

Generalized Geologic Map for Land-Use Planning: Martin County, Kentucky

Daniel I. Carey
Acknowledgments

Geology adapted from Murphy (2005a-f), Murphy and Duncan (2005), Murphy and Thompson (2005), Murphy and Tyra (2005), and Murphy and Yang (2005). Thanks to Kim and Kent Arness, Kentucky Division of Geographic Information, for base-map data. Thanks to Steve Webb and Bart Davidson, Kentucky Geological Survey, for photo assistance.

Floodplain Development (Unit 1)



Construction in the floodplain (unit 1) must ensure that living spaces are above flood levels, as shown in these homes along Wolf Creek. Photo by Dan Carey, Kentucky Geological Survey.

EXPLANATION

- School
- Water wells
 - Mining or industrial
 - Domestic
 - Monitoring
 - Public
 - Agriculture
- Spring
- Wet area
- Gas well
- Oil well
- Railroad
- Watershed boundary
- Geologic fault
- Source-water protection area, zone 1
- Wetlands > 1 acre (U.S. Fish and Wildlife Service, 2003)
- Mined areas (does not represent all mining)
- Incorporated city boundaries
- 100-foot contour interval
- Photo location

Source-Water Protection Areas

Source-water protection areas are those in which activities are likely to affect the quality of the drinking-water source. For more information, see kgsweb.uky.edu/download/water/swapp/swapp.htm.

Groundwater

About one-third of the people in Martin County rely on private domestic water supplies. 3,800 use wells and 100 use faulted water, cisterns, and other sources. Most wells drilled in valley bottoms are adequate for a modern domestic supply. Nearly three-quarters of the wells drilled on hillsides are adequate for a domestic supply, except in the northern third of the county, where only half of drilled wells on hillsides produce enough water for domestic use. Wells on hillsides and ridges yield smaller quantities of water. In the central and southern two-thirds of the county, drilled wells more than 200 feet deep in valleys may yield enough water for small municipal or industrial supplies. Groundwater from most drilled wells in this area is moderately to extremely hard and contains noticeable amounts of iron. Salty water may be found in wells drilled less than 100 feet below the level of the principal valley bottoms, except in the northern third of the county, where salty water can be found as shallow as 50 feet. A few springs supply enough water for domestic use. Almost all springs yield less than 5 gallons per minute. For more information on groundwater in the county, see Carey and Slickney (2004).

LAND-USE PLANNING TABLE DEFINITIONS

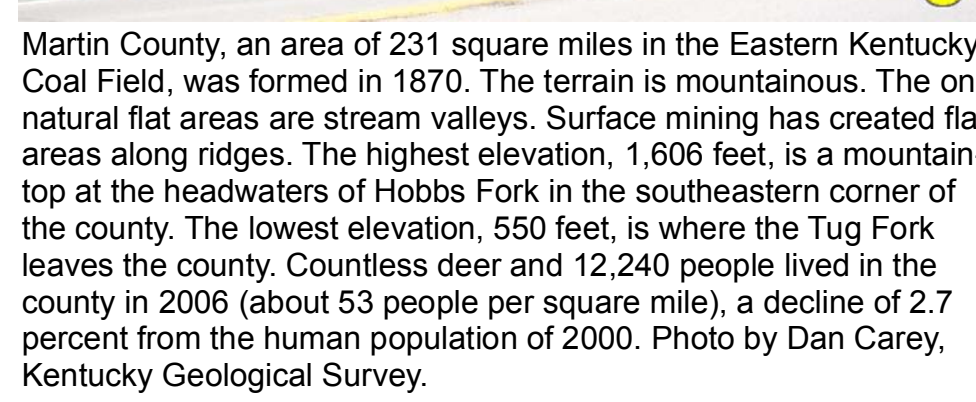
FOUNDATION AND EXCAVATION
The terms "earth" and "rock" excavation are used in the engineering sense; earth can be excavated by hand tools, whereas rock requires heavy equipment or blasting to remove.

LIMITATIONS
Slight—A slight limitation is one that commonly requires some corrective measure but can be overcome without a great deal of difficulty or expense.
Moderate—A moderate limitation is one that can normally be overcome but the difficulty and expense are great enough that completing the project is commonly a question of feasibility.
Severe—A severe limitation is one that is difficult to overcome and commonly is not feasible because of the expense involved.

LAND USES
Septic tank disposal system—A septic tank disposal system consists of a septic tank and a filter field. The filter field is a subsurface tile system laid in such a way that effluent from the septic tank is distributed with reasonable uniformity into the soil.
Residences—Ratings are made for residences with basements because the degree of limitation is dependent upon ease and required depth of excavation. For example, excavation in limestone has greater limitation than excavation in shale for a house with a basement.
Highways and streets—Refers to paved roads in which cuts and fills are made in hilly topography, and considerable work is done preparing subgrades and bases before the surface is applied.
Access roads—These are low-cost roads, driveways, etc., usually surfaced with crushed stone or a thin layer of blacktop. A minimum of cuts and fills are made. Little work is done preparing a subgrade, and generally only a thin base is used. The degree of limitation is based on local requirements and would be less severe if not used during the winter and early spring. Some types of recreation areas would not be used during these seasons.
Light industry and malls—Ratings are based on developments having structures or equivalent load limit requirements of three stories or less, and large paved areas for parking lots. Structures with greater load limit requirements would normally need footings in solid rock, and the rock would need to be core drilled to determine the presence of caverns, cracks, etc.
Intensive recreation—Athletic fields, stadiums, etc.
Extensive recreation—Camp sites, picnic areas, parks, etc.
Reservoir areas—The floor of the area where the water is impounded. Ratings are based on the permeability of the rock.
Reservoir embankments—The rocks are rated on limitations for embankment material.
Underground utilities—Included in this group are sanitary sewers, storm sewers, water mains, and other pipes that require fairly deep trenches.

Planning Guidance by Rock Unit Type

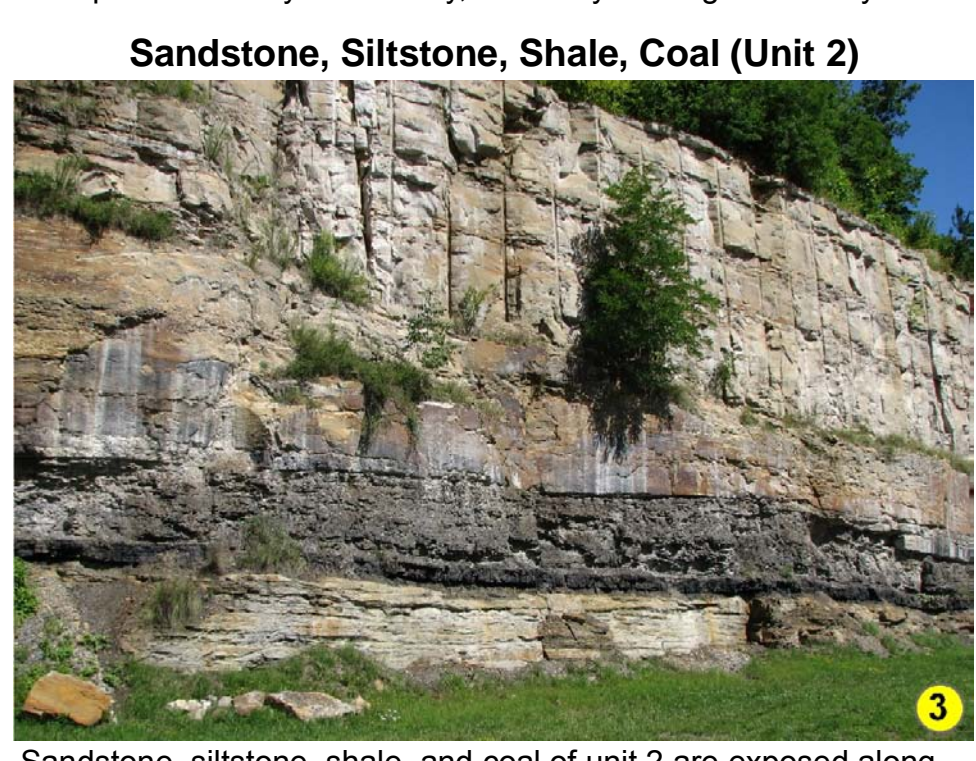
Rock Unit	Foundation and Excavation	Septic System	Residence with Basement	Highways and Streets	Access Roads	Light Industry and Malls	Intensive Recreation	Extensive Recreation	Reservoir Areas	Reservoir Embankments	Underground Utilities
1. Clay, silt, sand, and gravel (alluvium)	Fair foundation material; easy to excavate. Seasonal high water table. Subject to flooding. Refer to soil report (Barford and Moore, 2005).	Severe limitations. Seasonal high water table. Subject to flooding. Refer to soil report (Barford and Moore, 2005).	Severe limitations. Seasonal high water table. Subject to flooding. Refer to soil report (Barford and Moore, 2005).	Severe limitations. Seasonal high water table. Subject to flooding. Refer to soil report (Hayes, 1982).	Severe limitations. Seasonal high water table. Subject to flooding. Refer to soil report (Barford and Moore, 2005).	Slight to severe limitations, depending on type of activity and topography. Subject to flooding. Refer to soil report (Barford and Moore, 2005).	Slight to severe limitations, depending on type of activity and topography. Subject to flooding. Refer to soil report (Barford and Moore, 2005).	Slight to severe limitations, depending on type of activity and topography. Subject to flooding. Refer to soil report (Barford and Moore, 2005).	Previous material. Reservoir may leak where rocks are fractured.	Fair stability. Fair compaction, except for piping hazard. Refer to soil report (Barford and Moore, 2005).	Slight limitations. In general, except for seasonal high water table. Subject to flooding. Refer to soil report (Barford and Moore, 2005).
2. Sandstone, siltstone, shale, and clay	Fair to good foundation material; difficult to excavate. Possible low strength associated with shales, sandstone, and underlays. Possible sandstone and clayline voids.	Severe limitations. This soils and impermeable rock associated with shales.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Moderate to severe limitations. Rock excavation may be required. Possible steep slopes.	Moderate to severe limitations. Rock excavation may be required. Possible steep slopes.	Moderate to severe limitations. Rock excavation may be required. Possible steep slopes.	Moderate to severe limitations. Rock excavation may be required.	Slight to severe limitations, depending on activity and topography. Possible steep wooded slopes. Slight limitations for forest or nature preserve.	Slight limitations. Reservoir may leak where rocks are fractured.	Severe limitations. Reservoir may leak where rocks are fractured.	Severe to moderate limitations. Thin soils. Possible rock excavation.
3. Shale, siltstone, sandstone, coal	Fair to good foundation material; difficult to excavate. Possible low strength associated with shales, sandstone, and underlays.	Severe limitations. This soils and impermeable rock associated with shales.	Severe to moderate limitations. Rock excavation may be required.	Moderate to severe limitations. Rock excavation may be required.	Moderate to severe limitations. Rock excavation may be required.	Moderate to severe limitations. Rock excavation may be required.	Moderate to severe limitations. Rock excavation may be required.	Slight to severe limitations, depending on activity and topography. Possible steep wooded slopes. Slight limitations for forest or nature preserve.	Slight limitations. Reservoir may leak where rocks are fractured.	Severe limitations. Reservoir may leak where rocks are fractured.	Severe to moderate limitations. Thin soils. Possible rock excavation.
4. Sandstone, claystone, coal	Fair to good foundation material; difficult to excavate. Possible low strength associated with coals and underlays.	Severe limitations. This soils and impermeable rock.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Moderate to severe limitations. Rock excavation may be required. Possible steep slopes.	Moderate to severe limitations. Rock excavation may be required. Possible steep slopes.	Moderate to severe limitations. Rock excavation may be required. Possible steep slopes.	Moderate to severe limitations. Rock excavation may be required.	Slight to severe limitations, depending on activity and topography. Possible steep wooded slopes. Slight limitations for forest or nature preserve.	Slight limitations. Reservoir may leak where rocks are fractured.	Severe limitations. Reservoir may leak where rocks are fractured.	Severe to moderate limitations. Thin soils. Possible rock excavation.



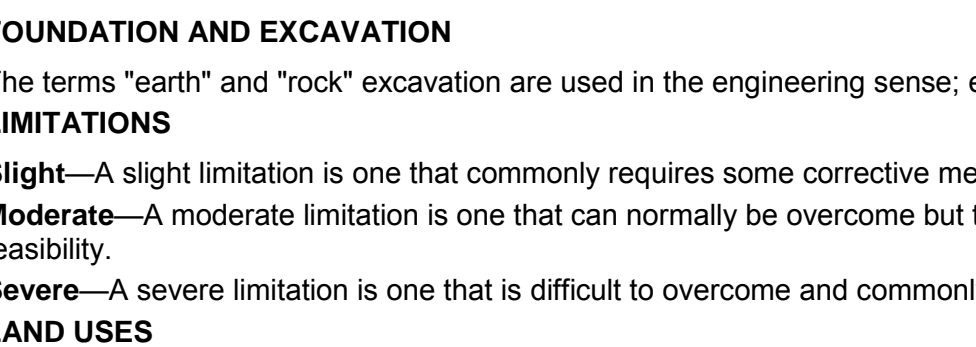
Martin County is blessed with an abundance of water. The Tug Fork River (seen above from the Ky. 40 bridge) and Curtis Crum Reservoir provide water to the Martin County Water District. Photo by Dan Carey, Kentucky Geological Survey.



The Honey Branch Regional Business Park is a public and private development partnership of Floyd, Johnson, Magoffin, Martin, and Pike Counties. Consisting of over 300 acres on a reclaimed mountaintop mining site, the park's tenants include Schlumberger Inc., an oil and gas well services company, and Consolidated Pipe, a pipe supplier to the region. In addition, Martin County Economic Development Authority has a 50,000-square-foot speculative building located in the park. Photo by Dan Carey, Kentucky Geological Survey.



Sandstone, siltstone, shale, and coal of unit 2 are exposed along Airport Road. Photo by Dan Carey, Kentucky Geological Survey.



Virtually every rock type in the county is exposed along the newly aligned Ky. 645 near Inez. Photo by Dan Carey, Kentucky Geological Survey.

Copyright 2007 by the University of Kentucky, Kentucky Geological Survey. For information on obtaining copies of this map and other Kentucky Geological Survey maps and publications call our Public Information Center at 859.257.3898 or 877.778.7827 (toll free). Visit the KGS World Wide Web site at www.uky.edu/kgs.

Coal has been central to the Martin County economy. From 1879 to 2004, 391 million tons were produced; 202 million from underground and 189 million from surface mining. Production declined from a high of 18.1 million tons in 1985 to 8.4 million tons in 2004. Surface mining has changed the face of Martin County (left). Post-mining land uses have included a federal prison, regional airport, and regional industrial park. Construction on reclaimed areas may require measures to prevent differential settlement of foundations. Aerial photos from the U.S. Department of Agriculture Farm Services Administration, National Aerial Imagery Program, 2004.

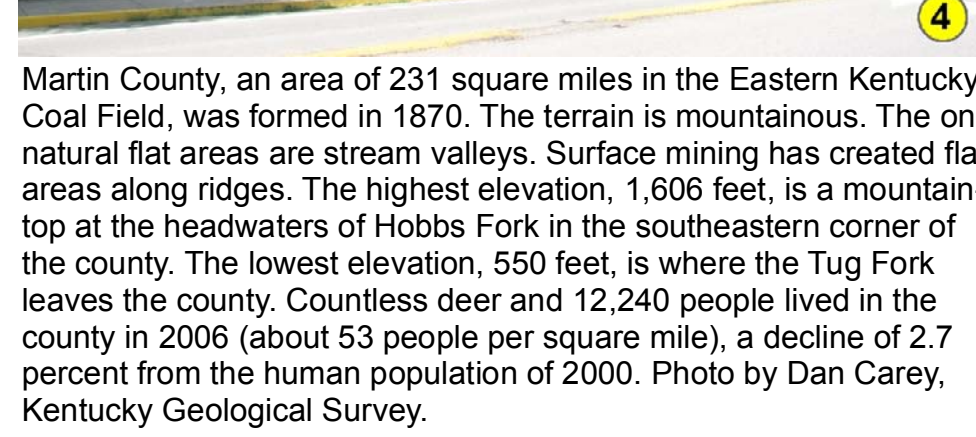
For Planning Use Only
This map is not intended to be used for selecting individual sites. Its purpose is to inform land-use planners, government officials, and the public in a general way about geologic bedrock conditions that affect the selection of sites for various purposes. The properties of thick soils may supersede those of the underlying bedrock and should be considered on a site-to-site basis. At any site, it is important to understand the characteristics of both the soils and the underlying rock. For further assistance, contact the Kentucky Geological Survey, 669.257.5000. For more information, visit the KGS Community Development Planning Web Site at kgsweb.uky.edu/download/kgsplanning.htm.

Additional Resources

- www.kyhome.com/inez/ Inez/Martin County GIS
- www.uky.edu/kgs/ University of Kentucky Cooperative Extension Service
- www.digsandy.org/ Big Sandy Area Development District
- www.kentucky.com/inez/ Kentucky Economic Development Information System
- www.uky.edu/KentuckyAtlas21159.html Kentucky Atlas and Gazetteer, Martin County
- quickfacts.census.gov/qd/states/21/21159.html U.S. Census data
- kgsweb.uky.edu/download/kgsplanning.htm Planning information from the Kentucky Geological Survey

References Cited

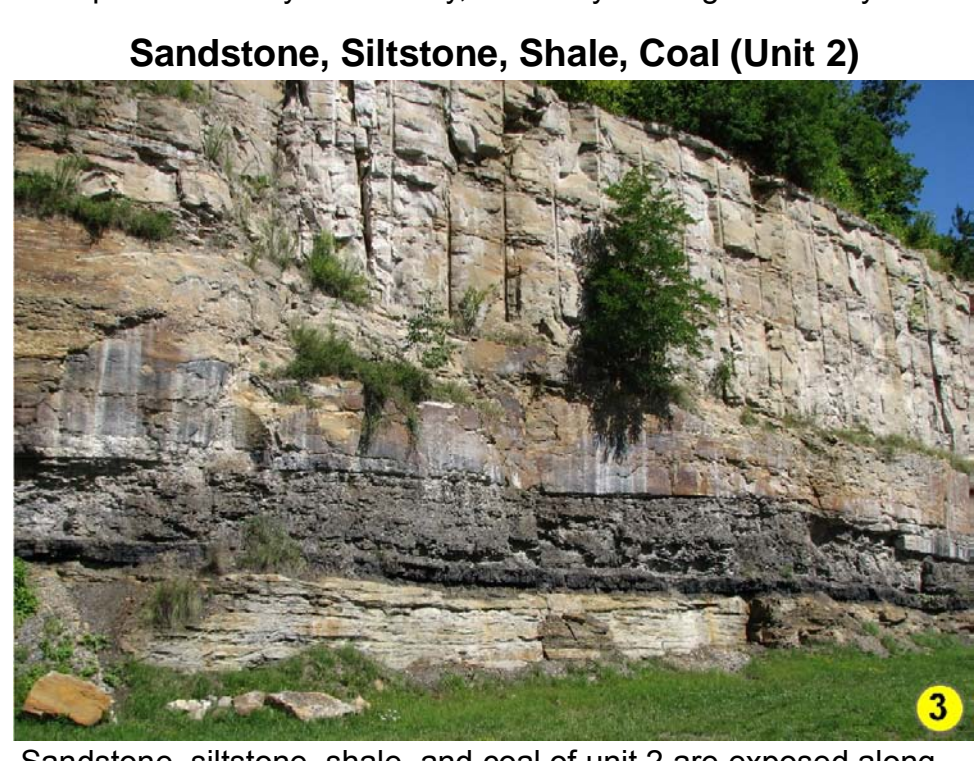
- Blanford, S.J., and Moore, A.K., 2005. Soil survey of Lawrence and Martin Counties, Kentucky. U.S. Department of Agriculture, Natural Resources Conservation Service, 140 p.
- Carey, D.I., and Slickney, J.F., 2004. Groundwater resources of Martin County, Kentucky. Kentucky Geological Survey, ser. 12, County Report 77, www.uky.edu/KGS/water/loray/geosites/NormalMartin.htm [accessed 9/10/07].
- Murphy, M.L., 2005a. Spatial database of the Kernt quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-178. Adapted from Hudde, J.W., and Englund, K.J., 1992. Geology of the Kernt quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-178, scale 1:24,000.
- Murphy, M.L., 2005b. Spatial database of the Lancer quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-241. Adapted from Rice, C.L., 1964. Geology of the Lancer quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-241, scale 1:24,000.
- Murphy, M.L., 2005c. Spatial database of the Naugatuck and Debaron quadrangles, eastern Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-879. Adapted from Alvord, D.C., 1971. Geologic map of the Naugatuck and Debaron quadrangles, eastern Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-879, scale 1:24,000.
- Murphy, M.L., 2005d. Spatial database of the Richmond quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-241. Adapted from Rice, C.L., 1964. Geology of the Richmond quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-241, scale 1:24,000.
- Murphy, M.L., 2005e. Spatial database of the Williamson quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-187. Adapted from Alvord, D.C., and Trent, V.A., 1962. Geology of the Williamson quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-187, scale 1:24,000.
- Murphy, M.L., and Duncan, R.S., 2005. Spatial database of the Thomas quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-227. Adapted from Rice, C.L., 1963. Geology of the Thomas quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-227, scale 1:24,000.
- Murphy, M.L., and Thompson, M.F., 2005. Spatial database of the Inez quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-226. Adapted from Outcrops, W.F., 1963. Geology of the Inez quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-226, scale 1:24,000.
- Murphy, M.L., and Tyra, M.A., 2005. Spatial database of the Varney quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-180. Adapted from Hudde, J.W., and Englund, K.J., 1962. Geology of the Varney quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-180, scale 1:24,000.
- Murphy, M.L., and Yang, X.Y., 2005. Spatial database of the Mio quadrangle, Kentucky-West Virginia, and the part of the Webb quadrangle in Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-543. Adapted from Jenkins, E.C., 1966. Geologic map of the Mio quadrangle, Kentucky-West Virginia, and the part of the Webb quadrangle in Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-543, scale 1:24,000.
- U.S. Department of Agriculture, Natural Resources Conservation Service, no date. Landslide prevention in eastern Kentucky. U.S. Department of Agriculture, National Wetlands Inventory, www.nwi.fws.gov/ [accessed 11/24/09].



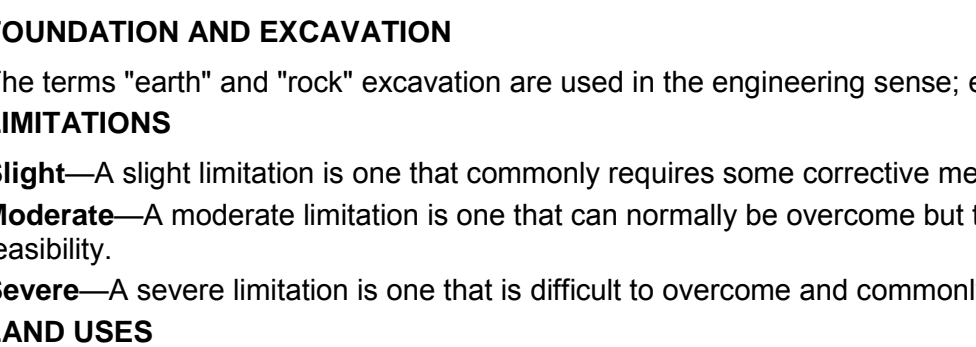
Martin County is blessed with an abundance of water. The Tug Fork River (seen above from the Ky. 40 bridge) and Curtis Crum Reservoir provide water to the Martin County Water District. Photo by Dan Carey, Kentucky Geological Survey.



The Honey Branch Regional Business Park is a public and private development partnership of Floyd, Johnson, Magoffin, Martin, and Pike Counties. Consisting of over 300 acres on a reclaimed mountaintop mining site, the park's tenants include Schlumberger Inc., an oil and gas well services company, and Consolidated Pipe, a pipe supplier to the region. In addition, Martin County Economic Development Authority has a 50,000-square-foot speculative building located in the park. Photo by Dan Carey, Kentucky Geological Survey.



Sandstone, siltstone, shale, and coal of unit 2 are exposed along Airport Road. Photo by Dan Carey, Kentucky Geological Survey.



Virtually every rock type in the county is exposed along the newly aligned Ky. 645 near Inez. Photo by Dan Carey, Kentucky Geological Survey.

Copyright 2007 by the University of Kentucky, Kentucky Geological Survey. For information on obtaining copies of this map and other Kentucky Geological Survey maps and publications call our Public Information Center at 859.257.3898 or 877.778.7827 (toll free). Visit the KGS World Wide Web site at www.uky.edu/kgs.

Coal has been central to the Martin County economy. From 1879 to 2004, 391 million tons were produced; 202 million from underground and 189 million from surface mining. Production declined from a high of 18.1 million tons in 1985 to 8.4 million tons in 2004. Surface mining has changed the face of Martin County (left). Post-mining land uses have included a federal prison, regional airport, and regional industrial park. Construction on reclaimed areas may require measures to prevent differential settlement of foundations. Aerial photos from the U.S. Department of Agriculture Farm Services Administration, National Aerial Imagery Program, 2004.

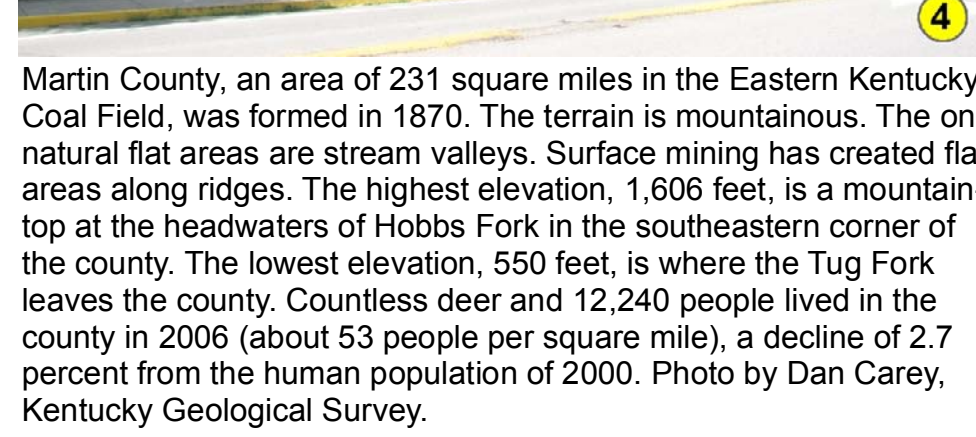
For Planning Use Only
This map is not intended to be used for selecting individual sites. Its purpose is to inform land-use planners, government officials, and the public in a general way about geologic bedrock conditions that affect the selection of sites for various purposes. The properties of thick soils may supersede those of the underlying bedrock and should be considered on a site-to-site basis. At any site, it is important to understand the characteristics of both the soils and the underlying rock. For further assistance, contact the Kentucky Geological Survey, 669.257.5000. For more information, visit the KGS Community Development Planning Web Site at kgsweb.uky.edu/download/kgsplanning.htm.

Additional Resources

- www.kyhome.com/inez/ Inez/Martin County GIS
- www.uky.edu/kgs/ University of Kentucky Cooperative Extension Service
- www.digsandy.org/ Big Sandy Area Development District
- www.kentucky.com/inez/ Kentucky Economic Development Information System
- www.uky.edu/KentuckyAtlas21159.html Kentucky Atlas and Gazetteer, Martin County
- quickfacts.census.gov/qd/states/21/21159.html U.S. Census data
- kgsweb.uky.edu/download/kgsplanning.htm Planning information from the Kentucky Geological Survey

References Cited

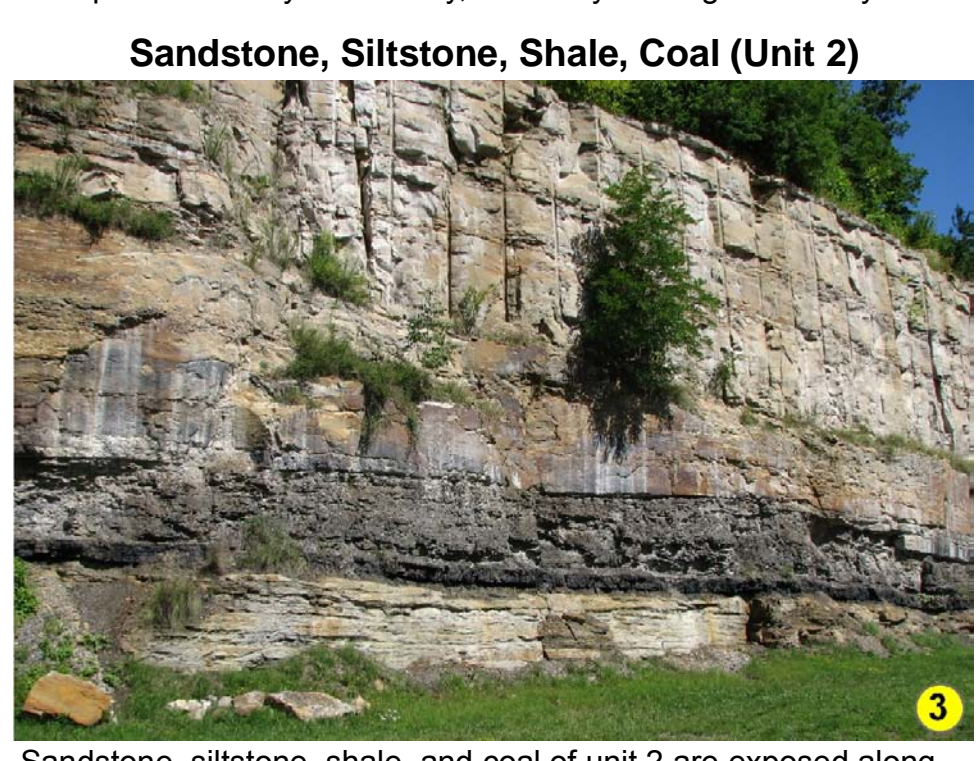
- Blanford, S.J., and Moore, A.K., 2005. Soil survey of Lawrence and Martin Counties, Kentucky. U.S. Department of Agriculture, Natural Resources Conservation Service, 140 p.
- Carey, D.I., and Slickney, J.F., 2004. Groundwater resources of Martin County, Kentucky. Kentucky Geological Survey, ser. 12, County Report 77, www.uky.edu/KGS/water/loray/geosites/NormalMartin.htm [accessed 9/10/07].
- Murphy, M.L., 2005a. Spatial database of the Kernt quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-178. Adapted from Hudde, J.W., and Englund, K.J., 1992. Geology of the Kernt quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-178, scale 1:24,000.
- Murphy, M.L., 2005b. Spatial database of the Lancer quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-241. Adapted from Rice, C.L., 1964. Geology of the Lancer quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-241, scale 1:24,000.
- Murphy, M.L., 2005c. Spatial database of the Naugatuck and Debaron quadrangles, eastern Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-879. Adapted from Alvord, D.C., 1971. Geologic map of the Naugatuck and Debaron quadrangles, eastern Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-879, scale 1:24,000.
- Murphy, M.L., 2005d. Spatial database of the Richmond quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-241. Adapted from Rice, C.L., 1964. Geology of the Richmond quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-241, scale 1:24,000.
- Murphy, M.L., 2005e. Spatial database of the Williamson quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-187. Adapted from Alvord, D.C., and Trent, V.A., 1962. Geology of the Williamson quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-187, scale 1:24,000.
- Murphy, M.L., and Duncan, R.S., 2005. Spatial database of the Thomas quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-227. Adapted from Rice, C.L., 1963. Geology of the Thomas quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-227, scale 1:24,000.
- Murphy, M.L., and Thompson, M.F., 2005. Spatial database of the Inez quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-226. Adapted from Outcrops, W.F., 1963. Geology of the Inez quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-226, scale 1:24,000.
- Murphy, M.L., and Tyra, M.A., 2005. Spatial database of the Varney quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-180. Adapted from Hudde, J.W., and Englund, K.J., 1962. Geology of the Varney quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-180, scale 1:24,000.
- Murphy, M.L., and Yang, X.Y., 2005. Spatial database of the Mio quadrangle, Kentucky-West Virginia, and the part of the Webb quadrangle in Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-543. Adapted from Jenkins, E.C., 1966. Geologic map of the Mio quadrangle, Kentucky-West Virginia, and the part of the Webb quadrangle in Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-543, scale 1:24,000.
- U.S. Department of Agriculture, Natural Resources Conservation Service, no date. Landslide prevention in eastern Kentucky. U.S. Department of Agriculture, National Wetlands Inventory, www.nwi.fws.gov/ [accessed 11/24/09].



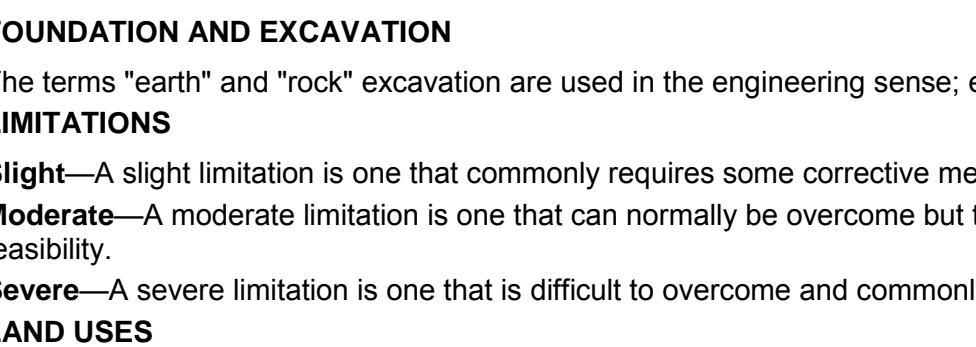
Martin County is blessed with an abundance of water. The Tug Fork River (seen above from the Ky. 40 bridge) and Curtis Crum Reservoir provide water to the Martin County Water District. Photo by Dan Carey, Kentucky Geological Survey.



The Honey Branch Regional Business Park is a public and private development partnership of Floyd, Johnson, Magoffin, Martin, and Pike Counties. Consisting of over 300 acres on a reclaimed mountaintop mining site, the park's tenants include Schlumberger Inc., an oil and gas well services company, and Consolidated Pipe, a pipe supplier to the region. In addition, Martin County Economic Development Authority has a 50,000-square-foot speculative building located in the park. Photo by Dan Carey, Kentucky Geological Survey.



Sandstone, siltstone, shale, and coal of unit 2 are exposed along Airport Road. Photo by Dan Carey, Kentucky Geological Survey.



Virtually every rock type in the county is exposed along the newly aligned Ky. 645 near Inez. Photo by Dan Carey, Kentucky Geological Survey.

Copyright 2007 by the University of Kentucky, Kentucky Geological Survey. For information on obtaining copies of this map and other Kentucky Geological Survey maps and publications call our Public Information Center at 859.257.3898 or 877.778.7827 (toll free). Visit the KGS World Wide Web site at www.uky.edu/kgs.

Coal has been central to the Martin County economy. From 1879 to 2004, 391 million tons were produced; 202 million from underground and 189 million from surface mining. Production declined from a high of 18.1 million tons in 1985 to 8.4 million tons in 2004. Surface mining has changed the face of Martin County (left). Post-mining land uses have included a federal prison, regional airport, and regional industrial park. Construction on reclaimed areas may require measures to prevent differential settlement of foundations. Aerial photos from the U.S. Department of Agriculture Farm Services Administration, National Aerial Imagery Program, 2004.

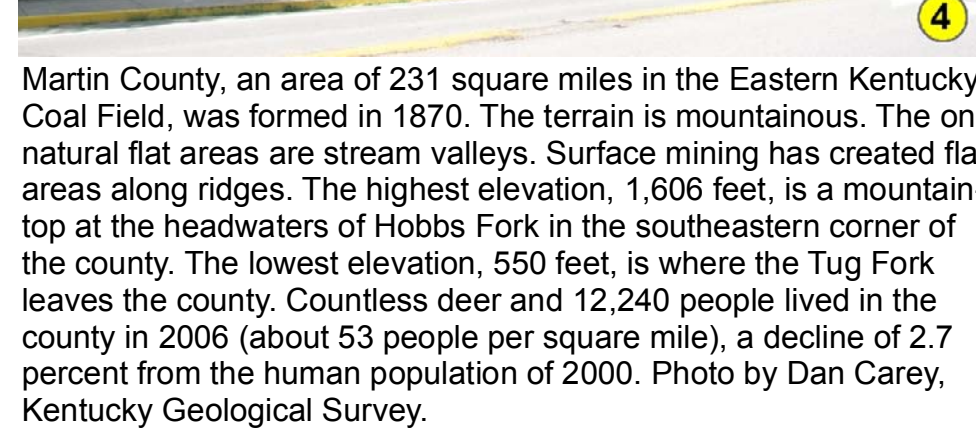
For Planning Use Only
This map is not intended to be used for selecting individual sites. Its purpose is to inform land-use planners, government officials, and the public in a general way about geologic bedrock conditions that affect the selection of sites for various purposes. The properties of thick soils may supersede those of the underlying bedrock and should be considered on a site-to-site basis. At any site, it is important to understand the characteristics of both the soils and the underlying rock. For further assistance, contact the Kentucky Geological Survey, 669.257.5000. For more information, visit the KGS Community Development Planning Web Site at kgsweb.uky.edu/download/kgsplanning.htm.

Additional Resources

- www.kyhome.com/inez/ Inez/Martin County GIS
- www.uky.edu/kgs/ University of Kentucky Cooperative Extension Service
- www.digsandy.org/ Big Sandy Area Development District
- www.kentucky.com/inez/ Kentucky Economic Development Information System
- www.uky.edu/KentuckyAtlas21159.html Kentucky Atlas and Gazetteer, Martin County
- quickfacts.census.gov/qd/states/21/21159.html U.S. Census data
- kgsweb.uky.edu/download/kgsplanning.htm Planning information from the Kentucky Geological Survey

References Cited

- Blanford, S.J., and Moore, A.K., 2005. Soil survey of Lawrence and Martin Counties, Kentucky. U.S. Department of Agriculture, Natural Resources Conservation Service, 140 p.
- Carey, D.I., and Slickney, J.F., 2004. Groundwater resources of Martin County, Kentucky. Kentucky Geological Survey, ser. 12, County Report 77, www.uky.edu/KGS/water/loray/geosites/NormalMartin.htm [accessed 9/10/07].
- Murphy, M.L., 2005a. Spatial database of the Kernt quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-178. Adapted from Hudde, J.W., and Englund, K.J., 1992. Geology of the Kernt quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-178, scale 1:24,000.
- Murphy, M.L., 2005b. Spatial database of the Lancer quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-241. Adapted from Rice, C.L., 1964. Geology of the Lancer quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-241, scale 1:24,000.
- Murphy, M.L., 2005c. Spatial database of the Naugatuck and Debaron quadrangles, eastern Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-879. Adapted from Alvord, D.C., 1971. Geologic map of the Naugatuck and Debaron quadrangles, eastern Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-879, scale 1:24,000.
- Murphy, M.L., 2005d. Spatial database of the Richmond quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-241. Adapted from Rice, C.L., 1964. Geology of the Richmond quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-241, scale 1:24,000.
- Murphy, M.L., 2005e. Spatial database of the Williamson quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-187. Adapted from Alvord, D.C., and Trent, V.A., 1962. Geology of the Williamson quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-187, scale 1:24,000.
- Murphy, M.L., and Duncan, R.S., 2005. Spatial database of the Thomas quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-227. Adapted from Rice, C.L., 1963. Geology of the Thomas quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-227, scale 1:24,000.
- Murphy, M.L., and Thompson, M.F., 2005. Spatial database of the Inez quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-226. Adapted from Outcrops, W.F., 1963. Geology of the Inez quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-226, scale 1:24,000.
- Murphy, M.L., and Tyra, M.A., 2005. Spatial database of the Varney quadrangle, Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-180. Adapted from Hudde, J.W., and Englund, K.J., 1962. Geology of the Varney quadrangle, Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-180, scale 1:24,000.
- Murphy, M.L., and Yang, X.Y., 2005. Spatial database of the Mio quadrangle, Kentucky-West Virginia, and the part of the Webb quadrangle in Kentucky. Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-543. Adapted from Jenkins, E.C., 1966. Geologic map of the Mio quadrangle, Kentucky-West Virginia, and the part of the Webb quadrangle in Kentucky. U.S. Geological Survey Geologic Quadrangle Map GQ-543, scale 1:24,000.
- U.S. Department of Agriculture, Natural Resources Conservation Service, no date. Landslide prevention in eastern Kentucky. U.S. Department of Agriculture, National Wetlands Inventory, www.nwi.fws.gov/ [accessed 11/24/09].



Martin County is blessed with an abundance of water. The Tug Fork River (seen above from the Ky. 40 bridge) and Curtis Crum Reservoir provide water to the Martin County Water District. Photo by Dan Carey, Kentucky Geological Survey.