APPENDIX J
RESOURCE AGENCY COORDINATION RESPONSES

Summary of Resource Agency Comments
KY 59/KY 344/KY 377 Planning Study
Item Number 9-231.00

1. Morehead Tourism Office: Requested bike lanes on KY 377
2. Kentucky State Agencies:
    - Office of Adventure Tourism: Supported bike lanes, wide shoulders, and bicycle signage
    - Division of Water:
        - 5.2 miles (34.6-39.8) of Kinniconick Creek (an Outstanding Water Resource) would be impacted.
        - Habitat and water quality cannot be degraded. BMP should be used to insure that.
        - No stream construction permit, or other certification or formal approval is needed.
        - Located in Karst region (groundwater highly sensitive to surface activities).
        - Sinkholes are located within project area.
        - Groundwater wells and springs are located within a one-mile radius of project area. A survey of groundwater users within a minimum of one-half-mile from the project area should be surveyed.
        - A Groundwater Protection Plan will be necessary.
        - During construction, daily inspections and periodic monitoring of Wilkins Blue Hole and Harris Spring to identify potential impacts to ground water are recommended.
        - Noted that KDFWR has a stream restoration project in study area.
        - Stormwater permits (KYR 10) will need to be completed before construction begins.
        - Spoil areas on private property will also need a KYR 10 permit.
    - Division of Waste Management: Usual precautions for project solid waste, underground storage tanks, asbestos, and lead paint.
    - Division of Air Quality: Usual precautions for fugitive emissions and open burning. Encouraged use of alternatively fueled equipment, emission controls on equipment, and reduced idling time.
    - Heritage Council: No major concerns at this early project stage with limited information, but concerned about possible impacts which may be identified at later stages of project development.
    - Mine Reclamation and Enforcement: Gas well and lines are located within the project area, but no mining operations (and hence no Acid Mine Drainage). Wetlands, endangered species, water wells, springs, and Karst terrain all present in project area.
    - Airport Zoning Commission: Permit required if construction cranes exceed 200 feet above ground level.
    - Department of Fish and Wildlife Resources (KDFWR):
        - Listed threatened or endangered species.
        - Advised of stream restoration project on Kinniconick and Indian Creeks.
        - Discussions with KDFWR and USACE may be necessary.
        - Recommended discussions with Daniel Boone National Forest.
        - Urged use of erosion control measures.

- State Nature Preserves Commission:
    - Listed known federal and state threatened or endangered species.
    - Advised of Designated Outstanding Water Resource and requirements.
    - Urged consultation with U of L Stream Institute regarding potential for altered hydrology, geomorphology, and channel stability of Kinniconick Creek and its tributaries. Noted that U of L is currently assessing the stream restoration potential of the upper Kinniconick system.
    - Urged mitigation measures for impacts.
- Department of Education: Urged coordination with Lewis and Rowan County School Systems.

3. Federal Agencies:
    - Fish and Wildlife Service:
        - Urged avoidance of wetlands and coordination with USACE
        - Asked that KYTC inform them of any anticipated interrelated and interdependent actions.
        - Provided a list of threatened or endangered species, including one (Northern Long Eared Bat) proposed for addition to those lists. Elaborated on mitigation measures associated with each.
    - FAA: Sees no construction impacts on surrounding airports.
    - USDA NRCS – Soil rating points illustrate that the study area has only small areas of prime farmland located in flat areas along KY 377 in Rowan County, near and around the KY 377/KY 59 intersection, the KY 344/KY 59 intersection and along KY 9 west of the KY 59/9 intersection.

MOREHEAD
TOURISM

June 30, 2015

Joe Callahan
Kentucky Transportation Cabinet
District 9 – Flemingsburg Office
P.O. Box 347
822 Elizaville Avenue
Flemingsburg, Ky. 41041

Mr. Callahan,

On behalf of Morehead Tourism Commission and the Morehead Trail Town Task Force, we are requesting your support in adding bike lanes to the KY 377 proposed improvement project.

As a certified Kentucky Trail Town we are continually looking for opportunities to improve access points for trail users. One item on our strategic plan is bike lanes in Morehead and Rowan County. The number of cyclists on our roadways continues to increase and making their experience on Kentucky roads safer is imperative.

We appreciate your consideration and would be happy to assist or present our case.

Sincerely,

Joy C. Brown
Executive Director

111 East First Street • Morehead, Ky. 40351
phone 606.780.4342 • 606.780.9694 • toll-free 855.270.8733 • fax 606.780.0675
www.moreheadtourism.com

From: Wheat, Seth (TAH)
Sent: Thursday, July 02, 2015 9:39 AM
To: Sawyers, Matt (TAH)
Subject: RE: Scanned from a Xerox Multifunction Printer

The Office of Adventure Tourism would like to express support for the addition of bike lanes, widened shoulders and the placement of cycling signage with project # 9-231.00 (roadway work on KY-59, KY-344, and KY-377).

The project area of # 9-231.00 9(Project) is in an area where the Office of Adventure Tourism has worked closely over the last few years.

The city of Morehead is a certified Kentucky Trail Town, and therefore has a dedicated Plan of Action to deal with developments of adventure tourism related activities. The Trail Town Task Force could work with the city and county governments to help develop a maintenance agreement with the Kentucky Transportation Cabinet. Having worked to develop and promote their current adventure tourism offerings, the addition of quality cycling routes would strengthen the local economy through the increased tourism visitation, as well as provide more access to citizens of the Project area for healthy activities.

The Sheltowee Trace National Recreation Trail is the longest, and one of the most popular, hiking trails in Kentucky. This Project area provides a potential extension of the Sheltowee Trace's corridor to the north, providing for additional miles of adventure tourism activities. The addition of quality cycling routes in this project area could provide a great tourism benefit to the hiking trail as numerous cyclists also participate in hiking activities and vice versa.

Seth Wheat
Kentucky Office of Adventure Tourism
500 Mero St.
24th Floor
Frankfort, KY 40601
Office: (502) 564-4270 x.167
Cell: (502) 330-5114

ENERGY AND ENVIRONMENT CABINET

Steven L. Beshear
Governor

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-2150
FAX (502) 564-4245
www.dep.ky.gov

Leonard K. Peters
Secretary

R. Bruce Scott
Commissioner

July 17, 2015

Joe Callahan
Kentucky Transportation Cabinet
District 9-Flemingsburg Office
P.O. Box 347
822 Elizaville Avenue
Flemingsburg, KY 41041

Re: SERO 2015-20
KY 59/KY 344/ KY 377-Planning Study
Rowan and Lewis Counties
Item No. 9-231.00

Mr. Callahan,

The Energy and Environment Cabinet serves as the state clearinghouse for review of environmental documents generated pursuant to the National Environmental Policy Act (NEPA). Within the Cabinet, the Commissioner's Office in the Department for Environmental Protection coordinates the review for Kentucky state agencies.

We received your letter dated June 12, 2015. Your letter requested the departments input on a Planning Study for KY 59/KY 344/ KY 377 - Rowan and Lewis Counties. The following comments are submitted in reference to this project.

Comments from the Division of Water:

5.2 miles of Kinniconick Creek would be impacted (34.6-39.8). This segment of Kinniconick is an Outstanding State Resource Water. Habitat and water quality of this segment of the creek cannot be degraded. Best management practices

shall be utilized and maintained so that water quality within this segment will not be degraded. Best management practices shall be utilized throughout the project to reduce runoff from the project into adjacent surface waters.

Please be advised that there are no permits, certifications or formal approvals needed from the Groundwater Section for this project to go forward; however, the site is underlain by karst and therefore located in a groundwater region that is highly sensitive to groundwater contamination from surface activities. There are sinkholes located within the footprint of the proposed construction/highway realignment and there are groundwater wells and springs within a one-mile radius of site activities. There are activities associated with the project's construction and road realignment that will require a Groundwater Protection Plan so it is recommend that these specific activities be identified and Best Management Practices (BMP) developed in regards to 401 KAR 5:037 to protect the groundwater from potential contaminant events, especially in the area of active sinkhole development. A survey of groundwater users, to include the number of water wells and springs within a minimum ½-mile radius of the construction activities should be conducted before construction activities begin and BMPs developed to protect them from construction activities. Daily inspections and periodic monitoring of Wilkins Blue Hole and Harris Spring to identify potential impacts to groundwater from road construction activities is recommended.

Kentucky Revised Statute KRS 151.250 provides for exemption for the Department of Highways; therefore, a stream construction permit will not be required.

Please note the following:

1) Kentucky Department of Fish and Wildlife Resources have a stream restoration project that has been completed that is in the project boundary;
2) All necessary stormwater (KYR10 permits) will need to be completed prior to construction start;
3) Spoil areas on private property will need the KYR10 permit and if applicable the necessary floodplain permits for fill.

<u>Comments from the Division of Waste Management:</u>

All solid waste generated by this project must be disposed at a permitted facility. If underground storage tanks are encountered, they must be properly addressed. If asbestos, lead paint, and/or other contaminants are encountered during this project, they must be properly addressed.

Comments from the Division of Air Quality:

Kentucky Division for Air Quality Regulation **401 KAR 63:010** Fugitive Emissions states that no person shall cause, suffer, or allow any material to be handled, processed, transported, or stored without taking reasonable precaution to prevent particulate matter from becoming airborne. Additional requirements include the covering of open bodied trucks, operating outside the work area transporting materials likely to become airborne, and that no one shall allow earth or other material being transported by truck or earth moving equipment to be deposited onto a paved street or roadway. Please note the Fugitive Emissions Fact Sheet.

Kentucky Division for Air Quality Regulation **401 KAR 63:005** states that open burning is prohibited. Open Burning is defined as the burning of any matter in such a manner that the products of combustion resulting from the burning are emitted directly into the outdoor atmosphere without passing through a stack or chimney. However, open burning may be utilized for the expressed purposes listed on the Open Burning Brochure.

The Division would like to offer the following suggestions on how this project can help us stay in compliance with the NAAQS. More importantly, these strategies are beneficial to the health of citizens of Kentucky.

§ Utilize alternatively fueled equipment.

§ Utilize other emission controls that are applicable to your equipment.

§ Reduce idling time on equipment.

Kentucky Heritage Council:

The agency must ensure compliance with relevant state and federal regulations regarding cultural resources. These may include any or all of the following: the Advisory Council on Historic Preservation's Rules and Regulations for the Protection of Historic and Cultural Properties(36CFR, Part 800) pursuant to the National Historic Preservation Act of 1966; the National Environmental Policy Act of 1969 Executive Order 11593; Kentucky Antiquities Act; Kentucky Cave Protection Act; and graves protection legislation.

This review is based upon the information that was provided by the applicant. An endorsement of this project does not satisfy, or imply, the acceptance or issuance of any permits, certifications or approvals that may be required from this agency under Kentucky Revised Statutes or Kentucky Administrative

Regulations. Such endorsement means this agency has found no major concerns from the review of the proposed project as presented other than those stated as conditions or comments.

If you should have any questions, please contact me at (502) 564-2150, ext. 3125.

Sincerely,

Ronald T Price

Ronald T. Price
State Environmental Review Officer
Kentucky Department for Environmental Protection

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR NATURAL RESOURCES

Steven L. Beshear
Governor

Leonard K. Peters
Secretary

Steve Hohmann
Commissioner

2 Hudson Hollow
Frankfort, Kentucky 40601
Phone (502) 564-6940
Fax (502) 564-5698
www.eec.ky.gov
www.dnr.ky.gov

June 17, 2015

Attn: Joe Callahan-KTC
District 9-Flemingsburg Office
Kentucky Transportation Cabinet
P.O. Box 347, 822 Elizaville Avenue
Flemingsburg, KY 41041

RE: Planning Study
KY 9 in Vanceburg to KY 799 in Triplett
Rowan and Lewis Counties
Item No. 9-231.00

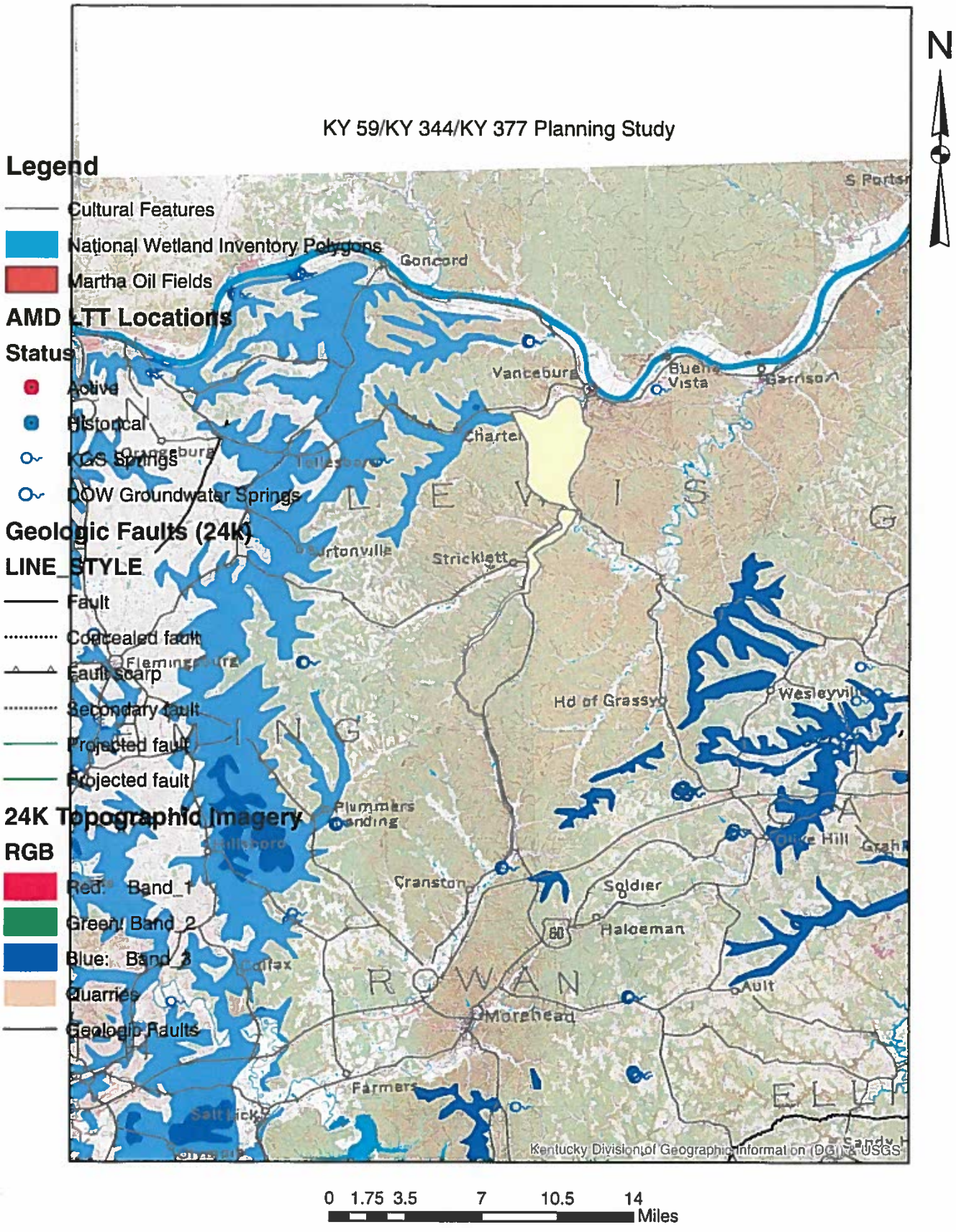
Comments about Proposed Study Plan:

- No mining operations are located within the study area.
- Gas wells and gathering lines are located within the project study area.
- No Acid Mine Drainage occurs within the project study area.
- Wetland Areas and endangered species may be an environmental concern for construction in the study area.
- Several water wells and springs exist within the proposed study area.
- Karst terrain may be present in and around the project study area.

Sincerely,

Wes Jones ~~Director~~
#2 Hudson Hollow Complex
Frankfort, KY 40601
Email: wes.jones@ky.gov

Cc: Jkh, File


KY 59/KY 344/KY 377 Planning Study
Legend
Cultural Features
National Wetland Inventory Polygons
Martha Oil Fields
AMD LTT Locations
Status
Active
Historical
KGS Springs
DOW Groundwater Springs
Geologic Faults (24k)
LINE_STYLE
Fault
Concealed fault
Fault scarp
Secondary fault
Projected fault
Projected fault
24K Topographic Imagery
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
Quarries
Geologic Faults
N
Concord
Vanceburg
Buena Vista
Charter
Stricklett
Hd of Grassy
Wesleyville
Plummers Landing
Cranston
Soldier
Haldeman
Morehead
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Kentucky Division of Geographic Information (DGI) & USGS
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TRANSPORTATION CABINET

Steven L. Beshear
Governor

Department of Highways District 9 Office
822 Elizaville Road
Flemingsburg, KY 41041
(606) 845-2551

Michael W. Hancock, P.E.
Secretary

June 12, 2015

Mr. Billy Ratliff
Director
Division of Mine Reclamation and Enforcement
2 Hudson Hollow
Frankfort KY 40601

Dear Mr. Ratliff:

Subject: KY 59/KY 344/KY 377 Planning Study
KY 9 in Vanceburg to KY 799 in Triplett
Rowan and Lewis Counties
Item No. 9-231.00

The Kentucky Transportation Cabinet (KYTC) is requesting your agency's input and comments on a planning study to determine the need and potential impacts for a proposed highway project, improving the transportation corridor between Morehead and Vanceburg, Kentucky. KYTC has assembled a study team to evaluate improvements along KY 59, KY 344 and KY 377 in Rowan and Lewis counties within the subject limits mentioned above.

The draft purpose and need of this project is as follows:

The purpose of this study is to improve the safety of three separate roadways (KY 59, KY 344, and KY 377), which collectively serve as the most direct route for travel between the cities of Vanceburg and Morehead for employment, educational, medical, and recreational opportunities.

The study derives from the following:

- *Narrow lanes and shoulders*
- *Sub-standard horizontal alignments and sight distances*
- *Inadequate travel times*
- *Infrequent passing opportunities*
- *Excessive shoulder drop offs and unstable slopes*

During the development of this study, comments will be solicited from federal, state, and local agencies, as well as other interested persons and the general public, in accordance with principles set forth in the National Environmental Policy Act (NEPA) of 1969. Other KYTC offices or consultants working on behalf of KYTC may have previously contacted you seeking more detailed data or information to assist them in completing the environmental portion of the study.

The planning study includes a scoping process for the early identification of potential alignments, environmental issues, or other impacts related to the improvement of the study corridor. Early identification of issues or concerns will minimize negative impacts on alternatives as we move forward. As a part of this study, an environmental overview has been developed by subject matter experts. The results of the overview are summarized for your use in the enclosed exhibits.

Enclosed for your agency's review and comment are:

- Project Study Area
- Environmental Constraints
- Existing Traffic Volumes
- 2010-2013 Reported Vehicle Crash History
- Existing Condition Inventory

In particular, we are asking that you provide the following information:

- Comments on the draft purpose and need for the project
- Significant issues or concerns in the project area that may need to be addressed so that a project can be adequately scoped
- Any conservation or development plans your agency or organization has ongoing or is aware of in the corridor area
- Locations of any known areas, issues, or resources within the corridor area that should be considered when developing alignment alternatives so that the impacts may be minimized, mitigated, or avoided early in the process
- Any mitigation strategies that should be considered during project development

We respectfully ask that you provide us with your comments by July 15, 2015, to ensure timely progress in this planning effort. KYTC appreciates any input you can provide concerning this study. Please direct any comments, questions, or requests for additional information to:

Joe Callahan, Kentucky Transportation Cabinet
District 9-Flemingsburg Office
P. O. Box 347
822 Elizaville Avenue
Flemingsburg, KY 41041
(606) 845-2551
Joe.Callahan@ky.gov

Please include a return address on any correspondence. Thank you in advance for your response.

Sincerely,

Bart Bryant, PE
Chief District Engineer

Enclosures

From:	Callahan, Joe (KYTC-D09)
To:	Coffey, Annette
Subject:	FW: KY 59 / KY 344 / KY 377 Planning Study Rowan and Lewis Counties Item No. 9-231.00
Date:	Tuesday, June 23, 2015 4:28:58 PM

From: Houlihan, John (KYTC)
Sent: Tuesday, June 16, 2015 2:42 PM
To: Callahan, Joe (KYTC-D09)
Subject: KY 59 / KY 344 / KY 377 Planning Study Rowan and Lewis Counties Item No. 9-231.00

Mr. Callahan,

The only issue I can see with the proposal, if any construction equipment (i.e. cranes) that exceeds 200 feet above ground level must have a permit from the KAZC prior to operating the equipment. Please see below regulation with yellow highlight.

602 KAR 50:030. Jurisdiction of the Kentucky Airport Zoning Commission.

RELATES TO: KRS 183.861, 183.867(2), 183.865, 183.867, 183.868, 183.870 STATUTORY AUTHORITY: KRS 183.861

NECESSITY, FUNCTION, AND CONFORMITY: KRS 183.861 authorizes the Airport Zoning Commission to promulgate administrative regulations concerning the use of land within and around designated airports in the Commonwealth. KRS 183.867(2) authorizes the commission to promulgate administrative regulations concerning jurisdiction over zoning of areas over which jurisdiction is assumed. This administrative regulation establishes the areas over which the Kentucky Airport Zoning Commission has zoning jurisdiction and establishes whether a permit shall be required from a property owner.

Section 1. Zoning Jurisdiction. The commission shall have zoning jurisdiction over the airspace above and around the airports designated in KRS 183.861. This jurisdiction shall include the airspace that lies above the surface extending outward and upward at one (1) of the following slopes:

(1) If an airport has at least one (1) runway that is 3,200 feet or more in length, the slope shall be 100 to one (1) for a horizontal distance of 20,000 feet from the closest point of the nearest runway; or

(2) If an airport's longest runway is less than 3,200 feet in actual length, the slope shall be fifty (50) to one (1) for a horizontal distance of 10,000 feet from the nearest point of the nearest runway.

Section 2. Airspace. (1) The commission shall have jurisdiction from the ground upward within the limits of the primary and approach surfaces as depicted on Airport Zoning Maps approved by the Kentucky Airport Zoning Commission, in accordance with KRS 183.867.

(2) The commission shall have jurisdiction over the airspace of the Commonwealth that exceeds 200 feet in height above ground level.

(3) The owner or person with control of a structure that penetrates or may penetrate the airspace over which the commission has jurisdiction shall apply for a permit from the commission, in accordance with 602 KAR 50:090. (KAV-9-1; 1 Ky.R. 807; eff. 5-14-75; Am. 2 Ky.R. 306; eff. 3-10-76; 5 Ky.R. 599; eff. 3-7-79; 10 Ky.R. 445; eff. 1-4-84; 14 Ky.R. 267; eff. 9-10-87; 19 Ky.R. 800; eff. 11-4-92; 27 Ky.R. 2228; 2774; eff. 4-9-2001; 39 Ky.R. 1058; 1881; eff. 4-5-2013.)

If you have any questions, please let me know. Thank you

Kentucky Airport Zoning Commission (KAZC)
John Houlihan, Administrator
90 Airport Road, Building 400
Frankfort, KY 40601
Direct Line 502-564-0310, Cell 502-330-3955, Office 502-564-4480, Fax 502-564-7953
KAZC webpage: http://transportation.ky.gov/Aviation/Pages/Zoning-Commission.aspx

18 June 2015

Kentucky Transportation Cabinet
District 9 – Flemingsburg Office
Attn: Joe Callahan
P.O. Box 347
822 Elizaville Avenue
Flemingsburg, KY 41041

RE: KY 59 / KY 344 / KY 377 Planning Study
KY 9 in Vanceburg to KY 799 in Triplett
Rowan and Lewis Counties
Item No. 9-231.00

Dear Mr. Callahan:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for information pertaining to the subject project and respectfully submits the following comments.

The federally-listed Northern Long-eared bat *(Myotis septentrionalis)*, Indiana bat *(Myotis sodalis)*, and Snuffbox *(Epioblasma triquetra)* are known to occur within close proximity to the project site. The KDFWR asks that alternatives that reduce the amount of stream impacts and tree-clearing while accomplishing project goals be strongly considered. KDFWR also recommends discussions with the U.S. Forest Service as the southern portion of the project meanders through the Daniel Boone National Forest.

Further, the KDFWR has a stream restoration site on Kinniconick Creek and Indian Creek within very close proximity to the proposed project. We strongly urge that site be left undisturbed and alternatives considered that do not enter this site. Discussions with KDFWR and the U.S. Army Corps of Engineers may need to be undertaken if other alternatives are not feasible.

To minimize impacts to the aquatic environment, the KDFWR recommends that erosion control measures be developed and implemented prior to construction to reduce siltation into

waterways located within the project area. Such erosion control measures may include, but are not limited to silt fences, staked straw bales, brush barriers, sediment basins, and diversion ditches. Erosion control measures will need to be installed prior to construction and should be inspected and repaired regularly as needed.

I hope this information is helpful to you, and if you have questions or require additional information, please call me at (502) 564-7109 extension 4453.

Sincerely,

Dan Stoelb
Environmental Scientist

Cc: Environmental Section File

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES

Steven L. Beshear
Governor

#1 Sportsman's Lane
Frankfort, Kentucky 40601
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Bob Stewart
Secretary

Gregory K. Johnson
Commissioner

18 June 2015

Kentucky Transportation Cabinet
District 9 – Flemingsburg Office
Attn: Joe Callahan
P.O. Box 347
822 Elizaville Avenue
Flemingsburg, KY 41041

RE: KY 59 / KY 344 / KY 377 Planning Study
KY 9 in Vanceburg to KY 799 in Triplett
Rowan and Lewis Counties
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Further, the KDFWR has a stream restoration site on Kinniconick Creek and Indian Creek within very close proximity to the proposed project. We strongly urge that site be left undisturbed and alternatives considered that do not enter this site. Discussions with KDFWR and the U.S. Army Corps of Engineers may need to be undertaken if other alternatives are not feasible.

To minimize impacts to the aquatic environment, the KDFWR recommends that erosion control measures be developed and implemented prior to construction to reduce siltation into waterways located within the project area. Such erosion control measures may include, but are

not limited to silt fences, staked straw bales, brush barriers, sediment basins, and diversion ditches. Erosion control measures will need to be installed prior to construction and should be inspected and repaired regularly as needed.

I hope this information is helpful to you, and if you have questions or require additional information, please call me at (502) 564-7109 extension 4453.

Sincerely,

Dan Stoelb
Environmental Scientist

Cc: Environmental Section File

Steven L. Beshear
Governor

Dr. Leonard Peters
Secretary
Energy and Environment Cabinet

Donald S. Dott, Jr.
Director

Commonwealth of Kentucky
Kentucky State Nature Preserves Commission
801 Teton Trail
Frankfort, Kentucky 40601-1403
502-573-2886 Voice
502-573-2355 Fax

July 15, 2015

Joe Callahan
Kentucky Transportation Cabinet
District 9-Flemingsburg Office
P.O. Box 347 822 Elizaville Avenue
Flemingsburg, KY 41041

RE: KY 59/KY 344/KY 377 Planning Study, KY 9 in Vanceburg to KY 799 in Triplett Rowan and Lewis Counties. Item No. 9-231.00

Thank you for the opportunity to comment on the proposed project. After a review of our natural heritage database and consultation with staff, we have determined that there are several issues that require further consideration.

1) There are known populations of state and federally listed species that will be affected by this project, including but not limited to, the freshwater mussels Snuffbox, Salamander mussel, and Little Spectaclecase; the fishes Longhead Darter and Trout-perch; the aquatic amphibian Eastern Hellbender; a state endangered plant, Kentucky's Lady's-slipper orchid; also, Indiana bats are known to occur in the project area.

2) A Designated Outstanding State Resource Water will be affected by this project and steps must be taken to ensure this does not change the current designated use for aquatic life. Aquatic monitoring for fish and macroinvertebrates should be conducted, within the appropriate sampling period, prior, during, and for at least 2 years following completion of the project.

3) We have concerns about the altered hydrology of this project changing the geomorphology and channel stability within Kinniconick Creek and tributaries within the project area. Consultation with the University of Louisville Stream Institute engineers should be conducted to understand and minimize any possible unintended impacts from the proposed work. The U of L Stream Institute is currently assessing the stream restoration potential of the upper part of the Kinniconick system.

4) Mitigation should be considered for the listed species, wetland losses, and any change to the current aquatic life designated use.

Please feel free to contact me if you have any questions or if we could provide additional information.

Thanks again for the opportunity to comment on this proposed project.

Sincerely,

Donald S. Dott, Jr.

United States Department of Agriculture

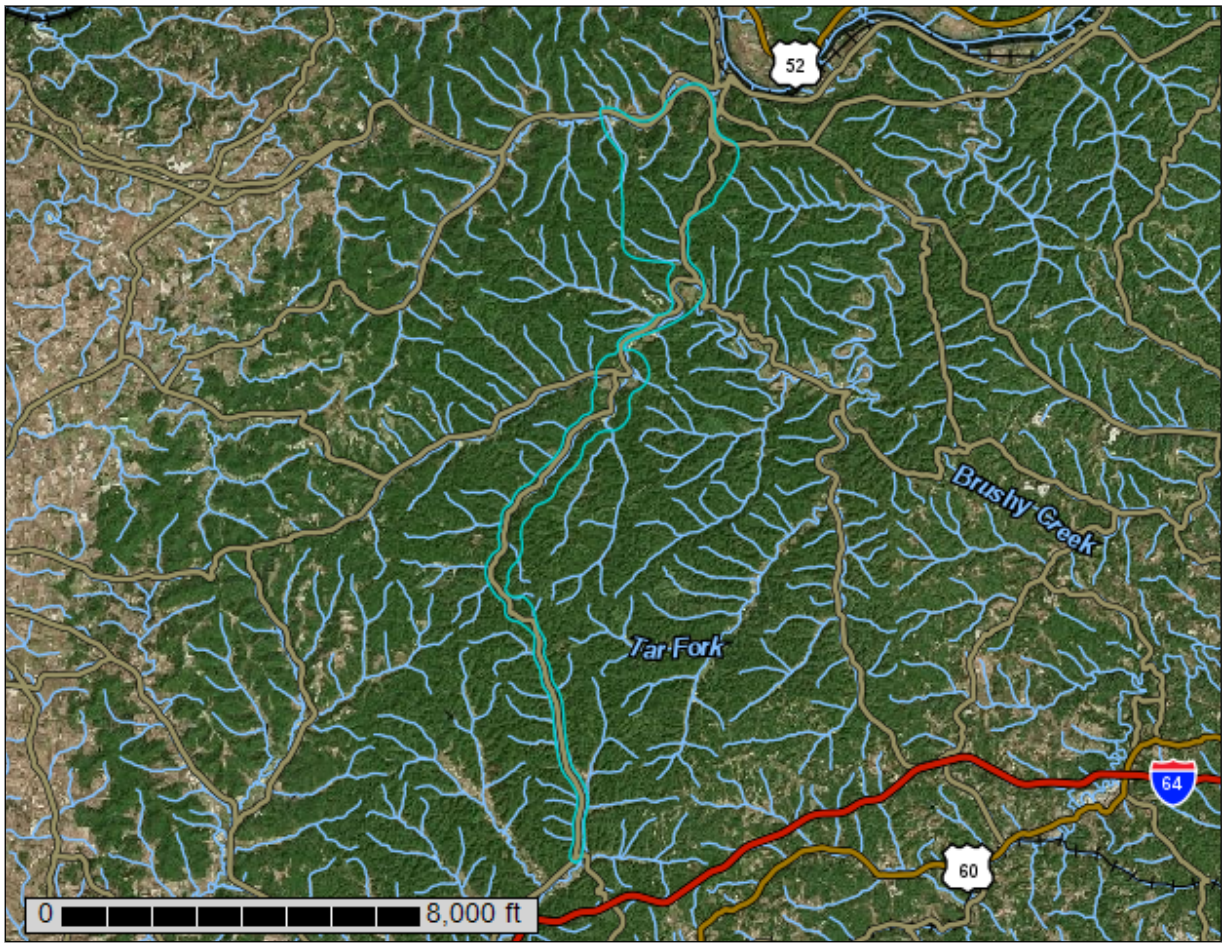
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Lewis County, Kentucky, and Menifee and Rowan Counties, Kentucky

KY 59 - KY 344 - KY 377 Study



February 11, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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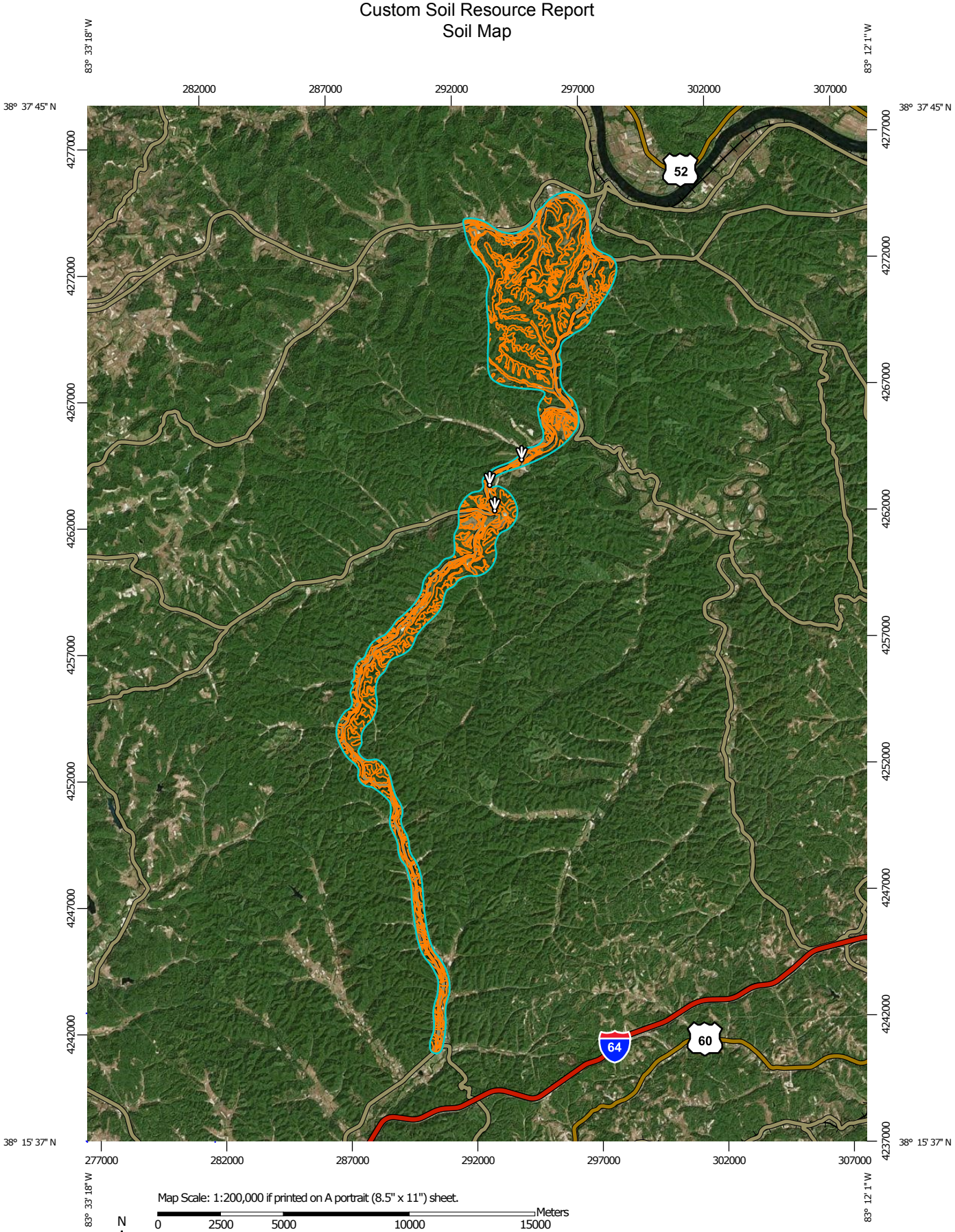
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map


83° 33' 18" W
83° 12' 1" W
38° 37' 45" N
38° 15' 37" N
282000
287000
292000
297000
302000
307000
277000
4277000
4272000
4267000
4262000
4257000
4252000
4247000
4242000
4237000
52
64
60
Map Scale: 1:200,000 if printed on A portrait (8.5" x 11") sheet.
Meters
0 2500 5000 10000 15000
Feet
0 5000 10000 20000 30000
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lewis County, Kentucky
Survey Area Data: Version 12, Sep 15, 2015

Soil Survey Area: Menifee and Rowan Counties, Kentucky
Survey Area Data: Version 10, Sep 17, 2014

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Lewis County, Kentucky (KY135)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BeC2	Beasley silt loam, 6 to 12 percent slopes, rocky, eroded	0.4	0.0%
BhE2	Beasley-Shrouts complex, 12 to 30 percent slopes, very rocky, eroded	11.7	0.1%
BnF2	Berks-Brownsville complex, 30 to 55 percent slopes, very rocky, eroded	5,618.6	41.8%
BoF2	Berks-Brownsville-Shelocta complex, 30 to 65 percent slopes, eroded	370.1	2.8%
BrB	Blairton silt loam, 2 to 6 percent slopes	64.3	0.5%
BrC2	Blairton silt loam, 6 to 12 percent slopes, eroded	201.5	1.5%
BrE2	Blairton silt loam, 12 to 30 percent slopes, eroded	1,371.0	10.2%
BvF2	Brownsville-Berks complex, 30 to 60 percent slopes, eroded	680.1	5.1%
CaE2	Caneyville-Hagerstown-Rock outcrop complex, 12 to 45 percent slopes, eroded	25.6	0.2%
CkF2	Colyer-Trappist silt loams, 12 to 60 percent slopes, eroded	5.3	0.0%
CoB	Covedale silt loam, 2 to 6 percent slopes	32.3	0.2%
CoC2	Covedale silt loam, 6 to 12 percent slopes, eroded	22.0	0.2%
CtD2	Covedale-Trappist silt loams, 12 to 20 percent slopes, eroded	26.6	0.2%
CtF2	Covedale-Trappist silt loams, 20 to 55 percent slopes, eroded	1,186.9	8.8%
EkB	Elk silt loam, 2 to 8 percent slopes	49.4	0.4%
Hn	Haymond silt loam, frequently flooded	394.2	2.9%
Kn	Kinnick silt loam, occasionally flooded	131.0	1.0%
Mo	Morehead silt loam, rarely flooded	17.2	0.1%
Ne	Newark silt loam, occasionally flooded	63.8	0.5%
No	Nolin silt loam, 0 to 3 percent slopes, occasionally flooded	2.2	0.0%

Lewis County, Kentucky (KY135)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
OtB	Otwell silt loam, 2 to 6 percent slopes	57.6	0.4%
OtC	Otwell silt loam, 6 to 12 percent slopes	30.7	0.2%
ShC	Shelocta gravelly silt loam, 6 to 12 percent slopes	174.3	1.3%
ShD	Shelocta gravelly silt loam, 12 to 20 percent slopes	60.0	0.4%
SkF2	Shelocta silt loam, 20 to 45 percent slopes, eroded	239.2	1.8%
SmB	Shelocta-Skidmore complex, 2 to 6 percent slopes	293.8	2.2%
SrB	Shrouts silty clay loam, 2 to 6 percent slopes	4.8	0.0%
Sx	Skidmore gravelly silt loam, occasionally flooded	802.0	6.0%
TsB	Tilsit silt loam, 2 to 6 percent slopes	12.7	0.1%
TsC	Tilsit silt loam, 6 to 12 percent slopes	3.3	0.0%
Ud	Udorthents, smoothed	52.8	0.4%
W	Water	42.2	0.3%
WoB	Woolper silty clay loam, 2 to 6 percent slopes, rarely flooded	11.8	0.1%
Subtotals for Soil Survey Area		**12,059.6**	**89.6%**
Totals for Area of Interest		**13,455.9**	**100.0%**

Menifee and Rowan Counties, Kentucky (KY645)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BeF	Berks silt loam, 40 to 70 percent slopes	224.7	1.7%
Bo	Bonnie silt loam	12.1	0.1%
Ck	Clifty silt loam	161.9	1.2%
CrC	Cranston gravelly silt loam, 6 to 12 percent slopes	114.5	0.9%
CrD	Cranston gravelly silt loam, 12 to 20 percent slopes	15.8	0.1%
CrE	Cranston gravelly silt loam, 20 to 30 percent slopes	2.6	0.0%
CrF	Cranston gravelly silt loam, 30 to 60 percent slopes	373.2	2.8%
Cu	Cuba silt loam	154.3	1.1%
Jo	Johnsburg silt loam	14.3	0.1%
Mp	Morehead silt loam	86.4	0.6%
Mr	Mullins silt loam	35.7	0.3%
St	Stendal silt loam	26.0	0.2%

Menifee and Rowan Counties, Kentucky (KY645)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
TlB	Tilsit silt loam, 2 to 6 percent slopes	58.0	0.4%
TlC	Tilsit silt loam, 6 to 12 percent slopes	3.1	0.0%
WtA	Whitley silt loam, terrace, 0 to 2 percent slopes	16.9	0.1%
WtB	Whitley silt loam, terrace, 2 to 6 percent slopes	94.0	0.7%
WtC	Whitley silt loam, terrace, 6 to 12 percent slopes	2.5	0.0%
Subtotals for Soil Survey Area		**1,396.3**	**10.4%**
Totals for Area of Interest		**13,455.9**	**100.0%**

Soil Information for All Uses

Suitabilities and Limitations for Use

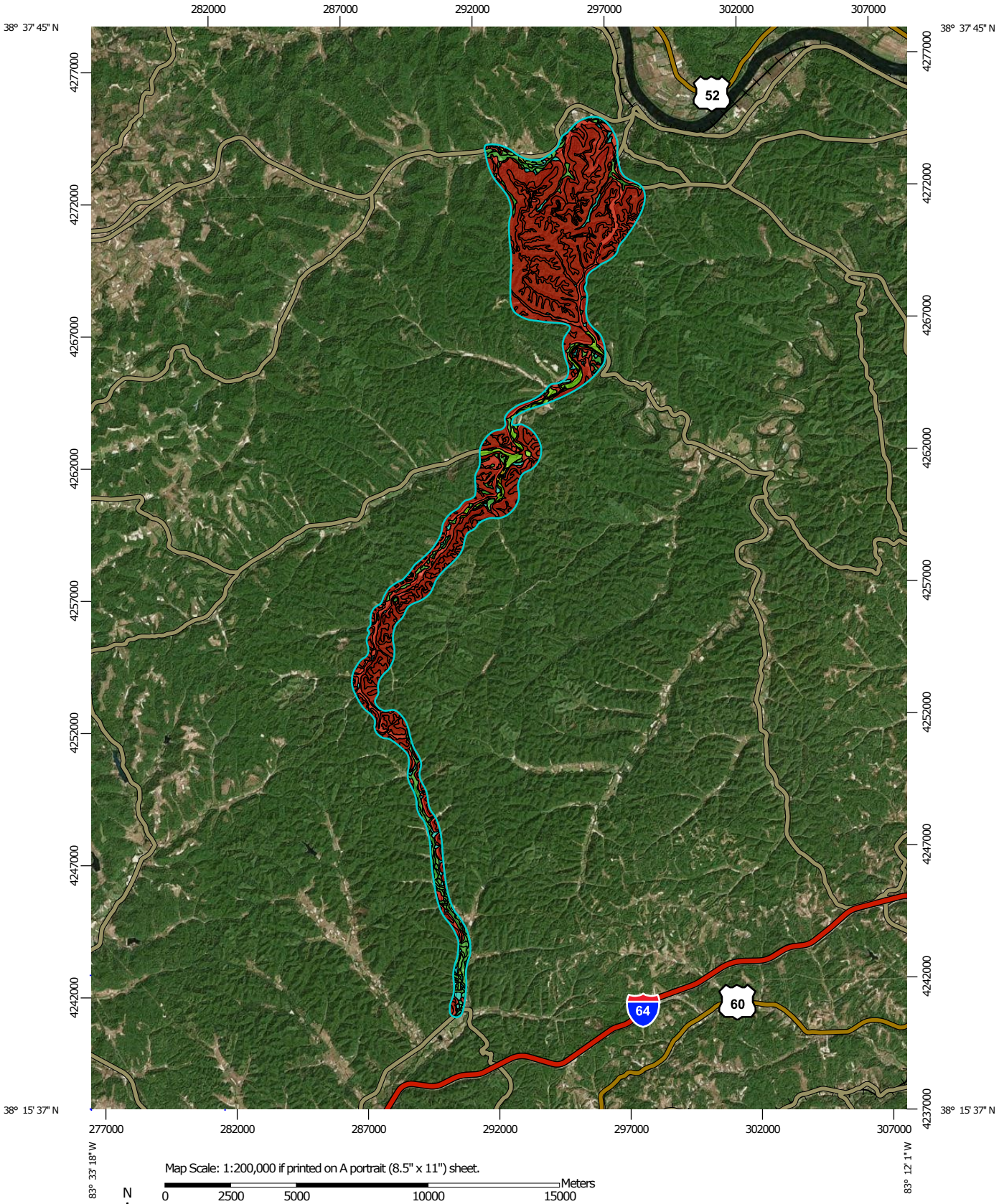
The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification (KY 59 - KY 344 - KY 377 Planning Study, Lewis and Rowan Counties KY)

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.


83° 33' 18" W
83° 12' 1" W
38° 37' 45" N
38° 15' 37" N
277000
282000
287000
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307000
4277000
4272000
4267000
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4257000
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4247000
4242000
4237000
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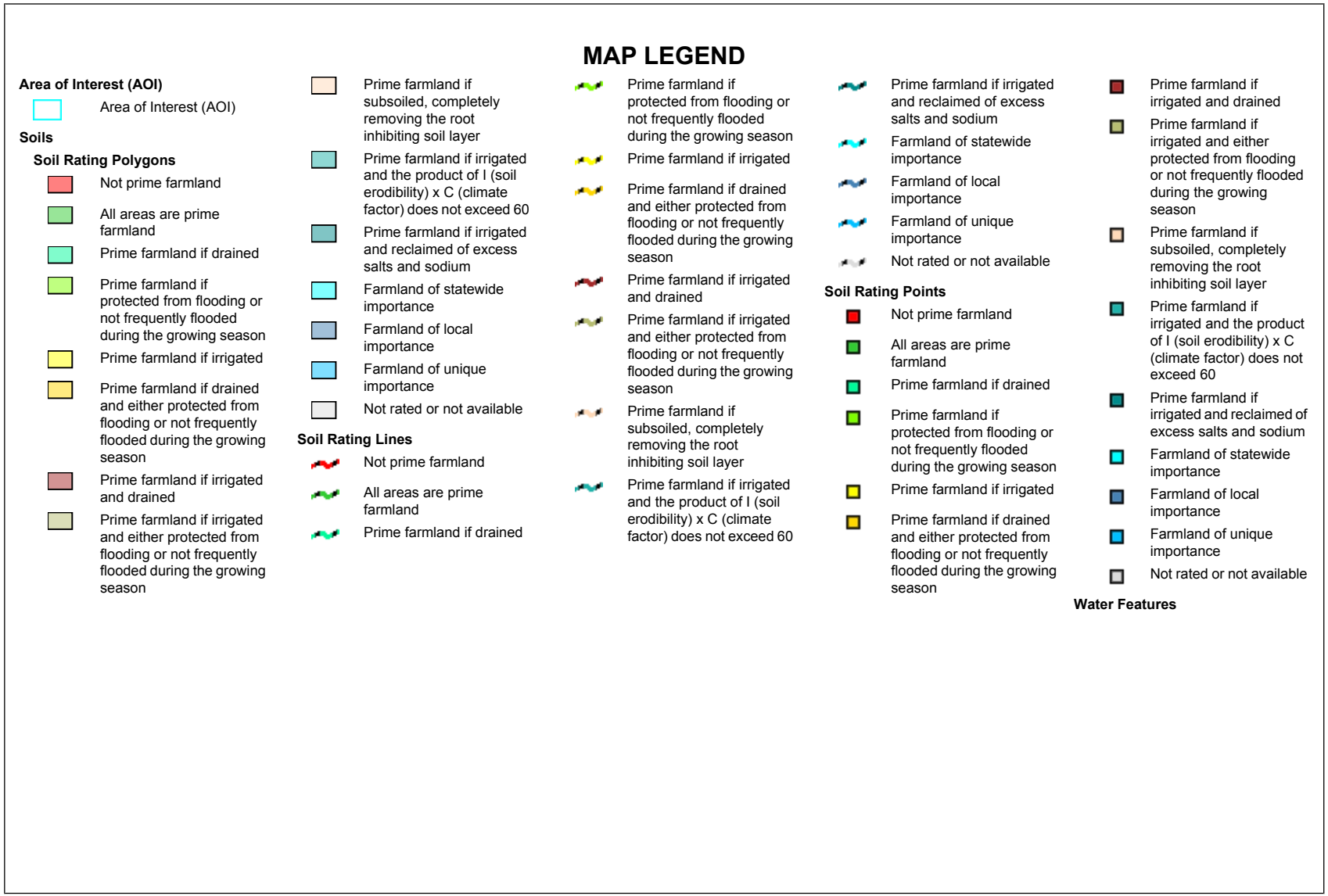
64
60
Map Scale: 1:200,000 if printed on A portrait (8.5" x 11") sheet.
N
0 2500 5000 10000 15000 Meters
0 5000 10000 20000 30000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84


MAP LEGEND
Area of Interest (AOI)
Area of Interest (AOI)
Soils
Soil Rating Polygons
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of local importance
Farmland of unique importance
Not rated or not available
Soil Rating Lines
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of local importance
Farmland of unique importance
Not rated or not available
Soil Rating Points
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of local importance
Farmland of unique importance
Not rated or not available
Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lewis County, Kentucky
Survey Area Data: Version 12, Sep 15, 2015

Soil Survey Area: Menifee and Rowan Counties, Kentucky
Survey Area Data: Version 10, Sep 17, 2014

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Farmland Classification (KY 59 - KY 344 - KY 377 Planning Study, Lewis and Rowan Counties KY)

Farmland Classification— Summary by Map Unit — Lewis County, Kentucky (KY135)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
BeC2	Beasley silt loam, 6 to 12 percent slopes, rocky, eroded	Farmland of statewide importance	0.4	0.0%
BhE2	Beasley-Shrouts complex, 12 to 30 percent slopes, very rocky, eroded	Not prime farmland	11.7	0.1%
BnF2	Berks-Brownsville complex, 30 to 55 percent slopes, very rocky, eroded	Not prime farmland	5,618.6	41.8%
BoF2	Berks-Brownsville-Shelocta complex, 30 to 65 percent slopes, eroded	Not prime farmland	370.1	2.8%
BrB	Blairton silt loam, 2 to 6 percent slopes	All areas are prime farmland	64.3	0.5%
BrC2	Blairton silt loam, 6 to 12 percent slopes, eroded	Not prime farmland	201.5	1.5%
BrE2	Blairton silt loam, 12 to 30 percent slopes, eroded	Not prime farmland	1,371.0	10.2%
BvF2	Brownsville-Berks complex, 30 to 60 percent slopes, eroded	Not prime farmland	680.1	5.1%
CaE2	Caneyville-Hagerstown-Rock outcrop complex, 12 to 45 percent slopes, eroded	Not prime farmland	25.6	0.2%
CkF2	Colyer-Trappist silt loams, 12 to 60 percent slopes, eroded	Not prime farmland	5.3	0.0%
CoB	Covedale silt loam, 2 to 6 percent slopes	All areas are prime farmland	32.3	0.2%
CoC2	Covedale silt loam, 6 to 12 percent slopes, eroded	Farmland of statewide importance	22.0	0.2%
CtD2	Covedale-Trappist silt loams, 12 to 20 percent slopes, eroded	Not prime farmland	26.6	0.2%
CtF2	Covedale-Trappist silt loams, 20 to 55 percent slopes, eroded	Not prime farmland	1,186.9	8.8%
EkB	Elk silt loam, 2 to 8 percent slopes	All areas are prime farmland	49.4	0.4%

Farmland Classification— Summary by Map Unit — Lewis County, Kentucky (KY135)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Hn	Haymond silt loam, frequently flooded	Prime farmland if protected from flooding or not frequently flooded during the growing season	394.2	2.9%
Kn	Kinnick silt loam, occasionally flooded	All areas are prime farmland	131.0	1.0%
Mo	Morehead silt loam, rarely flooded	Prime farmland if drained	17.2	0.1%
Ne	Newark silt loam, occasionally flooded	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	63.8	0.5%
No	Nolin silt loam, 0 to 3 percent slopes, occasionally flooded	Prime farmland if protected from flooding or not frequently flooded during the growing season	2.2	0.0%
OtB	Otwell silt loam, 2 to 6 percent slopes	All areas are prime farmland	57.6	0.4%
OtC	Otwell silt loam, 6 to 12 percent slopes	Farmland of statewide importance	30.7	0.2%
ShC	Shelocta gravelly silt loam, 6 to 12 percent slopes	Farmland of statewide importance	174.3	1.3%
ShD	Shelocta gravelly silt loam, 12 to 20 percent slopes	Not prime farmland	60.0	0.4%
SkF2	Shelocta silt loam, 20 to 45 percent slopes, eroded	Not prime farmland	239.2	1.8%
SmB	Shelocta-Skidmore complex, 2 to 6 percent slopes	All areas are prime farmland	293.8	2.2%
SrB	Shrouts silty clay loam, 2 to 6 percent slopes	Not prime farmland	4.8	0.0%
Sx	Skidmore gravelly silt loam, occasionally flooded	Not prime farmland	802.0	6.0%
TsB	Tilsit silt loam, 2 to 6 percent slopes	All areas are prime farmland	12.7	0.1%
TsC	Tilsit silt loam, 6 to 12 percent slopes	Farmland of statewide importance	3.3	0.0%
Ud	Udorthents, smoothed	Not prime farmland	52.8	0.4%
W	Water	Not prime farmland	42.2	0.3%
WoB	Woolper silty clay loam, 2 to 6 percent slopes, rarely flooded	All areas are prime farmland	11.8	0.1%

Farmland Classification— Summary by Map Unit — Lewis County, Kentucky (KY135)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Subtotals for Soil Survey Area			**12,059.6**	**89.6%**
Totals for Area of Interest			**13,455.9**	**100.0%**

Farmland Classification— Summary by Map Unit — Menifee and Rowan Counties, Kentucky (KY645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
BeF	Berks silt loam, 40 to 70 percent slopes	Not prime farmland	224.7	1.7%
Bo	Bonnie silt loam	Prime farmland if protected from flooding or not frequently flooded during the growing season	12.1	0.1%
Ck	Clifty silt loam	All areas are prime farmland	161.9	1.2%
CrC	Cranston gravelly silt loam, 6 to 12 percent slopes	Farmland of statewide importance	114.5	0.9%
CrD	Cranston gravelly silt loam, 12 to 20 percent slopes	Not prime farmland	15.8	0.1%
CrE	Cranston gravelly silt loam, 20 to 30 percent slopes	Not prime farmland	2.6	0.0%
CrF	Cranston gravelly silt loam, 30 to 60 percent slopes	Not prime farmland	373.2	2.8%
Cu	Cuba silt loam	All areas are prime farmland	154.3	1.1%
Jo	Johnsburg silt loam	Prime farmland if drained	14.3	0.1%
Mp	Morehead silt loam	All areas are prime farmland	86.4	0.6%
Mr	Mullins silt loam	Not prime farmland	35.7	0.3%
St	Stendal silt loam	Prime farmland if drained	26.0	0.2%
TlB	Tilsit silt loam, 2 to 6 percent slopes	All areas are prime farmland	58.0	0.4%
TlC	Tilsit silt loam, 6 to 12 percent slopes	Farmland of statewide importance	3.1	0.0%
WtA	Whitley silt loam, terrace, 0 to 2 percent slopes	All areas are prime farmland	16.9	0.1%
WtB	Whitley silt loam, terrace, 2 to 6 percent slopes	All areas are prime farmland	94.0	0.7%
WtC	Whitley silt loam, terrace, 6 to 12 percent slopes	Farmland of statewide importance	2.5	0.0%
Subtotals for Soil Survey Area			**1,396.3**	**10.4%**
Totals for Area of Interest			**13,455.9**	**100.0%**

Rating Options—Farmland Classification (KY 59 - KY 344 - KY 377 Planning Study, Lewis and Rowan Counties KY)

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

AOI Inventory

This folder contains a collection of tabular reports that present a variety of soil information. Included are various map unit description reports, special soil interpretation reports, and data summary reports.

Map Unit Description (Brief, Generated) (KY 59 - KY 344 - KY 377 Planning Study, Lewis and Rowan Counties KY)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief, Generated) (KY 59 - KY 344 - KY 377 Planning Study, Lewis and Rowan Counties KY)

Lewis County, Kentucky

Map Unit: BeC2—Beasley silt loam, 6 to 12 percent slopes, rocky, eroded

Component: Beasley (85%)

The Beasley component makes up 85 percent of the map unit. Slopes are 6 to 12 percent. This component is on ridges on uplands. The parent material consists of clayey residuum weathered from calcareous shale and/or dolomite. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 12 percent.

Component: Shrouts (5%)

Generated brief soil descriptions are created for major components. The Shrouts soil is a minor component.

Component: Nicholson (4%)

Generated brief soil descriptions are created for major components. The Nicholson soil is a minor component.

Component: McGary (3%)

Generated brief soil descriptions are created for major components. The McGary soil is a minor component.

Component: Other soils (2%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Component: Rock outcrop (1%)

Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Map Unit: BhE2—Beasley-Shrouts complex, 12 to 30 percent slopes, very rocky, eroded

Component: Beasley (40%)

The Beasley component makes up 40 percent of the map unit. Slopes are 12 to 30 percent. This component is on hills on uplands. The parent material consists of clayey residuum weathered from calcareous shale and/or dolomite. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 12 percent.

Component: Shrouts (35%)

The Shrouts component makes up 35 percent of the map unit. Slopes are 12 to 30 percent. This component is on hills on uplands. The parent material consists of clayey residuum weathered from calcareous shale and/or dolomite. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 13 percent.

Component: Woolper (8%)

Generated brief soil descriptions are created for major components. The Woolper soil is a minor component.

Component: Rock outcrop (7%)

Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Component: Other soils (5%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Component: Boonesboro (4%)

Generated brief soil descriptions are created for major components. The Boonesboro soil is a minor component.

Component: Nolin (1%)

Generated brief soil descriptions are created for major components. The Nolin soil is a minor component.

Map Unit: BnF2—Berks-Brownsville complex, 30 to 55 percent slopes, very rocky, eroded

Component: Berks (40%)

The Berks component makes up 40 percent of the map unit. Slopes are 30 to 55 percent. This component is on ridges on hills. The parent material consists of loamy-skeletal residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Brownsville (30%)

The Brownsville component makes up 30 percent of the map unit. Slopes are 30 to 55 percent. This component is on ridges on hills. The parent material consists of loamy-skeletal residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 40 to 72 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Blairton (8%)

Generated brief soil descriptions are created for major components. The Blairton soil is a minor component.

Component: Rock outcrop (7%)

Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Component: Skidmore (6%)

Generated brief soil descriptions are created for major components. The Skidmore soil is a minor component.

Component: Shelocta (5%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Component: Other soils (4%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: BoF2—Berks-Brownsville-Shelocta complex, 30 to 65 percent slopes, eroded

Component: Brownsville (35%)

The Brownsville component makes up 35 percent of the map unit. Slopes are 30 to 65 percent. This component is on hillslopes on hills. The parent material consists of loamy-skeletal colluvium derived from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 40 to 72 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Berks (35%)

The Berks component makes up 35 percent of the map unit. Slopes are 30 to 65 percent. This component is on hillslopes on hills. The parent material consists of loamy-skeletal colluvium derived from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Shelocta (15%)

The Shelocta component makes up 15 percent of the map unit. Slopes are 30 to 65 percent. This component is on hillslopes on hills. The parent material consists of fine-loamy colluvium derived from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Gilpin (10%)

Generated brief soil descriptions are created for major components. The Gilpin soil is a minor component.

Component: Other soils (5%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: BrB—Blairton silt loam, 2 to 6 percent slopes

Component: Blairton (85%)

The Blairton component makes up 85 percent of the map unit. Slopes are 2 to 6 percent. This component is on ridges on hills. The parent material consists of fine-loamy residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, November, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Tilsit (10%)

Generated brief soil descriptions are created for major components. The Tilsit soil is a minor component.

Component: Other soils (5%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: BrC2—Blairton silt loam, 6 to 12 percent slopes, eroded

Component: Blairton (85%)

The Blairton component makes up 85 percent of the map unit. Slopes are 6 to 12 percent. This component is on ridges on hills. The parent material consists of fine-loamy residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, November, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Tilsit (10%)

Generated brief soil descriptions are created for major components. The Tilsit soil is a minor component.

Component: Other soils (5%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: BrE2—Blairton silt loam, 12 to 30 percent slopes, eroded

Component: Blairton (85%)

The Blairton component makes up 85 percent of the map unit. Slopes are 12 to 30 percent. This component is on ridges on hills. The parent material consists of fine-loamy residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, November, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

Component: Brownsville (4%)

Generated brief soil descriptions are created for major components. The Brownsville soil is a minor component.

Component: Other soils (4%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Component: Berks (4%)

Generated brief soil descriptions are created for major components. The Berks soil is a minor component.

Component: Shelocta (3%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Map Unit: BvF2—Brownsville-Berks complex, 30 to 60 percent slopes, eroded

Component: Brownsville (45%)

The Brownsville component makes up 45 percent of the map unit. Slopes are 30 to 60 percent. This component is on ridges on hills. The parent material consists of fine-

loamy residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 40 to 72 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Berks (40%)

The Berks component makes up 40 percent of the map unit. Slopes are 30 to 60 percent. This component is on ridges on hills. The parent material consists of loamy-skeletal residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Blairton (7%)

Generated brief soil descriptions are created for major components. The Blairton soil is a minor component.

Component: Shelocta (5%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Component: Other soils (3%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: CaE2—Caneyville-Hagerstown-Rock outcrop complex, 12 to 45 percent slopes, eroded

Component: Caneyville (45%)

The Caneyville component makes up 45 percent of the map unit. Slopes are 12 to 45 percent. This component is on hillslopes on hills. The parent material consists of clayey residuum weathered from dolomite. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Hagerstown (30%)

The Hagerstown component makes up 30 percent of the map unit. Slopes are 12 to 45 percent. This component is on hillslopes on hills. The parent material consists of clayey residuum weathered from dolomite. Depth to a root restrictive layer, bedrock, lithic, is 60 to 84 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Rock outcrop (10%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Beasley (6%)

Generated brief soil descriptions are created for major components. The Beasley soil is a minor component.

Component: Shrouts (6%)

Generated brief soil descriptions are created for major components. The Shrouts soil is a minor component.

Component: Other soils (3%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: CkF2—Colyer-Trappist silt loams, 12 to 60 percent slopes, eroded

Component: Colyer (50%)

The Colyer component makes up 50 percent of the map unit. Slopes are 12 to 60 percent. This component is on knobs on uplands. The parent material consists of clayey-skeletal residuum weathered from acid shale. Depth to a root restrictive layer, bedrock, lithic, is 8 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Trappist (35%)

The Trappist component makes up 35 percent of the map unit. Slopes are 12 to 60 percent. This component is on knobs on uplands. The parent material consists of clayey residuum weathered from acid shale. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Covedale (10%)

Generated brief soil descriptions are created for major components. The Covedale soil is a minor component.

Component: Other soils (5%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: CoB—Covedale silt loam, 2 to 6 percent slopes

Component: Covedale (80%)

The Covedale component makes up 80 percent of the map unit. Slopes are 2 to 6 percent. This component is on alluvial fans on valleys. The parent material consists of fine-silty colluvium derived from acid shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Shelocta (15%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Component: Other soils (5%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: CoC2—Covedale silt loam, 6 to 12 percent slopes, eroded

Component: Covedale (85%)

The Covedale component makes up 85 percent of the map unit. Slopes are 6 to 12 percent. This component is on alluvial fans on valleys. The parent material consists of fine-silty colluvium derived from acid shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Trappist (5%)

Generated brief soil descriptions are created for major components. The Trappist soil is a minor component.

Component: Shelocta (5%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Component: Other soils (5%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: CtD2—Covedale-Trappist silt loams, 12 to 20 percent slopes, eroded

Component: Covedale (55%)

The Covedale component makes up 55 percent of the map unit. Slopes are 12 to 20 percent. This component is on knobs on uplands. The parent material consists of fine-silty colluvium derived from acid shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

Component: Trappist (35%)

The Trappist component makes up 35 percent of the map unit. Slopes are 12 to 20 percent. This component is on knobs on uplands. The parent material consists of clayey colluvium derived from acid shale. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

Component: Colyer (4%)

Generated brief soil descriptions are created for major components. The Colyer soil is a minor component.

Component: Shelocta (3%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Component: Other soils (3%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: CtF2—Covedale-Trappist silt loams, 20 to 55 percent slopes, eroded

Component: Covedale (55%)

The Covedale component makes up 55 percent of the map unit. Slopes are 20 to 55 percent. This component is on knobs on uplands. The parent material consists of fine-silty colluvium derived from acid shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Trappist (35%)

The Trappist component makes up 35 percent of the map unit. Slopes are 20 to 55 percent. This component is on knobs on uplands. The parent material consists of clayey colluvium derived from acid shale. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Colyer (4%)

Generated brief soil descriptions are created for major components. The Colyer soil is a minor component.

Component: Other soils (3%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Component: Shelocta (3%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Map Unit: EkB—Elk silt loam, 2 to 8 percent slopes

Component: Elk (80%)

The Elk component makes up 80 percent of the map unit. Slopes are 2 to 8 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Morehead (4%)

Generated brief soil descriptions are created for major components. The Morehead soil is a minor component.

Component: Other soils (4%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Component: Otwell (4%)

Generated brief soil descriptions are created for major components. The Otwell soil is a minor component.

Component: Shelocta (4%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Component: Haymond (4%)

Generated brief soil descriptions are created for major components. The Haymond soil is a minor component.

Map Unit: Hn—Haymond silt loam, frequently flooded

Component: Haymond, frequently flooded (85%)

The Haymond, frequently flooded component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains on valleys. The parent material consists of coarse-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Other soils (10%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Component: Newark (5%)

Generated brief soil descriptions are created for major components. The Newark soil is a minor component.

Map Unit: Kn—Kinnick silt loam, occasionally flooded

Component: Kinnick, occasionally flooded (85%)

The Kinnick, occasionally flooded component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains on valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 55 inches during February, March. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Haymond (4%)

Generated brief soil descriptions are created for major components. The Haymond soil is a minor component.

Component: Newark (4%)

Generated brief soil descriptions are created for major components. The Newark soil is a minor component.

Component: Boonesboro (4%)

Generated brief soil descriptions are created for major components. The Boonesboro soil is a minor component.

Component: Other soils (3%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: Mo—Morehead silt loam, rarely flooded

Component: Morehead, rarely flooded (90%)

The Morehead, rarely flooded component makes up 90 percent of the map unit. Slopes are 0 to 4 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Newark (4%)

Generated brief soil descriptions are created for major components. The Newark soil is a minor component.

Component: Sees (4%)

Generated brief soil descriptions are created for major components. The Sees soil is a minor component.

Component: Other soils (2%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: Ne—Newark silt loam, occasionally flooded

Component: Newark, occasionally flooded (85%)

The Newark, occasionally flooded component makes up 85 percent of the map unit. Slopes are 1 to 3 percent. This component is on flood plains on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 12

inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Melvin, frequently flooded (5%)

Generated brief soil descriptions are created for major components. The Melvin soil is a minor component.

Component: Other soils (5%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Component: Nolin (1%)

Generated brief soil descriptions are created for major components. The Nolin soil is a minor component.

Component: Skidmore (1%)

Generated brief soil descriptions are created for major components. The Skidmore soil is a minor component.

Component: Haymond (1%)

Generated brief soil descriptions are created for major components. The Haymond soil is a minor component.

Component: Boonesboro (1%)

Generated brief soil descriptions are created for major components. The Boonesboro soil is a minor component.

Component: Kinnick (1%)

Generated brief soil descriptions are created for major components. The Kinnick soil is a minor component.

Map Unit: No—Nolin silt loam, 0 to 3 percent slopes, occasionally flooded

Component: Nolin, occasionally flooded (85%)

The Nolin, occasionally flooded component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains on river valleys. The parent material consists of fine-silty alluvium derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential

is low. This soil is occasionally flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Melvin, occasionally flooded (5%)

Generated brief soil descriptions are created for major soil components. The Melvin soil is a minor component.

Component: Grigsby, frequently flooded (5%)

Generated brief soil descriptions are created for major soil components. The Grigsby soil is a minor component.

Component: Newark, frequently flooded (5%)

Generated brief soil descriptions are created for major soil components. The Newark soil is a minor component.

Map Unit: OtB—Otwell silt loam, 2 to 6 percent slopes

Component: Otwell (80%)

The Otwell component makes up 80 percent of the map unit. Slopes are 2 to 6 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer, fragipan, is 20 to 30 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 23 inches during January, February, March, April. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Elk (4%)

Generated brief soil descriptions are created for major components. The Elk soil is a minor component.

Component: Other soils (4%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Component: Beasley (4%)

Generated brief soil descriptions are created for major components. The Beasley soil is a minor component.

Component: Lawrence (4%)

Generated brief soil descriptions are created for major components. The Lawrence soil is a minor component.

Component: Morehead (4%)

Generated brief soil descriptions are created for major components. The Morehead soil is a minor component.

Map Unit: OtC—Otwell silt loam, 6 to 12 percent slopes

Component: Otwell (80%)

The Otwell component makes up 80 percent of the map unit. Slopes are 6 to 12 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer, fragipan, is 20 to 30 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 23 inches during January, February, March, April. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Elk (10%)

Generated brief soil descriptions are created for major components. The Elk soil is a minor component.

Component: Newark (6%)

Generated brief soil descriptions are created for major components. The Newark soil is a minor component.

Component: Other soils (4%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: ShC—Shelocta gravelly silt loam, 6 to 12 percent slopes

Component: Shelocta (80%)

The Shelocta component makes up 80 percent of the map unit. Slopes are 6 to 12 percent. This component is on hillslopes on hills. The parent material consists of fine-loamy colluvium derived from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth

of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Blairton (8%)

Generated brief soil descriptions are created for major components. The Blairton soil is a minor component.

Component: Skidmore (8%)

Generated brief soil descriptions are created for major components. The Skidmore soil is a minor component.

Component: Other soils (4%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: ShD—Shelocta gravelly silt loam, 12 to 20 percent slopes

Component: Shelocta (70%)

The Shelocta component makes up 70 percent of the map unit. Slopes are 12 to 20 percent. This component is on hillslopes on hills. The parent material consists of fine-loamy colluvium derived from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

Component: Blairton (13%)

Generated brief soil descriptions are created for major components. The Blairton soil is a minor component.

Component: Brownsville (12%)

Generated brief soil descriptions are created for major components. The Brownsville soil is a minor component.

Component: Other soils (5%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: SkF2—Shelocta silt loam, 20 to 45 percent slopes, eroded

Component: Shelocta (80%)

The Shelocta component makes up 80 percent of the map unit. Slopes are 20 to 45 percent. This component is on hillslopes on hills. The parent material consists of fine-loamy colluvium derived from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Blairton (8%)

Generated brief soil descriptions are created for major components. The Blairton soil is a minor component.

Component: Brownsville (8%)

Generated brief soil descriptions are created for major components. The Brownsville soil is a minor component.

Component: Other soils (4%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: SmB—Shelocta-Skidmore complex, 2 to 6 percent slopes

Component: Shelocta (45%)

The Shelocta component makes up 45 percent of the map unit. Slopes are 2 to 6 percent. This component is on hillslopes on hills. The parent material consists of fine-loamy colluvium derived from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Skidmore, occasionally flooded (30%)

The Skidmore, occasionally flooded component makes up 30 percent of the map unit. Slopes are 0 to 4 percent. This component is on flood plains on hills. The parent material consists of loamy-skeletal alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 42 inches during January, February,

March, December. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria.

Component: Haymond (15%)

Generated brief soil descriptions are created for major components. The Haymond soil is a minor component.

Component: Other soils (10%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: SrB—Shrouts silty clay loam, 2 to 6 percent slopes

Component: Shrouts (90%)

The Shrouts component makes up 90 percent of the map unit. Slopes are 2 to 6 percent. This component is on ridges on uplands. The parent material consists of clayey residuum weathered from calcareous shale. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 13 percent.

Component: Aaron (7%)

Generated brief soil descriptions are created for major components. The Aaron soil is a minor component.

Component: Other soils (3%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: Sx—Skidmore gravelly silt loam, occasionally flooded

Component: Skidmore, occasionally flooded (80%)

The Skidmore, occasionally flooded component makes up 80 percent of the map unit. Slopes are 0 to 4 percent. This component is on flood plains on hills. The parent material consists of loamy-skeletal alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 42 inches during January, February,

March, December. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria.

Component: Shelocta (7%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Component: Newark (6%)

Generated brief soil descriptions are created for major components. The Newark soil is a minor component.

Component: Haymond (4%)

Generated brief soil descriptions are created for major components. The Haymond soil is a minor component.

Component: Other soils (3%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: TsB—Tilsit silt loam, 2 to 6 percent slopes

Component: Tilsit (90%)

The Tilsit component makes up 90 percent of the map unit. Slopes are 2 to 6 percent. This component is on ridges on hills. The parent material consists of fine-silty residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, fragipan, is 18 to 28 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 17 inches during January, February, March, April. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Blairton (8%)

Generated brief soil descriptions are created for major components. The Blairton soil is a minor component.

Component: Other soils (2%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Map Unit: TsC—Tilsit silt loam, 6 to 12 percent slopes

Component: Tilsit (80%)

The Tilsit component makes up 80 percent of the map unit. Slopes are 6 to 12 percent. This component is on ridges on hills. The parent material consists of fine-silty residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, fragipan, is 18 to 28 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 17 inches during January, February, March, April. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Other soils (10%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Component: Blairton (10%)

Generated brief soil descriptions are created for major components. The Blairton soil is a minor component.

Map Unit: Ud—Udorthents, smoothed

Component: Udorthents (100%)

The Udorthents component makes up 100 percent of the map unit. Slopes are 0 to 70 percent. This component is on fills on drainageways on valleys. The parent material consists of mine spoil or earthy fill. Depth to a root restrictive layer is greater than 60 inches. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Map Unit: W—Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

Map Unit: WoB—Woolper silty clay loam, 2 to 6 percent slopes, rarely flooded

Component: Woolper, rarely flooded (80%)

The Woolper, rarely flooded component makes up 80 percent of the map unit. Slopes are 2 to 6 percent. This component is on hills on uplands. The parent material consists

of clayey colluvium derived from limestone and shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Boonesboro (8%)

Generated brief soil descriptions are created for major components. The Boonesboro soil is a minor component.

Component: Sees (8%)

Generated brief soil descriptions are created for major components. The Sees soil is a minor component.

Component: Other soils (4%)

Generated brief soil descriptions are created for major components. The Other soils soil is a minor component.

Menifee and Rowan Counties, Kentucky

Map Unit: BeF—Berks silt loam, 40 to 70 percent slopes

Component: Berks (90%)

The Berks component makes up 90 percent of the map unit. Slopes are 40 to 70 percent. This component is on hillslopes on hills. The parent material consists of loamy-skeletal residuum weathered from interbedded sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Cranston (5%)

Generated brief soil descriptions are created for major components. The Cranston soil is a minor component.

Component: Gilpin (5%)

Generated brief soil descriptions are created for major components. The Gilpin soil is a minor component.

Map Unit: Bo—Bonnie silt loam

Component: Bonnie, frequently flooded (90%)

The Bonnie, frequently flooded component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on hills. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during January, February, March, April, May, June, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria.

Component: Stendal (5%)

Generated brief soil descriptions are created for major components. The Stendal soil is a minor component.

Component: Cuba (5%)

Generated brief soil descriptions are created for major components. The Cuba soil is a minor component.

Map Unit: Ck—Clifty silt loam

Component: Clifty, occasionally flooded (90%)

The Clifty, occasionally flooded component makes up 90 percent of the map unit. Slopes are 0 to 4 percent. This component is on flood plains on hills. The parent material consists of fine-loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 48 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria.

Component: Renox (5%)

Generated brief soil descriptions are created for major components. The Renox soil is a minor component.

Component: Cranston (5%)

Generated brief soil descriptions are created for major components. The Cranston soil is a minor component.

Map Unit: CrC—Cranston gravelly silt loam, 6 to 12 percent slopes

Component: Cranston (85%)

The Cranston component makes up 85 percent of the map unit. Slopes are 6 to 12 percent. This component is on alluvial fans on hills. The parent material consists of coarse-loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Whitley (5%)

Generated brief soil descriptions are created for major components. The Whitley soil is a minor component.

Component: Tilsit (5%)

Generated brief soil descriptions are created for major components. The Tilsit soil is a minor component.

Component: Clifty (5%)

Generated brief soil descriptions are created for major components. The Clifty soil is a minor component.

Map Unit: CrD—Cranston gravelly silt loam, 12 to 20 percent slopes

Component: Cranston (85%)

The Cranston component makes up 85 percent of the map unit. Slopes are 12 to 20 percent. This component is on hillslopes on hills. The parent material consists of coarse-loamy colluvium derived from shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

Component: Gilpin (8%)

Generated brief soil descriptions are created for major components. The Gilpin soil is a minor component.

Component: Whitley (7%)

Generated brief soil descriptions are created for major components. The Whitley soil is a minor component.

Map Unit: CrE—Cranston gravelly silt loam, 20 to 30 percent slopes

Component: Cranston (85%)

The Cranston component makes up 85 percent of the map unit. Slopes are 20 to 30 percent. This component is on hillslopes on hills. The parent material consists of coarse-loamy colluvium derived from shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Shelocta (5%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Component: Latham (5%)

Generated brief soil descriptions are created for major components. The Latham soil is a minor component.

Component: Gilpin (5%)

Generated brief soil descriptions are created for major components. The Gilpin soil is a minor component.

Map Unit: CrF—Cranston gravelly silt loam, 30 to 60 percent slopes

Component: Cranston (85%)

The Cranston component makes up 85 percent of the map unit. Slopes are 30 to 60 percent. This component is on hillslopes on hills. The parent material consists of coarse-loamy colluvium derived from shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Berks (5%)

Generated brief soil descriptions are created for major components. The Berks soil is a minor component.

Component: Shelocta (5%)

Generated brief soil descriptions are created for major components. The Shelocta soil is a minor component.

Component: Gilpin (5%)

Generated brief soil descriptions are created for major components. The Gilpin soil is a minor component.

Map Unit: Cu—Cuba silt loam

Component: Cuba, occasionally flooded (90%)

The Cuba, occasionally flooded component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on hills. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 48 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Whitley (5%)

Generated brief soil descriptions are created for major components. The Whitley soil is a minor component.

Component: Morehead (5%)

Generated brief soil descriptions are created for major components. The Morehead soil is a minor component.

Map Unit: Jo—Johnsburg silt loam

Component: Johnsburg, rarely flooded (90%)

The Johnsburg, rarely flooded component makes up 90 percent of the map unit. Slopes are 0 to 4 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer, fragipan, is 15 to 25 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during

January, February, March, April, May, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Tilsit (5%)

Generated brief soil descriptions are created for major components. The Tilsit soil is a minor component.

Component: Mullins, rarely flooded (5%)

Generated brief soil descriptions are created for major components. The Mullins soil is a minor component.

Map Unit: Mp—Morehead silt loam

Component: Morehead, occasionally flooded (90%)

The Morehead, occasionally flooded component makes up 90 percent of the map unit. Slopes are 0 to 4 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, April, May, June, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Bonnie, frequently flooded (5%)

Generated brief soil descriptions are created for major components. The Bonnie soil is a minor component.

Component: Whitley (5%)

Generated brief soil descriptions are created for major components. The Whitley soil is a minor component.

Map Unit: Mr—Mullins silt loam

Component: Mullins, rarely flooded (90%)

The Mullins, rarely flooded component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer, fragipan, is 15 to 24 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded.

A seasonal zone of water saturation is at 3 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria.

Component: Johnsburg (10%)

Generated brief soil descriptions are created for major components. The Johnsburg soil is a minor component.

Map Unit: St—Stendal silt loam

Component: Stendal, occasionally flooded (90%)

The Stendal, occasionally flooded component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on hills. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Bonnie, frequently flooded (5%)

Generated brief soil descriptions are created for major components. The Bonnie soil is a minor component.

Component: Cuba (5%)

Generated brief soil descriptions are created for major components. The Cuba soil is a minor component.

Map Unit: TlB—Tilsit silt loam, 2 to 6 percent slopes

Component: Tilsit (90%)

The Tilsit component makes up 90 percent of the map unit. Slopes are 2 to 6 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer, fragipan, is 18 to 28 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 19 inches during January, February, March, April. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Whitley (5%)

Generated brief soil descriptions are created for major components. The Whitley soil is a minor component.

Component: Johnsburg (5%)

Generated brief soil descriptions are created for major components. The Johnsburg soil is a minor component.

Map Unit: TlC—Tilsit silt loam, 6 to 12 percent slopes

Component: Tilsit (90%)

The Tilsit component makes up 90 percent of the map unit. Slopes are 6 to 12 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer, fragipan, is 18 to 28 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 19 inches during January, February, March, April. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Latham (5%)

Generated brief soil descriptions are created for major components. The Latham soil is a minor component.

Component: Johnsburg (5%)

Generated brief soil descriptions are created for major components. The Johnsburg soil is a minor component.

Map Unit: WtA—Whitley silt loam, terrace, 0 to 2 percent slopes

Component: Whitley, rarely flooded (90%)

The Whitley, rarely flooded component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 48 inches during January, February, March, April. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 1. This soil does not meet hydric criteria.

Component: Cuba (5%)

Generated brief soil descriptions are created for major components. The Cuba soil is a minor component.

Component: Morehead (5%)

Generated brief soil descriptions are created for major components. The Morehead soil is a minor component.

Map Unit: WtB—Whitley silt loam, terrace, 2 to 6 percent slopes

Component: Whitley, rarely flooded (90%)

The Whitley, rarely flooded component makes up 90 percent of the map unit. Slopes are 2 to 6 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 48 inches during January, February, March, April. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Morehead (10%)

Generated brief soil descriptions are created for major components. The Morehead soil is a minor component.

Map Unit: WtC—Whitley silt loam, terrace, 6 to 12 percent slopes

Component: Whitley, rarely flooded (90%)

The Whitley, rarely flooded component makes up 90 percent of the map unit. Slopes are 6 to 12 percent. This component is on stream terraces on river valleys. The parent material consists of fine-silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 48 inches during January, February, March, April. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Tilsit (5%)

Generated brief soil descriptions are created for major components. The Tilsit soil is a minor component.

Component: Cranston (5%)

Generated brief soil descriptions are created for major components. The Cranston soil is a minor component.

Soil Physical Properties

This folder contains a collection of tabular reports that present soil physical properties. The reports (tables) include all selected map units and components for each map unit. Soil physical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Engineering Properties (KY 59 - KY 344 - KY 377 Planning Study, Lewis and Rowan Counties KY)

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba).

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
BeC2—Beasley silt loam, 6 to 12 percent slopes, rocky, eroded														
Beasley	85	C	0-5	Silt loam	CL-ML, ML	A-4	0- 0- 0	0- 0- 0	89-98-100	81-98-100	69-92-100	56-76-86	25-30-35	4-7 -10
			5-30	Silty clay, clay	CH, CL	A-7	0- 0- 0	0- 3- 5	90-95-100	85-93-100	85-93-100	75-88-100	45-58-70	20-30-40
			30-42	Clay, silty clay, gravelly silty clay	CH, CL	A-7	0- 0- 0	0- 0- 10	70-85-100	55-78-100	50-75-100	50-73-95	35-50-65	15-25-35
			42-53	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
			53-63	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
BhE2—Beasley-Shrouts complex, 12 to 30 percent slopes, very rocky, eroded														
Beasley	40	C	0-5	Silt loam	CL-ML, ML	A-4	0- 0- 0	0- 0- 0	89-98-100	81-98-100	69-92-100	56-76-86	25-30-35	4-7 -10
			5-30	Silty clay, clay	CH, CL	A-7	0- 0- 0	0- 3- 5	90-95-100	85-93-100	85-93-100	75-88-100	45-58-70	20-30-40
			30-42	Clay, silty clay, gravelly silty clay	CH, CL	A-7	0- 0- 0	0- 0- 10	70-85-100	55-78-100	50-75-100	50-73-95	35-50-65	15-25-35
			42-53	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
			53-63	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
Shrouts	35	D	0-3	Silty clay loam	CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	93-99-100	81-87-94	24-32-40	4-8 -12
			3-20	Clay, silty clay	CH, CL	A-7	0- 0- 0	0- 5- 10	90-95-100	90-95-100	85-93-100	80-90-100	45-55-65	20-30-40
			20-30	Clay, silty clay, channery silty clay	CH, CL	A-7	0- 0- 0	0- 0- 20	85-93-100	75-88-100	75-88-100	65-83-100	45-58-70	20-30-40
			30-40	Weathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
BnF2—Berks-Brownsville complex, 30 to 55 percent slopes, very rocky, eroded														
Berks	40	B	0-3	Channery silt loam	GC, GM, ML, SC	A-2, A-4	0- 0- 0	3- 7- 15	68-84-84	45-79-79	37-73-79	30-59-67	25-31-36	5-8 -10
			3-25	Very channery loam, channery loam, extremely channery silt loam	GC, GM, SC, SM	A-1, A-2, A-4	0- 0- 0	0-15- 30	40-60-80	35-53-70	25-43-60	20-33-45	25-31-36	5-8 -10
			25-35	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
Brownsville	30	A	0-4	Very channery silt loam, silt loam, channery silt loam	CL-ML, GC-GM, GM, ML	A-4	0- 0- 0	0- 9- 10	67-73-84	44-57-84	36-50-78	25-35-56	25-30-35	5-7 -10
			4-43	Very channery silt loam, channery silt loam, extremely channery loam, very flaggy silt loam	CL-ML, GC-GM, GM, ML	A-2, A-4, A-1	0- 0- 0	5-23- 40	35-58-80	30-50-70	25-48-70	20-40-60	25-30-35	5-7 -10
			43-62	Channery silt loam, extremely channery loam, very flaggy silt loam	GM, GP-GM, SM, SP-SM	A-1, A-2, A-4	0- 0- 0	15-45-60	25-45-65	20-38-55	15-33-50	10-28-45	20-28-35	2-5 -10
			62-72	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
BoF2—Berks-Brownsville-Shelocta complex, 30 to 65 percent slopes, eroded														
Berks	35	B	0-3	Channery silt loam	GC, GM, ML, SC	A-2, A-4	0- 0- 0	3- 7- 15	68-84-84	45-79-79	37-73-79	30-59-67	25-31-36	5-8 -10
			3-25	Channery loam, very channery loam, extremely channery silt loam	GC, GM, SC, SM	A-1, A-2, A-4	0- 0- 0	0-15- 30	40-60-80	35-53-70	25-43-60	20-33-45	25-31-36	5-8 -10
			25-35	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
Brownsville	35	A	0-4	Very channery silt loam, silt loam, channery silt loam	CL-ML, GC-GM, GM, ML	A-4	0- 0- 0	0- 9- 10	67-73-84	44-57-84	38-53-81	30-43-66	25-30-35	5-7 -10
			4-43	Very channery loam, channery silt loam, extremely channery loam, very flaggy silt loam	CL-ML, GC-GM, GM, ML	A-1, A-2, A-4	0- 0- 0	5-23- 40	35-58-80	30-50-70	25-48-70	20-40-60	25-30-35	5-7 -10
			43-62	Channery silt loam, extremely channery loam, very flaggy silt loam	GM, GP-GM, SM, SP-SM	A-1, A-2, A-4	0- 0- 0	15-45-60	25-45-65	20-38-55	15-33-50	10-28-45	20-28-35	2-5 -10
			62-72	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
Shelocta	15	B	0-8	Silt loam	CL-ML, ML	A-4	0- 0- 1	0- 0- 4	84-90-95	68-83-95	58-77-95	47-63-79	0-18 -35	NP-5 -10
			8-50	Loam, silty clay loam, silt loam, channery silty clay loam	CL, CL-ML, GC, SC	A-4, A-6	0- 3- 5	0- 5- 10	55-75-95	50-73-95	45-70-95	40-65-90	25-33-40	4-10-15

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
			50-60	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
BrB—Blairton silt loam, 2 to 6 percent slopes														
Blairton	85	C/D	0-9	Silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 0	81-98-100	63-93-100	53-87-100	44-72-86	20-28-35	2-6 -10
			9-35	Gravelly silt loam, silt loam, channery silty clay loam, very channery loam	GM, ML, CL, GC	A-2, A-4, A-6, A-7	0- 0- 0	0- 0- 5	50-70-90	35-63-90	30-58-85	25-48-70	25-35-45	2-11-20
			35-45	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
BrC2—Blairton silt loam, 6 to 12 percent slopes, eroded														
Blairton	85	C/D	0-5	Silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 0	81-98-100	63-93-100	53-87-100	44-72-86	20-28-35	2-6 -10
			5-31	Gravelly silt loam, silt loam, channery silty clay loam, very channery loam	CL, GC, GM, ML	A-2, A-4, A-6, A-7	0- 0- 0	0- 0- 5	50-70-90	35-63-90	30-58-85	25-48-70	25-35-45	2-11-20
			31-41	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
BrE2—Blairton silt loam, 12 to 30 percent slopes, eroded														
Blairton	85	C/D	0-5	Silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 0	81-98-100	63-93-100	53-87-100	44-72-86	20-28-35	2-6 -10
			5-31	Gravelly silt loam, silt loam, channery silty clay loam, very channery loam	CL, GC, GM, ML	A-2, A-4, A-6, A-7	0- 0- 0	0- 0- 5	50-70-90	35-63-90	30-58-85	25-48-70	25-35-45	2-11-20
			31-41	Weathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
BvF2—Brownsville-Berks complex, 30 to 60 percent slopes, eroded														
Brownsville	45	A	0-4	Very channery silt loam, silt loam, channery silt loam	CL-ML, GC-GM, GM, ML	A-4	0- 0- 0	0- 9- 10	67-73-84	44-57-84	38-53-81	30-43-66	25-30 -35	5-7 -10
			4-43	Very channery loam, channery silt loam, extremely channery loam, very flaggy silt loam	CL-ML, GC-GM, GM, ML	A-1, A-2, A-4	0- 0- 0	5-23- 40	35-58-80	30-50-70	25-48-70	20-40-60	25-30 -35	5-7 -10
			43-62	Channery silt loam, extremely channery loam, very flaggy silt loam	GM, GP-GM, SM, SP-SM	A-1, A-2, A-4	0- 0- 0	15-45-60	25-45-65	20-38-55	15-33-50	10-28-45	20-28 -35	2-5 -10
			62-72	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
Berks	40	B	0-3	Channery silt loam	GC, GM, ML, SC	A-2, A-4	0- 0- 0	3- 7- 15	68-84-84	45-79-79	37-73-79	30-59-67	25-31 -36	5-8 -10
			3-25	Channery loam, very channery loam, extremely channery silt loam	GC, GM, SC, SM	A-1, A-2, A-4	0- 0- 0	0-15- 30	40-60-80	35-53-70	25-43-60	20-33-45	25-31 -36	5-8 -10
			25-35	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
CaE2—Caneyville-Hagerstown-Rock outcrop complex, 12 to 45 percent slopes, eroded														
Caneyville	45	C	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 3	90-100-100	76-100-100	59-93-93	50-81-81	20-28-35	2-7 -12
			7-31	Silty clay, clay, silty clay loam	CH, CL	A-7	0- 0- 0	0- 2- 3	90-95-100	85-93-100	75-88-100	65-83-100	42-56-70	20-33-45
			31-41	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
Hagerstown	30	B	0-4	Silt loam	CL, CL-ML	A-4, A-6, A-7	0- 0- 0	0- 0- 4	91-100-100	82-100-100	77-96-100	73-91-100	25-38-50	5-15-25
			4-62	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0- 1- 1	0- 3- 5	85-93-100	80-90-100	75-88-100	75-85-95	30-50-70	15-28-40
			62-72	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
CkF2—Colyer-Trappist silt loams, 12 to 60 percent slopes, eroded														
Colyer	50	D	0-2	Silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	82-82-91	68-79-91	58-75-89	49-65-76	25-33-40	5-10-15
			2-12	Channery clay, very channery silty clay, very channery silty clay loam	GC, GM	A-2, A-6, A-7	0- 0- 0	0- 2- 10	25-43-60	20-35-50	20-35-50	15-30-45	35-45-55	11-21-30
			12-19	Very channery clay, channery clay, very channery silty clay, very channery silty clay loam	GC, GM	A-2, A-6, A-7	0- 0- 0	0- 8- 15	25-43-60	20-35-50	20-35-50	15-30-45	35-45-55	11-21-30
			19-29	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
Trappist	35	C	0-2	Silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	94-100-100	83-100-100	69-93-100	55-76-86	20-28-35	2-8 -14
			2-20	Silty clay, clay, channery silty clay	CH, CL	A-6, A-7	0- 0- 0	0- 0- 0	80-90-100	60-80-100	55-78-100	50-73-95	35-48-60	12-21-30
			20-30	Very channery clay, very channery silty clay, channery clay	GC, SC, CH, CL	A-2, A-6, A-7	0- 0- 0	0- 3- 5	30-53-75	20-43-65	20-40-60	15-38-60	35-48-60	12-21-30
			30-40	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
CoB—Covedale silt loam, 2 to 6 percent slopes														
Covedale	80	B	0-7	Silt loam	CL, ML	A-4, A-6	0- 0- 0	0- 0- 0	83-100-100	67-100-100	61-99-100	57-92-100	18-25-32	4-8 -12
			7-67	Silty clay loam, clay, channery silty clay	CH, CL	A-6, A-7	0- 0- 0	0- 0- 0	70-85-100	65-83-100	60-80-100	55-78-100	35-50-65	15-25-35
			67-71	Silty clay, channery silty clay, very channery clay, clay	CH, CL, GC, MH	A-2, A-7	0- 0- 0	0- 0- 0	50-75-100	40-68-95	35-65-95	30-63-95	40-58-75	20-30-40
CoC2—Covedale silt loam, 6 to 12 percent slopes, eroded														
Covedale	85	B	0-5	Silt loam	CH, CL	A-4, A-6	0- 0- 0	0- 0- 0	83-100-100	67-100-100	61-99-100	57-92-100	18-25-32	4-8 -12
			5-65	Silty clay loam, clay, channery silty clay	CH, CL	A-6, A-7	0- 0- 0	0- 0- 0	70-85-100	65-83-100	60-80-100	55-78-100	35-50-65	15-25-35
			65-71	Silty clay, channery silty clay, very channery clay, clay	CH, CL, GC, MH	A-2, A-7	0- 0- 0	0- 0- 0	50-75-100	40-68-95	35-65-95	30-63-95	40-58-75	20-30-40

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
CtD2—Covedale-Trappist silt loams, 12 to 20 percent slopes, eroded														
Covedale	55	B	0-5	Silt loam	CL, ML	A-4, A-6	0- 0- 0	0- 0- 0	83-100-100	67-100-100	61-99-100	57-92-100	18-25-32	4-8 -12
			5-65	Silty clay loam, clay, channery silty clay	CH, CL	A-6, A-7	0- 0- 0	0- 0- 0	70-85-100	65-83-100	60-80-100	55-78-100	35-50-65	15-25-35
			65-71	Silty clay, channery silty clay, very channery clay, clay	CH, CL, MH	A-2, A-7	0- 0- 0	0- 0- 0	50-75-100	40-68-95	35-65-95	30-63-95	40-58-75	20-30-40
Trappist	35	C	0-2	Silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	94-100-100	83-100-100	69-93-100	55-76-86	20-28-35	2-8 -14
			2-20	Silty clay, clay, channery silty clay	CH, CL	A-6, A-7	0- 0- 0	0- 0- 0	80-90-100	60-80-100	55-78-100	50-73-95	35-48-60	12-21-30
			20-30	Very channery clay, very channery silty clay, channery clay	CH, CL, GC, SC	A-2, A-6, A-7	0- 0- 0	0- 3- 5	30-53-75	20-43-65	20-40-60	15-38-60	35-48-60	12-21-30
			30-40	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
CtF2—Covedale-Trappist silt loams, 20 to 55 percent slopes, eroded														
Covedale	55	B	0-5	Silt loam	CL, ML	A-4, A-6	0- 0- 0	0- 0- 0	83-100-100	67-100-100	61-99-100	57-92-100	18-25-32	4-8 -12
			5-65	Silty clay loam, clay, channery silty clay	CH, CL	A-6, A-7	0- 0- 0	0- 0- 0	70-85-100	65-83-100	60-80-100	55-78-100	35-50-65	15-25-35
			65-71	Silty clay, channery silty clay, very channery clay, clay	CH, CL, GC, MH	A-2, A-7	0- 0- 0	0- 0- 0	50-75-100	40-68-95	35-65-95	30-63-95	40-58-75	20-30-40
Trappist	35	C	0-2	Silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	94-100-100	83-100-100	69-93-100	55-76-86	20-28-35	2-8 -14
			2-20	Silty clay, clay, channery silty clay	CH, CL	A-6, A-7	0- 0- 0	0- 0- 0	80-90-100	60-80-100	55-78-100	50-73-95	35-48-60	12-21-30
			20-30	Very channery clay, very channery silty clay, channery clay	CH, CL, GC, SC	A-2, A-6, A-7	0- 0- 0	0- 3- 5	30-53-75	20-43-65	20-40-60	15-38-60	35-48-60	12-21-30
			30-40	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
EkB—Elk silt loam, 2 to 8 percent slopes														
Elk	80	B	0-8	Silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 0	94-100-100	88-100-100	80-99-100	74-92-100	25-30-35	3-7 -10
			8-66	Silty clay loam, silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	95-98-100	90-95-100	85-93-100	75-88-100	25-33-40	5-10-15
			66-75	Clay, silty clay loam, silty clay	CL, CL-ML, ML, SC-SM	A-4, A-6	0- 0- 0	0- 0- 0	75-88-100	50-80-100	45-73-100	40-68-95	25-33-40	5-10-15

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
Hn—Haymond silt loam, frequently flooded														
Haymond, frequently flooded	85	B	0-6	Silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-99-100	87-91-95	20-25-30	3-7 -10
			6-65	Silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-95-100	80-90-100	20-25-30	3-7 -10
			65-95	Fine sandy loam, silt loam, loam	CL, ML, SC, SM	A-4, A-6	0- 0- 0	0- 0- 0	95-98-100	90-95-100	65-83-100	35-63-90	15-25-35	2-9 -15
Kn—Kinnick silt loam, occasionally flooded														
Kinnick, occasionally flooded	85	B	0-9	Silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	90-100-100	80-100-100	75-94-98	25-33-40	5-12-18
			9-55	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7	0- 0- 0	0- 0- 0	100-100-100	95-98-100	85-90-95	65-83-95	25-36-46	5-14-23
			55-76	Silt loam, loam, silty clay loam, gravelly loam	CL, CL-ML, GM	A-6, A-4	0- 0- 0	0- 0- 0	50-75-100	50-75-100	40-68-95	35-65-95	15-23-30	NP-5-15
Mo—Morehead silt loam, rarely flooded														
Morehead, rarely flooded	90	B/D	0-9	Silt loam	ML	A-4	0- 0- 0	0- 0- 0	94-96-100	89-91-100	82-90-100	75-84-100	25-30-35	2-6 -10
			9-42	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	95-98-100	95-98-100	90-95-100	75-88-100	25-33-40	5-13-20
			42-60	Silty clay, silt loam, silty clay loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	90-95-100	85-93-100	70-85-100	60-78-95	20-30-40	2-11-20

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
Ne—Newark silt loam, occasionally flooded														
Newark, occasionally flooded	85	B/D	0-8	Silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 0	95-100-100	85-100-100	76-99-100	69-91-100	0-16 -32	NP-5 -10
			8-26	Silt loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0- 0- 0	0- 0- 0	95-98-100	90-95-100	85-93-100	70-85-100	22-32 -42	3-12-20
			26-62	Silt loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0- 0- 0	0- 0- 3	75-88-100	70-85-100	65-83-100	55-75-95	22-32 -42	3-12-20
No—Nolin silt loam, 0 to 3 percent slopes, occasionally flooded														
Nolin, occasionally flooded	85	B	0-12	Silt loam, loam, silty clay loam	CH, CL-ML, CL	A-4, A-6, A-7-6	0- 0- 0	0- 0- 0	92-100-100	91-100-100	82-100-100	72-95-100	23-39 -57	6-15-28
			12-74	Silt loam, silty clay loam, loam	CL, CH, CL-ML	A-6, A-7-6, A-4	0- 0- 0	0- 0- 0	93-97-100	92-97-100	82-96-100	73-92-100	21-37 -52	6-17-28
			74-80	Gravelly loam, silty clay loam, very gravelly fine sandy loam, cobbly sandy loam, silt loam, stratified fine sandy loam to silt loam	CL-ML, CL, GM	A-4, A-6, A-2-4	0- 0- 0	0- 0- 19	55-100-100	52-100-100	45-99-100	34-86-100	17-24 -40	3-7 -21
OtB—Otwell silt loam, 2 to 6 percent slopes														
Otwell	80	C/D	0-9	Silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-100-100	90-94-99	25-30 -35	5-10-15
			9-29	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	70-83-95	25-33 -40	5-13-20
			29-65	Silty clay loam, loam, silt loam	CL	A-6, A-7	0- 0- 0	0- 0- 0	95-98-100	95-98-100	85-93-100	65-78-90	35-43 -50	20-25-30

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
OtC—Otwell silt loam, 6 to 12 percent slopes														
Otwell	80	C/D	0-9	Silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-100-100	90-94-99	25-30-35	5-10-15
			9-29	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	70-83-95	25-33-40	5-13-20
			29-65	Silty clay loam, loam, silt loam	CL	A-6, A-7	0- 0- 0	0- 0- 0	95-98-100	95-98-100	85-93-100	65-78-90	35-43-50	20-25-30
ShC—Shelocta gravelly silt loam, 6 to 12 percent slopes														
Shelocta	80	B	0-10	Gravelly silt loam, silt loam	GM, ML, SM, CL-ML	A-4	0- 0- 4	0- 0- 8	70-84-96	41-71-96	35-66-96	28-54-81	0-18 -35	NP-5 -10
			10-52	Silty clay loam, silt loam, channery silty clay loam, loam	CL, CL-ML, GC, SC	A-4, A-6	0- 0- 5	0- 0- 10	55-75-95	50-73-95	45-70-95	40-65-90	25-33-40	4-10-15
			52-62	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
ShD—Shelocta gravelly silt loam, 12 to 20 percent slopes														
Shelocta	70	B	0-10	Gravelly silt loam, silt loam	GM, ML, SM, CL-ML	A-4	0- 0- 4	0- 0- 8	70-84-96	41-71-96	35-66-96	28-54-81	0-18 -35	NP-5 -10
			10-52	Silty clay loam, silt loam, channery silty clay loam, loam	CL, CL-ML, GC, SC	A-4, A-6	0- 0- 5	0- 0- 10	55-75-95	50-73-95	45-70-95	40-65-90	25-33-40	4-10-15
			52-62	Weathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
SkF2—Shelocta silt loam, 20 to 45 percent slopes, eroded														
Shelocta	80	B	0-8	Silt loam	CL-ML, ML	A-4	0- 0- 1	0- 0- 4	84-90-95	68-83-95	58-77-95	47-63-79	0-18 -35	NP-5 -10
			8-50	Silty clay loam, silt loam, channery silty clay loam, loam	CL, CL-ML, GC, SC	A-4, A-6	0- 0- 5	0- 0- 10	55-75-95	50-73-95	45-70-95	40-65-90	25-33 -40	4-10-15
			50-60	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
SmB—Shelocta-Skidmore complex, 2 to 6 percent slopes														
Shelocta	45	B	0-10	Gravelly silt loam	CL-ML, ML	A-4	0- 0- 1	0- 0- 4	75-88-88	50-75-75	43-70-75	34-57-63	0-18 -35	NP-5 -10
			10-52	Silty clay loam, silt loam, channery silty clay loam, loam	CL, CL-ML, GC, SC	A-4, A-6	0- 0- 5	0- 0- 10	55-75-95	50-73-95	45-70-95	40-65-90	25-33 -40	4-10-15
			52-62	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
Skidmore, occasionally flooded	30	A	0-6	Gravelly loam	GM, ML, SM	A-2, A-4	0- 0- 0	0- 1- 8	74-86-92	42-71-76	35-62-71	24-43-51	0-15 -30	NP-4 -7
			6-72	Gravelly loam, very gravelly silt loam, extremely gravelly loam	GM, GP-GM	A-1, A-2	0- 0- 0	5-18- 30	35-48-60	20-35-50	15-28-40	10-23-35	0-15 -30	NP-3 -5

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
SrB—Shrouts silty clay loam, 2 to 6 percent slopes														
Shrouts	90	D	0-6	Silty clay loam	CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	93-99-100	81-87-94	24-32 -40	4-8 -12
			6-23	Clay, silty clay	CH, CL	A-7	0- 0- 0	0- 5- 10	90-95-100	90-95-100	85-93-100	80-90-100	45-55 -65	20-30-40
			23-33	Clay, silty clay, channery silty clay	CH, CL	A-7	0- 0- 0	0- 0- 20	85-93-100	75-88-100	75-88-100	65-83-100	45-58 -70	20-30-40
			33-43	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
Sx—Skidmore gravelly silt loam, occasionally flooded														
Skidmore, occasionally flooded	80	A	0-6	Gravelly silt loam	GM, ML, SM	A-2, A-4	0- 0- 0	0- 1- 8	74-86-92	42-71-76	35-62-71	24-43-51	0-15 -30	NP-4 -7
			6-72	Gravelly loam, very gravelly silt loam, extremely gravelly loam	GM, GP-GM	A-1, A-2	0- 0- 0	5-18- 30	35-48-60	20-35-50	15-28-40	10-23-35	0-15 -30	NP-3 -5
TsB—Tilsit silt loam, 2 to 6 percent slopes														
Tilsit	90	D	0-9	Silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	92-100-100	83-100-100	76-99-100	69-91-99	20-28 -35	4-10-15
			9-23	Silt loam, silty clay loam, loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	90-95-100	85-93-100	75-88-100	65-83-100	25-33 -40	5-13-20
			23-43	Silt loam, silty clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0- 0- 0	0- 0- 0	90-95-100	85-93-100	75-88-100	65-83-100	25-35 -45	5-15-25
			43-53	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Lewis County, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
TsC—Tilsit silt loam, 6 to 12 percent slopes														
Tilsit	80	D	0-9	Silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	92-100-100	83-100-100	76-99-100	69-91-99	20-28-35	4-10-15
			9-23	Silt loam, silty clay loam, loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	90-95-100	85-93-100	75-88-100	65-83-100	25-33-40	5-13-20
			23-43	Silt loam, silty clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0- 0- 0	0- 0- 0	90-95-100	85-93-100	75-88-100	65-83-100	25-35-45	5-15-25
			43-53	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
WoB—Woolper silty clay loam, 2 to 6 percent slopes, rarely flooded														
Woolper, rarely flooded	80	C	0-10	Silty clay loam	CL-ML, CL	A-4, A-6	0- 0- 0	0- 5- 10	90-93-100	79-87-100	74-86-100	64-76-94	25-30-35	6-11-15
			10-35	Silty clay, silty clay loam, channery silty clay, clay	CH, CL	A-6, A-7	0- 0- 0	0- 5- 10	95-98-100	90-95-100	85-93-100	75-88-100	35-50-65	15-28-40
			35-62	Silty clay, channery clay, clay, very channery clay	CH, CL	A-7	0- 0- 0	0- 5- 10	95-98-100	90-95-100	85-93-100	75-88-100	45-60-75	20-33-45

Engineering Properties–Menifee and Rowan Counties, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
BeF—Berks silt loam, 40 to 70 percent slopes														
Berks	90	B	0-10	Silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 10	84-91-100	64-82-100	53-76-100	42-62-84	25-31-36	5-8 -10
			10-26	Channery loam, very channery loam, channery silt loam, very channery silt loam	GC, GM, SC, SM	A-1, A-2, A-4	0- 0- 0	0-15- 30	40-60-80	35-53-70	25-43-60	20-33-45	25-31-36	5-8 -10
			26-33	Channery loam, very channery loam, channery silt loam, extremely channery silt loam	GM, SM	A-1, A-2	0- 0- 0	0-25- 40	35-52-65	25-27-55	20-26-40	15-25-35	24-31-38	2-6 -10
			33-43	Weathered bedrock	—	—	—	—	—	—	—	—	—	—
Bo—Bonnie silt loam														
Bonnie, frequently flooded	90	C/D	0-8	Silt loam	CL	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-100-100	91-96-100	27-31-34	8-10-12
			8-44	Silt loam	CL	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	90-95-100	27-31-34	8-10-12
			44-60	Silt loam, silty clay loam	CL	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-95-100	80-90-100	25-32-39	8-12-15

Engineering Properties–Menifee and Rowan Counties, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
Ck—Clifty silt loam														
Clifty, occasionally flooded	90	A	0-8	Silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 0	85-93-100	71-84-100	61-78-100	50-65-86	20-28-35	2-6 -10
			8-36	Gravelly sandy clay loam, gravelly loam, very gravelly silt loam	GM, ML, CL-ML, GC-GM	A-4	0- 0- 0	0- 8- 15	55-62-75	50-50-70	45-48-65	35-48-60	20-28-35	2-6 -10
			36-60	Gravelly sandy loam, very gravelly loam, very gravelly silt loam	GC-GM, GM, SM	A-1, A-2, A-4	0- 0- 0	0-13- 25	40-58-75	35-53-70	25-43-60	15-33-50	15-23-30	NP-4 -7
CrC—Cranston gravelly silt loam, 6 to 12 percent slopes														
Cranston	85	A	0-5	Gravelly silt loam	GC, GM, ML, SM	A-1, A-2, A-4	0- 0- 0	0- 0- 25	66-76-82	39-60-74	35-55-70	28-45-58	15-25-35	NP-4 -10
			5-50	Channery silt loam, gravelly silt loam	CL-ML, CL, GC, GM, ML	A-4	0- 0- 0	0-10- 20	60-70-80	55-65-75	50-60-70	40-53-65	15-25-35	NP-5 -10
			50-76	Channery silt loam, very gravelly silt loam, gravelly silt loam	SC-SM, GC, GM, SM	A-1, A-2, A-4	0- 0- 0	0- 8- 30	50-80-80	25-65-75	23-42-60	18-32-45	15-25-35	NP-5 -10

Engineering Properties–Menifee and Rowan Counties, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
CrD—Cranston gravelly silt loam, 12 to 20 percent slopes														
Cranston	85	A	0-5	Gravelly silt loam	GC, GM, ML, SM	A-1, A-2, A-4	0- 0- 0	0- 0- 25	66-76-82	39-60-74	35-55-70	28-45-58	15-25-35	NP-4-10
			5-50	Channery silt loam, gravelly silt loam	CL-ML, CL, GC, GM, ML	A-4	0- 0- 0	0-10- 20	60-70-80	55-65-75	50-60-70	40-53-65	15-25-35	NP-5-10
			50-76	Channery silt loam, very gravelly silt loam, gravelly silt loam	SC-SM, GC, GM, SM	A-1, A-2, A-4	0- 0- 0	0- 8- 30	50-80-80	25-65-75	23-42-60	18-32-45	15-25-35	NP-5-10
CrE—Cranston gravelly silt loam, 20 to 30 percent slopes														
Cranston	85	A	0-5	Gravelly silt loam	GC, GM, ML, SM	A-1, A-2, A-4	0- 0- 0	0- 0- 25	66-76-82	39-60-74	35-55-70	28-45-58	15-25-35	NP-4-10
			5-50	Channery silt loam, gravelly silt loam	CL-ML, CL, GC, GM, ML	A-4	0- 0- 0	0-10- 20	60-70-80	55-65-75	50-60-70	40-53-65	15-25-35	NP-5-10
			50-76	Channery silt loam, very gravelly silt loam, gravelly silt loam	SC-SM, GC, GM, SM	A-1, A-2, A-4	0- 0- 0	0- 8- 30	50-80-80	25-65-75	23-42-60	18-32-45	15-25-35	NP-5-10

Engineering Properties–Menifee and Rowan Counties, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
CrF—Cranston gravelly silt loam, 30 to 60 percent slopes														
Cranston	85	A	0-5	Gravelly silt loam	GC, GM, ML, SM	A-1, A-2, A-4	0- 0- 0	0- 0- 25	66-76-82	39-60-74	35-55-70	28-45-58	15-25-35	NP-4-10
			5-50	Channery silt loam, gravelly silt loam	CL-ML, CL, GC, GM, ML	A-4	0- 0- 0	0-10- 20	60-70-80	55-65-75	50-60-70	40-53-65	15-25-35	NP-5-10
			50-76	Channery silt loam, very gravelly silt loam, gravelly silt loam	SC-SM, GC, GM, SM	A-1, A-2, A-4	0- 0- 0	0- 8- 30	50-80-80	25-65-75	23-42-60	18-32-45	15-25-35	NP-5-10
Cu—Cuba silt loam														
Cuba, occasionally flooded	90	B	0-33	Silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	94-100-100	90-99-100	84-92-96	25-30-35	3-8 -12
			33-60	Stratified fine sand to silt loam	CL, CL-ML, ML	A-4	0- 0- 0	0- 0- 0	100-100-100	80-90-100	75-88-100	50-68-85	15-23-30	2-6 -10
Jo—Johnsburg silt loam														
Johnsburg, rarely flooded	90	C/D	0-10	Silt loam	CL, ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-99-100	87-91-95	30-35-40	5-10-15
			10-24	Silty clay loam, silt loam	CL	A-6, A-7	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	85-90-95	35-43-50	20-25-30
			24-56	Silty clay loam, silt loam, loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 3- 5	95-98-100	90-93-95	85-90-95	60-73-85	20-28-35	5-10-15
			56-70	Silt loam, sandy loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0- 1- 2	5- 8- 10	90-93-95	85-88-90	60-75-90	35-53-70	20-25-30	5-10-15
			70-80	Weathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Menifee and Rowan Counties, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
Mp—Morehead silt loam														
Morehead, occasionally flooded	90	B/D	0-18	Silt loam	ML	A-4	0- 0- 0	0- 0- 0	94-100-100	89-100-100	82-99-100	75-92-100	25-30-35	2-6 -10
			18-48	Silty clay loam, silt loam	CL, CL-ML	A-6, A-4	0- 0- 0	0- 0- 0	95-98-100	95-98-100	90-95-100	75-88-100	25-33-40	5-13-20
			48-70	Silty clay loam, loam, silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	90-95-100	85-93-100	70-85-100	60-78-95	20-30-40	2-11-20
Mr—Mullins silt loam														
Mullins, rarely flooded	90	D	0-9	Silt loam	CL, ML	A-4	0- 0- 0	0- 0- 0	94-100-100	89-100-100	81-99-100	75-92-100	25-30-35	2-6 -10
			9-16	Silty clay loam, silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	95-98-100	95-98-100	90-95-100	80-90-100	25-33-40	5-13-20
			16-48	Silty clay loam, silt loam	CL, CL-ML, ML	A-4, A-6	0- 0- 0	0- 0- 0	95-98-100	95-98-100	90-95-100	80-90-100	25-33-40	5-13-20
			48-60	Silty clay, silt loam, silty clay loam	CL, GM, ML, SM	A-4, A-6, A-7	0- 0- 0	0- 0- 10	70-100-100	65-92-100	55-78-100	45-73-100	20-35-50	2-16-30
St—Stendal silt loam														
Stendal, occasionally flooded	90	B/D	0-10	Silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-100-100	91-96-100	25-33-40	5-10-15
			10-60	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-95-100	75-83-90	25-33-40	5-10-15

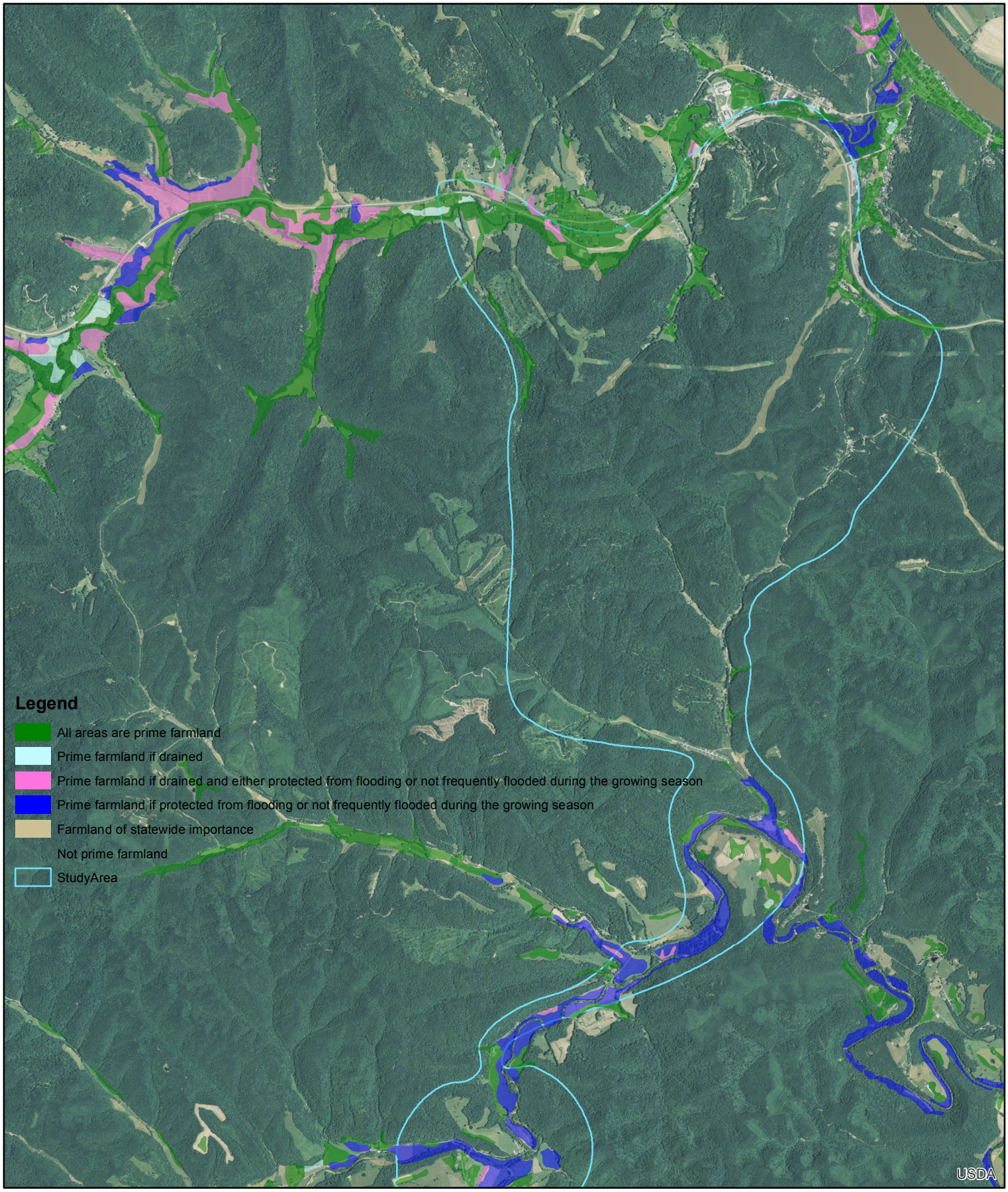
Engineering Properties–Menifee and Rowan Counties, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
TIB—Tilsit silt loam, 2 to 6 percent slopes														
Tilsit	90	C/D	0-9	Silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	90-100-100	77-100-100	71-99-100	64-91-99	20-28-35	4-10-15
			9-24	Loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	90-95-100	85-93-100	75-88-100	65-83-100	25-33-40	5-13-20
			24-56	Loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0- 0- 0	0- 0- 0	90-95-100	85-93-100	75-88-100	65-83-100	25-35-45	5-15-25
			56-65	Silty clay, silty clay loam, very channery silt loam	CH, CL, CL-ML	A-4, A-6, A-7	0- 0- 0	0-20- 30	70-90-100	65-65-85	60-64-85	55-62-80	25-43-60	5-20-35
			65-75	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
TIC—Tilsit silt loam, 6 to 12 percent slopes														
Tilsit	90	C/D	0-9	Silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	90-100-100	77-100-100	71-99-100	64-91-99	20-28-35	4-10-15
			9-24	Loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	90-95-100	85-93-100	75-88-100	65-83-100	25-33-40	5-13-20
			24-56	Loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0- 0- 0	0- 0- 0	90-95-100	85-93-100	75-88-100	65-83-100	25-35-45	5-15-25
			56-65	Silty clay, silty clay loam, very channery silt loam	CH, CL, CL-ML	A-4, A-6, A-7	0- 0- 0	0-20- 30	70-90-100	65-65-85	60-64-85	55-62-80	25-43-60	5-20-35
			65-75	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Menifee and Rowan Counties, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
WtA—Whitley silt loam, terrace, 0 to 2 percent slopes														
Whitley, rarely flooded	90	B	0-9	Silt loam	CL-ML, CL, ML	A-4	0- 0- 0	0- 0- 0	95-100-100	86-100-100	76-99-100	69-91-100	15-25-35	NP-5-10
			9-36	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	95-98-100	90-95-100	85-93-100	70-85-100	20-30-40	5-13-20
			36-50	Gravelly silty clay loam, silt loam	CL, ML, SC, SM	A-4, A-6	0- 0- 0	0- 0- 0	75-88-100	50-75-100	45-70-95	36-63-90	20-30-40	2-11-20
			50-62	Gravelly silty clay loam, silt loam	CL, GC, GM, ML, SC	A-1-b, A-2, A-4, A-6	0- 0- 0	0- 5- 25	45-91-100	35-79-100	30-63-95	15-48-80	15-23-30	NP-8-15
WtB—Whitley silt loam, terrace, 2 to 6 percent slopes														
Whitley, rarely flooded	90	B	0-9	Silt loam	CL-ML, CL, ML	A-4	0- 0- 0	0- 0- 0	95-100-100	86-100-100	76-99-100	69-91-100	15-25-35	NP-5-10
			9-36	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	95-98-100	90-95-100	85-93-100	70-85-100	20-30-40	5-13-20
			36-50	Gravelly silty clay loam, silt loam	CL, ML, SC, SM	A-4, A-6	0- 0- 0	0- 0- 0	75-88-100	50-75-100	45-70-95	36-63-90	20-30-40	2-11-20
			50-62	Gravelly silty clay loam, silt loam	ML, SC, CL, GC, GM	A-1-b, A-2, A-4, A-6	0- 0- 0	0- 5- 25	45-91-100	35-79-100	30-63-95	15-48-80	15-23-30	NP-8-15

Engineering Properties–Menifee and Rowan Counties, Kentucky														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
WtC—Whitley silt loam, terrace, 6 to 12 percent slopes														
Whitley, rarely flooded	90	B	0-9	Silt loam	CL-ML, CL, ML	A-4	0- 0- 0	0- 0- 0	95-100-100	86-100-100	76-99-100	69-91-100	15-25-35	NP-5-10
			9-36	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0- 0- 0	0- 0- 0	95-98-100	90-95-100	85-93-100	70-85-100	20-30-40	5-13-20
			36-50	Gravelly silty clay loam, silt loam	CL, ML, SC, SM	A-4, A-6	0- 0- 0	0- 0- 0	75-88-100	50-75-100	45-70-95	36-63-90	20-30-40	2-11-20
			50-62	Gravelly silty clay loam, silt loam	CL, GC, GM, ML, SC	A-1-b, A-2, A-4, A-6	0- 0- 0	0- 5- 25	45-91-100	35-79-100	30-63-95	15-48-80	15-23-30	NP-8-15

Ky 59 - Ky 344 - Ky 377 Planning Study -Lewis-Rowan, only Prime and Statewide Important Soils are shown.

Scale 1:60,000



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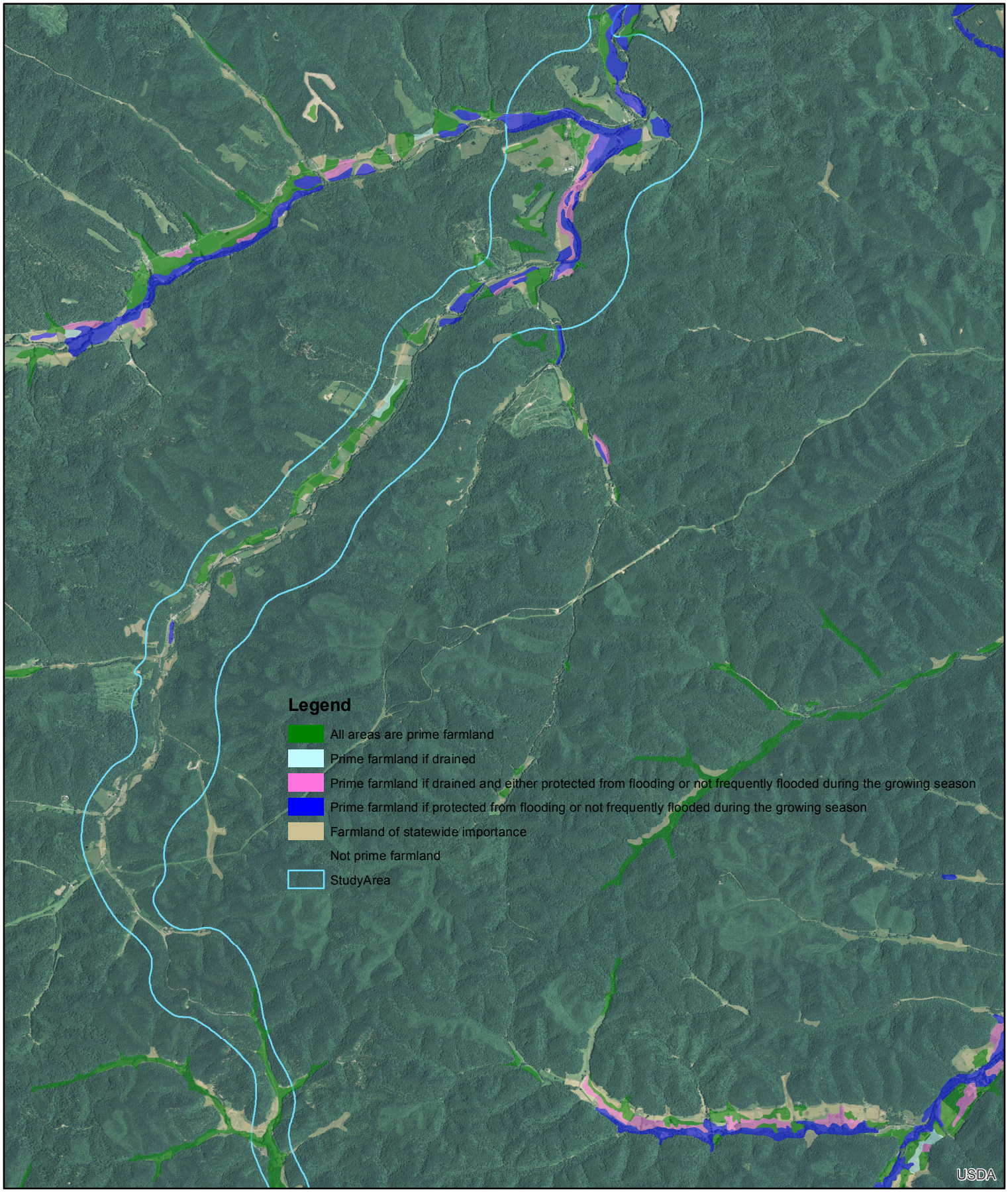

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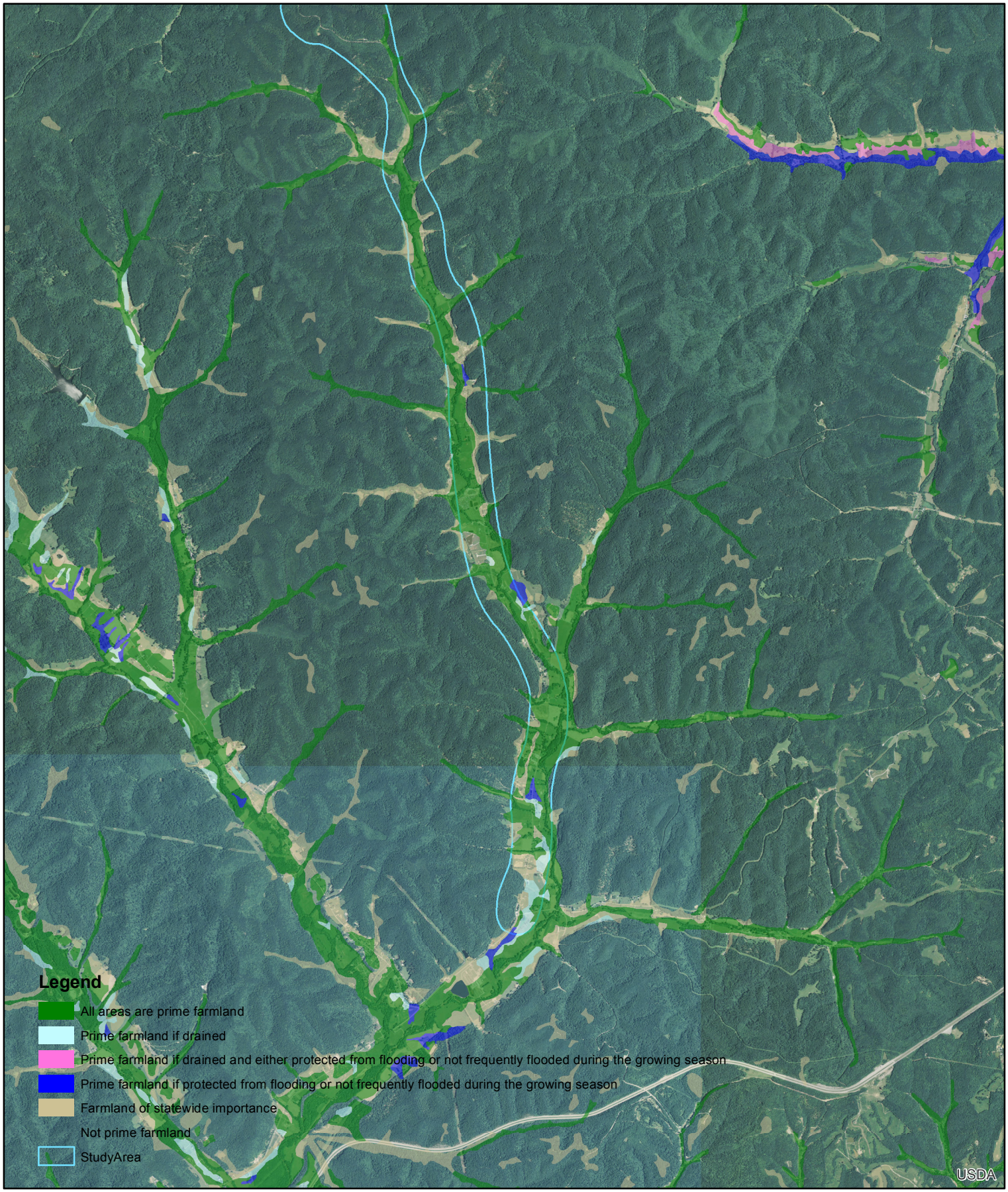

Steven L. Beshear
Governor

Terry Holliday, Ph.D.
Commissioner of Education

EDUCATION AND WORKFORCE DEVELOPMENT CABINET
DEPARTMENT OF EDUCATION
Capital Plaza Tower • 500 Mero Street • Frankfort, Kentucky 40601
Phone: (502) 564-4770 • www.education.ky.gov

June 26, 2015

Mr. Joe Callahan
Kentucky Transportation Cabinet
District 9-Flemingsburg Office
P.O. Box 347
822 Elizaville Avenue
Flemingsburg, KY 41041

Dear Mr. Callahan:

Thank you for the opportunity to review the "KY 59 / KY 344 / KY 377 Planning Study, Item No. 9-231.00" for Rowan County and Lewis County. I forwarded the information to the District Facilities Branch and the Student Tracking and Transportation Branch here at the Kentucky Department of Education (KDE) for their review and input. Staff reported there is nothing in the report that impacts anything under the direct control of KDE in terms of school facilities or school bus routes. However, it is the recommendation of KDE staff that the Transportation Cabinet contact the Rowan County School District and the Lewis County School District directly to solicit feedback from school district officials who have a better knowledge of how this project could impact schools in the affected area. The contact information is:

Superintendent Marvin Moore
Rowan County School District
121 East Second Street
Morehead, KY 40351-1669
(606) 784-8928

Superintendent Maurice Reeder
Lewis County School District
96 Plummer Lane
Vanceburg, KY 41179
(606) 796-2811

If you have any questions concerning school facilities or school bus transportation in general, please contact Kay Kennedy, KDE Director, Division of District Support, at kay.kennedy@education.ky.gov or (502) 564-3930, ext. 4433.

Sincerely,

Terry Holliday, Ph.D.

cc: Thomas Zawacki, Secretary, Education and Workforce Development Cabinet
cc: Bart Bryant, Transportation Cabinet

Steven L. Beshear
Governor

Terry Holliday, Ph.D.
Commissioner of Education

EDUCATION AND WORKFORCE DEVELOPMENT CABINET
DEPARTMENT OF EDUCATION

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June 26, 2015

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Kentucky Transportation Cabinet
District 9-Flemingsburg Office
~~P.O. Box 347~~
822 Elizaville Avenue
Flemingsburg, KY 41041

Dear Mr. Callahan:

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If you have any questions concerning school facilities or school bus transportation in general, please contact Kay Kennedy, KDE Director, Division of District Support, at kay.kennedy@education.ky.gov or (502) 564-3930, ext. 4433.

Sincerely,

Terry Holliday, Ph.D.

cc: Thomas Zawacki, Secretary, Education and Workforce Development Cabinet
cc: Bart Bryant, Transportation Cabinet

Steven L. Beshear
Governor

Energy and Environment Cabinet
Department for Environmental Protection
Division for Air Quality
200 Fair Oaks Lane, 1st Floor
Frankfort, Kentucky 40601-1403
Web site: air.ky.gov

Leonard K. Peters
Secretary

July 6, 2015

Mr. Joe Callahan
Kentucky Transportation Cabinet
District 9-Flemingsburg Office
PO Box 347
Flemingsburg, Kentucky 41041

Dear Mr. Callahan:

The Division has reviewed the planning study for improvements along KY 59, KY 344 and KY 377 in Rowan and Lewis Counties. The following Kentucky Administrative Regulations apply to this proposed project:

401 KAR 63:005 states that open burning shall be prohibited except as specifically provided. Open Burning is defined as the burning of any matter in such a manner that the products of combustion resulting from the burning are emitted directly into the outdoor atmosphere without passing through a stack or chimney. However, open burning may be utilized for the expressed purposes listed on the Open Burning Brochure located at http://air.ky.gov/Pages/OpenBurning.aspx

401 KAR 63:010, Fugitive Emissions, states that no person shall cause, suffer, or allow any material to be handled, processed, transported, or stored without taking reasonable precaution to prevent particulate matter from becoming airborne. Additional requirements include the covering of open bodied trucks, operating outside the work area transporting materials likely to become airborne, and that no one shall allow earth or other material being transported by truck or earth moving equipment to be deposited onto a paved street or roadway. Please note the Fugitive Emissions Fact Sheet located at http://air.ky.gov/SiteCollectionDocuments/Fugitive%20Dust%20Fact%20Sheet.pdf

The Division would like to offer the following suggestions on how this project can help maintain compliance with the National Ambient Air Quality Standards. These air quality control strategies are beneficial to the health of citizens of Kentucky:

- Utilize alternatively fueled equipment;
- Utilize other emission controls that are applicable to your equipment;
- Reduce idling time on equipment.

Finally, the projects listed in this document must meet the conformity requirements of 401 KAR 50:066 as amended and the transportation planning provisions of Title 40 of United States Code. The Division also suggests an investigation into compliance with applicable local government regulations. The Division appreciates the opportunity to review this submittal. If you have any questions regarding this matter, please contact Mr. Joe Forgacs, at (502) 564-3999.

Sincerely,

Sean Alteri
Director

SA/lmp

Joe

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

June 29, 2015

Mr. Bart Bryant
Transportation Cabinet
Department of Highways, District 9 Office
822 Elizaville Road
Flemingsburg, Kentucky 41041

Re: FWS 2015-B-0548; KYTC 9-231.00, KY 59/KY 344/KY 377 Planning Study, KY 9 in Vanceburg to KY 799 in Triplett; Rowan and Lewis Counties, Kentucky

Dear Mr. Bryant:

Thank you for the opportunity to provide comments on the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed this proposed project and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

In accordance with the provisions of the Fish and Wildlife Coordination Act, the Service has reviewed the project with regards to the effects the proposed actions may have on wetlands and/or other jurisdictional waters. We recommend that project plans be developed to avoid impacting wetland areas and/or streams, and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands or other jurisdictional waters are present or if a permit is required.

In accordance to section 7 of the ESA, the Service must also consider the effects of actions interrelated and interdependent to the proposed project. "Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification and "interdependent actions" are those that have no independent utility apart from the action under consideration. Please inform us of any future actions and/or projects (*i.e.*; additional development, roads, structures, utilities, pump stations, etc.) that would reasonably occur as a result of the proposed project so that we may adequately analyze those effects.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the following federally listed species have the potential to occur within the project vicinity. The listed species are:

Group	Species	Common name	Legal* Status
Mammals	*Myotis sodalis*	Indiana bat	E
	Myotis septentrionalis	Northern long-eared bat	P
	Myotis grisescens	gray bat	E
	Corynorhinus townsendii viginianus	Virginia big-eared bat	E
Mussels	*Epioblasma o. obliquata*	purple catspaw pearlymussel	E
	Cyprogenia stegaria	fanshell	E
	Plethobasus cooperianus	orangefoot pimpleback	E
	Lampsilis abrupta	pink mucket	E
	Obovaria retusa	ring pink	E
	Pleurobema plenum	rough pigtoe	E
	Plethobasus cyphyus	sheepnose	E
	Pleurobema clava	clubshell	E
	Quadrula cylindrica cylindrica	rabbitsfoot	T
	Epioblasma triquetra	snuffbox	E
	Epioblasma torulosa rangiana	Northern riffleshell	E
	Lampsilis abrupta	pink mucket	E
Plants	*Spiraea virginiana*	Virginia spiraea	T

** Key to notations: E = Endangered, T = Threatened, P = Proposed, C = Candidate, CH = Critical Habitat*

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat
Northern long-eared bat

The proposed project is located in "known Indiana bat non-maternity" for the Indiana bat and the known summer roosting habitat (summer 1) for the northern long-eared bat. These two bat species winter in caves, rock shelters, abandoned underground mines, and other structures. During the summer they roost in trees and forage in and around forested habitat. In order to address the concerns and be in compliance with the ESA, we have the following recommendations relative to potential direct and/or indirect effects as a result of impacts to the habitats listed above:

(1) Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, we believe that it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter habitat for Indiana bats. Therefore, we recommend that the project proponent survey the project area for caves, rock shelters, and underground mines, identify

any such habitats that may exist on-site, and avoid impacts to those sites pending an analysis of their suitability as Indiana bat habitat and/or northern long-eared bat by this office.

(2) Both bat species utilize a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Suitable roost trees are greater than 3 inches diameter at breast height (DBH), can be living or dead, and exhibit any of the following characteristics: exfoliating bark, cavities of dead and live trees, broken limbs, broken tops, cracks, and crevices.

To address potential impacts to Indiana bat or the northern long-eared bat summer roosting and foraging habitat, the following options are available:

- The project proponent can modify the proposed project to eliminate or reduce impacts to suitable habitat, thus avoiding impacts. A habitat assessment may useful in determining if suitable summer roosting or foraging habitat is present in the action area of the proposed project.

- The project proponent can survey portions of the project area to determine the presence or likely absence of the species within the project area in an effort to determine if potential effects are likely. A qualified biologist who holds the appropriate collection permits must undertake such surveys in accordance with our most current survey guidance, which is available at the following link: https://www.fws.gov/frankfort/indiana_bat_procedures.html.

  If any Indiana bats or northern long-eared bats are captured, we request written notification of such occurrence(s) and further coordination and consultation. Survey results cannot be used to support probable absence of a bat species that has already been identified as "known" habitat for that species.

- The project proponent can request formal section 7 consultation through the lead federal action agency associated with the proposed project. To request formal consultation, the project proponent would need to submit a Biological Assessment that describes the action and evaluates the effects of the action on the listed species in the project area. After formal consultation is initiated, the Service has 135 days to prepare a Biological Opinion that analyzes the effects of the action on the listed species and identifies actions to minimize those effects.

- The project proponent may provide the Service with additional information through the informal consultation process, prepared by a qualified biologist, that includes site-specific habitat information and a thorough effects analysis (direct, indirect, and cumulative) to support a "not likely to adversely affect" determination. The Service will review this and decide if there is enough supporting information to concur with the determination.

- The project proponent may choose to assume presence of the species in the project area and enter into a Conservation Memorandum of Agreement (MOA) with the Service to account for the incidental take of Indiana bats and/or northern long-eared bats. By entering into a Conservation MOA with the Service, Cooperators gain

Federally listed mussels

Freshwater mussels are one of the most imperiled groups of animals in North America. Reservoir construction, siltation, channelization, and water pollution are all factors that have contributed to the decline of our native mussel populations. The runoff from urban areas has degraded the quality of water and the substrate of many streams. As filter feeders, mussels are sensitive to contaminants and function as indicators of problems with water quality. Several species of federally listed mussels are known to exist in Rowan and Lewis Counties. The potential of the proposed project to impact federally listed mussel species, either directly or indirectly as a result of siltation/sedimentation and contamination, should be addressed when evaluating the effects the proposed project

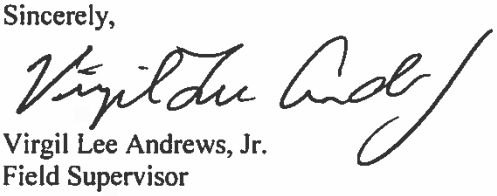
Virginia spiraea

Virginia spiraea is a shrub in the Rose family that can grow to a height of 9 feet. Virginia spiraea only grows naturally on gravel bars and banks of high quality, swift flowing streams and rivers that are subject to periodic flooding. These floods are important because Virginia spiraea grows best in full sun, and flooding topples trees that can out compete it for sunlight.

A major cause of the decline of Virginia spiraea is erosion from river crossings or disturbance of the surrounding slopes which causes sedimentation where this shrub grows and degrades river habitat. Because we have concerns regarding the project's potential effects to Virginia spiraea and to ensure the project is in full compliance with section 7 of the Endangered Species Act, the Service recommends surveying any potential Virginia spiraea habitat, as described above, in the action area of the proposed project. Surveys should be done by qualified personnel and be conducted during the appropriate time of year to ensure confidence in survey results. A survey for Virginia spiraea would not be necessary if sufficient site-specific information was available that showed that: (1) there is no potentially suitable habitat within the project area or its vicinity or (2) the species would not be present within the project area or its vicinity due to site-specific factors.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jonathan Baxter at (502) 695-0468 extension 111.

Sincerely,



Virgil Lee Andrews, Jr.
Field Supervisor

From: Callahan, Joe (KYTC-D09)
To: Stephen.Wilson@faa.gov
Cc: Coffey, Annette; Mills, Deanna (KYTC)
Subject: RE: KY 59 Study
Date: Wednesday, July 01, 2015 9:28:40 AM

Mr. Wilson.

Thank you for your response. If anything changes in the future that you feel we should be made aware of, please let me know.

Joe Callahan, P.E.
Planning Section Supervisor
Kentucky Transportation Cabinet, District 9
P. O. Box 347
Flemingsburg, KY 41041
Office: 606-845-2551
Fax: 606-849-2286
Cell: 606-776-5020

From: Stephen.Wilson@faa.gov [mailto:Stephen.Wilson@faa.gov]
Sent: Tuesday, June 30, 2015 10:57 AM
To: Callahan, Joe (KYTC-D09)
Subject: KY 59 Study

Joe-

We have reviewed the KY 59/KY 344/KY 377 Planning Study in Rowan and Lewis Counties. Based on the available data, we see no construction impacts to surrounding airports.

Thanks

Stephen Wilson
Community Planner
FAA, Memphis Airports District Office
2600 Thousand Oaks Blvd., Suite 2250
Memphis, TN 38118 2482
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CRAIG A. POTTS
EXECUTIVE DIRECTOR AND
STATE HISTORIC PRESERVATION OFFICER

June 22, 2015

Mr. Joe Callahan, Kentucky Transportation Cabinet
District 9- Flemingsburg Office
P.O. Box 347
822 Elizaville Avenue
Flemingsburg, KY 41041

Re: KY 59/ KY 344/ KY377 Planning Study
KY 9 in Vanceburg to KY 799 in Triplett
Rowan and Lewis Counties
Item No. 9-231.00

Dear Mr. Callahan:

Thank you for submitting the letter and planning documents for the above-listed proposed project, which we received on June 15, 2015. We understand that you would like preliminary comment on the planning study as part of your NEPA compliance process to determine the need and potential impacts for the proposed highway project. We are indeed concerned that the proposed undertaking will have impacts to historic resources, though the specific properties and the full scope and scale of those effects have not yet been determined. We understand that documentation regarding these resources and assessments of effects will be coordinated with our office as part of the Section 106 consultation process under the National Historic Preservation Act. We look forward to receiving that additional information and further coordination. If you have any questions please contact Amanda Kincaid of my staff at (502)564.7005 ext. 147.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: ak
cc: Bart Bryant (KYTC)