SECTION 4-1

MADISON COUNTY PROJECTED POPULATION CHART 4-1

for

Northern Madison County Sanitation District

Regional Facilities Plan

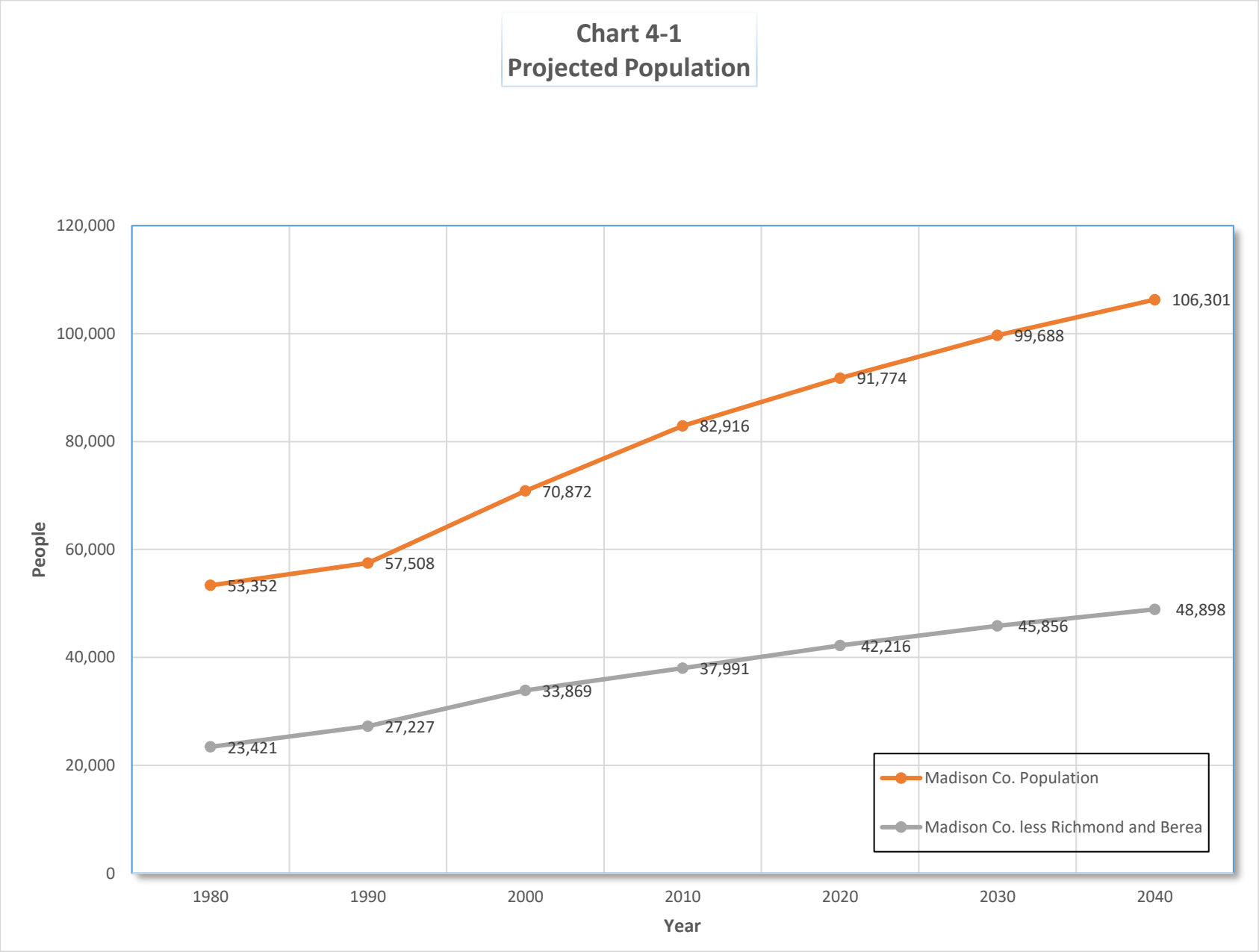


Chart 4-1
Projected Population
120,000
100,000
80,000
60,000
40,000
20,000
0
People
1980
1990
2000
2010
2020
2030
2040
Year
53,352
57,508
70,872
82,916
91,774
99,688
106,301
23,421
27,227
33,869
37,991
42,216
45,856
48,898
Madison Co. Population
Madison Co. less Richmond and Berea

SECTION 4-2

MADISON COUNTY PROJECTED CUSTOMER BASE CHART 4-2

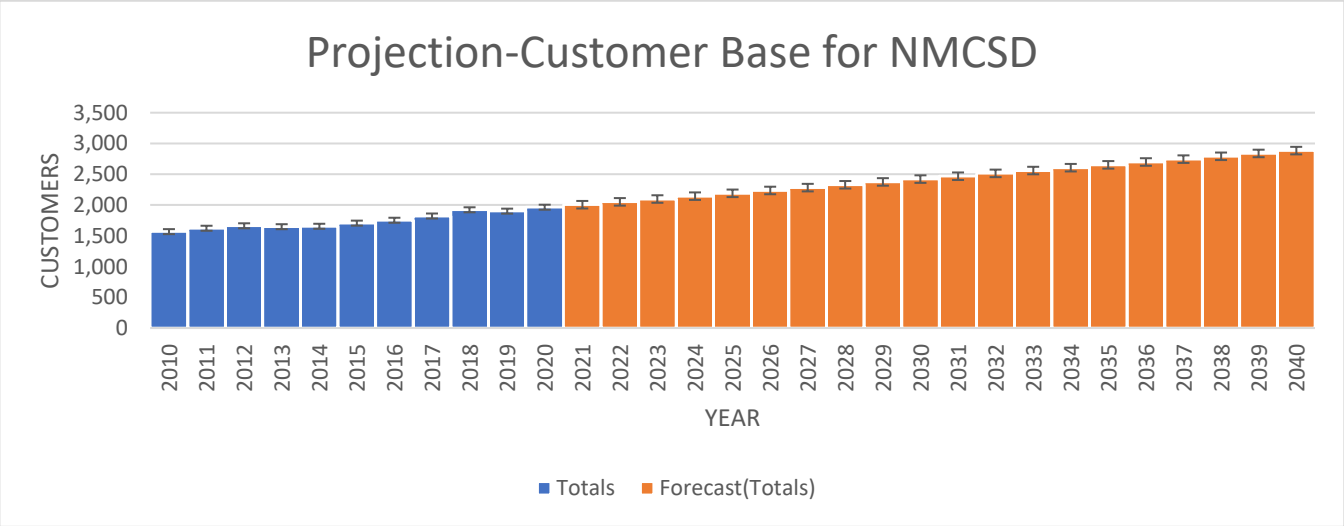
for

Northern Madison County Sanitation District

Regional Facilities Plan

CHART 4-2 NMCSD - PROJECTION OF CUSTOMER BASE

Year	Totals	Forecast(Totals)
2010	1,567	
2011	1,622	
2012	1,662	
2013	1,647	
2014	1,654	
2015	1,705	
2016	1,752	
2017	1,821	
2018	1,922	
2019	1,900	
2020	1,964	
2021		2,004
2022		2,051
2023		2,097
2024		2,143
2025		2,190
2026		2,236
2027		2,282
2028		2,328
2029		2,375
2030		2,421
2031		2,467
2032		2,514
2033		2,560
2034		2,606
2035		2,652
2036		2,699
2037		2,745
2038		2,791
2039		2,838
2040		2,884



Kentucky Geological Survey
James C. Cobb, Director and State Geologists
UNIVERSITY OF KENTUCKY

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

Bart Davidson and Daniel I. Carey

MAP AND CHART 72
Series XII, 2004

Landslides

Hillside construction can cause earth movements if not properly planned. Photos by Paul Howell, Natural Resources Conservation Service.

Heavy equipment is used to clean up a rockfall between Richmond and Irvine on Ky. 52. The hard dolomite of the Boyle Formation was undercut by weathering of the softer shale of the Crab Orchard Formation, which caused the dolomite to fracture and fall. Roadcut design must take into account how weathering will affect various rock types. Photo by Bart Davidson, Kentucky Geological Survey.

1

Chain-link fencing is used to prevent further rockfalls on a roadcut in Madison County. Photo by Bart Davidson, Kentucky Geological Survey.

Karst

Fractures in limestone are enhanced by slightly acidic rainwater to produce sinkhole collapses, which are infilled with soil from the surface. These fractures can also contribute to roadway failure. Photo by Bart Davidson, Kentucky Geological Survey.

The term "karst" refers to a landscape characterized by sinkholes, springs, sinking streams (streams that disappear underground), and underground drainage through solution-enlarged conduits or caves. Karst landscapes form when slightly acidic water from rain and snow-melt seeps through soil cover into fractured and soluble bedrock (usually limestone, dolomite, or gypsum).

Sinkholes are depressions on the land surface where water drains underground. Usually circular and often funnel-shaped, they range in size from a few feet to hundreds of feet in diameter. Springs occur when water emerges from underground to become surface water. Caves are solution-enlarged fractures or conduits that are large enough for a person to enter.

DEFINITIONS

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

LIMITATIONS
Slight--A slight limitation is one that commonly requires some corrective measure but can be overcome without a great deal of difficulty or expense.

Moderate--A moderate limitation is one that can normally be overcome but the difficulty and expense are great enough that completing the project is commonly a question of feasibility.

Severe--A severe limitation is one that is difficult to overcome and commonly is not feasible because of the expense involved.

LAND USES
Septic tank disposal system--A septic tank disposal system consists of a septic tank and a filter field. The filter field is a subsurface tile system laid in such a way that effluent from the septic tank is distributed with reasonable uniformity into the natural soil.

Residences--Ratings are made for residences with and without basements because the degree of limitation is dependent upon ease and required depth of excavation. For example, excavation in limestone has greater limitation than excavation in shale for a house with a basement.

Highways and streets--Refers to paved roads in which cuts and fills are made in hilly topography, and considerable work is done preparing subgrades and bases before the surface is applied.

Access roads--These are low-cost roads, driveways, etc., usually surfaced with crushed stone or a thin layer of blacktop. A minimum of cuts and fills are made, little work is done preparing a subgrade, and generally only a thin base is used. The degree of limitation is based on year-around use and would be less severe if not used during the winter and early spring. Some types of recreation areas would not be used during these seasons.

Light industry and malls--Ratings are based on developments having structures or equivalent load limit requirements of three stories or less, and large paved areas for parking lots. Structures with greater load limit requirements would normally need footings in solid rock, and the rock would need to be core drilled to determine presence of caverns, cracks, etc.

Intensive recreation--Athletic fields, stadiums, etc.

Extensive recreation--Camp sites, picnic areas, parks, etc.

Reservoir areas--The floor of the area where the water is impounded. Ratings are based on the permeability of the rock.

Reservoir embankments--The rocks are rated on limitations for embankment material.

Underground utilities--Included in this group are sanitary sewers, storm sewers, water mains, and other pipes that require fairly deep trenches.

Environmental Issues

A septic system is installed for a public facility near Berea. Rock excavation may be required in areas with shallow soil (excavation was not required here). Underlying shale may restrict percolation in some areas. In areas overlying limestone, septic systems can leak through fractures in the limestone, contaminating groundwater. Photo by Bart Davidson, Kentucky Geological Survey.

5

For Planning Use Only

This map is not intended to be used for selecting individual sites. Its purpose is to inform land-use planners, government officials, and the public in a general way about geologic bedrock conditions that affect the selection of sites for various purposes. The properties of thick soils may supercede those of the underlying bedrock and should be considered on a site-to-site basis. At any site, it is important to understand the characteristics of both the soils and the underlying rock. For further assistance, contact Bart Davidson, Kentucky Geological Survey, 859.257.5500 x162. For more information, and to make custom maps of your local area, visit our Land-Use Planning Internet Mapping Web Site at kgsmap.uky.edu/website/kyluplan/viewer.htm.

Madison County Courthouse

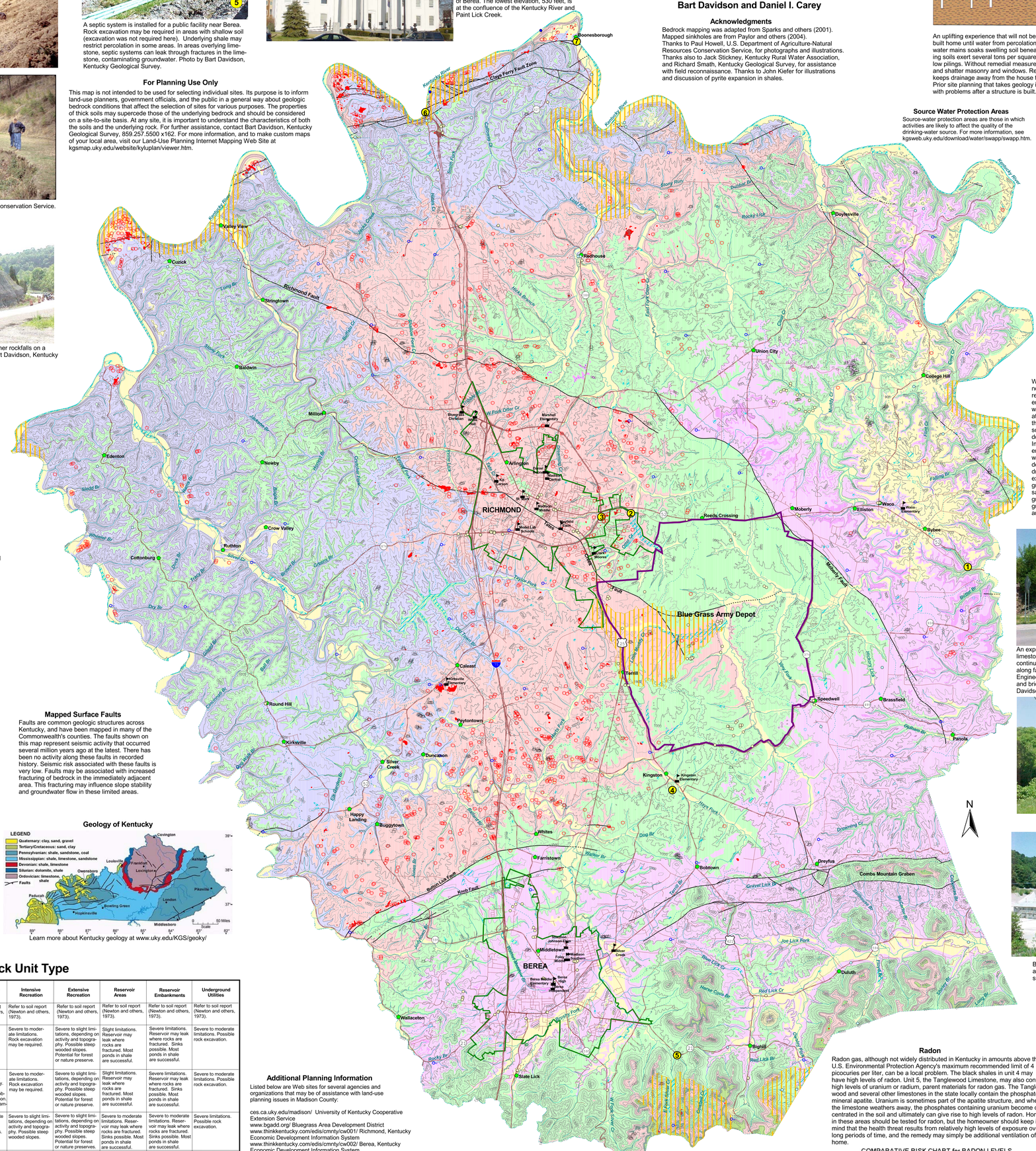
Madison County has two major townships--Richmond, the county seat and home of Eastern Kentucky University, and Berea, home of Berea College. The 2005 population of 72,408, was 25.9 percent greater than the population in 1990.

Madison County was founded in 1798 and named after James Madison, the fourth president of the United States. Most of the county lies in the Outer Bluegrass Region, but the extreme southern area includes the outer edge of the Eastern Coalfield.

The highest elevation in the county, 1,660 feet, is on Bear Mountain, 3 miles southeast of Berea. The lowest elevation, 530 feet, is at the confluence of the Kentucky River and Paint Lick Creek.

Acknowledgments

Bedrock mapping was adapted from Sparks and others (2001). Mapped sinkholes are from Paylor and others (2004). Thanks to Paul Howell, U.S. Department of Agriculture-Natural Resources Conservation Service, for photographs and illustrations. Thanks also to Jack Stickney, Kentucky Rural Water Association, and Richard Smath, Kentucky Geological Survey, for assistance with field reconnaissance. Thanks to John Kiefer for illustrations and discussion of pyrite expansion in shales.



Mapped Surface Faults

Faults are common geologic structures across Kentucky, and have been mapped in many of the Commonwealth's counties. The faults shown on this map represent seismic activity that occurred several million years ago at the latest. There has been no activity along these faults in recorded history. Seismic risk associated with these faults is very low. Faults may be associated with increased fracturing of bedrock in the immediately adjacent area. This fracturing may influence slope stability and groundwater flow in these limited areas.

Geology of Kentucky

Learn more about Kentucky geology at www.uky.edu/KGS/geoky/

Planning Guidance by Rock Unit Type

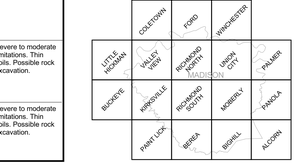
Rock Unit	Foundation and Excavation	Septic System	Residence with Basement	Highways and Streets	Access Roads	Light Industry and Malls	Intensive Recreation	Extensive Recreation	Reservoir Areas	Reservoir Embankments	Underground Utilities
1. Sand, gravel, silt, clay	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).	Refer to soil report (Newton and others, 1973).
2. Siltstone, limestone, and shale (See discussion of swelling shales.)	Fair to good foundation material; difficult to excavate. Pyrite expansion in shales possible. Easy to excavate, but poor foundation.	Severe limitations. Impermeable rock. Thin soils. Locally fast drainage through fractures and sinks to water table; possible groundwater contamination.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes. Potential for forest or nature preserve.	Slight limitations. Reservoir may leak where rocks are fractured. Most ponds in shale are successful.	Severe limitations. Reservoir may leak where rocks are fractured. Sinks possible. Most ponds in shale are successful.	Severe to moderate limitations. Possible rock excavation.
3. Limestone and shale (See discussion of swelling shales.)	Limestone--good to excellent foundation material; difficult to excavate. Possible pyrite expansion in shales. Easy to excavate, but poor foundation.	Severe limitations. Impermeable rock. Locally fast drainage through fractures and sinks to water table, possible groundwater contamination.	Severe limitations. Rock excavation may be required.	Severe limitations. Rock excavation. Steep slopes.	Moderate limitations. Rock excavation; possible steep slopes. Slight limitations with suitable topography.	Severe to slight limitations, depending on topography. Rock excavation. Local drainage problems. Sinks common. Groundwater contamination possible.	Severe to moderate limitations. Rock excavation may be required.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes. Potential for forest or nature preserve.	Slight limitations. Reservoir may leak where rocks are fractured. Most ponds in shale are successful.	Severe limitations. Reservoir may leak where rocks are fractured. Sinks possible. Most ponds in shale are successful.	Severe to moderate limitations. Possible rock excavation.
4. Shale and dolomite (See discussion of swelling shales.)	Dolomite--excellent foundation material; difficult to excavate. Possible pyrite expansion in shales; easy to excavate, but poor foundation.	Severe limitations. Impermeable rock. Locally fast drainage through fractures and sinks to water table; possible groundwater contamination.	Severe limitations. Rock excavation may be required.	Moderate limitations. Rock excavation. Local drainage problems. Sinks common.	Moderate limitations. Rock excavation. Local drainage problems. Sinks common.	Severe to moderate limitations. Rock excavation. Local drainage problems. Sinks common.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes. Potential for forest or nature preserve.	Severe to moderate limitations. Reservoir may leak where rocks are fractured. Sinks possible. Most ponds in shale are successful.	Severe to moderate limitations. Reservoir may leak where rocks are fractured. Sinks possible. Most ponds in shale are successful.	Severe limitations. Possible rock excavation.
5. Limestone, dolomite, and shale (See discussion of swelling shales.)	Fair to good foundation material; difficult to excavate. Possible expansive shales; easy to excavate, but poor foundation.	Severe limitations. Impermeable rock. Locally fast drainage through fractures and sinks to water table; possible groundwater contamination.	Severe limitations. Rock excavation may be required.	Moderate limitations. Rock excavation. Local drainage problems. Sinks common.	Moderate limitations. Rock excavation. Local drainage problems. Sinks common.	Severe to slight limitations, depending on topography. Rock excavation. Local drainage problems. Sinks common. Groundwater contamination possible.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes. Potential for forest or nature preserve.	Severe to moderate limitations. Reservoir may leak where rocks are fractured. Sinks possible. Most ponds in shale are successful.	Severe to moderate limitations. Reservoir may leak where rocks are fractured. Sinks possible. Most ponds in shale are successful.	Severe limitations. Possible rock excavation.
6. Dolomite	Excellent foundation material; difficult to excavate.	Severe limitations. Impermeable rock. Locally fast drainage through fractures and sinks to water table; possible groundwater contamination.	Severe limitations. Rock excavation may be required.	Severe limitations. Rock excavation. Possible steep slopes.	Severe to moderate limitations. Rock excavation. Possible steep slopes and narrow ravines.	Moderate to slight limitations, depending on topography. Rock excavation. Local drainage problems. Sinks common.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes. Potential for forest or nature preserve.	Moderate to slight limitations. Reservoir may leak where rocks are fractured. Sinks possible.	Moderate to slight limitations. Reservoir may leak where rocks are fractured. Sinks possible.	Severe limitations. Rock excavation.
7. Shale, siltstone, and sandstone (See discussion of swelling shales.)	Fair to good foundation material; difficult to excavate. Possible pyrite expansion in shales, Easy to excavate, but poor foundation.	Severe limitations. Thin soils. Impermeable rock.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes. Potential for forest or nature preserve.	Slight limitations. Reservoir may leak where rocks are fractured. Most ponds in shale are successful.	Severe limitations. Reservoir may leak where rocks are fractured. Most ponds in shale are successful.	Severe to moderate limitations. Thin soils. Possible rock excavation.
8. Sandstone	Fair to good foundation material; difficult to excavate.	Severe limitations. Thin soils.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required. Possible steep slopes.	Severe to moderate limitations. Rock excavation may be required.	Severe to slight limitations, depending on activity and topography. Possible steep wooded slopes. Potential for forest or nature preserve.	Slight limitations. Reservoir may leak where rocks are fractured.	Severe limitations. Reservoir may leak where rocks are fractured.	Severe to moderate limitations. Thin soils. Possible rock excavation.

Additional Planning Information

Listed below are Web sites for several agencies and organizations that may be of assistance with land-use planning issues in Madison County:

ces.ca.uky.edu/madison/ University of Kentucky Cooperative Extension Service
www.bgadd.org/ Bluegrass Area Development District
www.thinkkentucky.com/edis/cmnty/cw001/ Richmond, Kentucky Economic Development Information System
www.thinkkentucky.com/edis/cmnty/cw002/ Berea, Kentucky Economic Development Information System
http://www.uky.edu/KentuckyAtlas/21151.html Kentucky Atlas and Gazetteer, Madison County
quickfacts.census.gov/qfd/states/21/21151.html U.S. census data
kgsweb.uky.edu/download/kgsplanning.htm County planning information from the Kentucky Geological Survey

7.5-Minute Map Index



For information on obtaining copies of this map and other Kentucky Geological Survey maps and publications call our Public Information Center at 859.257.3896, or 877.778.7827 (toll free)

View the KGS World Wide Web site at: www.uky.edu/kgs.

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Sparks, T.N., Dever, G.R., Jr., and Anderson, W.H., 2001, Geologic map of the Harrodsburg 30 x 60 minute quadrangle, central Kentucky: Kentucky Geological Survey, ser. 12, Geologic Map 1, scale 1:100,000.
U.S. Fish & Wildlife Service, 2003, National Wetlands Inventory, www.nwi.fws.gov/ [accessed 1/16/06].

Source Water Protection Areas

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

An uplifting experience that will not be appreciated! Left: All is well in this newly built home until water from percolation, drains, lawn sprinklers, leaking sewers, or water mains soaks swelling soil beneath the foundation. Right: With time, expanding soils exert several tons per square foot of pressure on the foundation and shallow pilings. Without remedial measures, the house will actually become deformed and shatter masonry and windows. Remedies vary from mere maintenance that keeps drainage away from the house to expensive reconstruction of foundations. Prior site planning that takes geology into account is always preferable to dealing with problems after a structure is built. From AIPG (1993).

EXPLANATION

- School

Soil Survey Observations
- Rock outcrop
- Sinkhole

Water wells
- Domestic
- Monitoring
- Public
- Spring
- Gas well
- Oil well

- Blue Grass Army Depot boundary
- Source water protection areas--zone1
- Wetlands > 1 acre (U.S. Fish & Wildlife Service, 2003)
- Corporate limits
- Watershed boundary
- Concealed fault
- Fault
- Artificial fill
- Mapped sinkholes

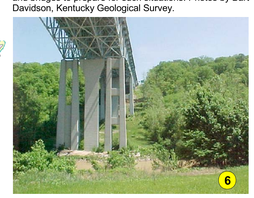
50-foot elevation contour interval

7 Photography location

Groundwater Availability

Within the thin Kentucky River Valley along the northern edge of Madison County, and in the lower reaches of the valleys of the larger creeks that empty into the Kentucky River, most drilled wells will produce enough water for a domestic supply at depths of less than 100 feet. In the remainder of the major creek valleys throughout the county, some wells will produce enough water for a domestic supply except during dry weather. In the upland areas of Madison County, which encompasses 70 percent of the county, most drilled wells will not produce enough water for a dependable domestic supply except along drainage lines that may produce enough water except during dry weather. Throughout the county, groundwater is hard or very hard and may contain salt or hydrogen sulfide, especially at depths greater than 100 feet. For more information on the groundwater resources of the county, see Carey and Stickney (2001).

An expression (above) of the Kentucky River Fault in limestone north of the Clays Ferry bridge on I-75, which continues under the bridge itself (below). Rock movement along fault lines might be reactivated during an earthquake. Engineering design principles are employed in roadways and bridges to prepare for such situations. Photos by Bart Davidson, Kentucky Geological Survey.



6

Radon

Radon gas, although not widely distributed in Kentucky in amounts above the U.S. Environmental Protection Agency's maximum recommended limit of 4 picocuries per liter, can be a local problem. The black shales in unit 4 may have high levels of radon. Unit 5, the Tanglewood Limestone, may also contain high levels of uranium or radium, parent materials for radon gas. The Tanglewood and several other limestones in the state locally contain the phosphate mineral apatite. Uranium is sometimes part of the apatite structure, and when the limestone weathers away, the phosphates containing uranium become concentrated in the soil and ultimately can give rise to high levels of radon. Homes in these areas should be tested for radon, but the homeowner should keep in mind that the health threat results from relatively high levels of exposure over long periods of time, and the remedy may simply be additional ventilation of the home.

COMPARATIVE RISK CHART for RADON LEVELS

Radon Level pCi/L	Estimated Fatal Lung Cancers/1000	Comparable Exposure Levels	Comparable Risk Estimate
200	440 - 770	1,000 times average outdoor level	More than 60 times non-smoker risk
100	270 - 630	100 times average outdoor level	Four pack-/day smoker or 20,000 chest X-rays/yr
40	120 - 380	100 times average outdoor level	Two-pack/day smoker
20	60 - 210		
10	30 - 120	10 times average indoor level	One pack/day smoker
4	13 - 50	10 times average outdoor level	Five times non-smoker risk
2	7 - 30		
1	3 - 13	Average indoor level	Non-smoker risk of fatal lung cancer
0.2	1 - 3	Average outdoor level	20 chest X-rays/yr

EPA recommends action be taken if indoor levels exceed 4 pCi/L, which is 10 times the average outdoor level. Some EPA representatives believe the action level should be lowered to 2 pCi/L; other scientists dissent and claim the risks estimated in this chart are already much too high for low levels of radon. The action level in European countries is set at 10 pCi/L. Note that this chart is only one estimate; it is not based upon any scientific result from a study of a large population meeting the listed criteria. (from the U.S. Environmental Protection Agency)

Construction

3

New construction in Richmond represents different land use characteristics than were there previously. Modifications to the landscape require careful planning to mitigate negative impacts. For example, less groundwater recharge and increased storm runoff occur because of increased pavement area. Photo by Bart Davidson, Kentucky Geological Survey.

4

Natural gas piplines (30-inch mains) are laid across a new subdivision in Kingston. Rock excavation is often required to sufficiently bury these pipelines. Photo by Bart Davidson, Kentucky Geological Survey.

Ponds and Reservoirs

2

An earthen dam was constructed to contain Lake Reba in Richmond. Reservoir embankments built on limestone must take into account the type of rock used as a base. Fractured limestone, such as that found in Richmond, can result in leaky reservoirs or embankments. Photo by Bart Davidson, Kentucky Geological Survey.

Successful pond construction must prevent water from seeping through structured soils into limestone solution channels below. A compacted clay liner, or artificial liner, may prevent pond failure. Getting the basin filled with water as soon as possible after construction prevents drying and cracking, and possible leakage of the clayey soil liner. Ponds constructed in dry weather are more apt to leak than ponds constructed in wet weather. Illustration by Paul Howell, Natural Resources Conservation Service.

A clayey-soil pond liner is placed in loose, moist layers and compacted with a sheepsfoot roller. A geotechnical engineer or geologist should be consulted about the requirements of a specific site. Other leakage-prevention measures include synthetic liners, bentonite, and asphaltic emulsions. The U.S. Department of Agriculture-Natural Resources Conservation Service can provide guidance on the application of these liners to new construction, and for treatment of existing leaking ponds. Photo by Paul Howell, Natural Resources Conservation Service.

Dams should be constructed of compacted clayey soils at slopes flatter than 3 units horizontal to 1 unit vertical. Ponds with dam heights exceeding 25 feet, or pond volumes exceeding 50 acre-feet, require permits. Contact the Kentucky Division of Water, 14 Reilly Rd., Frankfort, KY 40601, telephone: 502.564.3410.

Resources

Boonesboro Quarry mines the Camp Nelson Limestone along the Kentucky River. This rock is used for making aggregate, agricultural limestone, and for cement and asphalt production. Kentucky is one of the top 10 limestone producers in the country. Photo by Bart Davidson, Kentucky Geological Survey. 7

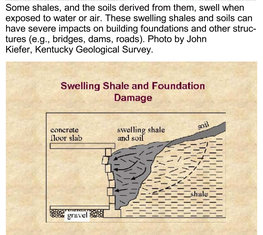
Swelling Shales and Soils

A problem of considerable concern in this area is the swelling of some of the clay minerals in shales such as the Crab Orchard (unit 4) and the Borden (unit 2) formations. This process is exacerbated when the shale contains the mineral pyrite (fool's gold), such as is the case in the Devonian New Albany (unit 4) black shale. Pyrite is a common mineral and can be found distributed throughout the black shale, although it is not always present and may be discontinuous both laterally and horizontally. In the presence of moisture and oxygen, pyrite oxidizes and produces sulfuric acid. The acid reacts with calcium carbonates found in water, the rock itself, crushed limestone, and concrete. This chemical reaction produces sulfate and can form the mineral gypsum, whose crystallization can cause layers of shale to expand and burst, backfill to swell, and concrete to crack and crumble. It can heave the foundation, the slab and interior partitions resting on it, and can even damage upper floors and interior partitions. This phenomenon has been responsible for extensive damage to schools, homes, and businesses in Kentucky.

We strongly suggest that anyone planning construction on these shales seek professional advice from a geologist or engineer familiar with the problem.

DWG 5 - 1

Some shales, and the soils derived from them, swell when exposed to water or air. These swelling shales and soils can have severe impacts on building foundations and other structures (e.g., bridges, dams, roads). Photo by John Kiefer, Kentucky Geological Survey.



Swelling shales should never be used for backfill. Illustration by John Kiefer, Kentucky Geological Survey.

SECTION 5-1

KENTUCKY RIVER 205 060 WATERSHED REPORT

Northern Madison County Sanitation District

Regional Facilities Plan

Taken from: Kentucky River Basin Assessment Report Web Site

Watershed Name: Kentucky River *11-Digit Watershed Identity Number:* 05100205060

This report was prepared by the Kentucky Water Research Institute as a product of the statewide Kentucky Watershed Management process. Information presented in this report was collected from many sources. Reasonable attempts were made to ensure that information and figures are as accurate as possible, but no representation or guarantee is made as to either the correctness or suitability of information for particular purposes. All critical information should be independently verified. Please address questions or corrections to Basin Coordinator, KWRI, Rm. 233 Mining and Minerals Resources Building, University of Kentucky, Lexington, Kentucky 40506-0107.

Summary of Basin Characteristics and Facilities

General Land-use Characteristics:

Total Land Area (Acres):	52,351	*Acres*	*% of Total*	
Residential Area:	617		1.2	*Number of Mine Permits:* 0
Commercial Area:	438		0.8	*Total Permitted Mining Area (Acres):* 0
Industrial Area:	47		0.1	
Agricultural Area:	35,037		67.0	*Number of Identified Wetland Areas:* 69
Rural and Wooded Area:	16,102		30.8	*Total Wetland Area (Acres):* 38
Other Land-use Area:	82		0.2	

Withdrawal and Discharge Sites:

Number of Public Water Supplies and Water Withdrawal Sites:	10	*Number of KPDES Discharge Permits:*	16
Surface Water Withdrawals:	9		
Groundwater Withdrawals:	1		
No. of Potable Water Treatment Facilities:	5		

Sampling Site Statistics:

Number of USGS Gaging Stations:	0
Number of Kentucky Division of Water Sampling Sites:	0
Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:	0
Number of US Forest Service Sampling Sites:	0
Number of US Army Corps of Engineers Sampling Sites:	0
Number of Kentucky River Watershed Watch Sampling Sites:	0
Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:	0

Watershed Name: Kentucky River *11-Digit Watershed Identity Number:* 05100205060

Watershed Indicators and Ranking Categories:

Protection Ranking	Observed Impacts	Potential Impacts	Restoration Ranking
High	High	High	High

Overall Watershed Ranking: High

Protection Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Wetland Areas	38	Acres	0 - 106	12
Surface Drinking Water Sources	9	No. of sources	0 - 14	2
Ground Drinking Water Sources	1	No. of sources	0 - 17	1
Groundwater Sensitivity	3.98	Score	2 - 5	3.21
KY Dept. of Fish and Wildlife Management Areas	0	Acres	0 - 2951	93
U.S. Forest Service Management Areas	0	Acres	0 - 155253	12,600
Kentucky State Park Areas	5	Acres	0 - 1928	42
Nature Preserves Commission Areas	0	Acres	0 - 1430	32
Nature Conservancy Areas	24	Acres	0 - 2473	28
Reference Reach Watersheds	0.00	Score	0 - 100	3.08
Outstanding Resource Watersheds	0.00	Score	0 - 0	0.00
Recognized Stream Resources	3	No. of resources	0 - 8	1
Kentucky Rivers Assessment Scores	9.22	Score	0 - 11	1.80

Observed Impact Categories:

Human Health Impact Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Flood Declarations	2	Number since 1970	0 - 10	4
Water Supply Inadequacy	2.00	Score	0 - 2	0.22
Observed Impacts to Surface Drinking Water	1.00	Score	1 - 1	1.00
Observed Impacts to Fish Consumption	1.00	Score	1 - 1	1.00
Observed Impacts to Primary Water Contact	1.00	Score	1 - 3	1.33
Contamination Sites Impacting Human Health	14	Number of sites	0 - 71	4

Ecological Health Impact Categories:

Indicator	*Value*	*Units*		
Observed Impacts to Aquatic Life	1.00	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	14	Number of sites	0 - 71	4

Potential Impact Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Potential Contamination Sites	28	Number of sites	1 - 121	12
Potential Pesticide Loading	28	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	788	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	2.60	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	17,752	Animal units	55 - 43826	7,021
KPDES Discharge Violations	84	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	15	Number of complaints	0 - 53	9
Toxic Release Inventory	6,879	Score	0 - 11547626	231,638
Population Change Projection	714	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	1,428	Number of persons	12 - 4511	1,114
Mining Area	0	Acres	0 - 6305	355
Surface Water Runoff Potential	74.20	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	16	Number of sites	0 - 56	6

Watershed Name: Kentucky River *11-Digit Watershed Identity Number:* 05100205060

Stream and Waterbody Use Support Summary

Total Stream Miles: 63.44	*Number of Segments*	*Stream Miles Assessed*	*Miles * Fully Supporting*	*Miles * Partially Supporting*	*Miles * Not Supporting*	*Miles * Threatened*
Segments Assessed:	0	0.0				
Designated Uses						
Aquatic Life:	0	0.0				
Primary Contact:						
Fish Consumption:						
Drinking Water:						

** Blank values indicate no assessed segments for this category.*

Watershed Name: Kentucky River *11-Digit Watershed Identity Number:* 05100205060

Withdrawal Sites and Discharge Facilities:

Public Water Supplies and Water Withdrawal

Facility	*Origin of Source*	*Type of Facility*	*Permit ID Number*
BULL RUN LLC/BULL AT BOONE'S TRACE	Surface Water	Water Withdrawal Site	WW1416
BULL RUN LLC/BULL AT BOONE'S TRACE	Surface Water	Water Withdrawal Site	WW1417
CLAYS FERRY CAMPGROUND	Groundwater	Water Treatment Plant	0762058
KENTUCKY-AMERICAN WATER CO	Surface Water	Water Treatment Plant	0340250
KENTUCKY-AMERICAN WATER CO	Surface Water	Water Withdrawal Site	0340250
LANCASTER WATER WORKS	Surface Water	Water Treatment Plant	0400233
LANCASTER WATER WORKS	Surface Water	Water Withdrawal Site	0400233
NICHOLASVILLE WATER DEPARTMENT	Surface Water	Water Treatment Plant	0570315
NICHOLASVILLE WATER DEPARTMENT	Surface Water	Water Withdrawal Site	0570315

KPDES Permitted Discharge Facilities

Facility	*Type of Facility*	*KPDES Site ID Number*
BLUEGRASS WOODMEN YOUTH CAMP	SPORTING & RECREATIONAL CAMPS	KY0044105
CLAYS FERRY TRAVEL PLAZA	GASOLINE SERVICE STATIONS	KY0078131
EKU D J WILLIAMS FIRING RANGE	COLLEGES, UNIV & PROF SCHOOLS	KY0082422
KY AMERICAN WATER CO	WATER SUPPLY	KY0091049
NICHOLASVILLE WTP	WATER SUPPLY	KY0089915
NICHOLASVILLE WTP	WATER SUPPLY	KYG640081
PTRL EAST INC	LAB APPARATUS & FURNITURE	KY0094803
VULCAN MATERIALS CO	CRUSHED AND BROKEN LIMESTONE	KYG840196
WOODLAND COUNTRY ESTATES MHP	OPER OF RES MOBILE HOME SITES	KY0099601

Gaging Stations and Sampling Sites:

US Geological Survey and US Army Corps of Engineers Stream Gaging Stations

Stream Location	*Agency*	*Station ID Number*	*Sampling Parameter*
Kentucky River	US COE	USCE375037084262601	Flow
Kentucky River	US COE	USCE03284230	Flow
Kentucky River	USGS	USGS03284230	Flow
Kentucky River	USGS	USGS03284500	Flow
Kentucky River	US COE	USCE374442084351401	Flow

SECTION 5-2

KENTUCKY RIVER MUDDY CREEK WATERSHED REPORT

Northern Madison County Sanitation District

Regional Facilities Plan

Taken from: Kentucky River Basin Assessment Report Web Site

Watershed Name: Muddy Creek *11-Digit Watershed Identity Number:* 05100205020

This report was prepared by the Kentucky Water Research Institute as a product of the statewide Kentucky Watershed Management process. Information presented in this report was collected from many sources. Reasonable attempts were made to ensure that information and figures are as accurate as possible, but no representation or guarantee is made as to either the correctness or suitability of information for particular purposes. All critical information should be independently verified. Please address questions or corrections to Basin Coordinator, KWRI, Rm. 233 Mining and Minerals Resources Building, University of Kentucky, Lexington, Kentucky 40506-0107.

Summary of Basin Characteristics and Facilities

General Land-use Characteristics:

Total Land Area (Acres):	43,491	*Acres*	*% of Total*	
Residential Area:	1,135		2.6	*Number of Mine Permits:* 0
Commercial Area:	4,581		10.5	*Total Permitted Mining Area (Acres):* 0
Industrial Area:	65		0.1	
Agricultural Area:	32,956		75.8	*Number of Identified Wetland Areas:* 13
Rural and Wooded Area:	4,013		9.2	*Total Wetland Area (Acres):* 9
Other Land-use Area:	705		1.6	

Withdrawal and Discharge Sites:

Number of Public Water Supplies and Water Withdrawal Sites:	2	*Number of KPDES Discharge Permits:*	10
Surface Water Withdrawals:	2		
Groundwater Withdrawals:	0		
No. of Potable Water Treatment Facilities:	1		

Sampling Site Statistics:

Number of USGS Gaging Stations:	0
Number of Kentucky Division of Water Sampling Sites:	1
Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:	0
Number of US Forest Service Sampling Sites:	0
Number of US Army Corps of Engineers Sampling Sites:	0
Number of Kentucky River Watershed Watch Sampling Sites:	1
Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:	0

Watershed Name: Muddy Creek *11-Digit Watershed Identity Number:* 05100205020

Watershed Indicators and Ranking Categories:

Protection Ranking	Observed Impacts	Potential Impacts	Restoration Ranking	*Overall Watershed Ranking:*
Medium	High	High	High	High

Protection Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Wetland Areas	9	Acres	0 - 106	12
Surface Drinking Water Sources	2	No. of sources	0 - 14	2
Ground Drinking Water Sources	0	No. of sources	0 - 17	1
Groundwater Sensitivity	3.08	Score	2 - 5	3.21
KY Dept. of Fish and Wildlife Management Areas	678	Acres	0 - 2951	93
U.S. Forest Service Management Areas	0	Acres	0 - 155253	12,600
Kentucky State Park Areas	0	Acres	0 - 1928	42
Nature Preserves Commission Areas	0	Acres	0 - 1430	32
Nature Conservancy Areas	0	Acres	0 - 2473	28
Reference Reach Watersheds	0.00	Score	0 - 100	3.08
Outstanding Resource Watersheds	0.00	Score	0 - 0	0.00
Recognized Stream Resources	0	No. of resources	0 - 8	1
Kentucky Rivers Assessment Scores	0.68	Score	0 - 11	1.80

Observed Impact Categories:

Human Health Impact Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Flood Declarations	3	Number since 1970	0 - 10	4
Water Supply Inadequacy	0.00	Score	0 - 2	0.22
Observed Impacts to Surface Drinking Water	1.00	Score	1 - 1	1.00
Observed Impacts to Fish Consumption	1.00	Score	1 - 1	1.00
Observed Impacts to Primary Water Contact	3.00	Score	1 - 3	1.33
Contamination Sites Impacting Human Health	5	Number of sites	0 - 71	4

Ecological Health Impact Categories:

Indicator	*Value*	*Units*		
Observed Impacts to Aquatic Life	1.00	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	5	Number of sites	0 - 71	4

Potential Impact Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Potential Contamination Sites	17	Number of sites	1 - 121	12
Potential Pesticide Loading	31	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	598	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	4.07	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	15,218	Animal units	55 - 43826	7,021
KPDES Discharge Violations	92	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	10	Number of complaints	0 - 53	9
Toxic Release Inventory	0	Score	0 - 11547626	231,638
Population Change Projection	157	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	1,279	Number of persons	12 - 4511	1,114
Mining Area	0	Acres	0 - 6305	355
Surface Water Runoff Potential	79.26	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	10	Number of sites	0 - 56	6

Watershed Name: Muddy Creek *11-Digit Watershed Identity Number:* 05100205020

Stream and Waterbody Use Support Summary

Total Stream Miles: 51.87	*Number of Segments*	*Stream Miles Assessed*	*Miles * Fully Supporting*	*Miles * Partially Supporting*	*Miles * Not Supporting*	*Miles * Threatened*
Segments Assessed:	2	29.2	9.0	0.0	20.2	0.0
Designated Uses						
Aquatic Life:	2	29.2	29.2	0.0	0.0	0.0
Primary Contact:	1	20.2	0.0	0.0	20.2	0.0
Fish Consumption:	1	20.2	20.2	0.0	0.0	0.0
Drinking Water:						

** Blank values indicate no assessed segments for this category.*

Assessed Stream Segments and Waterbodies

*Stream or Waterbody Name **	*Starting Milepoint*	*Ending Milepoint*	*Segment Length (miles)*	*Designated Uses **	*Overall Level of Support*
Muddy Creek	20.2	29.2	9	AL	Fully Supporting
Muddy Creek	0	20.2	20.2	AL, FC, PC	Not Supporting

**Abbreviations: AL - Aquatic Life Support, PC - Primary Contact Recreation, SC - Secondary Contact Recreation, FC - Fish Consumption, DW - Drinking Water Supply, UT - Unnamed Tributary*

Causes for Nonsupport or Impairment of Designated Uses

*Stream or Waterbody Name **	*Starting Milepoint*	*Ending Milepoint*	*Segment Length (miles)*	*Impaired or Threatened Designated Use*	*Level of Support*
Muddy Creek	0	20.2	20.2	Primary Contact (Recr)	Not Supporting

Possible Causes of Impairment:	*Possible Sources For Impairment:*
Pathogens	Agriculture, Grazing related Sources

**Abbreviations: UT - Unnamed Tributary*

Watershed Name: Muddy Creek *11-Digit Watershed Identity Number:* 05100205020

Withdrawal Sites and Discharge Facilities:

Public Water Supplies and Water Withdrawal

Facility	*Origin of Source*	*Type of Facility*	*Permit ID Number*
BLUE GRASS STATION	Surface Water	Water Withdrawal Site	0340965
LEX BG ARMY DEPOT COMMANDER	Surface Water	Water Treatment Plant	0762637

KPDES Permitted Discharge Facilities

Facility	*Type of Facility*	*KPDES Site ID Number*
A & B MARKET	GROCERY STORES	KY0095168
AJAX MAGNETHERMIC CORP	INDUSTRIAL FURNACES AND OVENS	KY0082473
BLUEGRASS ARMY DEPOT	NATIONAL SECURITY	KY0020737
OVERBAYS MHP	OPER OF RES MOBILE HOME SITES	KY0089869
RICHMOND LANDFILL	REFUSE SYSTEMS	KY0100714
SOMEPLACE TO EAT	GROCERY STORES	KY0098175
WACO FOODS	GROCERY STORES	KY0101303

Gaging Stations and Sampling Sites:

US Geological Survey and US Army Corps of Engineers Stream Gaging Stations

Stream Location	*Agency*	*Station ID Number*	*Sampling Parameter*
Muddy Creek	USGS	USGS03283830	Flow

KY Division of Water Sampling Sites

Stream Name	*Type of Sampling*
Muddy Creek	Physical/Chemical Monitoring

KY River Watershed Watch Sampling Sites

Stream Name	*KRWW Sample ID No.*	*Site Description*
Muddy Creek	K65	SR 1986 Bridge at Doylesville

Watershed Name: Muddy Creek *11-Digit Watershed Identity Number:* 05100205020

Results from 1999 KY River Watershed Watch Sampling:

Conventional Parameters:

Sample ID Number: K65 *Stream:* Muddy Creek

Physical Data (May):

pH	8	*Alkalinity*	
Temperature	0	*Total Hardness*	
Dissolved Oxygen	8.2	*Chlorides*	
		Conductivity	
		Total Organic Carbon	
		Total Suspended Solids	

Fecal Data (July / August):

	Coliform Count	*Strep Count*	*Coliform/Strep Ratio*
July	20	210	0.095
August			

Note: Most indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm). Temperature is in Celsius degrees. Alkalinity and hardness are as mg/L of calcium carbonate. Bacterial counts are in colonies per 100 milliliters. Conductivity units are micro-mhos per centimeter.

Nutrient Parameters:

Sample ID Number: K65 *Stream:* Muddy Creek

Ammonia		*Orthophosphate as Phosphate*		*Sulfate*	
Ammonia Nitrogen		*Orthophosphate as Phosphorus*			
Total Kjeldahl Nitrogen as NH3		*Total Recoverable Phosphorus*			
Total Kjeldahl Nitrogen as N					
Nitrate					
Nitrate Nitrogen					

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Metals and Mineral Parameters:

Sample ID Number: K65 *Stream:* Muddy Creek

Aluminum		*Calcium*		*Lead*		*Selenium*		*Thallium*	
Antimony		*Chromium*		*Lithium*		*Silicon*		*Vanadium*	
Barium		*Cobalt*		*Magnesium*		*Sodium*		*Zinc*	
Beryllium		*Copper*		*Manganese*		*Strontium*			
Boron		*Iron*		*Potassium*		*Sulfur*			

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Pesticide/Herbicide Parameters:

Sample ID No.	*Stream*	*2,4-D*	*Chlorpyrifos*	*Triazines*
K65	Muddy Creek			

Note: All indicators are in micrograms per liter which is equivalent to parts per billion (ppb).

SECTION 5-3

KENTUCKY RIVER OTTER CREEK WATERSHED REPORT

Northern Madison County Sanitation District

Regional Facilities Plan

Taken from: Kentucky River Basin Assessment Report Web Site

Watershed Name: Otter Creek *11-Digit Watershed Identity Number:* 05100205040

This report was prepared by the Kentucky Water Research Institute as a product of the statewide Kentucky Watershed Management process. Information presented in this report was collected from many sources. Reasonable attempts were made to ensure that information and figures are as accurate as possible, but no representation or guarantee is made as to either the correctness or suitability of information for particular purposes. All critical information should be independently verified. Please address questions or corrections to Basin Coordinator, KWRI, Rm. 233 Mining and Minerals Resources Building, University of Kentucky, Lexington, Kentucky 40506-0107.

Summary of Basin Characteristics and Facilities

General Land-use Characteristics:

Total Land Area (Acres):	41,832	*Acres*	*% of Total*	
Residential Area:	2,324		5.6	*Number of Mine Permits:* 0
Commercial Area:	1,576		3.8	*Total Permitted Mining Area (Acres):* 0
Industrial Area:	88		0.2	
Agricultural Area:	35,660		85.3	*Number of Identified Wetland Areas:* 2
Rural and Wooded Area:	1,680		4.0	*Total Wetland Area (Acres):* 1
Other Land-use Area:	473		1.1	

Withdrawal and Discharge Sites:

Number of Public Water Supplies and Water Withdrawal Sites:	0	*Number of KPDES Discharge Permits:*	7
Surface Water Withdrawals:	0		
Groundwater Withdrawals:	0		
No. of Potable Water Treatment Facilities:	0		

Sampling Site Statistics:

Number of USGS Gaging Stations:	0
Number of Kentucky Division of Water Sampling Sites:	3
Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:	0
Number of US Forest Service Sampling Sites:	0
Number of US Army Corps of Engineers Sampling Sites:	0
Number of Kentucky River Watershed Watch Sampling Sites:	2
Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:	0

Watershed Name: Otter Creek *11-Digit Watershed Identity Number:* 05100205040

Watershed Indicators and Ranking Categories:

Protection Ranking	Observed Impacts	Potential Impacts	Restoration Ranking
Low	Medium	High	Medium

Overall Watershed Ranking: Low

Protection Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Wetland Areas	1	Acres	0 - 106	12
Surface Drinking Water Sources	0	No. of sources	0 - 14	2
Ground Drinking Water Sources	0	No. of sources	0 - 17	1
Groundwater Sensitivity	3.32	Score	2 - 5	3.21
KY Dept. of Fish and Wildlife Management Areas	0	Acres	0 - 2951	93
U.S. Forest Service Management Areas	0	Acres	0 - 155253	12,600
Kentucky State Park Areas	0	Acres	0 - 1928	42
Nature Preserves Commission Areas	0	Acres	0 - 1430	32
Nature Conservancy Areas	0	Acres	0 - 2473	28
Reference Reach Watersheds	0.00	Score	0 - 100	3.08
Outstanding Resource Watersheds	0.00	Score	0 - 0	0.00
Recognized Stream Resources	0	No. of resources	0 - 8	1
Kentucky Rivers Assessment Scores	0.44	Score	0 - 11	1.80

Observed Impact Categories:

Human Health Impact Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Flood Declarations	3	Number since 1970	0 - 10	4
Water Supply Inadequacy	0.00	Score	0 - 2	0.22
Observed Impacts to Surface Drinking Water	1.00	Score	1 - 1	1.00
Observed Impacts to Fish Consumption	1.00	Score	1 - 1	1.00
Observed Impacts to Primary Water Contact	1.00	Score	1 - 3	1.33
Contamination Sites Impacting Human Health	5	Number of sites	0 - 71	4

Ecological Health Impact Categories:

Indicator	*Value*	*Units*		
Observed Impacts to Aquatic Life	1.49	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	5	Number of sites	0 - 71	4

Potential Impact Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Potential Contamination Sites	17	Number of sites	1 - 121	12
Potential Pesticide Loading	31	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	575	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	4.07	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	14,637	Animal units	55 - 43826	7,021
KPDES Discharge Violations	16	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	9	Number of complaints	0 - 53	9
Toxic Release Inventory	0	Score	0 - 11547626	231,638
Population Change Projection	1,803	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	1,344	Number of persons	12 - 4511	1,114
Mining Area	0	Acres	0 - 6305	355
Surface Water Runoff Potential	75.39	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	7	Number of sites	0 - 56	6

Watershed Name: Otter Creek *11-Digit Watershed Identity Number:* 05100205040

Stream and Waterbody Use Support Summary

Total Stream Miles: 46.61	*Number of Segments*	*Stream Miles Assessed*	*Miles * Fully Supporting*	*Miles * Partially Supporting*	*Miles * Not Supporting*	*Miles * Threatened*
Segments Assessed:	4	9.4	6.7	2.7	0.0	0.0
Designated Uses						
Aquatic Life:	4	9.4	2.8	2.7	0.0	3.9
Primary Contact:						
Fish Consumption:	1	3.9	3.9	0.0	0.0	0.0
Drinking Water:						

** Blank values indicate no assessed segments for this category.*

Assessed Stream Segments and Waterbodies

*Stream or Waterbody Name **	*Starting Milepoint*	*Ending Milepoint*	*Segment Length (miles)*	*Designated Uses **	*Overall Level of Support*
East Fork of Otter Creek	0	2.7	2.7	AL	Partially Supporting
Lake Reba	0	0	0	AL	Fully Supporting
Otter Creek	0	3.9	3.9	FC, AL	Fully Supporting
West Fork Otter Creek	0	2.8	2.8	AL	Fully Supporting

**Abbreviations: AL - Aquatic Life Support, PC - Primary Contact Recreation, SC - Secondary Contact Recreation, FC - Fish Consumption, DW - Drinking Water Supply, UT - Unnamed Tributary*

Causes for Nonsupport or Impairment of Designated Uses

*Stream or Waterbody Name **	*Starting Milepoint*	*Ending Milepoint*	*Segment Length (miles)*	*Impaired or Threatened Designated Use*	*Level of Support*
East Fork of Otter Creek	0	2.7	2.7	Aquatic Life Support	Partially Supporting

Possible Causes of Impairment:
Algal Grwth/Chlorophyll a, Nutrients

Possible Sources For Impairment:
Agriculture, Crop-related Sources, Grazing related Sources, Pasture grazing - Riparian and/or Upland

**Abbreviations: UT - Unnamed Tributary*

Watershed Name: Otter Creek *11-Digit Watershed Identity Number:* 05100205040

Withdrawal Sites and Discharge Facilities:

KPDES Permitted Discharge Facilities

Facility	*Type of Facility*	*KPDES Site ID Number*
CONTINENTAL METAL SPECIALTY IN	FABRICATED METAL PRODUCTS NEC	KY0074748
KTC MADISON CO MAINT GARAGE	BUS TERMINAL & SERVICE FACILIT	KY0099147
MADISON VILLAGE SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0056383
RICHMOND DREAMING CREEK STP	SEWERAGE SYSTEMS	KY0022845
SUPERTEST FOOD MART	GASOLINE SERVICE STATIONS	KY0099406
YUASA-EXIDE INC	STORAGE BATTERIES	KY0097381

Gaging Stations and Sampling Sites:

US Geological Survey and US Army Corps of Engineers Stream Gaging Stations

Stream Location	*Agency*	*Station ID Number*	*Sampling Parameter*
Otter Creek	USGS	USGS03283995	Flow

KY Division of Water Sampling Sites

Stream Name	*Type of Sampling*
Otter Creek	Biological Monitoring
East Fork Otter Creek	Biological Monitoring
West Fork Otter Creek	Biological Monitoring

KY River Watershed Watch Sampling Sites

Stream Name	*KRWW Sample ID No.*	*Site Description*
Dreaming Creek	K60	Mouth of Dreaming near Otter Creek
Otter Creek	K66	RR crossing on 388 near Boonesboro

Watershed Name: Otter Creek *11-Digit Watershed Identity Number:* 05100205040

Results from 1999 KY River Watershed Watch Sampling:

Conventional Parameters:

Sample ID Number: K60 *Stream:* Dreaming Creek

Physical Data (May):

pH	7.5	*Alkalinity*	
Temperature	0	*Total Hardness*	
Dissolved Oxygen	8.2	*Chlorides*	
		Conductivity	
		Total Organic Carbon	
		Total Suspended Solids	

Fecal Data (July / August):

	Coliform Count	*Strep Count*	*Coliform/Strep Ratio*
July	1300	1600	0.81
August			

Sample ID Number: K66 *Stream:* Otter Creek

Physical Data (May):

pH	8.54	*Alkalinity*	
Temperature	0	*Total Hardness*	
Dissolved Oxygen	12.5	*Chlorides*	
		Conductivity	
		Total Organic Carbon	
		Total Suspended Solids	

Fecal Data (July / August):

	Coliform Count	*Strep Count*	*Coliform/Strep Ratio*
July	10	20	0.5
August			

Note: Most indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm). Temperature is in Celsius degrees. Alkalinity and hardness are as mg/L of calcium carbonate. Bacterial counts are in colonies per 100 milliliters. Conductivity units are micro-mhos per centimeter.

Nutrient Parameters:

Sample ID Number: K60 *Stream:* Dreaming Creek

Ammonia		*Orthophosphate as Phosphate*		*Sulfate*	
Ammonia Nitrogen		*Orthophosphate as Phosphorus*			
Total Kjeldahl Nitrogen as NH3		*Total Recoverable Phosphorus*			
Total Kjeldahl Nitrogen as N					
Nitrate					
Nitrate Nitrogen					

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K66 *Stream:* Otter Creek

Ammonia		*Orthophosphate as Phosphate*		*Sulfate*	
Ammonia Nitrogen		*Orthophosphate as Phosphorus*			
Total Kjeldahl Nitrogen as NH3		*Total Recoverable Phosphorus*			
Total Kjeldahl Nitrogen as N					
Nitrate					
Nitrate Nitrogen					

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Metals and Mineral Parameters:

Sample ID Number: K60 *Stream:* Dreaming Creek

Aluminum		*Calcium*		*Lead*		*Selenium*		*Thallium*	
Antimony		*Chromium*		*Lithium*		*Silicon*		*Vanadium*	
Barium		*Cobalt*		*Magnesium*		*Sodium*		*Zinc*	
Beryllium		*Copper*		*Manganese*		*Strontium*			
Boron		*Iron*		*Potassium*		*Sulfur*			

Watershed Name: Otter Creek *11-Digit Watershed Identity Number:* 05100205040

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K66 *Stream:* Otter Creek

Aluminum		*Calcium*		*Lead*		*Selenium*		*Thallium*	
Antimony		*Chromium*		*Lithium*		*Silicon*		*Vanadium*	
Barium		*Cobalt*		*Magnesium*		*Sodium*		*Zinc*	
Beryllium		*Copper*		*Manganese*		*Strontium*			
Boron		*Iron*		*Potassium*		*Sulfur*			

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Pesticide/Herbicide Parameters:

Sample ID No.	*Stream*	*2,4-D*	*Chlorpyrifos*	*Triazines*
K60	Dreaming Creek			
K66	Otter Creek			0.49

Note: All indicators are in micrograms per liter which is equivalent to parts per billion (ppb).

SECTION 5-4

KENTUCKY RIVER SILVER CREEK WATERSHED REPORT

Northern Madison County Sanitation District

Regional Facilities Plan

Taken from: Kentucky River Basin Assessment Report Web Site

Watershed Name: Silver Creek *11-Digit Watershed Identity Number:* 05100205090

This report was prepared by the Kentucky Water Research Institute as a product of the statewide Kentucky Watershed Management process. Information presented in this report was collected from many sources. Reasonable attempts were made to ensure that information and figures are as accurate as possible, but no representation or guarantee is made as to either the correctness or suitability of information for particular purposes. All critical information should be independently verified. Please address questions or corrections to Basin Coordinator, KWRI, Rm. 233 Mining and Minerals Resources Building, University of Kentucky, Lexington, Kentucky 40506-0107.

Summary of Basin Characteristics and Facilities

General Land-use Characteristics:

Total Land Area (Acres):	80,540	*Acres*	*% of Total*	
Residential Area:	3,584		4.5	*Number of Mine Permits:* 0
Commercial Area:	2,130		2.6	*Total Permitted Mining Area (Acres):* 0
Industrial Area:	152		0.2	
Agricultural Area:	62,437		77.6	*Number of Identified Wetland Areas:* 130
Rural and Wooded Area:	11,697		14.5	*Total Wetland Area (Acres):* 57
Other Land-use Area:	485		0.6	

Withdrawal and Discharge Sites:

Number of Public Water Supplies and Water Withdrawal Sites:	3	*Number of KPDES Discharge Permits:*	17
Surface Water Withdrawals:	3		
Groundwater Withdrawals:	0		
No. of Potable Water Treatment Facilities:	1		

Sampling Site Statistics:

Number of USGS Gaging Stations:	0
Number of Kentucky Division of Water Sampling Sites:	2
Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:	0
Number of US Forest Service Sampling Sites:	0
Number of US Army Corps of Engineers Sampling Sites:	0
Number of Kentucky River Watershed Watch Sampling Sites:	2
Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:	0

Watershed Name: Silver Creek *11-Digit Watershed Identity Number:* 05100205090

Watershed Indicators and Ranking Categories:

Protection Ranking	Observed Impacts	Potential Impacts	Restoration Ranking
Medium	Medium	High	Medium

Overall Watershed Ranking: Medium

Protection Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Wetland Areas	57	Acres	0 - 106	12
Surface Drinking Water Sources	3	No. of sources	0 - 14	2
Ground Drinking Water Sources	0	No. of sources	0 - 17	1
Groundwater Sensitivity	3.35	Score	2 - 5	3.21
KY Dept. of Fish and Wildlife Management Areas	878	Acres	0 - 2951	93
U.S. Forest Service Management Areas	0	Acres	0 - 155253	12,600
Kentucky State Park Areas	0	Acres	0 - 1928	42
Nature Preserves Commission Areas	0	Acres	0 - 1430	32
Nature Conservancy Areas	0	Acres	0 - 2473	28
Reference Reach Watersheds	0.00	Score	0 - 100	3.08
Outstanding Resource Watersheds	0.00	Score	0 - 0	0.00
Recognized Stream Resources	0	No. of resources	0 - 8	1
Kentucky Rivers Assessment Scores	2.52	Score	0 - 11	1.80

Observed Impact Categories:

Human Health Impact Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Flood Declarations	3	Number since 1970	0 - 10	4
Water Supply Inadequacy	1.00	Score	0 - 2	0.22
Observed Impacts to Surface Drinking Water	1.00	Score	1 - 1	1.00
Observed Impacts to Fish Consumption	1.00	Score	1 - 1	1.00
Observed Impacts to Primary Water Contact	2.00	Score	1 - 3	1.33
Contamination Sites Impacting Human Health	9	Number of sites	0 - 71	4

Ecological Health Impact Categories:

Indicator	*Value*	*Units*		
Observed Impacts to Aquatic Life	1.64	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	9	Number of sites	0 - 71	4

Potential Impact Categories:

Indicator	*Value*	*Units*	*Range of All Watersheds*	*Mean of All Watersheds*
Potential Contamination Sites	32	Number of sites	1 - 121	12
Potential Pesticide Loading	31	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	1,108	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	4.07	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	28,181	Animal units	55 - 43826	7,021
KPDES Discharge Violations	116	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	18	Number of complaints	0 - 53	9
Toxic Release Inventory	104,928	Score	0 - 11547626	231,638
Population Change Projection	1,904	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	2,858	Number of persons	12 - 4511	1,114
Mining Area	0	Acres	0 - 6305	355
Surface Water Runoff Potential	74.00	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	17	Number of sites	0 - 56	6

Watershed Name: Silver Creek *11-Digit Watershed Identity Number:* 05100205090

Stream and Waterbody Use Support Summary

Total Stream Miles: 100.82	*Number of Segments*	*Stream Miles Assessed*	*Miles * Fully Supporting*	*Miles * Partially Supporting*	*Miles * Not Supporting*	*Miles * Threatened*
Segments Assessed:	5	33.7	0.0	30.2	0.0	3.5
Designated Uses						
Aquatic Life:	5	33.7	10.9	19.3	0.0	3.5
Primary Contact:	1	10.9	0.0	10.9	0.0	0.0
Fish Consumption:	1	10.9	10.9	0.0	0.0	0.0
Drinking Water:						

** Blank values indicate no assessed segments for this category.*

Assessed Stream Segments and Waterbodies

*Stream or Waterbody Name **	*Starting Milepoint*	*Ending Milepoint*	*Segment Length (miles)*	*Designated Uses **	*Overall Level of Support*
Harts Fork	3.2	4.2	1	AL	Partially Supporting
Hays Fork	1.2	4.7	3.5	AL	Threatened
Silver Creek	10.9	29.2	18.3	AL	Partially Supporting
Silver Creek	0	10.9	10.9	AL, FC, PC	Partially Supporting
Wilgreen Lake	0	0	0	AL, SC	Partially Supporting

**Abbreviations: AL - Aquatic Life Support, PC - Primary Contact Recreation, SC - Secondary Contact Recreation, FC - Fish Consumption, DW - Drinking Water Supply, UT - Unnamed Tributary*

Causes for Nonsupport or Impairment of Designated Uses

*Stream or Waterbody Name **	*Starting Milepoint*	*Ending Milepoint*	*Segment Length (miles)*	*Impaired or Threatened Designated Use*	*Level of Support*
Harts Fork	3.2	4.2	1	Aquatic Life Support	Partially Supporting
Possible Causes of Impairment: pH, Suspended solids, Organic enrichment/Low DO, Unionized Ammonia			*Possible Sources For Impairment:* Industrial Point Sources		
Silver Creek	0	10.9	10.9	Primary Contact (Recr)	Partially Supporting
Possible Causes of Impairment: Pathogens			*Possible Sources For Impairment:* Agriculture		
Silver Creek	10.9	29.2	18.3	Aquatic Life Support	Partially Supporting
Possible Causes of Impairment: Siltation			*Possible Sources For Impairment:* Agriculture, Crop-related Sources, Grazing related Sources, Municipal Point Sources, Nonirrigated Crop Production, Pasture grazing - Riparian and/or Upland, Silviculture		
Wilgreen Lake	0	0	0	Secondary Contact (Recr)	Partially Supporting

Watershed Name: Silver Creek *11-Digit Watershed Identity Number:* 05100205090

Wilgreen Lake	0	0	0	Aquatic Life Support	Partially Supporting

Possible Causes of Impairment:	*Possible Sources For Impairment:*
Nutrients	Land Disposal, Onsite Wastewater Systems (Septic Tanks)

**Abbreviations: UT - Unnamed Tributary*

Watershed Name: Silver Creek *11-Digit Watershed Identity Number:* 05100205090

Withdrawal Sites and Discharge Facilities:

Public Water Supplies and Water Withdrawal

Facility	*Origin of Source*	*Type of Facility*	*Permit ID Number*
BEREA COLLEGE WATER DEPARTMENT	Surface Water	Water Treatment Plant	0760030
BEREA COLLEGE WATER DEPARTMENT	Surface Water	Water Withdrawal Site	0760030

KPDES Permitted Discharge Facilities

Facility	*Type of Facility*	*KPDES Site ID Number*
ALCAN RECYCLING	2NDARY SMELT/NONFERROUS METALS	KY0091081
BEREA STP	SEWERAGE SYSTEMS	KY0079898
BLUEGRASS ARMY DEPOT	NATIONAL SECURITY	KY0020737
BROCKLYN SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0081299
EXECUTIVE PARK SUBD MCSD	LAND SUBDIVIDERS & DEV, EX CEM	KY0056561
HAYES WHEELS INTERNATIONAL INC	MOTOR VEHICLE PARTS & ACCESSOR	KY0097276
KINGSTON ELEM SCHOOL	ELEMENTARY & SECONDARY SCHOOLS	KY0074543
KIRKSVILLE ELEM SCHOOL	ELEMENTARY & SECONDARY SCHOOLS	KY0074560
KTC MADISON CO REST AREA I 75	BUS TERMINAL & SERVICE FACILIT	KY0025500
OKONITE CO	MISC. FABRICATED WIRE PRODUCTS	KY0041254
REED DUPLEX APT BLDG	OPERATORS OF APART BUILDINGS	KY0095036
SHERMAN WILLIAMS AUTOMOTIVE	PAINTS/VARNISH/LACQUERS/ENAMEL	KY0096822
YUASA-EXIDE INC	STORAGE BATTERIES	KY0097381

Gaging Stations and Sampling Sites:

US Geological Survey and US Army Corps of Engineers Stream Gaging Stations

Stream Location	*Agency*	*Station ID Number*	*Sampling Parameter*
Old Town Branch	USGS	USGS03284340	Flow
Silver Creek	USGS	USGS03284350	Flow
Silver Creek	USGS	USGS03284310	Flow
Silver Creek	USGS	USGS03284300	Flow

KY Division of Water Sampling Sites

Stream Name	*Type of Sampling*
Silver Creek	Biological Monitoring
Silver Creek	Physical/Chemical Monitoring

KY River Watershed Watch Sampling Sites

Stream Name	*KRWW Sample ID No.*	*Site Description*
Silver Creek	K39	below I-75 bridge
Silver Creek	K38	Ruthton

Watershed Name: Silver Creek *11-Digit Watershed Identity Number:* 05100205090

Results from 1999 KY River Watershed Watch Sampling:

Conventional Parameters:

Sample ID Number: K38 *Stream:* Silver Creek

Physical Data (May):

pH	8.5	*Alkalinity*	130
Temperature	20	*Total Hardness*	156
Dissolved Oxygen	10	*Chlorides*	19.8
		Conductivity	353
		Total Organic Carbon	3.3
		Total Suspended Solids	8

Fecal Data (July / August):

	Coliform Count	*Strep Count*	*Coliform/Strep Ratio*
July	30	200	0.15
August			

Sample ID Number: K39 *Stream:* Silver Creek

Physical Data (May):

pH	7.5	*Alkalinity*	145
Temperature	19	*Total Hardness*	158
Dissolved Oxygen	6.5	*Chlorides*	54.2
		Conductivity	585
		Total Organic Carbon	6.3
		Total Suspended Solids	

Fecal Data (July / August):

	Coliform Count	*Strep Count*	*Coliform/Strep Ratio*
July	70	300	0.23
August			

Note: Most indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm). Temperature is in Celsius degrees. Alkalinity and hardness are as mg/L of calcium carbonate. Bacterial counts are in colonies per 100 milliliters. Conductivity units are micro-mhos per centimeter.

Nutrient Parameters:

Sample ID Number: K38 *Stream:* Silver Creek

Ammonia		*Orthophosphate as Phosphate*	0.093	*Sulfate*	24.0
Ammonia Nitrogen		*Orthophosphate as Phosphorus*	0.030		
Total Kjeldahl Nitrogen as NH3		*Total Recoverable Phosphorus*	0.06		
Total Kjeldahl Nitrogen as N					
Nitrate	0.2				
Nitrate Nitrogen	0.04				

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K39 *Stream:* Silver Creek

Ammonia	0.09	*Orthophosphate as Phosphate*	2.348	*Sulfate*	57.4
Ammonia Nitrogen	0.07	*Orthophosphate as Phosphorus*	0.766		
Total Kjeldahl Nitrogen as NH3		*Total Recoverable Phosphorus*	0.66		
Total Kjeldahl Nitrogen as N					
Nitrate	9.8				
Nitrate Nitrogen	2.21				

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Metals and Mineral Parameters:

Sample ID Number: K38 *Stream:* Silver Creek

Aluminum	0.40	*Calcium*	42.77	*Lead*		*Selenium*		*Thallium*	
Antimony		*Chromium*		*Lithium*		*Silicon*	1.44	*Vanadium*	
Barium	0.03	*Cobalt*	0.003	*Magnesium*	10.11	*Sodium*	10.87	*Zinc*	0.006
Beryllium	0.001	*Copper*		*Manganese*	0.04	*Strontium*	0.12		
Boron	0.12	*Iron*	0.16	*Potassium*	4.66	*Sulfur*	6.80		

Watershed Name: Silver Creek *11-Digit Watershed Identity Number:* 05100205090

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K39 *Stream:* Silver Creek

Aluminum	0.07	*Calcium*	47.69	*Lead*		*Selenium*		*Thallium*	
Antimony		*Chromium*		*Lithium*		*Silicon*	2.75	*Vanadium*	
Barium	0.03	*Cobalt*	0.003	*Magnesium*	10.30	*Sodium*	50.14	*Zinc*	0.02
Beryllium		*Copper*		*Manganese*	0.02	*Strontium*	0.12		
Boron	0.36	*Iron*	0.20	*Potassium*	11.90	*Sulfur*	15.43		

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Pesticide/Herbicide Parameters:

Sample ID No.	*Stream*	*2,4-D*	*Chlorpyrifos*	*Triazines*
K38	Silver Creek			
K39	Silver Creek			

Note: All indicators are in micrograms per liter which is equivalent to parts per billion (ppb).

SECTION 5-5

BOONE VILLAGE SUBDIVSION SOILS MAP & REPORT

Northern Madison County Sanitation District

Regional Facilities Plan

Taken from: Natural Resources Conservation Service (NRCS) web site

Soil Map—Madison County, Kentucky
(Boone Village Project #0-2A)

Map Scale: 1:4,940 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N 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.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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: Madison County, Kentucky
Survey Area Data: Version 18, May 29, 2020

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

Date(s) aerial images were photographed: May 8, 2019—Aug 11, 2019

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ShB	Shelbyville silt loam, 2 to 6 percent slopes	15.1	34.6%
uLfC	Lowell-Faywood silt loams, 6 to 12 percent slopes	17.2	39.4%
uLfD	Lowell-Faywood silt loams, 12 to 20 percent slopes	11.4	26.0%
Totals for Area of Interest		**43.6**	**100.0%**

Sewage Disposal

This table shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Saturated hydraulic conductivity (Ksat) is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a Ksat rate of more than 14 micrometers per second are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Sewage Disposal

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Sewage Disposal–Madison County, Kentucky					
Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
ShB—Shelbyville silt loam, 2 to 6 percent slopes					
Shelbyville	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.32

Sewage Disposal–Madison County, Kentucky					
Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
uLfC—Lowell-Faywood silt loams, 6 to 12 percent slopes					
Lowell	70	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to bedrock	0.62	Depth to hard bedrock	0.18
		Slope	0.04		
Faywood	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.04		
uLfD—Lowell-Faywood silt loams, 12 to 20 percent slopes					
Lowell	70	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	0.18
		Depth to bedrock	0.62		
Faywood	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	1.00		

Data Source Information

Soil Survey Area: Madison County, Kentucky
Survey Area Data: Version 18, May 29, 2020

SECTION 5-6

MADISON VILLAGE SUBDIVSION SOILS MAP & REPORT

Northern Madison County Sanitation District

Regional Facilities Plan

Taken from: Natural Resources Conservation Service (NRCS) web site

Soil Map—Madison County, Kentucky
(Madison Village Project #3-10A)

Map Scale: 1:5,670 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

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

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- 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
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Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Madison County, Kentucky
Survey Area Data: Version 18, May 29, 2020

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

Date(s) aerial images were photographed: May 8, 2019—Aug 11, 2019

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BrE	Brassfield silt loam, 12 to 30 percent slopes	7.3	10.3%
CyE	Cynthiana-Rock outcrop complex, 12 to 30 percent slopes	1.2	1.7%
FdE	Faywood silt loam, 12 to 30 percent slopes	5.4	7.6%
HaB	Hagerstown silt loam, 2 to 6 percent slopes	3.2	4.6%
Lc	Lawrence silt loam	3.9	5.5%
LyE3	Lowell silty clay loam, 12 to 30 percent slopes, severely eroded	5.9	8.3%
MuB	Mercer silt loam, 2 to 6 percent slopes	13.6	19.1%
MuC	Mercer silt loam, 6 to 12 percent slopes	12.2	17.1%
OtC	Otway silty clay, 6 to 12 percent slopes (shrouts)	3.5	5.0%
OtE	Otway silty clay, 12 to 30 percent slopes (shrouts)	2.8	4.0%
ShB	Shelbyville silt loam, 2 to 6 percent slopes	2.5	3.5%
uLfC	Lowell-Faywood silt loams, 6 to 12 percent slopes	9.1	12.8%
WoC	Woolper silty clay loam, 6 to 12 percent slopes	0.4	0.5%
Totals for Area of Interest		**71.0**	**100.0%**

Sewage Disposal

This table shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Saturated hydraulic conductivity (Ksat) is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a Ksat rate of more than 14 micrometers per second are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Sewage Disposal

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Sewage Disposal–Madison County, Kentucky					
Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BrE—Brassfield silt loam, 12 to 30 percent slopes					
Brassfield	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50

Sewage Disposal–Madison County, Kentucky					
Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
CyE—Cynthiana-Rock outcrop complex, 12 to 30 percent slopes					
Cynthiana	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop	30	Not rated		Not rated	
FdE—Faywood silt loam, 12 to 30 percent slopes					
Faywood	70	Very limited		Very limited	
		Slow water movement	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00		
HaB—Hagerstown silt loam, 2 to 6 percent slopes					
Hagerstown	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.53
				Slope	0.32
Lc—Lawrence silt loam					
Lawrence	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50
LyE3—Lowell silty clay loam, 12 to 30 percent slopes, severely eroded					
Lowell, severely eroded	70	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	1.00	Seepage	0.27
		Depth to bedrock	0.62	Depth to hard bedrock	0.18
MuB—Mercer silt loam, 2 to 6 percent slopes					
Mercer	90	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.96
		Slow water movement	1.00	Seepage	0.50
				Slope	0.32

Sewage Disposal–Madison County, Kentucky					
Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MuC—Mercer silt loam, 6 to 12 percent slopes					
Mercer	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	0.96
		Slope	0.04	Seepage	0.50
OtC—Otway silty clay, 6 to 12 percent slopes (shrouts)					
Shrouts	85	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	0.04		
OtE—Otway silty clay, 12 to 30 percent slopes (shrouts)					
Shrouts	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00		
ShB—Shelbyville silt loam, 2 to 6 percent slopes					
Shelbyville	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.32
uLfC—Lowell-Faywood silt loams, 6 to 12 percent slopes					
Lowell	70	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to bedrock	0.62	Depth to hard bedrock	0.18
		Slope	0.04		
Faywood	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.04		
WoC—Woolper silty clay loam, 6 to 12 percent slopes					
Woolper	85	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.04	Seepage	0.27

Data Source Information

Soil Survey Area: Madison County, Kentucky
Survey Area Data: Version 18, May 29, 2020

SECTION 5-7

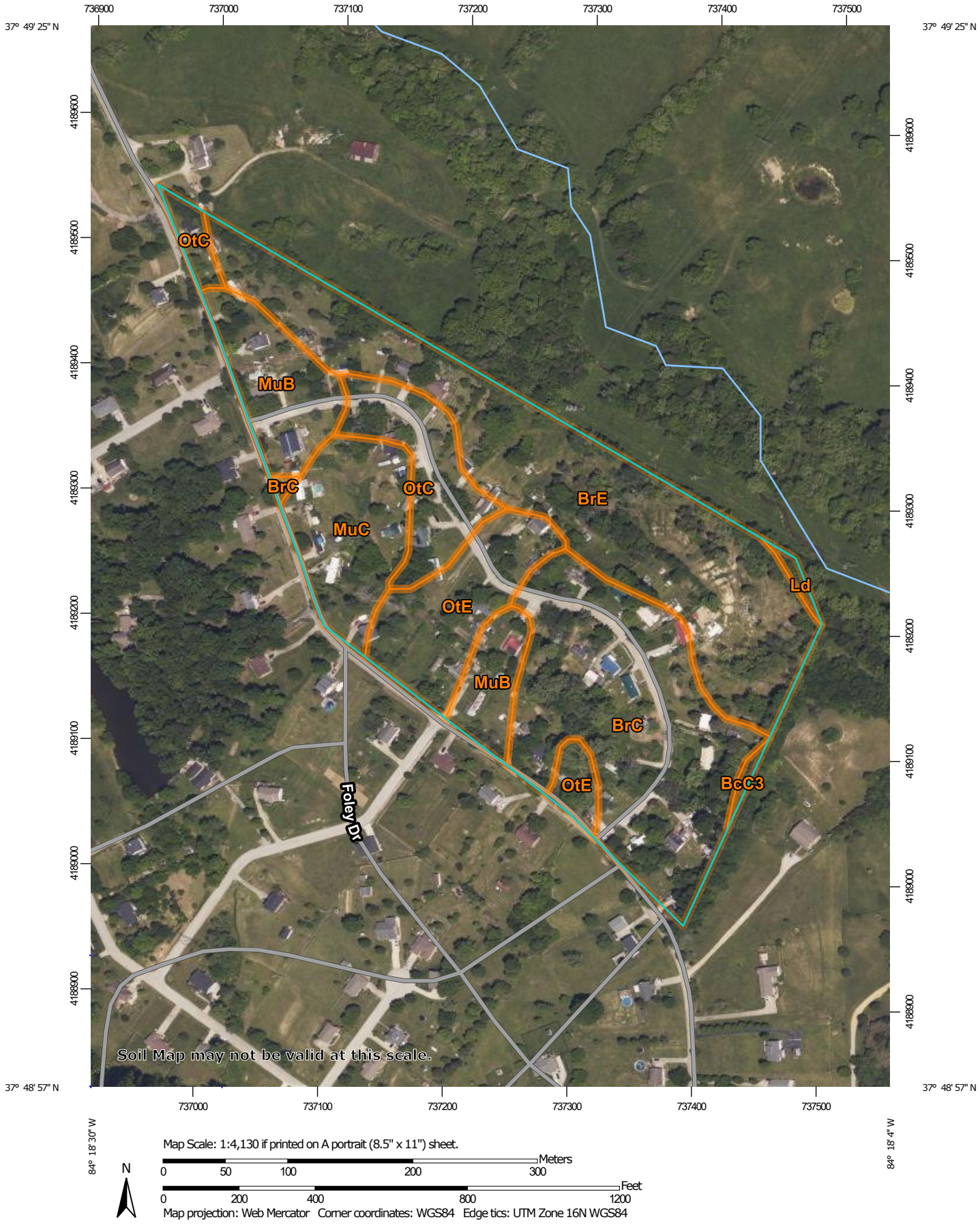
SHADY HILLS SUBDIVSION SOILS MAP & REPORT

Northern Madison County Sanitation District

Regional Facilities Plan

Taken from: Natural Resources Conservation Service (NRCS) web site

Soil Map—Madison County, Kentucky
(Shady Hills Project #3-10D)



Map Scale: 1:4,130 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N 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.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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: Madison County, Kentucky
Survey Area Data: Version 18, May 29, 2020

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

Date(s) aerial images were photographed: May 8, 2019—Aug 11, 2019

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BcC3	Beasley silty clay loam, 6 to 12 percent slopes, severely eroded	0.1	0.4%
BrC	Brassfield silt loam, 6 to 12 percent slopes	8.2	26.2%
BrE	Brassfield silt loam, 12 to 30 percent slopes	10.3	32.9%
Ld	Lindside silt loam, 0 to 2 percent slopes, occasionally flooded	0.1	0.4%
MuB	Mercer silt loam, 2 to 6 percent slopes	3.4	10.9%
MuC	Mercer silt loam, 6 to 12 percent slopes	3.0	9.7%
OtC	Otway silty clay, 6 to 12 percent slopes (shrouts)	2.7	8.8%
OtE	Otway silty clay, 12 to 30 percent slopes (shrouts)	3.4	10.7%
Totals for Area of Interest		**31.3**	**100.0%**

Sewage Disposal

This table shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Saturated hydraulic conductivity (Ksat) is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a Ksat rate of more than 14 micrometers per second are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Sewage Disposal

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Sewage Disposal–Madison County, Kentucky					
Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BcC3—Beasley silty clay loam, 6 to 12 percent slopes, severely eroded					
Beasley, severely eroded	80	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to bedrock	0.77	Depth to soft bedrock	0.42
		Slope	0.04		

Sewage Disposal–Madison County, Kentucky					
Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BrC—Brassfield silt loam, 6 to 12 percent slopes					
Brassfield	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	0.50	Slope	1.00
		Slope	0.04	Seepage	0.50
BrE—Brassfield silt loam, 12 to 30 percent slopes					
Brassfield	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Ld—Lindside silt loam, 0 to 2 percent slopes, occasionally flooded					
Lindside, occasionally flooded	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.99	Seepage	0.28
MuB—Mercer silt loam, 2 to 6 percent slopes					
Mercer	90	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.96
		Slow water movement	1.00	Seepage	0.50
				Slope	0.32
MuC—Mercer silt loam, 6 to 12 percent slopes					
Mercer	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	0.96
		Slope	0.04	Seepage	0.50
OtC—Otway silty clay, 6 to 12 percent slopes (shrouts)					
Shrouts	85	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	0.04		

Sewage Disposal–Madison County, Kentucky					
Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
OtE—Otway silty clay, 12 to 30 percent slopes (shrouts)					
Shrouts	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00		

Data Source Information

Soil Survey Area: Madison County, Kentucky
Survey Area Data: Version 18, May 29, 2020

EXHIBIT 6-1

WRIS ASSET INVENTORY REPORT – EXECUTIVE PARK WWTP

for

Northern Madison County Sanitation District

Regional Facilities Plan

WRIS Asset Inventory Report

KY0056561 - Northern Madison County Sanitation District - Executive Park Subdivision

Rating Code	Condition Rating	Performance Rating	Priority Rating
0			Not a priority
1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
2	Good - Defects that have not begun to deteriorate.	Minor performance deficiencies.	Improved system operations & maintenance (O&M) efficiency.
3	Fair - Moderate defects that will continue to deteriorate.	Considerable performance deficiencies.	Internal safety concern or public nuisance.
4	Poor - Severe defects that will collapse/break in near future.	Major performance deficiencies.	Potential public health, safety, or environmental concern.
5	Inoperable - Defects need immediate attention.	Fails to meet performance targets.	Existing threat to public health, safety, or environment.

Sewer Line Assets

Size (inches)	Type	Material	Decade Constructed	Length (feet)	Condition ID	Performnce ID	Priority ID	WRIS PNum
Assessment Area: EXECUTIVE PARK								
4	Force	PVC	1960	879	2	1	0	
8	Gravity	PVC	1960	5,058	2	2	1	

WRIS Asset Inventory Report

KY0056561 - Northern Madison County Sanitation District - Executive Park Subdivision

Rating Code	Condition Rating	Performance Rating	Priority Rating
0			Not a priority
1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
2	Good - Defects that have not begun to deteriorate.	Minor performance deficiencies.	Improved system operations & maintenance (O&M) efficiency.
3	Fair - Moderate defects that will continue to deteriorate.	Considerable performance deficiencies.	Internal safety concern or public nuisance.
4	Poor - Severe defects that will collapse/break in near future.	Major performance deficiencies.	Potential public health, safety, or environmental concern.
5	Inoperable - Defects need immediate attention.	Fails to meet performance targets.	Existing threat to public health, safety, or environment.

Lift Station Assets

Asset Name	Date of Last Maintenance	Date of Next Maintenance	Capacity (GPM)	Pump Count	Condition ID	Performnce ID	Priority ID	WRIS PNum
Assessment Area: EXECUTIVE PARK								
EXECUTIVE PARK LIFT STATION			100	2	2	2	0	

WRIS Asset Inventory Report

KY0056561 - Northern Madison County Sanitation District - Executive Park Subdivision

Rating Code	Condition Rating	Performance Rating	Priority Rating
0			Not a priority
1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
2	Good - Defects that have not begun to deteriorate.	Minor performance deficiencies.	Improved system operations & maintenance (O&M) efficiency.
3	Fair - Moderate defects that will continue to deteriorate.	Considerable performance deficiencies.	Internal safety concern or public nuisance.
4	Poor - Severe defects that will collapse/break in near future.	Major performance deficiencies.	Potential public health, safety, or environmental concern.
5	Inoperable - Defects need immediate attention.	Fails to meet performance targets.	Existing threat to public health, safety, or environment.

Sewer Treatment Plants

STP Name	Design Capacity (MGD)	Date Constructed	Major Expansion Date	Condition ID	Performance ID	Priority ID
Executive Park	30 GPD	1970's	2008	3	2	1

EXHIBIT 6-2

WRIS ASSET INVENTORY REPORT – BATTLEFIELD WWTP

for

Northern Madison County Sanitation District

Regional Facilities Plan

WRIS Asset Inventory Report

KY0102971 - Northern Madison County Sanitation District - Battlefield Estates

Rating Code	Condition Rating	Performance Rating	Priority Rating
0			Not a priority
1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
2	Good - Defects that have not begun to deteriorate.	Minor performance deficiencies.	Improved system operations & maintenance (O&M) efficiency.
3	Fair - Moderate defects that will continue to deteriorate.	Considerable performance deficiencies.	Internal safety concern or public nuisance.
4	Poor - Severe defects that will collapse/break in near future.	Major performance deficiencies.	Potential public health, safety, or environmental concern.
5	Inoperable - Defects need immediate attention.	Fails to meet performance targets.	Existing threat to public health, safety, or environment.

Sewer Line Assets

Size (inches)	Type	Material	Decade Constructed	Length (feet)	Condition ID	Performnce ID	Priority ID	WRIS PNum
Assessment Area: BATTLEFIELD								
6	Force	PVC	2000	4,535	1	1	0	
8	Gravity	PVC	1990	24,579	2	2	1	
8	Gravity	PVC	2000	20,162	1	1	0	
8	Gravity	PVC	2010	179	1	1	0	

WRIS Asset Inventory Report

KY0102971 - Northern Madison County Sanitation District - Battlefield Estates

Rating Code	Condition Rating	Performance Rating	Priority Rating
0			Not a priority
1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
2	Good - Defects that have not begun to deteriorate.	Minor performance deficiencies.	Improved system operations & maintenance (O&M) efficiency.
3	Fair - Moderate defects that will continue to deteriorate.	Considerable performance deficiencies.	Internal safety concern or public nuisance.
4	Poor - Severe defects that will collapse/break in near future.	Major performance deficiencies.	Potential public health, safety, or environmental concern.
5	Inoperable - Defects need immediate attention.	Fails to meet performance targets.	Existing threat to public health, safety, or environment.

Lift Station Assets

Asset Name	Date of Last Maintenance	Date of Next Maintenance	Capacity (GPM)	Pump Count	Condition ID	Performnce ID	Priority ID	WRIS PNum
Assessment Area: BATTLEFIELD								
TWIN LAKES LIFTSTATION			289	2	1	1	0	

WRIS Asset Inventory Report

KY0102971 - Northern Madison County Sanitation District - Battlefield Estates

Rating Code	Condition Rating	Performance Rating	Priority Rating
0			Not a priority
1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
2	Good - Defects that have not begun to deteriorate.	Minor performance deficiencies.	Improved system operations & maintenance (O&M) efficiency.
3	Fair - Moderate defects that will continue to deteriorate.	Considerable performance deficiencies.	Internal safety concern or public nuisance.
4	Poor - Severe defects that will collapse/break in near future.	Major performance deficiencies.	Potential public health, safety, or environmental concern.
5	Inoperable - Defects need immediate attention.	Fails to meet performance targets.	Existing threat to public health, safety, or environment.

Sewer Treatment Plants

STP Name	Design Capacity (MGD)	Date Constructed	Major Expansion Date	Condition ID	Performance ID	Priority ID	WRIS PNum
BATTLEFIELD WWTP	0.11400000	01/01/1995	01/01/1995	1	1	0	

Treatment Plant Components:

EXHIBIT 6-3

WRIS ASSET INVENTORY REPORT – REGIONAL WWTP

for

Northern Madison County Sanitation District

Regional Facilities Plan

WRIS Asset Inventory Report

KY0105376 - Northern Madison County Sanitation District - Regional Plant

Rating Code	Condition Rating	Performance Rating	Priority Rating
0			Not a priority
1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
2	Good - Defects that have not begun to deteriorate.	Minor performance deficiencies.	Improved system operations & maintenance (O&M) efficiency.
3	Fair - Moderate defects that will continue to deteriorate.	Considerable performance deficiencies.	Internal safety concern or public nuisance.
4	Poor - Severe defects that will collapse/break in near future.	Major performance deficiencies.	Potential public health, safety, or environmental concern.
5	Inoperable - Defects need immediate attention.	Fails to meet performance targets.	Existing threat to public health, safety, or environment.

Sewer Line Assets

Size (inches)	Type	Material	Decade Constructed	Length (feet)	Condition ID	Performnce ID	Priority ID	WRIS PNum
Assessment Area: REGIONAL AREA								
Up to 2	Force	DUCTILE IRON	2000	497	1	1	0	
Up to 2	Force	PVC	1970	817	2	1	0	
Up to 2	Force	PVC	1990	1,318	1	1	0	
Up to 2	Force	PVC	2000	13,993	1	1	0	
3	Force	PVC	1990	1,517	1	1	0	
3	Force	PVC	2000	9,679	1	1	0	
4	Gravity	CLAY TILE	1970	5,199	4	2	2	
4	Force	PVC	1990	20,041	1	1	0	
4	Force	PVC	2000	15,631	1	1	0	
6	Force	PVC	1990	4,693	1	1	0	
8	Gravity	CLAY TILE	1970	5,350	4	3	2	
8	Gravity	DUCTILE IRON	1970	1,003	-	-	-	
8	Gravity	DUCTILE IRON	2000	3,620	-	-	-	
8	Gravity	OTHER	1970	3,269	-	-	-	
8	Force	PVC	2000	19,523	1	1	0	
8	Gravity	PVC	2010	14,023	1	1	0	
10	Gravity	PVC	2000	1,813	1	1	0	
10	Force	PVC	2010	14,903	1	1	0	
12	Gravity	DUCTILE IRON	2000	1,795	2	1	1	
12	Gravity	PVC	2000	2,201	1	1	0	
14	Force	PVC	2000	9,916	2	1	1	
18	Gravity	PVC	2000	2,568	1	1	0	
18	Gravity	PVC	2010	18,719	1	1	0	

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Lift Station Assets

Asset Name	Date of Last Maintenance	Date of Next Maintenance	Capacity (GPM)	Pump Count	Condition ID	Performnce ID	Priority ID	WRIS PNum
Assessment Area: REGIONAL AREA								
ADAMS POINT LIFT STATION #1			33	2	3	2	2	
ADAMS POINT LIFT STATION #2			33	2	1	1	0	
BOONES TRACE #1 LIFT STATION			80	2	3	2	2	
BOONES TRACE #2 LIFT STATION			80	2	2	2	1	
BOONES TRACE #3 LIFTSTATION			180	2	1	1	0	
CLAY LN #1 LIFTSTATION			365	2	1	1	0	
EXIT 95 LIFT STATION			1,597	2	1	1	0	
EXIT 97 LIFTSTATION			364	2	1	1	0	
MADISON VILLAGE LIFT STATION			343	2	1	1	0	
MADISON VILLAGE LIFT STATION #1			90	2	3	2	1	
MADISON VILLAGE LIFT STATION #2			110	2	3	2	1	
MADISON VILLAGE LIFT STATION #3			90	2	3	2	1	
SHILOH POINT LIFT STATION			246	2	1	1	0	
WHITE HALL MANOR LIFT STATION			27	2	1	1	0	

WRIS Asset Inventory Report

KY0105376 - Northern Madison County Sanitation District - Regional Plant

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Sewer Treatment Plants

STP Name	Design Capacity (MGD)	Date Constructed	Major Expansion Date	Condition ID	Performance ID	Priority ID	WRIS PNum
REGIONAL WWTP	1.00000000	06/01/2008		1	1	0	

Treatment Plant Components:

EXHIBIT 6-4

WRIS ASSET INVENTORY REPORT – MUDDY CREEK WWTP

for

Northern Madison County Sanitation District

Regional Facilities Plan

WRIS Asset Inventory Report

KY0111449 - Northern Madison County Sanitation District - Muddy Creek WWTP

Rating Code	Condition Rating	Performance Rating	Priority Rating
0			Not a priority
1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
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Sewer Line Assets

Size (inches)	Type	Material	Decade Constructed	Length (feet)	Condition ID	Performnce ID	Priority ID	WRIS PNum
Assessment Area: GREENS CROSSING								
6	Force	PVC	2000	5,282	1	1	0	
8	Force	PVC	2000	52,158	2	1	1	
Assessment Area: MUDDY CREEK								
6	Force	PVC	2000	14,485	1	1	0	
8	Force	PVC	2000	1,723	1	1	0	

WRIS Asset Inventory Report

KY0111449 - Northern Madison County Sanitation District - Muddy Creek WWTP

Rating Code	Condition Rating	Performance Rating	Priority Rating
0			Not a priority
1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
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5	Inoperable - Defects need immediate attention.	Fails to meet performance targets.	Existing threat to public health, safety, or environment.

Lift Station Assets

Asset Name	Date of Last Maintenance	Date of Next Maintenance	Capacity (GPM)	Pump Count	Condition ID	Performnce ID	Priority ID	WRIS PNum
Assessment Area: GREENS CROSSING								
ESTONIA LIFTSTATION			230	2	1	1	0	
GREENS CROSSING LIFT STATION #1			260	2	1	1	0	
ROBBINSVILLE LIFTSTATION			122	2	1	1	0	

WRIS Asset Inventory Report

KY0111449 - Northern Madison County Sanitation District - Muddy Creek WWTP

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1	New or Excellent - None or minor defects.	Exceeds/Meets all performance targets.	It would be nice to have.
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5	Inoperable - Defects need immediate attention.	Fails to meet performance targets.	Existing threat to public health, safety, or environment.

Sewer Treatment Plants

STP Name	Design Capacity (MGD)	Date Constructed	Major Expansion Date	Condition ID	Performance ID	Priority ID	WRIS PNum
MUDDY CREEK WWTP	0.20000000	03/15/2016	03/15/2016	1	1	0	

Treatment Plant Components:

SECTION 7-1

EXECUTIVE PARK WASTE WATER TREATMENT PLANT

KENTUCY POLLUTANT DISCHARGE ELIMINATION SYSTEM

(KPDES) CURRENT PERMIT #KY0056561

Owner: Northern Madison County Sanitation District

for

Northern Madison County Sanitation District

Regional Facilities Plan

Taken from: Kentucky Department for Environmental Protection,

Division of Water

KPDES

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT

AUTHORIZATION TO DISCHARGE UNDER THE
KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT NO.: KY0056561

AGENCY INTEREST NO.: 2823

Pursuant to Authority in KRS 224,

Northern Madison County Sanitation district
201 Aqueduct Dr. Suite B-9
Richmond, Kentucky 40475

is authorized to discharge from a facility located at

Executive Park Subdivision
Salter Road
Berea, Madison County, Kentucky

to receiving waters named

Hays Fork

in accordance with effluent limitations, monitoring requirements and other conditions set forth in this permit.

This permit shall become effective on January 1, 2019.

This permit and the authorization to discharge shall expire at midnight, December 31, 2023.

November 6, 2018

Date Signed

Peter T. Goodmann, Director
Division of Water

THIS KPDES PERMIT CONSISTS OF THE FOLLOWING SECTIONS:

SECTION 1

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. Compliance Monitoring Locations (Outfalls)

The following table lists the outfalls authorized by this permit, the latitude and longitude of each and the DOW assigned KPDES outfall number:

TABLE 1.					
Outfall No.	**Outfall Type**	**Latitude (N)**	**Longitude (W)**	**Receiving Water**	**Description of Outfall**
001	External	37.6507570°	84.275195°	Hays Fork	Domestic Wastewater

1.2. Effluent Limitations and Monitoring Requirements

Beginning on the effective date and lasting through the term of this permit, discharges from Outfall 001 shall comply with the following effluent limitations:

TABLE 2.									
EFFLUENT LIMITATIONS								**MONITORING REQUIREMENTS**	
Effluent Characteristic	**Units**	**Loadings (lbs/day)**		**Concentrations**				**Frequency**	**Sample Type**
		Monthly Average	**Maximum Weekly Average**	**Minimum**	**Monthly Average**	**Maximum Weekly Average**	**Maximum**		
Flow	MGD	Report	Report[1]	N/A	N/A	N/A	N/A	1/Quarter	Instantaneous
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	1/Quarter	Grab
$CBOD_5$[2]	mg/l	N/A	N/A	N/A	25.0	37.5	N/A	1/Quarter	Composite[3]
Total Suspended Solids	mg/l	N/A	N/A	N/A	30	45	N/A	1/Quarter	Composite[3]
Ammonia (as mg/l NH_3N)									
May 1 – October 31	mg/l	N/A	N/A	N/A	4.0	6.0[1]	N/A	1/Quarter	Composite[3]
November 1 – April 30	mg/l	N/A	N/A	N/A	10	15[1]	N/A	1/Quarter	Composite[3]
Dissolved Oxygen	mg/l	N/A	N/A	7.0	N/A	N/A	N/A	1/Quarter	Grab
E. Coli[4]	#/100 ml	N/A	N/A	N/A	130[5]	240[6]	N/A	1/Quarter	Grab
Total Residual Chlorine	mg/l	N/A	N/A	N/A	0.011	0.019[1]	N/A	1/Quarter	Grab
[1]Daily Maximum									
[2]$CBOD_5$ – Carbonaceous Biochemical Oxygen Demand, 5-day									
[3]A sample composed of four or more equal or flow-proportional aliquots collected over a period of no less than eight and no more than twenty-four hours and aggregated so that the aggregate sample reflects the average water quality of the effluent during the compositing or sample period									
[4]E. Coli – Escherichia Coli Bacteria									

TABLE 2.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs/day)		Concentrations				Frequency	Sample Type
		Monthly Average	Maximum Weekly Average	Minimum	Monthly Average	Maximum Weekly Average	Maximum		
[5]Thirty (30) day Geometric Mean									
[6]Seven (7) day Geometric Mean									

1.3. Standard Effluent Requirements

The discharges to Waters of the Commonwealth shall not produce floating solids, visible foam or a visible sheen on the surface of the receiving waters.

SECTION 2

STANDARD CONDITIONS

2. STANDARD CONDITIONS

The following conditions apply to all KPDES permits.

2.1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of KRS Chapter 224 and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Any person who violates applicable statutes or who fails to perform any duty imposed, or who violates any determination, permit, administrative regulation, or order of the Cabinet promulgated pursuant thereto shall be liable for a civil penalty as provided at KRS 224.99.010.

2.2. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for a new permit.

2.3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2.4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

2.5. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2.6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

2.7. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

2.8. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this permit.

2.9. Inspection and Entry

The permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(4) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

2.10. Monitoring and Records

(1) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(2) Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 401 KAR 5:065, Section 2(10) [40 CFR 503]), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

(3) Records of monitoring information shall include:

a) The date, exact place, and time of sampling or measurements;
b) The individual(s) who performed the sampling or measurements;
c) The date(s) analyses were performed;
d) The individual(s) who performed the analyses;
e) The analytical techniques or methods used; and
f) The results of such analyses.

(4) Monitoring must be conducted according to test procedures approved under 401 KAR 5:065, Section 2(8) [40 CFR 136] unless another method is required under 401 KAR 5:065, Section 2(9) or (10) [40 CFR subchapters N or O].

(5) KRS 224.99-010 provides that any person who knowingly violates KRS 224.70-110 or other enumerated statutes, or who knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall be guilty of a Class D felony and, upon conviction, shall be punished by a fine of not more than $25,000, or by imprisonment for not less than one (1) year and not more than five (5) years, or by both fine and imprisonment for each separate violation. Each day upon which a violation occurs shall constitute a separate violation.

2.11. Signatory Requirement

(1) All applications, reports, or information submitted to the Director shall be signed and certified pursuant to 401 KAR 5:060, Section 4 [40 CFR 122.22].

(2) KRS 224.99-010 provides that any person who knowingly provides false information in any document filed or required to be maintained under KRS Chapter 224 shall be guilty of a Class D felony and upon conviction thereof, shall be punished by a fine not to exceed twenty-five thousand dollars ($25,000), or by imprisonment, or by fine and imprisonment, for each separate violation. Each day upon which a violation occurs shall constitute a separate violation.

2.12. Reporting Requirements

2.12.1. Planned Changes

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(1) The alteration or addition to a permitted facility may meet one (1) of the criteria for determining whether a facility is a new source in KRS 224.16-050 [40 CFR 122.29(b)]; or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under KRS 224.16-050 [40 CFR 122.42(a)(1)].

(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

2.12.2. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

2.12.3. Transfers

This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under KRS 224 [CWA; see 40 CFR 122.61; in some cases, modification or revocation and reissuance is mandatory].

2.12.4. Monitoring Reports

Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 401 KAR 5:065, Section 2(8) [40 CFR 136], or another method required for an industry-specific waste stream under 401 KAR 5:065, Section 2(9) or (10) [40 CFR subchapters N or O], the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

2.12.5. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date.

2.12.6. Twenty-four-Hour Reporting

(1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information which must be reported within twenty-four (24) hours under this paragraph.

a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See §122.41(g))
b) Any upset which exceeds any effluent limitation in the permit.
c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within twenty-four (24) hours.

(3) The Director may waive the written report on a case-by-case basis under 40 CFR 122.41 (l), if the oral report has been received within twenty-four (24) hours.

2.12.7. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under Sections 2.12.1, 2.12.4, 2.12.5 and 2.12.6, at the time monitoring reports are submitted. The reports shall contain the information listed in Section 2.12.6.

2.12.8. Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

2.13. Bypass

2.13.1. Definitions

(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

2.13.2. Bypass Not Exceeding Limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Section 2.13.3 and 2.13.4.

2.13.3. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section 2.12.6.

2.13.4. Prohibition of Bypass

(1) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
c) The permittee submitted notices as required under Section 2.13.3.

(2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three (3) conditions listed above in Section 2.13.4.

2.14. Upset

2.14.1. Definition

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2.14.2. Effect of an Upset

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Section 2.14.3 are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

2.14.3. Conditions Necessary for a Demonstration of Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in Section 2.12.6; and

(4) The permittee complied with any remedial measures required under Section 2.4.

2.14.4. Burden of Proof

In any enforcement preceding the permittee seeking to establish the occurrence of an upset has the burden of proof.

SECTION 3

OTHER CONDITIONS

3. OTHER CONDITIONS

3.1. Schedule of Compliance

The permittee shall attain compliance with all requirements of this permit on the effective date of this permit unless otherwise stated.

3.2. Other Permits

This permit has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal, and local agencies.

3.3. Continuation of Expiring Permit

This permit shall be continued in effect and enforceable after the expiration date of the permit provided the permittee submits a timely and complete application in accordance with 401 KAR 5:060, Section 2(4).

3.4. Antidegradation

For those discharges subject to the provisions of 401 KAR 10:030, Section 1(3)(b)5, the permittee shall install, operate, and maintain wastewater treatment facilities consistent with those identified in the Socioeconomic Demonstration and Alternatives Analysis (SDAA) submitted with the KPDES permit application.

3.5. Reopener Clause

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved in accordance with 401 KAR 5:050 through 5:080, if the effluent standard or limitation so issued or approved:

(1) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

(2) Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of KRS Chapter 224 when applicable.

3.6. Connection to Regional Sewer System

This WWTP is temporary and in no way supersedes the need of a regional sewer system. The permittee shall eliminate the discharge and WWTP plant by connection to a regional sewer system when it becomes available as defined in 401 KAR 5:002.

3.7. Certified Operators

The wastewater treatment plant shall be under the primary responsibility of a Class I Wastewater Treatment Plant Certified Operator or higher.

3.8. Outfall Signage

This KPDES permit establishes monitoring points, effluent limitations, and other conditions to address discharges from the permitted facility. In an effort to better document and clarify these locations, the permittee should place and maintain a permanent marker at each of the monitoring locations.

SECTION 4

MONITORING AND REPORTING REQUIREMENTS

4. MONITORING AND REPORTING REQUIREMENTS

4.1. KPDES Outfalls

Discharge samples and measurements shall be collected at the compliance point for each KPDES Outfall identified in this permit. Each sample shall be representative of the volume and nature of the monitored discharge.

4.2. Sufficiently Sensitive Analytical Methods

Analytical methods utilized to demonstrate compliance with the effluent limitations established in this permit shall be sufficiently sensitive to detect pollutant levels at or below the required effluent limit, i.e. the Method Minimum Level shall be at or below the effluent limit. In the instance where an EPA-approved method does not exist that has a Method Minimum Level at or below the established effluent limitation, the permittee shall:

(1) Use the method specified in the permit; or

(2) The EPA-approved method with an ML that is nearest to the established effluent limit.

It is the responsibility of the permittee to demonstrate compliance with permit parameter limitations by utilization of sufficiently sensitive analytical methods.

4.3. Certified Laboratory Requirements

All laboratory analyses and tests required to demonstrate compliance with the conditions of this permit shall be performed by a laboratory holding the appropriate general or field-only certification issued by the Cabinet pursuant to 401 KAR 5:320.

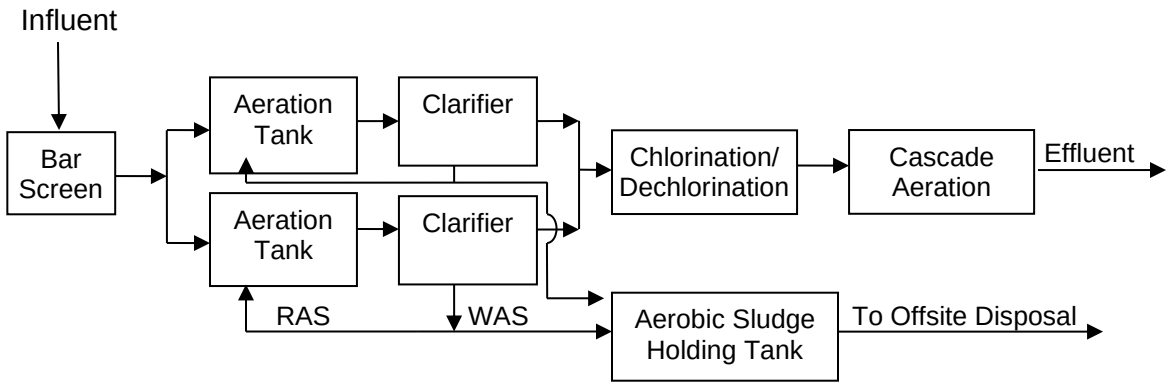
4.4. Submission of DMRs

The completed DMR for each monitoring period must be entered into the DOW approved electronic system no later than midnight on the 28th day of the month following the monitoring period for which monitoring results were obtained.

For more information regarding electronic submittal of DMRs, please visit the Division's website at: http://water.ky.gov/permitting/Pages/netDMRInformation.aspx or contact the DMR Coordinator at (502) 564-3410.

4.8. Location Map

Executive Park WWTP – Process Flow Diagram



SECTION 7-2

BATTLEFIELD ESTATES WASTE WATER TREATMENT PLANT

KENTUCY POLLUTANT DISCHARGE ELIMINATION SYSTEM

(KPDES) CURRENT PERMIT #KY 0102971

Owner: Northern Madison County Sanitation District

for

Northern Madison County Sanitation District

Regional Facilities Plan

Taken from: Kentucky Department for Environmental Protection,

Division of Water

KPDES

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT

AUTHORIZATION TO DISCHARGE UNDER THE
KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT NO.: KY0102971

AGENCY INTEREST NO.: 2801

Pursuant to Authority in KRS 224,

Northern Madison County Sanitation District
201 Aqueduct Drive Suite B-9
Richmond, Kentucky, 40475

is authorized to discharge from a facility located at

Battlefield Estates
142 McCray Way
Richmond, Madison County, Kentucky

to receiving waters named

UT to Hayes Fork

in accordance with effluent limitations, monitoring requirements and other conditions set forth in this permit.

This permit shall become effective on June 1, 2018.

This permit and the authorization to discharge shall expire at midnight, May 31, 2023.

April 24, 2018

Date Signed

Peter T. Goodmann, Director
Division of Water

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
Division of Water, 300 Sower Blvd, Frankfort, Kentucky 40601
Printed on Recycled Paper

THIS KPDES PERMIT CONSISTS OF THE FOLLOWING SECTIONS.

SECTION 1

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. Compliance Monitoring Locations (Outfalls)

The following table lists the outfalls authorized by this permit, the location and description of each, and the DOW assigned KPDES outfall number:

TABLE 1.					
Outfall No.	**Outfall Type**	**Latitude (N)**	**Longitude (W)**	**Receiving Water**	**Description of Outfall**
001	External	37.663194°	-84.257167°	UT to Hayes Fork	Domestic Wastewater from a Publicly Owned Treatment Works

1.2. Effluent Limitations and Monitoring Requirements

Beginning on the effective date and lasting through the term of this permit, discharges from Outfall 001 shall comply with the following effluent limitations:

TABLE 2.									
EFFLUENT LIMITATIONS								**MONITORING REQUIREMENTS**	
Effluent Characteristic	**Units**	**Loadings (lbs/day)**		**Concentrations**				**Frequency**	**Sample Type**
		Monthly Average	**Maximum Weekly Average**	**Minimum**	**Monthly Average**	**Maximum Weekly Average**	**Maximum**		
Flow, Effluent	MGD	Report	Report	N/A	N/A	N/A	N/A	Continuous	Recorder
Flow, Influent	MGD	Report	Report	N/A	N/A	N/A	N/A	Continuous	Recorder
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	1/Week	Grab
$CBOD_5$[1], Effluent	mg/l	14.3	21.4	N/A	15	22.5	N/A	1/Week	24-Hr Composite[2]
$CBOD_5$[1], Influent	mg/l	N/A	N/A	N/A	Report	Report	N/A	1/Week	24-Hr Composite[2]
$CBOD_5$[1], Percent Removal	%	N/A	N/A	N/A	85	N/A	N/A	1/Month	Calculated[3]
TSS[4], Effluent	mg/l	28.5	42.8	N/A	30	45	N/A	1/Week	24-Hr Composite[2]
TSS[4], Influent	mg/l	N/A	N/A	N/A	Report	Report	N/A	1/Week	24-Hr Composite[2]
TSS[4], Percent Removal	%	N/A	N/A	N/A	85	N/A	N/A	1/Month	Calculated[3]
Ammonia (as mg/l NH_3N)									
May 1 – October 31	mg/l	N/A	N/A	N/A	4	6[5]	N/A	1/Week	24-Hr Composite[2]
November 1 – April 30	mg/l	N/A	N/A	N/A	10	15[5]	N/A	1/Week	24-Hr Composite[2]
Dissolved Oxygen	mg/l	N/A	N/A	7.0	N/A	N/A	N/A	1/Week	Grab
E. Coli[6]	#/100 ml	N/A	N/A	N/A	130[7]	240[8]	N/A	1/Week	Grab
Total Residual Chlorine	mg/l	N/A	N/A	N/A	0.011	0.019[5]	N/A	1/Week	Grab

TABLE 2.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs/day)		Concentrations				Frequency	Sample Type
		Monthly Average	Maximum Weekly Average	Minimum	Monthly Average	Maximum Weekly Average	Maximum		
Total Nitrogen[9], Effluent	mg/l	N/A	N/A	N/A	Report	Report[5]	N/A	1/Week	24-Hr Composite[2]
Total Nitrogen[9], Influent	mg/l	N/A	N/A	N/A	Report	Report[5]	N/A	1/Week	24-Hr Composite[2]
Total Phosphorus, Effluent	mg/l	N/A	N/A	N/A	Report	Report[5]	N/A	1/Week	24-Hr Composite[2]
Total Phosphorus, Influent	mg/l	N/A	N/A	N/A	Report	Report[5]	N/A	1/Week	24-Hr Composite[2]
[1]$CBOD_5$ – Carbonaceous Biochemical Oxygen Demand, 5-day									
[2]A 24-hour composite is a sample collected using an automated sampler set to collect equal volume aliquots of 120 to 140 ml each every 15 minutes over a 24 hour period. The sample must be maintained at between 0° C and 6° C at all times.									
[3]Percent Removal is calculated using the following equation: $\text{Percent Removal} = \left[\frac{(\text{Monthly Average Influent} - \text{Monthly Average Effluent})}{\text{Monthly Average Influent}}\right] \times 100$									
[4]Total Suspended Solids									
[5]Daily Maximum									
[6]E. Coli – Escherichia Coli Bacteria									
[7]Thirty (30) day Geometric Mean									
[8]Seven (7) day Geometric Mean									
[9]Total Nitrogen is the summation of the analytical results for Total Nitrates, Total Nitrites, and Total Kjeldahl Nitrogen									

1.3. Standard Effluent Requirements

The discharges to waters of the Commonwealth shall not produce floating solids, visible foam or a visible sheen on the surface of the receiving waters.

1.4. Application Monitoring for Outfall 001

POTWs are required to complete application Form A which requires a minimum of three (3) samples to be collected and analyzed. To ensure that sufficient samples are collected and analyzed, DOW shall impose minimum annual sampling during years two (2) through four (4) of the permit term, for those parameters required to be analyzed and reported on the application (See Table 3 below). Of the three (3) samples, two (2) shall be taken no closer than four (4) months together and no greater than eight (8) months apart. The results of the application monitoring shall be submitted on an annual DMR and summarized on the renewal application. The permittee shall report No Discharge – Conditional Monitoring Not Required This Period (NODI 9) for years 1 and 5 of the permit.

TABLE 3.					
Effluent Characteristic	Units	Concentrations		Frequency	Sample Type
		Average	Maximum		
Temperature (May 1- October 31)	^{o}F	Report	Report	3/5 years	Grab
Temperature (November 1- April 30)	^{o}F	Report	Report	3/5 years	Grab
Total Kjeldahl Nitrogen (TKN)	mg/l	Report	Report	3/5 years	Grab
Nitrate Plus Nitrite Nitrogen	mg/l	Report	Report	3/5 years	Grab
Oil & Grease	mg/l	Report	Report	3/5 years	Grab
Phosphorus (Total)	mg/l	Report	Report	3/5 years	Grab[1]
Total Dissolved Solids (TDS)	mg/l	Report	Report	3/5 years	Grab
[1]The 24-Hr Composite sample required in Table 2 may be used.					

SECTION 2

COLLECTION SYSTEM REQUIREMENTS

2. COLLECTION SYSTEM REQUIREMENTS

2.1. Prohibitions

The following prohibitions apply to the collection system and its users:

(1) There shall be no sanitary sewer overflows (SSOs);
(2) No user shall introduce any pollutant or pollutants that will cause pass through or interference with the operation of the POTW and the collection system; or
(3) No user shall introduce any of the following pollutants:
   a) Pollutants which create a fire or explosion hazard, including but not limited to, wastestreams with a closed cup flashpoint of less than 140 ^{o}F (60 ^{o}C);
   b) Pollutants which will cause corrosive structural damage or have a pH less than 5.0 standard units unless the POTW is designed to accommodate such pH levels;
   c) Solid or viscous pollutants in amounts that would obstruct the flow to the POTW thus resulting in interference;
   d) Any pollutant released in a discharge at such a volume or strength as to cause interference in the POTW;
   e) Heat in such quantities that the temperature at the POTW treatment plant exceeds 104 ^{o}F (40 ^{o}C) unless the POTW requests and the Approval Authority grants alternate temperature limits;
   f) Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass-through;
   g) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and,
   h) Any trucked or hauled waste except, at discharge points designated by the POTW.

All POTW's, in cases where pollutants contributed by user(s) of the collection system are likely to result in reoccurring interference or pass-through, shall develop and enforce specific effluent limits for industrial user(s), and all other users, as appropriate, which, together with appropriate changes in the POTW treatment plant's facilities or operation, are necessary to ensure renewed and continued compliance with the POTW's KPDES permit or sludge use or disposal practices. POTW's with approved Pretreatment Programs meet this requirement.

2.2. Capacity, Management, Operation and Maintenance (CMOM) Program

2.2.1. <u>Applicability</u>

These conditions apply to all permittees with sewage infrastructure including the sewer system and wastewater treatment plant.

2.2.2. <u>Goals</u>

The goals of a comprehensive CMOM Program are:

(1) To better manage, operate, and maintain the collection system;
(2) Investigate capacity constrained areas of the collection system;
(3) Proactively prevent or minimize SSOs;
(4) Respond to SSO events; and
(5) Proactively prevent or minimize the potential for the release of pollutants from ancillary activities through plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from storage areas.

To achieve these goals, the permittee shall complete a CMOM self-assessment using the checklist in the "Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems," EPA 305-B-05-002 to determine the scope of the CMOM program.

The guide is available at: http://www.epa.gov/npdes/pubs/cmom_guide_for_collection_systems.pdf. Upon completion of the checklist, the permittee shall develop a proposed plan of action to achieve the goals of the CMOM program.

2.2.3. CMOM Plan of Action

At a minimum the plan of action shall include the following:

(1) Self-Assessment Summary (including recommended improvements and schedules);
(2) Collection System Diagram;
(3) Sewer Overflow Response Protocol (SORP);
(4) Best Management Practices (BMPs); and
(5) Any other constituent programs necessary to achieve the goals of the CMOM program

2.2.4. Collection System Diagram

The collection system diagram shall include the following:

(1) Scale;
(2) North arrow;
(3) Date the map was drafted and most recent revision;
(4) Street names;
(5) Surface waters;
(6) Service area boundaries;
(7) Manholes and other access points (including structure IDs);
(8) Sewer lines;
(9) Pump stations (including structure IDs);
(10) Wastewater treatment plants;
(11) Permitted discharge points or outfalls (including CSO outfalls);
(12) CSO regulators, for combined sewer systems; and
(13) Locations of recurring SSOs that occurred within the last five (5) years prior to the effective date of this permit.

2.2.5. Sewer Overflow Response Protocol (SORP)

At a minimum the SORP shall include the following elements:

(1) An overflow response procedure including designated responders for the permittee, response times, and cleanup methods;
(2) A public advisory procedure;
(3) A regulatory agency notification procedure;
(4) A manhole and pump station inspection schedule;
(5) A procedure for addressing discharges to buildings caused by blockage, flow condition, or other malfunction in sewer infrastructure owned or operationally-controlled by the permittee; and
(6) A requirement to include the structure ID for reported incidents.

2.2.6. Best Management Practices (BMPs)

BMPs are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to implement the prohibitions listed in Section 2.1 of this permit. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.

2.2.7. Implementation

Implementation shall be as soon as possible, but no later than one year from the effective date of the permit or as specified in the schedule of compliance for this permit.

2.2.8. Documentation

The permittee shall maintain all applicable CMOM program documents at the facility and make them available upon request to EEC personnel. Initial copies and modification thereof shall be sent to DOW upon request.

2.2.9. Modification

The permittee shall amend CMOM Programs documentation whenever there is a change in the facility or change in operation of the facility which materially affects the requirements specified in applicable documents.

2.2.10. Modification for Ineffectiveness

If any of the CMOM programs prove to be ineffective in achieving the general objective of preventing and eliminating SSOs and other unauthorized discharges, the permit, and/or specific CMOM programs shall be subject to modification to address deficiencies. If at any time following the issuance of this permit any of the CMOM programs are found to be inadequate pursuant to a state or federal site inspection or review, affected CMOM program documents shall be modified to incorporate such changes necessary to resolve concerns.

SECTION 3

STANDARD CONDITIONS

3. STANDARD CONDITIONS

The following conditions apply to all KPDES permits.

3.1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of KRS Chapter 224 and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Any person who violates applicable statutes or who fails to perform any duty imposed, or who violates any determination, permit, administrative regulation, or order of the cabinet promulgated pursuant thereto shall be liable for a civil penalty as provided at KRS 224.99.010.

3.2. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for a new permit.

3.3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3.4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

3.5. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

3.6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

3.7. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

3.8. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this permit.

3.9. Inspection and Entry

The permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(4) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

3.10. Monitoring and Records

(1) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(2) Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 401 KAR 5:065, Section 2(10) [40 CFR 503]), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

(3) Records of monitoring information shall include:

a) The date, exact place, and time of sampling or measurements;
b) The individual(s) who performed the sampling or measurements;
c) The date(s) analyses were performed;
d) The individual(s) who performed the analyses;
e) The analytical techniques or methods used; and
f) The results of such analyses.

(4) Monitoring must be conducted according to test procedures approved under 401 KAR 5:065, Section 2(8) [40 CFR 136] unless another method is required under 401 KAR 5:065, Section 2(9) or (10) [40 CFR subchapters N or O].

(5) KRS 224.99-010 provides that any person who knowingly violates KRS 224.70-110 or other enumerated statutes, or who knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall be guilty of a Class D felony and, upon conviction, shall be punished by a fine of not more than $25,000, or by imprisonment for not more than one (1) year, or both. Each day upon which a violation occurs shall constitute a separate violation.

3.11. Signatory Requirement

(1) All applications, reports, or information submitted to the Director shall be signed and certified pursuant to 401 KAR 5:060, Section 4 [40 CFR 122.22].

(2) KRS 224.99-010 provides that any person who knowingly provides false information in any document filed or required to be maintained under KRS Chapter 224 shall be guilty of a Class D felony and upon conviction thereof, shall b punished by a fine not to exceed twenty-five thousand dollars ($25,000), or by imprisonment, or by fine and imprisonment, for each separate violation. Each day upon which a violation occurs shall constitute a separate violation

3.12. Reporting Requirements

3.12.1. Planned Changes

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(1) The alteration or addition to a permitted facility may meet one (1) of the criteria for determining whether a facility is a new source in KRS 224.16-050 [40 CFR 122.29(b)]; or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under KRS 224.16-050 [40 CFR 122.42(a)(1)].

(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

3.12.2. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3.12.3. Transfers

This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under KRS 224 [CWA; see 40 CFR 122.61; in some cases, modification or revocation and reissuance is mandatory].

3.12.4. Monitoring Reports

Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 401 KAR 5:065, Section 2(8) [40 CFR 136], or another method required for an industry-specific waste stream under 401 KAR 5:065, Section 2(9) or (10) [40 CFR subchapters N or O], the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

3.12.5. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date.

3.12.6. Twenty-Four-Hour Reporting

(1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information which must be reported within twenty-four (24) hours under this paragraph.

a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See §122.41(g))
b) Any upset which exceeds any effluent limitation in the permit.
c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within twenty-four (24) hours.

(3) The Director may waive the written report on a case-by-case basis under 40 CFR 122.41 (l), if the oral report has been received within twenty-four (24) hours.

3.12.7. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under Sections 3.12.1, 3.12.4, 3.12.5 and 3.12.6, at the time monitoring reports are submitted. The reports shall contain the information listed in Section 3.12.6.

3.12.8. Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

3.13. Bypass

3.13.1. Definitions

(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

3.13.2. Bypass Not Exceeding Limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Section 3.13.3 and 3.13.4.

3.13.3. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section 3.12.6.

3.13.4. Prohibition of Bypass

(1) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
c) The permittee submitted notices as required under Section 3.13.3.

(2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three (3) conditions listed above in Section 3.13.4

3.14. Upset

3.14.1. Definition

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

3.14.2. Effect of an Upset

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Section 3.14.3 are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

3.14.3. Conditions Necessary for a Demonstration of Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in Section 3.12.6; and

(4) The permittee complied with any remedial measures required under Section 3.4.

3.14.4. Burden of Proof

In any enforcement preceding the permittee seeking to establish the occurrence of an upset has the burden of proof.

SECTION 4

OTHER CONDITIONS

4. OTHER CONDITIONS

4.1. Schedule of Compliance

The permittee shall attain compliance with all requirements of this permit on the effective date of this permit unless otherwise stated below:

4.2. Other Permits

This permit has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal, and local agencies.

4.3. Continuation of Expiring Permit

This permit shall be continued in effect and enforceable after the expiration date of the permit provided the permittee submits a timely and complete application in accordance with 401 KAR 5:060, Section 2(4).

4.4. Antidegradation

For those discharges subject to the provisions of 401 KAR 10:030, Section 1(3)(b)5, the permittee shall install, operate, and maintain wastewater treatment facilities consistent with those identified in the approved regional facility plan.

4.5. Reopener Clause

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved in accordance with 401 KAR 5:050 through 5:080, if the effluent standard or limitation so issued or approved:

(1) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
(2) Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of KRS Chapter 224 when applicable.

4.6. Sludge Disposal

The disposal or final use of sewage sludge generated during the treatment of domestic sewage by a POTW shall be disposed of in accordance with state and federal requirements [401 KAR Chapter 45 and 40 CFR 503].

4.7. Certified Operators

The wastewater treatment plant shall be under the primary responsibility of Class II Wastewater Treatment Plant Certified Operators or higher.

The collection system shall be under the primary responsibility of Class II Collection System Certified Operators or higher.

4.8. Outfall Signage

The KPDES permit establishes monitoring points, effluent limitations, and other conditions to address discharges from the permitted facility. In an effort to better document and clarify these locations the permittee should place and maintain a permanent marker at each of the monitoring locations.

SECTION 5

MONITORING AND REPORTING REQUIREMENTS

5. MONITORING AND REPORTING REQUIREMENTS

5.1. KPDES Outfalls

Discharge samples and measurements shall be collected at the compliance point for each KPDES Outfall identified in this permit. Each sample shall be representative of the volume and nature of the monitored discharge.

5.2. Monthly Operating Reports (MORs)

In addition to the monitoring of effluent as specified by the permit, the permittee shall conduct process control monitoring on a daily basis. Process control monitoring is that monitoring performed by the operators of the wastewater treatment plant to determine if the wastewater system is operating at its optimum efficiency. This monitoring includes but is not limited to influent and effluent quality and quantity monitoring, chemical usage, sludge monitoring including volume produced, wasted, and disposed, and monitoring of internal units such as aeration basins and oxidation ditches.

The data is recommended to be recorded using the Microsoft EXCEL-based Monthly Operating Report (MOR) workbook available on the Department for Environmental Protection's Forms webpage at:

http://dep.ky.gov/formslibrary/Pages/default.aspx

Alternatively, the permitee may choose to use their own electronic or paper MOR workbook, as long as it includes the information required by the above form and/or is approved by the Division's Regional Field Office Supervisor.

The updated workbook shall be maintained on-site and made available upon request by Cabinet personnel.

5.3. Sufficiently Sensitive Analytical Methods

Analytical methods utilized to demonstrate compliance with the effluent limitations established in this permit shall be sufficiently sensitive to detect pollutant levels at or below the required effluent limit, i.e. the Method Minimum Level shall be at or below the effluent limit. In the instance where an EPA-approved method does not exist that has a Method Minimum Level at or below the established effluent limitation, the permittee shall:

(1) Use the method specified in the permit; or
(2) The EPA-approved method with an ML that is nearest to the established effluent limit.

It is the responsibility of the permittee to demonstrate compliance with permit parameter limitations by utilization of sufficiently sensitive analytical methods.

5.4. Certified Laboratory Requirements

All laboratory analyses and tests required to demonstrate compliance with the conditions of this permit shall be performed by EEC certified wastewater laboratories.

5.5. Submission of DMRs

The completed DMR for each monitoring period must be entered into the DOW approved electronic system no later than midnight on the 28th day of the month following the monitoring period for which monitoring results were obtained.

For more information regarding electronic submittal of DMRs, please visit the Division's website at: http://water.ky.gov/permitting/Pages/netDMRInformation.aspx or contact the DMR Coordinator at (502) 564-3410.

SECTION 4

COLLECTION SYSTEM REQUIREMENTS

4. COLLECTION SYSTEM REQUIREMENTS

4.1. General Prohibitions

The following prohibitions apply to the collection system and its users:

(1) There shall be no sanitary sewer overflows (SSOs);
(2) No user shall introduce any pollutant or pollutants that will cause pass through or interference with the operation of the POTW and the collection system; or
(3) No user shall introduce any of the following pollutants:
   a. Pollutants which create a fire or explosion hazard, including but not limited to, wastestreams with a closed cup flashpoint of less than 140 ^{o}F (60 ^{o}C);
   b. Pollutants which will cause corrosive structural damage or have a pH less than 5.0 standard units unless the POTW is designed to accommodate such pH levels;
   c. Solid or viscous pollutants in amounts that would obstruct the flow to the POTW thus resulting in interference;
   d. Any pollutant released in a discharge at such a volume or strength as to cause interference in the POTW;
   e. Heat in such quantities that the temperature at the POTW treatment plant exceeds 104 ^{o}F (40 ^{o}C) unless the POTW requests and the Approval Authority grants alternate temperature limits;
   f. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass-through;
   g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and,
   h. Any trucked or hauled waste except, at discharge points designated by the POTW.

All POTWs, in cases where pollutants contributed by user(s) of the collection system are likely to result in reoccurring interference or pass-through, shall develop and enforce specific effluent limits for industrial user(s), and all other users, as appropriate, which, together with appropriate changes in the POTW treatment plant's facilities or operation, are necessary to ensure renewed and continued compliance with the POTW's KPDES permit or sludge use or disposal practices.

These prohibitions are consistent with Kentucky's general prohibition against water pollution, the Combined Sewer Overflow Control Policy of 1994 (CSO Policy), and the national pretreatment standards prohibited discharges applicable to all POTW collection systems [KRS 224.70-110, 33 U.S.C. 1342 (q) and 401 KAR 5:057, Section 3 – 40 CFR 403.5 respectively]

4.2. Capacity, Management, Operation and Maintenance (CMOM) Programs

The permittee shall develop and implement CMOM programs that: (1) better manages, operates, and maintains collection systems, (2) investigates capacity constrained areas of the collection system, (3) proactively prevents or minimizes SSOs, and (4) responds to SSO events.

Guidance for the development of effective CMOM programs is available at the following EPA web address: http://www.epa.gov/npdes/pubs/cmom_guide_for_collection_systems.pdf

This requirement replaces the requirement to develop and implement a Best Management Practices (BMP) plan imposed in prior permits. The imposition of this requirement is consistent with the standard conditions applied to all permits regarding the proper operation and maintenance of all facilities and systems of treatment and control including all related appurtenances [401 KAR 5:065, Section 2(1) – 40 CFR 122.41(e)].

SECTION 5

OTHER CONDITIONS

5. OTHER CONDITIONS

5.1. Schedule of Compliance

The permittee will comply with all effluent limitations by the effective date of the permit except as specified below [401 KAR 5:070, Section 2 – 40 CFR 122.47].

5.2. Antidegradation

The conditions of Kentucky's Antidegradation Policy have been satisfied [401 KAR 10:029, Section 1]. This permitting action is a reissuance of a KPDES permit that does not authorize an expanded discharge from a POTW. The POTW has developed an approved regional facility plan in accordance with state wastewater planning requirements for regional planning agencies [401 KAR 5:006]. This approved plan constitutes compliance with socioeconomic demonstration and alternatives analysis of the Antidegradation Policy Implementation Methodology [401 KAR 10:030, Section 1(3)(b)2b].

5.3. Sludge Disposal

The disposal or final use of sewage sludge generated during the treatment of domestic sewage by a POTW shall be disposed of in accordance with state and federal requirements [401 KAR Chapter 45 and 40 CFR 503].

5.4. Standard Conditions

The conditions listed in the Standard Conditions Section of the permit are consistent with the conditions applicable to all permits [401 KAR 5:065, Section 2(1) – 40 CFR 122.41].

5.5. Sufficiently Sensitive Analytical Methods

Analytical methods utilized to demonstrate compliance with the effluent limitations established in this permit shall be sufficiently sensitive to detect pollutant levels at or below the required effluent limit, i.e. the Method Minimum Level (ML) shall be at or below the effluent limit. In that instance where an EPA-approved method does not exist that has an ML at or below the established effluent limitation, the permit shall: (1) use the method specified in the permit; or (2) the EPA-approved method with an ML that is nearest to the established effluent limit [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)].

5.6. Certified Laboratory

All environmental analysis to be performed by a certified laboratory is consistent with the certified wastewater laboratory requirements [401 KAR 5:320, Section 3].

5.7. Certified Operators

Wastewater treatment plants and wastewater collection systems that accept wastewaters containing domestic sewage are to be operated by a certified operator [401 KAR 5:10].

5.8. Application Monitoring

POTWs are required to complete application Form A which requires a minimum of three (3) samples to be collected and analyzed. To ensure that sufficient samples are collected and analyzed, DOW placed sampling requirements within the permit. The results of the application monitoring shall be submitted on an annual DMR and summarized on the renewal application [401 KAR 5:065, Section 2(1) – 40 CFR 122.41(j) and 401 KAR 5:070, Section 3 – 40 CFR 122.48].

5.9. Monthly Operating Reports (MORs)

In addition to the monitoring of effluent as specified by the permit, the permittee shall conduct process control monitoring on a daily basis. Process control monitoring is that monitoring performed by the operators of the wastewater treatment plant to determine if the wastewater system is operating at its optimum efficiency. This monitoring includes but is not limited to influent and effluent quality and

quantity monitoring, chemical usage, sludge monitoring including volume produced, wasted, and disposed, and monitoring of internal units such as aeration basins and oxidation ditches.

The data is recommended to be recorded using the Microsoft EXCEL-based Monthly Operating Report (MOR) workbook available on the Department for Environmental Protection's Forms webpage at:

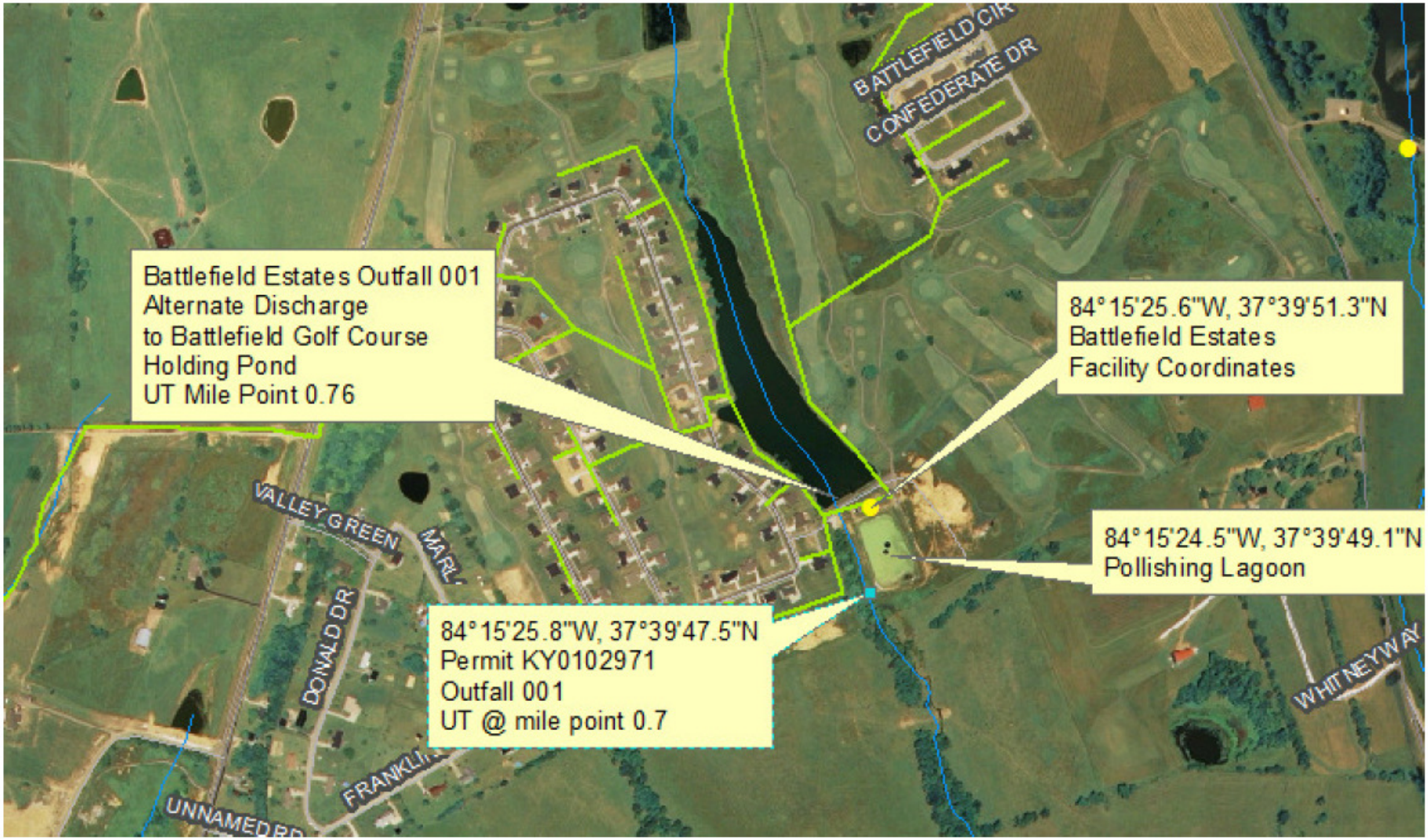
http://dep.ky.gov/formslibrary/Pages/default.aspx

Alternatively, the permittee may choose to use their own electronic MOR workbook, as long as it includes the information required by the above form and/or is approved by the Division's Regional Field Office Supervisor.

The updated workbook shall be maintained on-site and made available upon request by Cabinet personnel.

These additional monitoring requirements are consistent with state and federal regulations that require the permit to include as appropriate monitoring requirements to assure compliance with the permit limitations [401 KAR 5:070, Section 3 – 40 CFR 122.48].

5.10. Location Map



Battlefield Estates WWTP – Process Flow Diagram