gravel facies. Mining was done by open pit, gouging, and tunneling. The largest operation was known as the "Swampoodle Ore Banks" now the site of the U.S. Department of Agriculture Research Center in Beltsville. The pit was three quarters of a mile long and one quarter of a mile wide. In 1847, Muirkirk Furnace was established near Muirkirk and operated continuously until about 1916. The product was claimed by the proprietors to be the strongest pig iron produced in the United States. It was used for special items requiring great strength, i.e. cannons, car wheels, cylinders, and special kinds of steel.

Paint Ore: In the Potomac Group are clays rich in iron oxide which were excavated for paint pigments. Near Ft. Washington, this ore was mined during Colonial times as a "bole" dye for fabrics.

Building Stone: Four types of building stone have been used for local construction needs in the County. The granitic gneiss found in stream valleys in the northwestern part of the County furnished material for foundations, rough stone work, and some flagging. In the Coastal Plain, sediments contain sporadic indurated beds that have been used for building purposes. One such is a tough white opal cemented quartzite which occurs as large blocks scattered over the surface of the Upper Potomac Group. This material was quarried north of Collington. Another is a brown ferruginous conglomerate also present in the Potomac Group. This stone, which tends to weather to a brownish-orange hue, was used primarily for foundations. Consolidated shelly sandstones present in the Aquia Formation have also been used for rough construction work.

Molding Sands: South of Upper Marlboro near the Conrail tracks is the only site in the County operated strictly for molding sands. Here a minor terrace deposit was worked by the Plum Point Molding Sand Company on Wilson's farm. Molding sands are used to cast metal.

Marl: In the Aquia Formation near Seat Pleasant there was at one time a "green-sand marl" operation. The fossil shells in the unit provided the necessary calcium carbonate, and with the presence of potassium from the glauconite and trace mineral phosphates, this unit provided an excellent local source of fertilizer.



GENERAL GEOLOGIC MAP

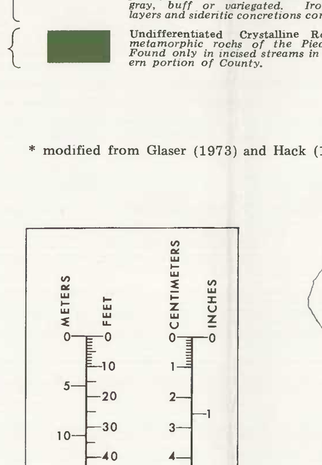
DESCRIPTION OF GENERAL GEOLOGY

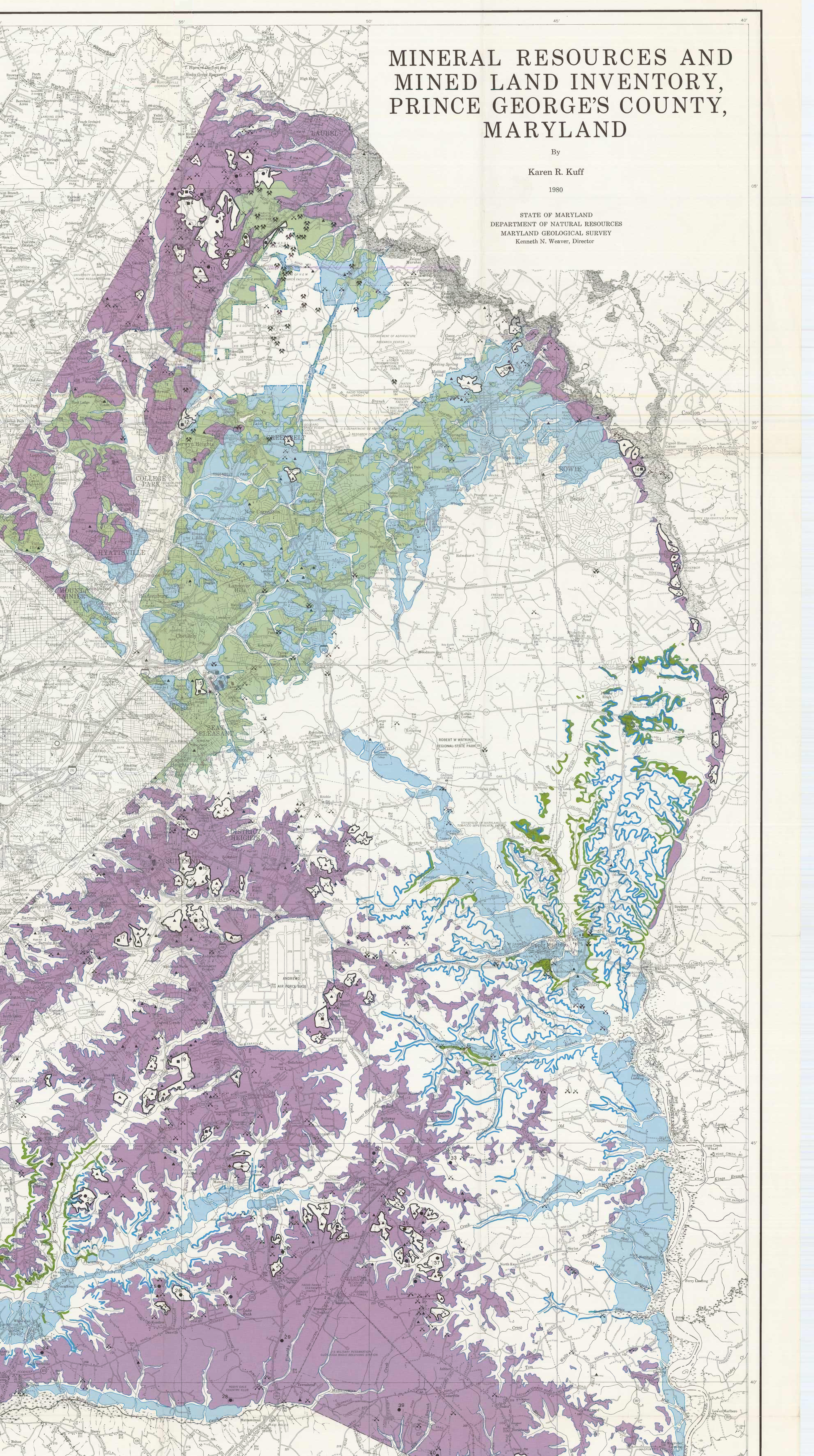
The geology of Prince George's County is predominantly comprised of layered unconsolidated Coastal Plain sediments. Crystalline rock outcrop is found only along incised streams near the Montgomery County boundary. The following legend briefly describes the nature of the various geologic units within the County shown on the small generalized geologic map. Those units of present or potential value as a mineral resource are shown on the large map. A more detailed description of the mineral resources is provided in the preceding sections. For additional information on the geology of the County, refer to Cooke and Cloos (1951), Darton (1939), Glaser and Kuff (1978), Glaser (1973 and 1971), Hack (1977 and 1955), Keith, Miller and Bibbons (1911) and Wittington and Froelich (1974).

GEOLOGIC LEGEND*

Era/Period	Epoch	Unit
QUATERNARY	PLEISTOCENE TO RECENT	*Alluvium - sand, silt, clay, and gravel; interbedded, lenticular, poorly sorted, generally fines upward. Color tan, brown or gray. Found in stream channels, flood plains and adjacent low-lying areas. Gravel more common in upstream areas of larger streams and rivers. Often inundated or water saturated. Thickness 2 to 15 feet.*
QUATERNARY	PLEISTOCENE TO RECENT	*Terrace Deposits - sand, silt, variable amounts of gravel, and minor clay; poorly sorted, relatively heterogeneous. Color generally tan to brown, gray to dark gray, gray or mottled. Found adjacent to rivers and streams. In some places overlain by sandy to silty clay loam. Gravel and sand concentrated in upstream terraces. Thickness varies but generally ranges from 3 to 25 feet, reaching a maximum of 60 feet.*
TERTIARY	PLIOCENE	*Upland Deposits - interbedded sand, pebbly sand, and gravel; poorly sorted, grades upward to sandy, silt loam which caps undissected areas. Color tan to orange or reddish brown. Found primarily in upland areas in southern portion of County. Basal portion varies from 4 to 50 feet thick, averaging 30 feet; overlying loam unit reaches as much as 15 feet thick in thickness in upland areas but is generally thinner on slopes.*
TERTIARY	MIOCENE	*Calvert Formation - fine-grained sand, silt, diatomaceous silt, and minor clay; massively bedded with burrow mottling, some beds abundantly fossiliferous. Color olive-green to olive-brown, buff where weathered. Overlying basal coarse sand, pebbles, and phosphate clasts, are beds of diatomateous silt from 3 to 40 feet thick. Upper beds mostly fine sand and silt. Total thichness from 3 to 150 feet.*
TERTIARY	EOCENE	*Nanjemoy Formation - sand, variably clayey and glauconitic, silt and clayey silt; poorly sorted, massively bedded, sand, fine to medium grained, contains up to 50% glauconite. Color darh greenish gray to blue-green. Thickness as much as 100 feet.*
TERTIARY	PALEOCENE	*Marlboro Clay - haolinitic clay, brittle to slightly plastic, thinly bedded or laminated, with minor silt partings and lenses. Color silver-gray in upper and lower beds, pale red to reddish brown in middle. Outcrops mostly on slopes in narrow bands; underlies some flat areas, forming terraces. Unit often concealed by minor terrace deposits or colluvium. Thickness to 30 feet maximum.*
TERTIARY	PALEOCENE	*Aquia Formation - sand, variably glauconitic and clayey, and calcareous sandstone; sand well-sorted and interbedded with layers of friable to hard, shelly, calcareous sandstone up to 5 feet thick. Color dark gray-green or olive-green, rusty brown where deeply weathered. Abundant fossils in places. Residual limonitic sandstone boulders common in soil zone. Thickness 3 to 200 feet.*
CRETACEOUS	UPPER	*Brightseat and Severn Formations - sand, fine-grained, variably clayey, micaceous, sparsely glauconitic; poor to well sorted, sparsely fossiliferous. Color dark gray to dark greenish gray or olive-black. Thickness ranges from 3 to 50 feet.*
CRETACEOUS	LOWER	*Potomac Group - divided into sand-gravel and silt-clay facies. Thickness of both facies ranges up to 1,000 feet. This group has also been separated into the Patuxent, Arundel and Patapsco Formations elsewhere.* *Sand-Gravel Facies - sand, pebbly sand, and silt clay; lenticular or irregular bedding with some fining-upward cycles. Sands, fine to coarse grained, poorly to well sorted. Color white, buff, red-brown to varicolored. Ferruginous concretions and limonite cemented pods and ledges common. Gravel predominant in northwest areas near contact with crystalline rocks.* *Silt-Clay Facies - silt and clay with subordinate amounts of sand; generally massive and thich bedded, with lenses of sandy clay, laminated silt clay, and poorly-sorted sand. Color is red, tan, gray, buff or variegated. Ironstone layers and sideritic concretions common.*
LOWER PALEOZOIC - PRECAMBRIAN		*Undifferentiated Crystalline Rocks - metamorphic rochs of the Piedmont. Found only in incised streams in northern portion of County.*

* modified from Glaser (1973) and Hack (1977).





EXPLANATION

- Sand and Gravel
- Discontinuous Sand and Gravel, Sand
- Potomac Group Clay
- Marlboro Clay
- Diatomite
- Boundary of Federal property excluded from this report
- ● 1 Working operation, see DESCRIPTION OF OPERATIONS
- ■ 2 Plant and storage area, former working site, see DESCRIPTION OF OPERATIONS
- ▲ Reclaimed extraction site
- ✕ Abandoned or inactive sand and gravel, clay, sand, ocher or marl operation
- ⚒ Site of former iron ore operation
- Borrow pit
- Boundary of larger operation

DESCRIPTION OF OPERATIONS

1 Contee Sand and Gravel Co., Inc.; working, part of landfill operation to north
2 Contee Sand and Gravel Co., Inc.; supply storage area
3 Contee Sand and Gravel Co., Inc.; supply storage area
4 Contee Sand and Gravel Co., Inc.; plant and storage area, portions reclaimed or overgrown, east of I-95, some areas being worked
5 Contee Sand and Gravel Co., Inc.; working, portions graded
6 A.H. Smith; working
7 Contee Sand and Gravel Co., Inc.; working, portion reclaimed
8 Cherry Hill Sand and Gravel Co., Inc.; reclamation in progress
9 Maryland Clay Products, Inc.; working, portions graded or overgrown
10 Willard Sand and Gravel Company; intermittently working
11 Ammendale Sand and Gravel, Inc.; working
12 A.H. Smith; plant and storage site
13 Daisey Brothers, Inc.; intermittently working
14 A.H. Smith; plant and storage site
15 Arundel Asphalt Co. and Brandywine Sand and Gravel Co.; plant and storage site
16 Hil-Mar Corp.; intermittently working, primarily overgrown, school built on southern portion
17 Silver Hill Sand and Gravel Co.; plant and storage site
18 Buffalo Sand and Gravel Co.; plant and storage site
19 Inland Materials, Inc.; plant and storage site, southern portion being developed
20 Lone Star Industries, Inc.; plant and storage site
21 A.H. Smith; plant and storage site
22 Contee Sand and Gravel Co., Inc.; working
23 Inland Materials, Inc.; working, portions reclaimed
24 Accokeek Mining Co., working
25 A.H. Smith; intermittently working
26 Prince George's Bank Run Gravel Corp.; working
27 Lone Star Industries, Inc.; intermittently working
28 Brandywine Sand and Gravel Co.; working
29 Brandywine Mining Co.; working
30 Brandywine Sand and Gravel Co.; intermittently working
31 A.H. Smith; plant and storage site
32 Western Shore Mining Co.; working
33 Brandywine Mining Co.; reclamation in progress
34 Lone Star Industries, Inc.; intermittently working, currently reclaiming pit to west
35 Brandywine Sand and Gravel Co.; working, filling in east side of operation
36 A.H. Smith; intermittently working
37 E.L. Gardner; primarily reclaimed
38 E.L. Gardner; working
39 Daisey Brothers, Inc.; working
40 Inland Materials, Inc.; working
41 Sleepy Hollow, Inc.; working

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Scale 1/62500
1 1/2 0 1 2 3 4 Miles
1 1/2 0 1 2 3 4 5 Kilometers

Base Map, Prince George's County Topographic Map published by Maryland Geological Survey

Copies of Map available from
Maryland Geological Survey
Johns Hopkins University
Baltimore, Maryland 21218

Williams & Heintz Map Corporation, Washington, D.C. 20027

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