

West Virginia Watershed Atlas

WATER USE SECTION



west virginia department of environmental protection

November 2013

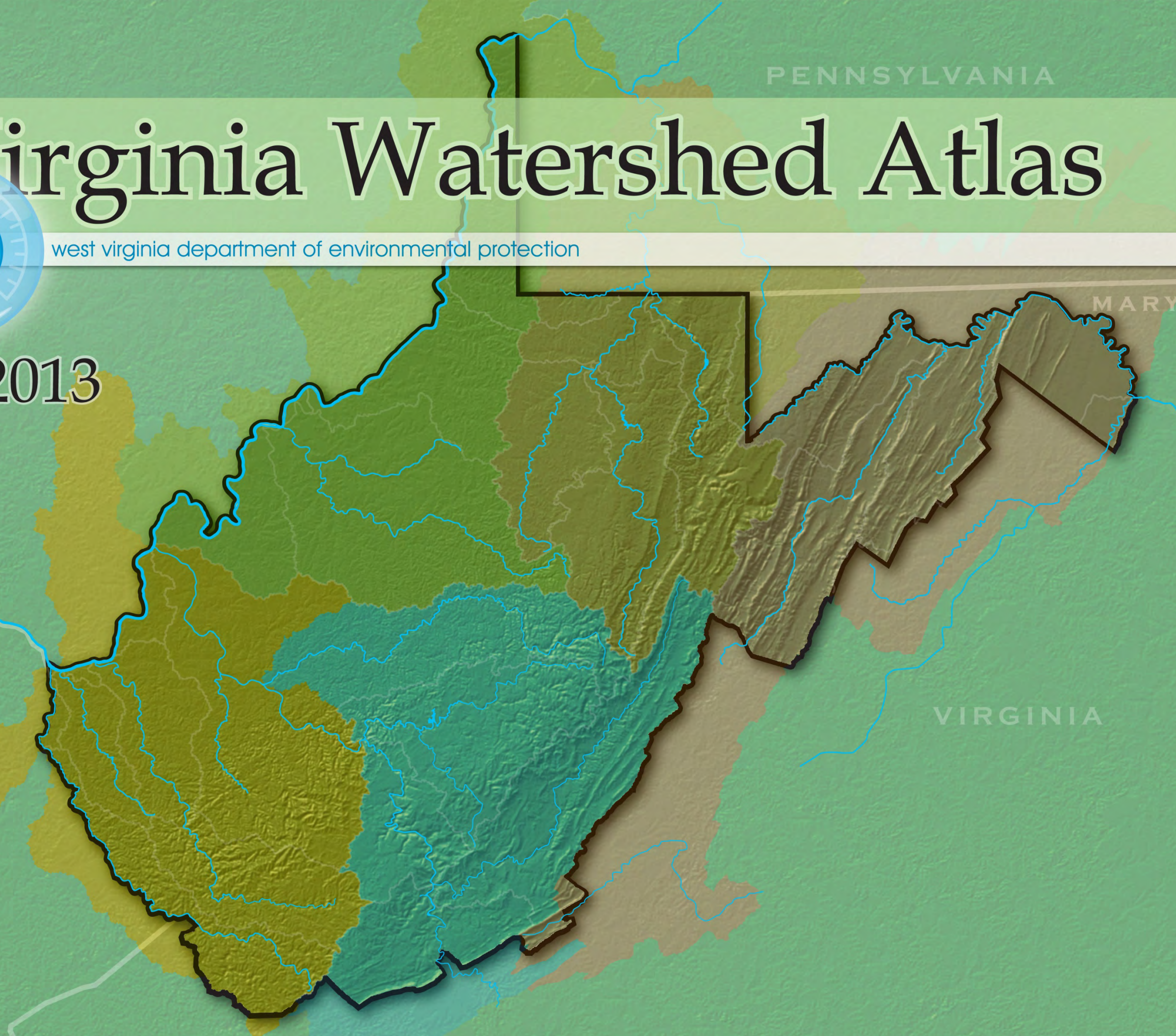
KENTUCKY

OHIO

PENNSYLVANIA

VIRGINIA

MARYLAND



Legal Disclaimer

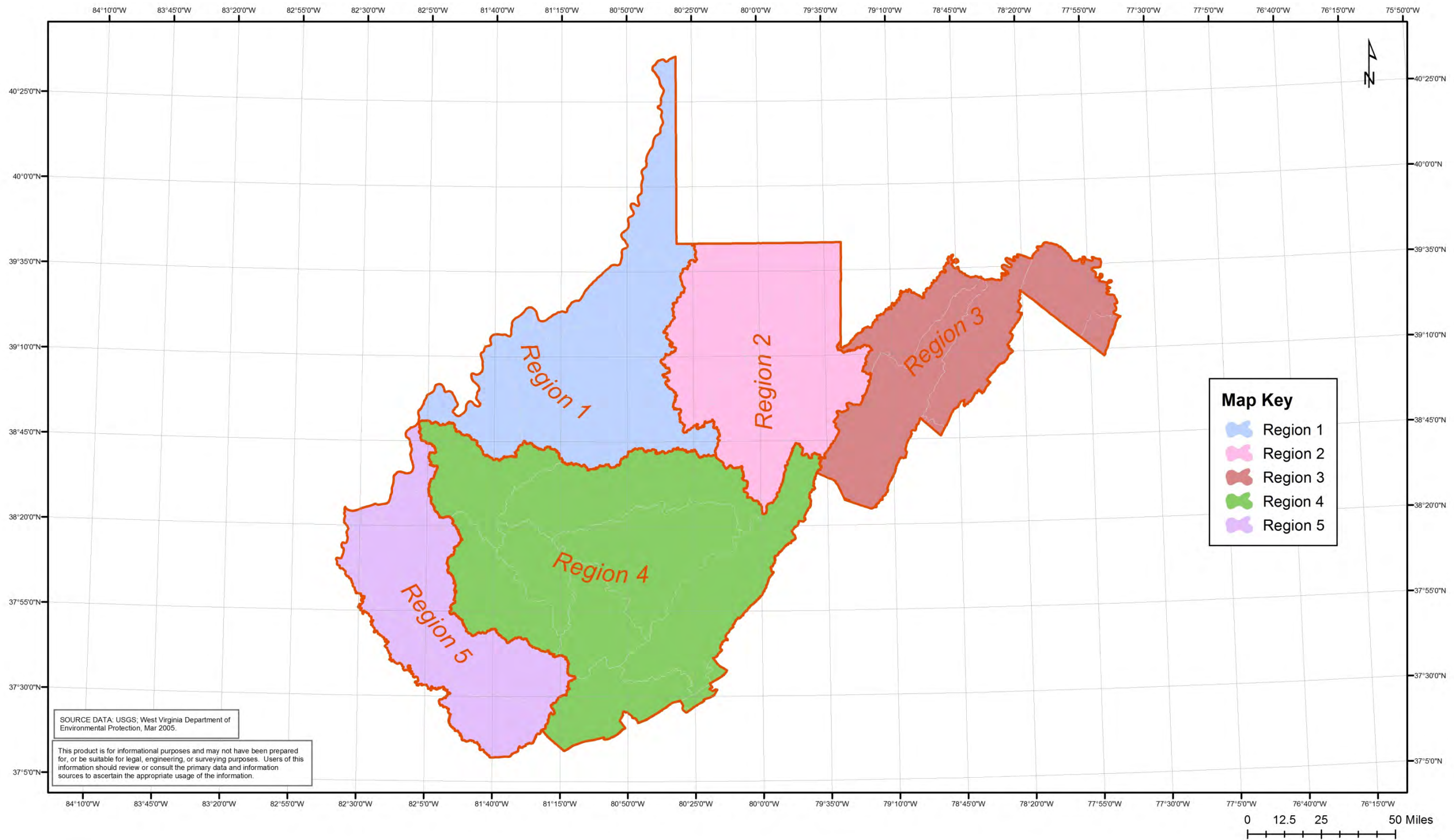


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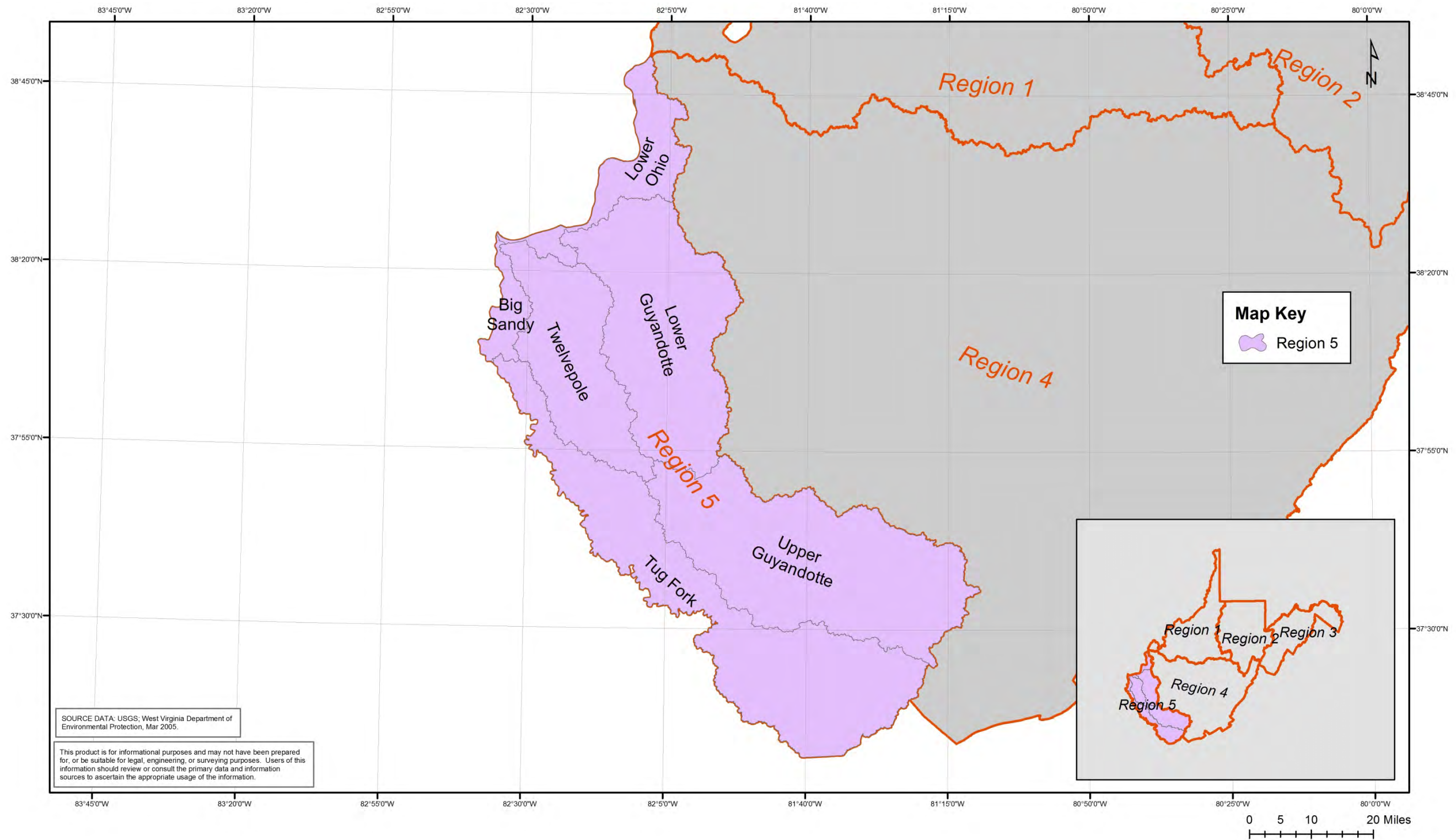
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West Virginia Watershed – Regional Map

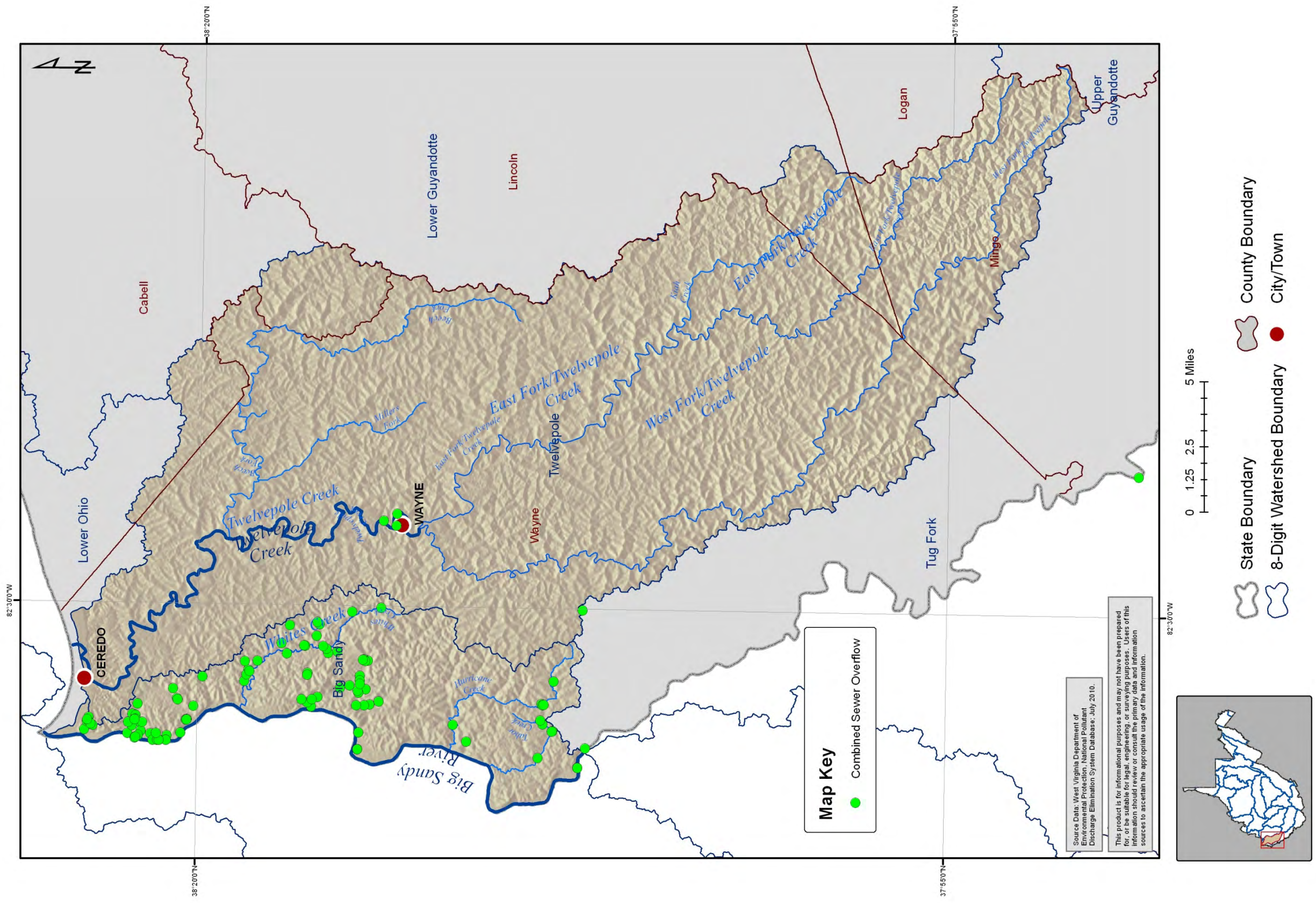


Region 5



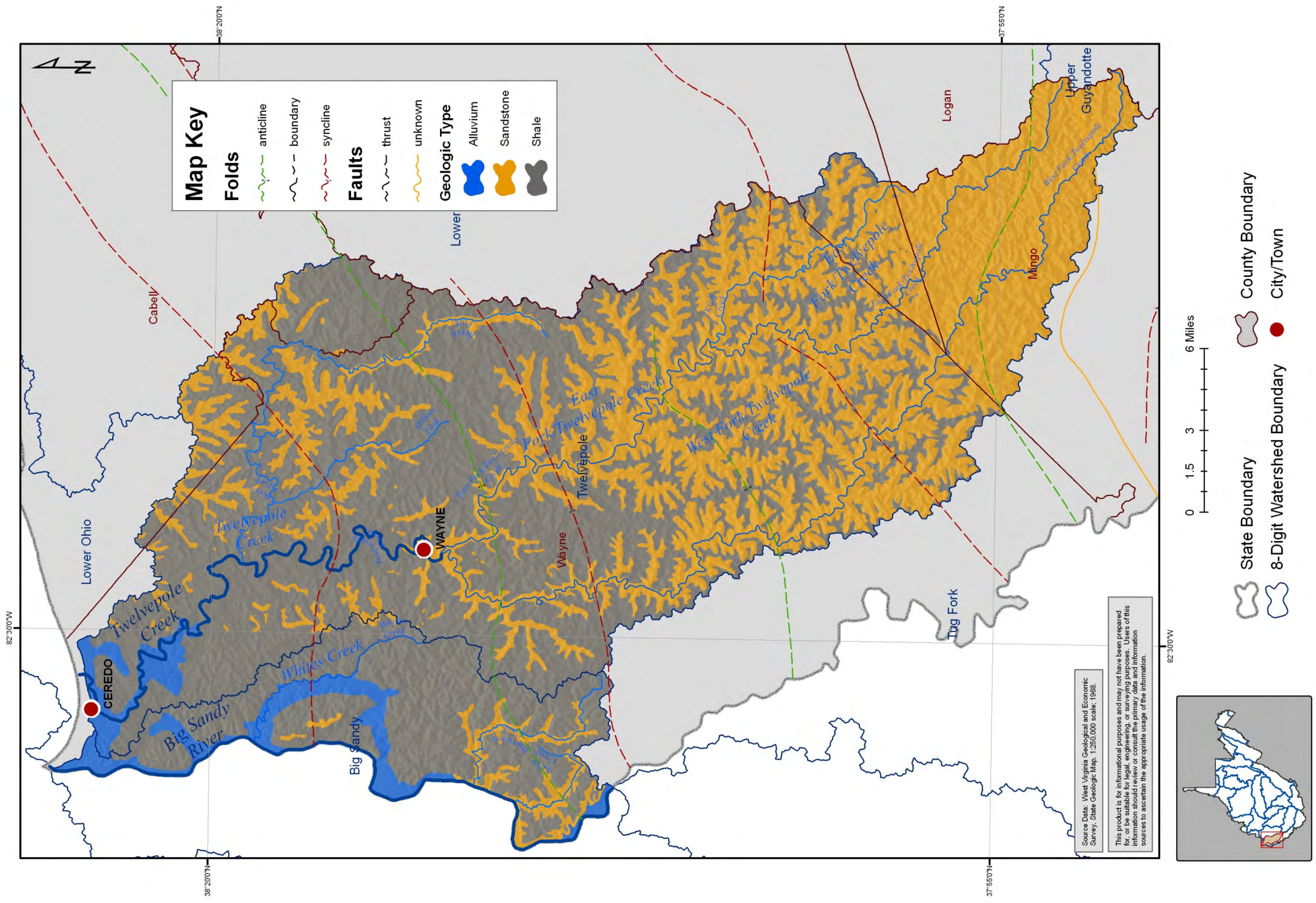
Big Sandy and Twelvepole HUC-8 Watersheds

Combined Sewer Overflows



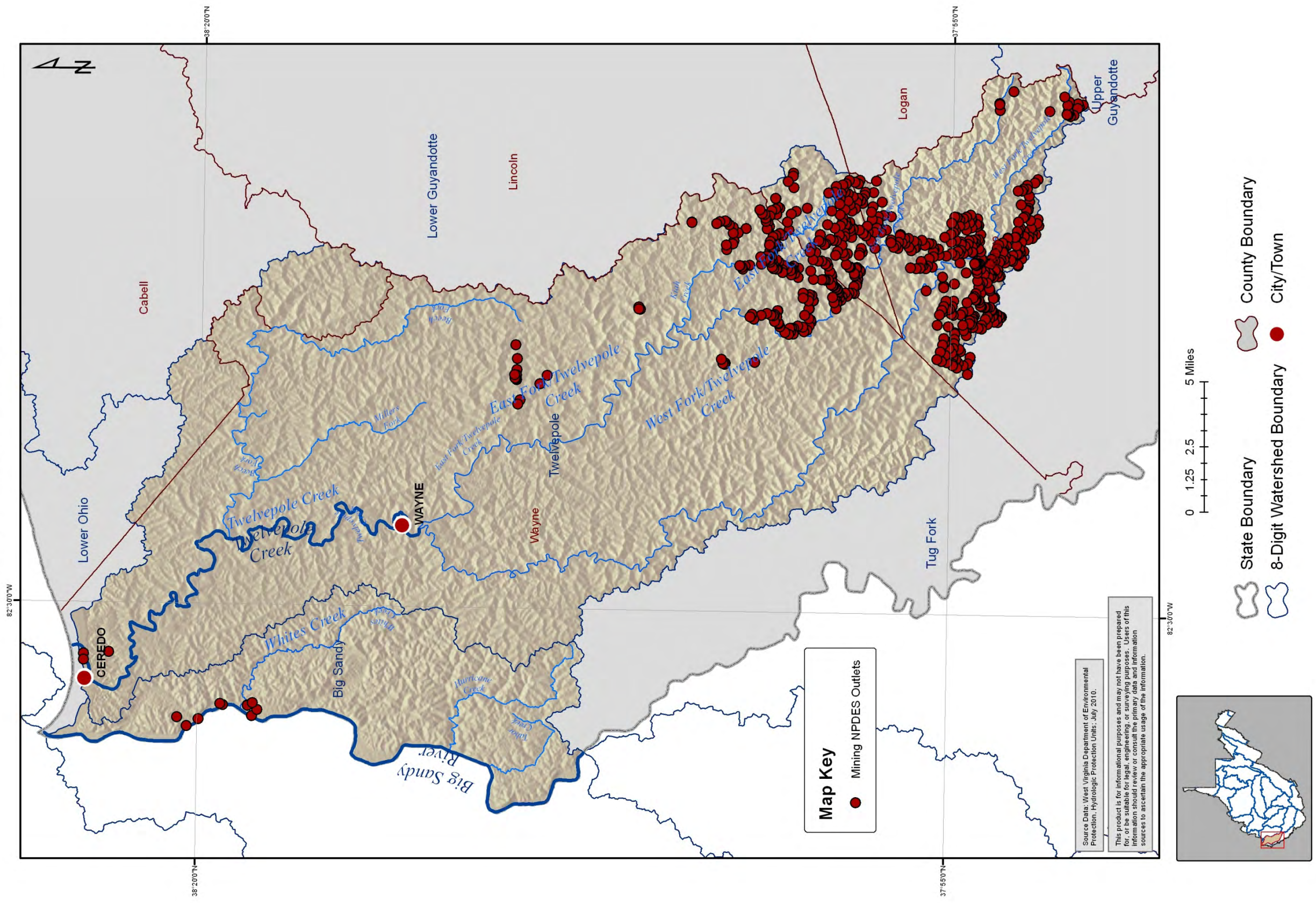
Big Sandy and Twelvepole HUC-8 Watersheds

Surface Geology



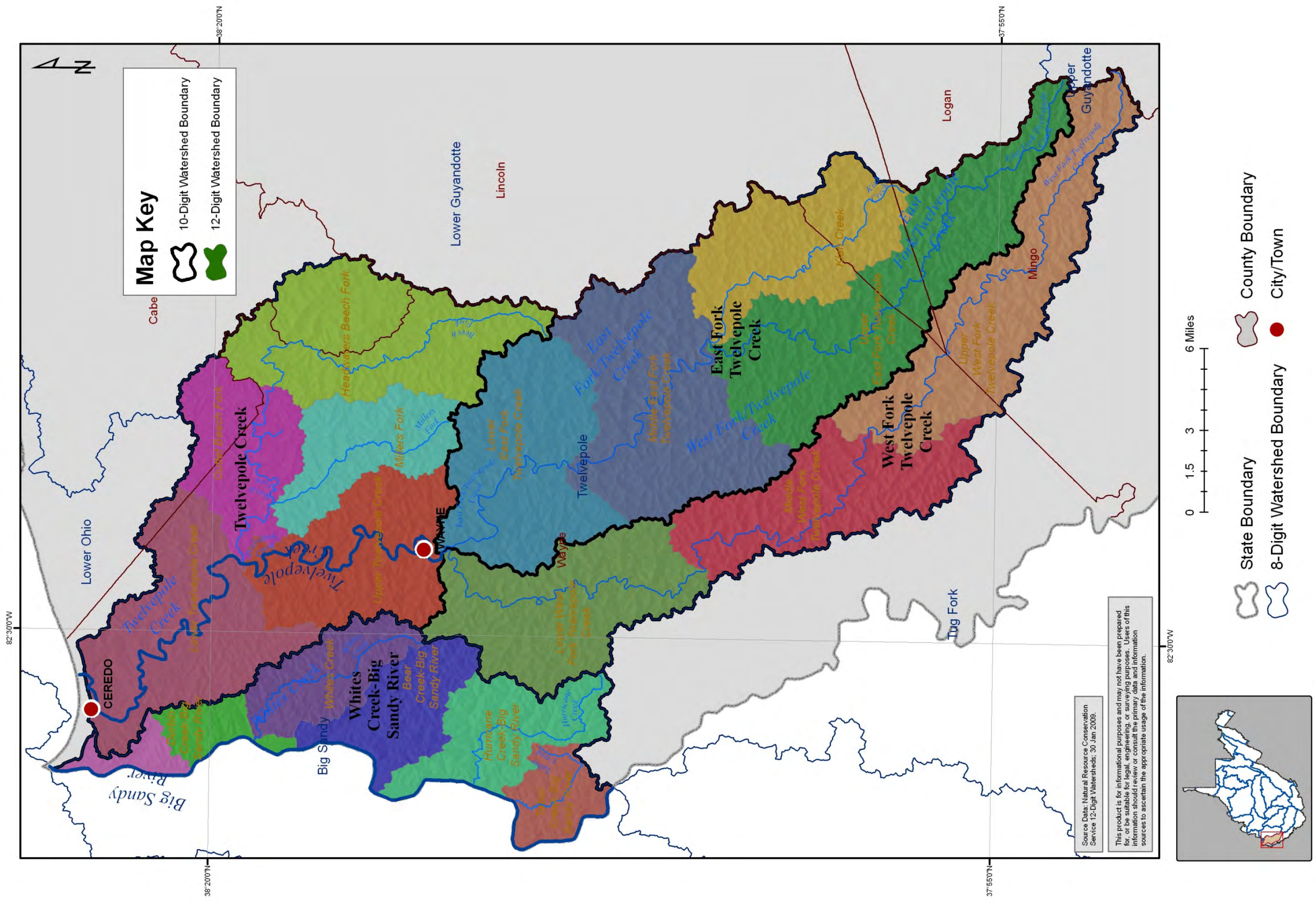
Big Sandy and Twelvepole HUC-8 Watersheds

Mining Related NPDES Outlets



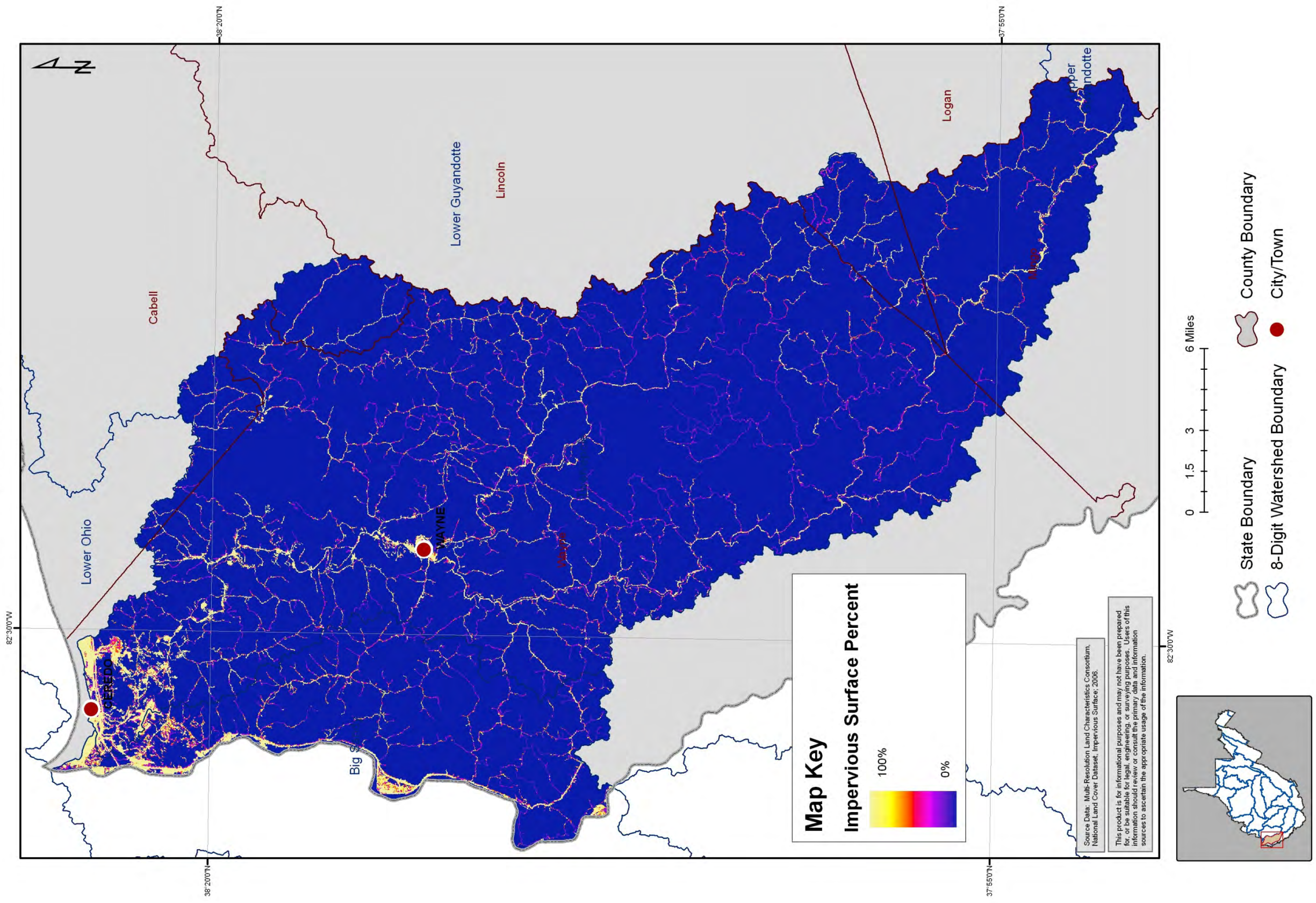
Big Sandy and Twelvepole HUC-8 Watersheds

HUC 10 and HUC 12 Watersheds



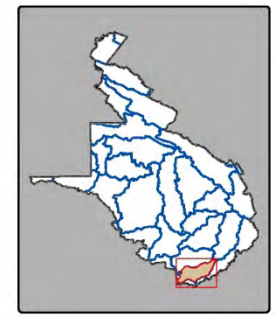
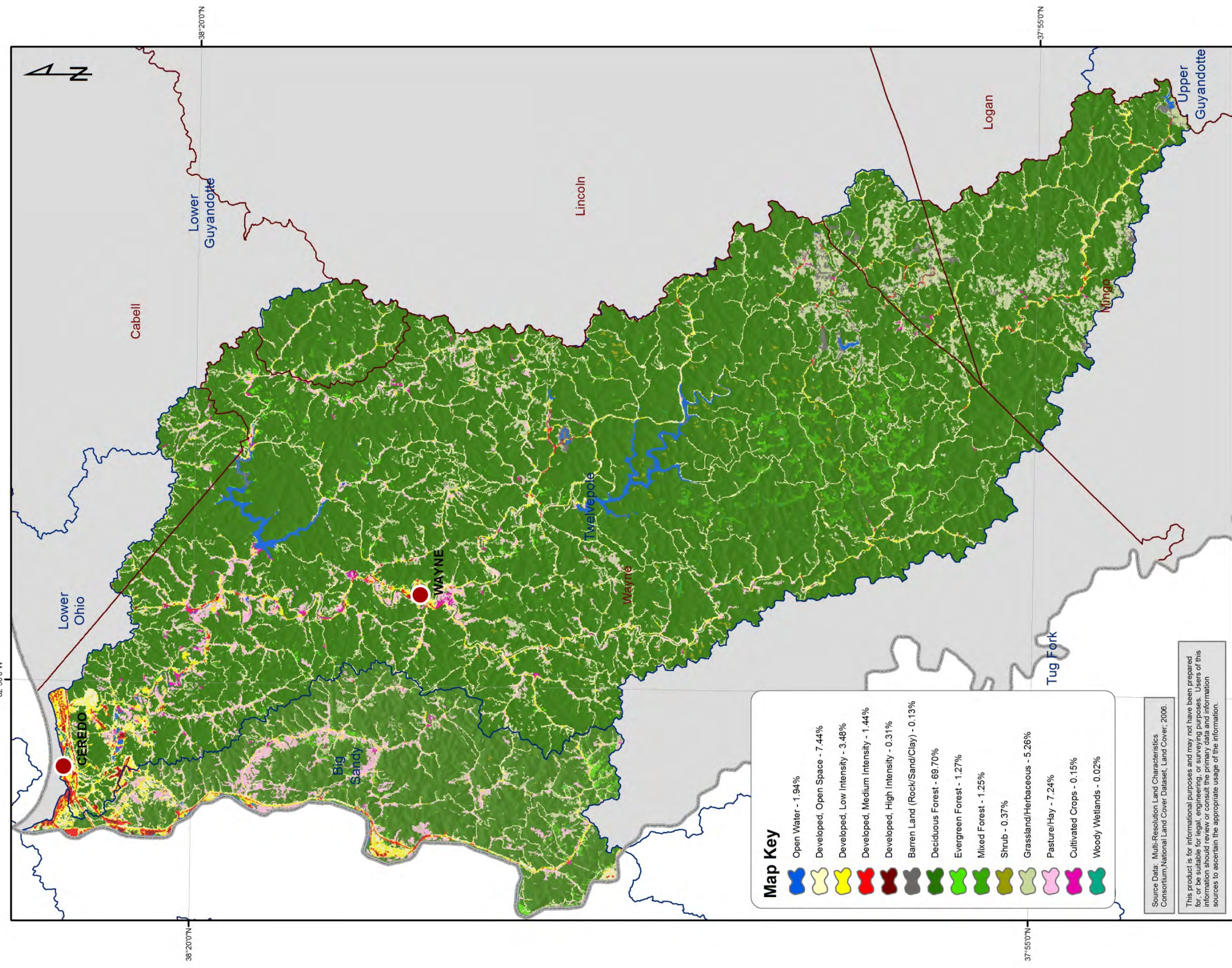
Big Sandy and Twelvepole HUC-8 Watersheds

2006 Impervious Surfaces



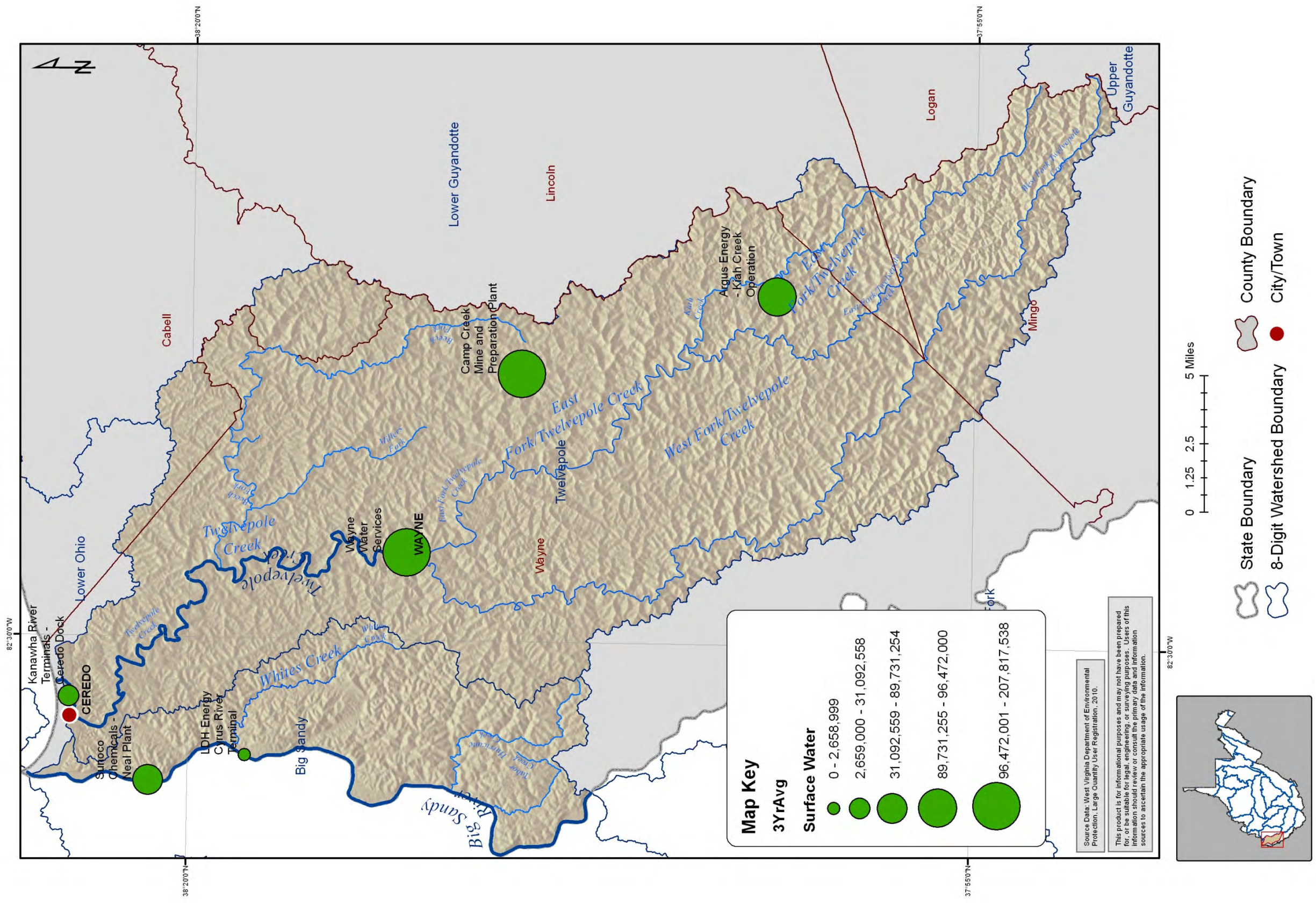
Big Sandy and Twelvepole HUC-8 Watersheds

2006 Land Cover



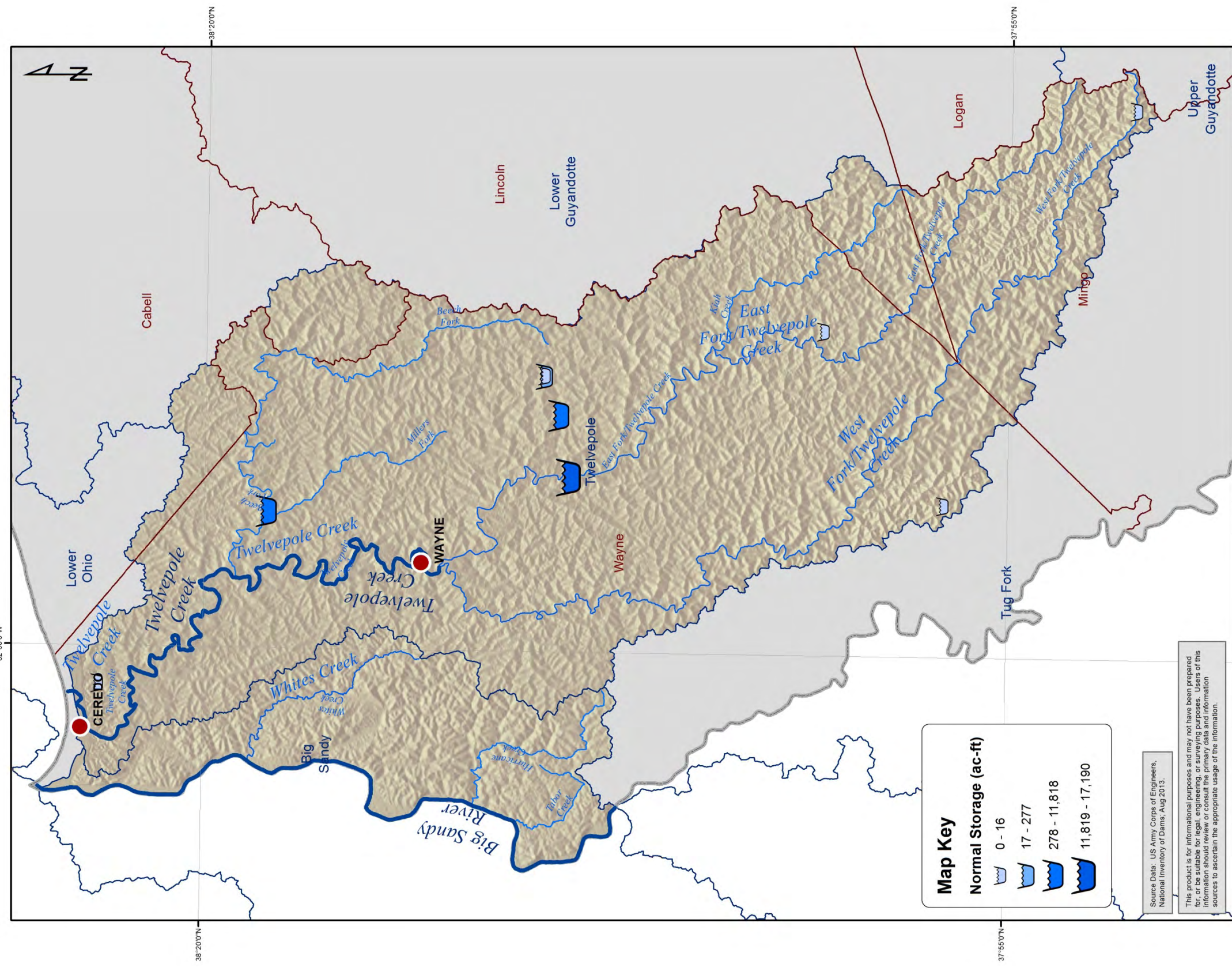
Big Sandy and Twelvepole HUC-8 Watersheds

Large Quantity Users



Big Sandy and Twelvepole HUC-8 Watersheds

Permitted Dams



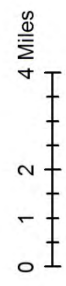
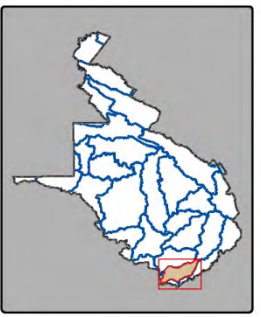
Map Key

Normal Storage (ac-ft)

	0 - 16
	17 - 277
	278 - 11,818
	11,819 - 17,190

Source Data: US Army Corps of Engineers, National Inventory of Dams, Aug 2013.

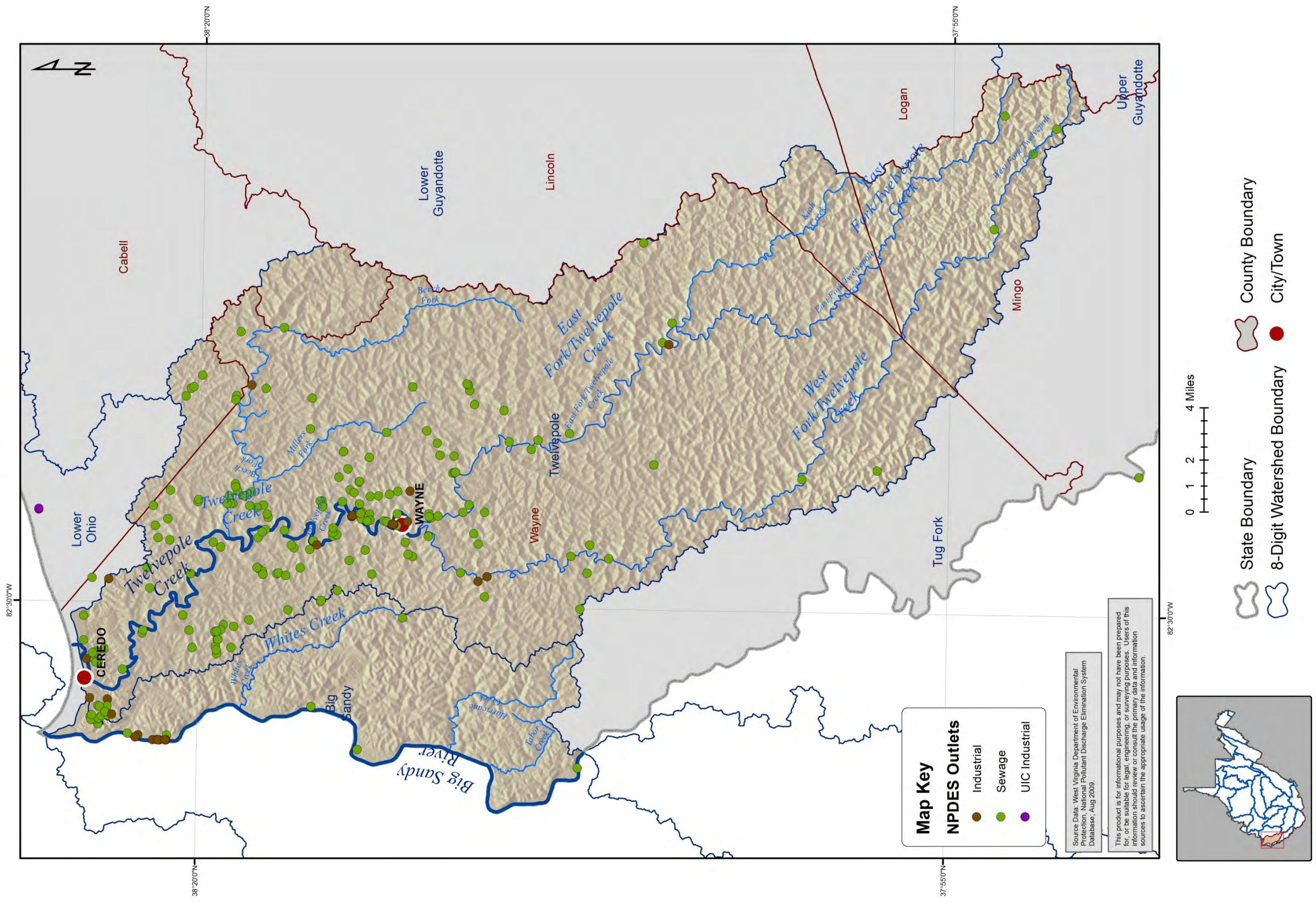
This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the appropriate usage of the information.



- State Boundary
- 8-Digit Watershed Boundary
- County Boundary
- City/Town

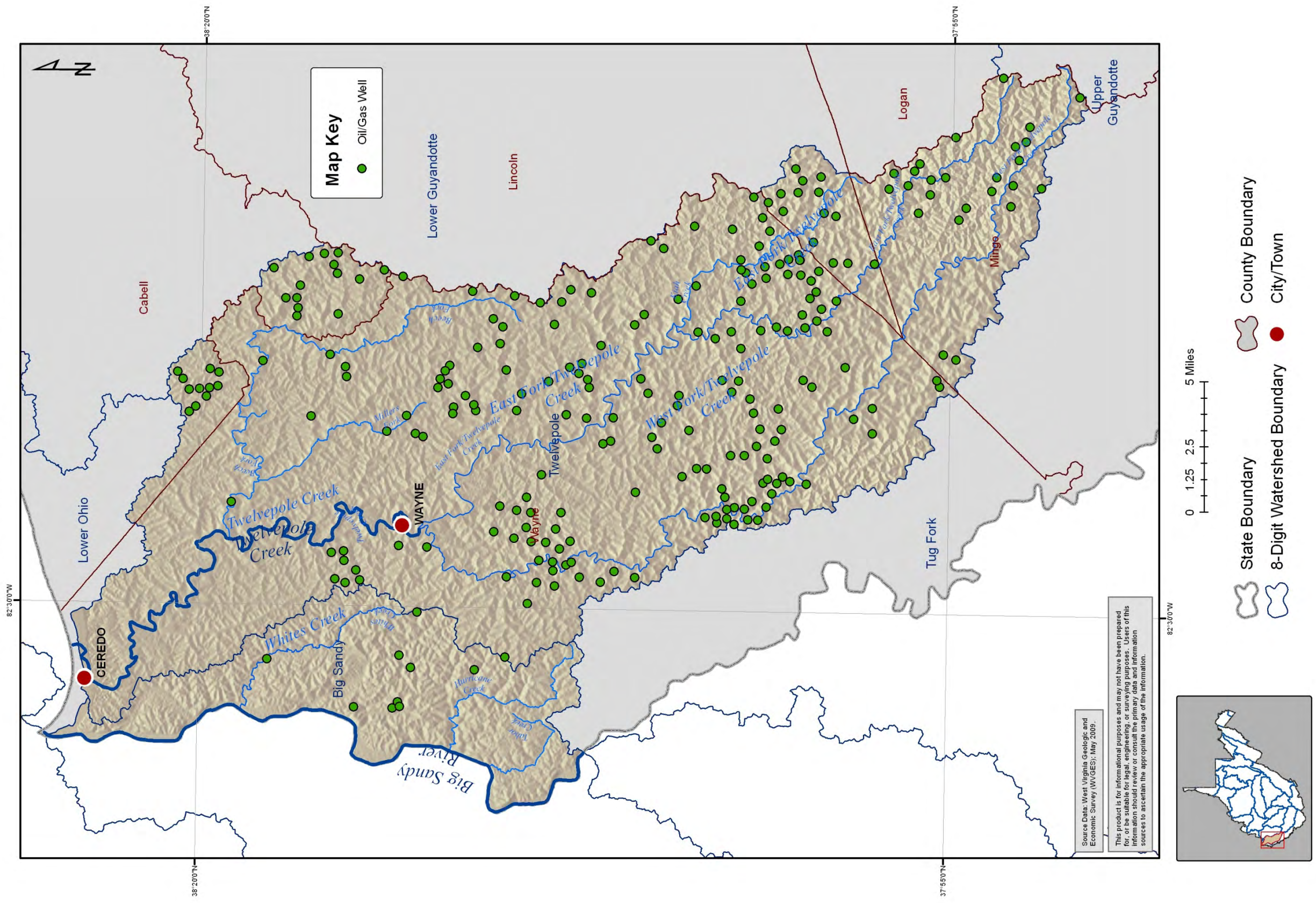
Big Sandy and Twelvepole HUC-8 Watersheds

Non-Mining NPDES Outlets



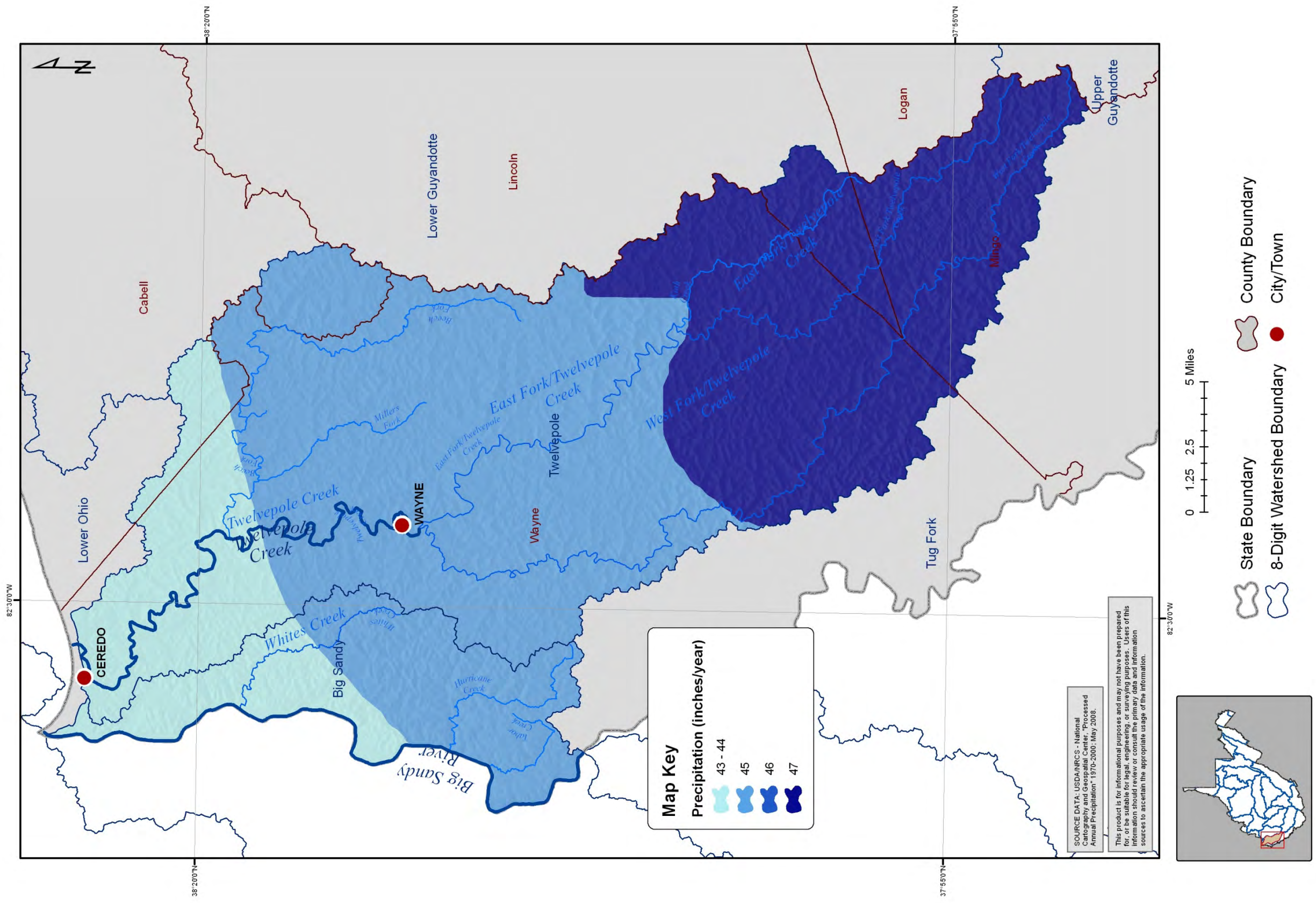
Big Sandy and Twelvepole HUC-8 Watersheds

Well Logs with Gamma Rays and Water Shows



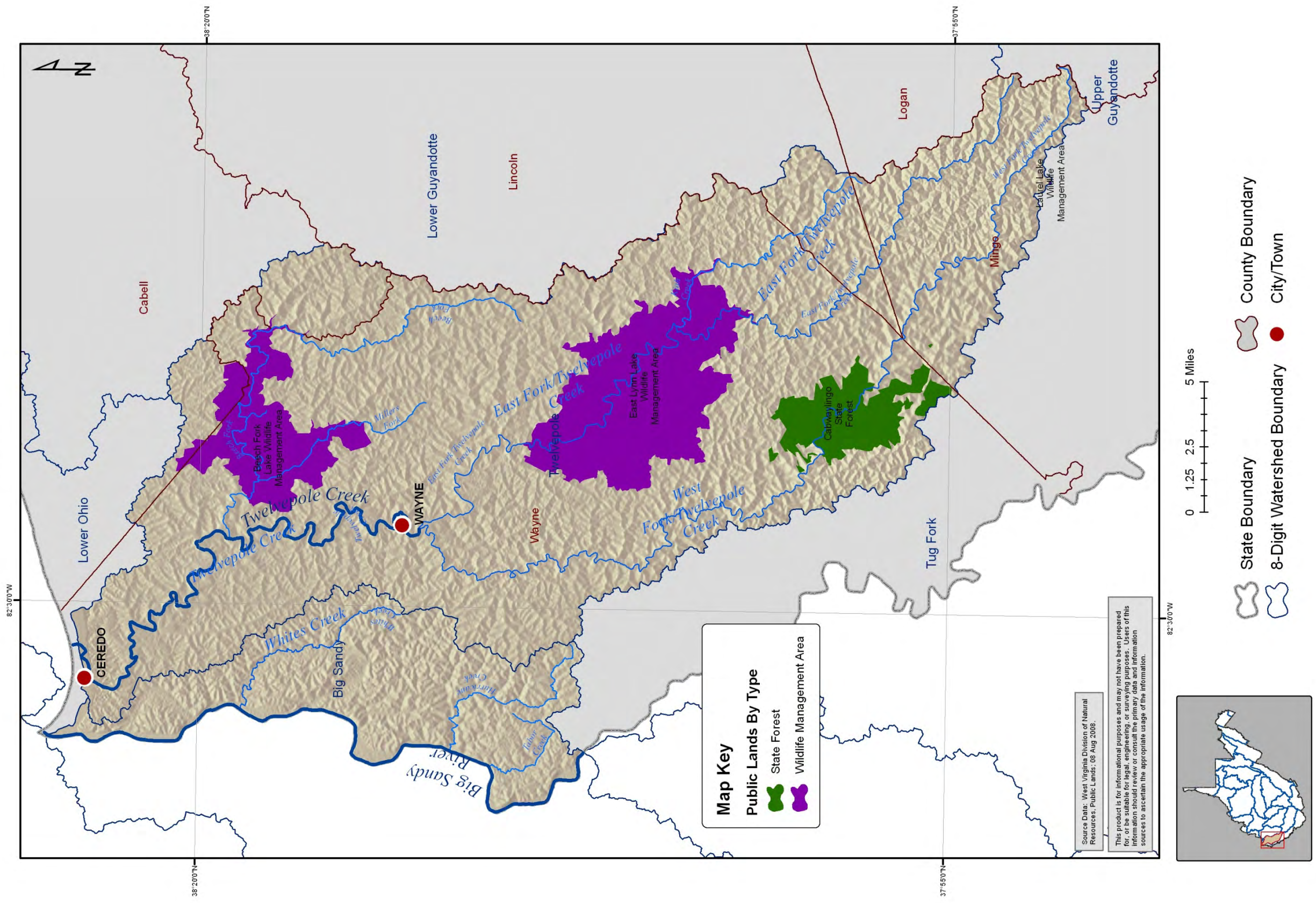
Big Sandy and Twelvepole HUC-8 Watersheds

Average Annual Precipitation (1971-2000)



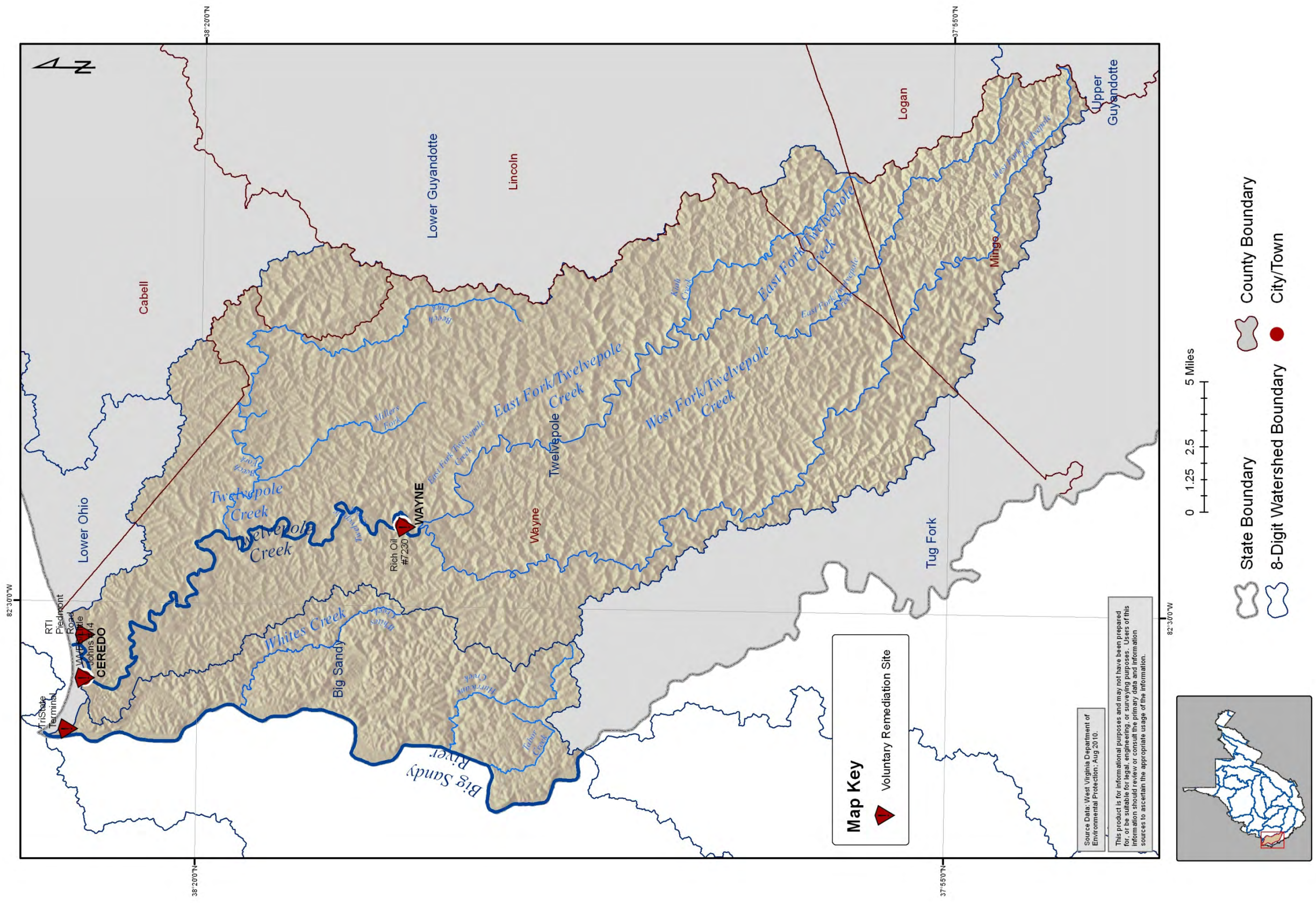
Big Sandy and Twelvepole HUC-8 Watersheds

Public Lands



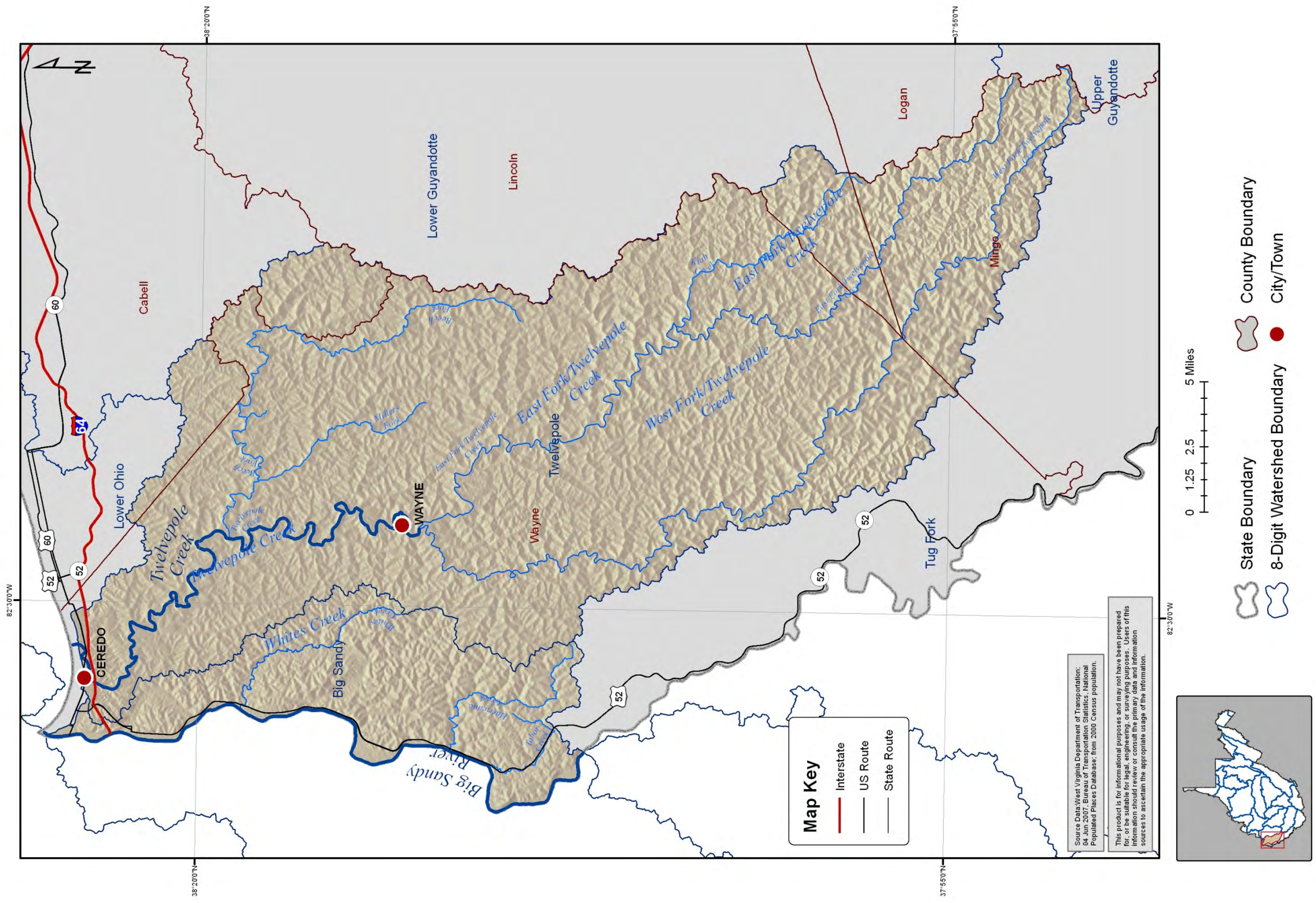
Big Sandy and Twelvepole HUC-8 Watersheds

Remediation Sites



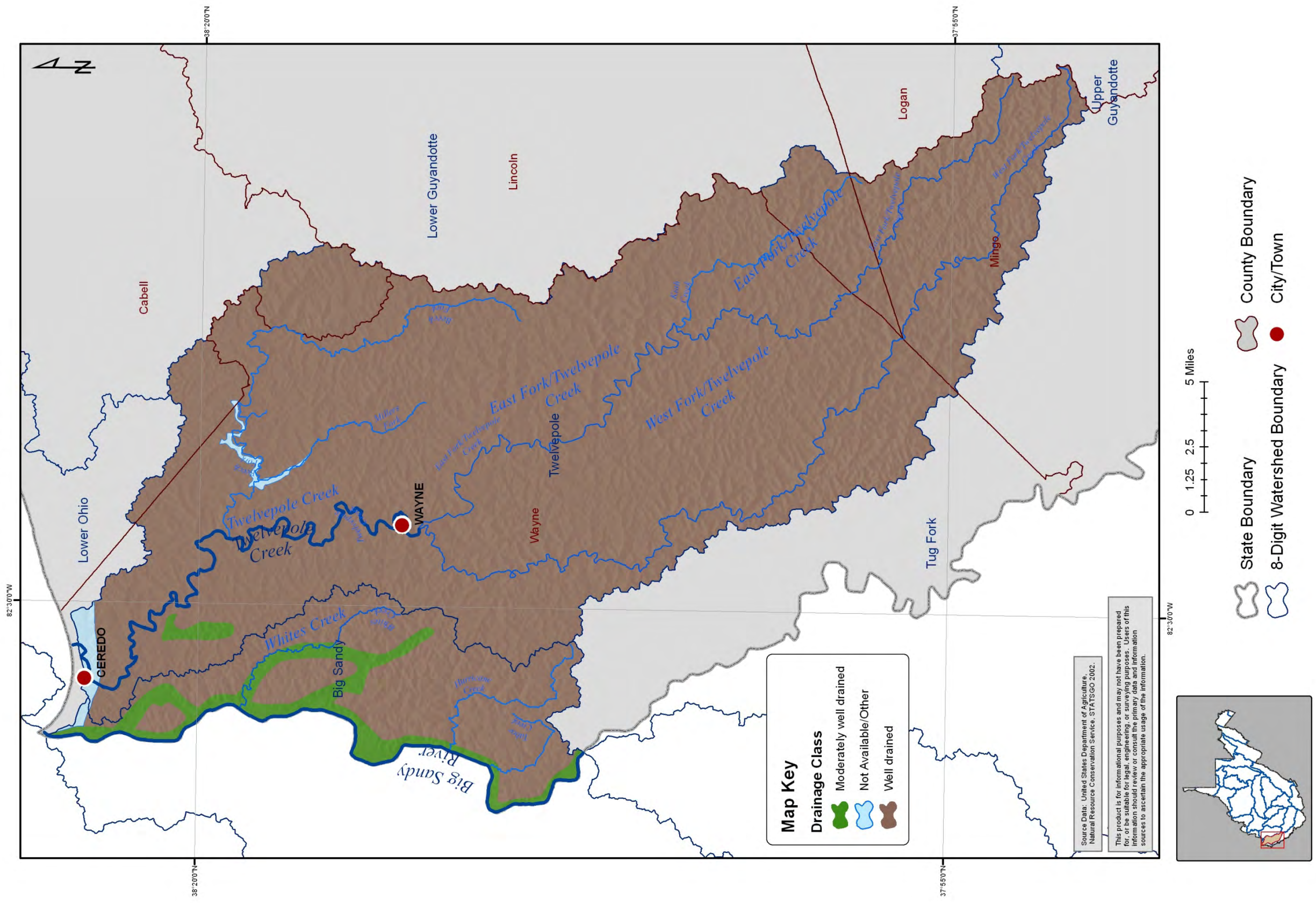
Big Sandy and Twelvepole HUC-8 Watersheds

Major Roads and Cities



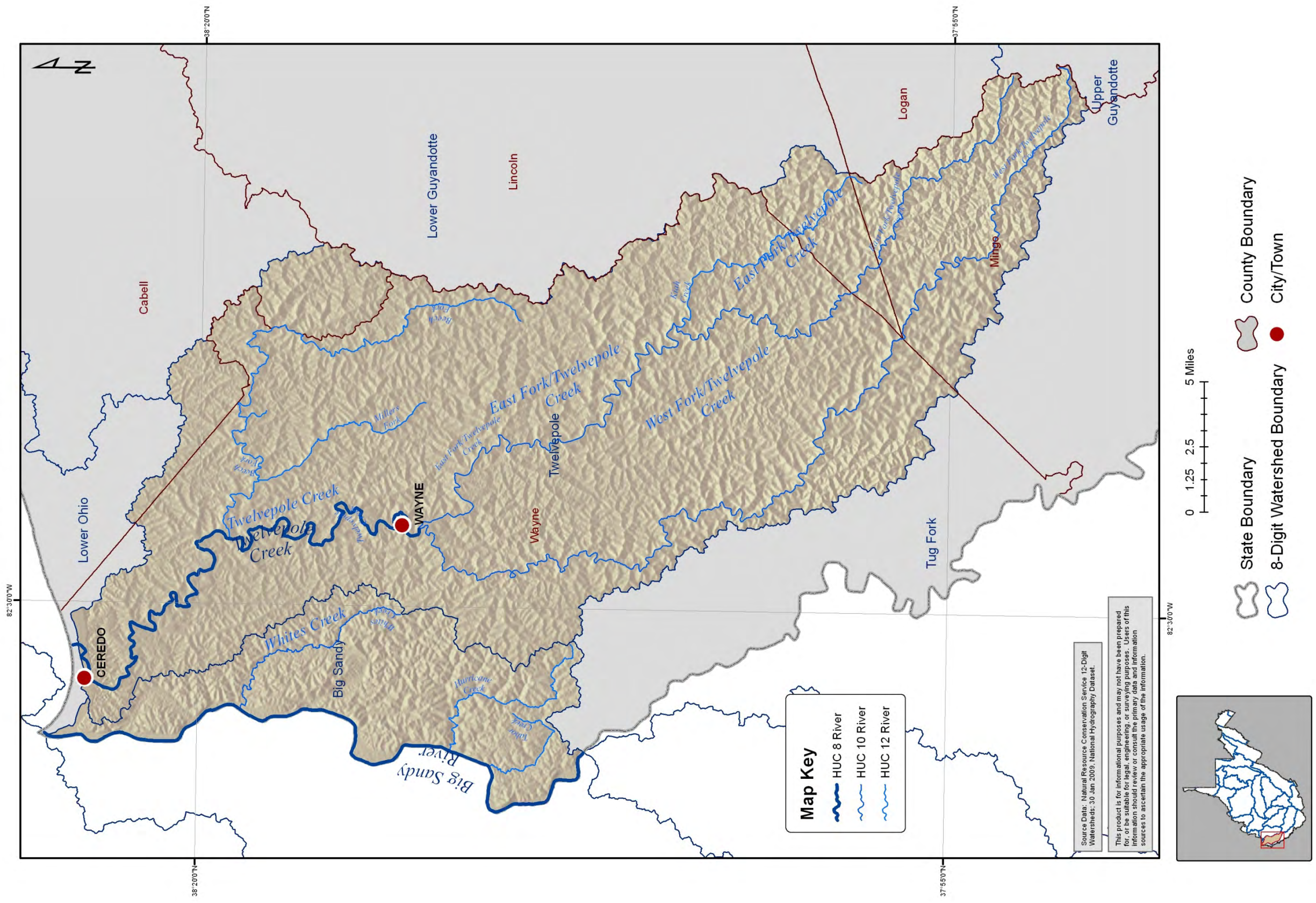
Big Sandy and Twelvepole HUC-8 Watersheds

Soil Drainage Classes



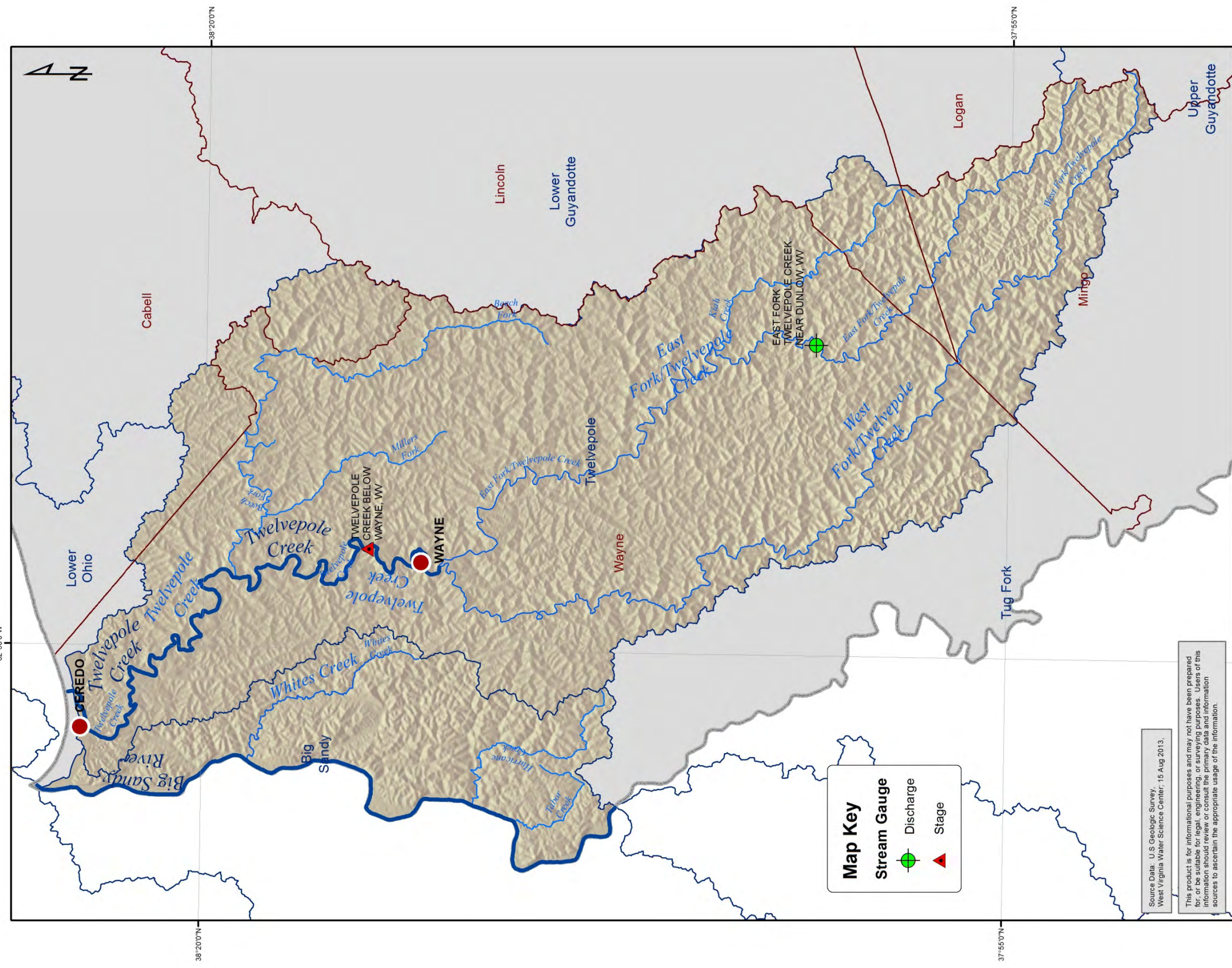
Big Sandy and Twelvepole HUC-8 Watersheds

Stream Connections



Big Sandy and Twelvepole HUC-8 Watersheds

Stream Gauges



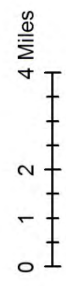
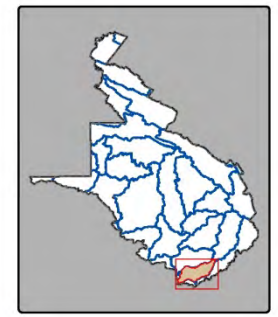
Map Key

Stream Gauge

- Discharge (Green circle with crosshair)
- Stage (Red triangle)

Source Data: U.S. Geologic Survey, West Virginia Water Science Center, 15 Aug 2013.

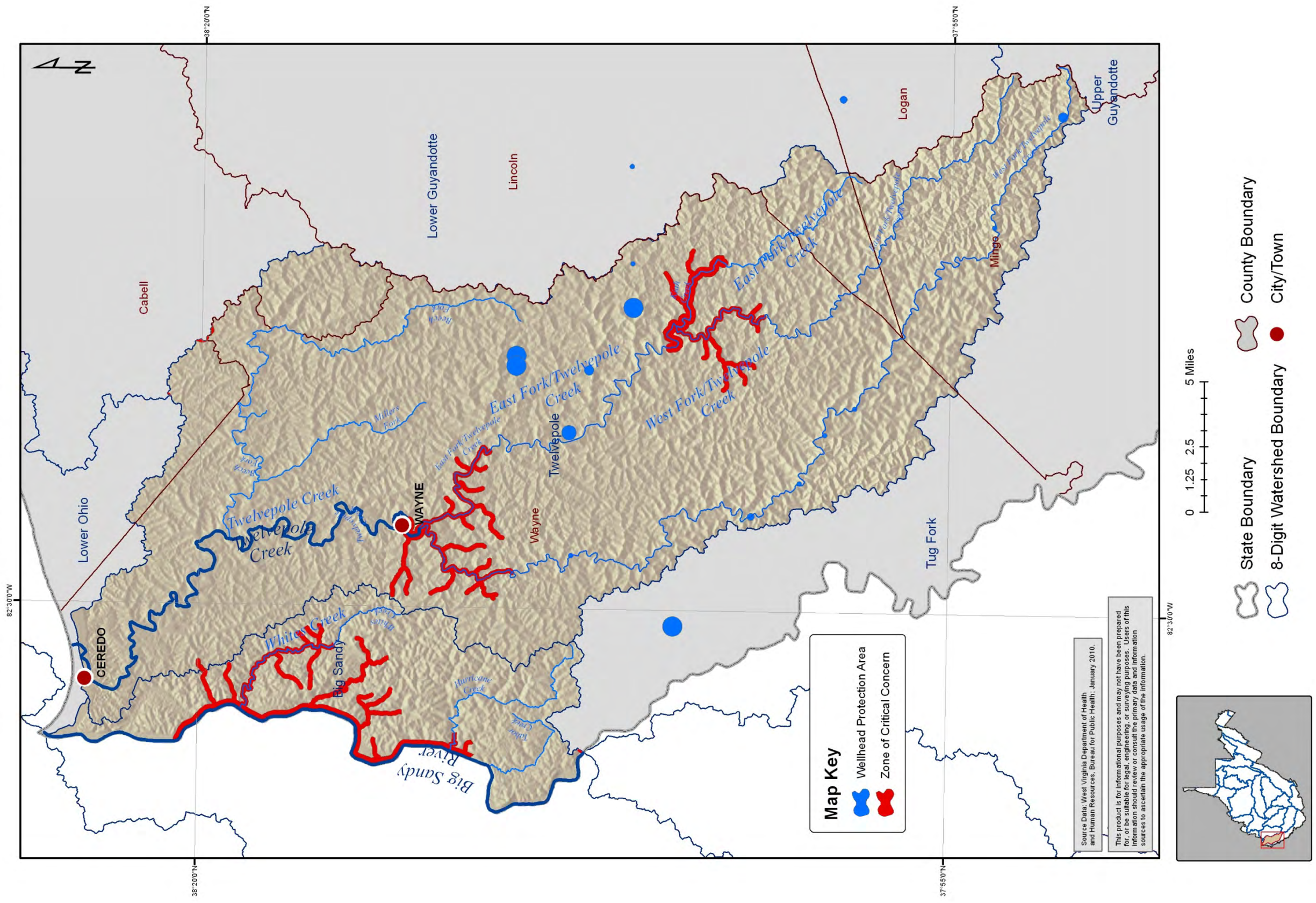
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- State Boundary (Grey outline)
- 8-Digit Watershed Boundary (Blue outline)
- County Boundary (Red outline)
- City/Town (Red dot)

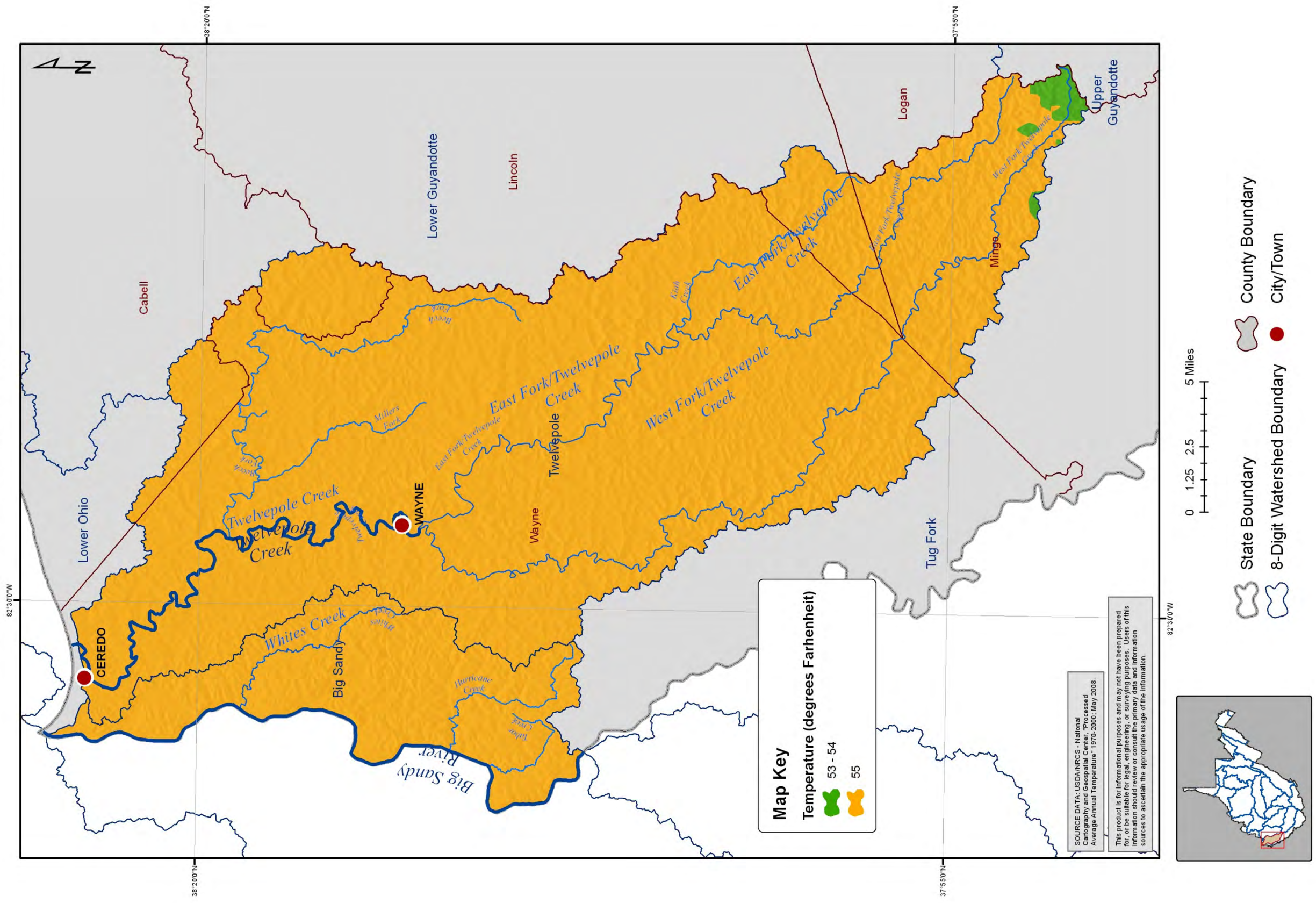
Big Sandy and Twelvepole HUC-8 Watersheds

Source Water Assessment and Wellhead Protection Programs



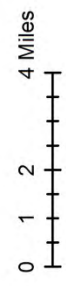
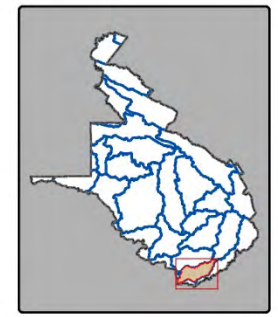
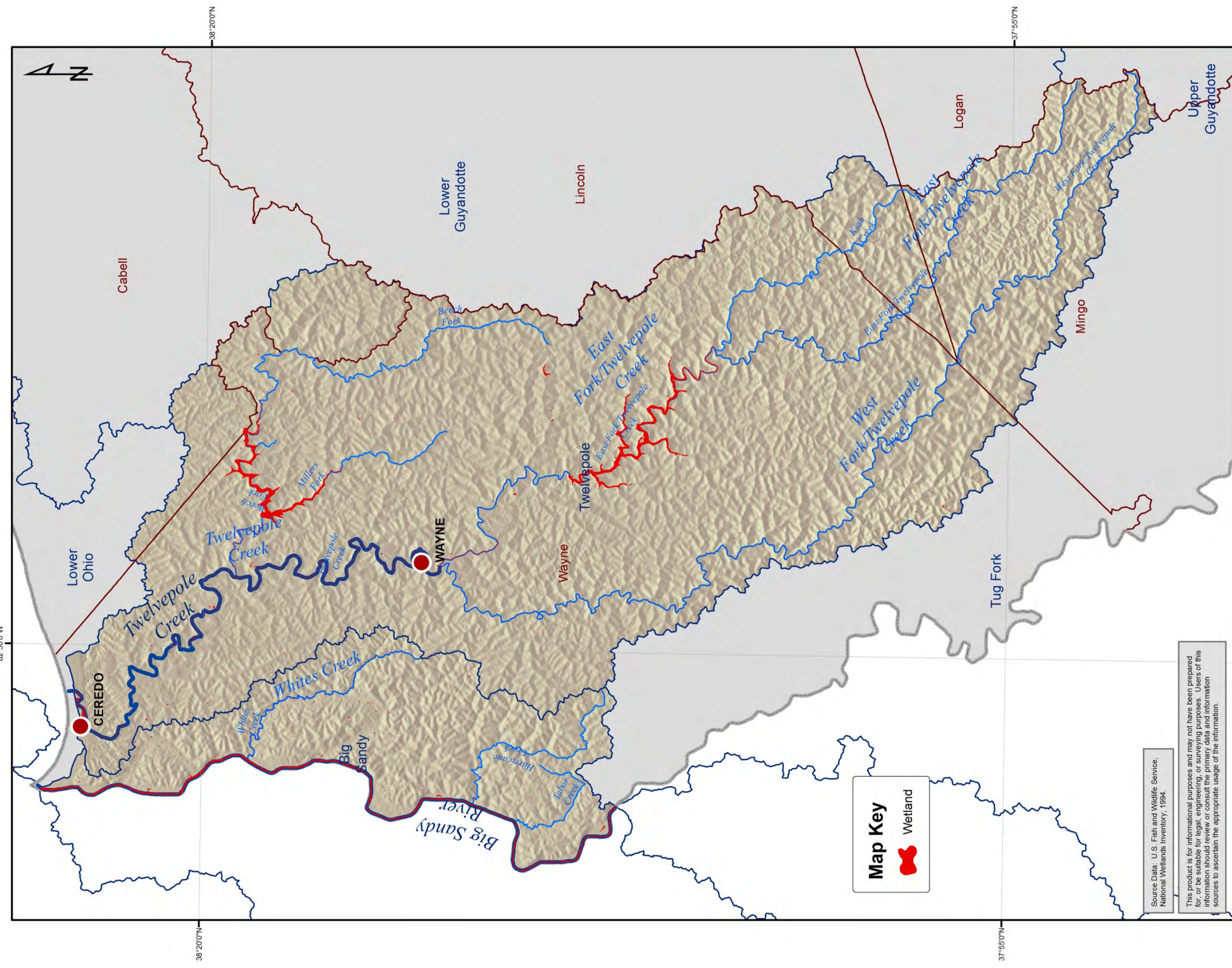
Big Sandy and Twelvepole HUC-8 Watersheds

Average Annual Temperature (1971-2000)



Big Sandy and Twelvepole HUC-8 Watersheds

Wetlands



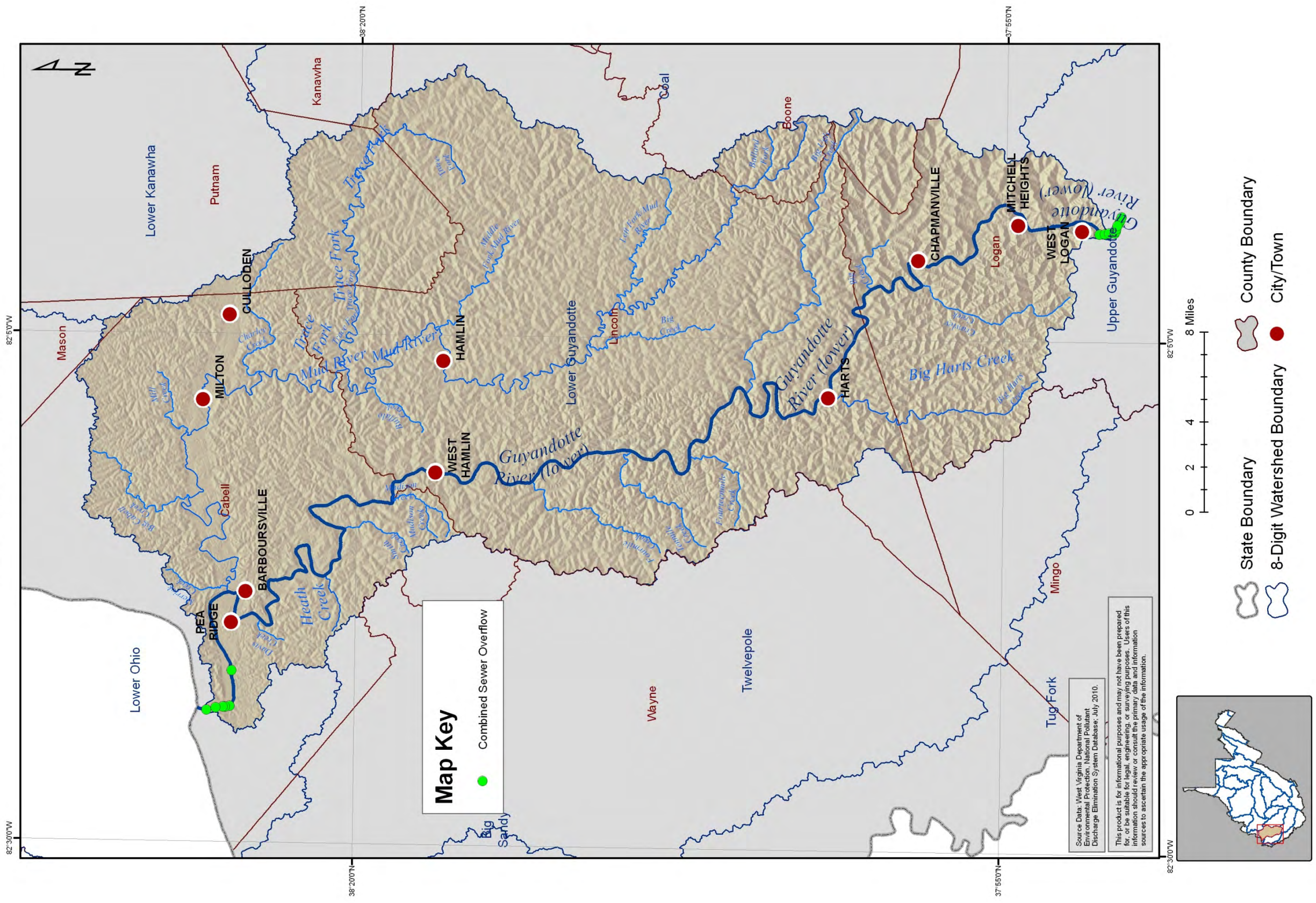
-  State Boundary
-  8-Digit Watershed Boundary
-  County Boundary
-  City/Town

Source Data: U.S. Fish and Wildlife Service, National Wetlands Inventory, 1994.

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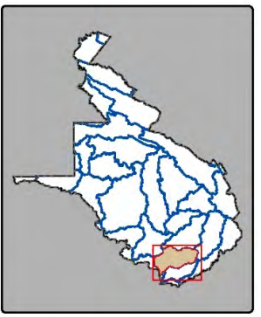
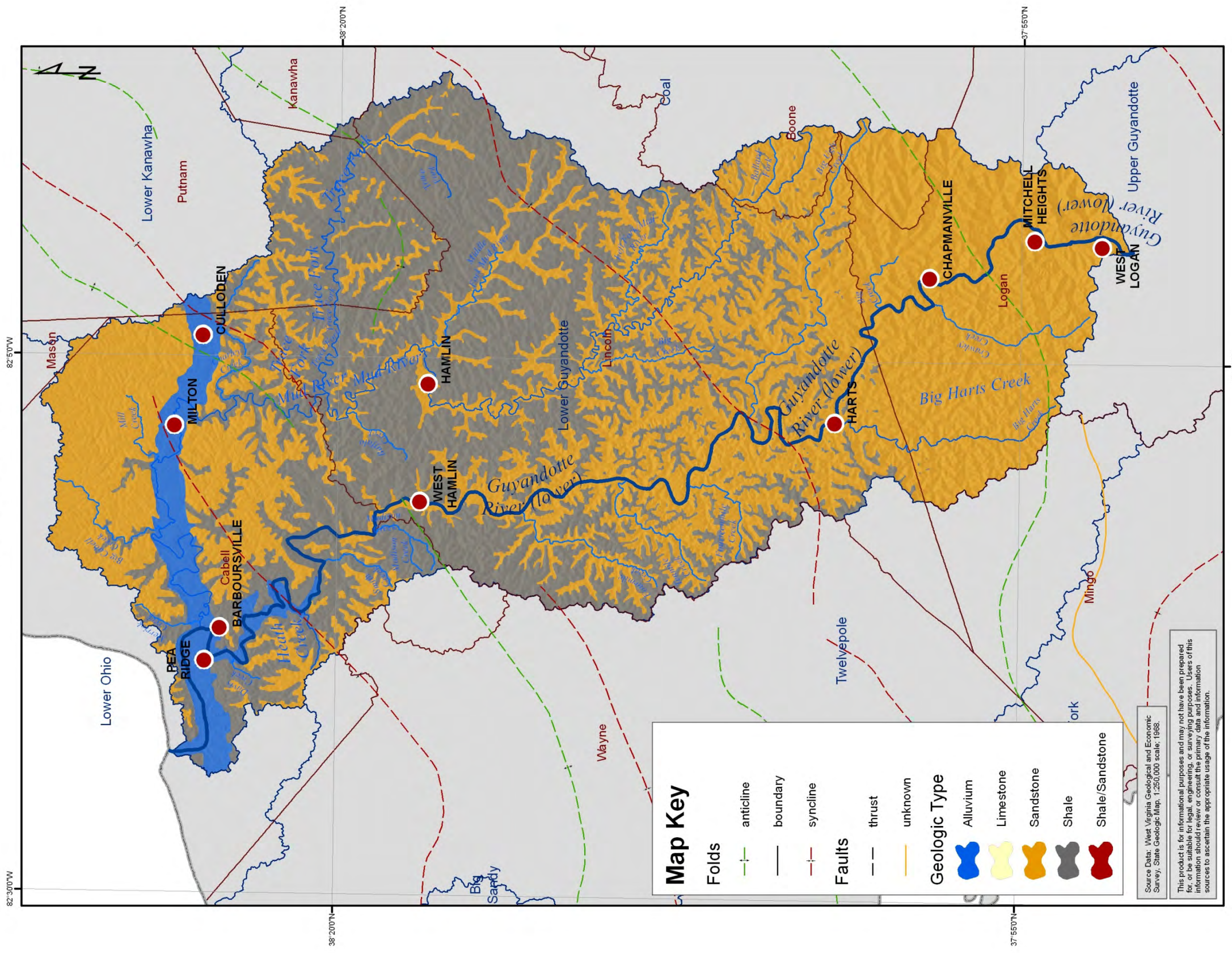
Lower Guyandotte HUC-8 Watershed

Combined Sewer Overflows



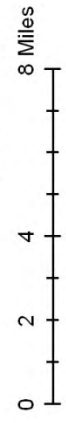
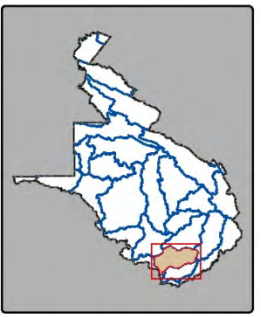
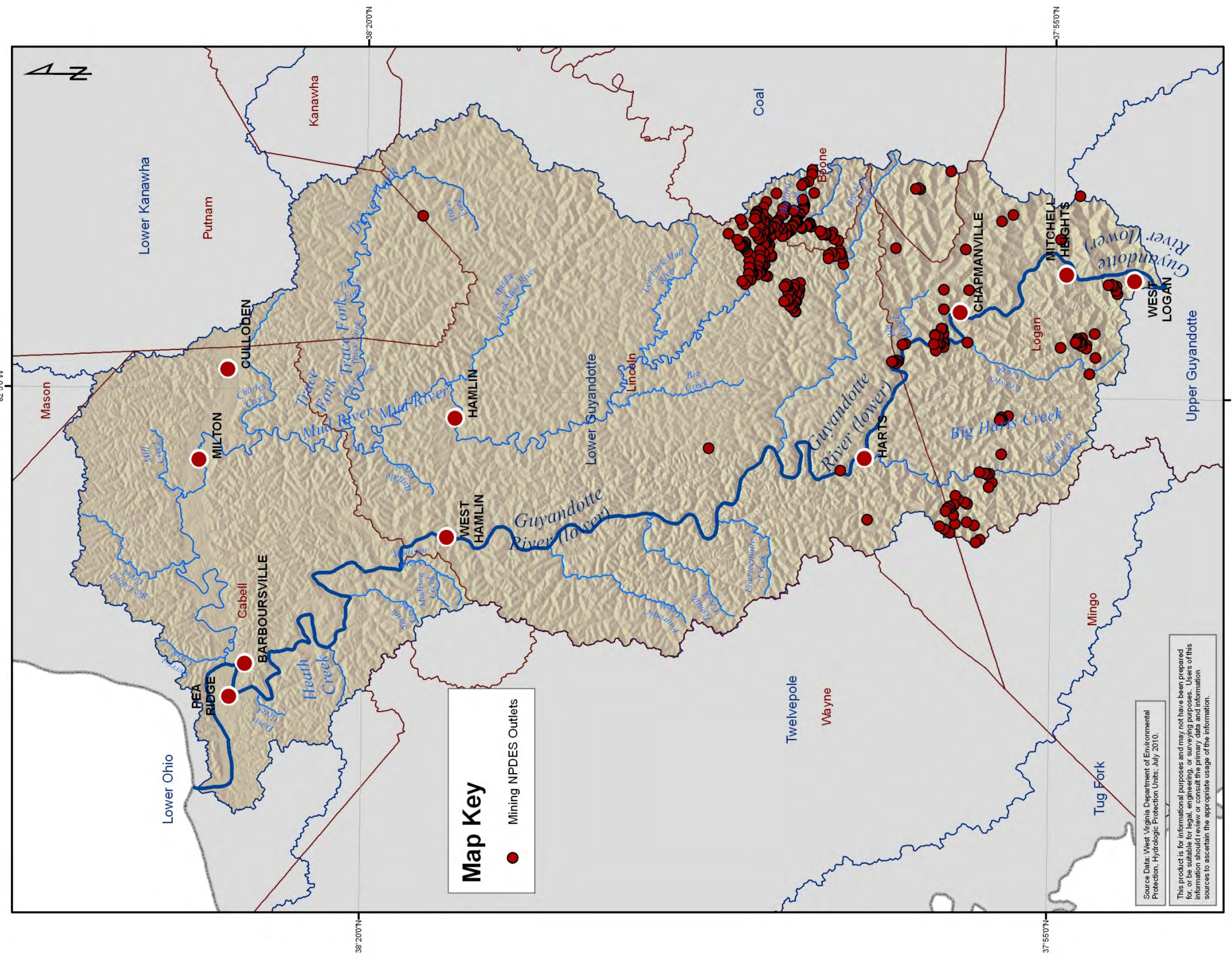
Lower Guyandotte HUC-8 Watershed

Surface Geology



Lower Guyandotte HUC-8 Watershed

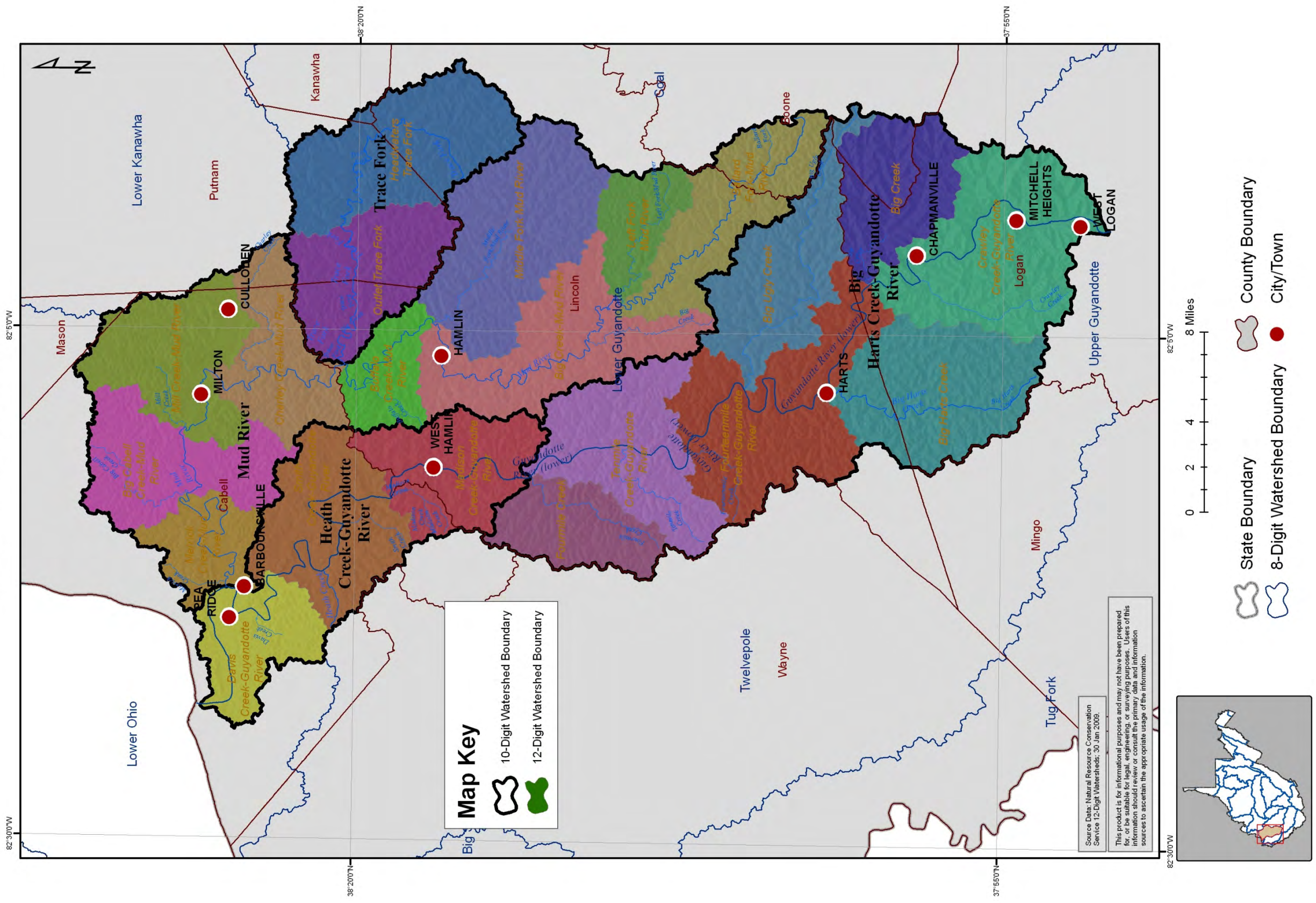
Mining Related NPDES Outlets



- State Boundary
- 8-Digit Watershed Boundary
- County Boundary
- City/Town

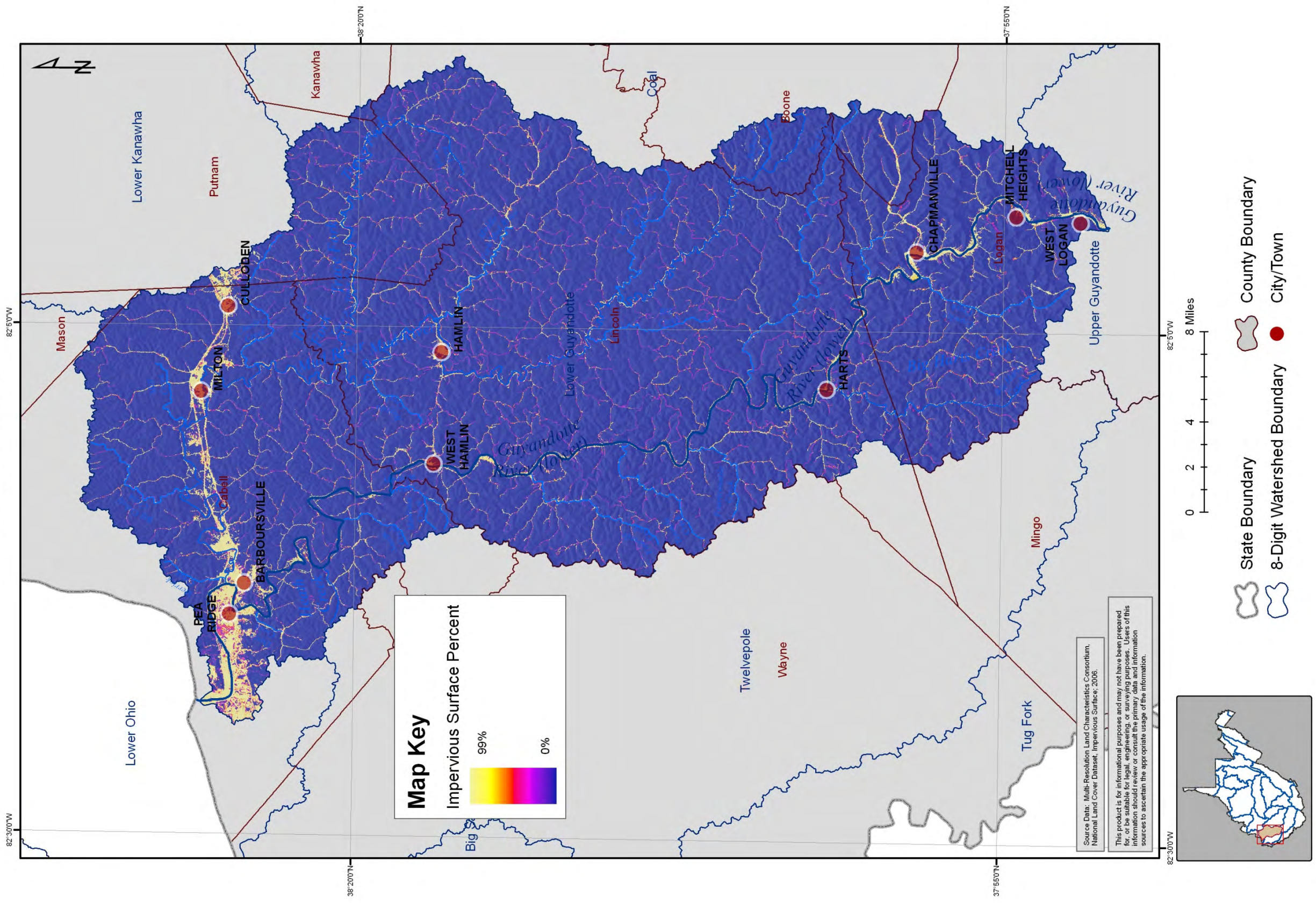
Lower Guyandotte HUC-8 Watershed

HUC 10 and HUC 12 Watersheds



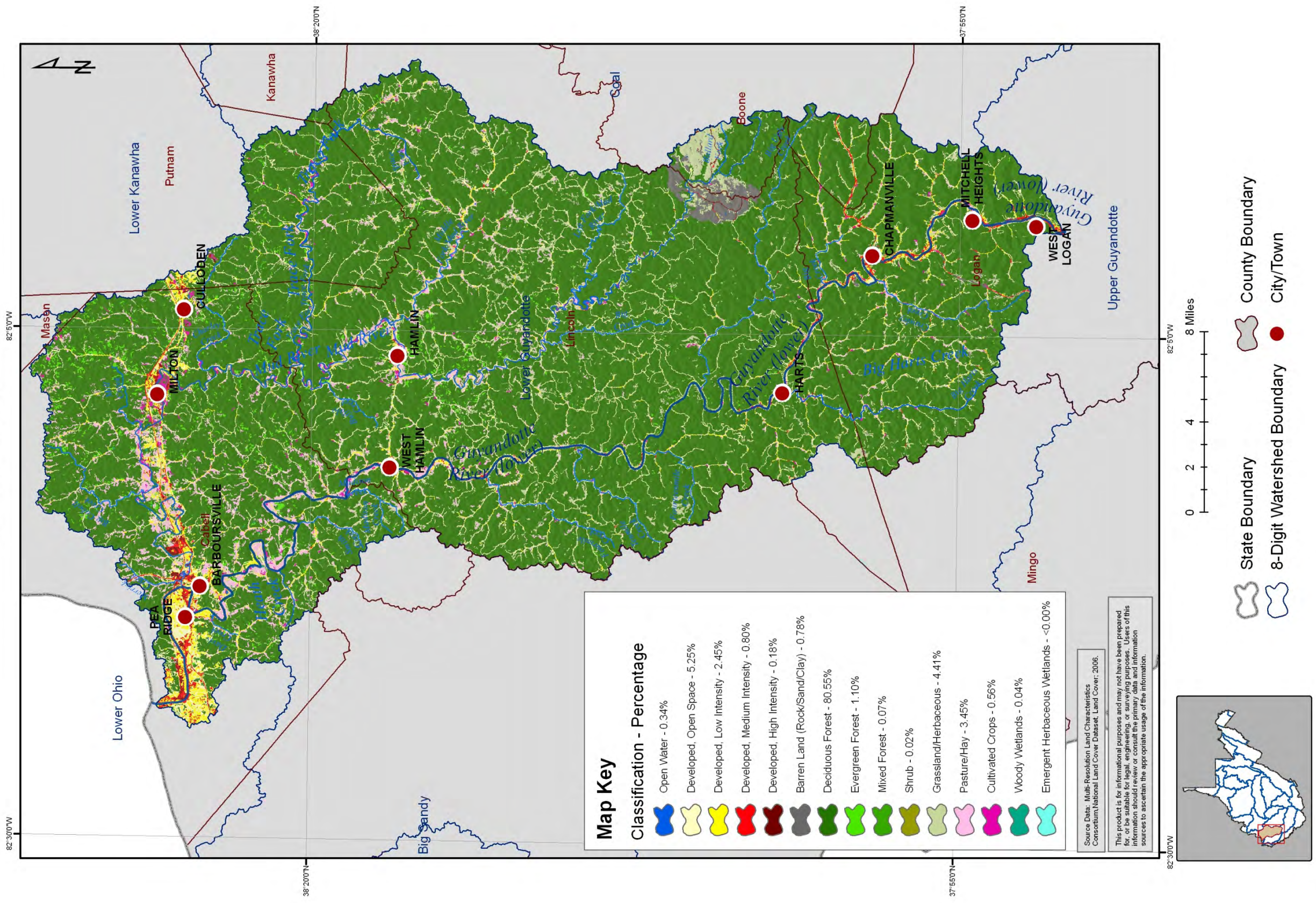
Lower Guyandotte HUC-8 Watershed

2006 Impervious Surfaces



Lower Guyandotte HUC-8 Watershed

2006 Land Cover



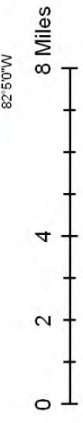
Map Key

Classification - Percentage

	Open Water - 0.34%
	Developed, Open Space - 5.25%
	Developed, Low Intensity - 2.45%
	Developed, Medium Intensity - 0.80%
	Developed, High Intensity - 0.18%
	Barren Land (Rock/Sand/Clay) - 0.78%
	Deciduous Forest - 80.55%
	Evergreen Forest - 1.10%
	Mixed Forest - 0.07%
	Shrub - 0.02%
	Grassland/Herbaceous - 4.41%
	Pasture/Hay - 3.45%
	Cultivated Crops - 0.56%
	Woody Wetlands - 0.04%
	Emergent Herbaceous Wetlands - <0.00%

Source Data: Multi-Resolution Land Characteristics Consortium National Land Cover Dataset, Land Cover, 2006.

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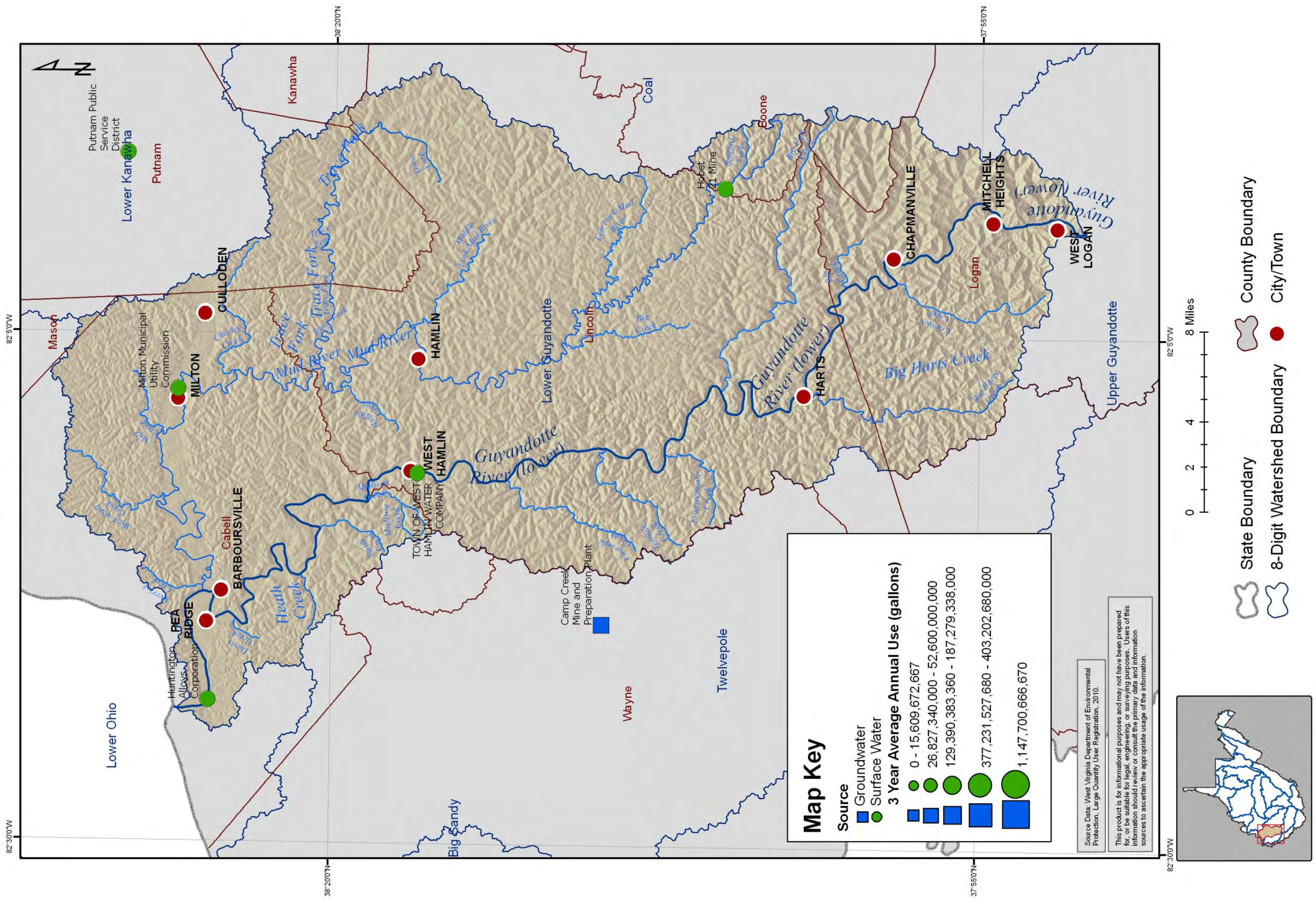


- State Boundary
- 8-Digit Watershed Boundary
- County Boundary
- City/Town



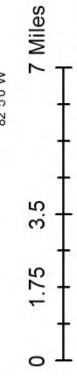
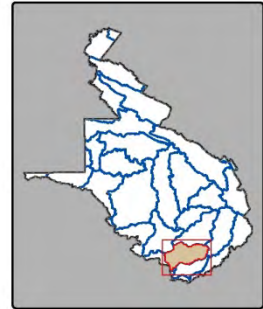
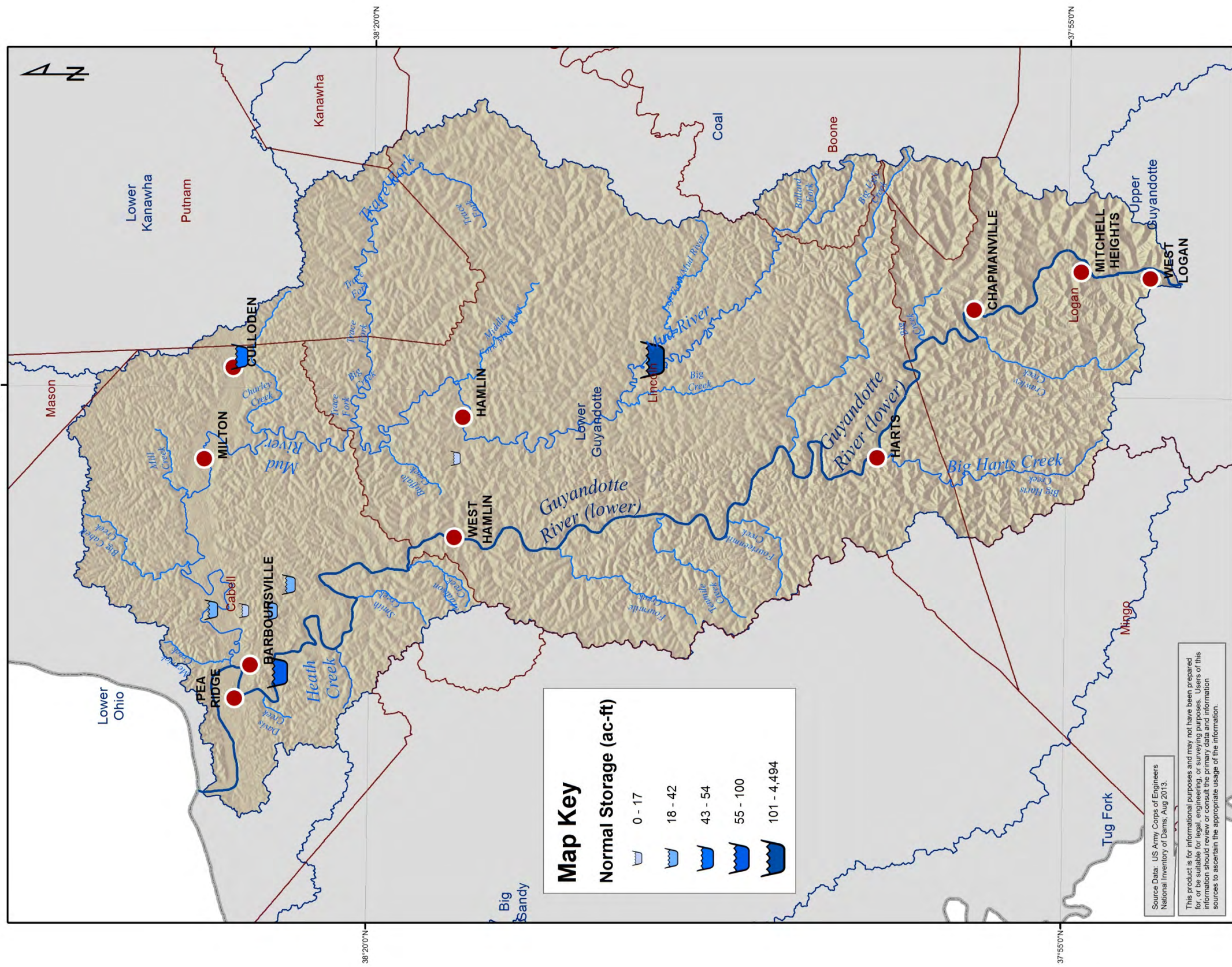
Lower Guyandotte HUC-8 Watershed

Large Quantity Users



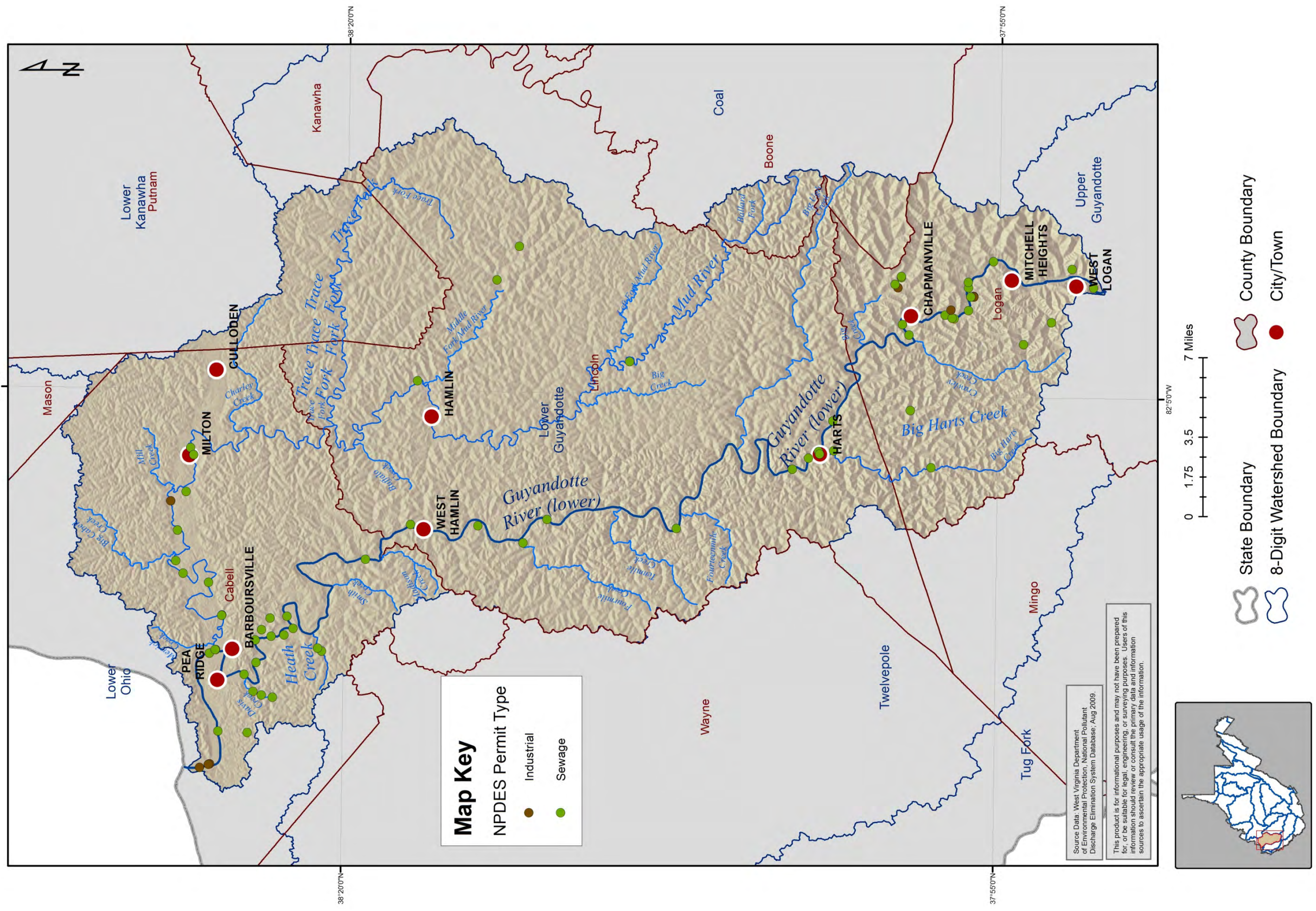
Lower Guyandotte HUC-8 Watershed

Permitted Dams



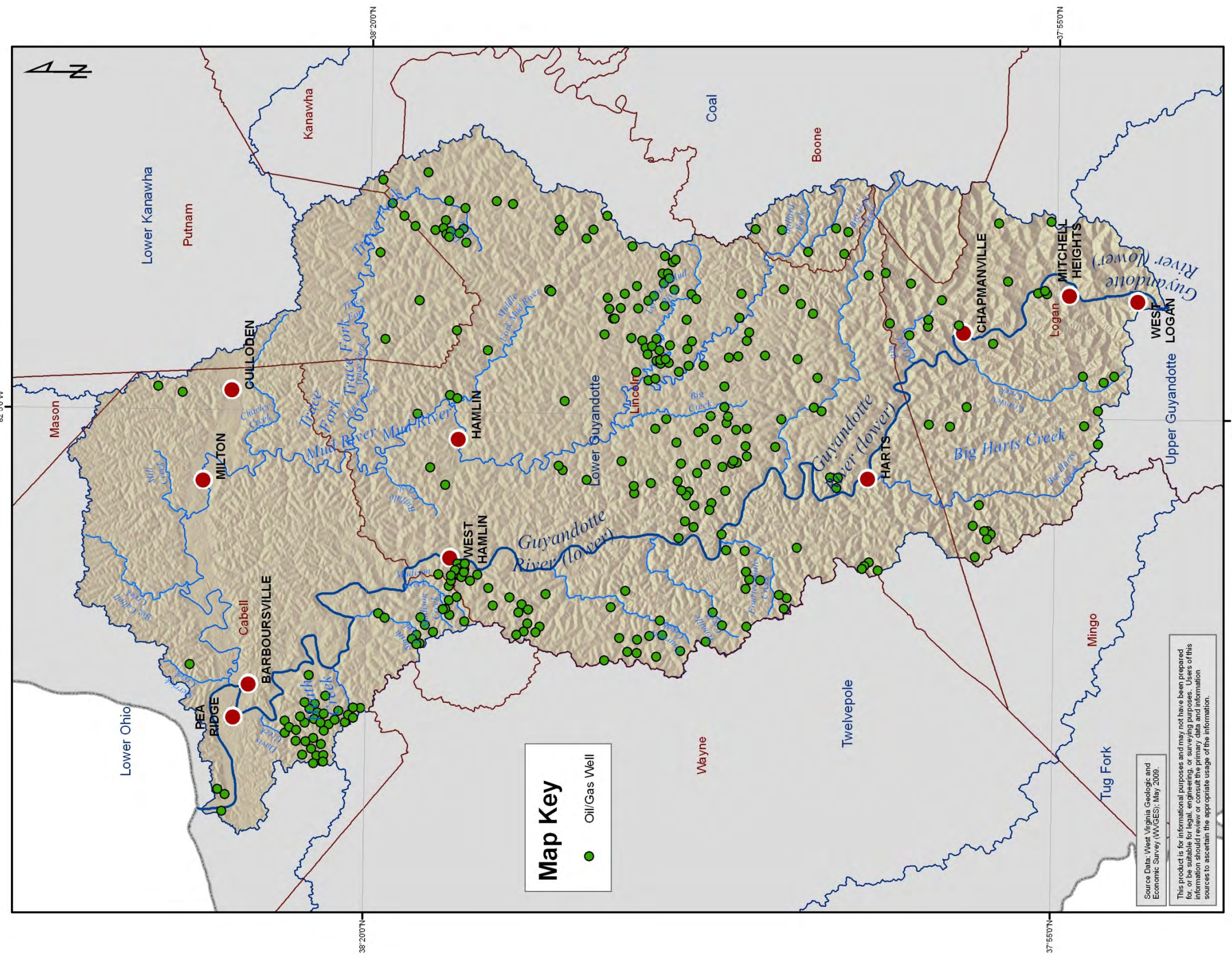
Lower Guyandotte HUC-8 Watershed

Non-Mining NPDES Outlets

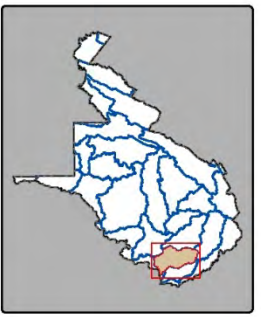


Lower Guyandotte HUC-8 Watershed

Well Logs with Gamma Rays and Water Shows



Map Key
 ● Oil/Gas Well



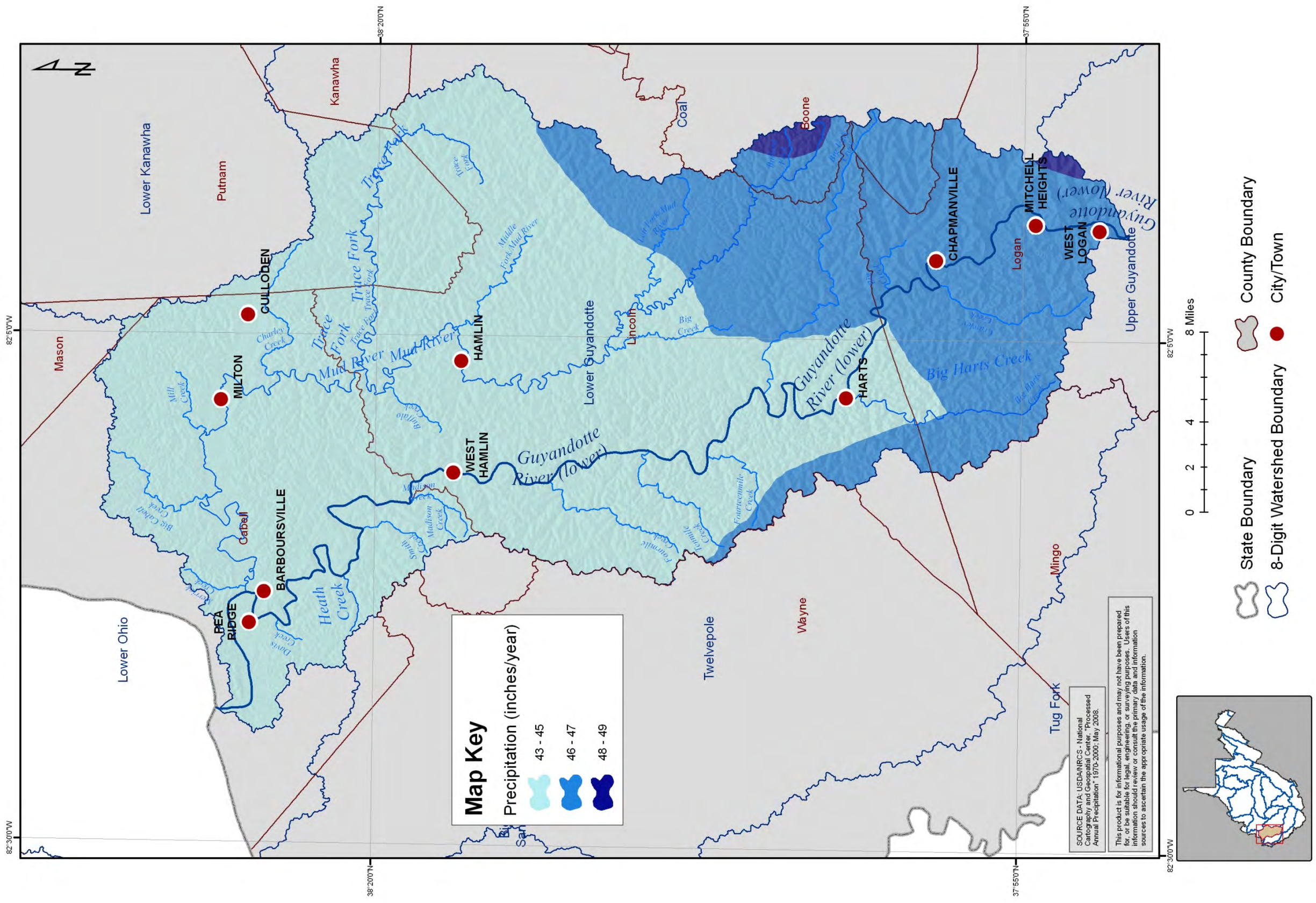
0 2 4 8 Miles

State Boundary
 8-Digit Watershed Boundary
 County Boundary
 City/Town

Source Data: West Virginia Geologic and Economic Survey (WVGES); May, 2009.
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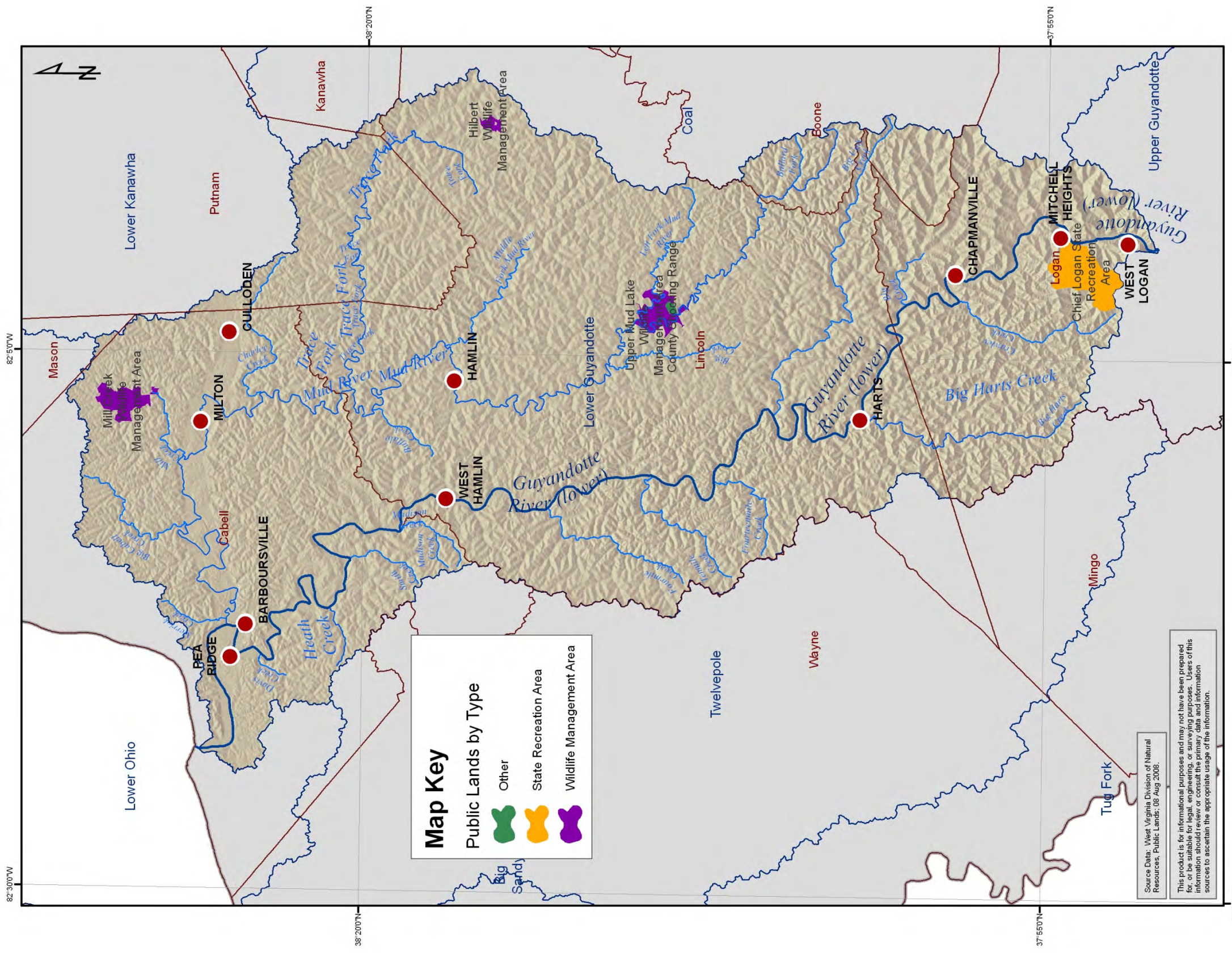
Lower Guyandotte HUC-8 Watershed

Average Annual Precipitation (1971-2000)



Lower Guyandotte HUC-8 Watershed

Public Lands



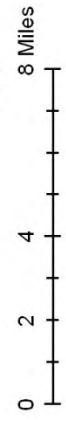
Map Key

Public Lands by Type

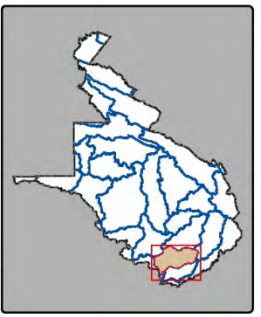
- Other (Green)
- State Recreation Area (Yellow)
- Wildlife Management Area (Purple)

Source Data: West Virginia Division of Natural Resources, Public Lands; 08 Aug 2008.

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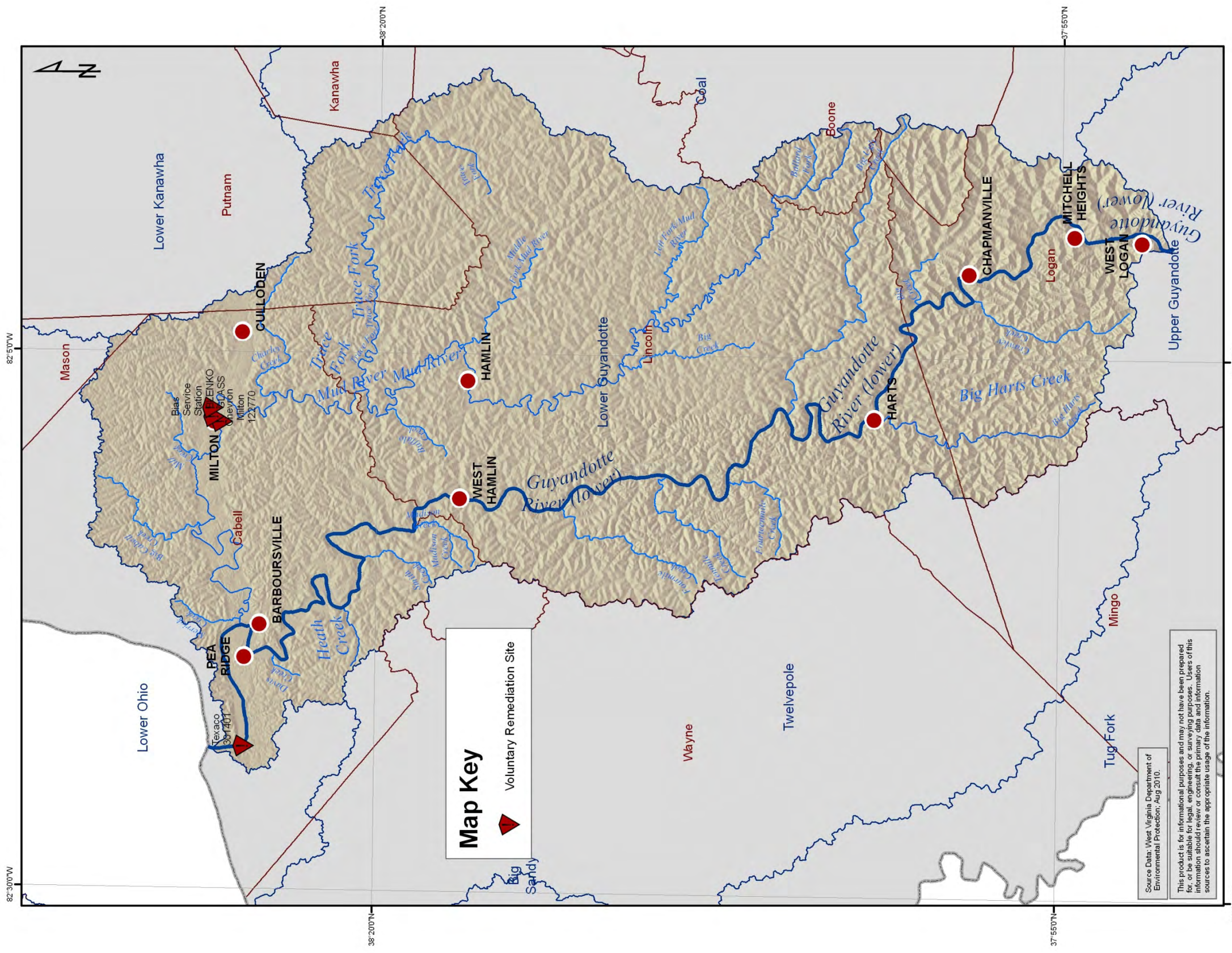


- State Boundary (Dashed line)
- 8-Digit Watershed Boundary (Blue line)
- County Boundary (Red line)
- City/Town (Red dot)



Lower Guyandotte HUC-8 Watershed

Remediation Sites

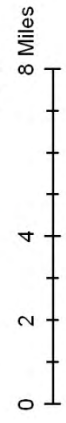
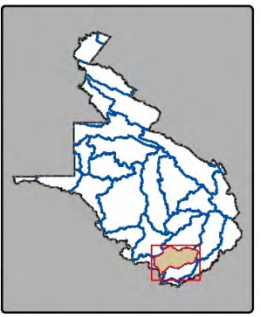


Map Key

- Voluntary Remediation Site

Source Data: West Virginia Department of Environmental Protection; Aug 2010.

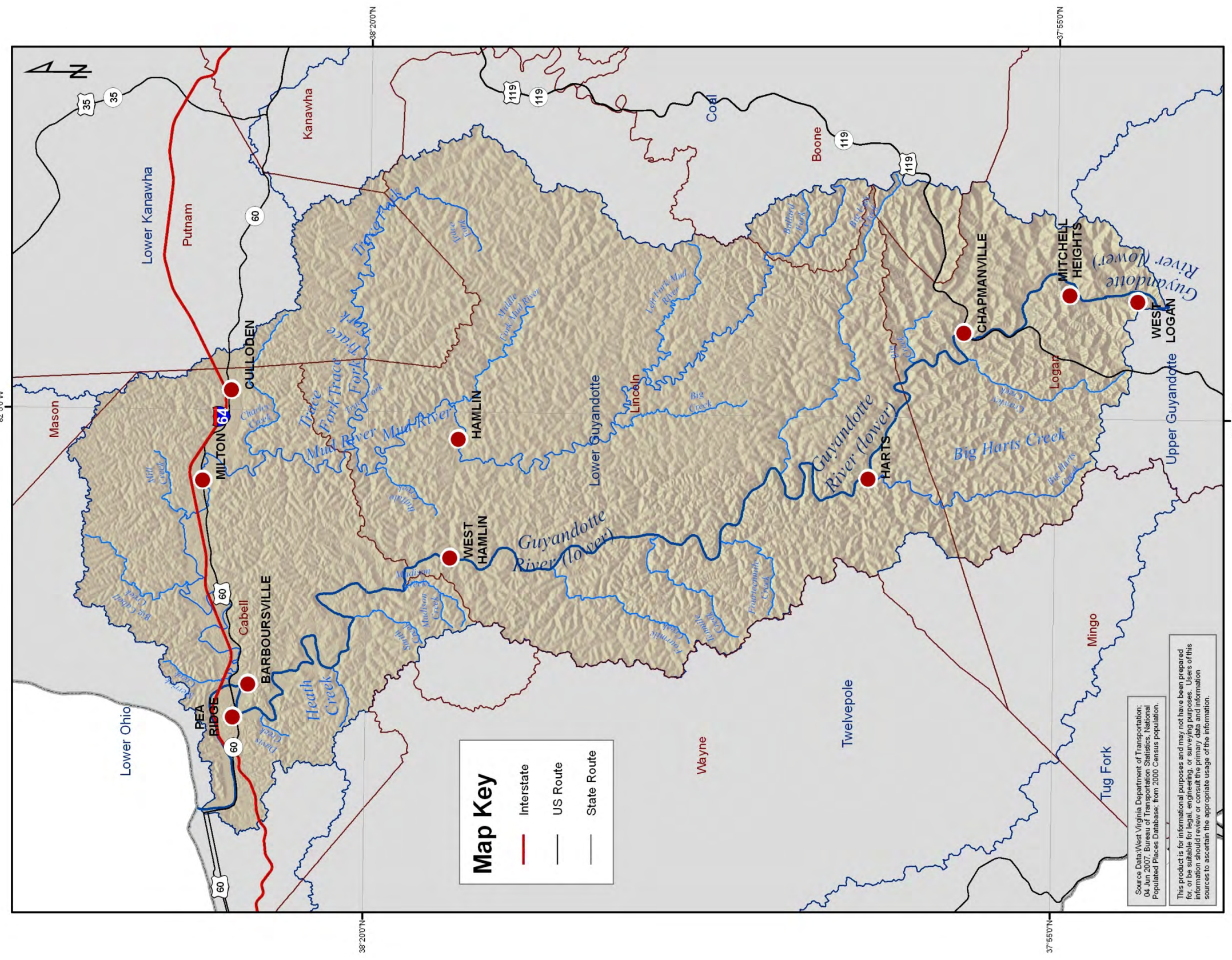
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- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

Lower Guyandotte HUC-8 Watershed

Major Roads and Cities

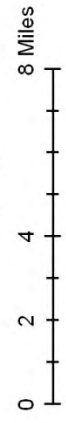
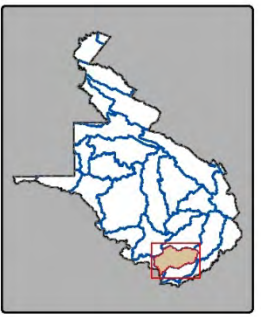


Map Key

- Interstate
- US Route
- State Route

Source Data: West Virginia Department of Transportation; 04 Jun 2007. Bureau of Transportation Statistics. National Populated Places Database. from 2000 Census population.

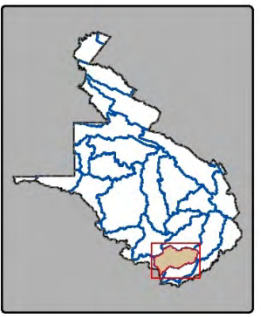
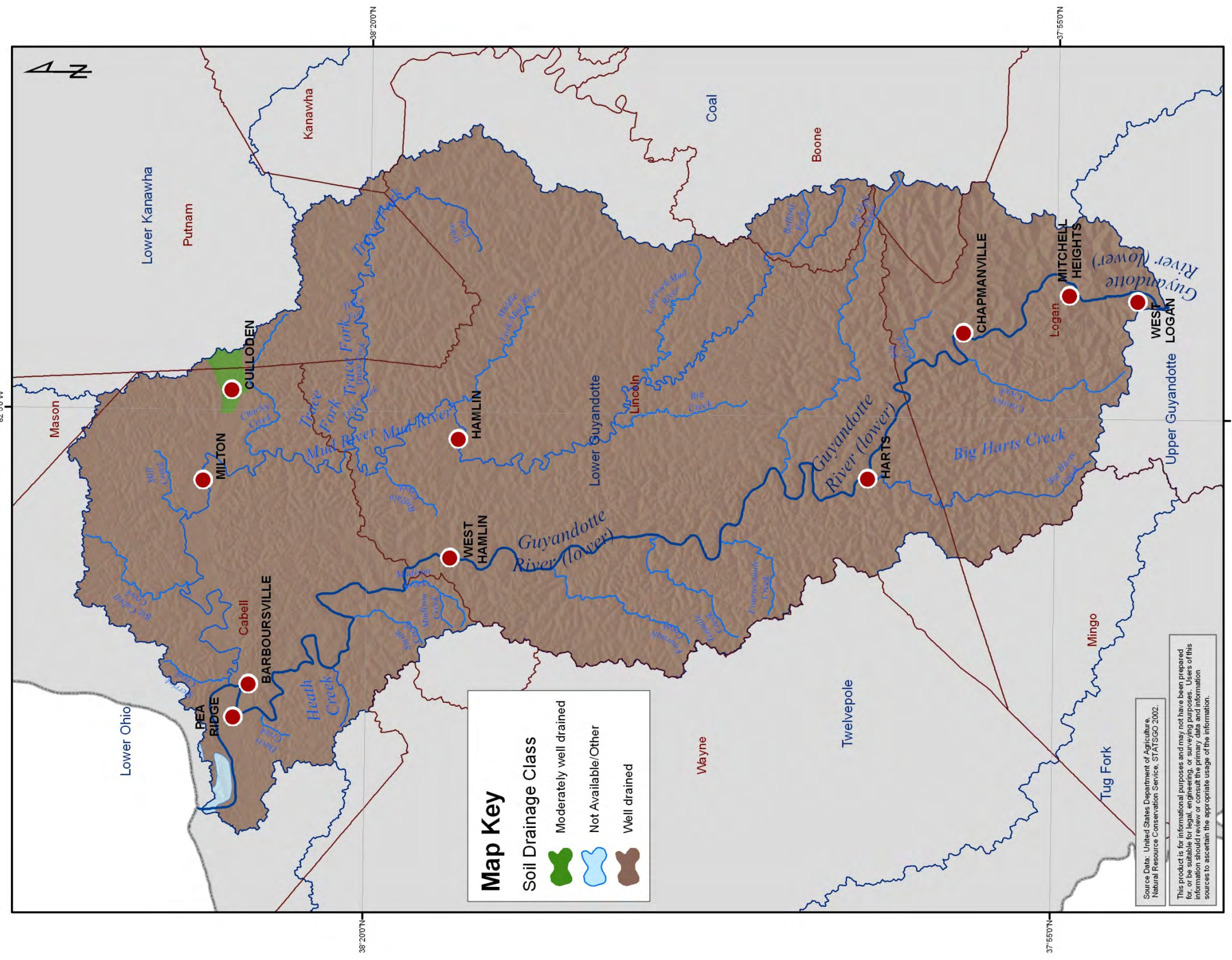
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- County Boundary
- City/Town

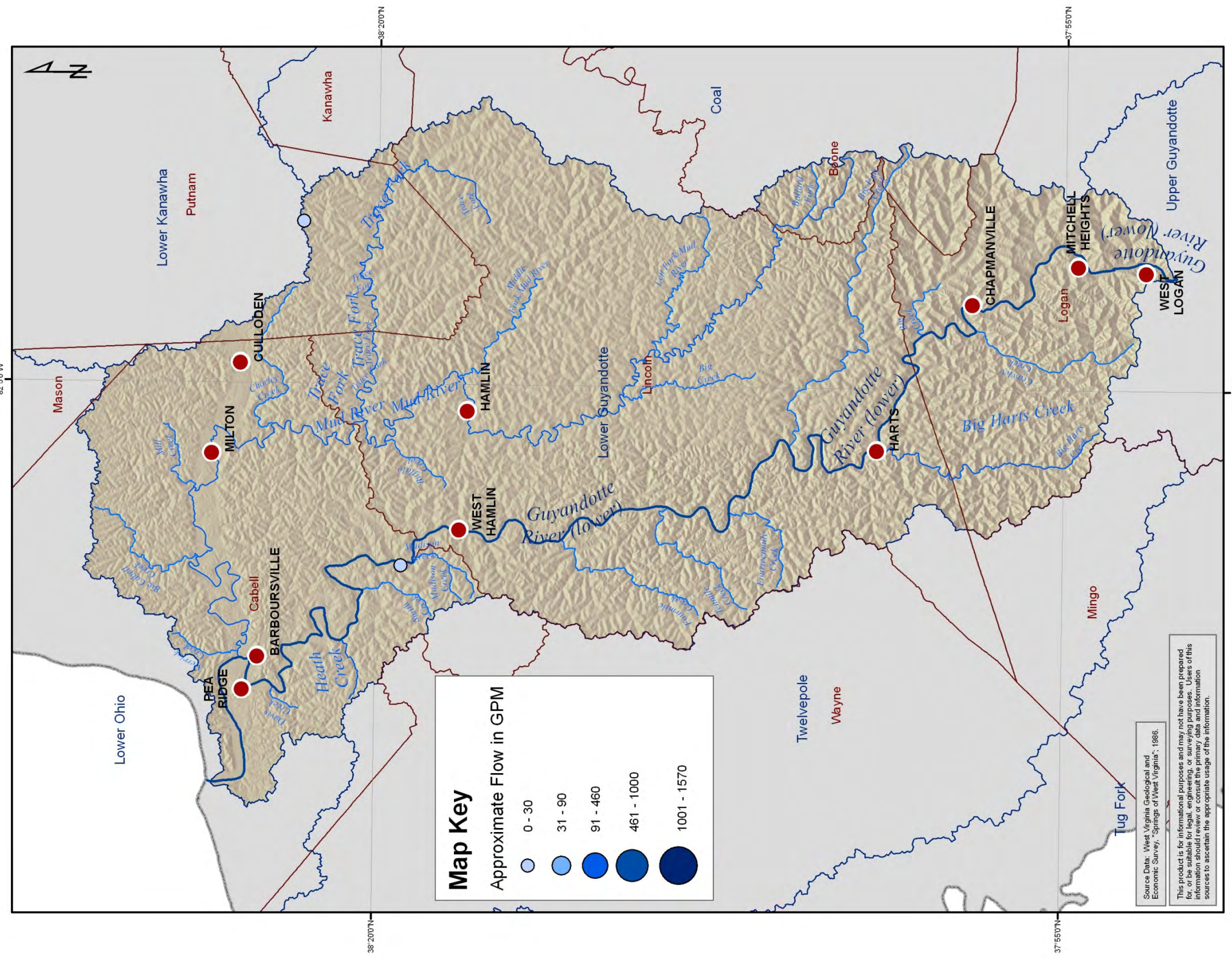
Lower Guyandotte HUC-8 Watershed

Soil Drainage Classes



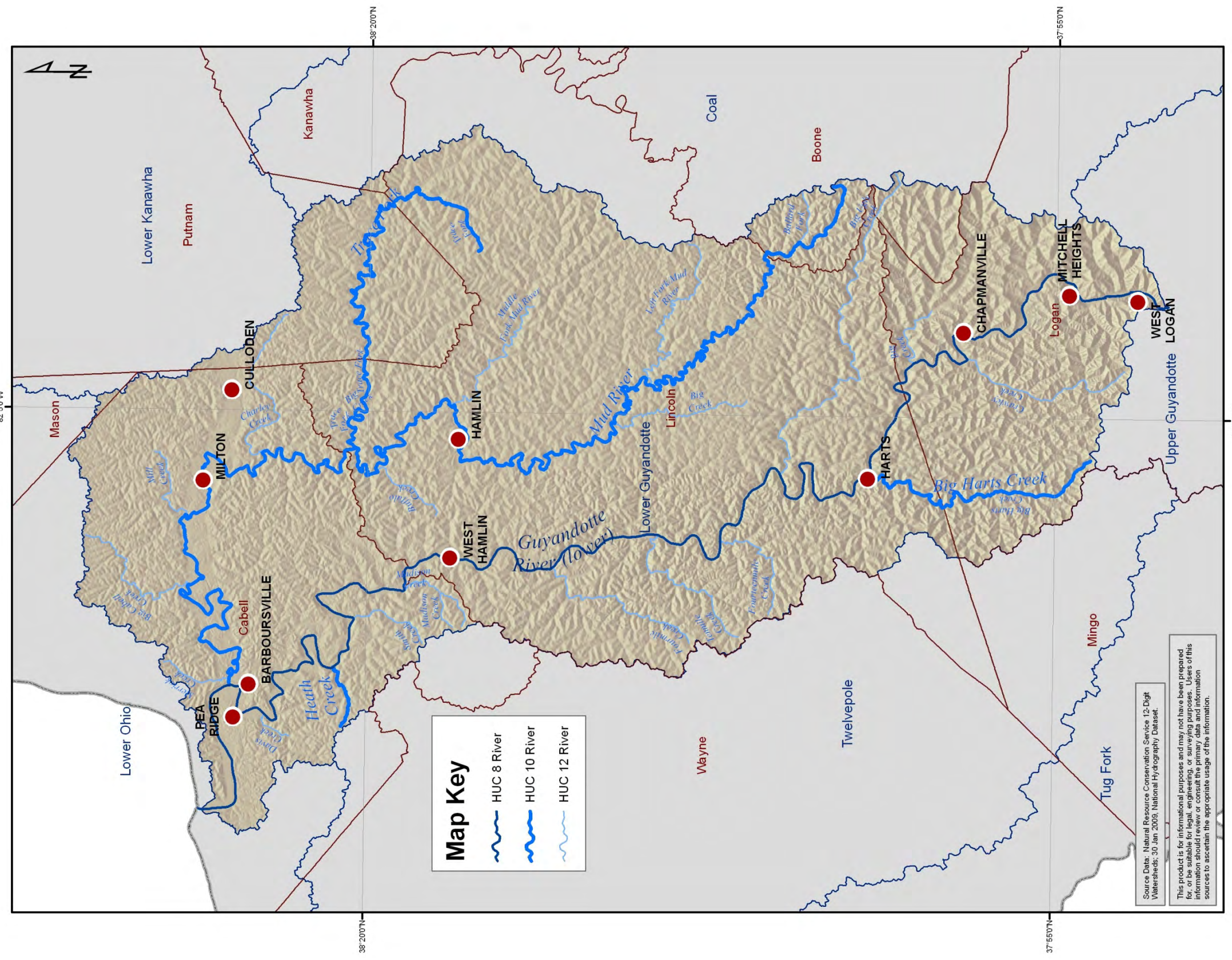
Lower Guyandotte HUC-8 Watershed

Documented Springs



Lower Guyandotte HUC-8 Watershed

Stream Connections

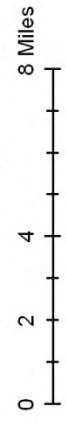
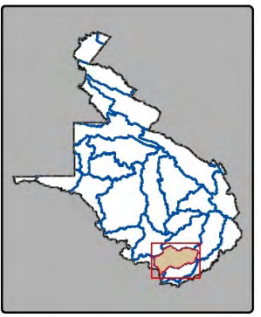


Map Key

- HUC 8 River
- HUC 10 River
- HUC 12 River

Source Data: Natural Resource Conservation Service 12-Digit Watersheds; 30 Jan 2003; National Hydrography Dataset.

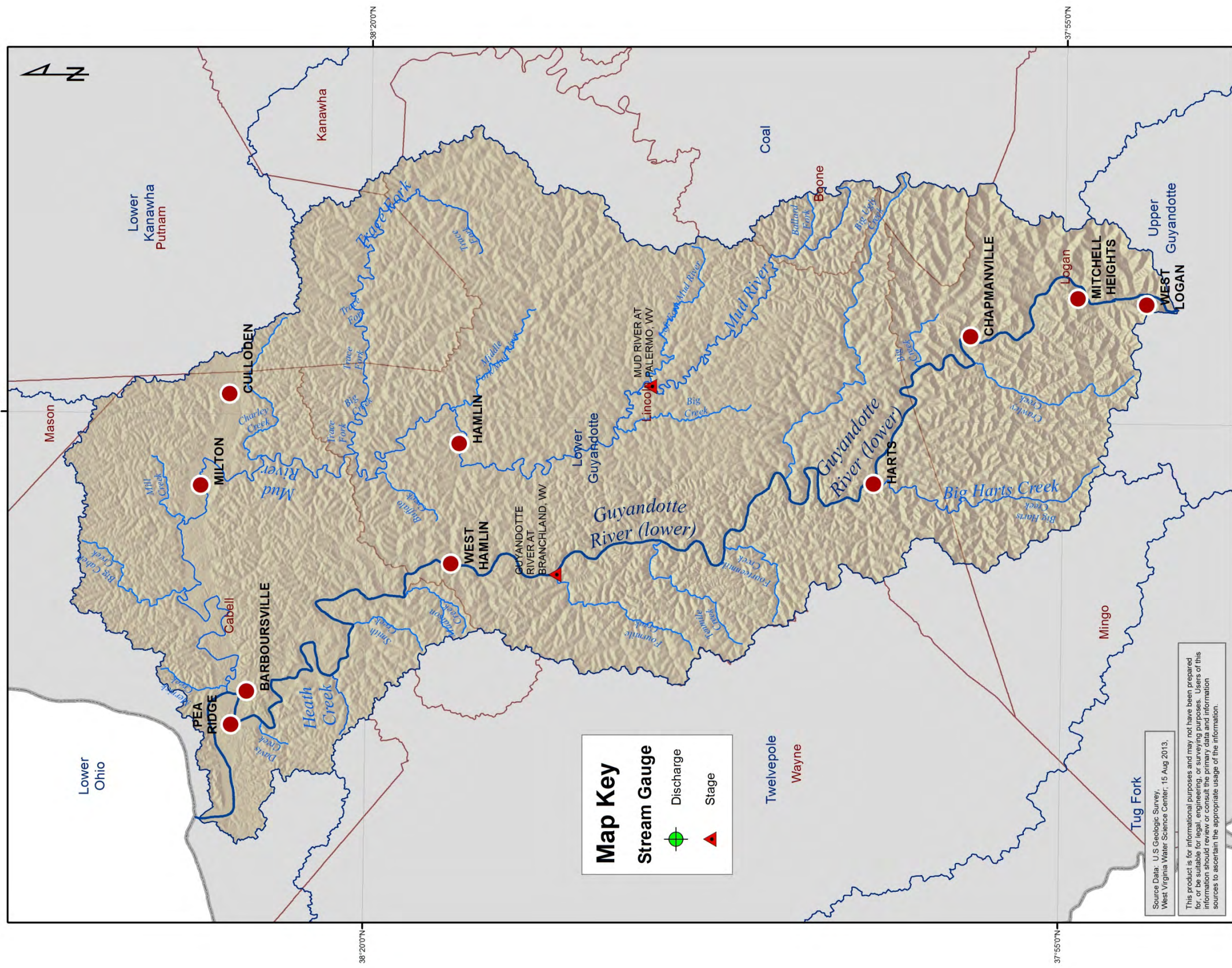
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- County Boundary
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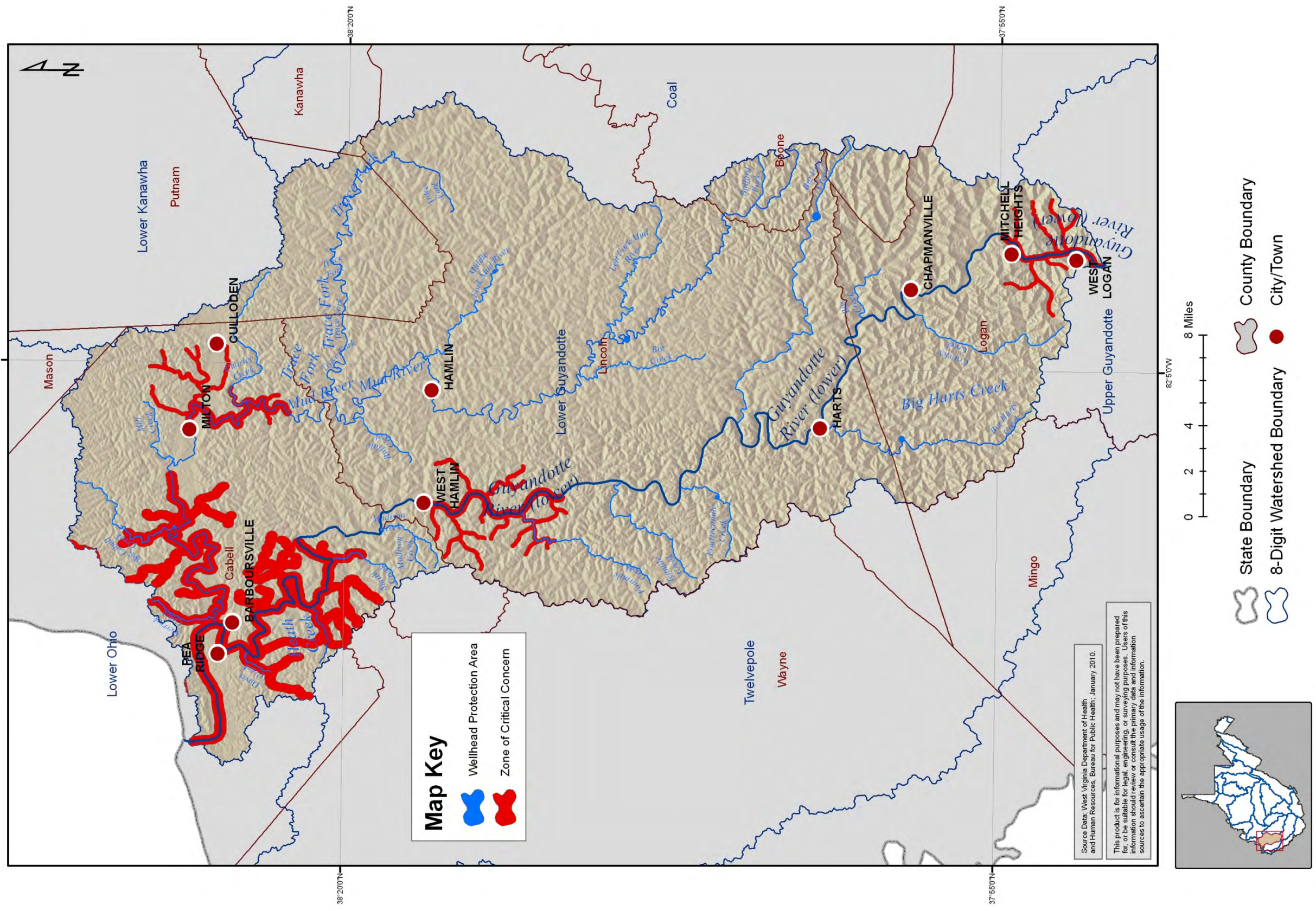
Lower Guyandotte HUC-8 Watershed

Stream Gauges



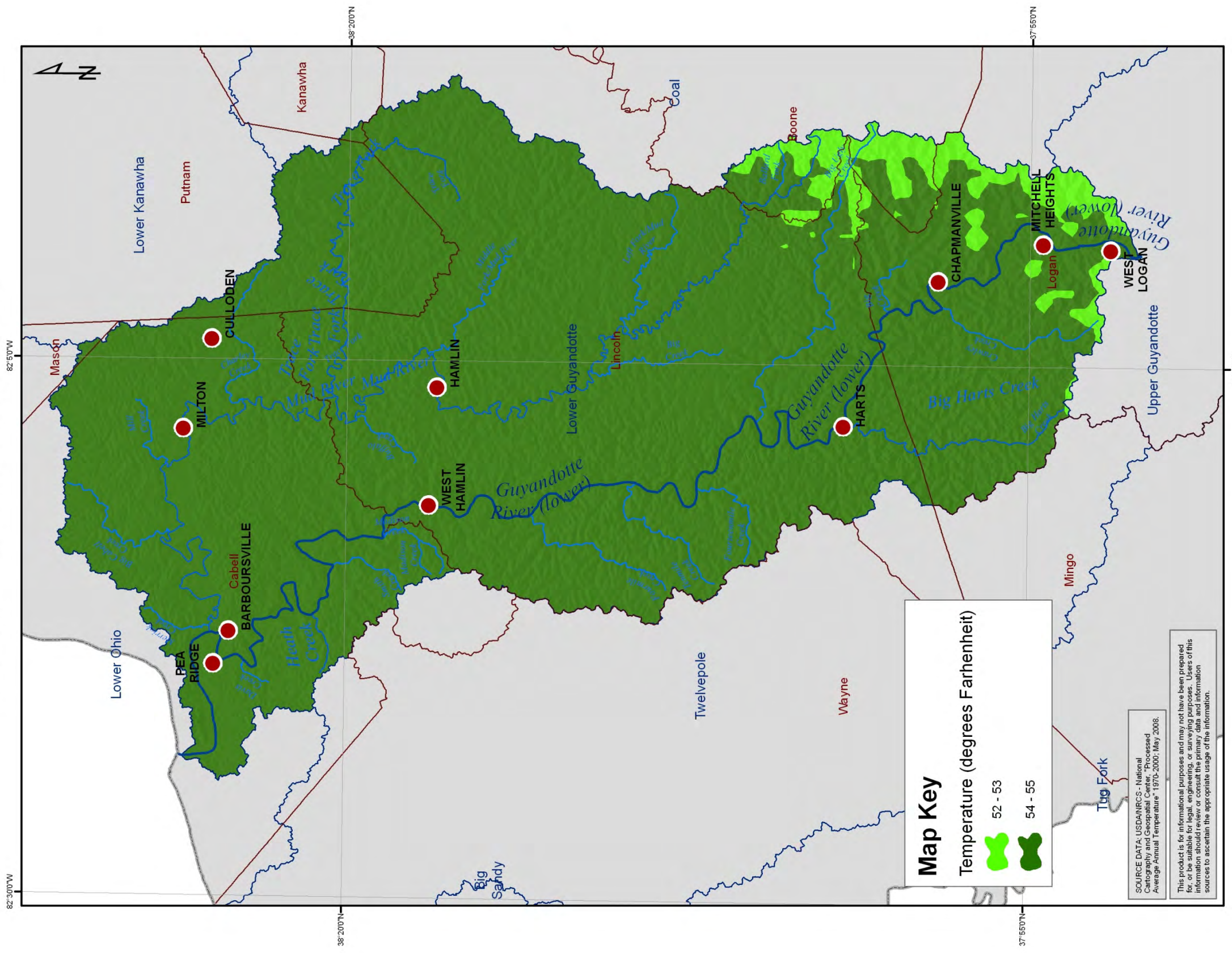
Lower Guyandotte HUC-8 Watershed

Source Water Assessment and Wellhead Protection Programs



Lower Guyandotte HUC-8 Watershed

Average Annual Temperature (1971-2000)



Map Key

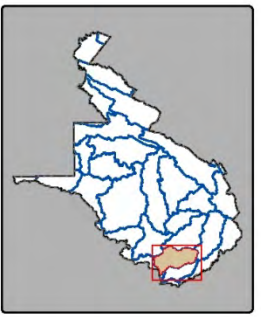
Temperature (degrees Fahrenheit)

- 52 - 53
- 54 - 55

SOURCE DATA: USDA/NRCS - National Cartography and Geospatial Center, "Processed Average Annual Temperature - 1970-2000"; May 2008.

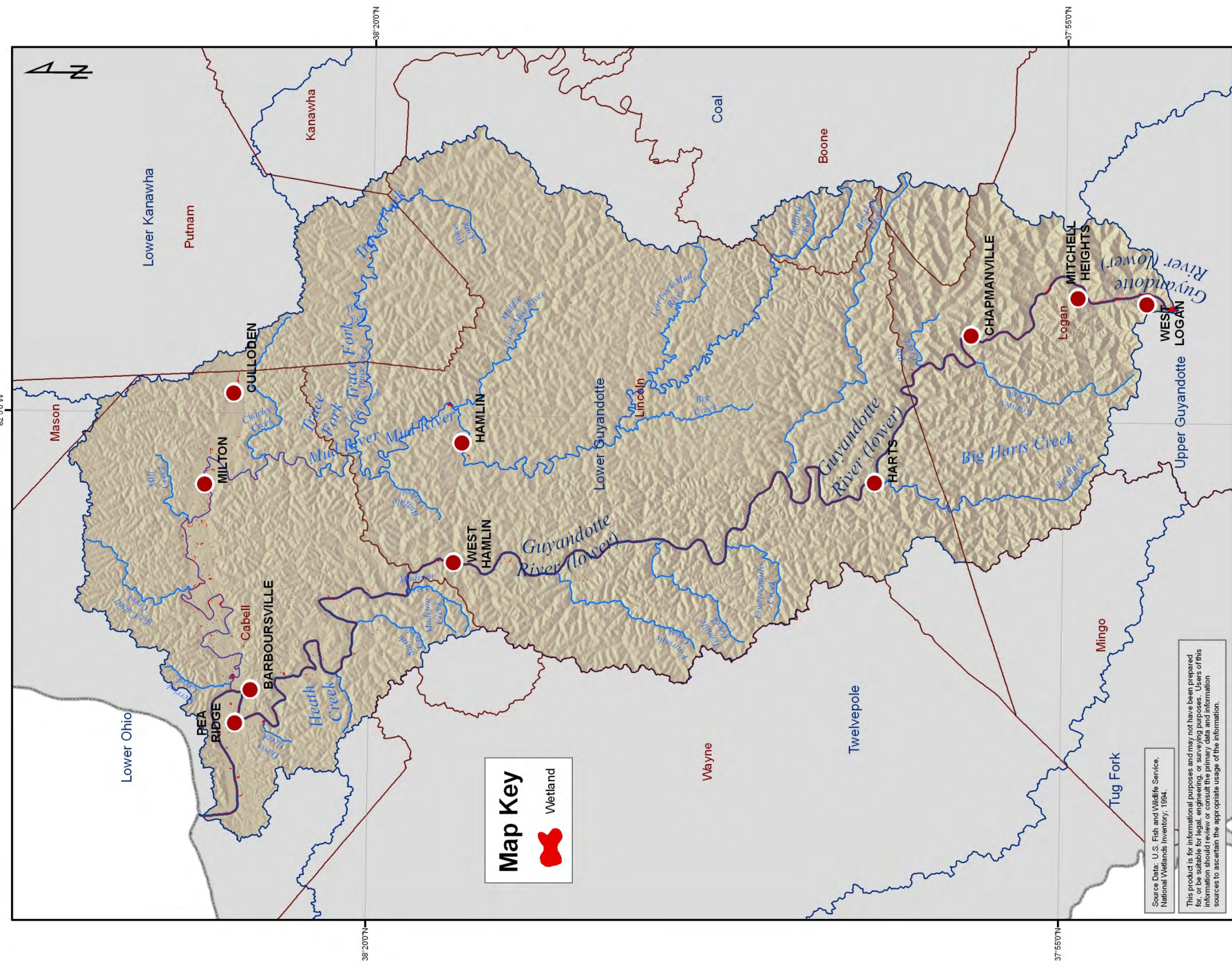
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- State Boundary
- 8-Digit Watershed Boundary
- County Boundary
- City/Town



Lower Guyandotte HUC-8 Watershed

Wetlands

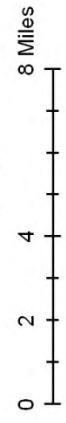
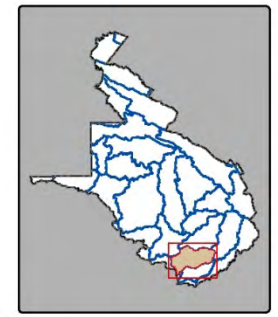


Map Key

- Wetland

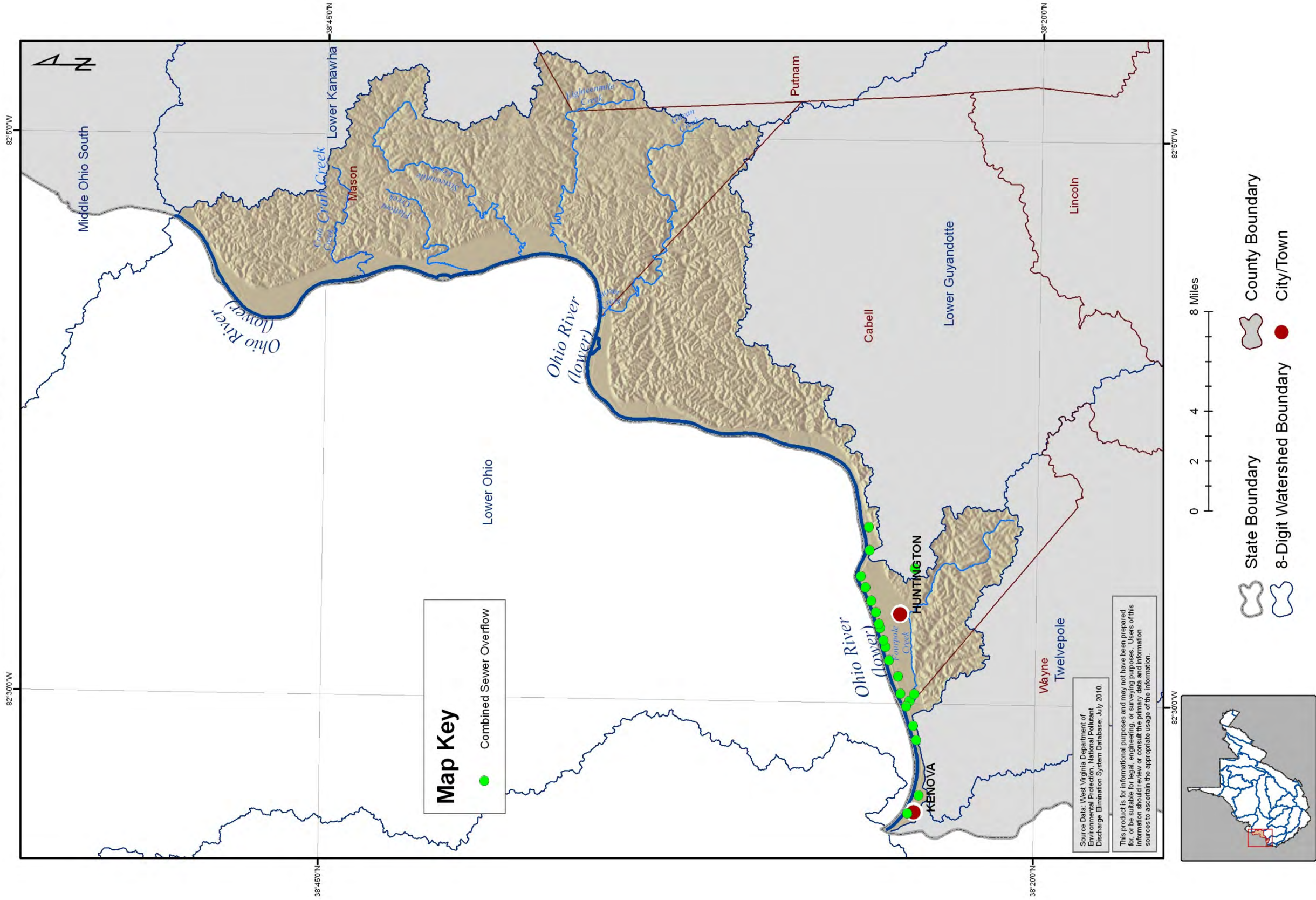
Source Data: U.S. Fish and Wildlife Service, National Wetlands Inventory, 1984.

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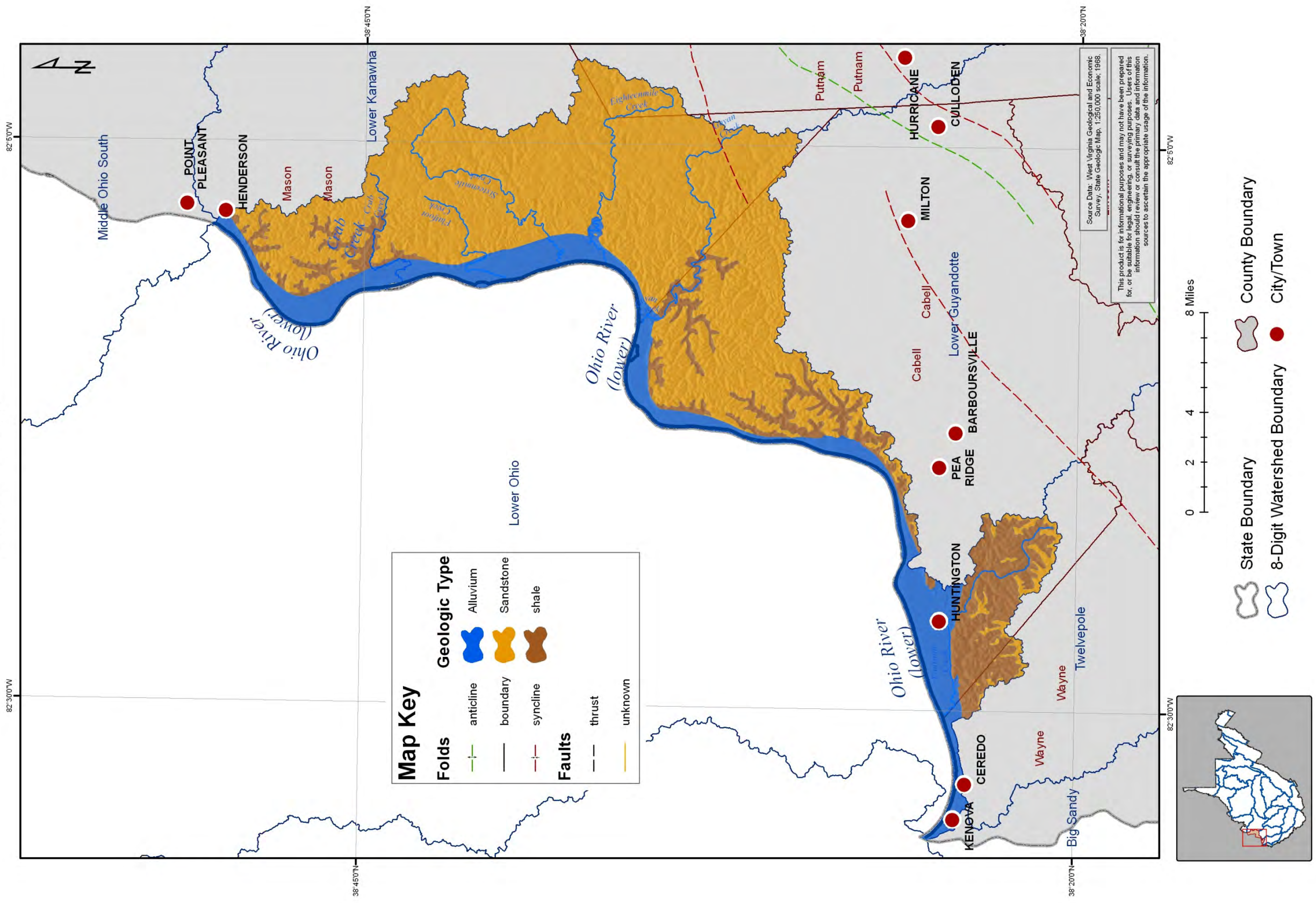
- State Boundary
- 8-Digit Watershed Boundary
- County Boundary
- City/Town

Lower Ohio HUC-8 Watershed Combined Sewer Overflows



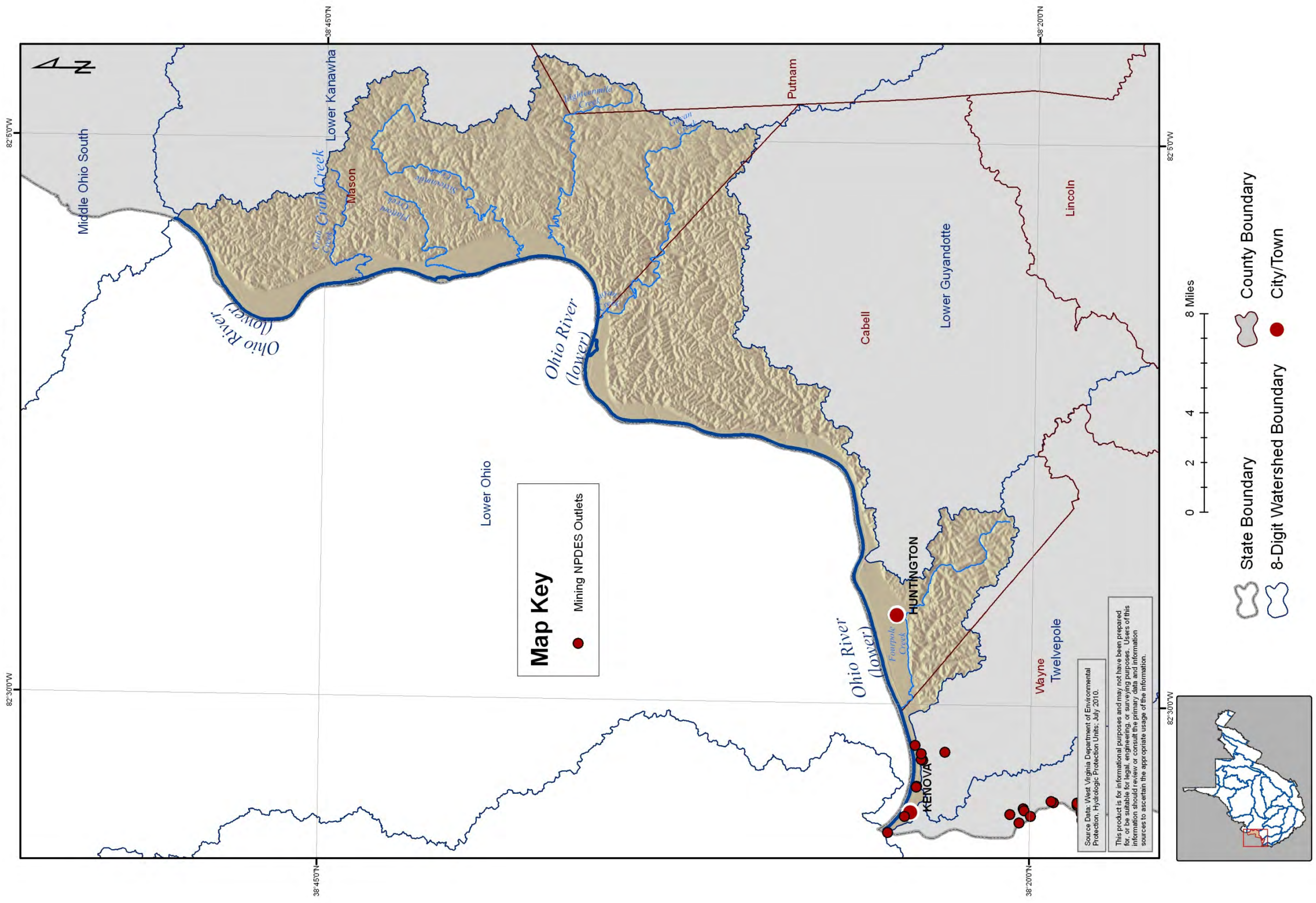
Lower Ohio HUC-8 Watershed

Surface Geology



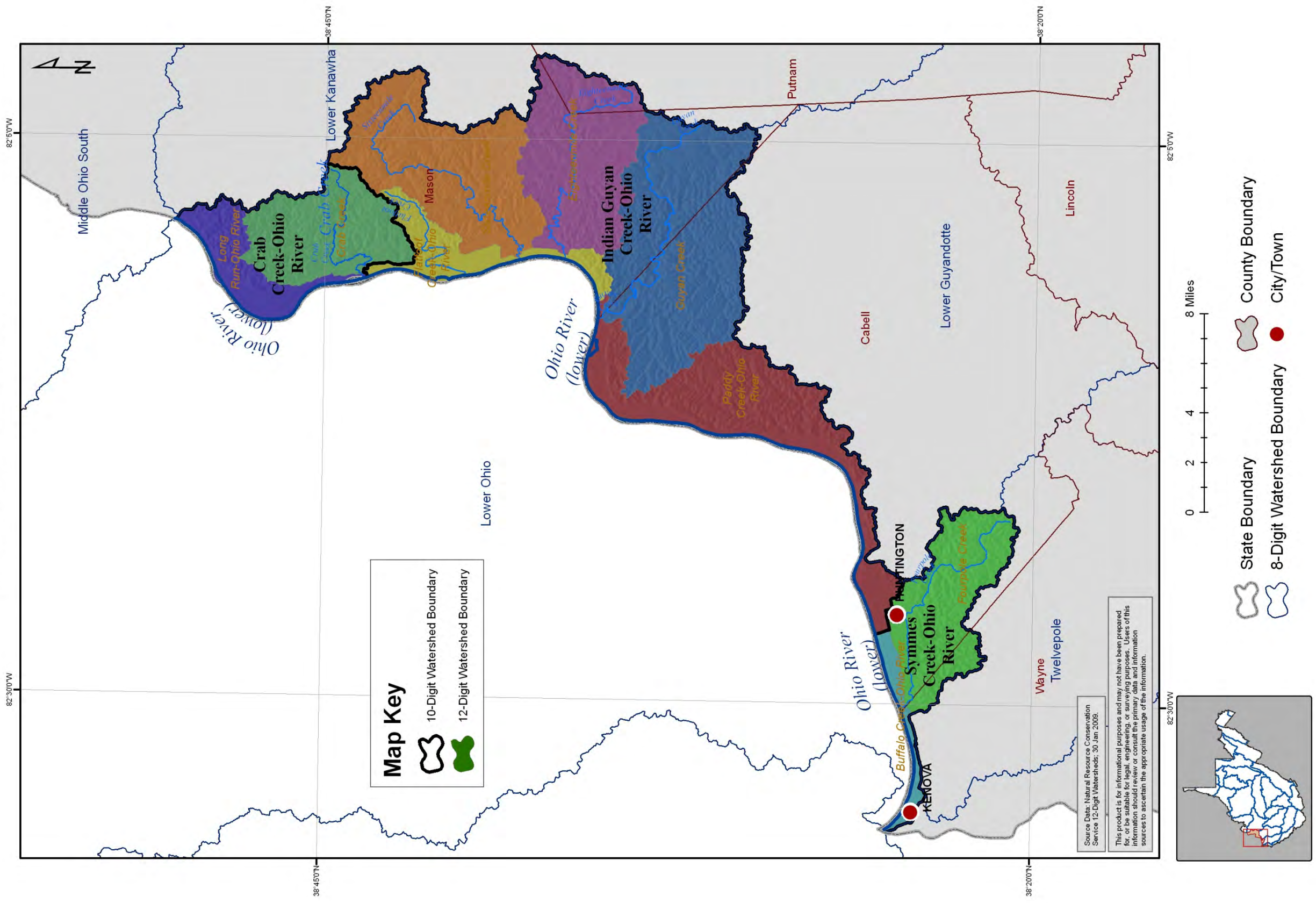
Lower Ohio HUC-8 Watershed

Mining Related NPDES Outlets

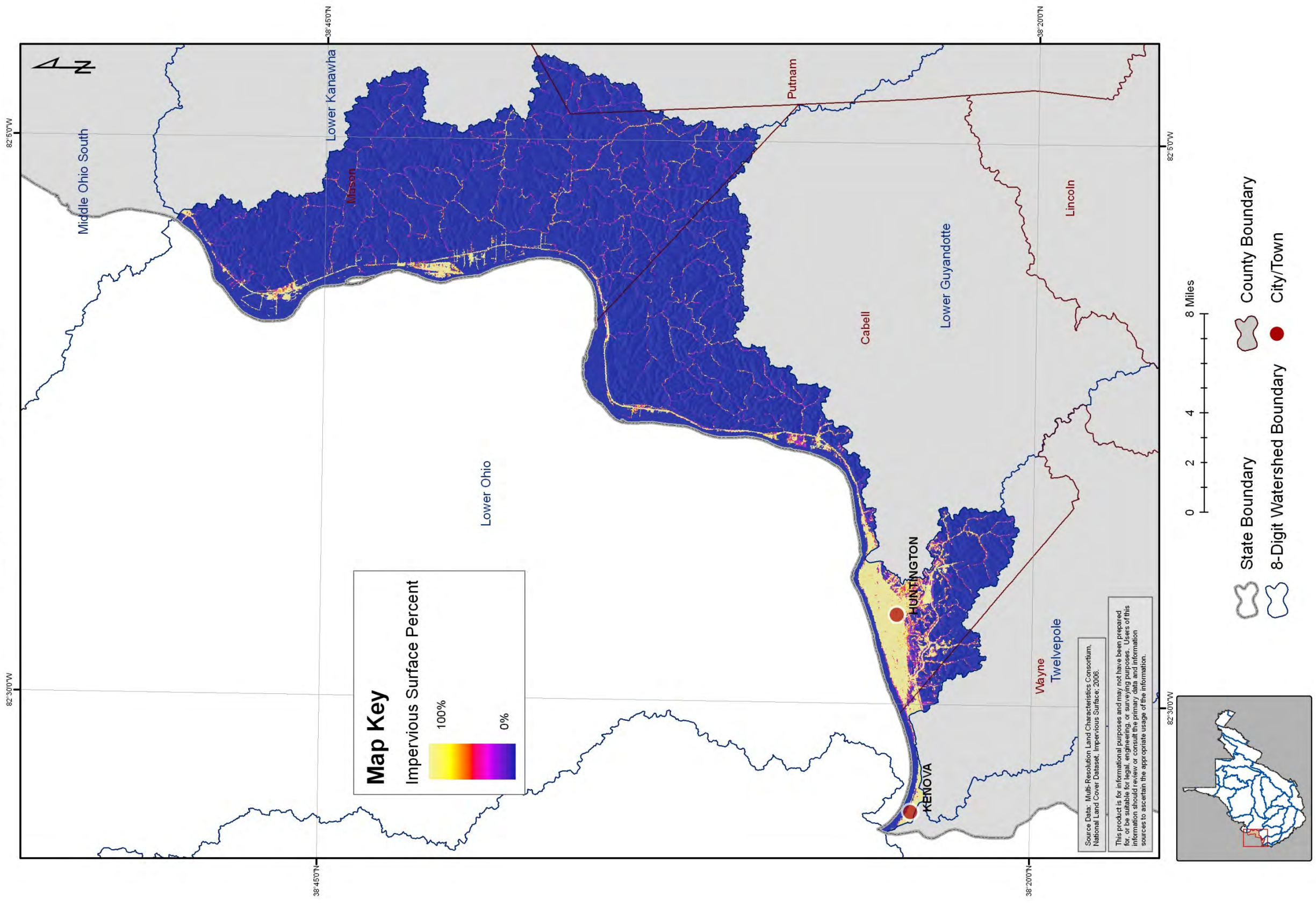


Lower Ohio HUC-8 Watershed

HUC 10 and HUC 12 Watersheds

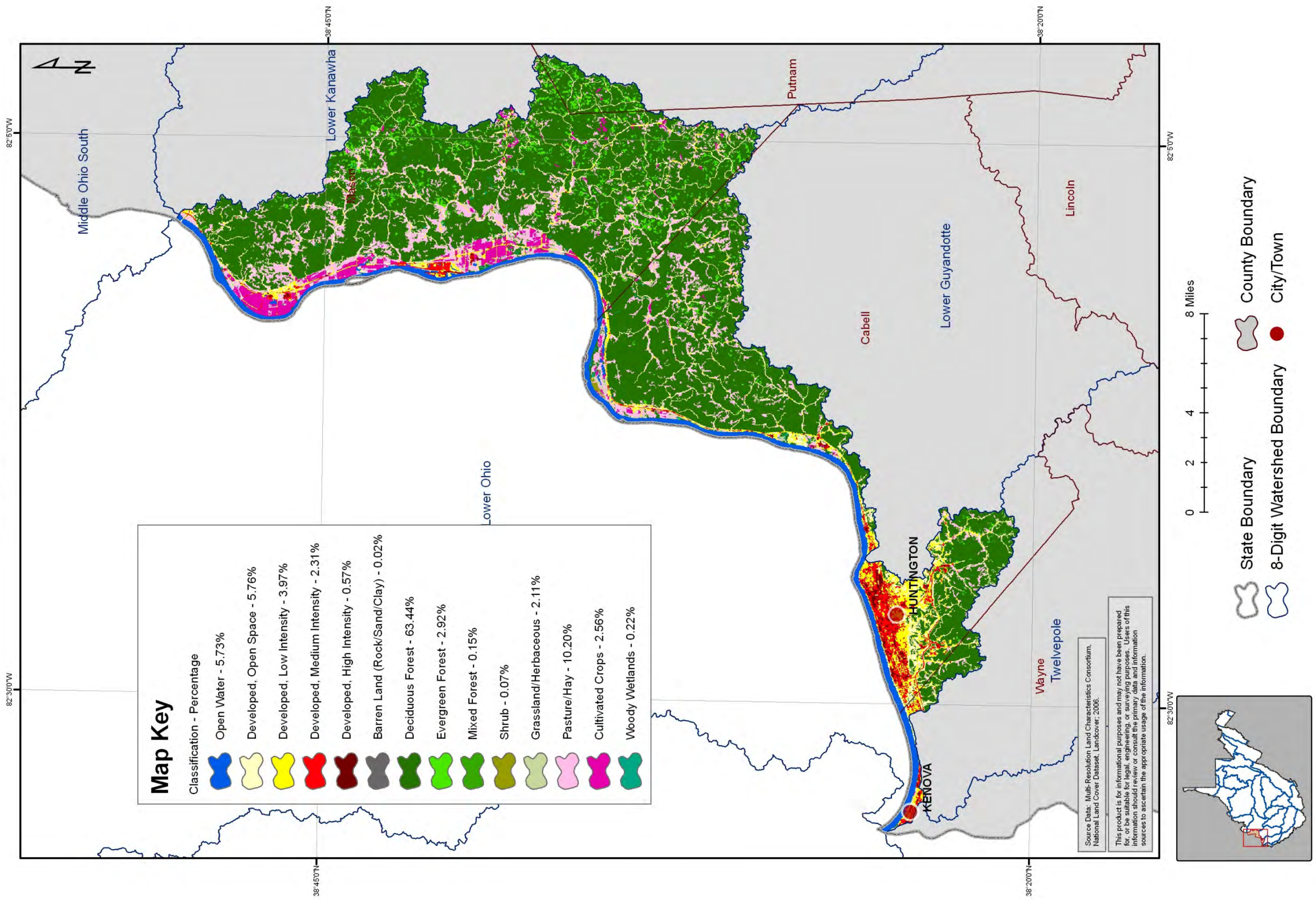


Lower Ohio HUC-8 Watershed 2006 Impervious Surface



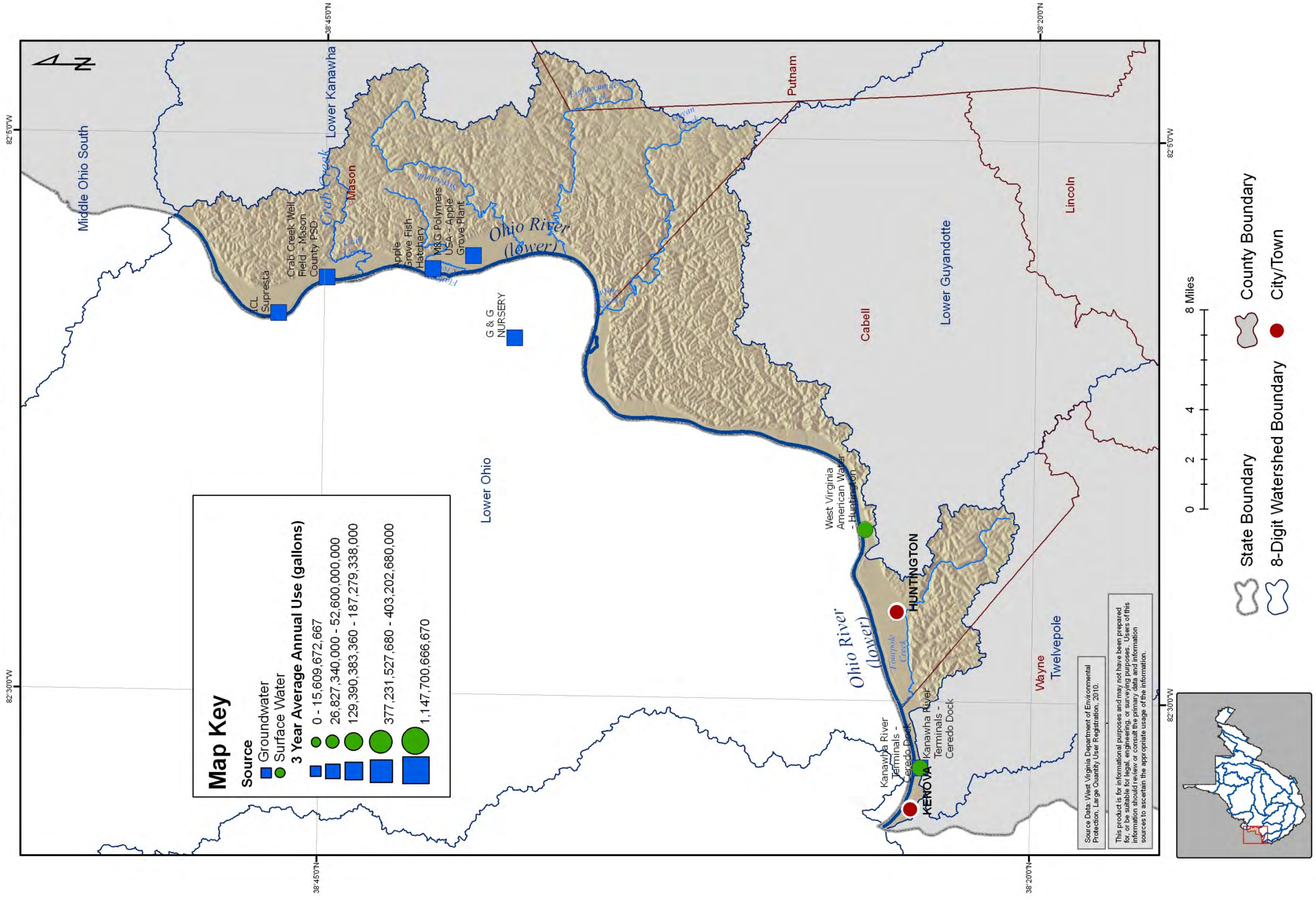
Lower Ohio HUC-8 Watershed

2006 Land Cover



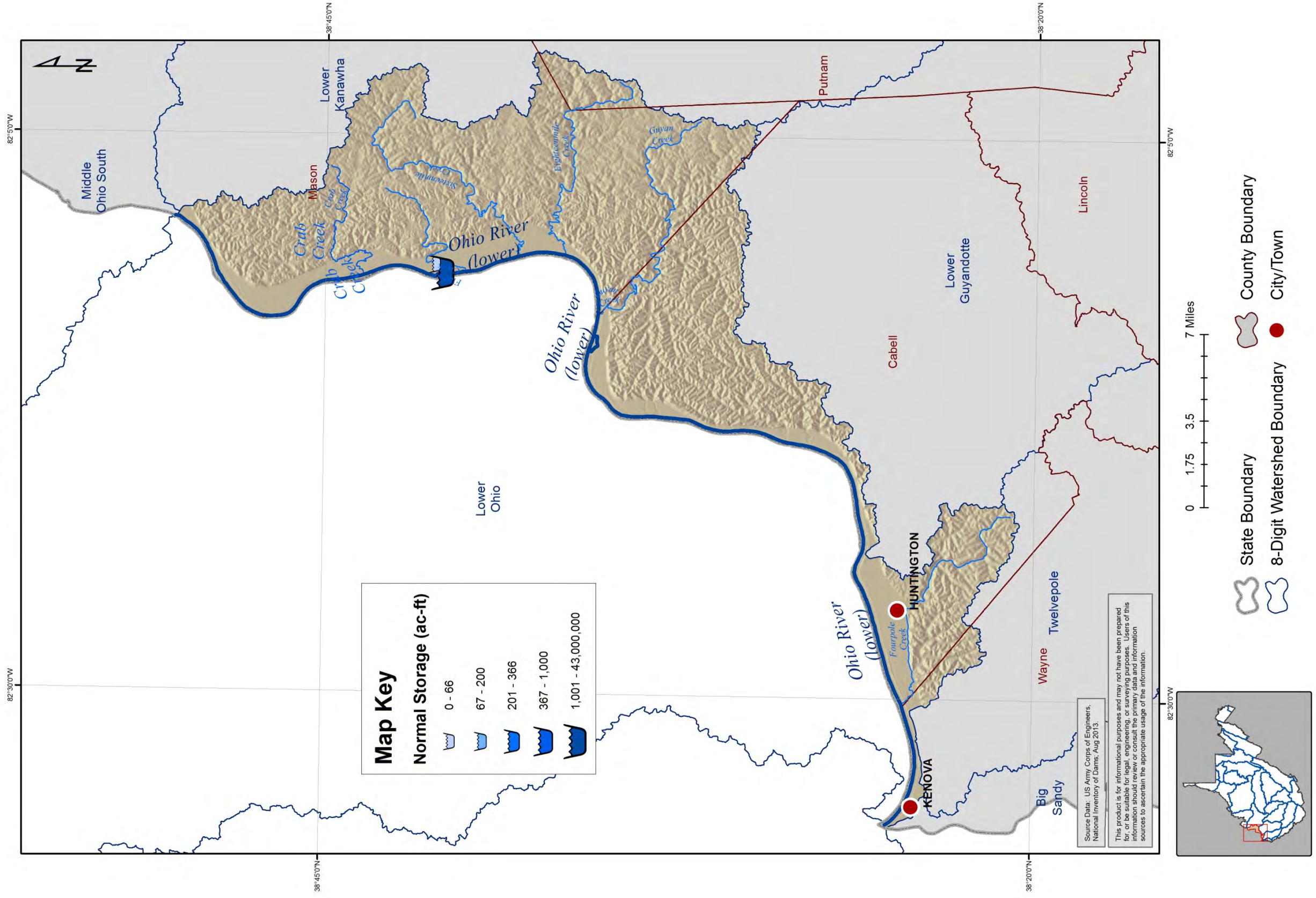
Lower Ohio HUC-8 Watershed

Large Quantity Users



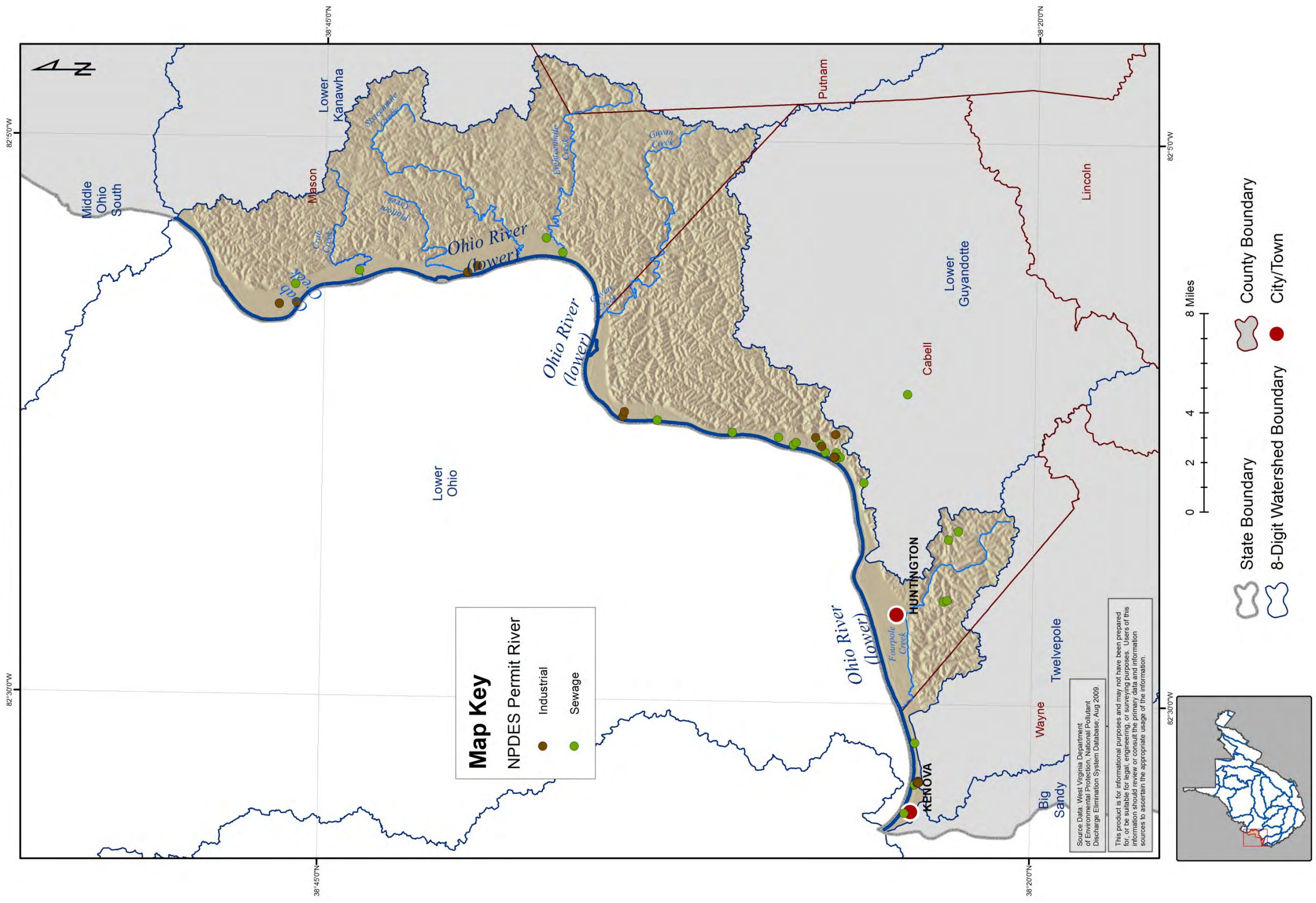
Lower Ohio HUC-8 Watershed

Permitted Dams



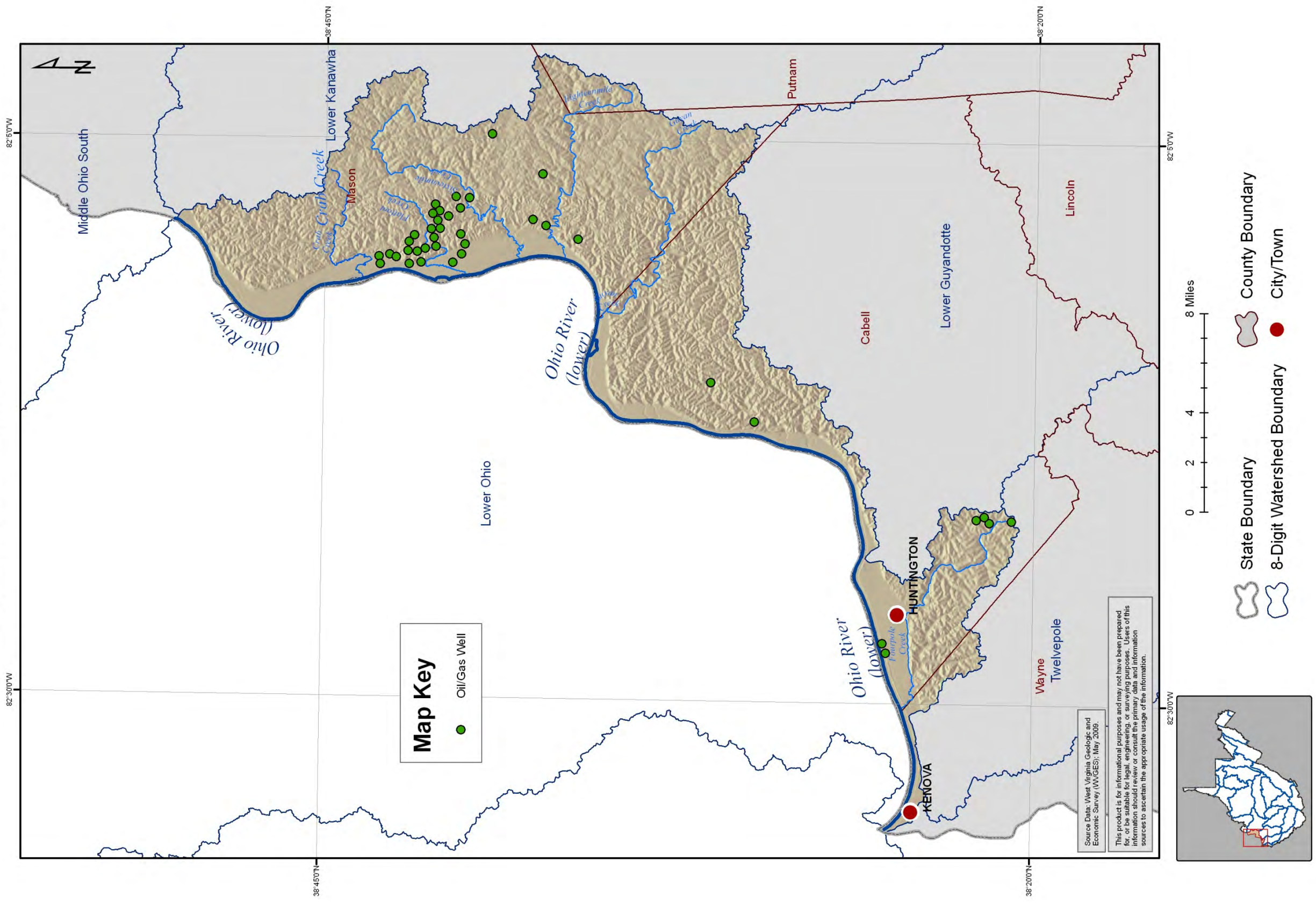
Lower Ohio HUC-8 Watershed

Non-Mining NPDES Outlets



Lower Ohio HUC-8 Watershed

Well Logs with Gamma Rays and Water Shows

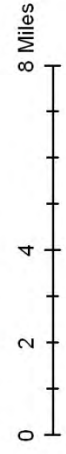
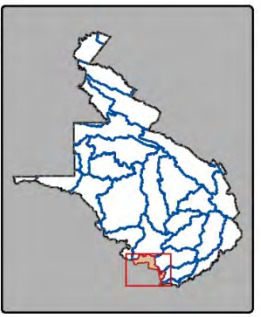


Map Key

- Oil/Gas Well

Source Data: West Virginia Geologic and Economic Survey (WVGES); May, 2009.

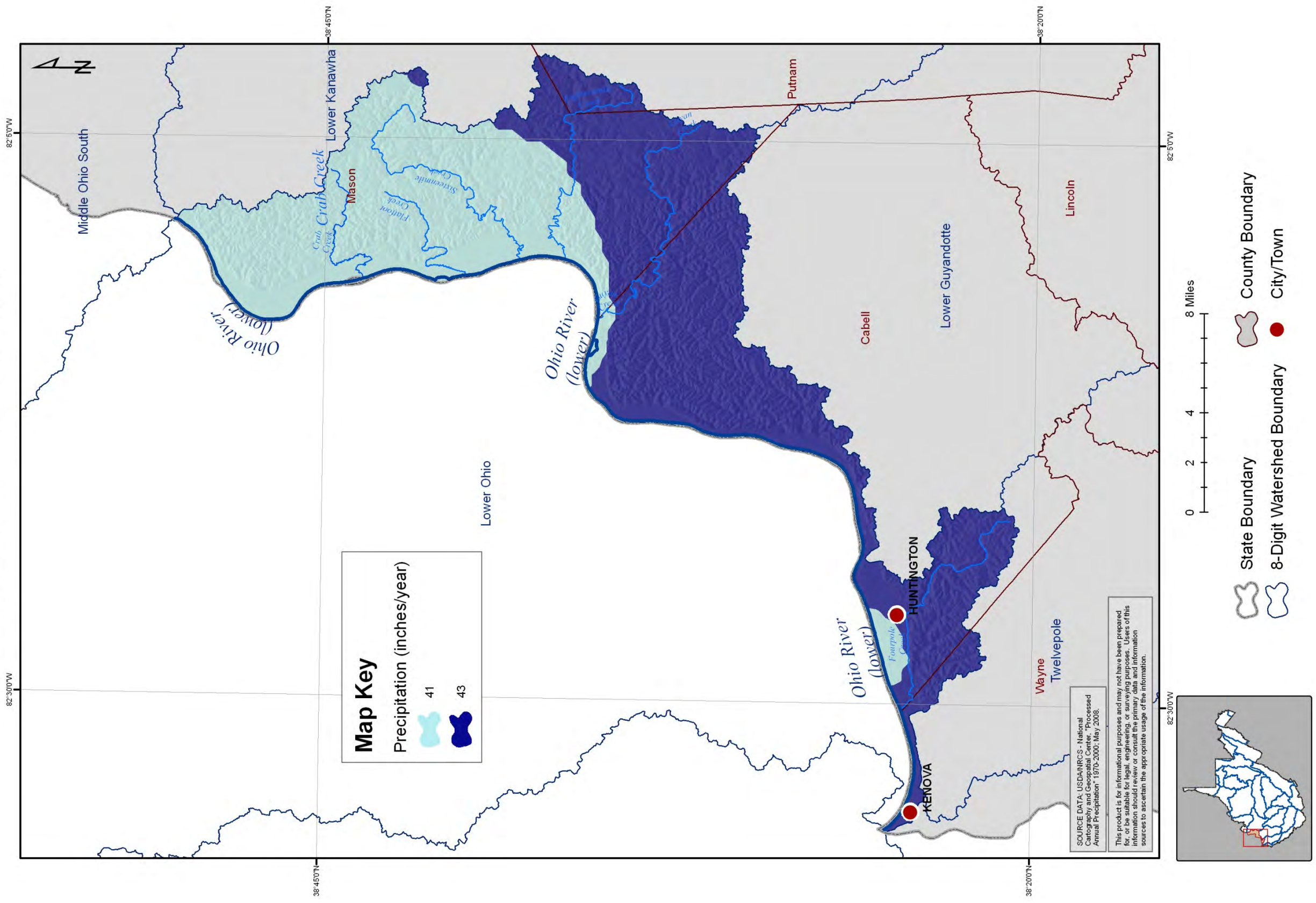
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- State Boundary
- 8-Digit Watershed Boundary
- County Boundary
- City/Town

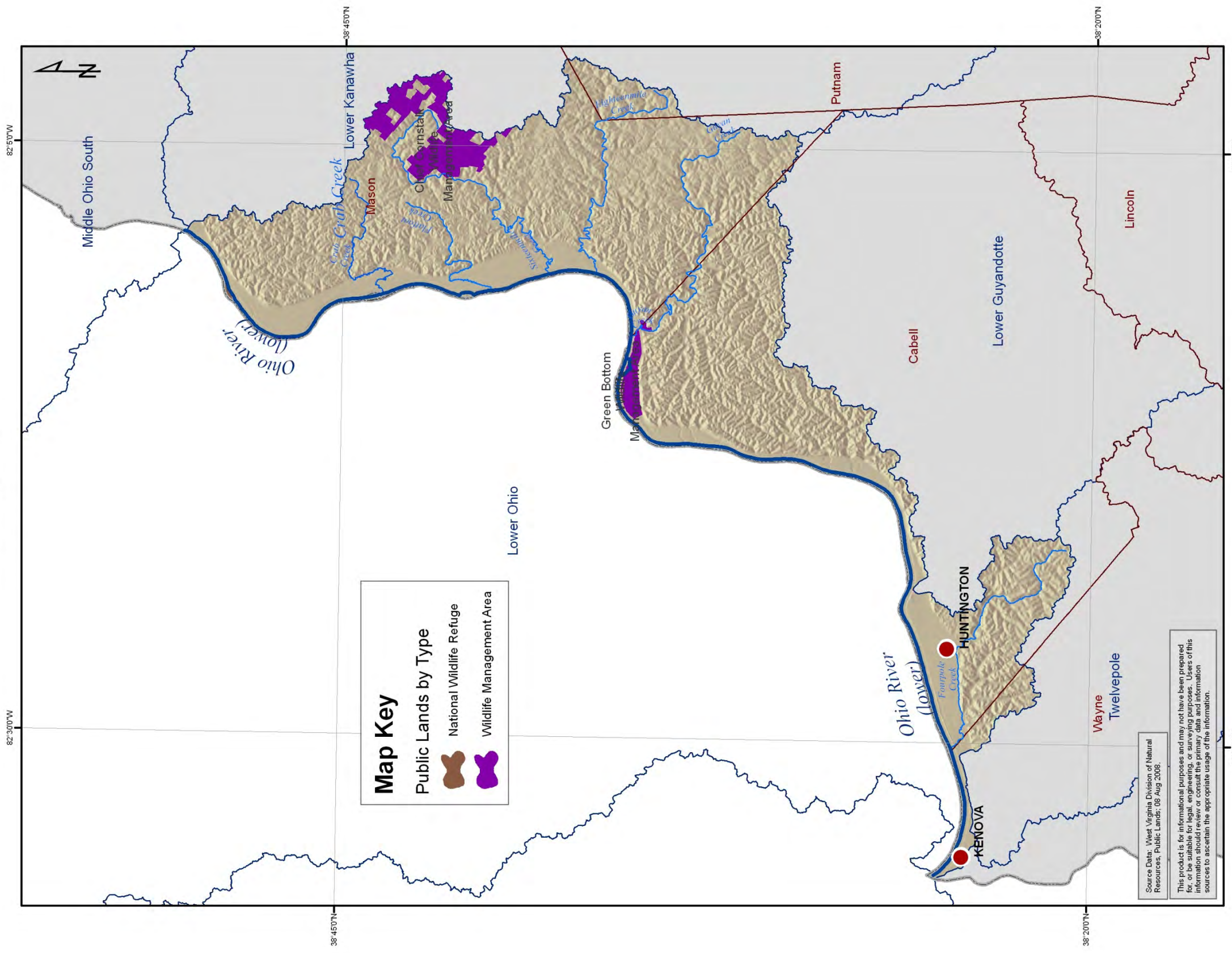
Lower Ohio HUC-8 Watershed

Average Annual Precipitation (1971-2000)



Lower Ohio HUC-8 Watershed

Public Lands



Map Key

Public Lands by Type

- National Wildlife Refuge
- Wildlife Management Area

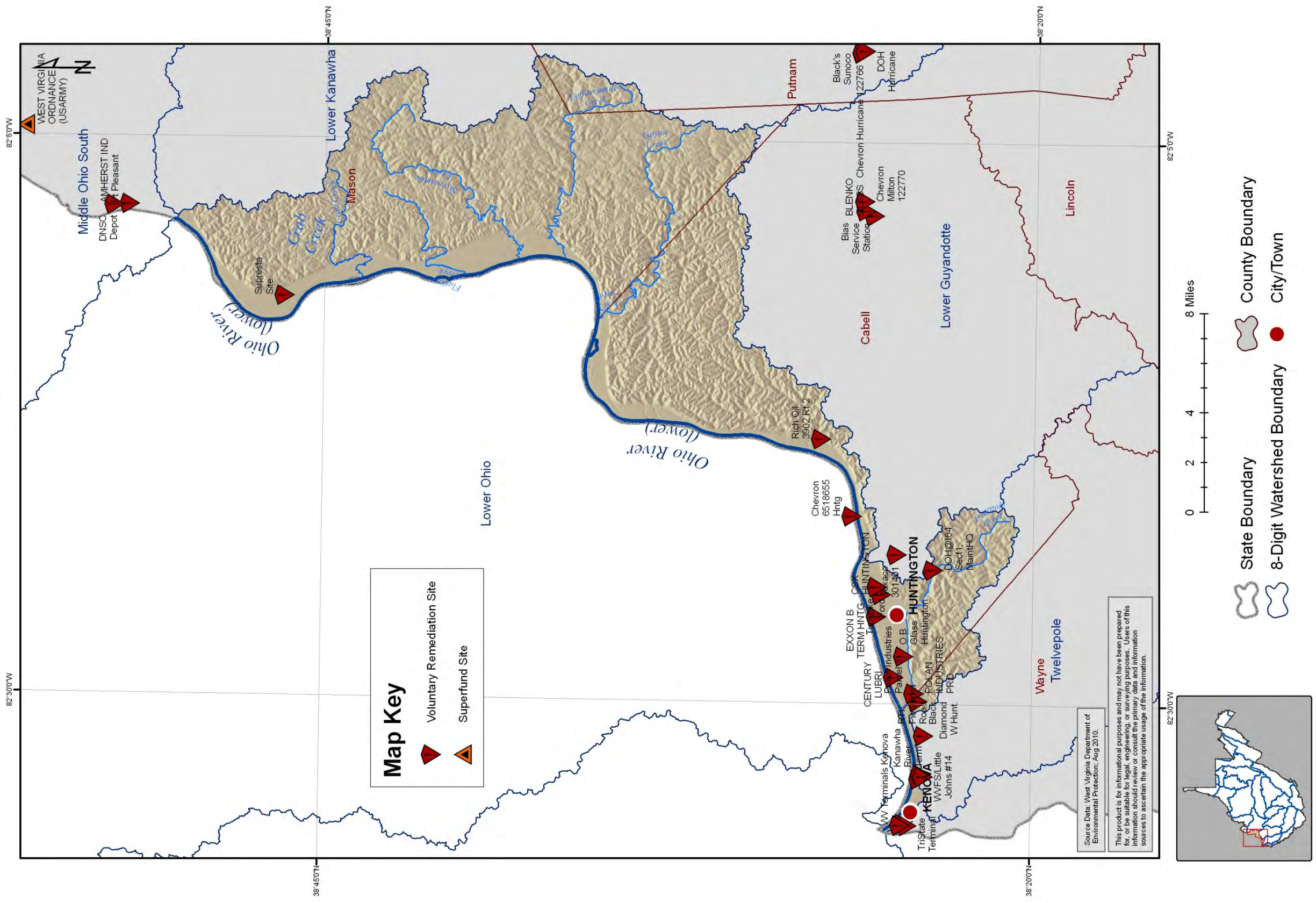
Source Data: West Virginia Division of Natural Resources, Public Lands, 08 Aug 2008.

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- State Boundary
- 8-Digit Watershed Boundary
- County Boundary
- City/Town

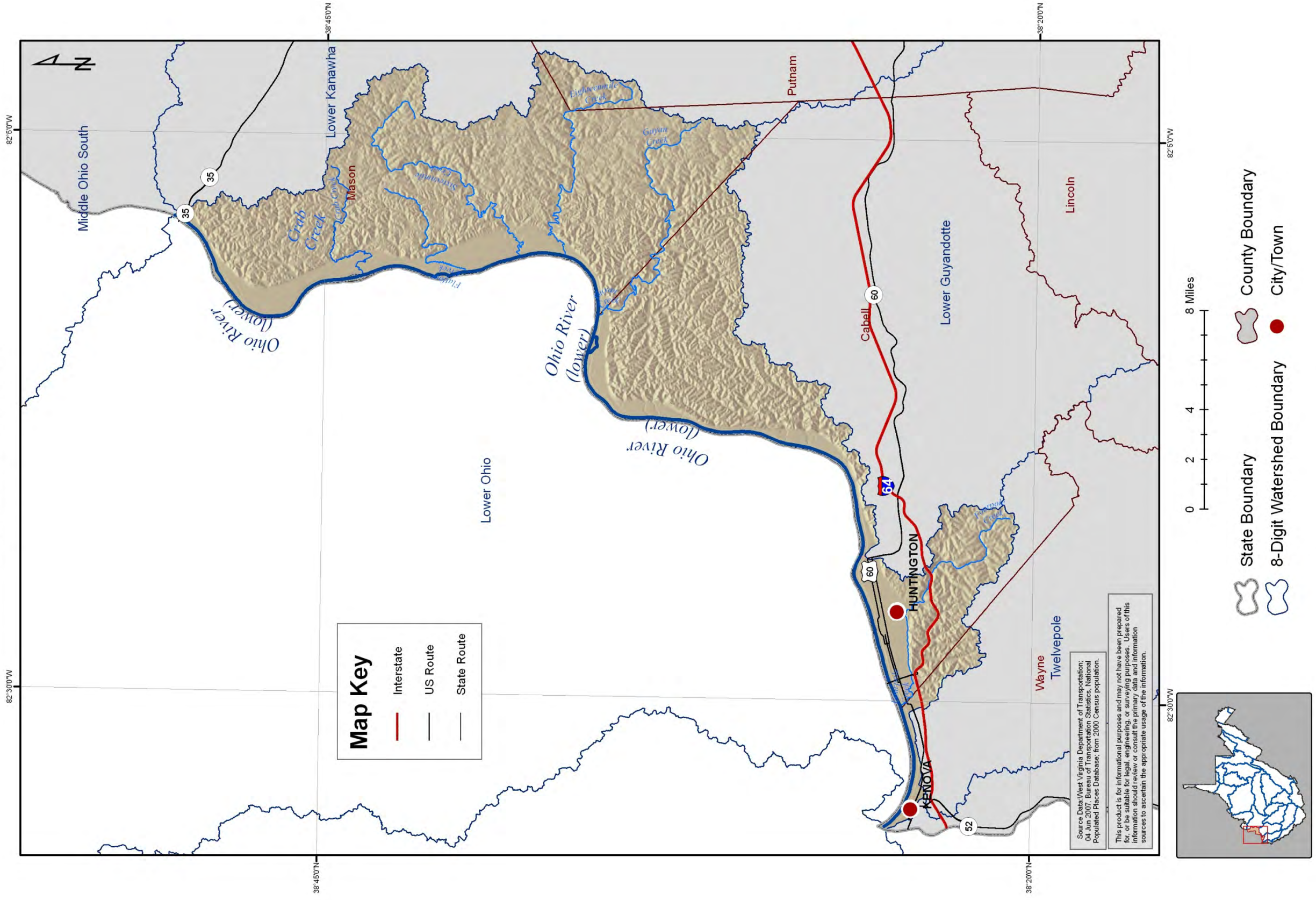
Lower Ohio HUC-8 Watershed

Remediation Sites



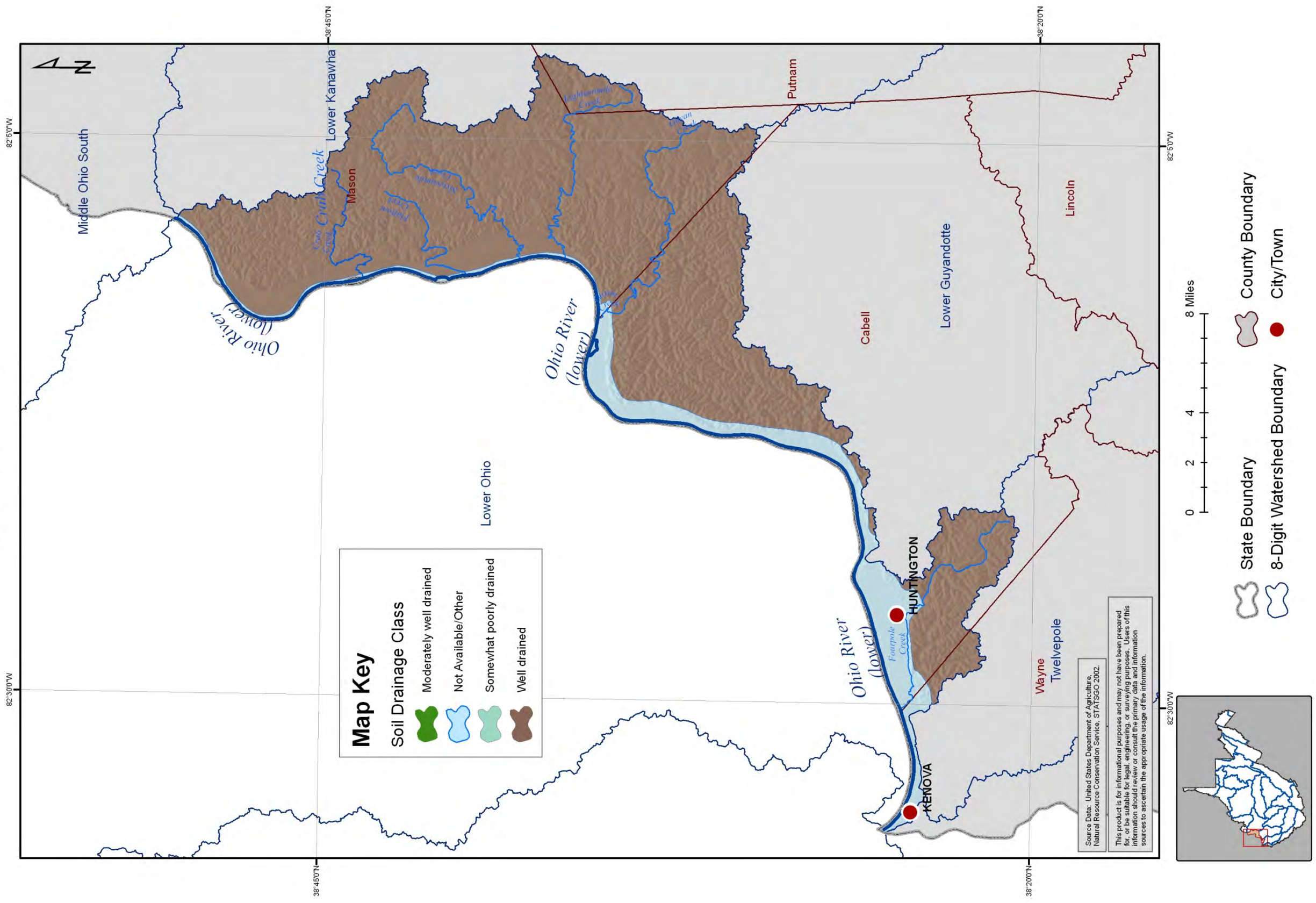
Lower Ohio HUC-8 Watershed

Major Roads and Cities



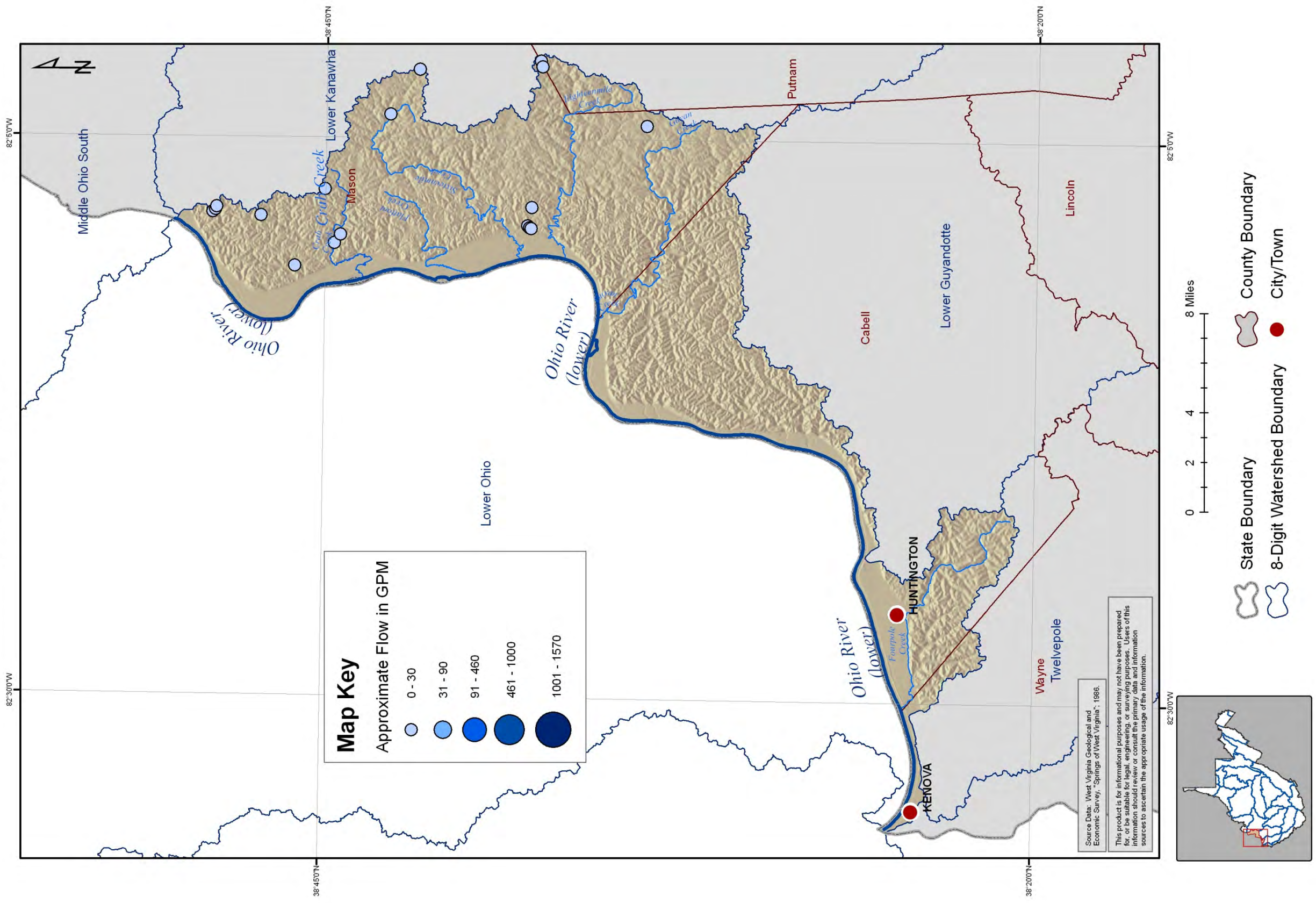
Lower Ohio HUC-8 Watershed

Soil Drainage Classes



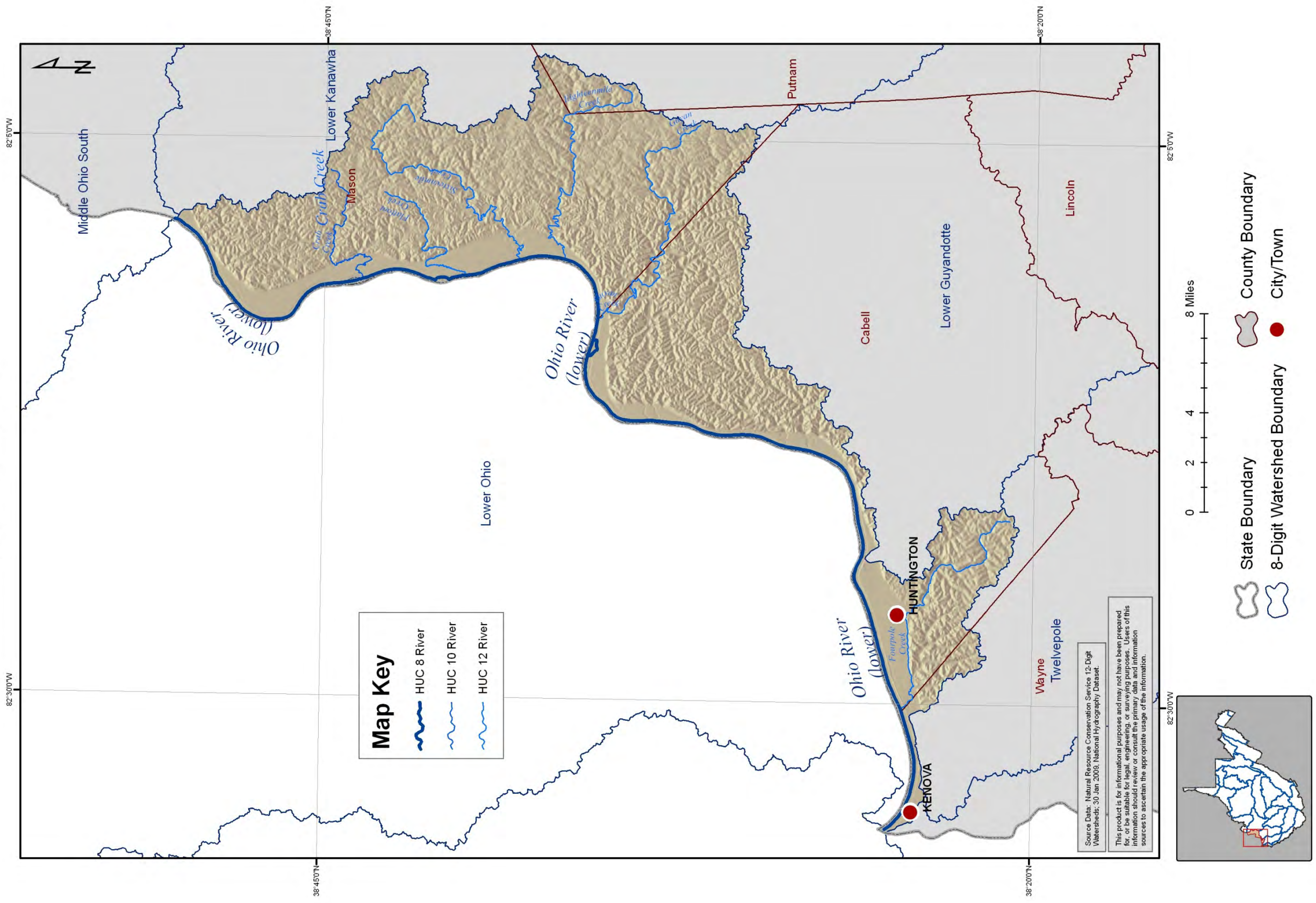
Lower Ohio HUC-8 Watershed

Documented Springs



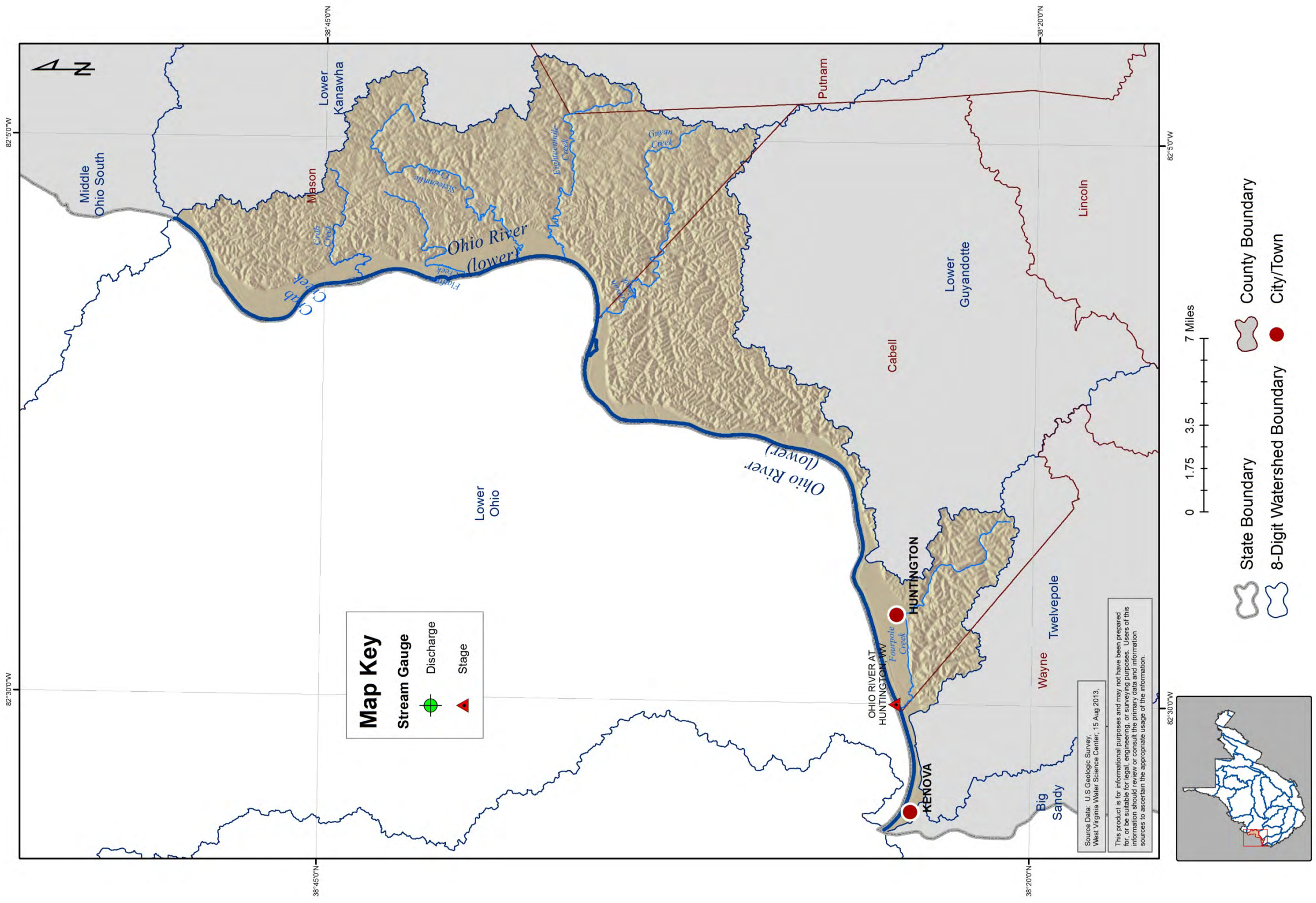
Lower Ohio HUC-8 Watershed

Stream Connections



Lower Ohio HUC-8 Watershed

Stream Gauges



Map Key

Stream Gauge

- Discharge (Green circle with vertical line)
- Stage (Red triangle)

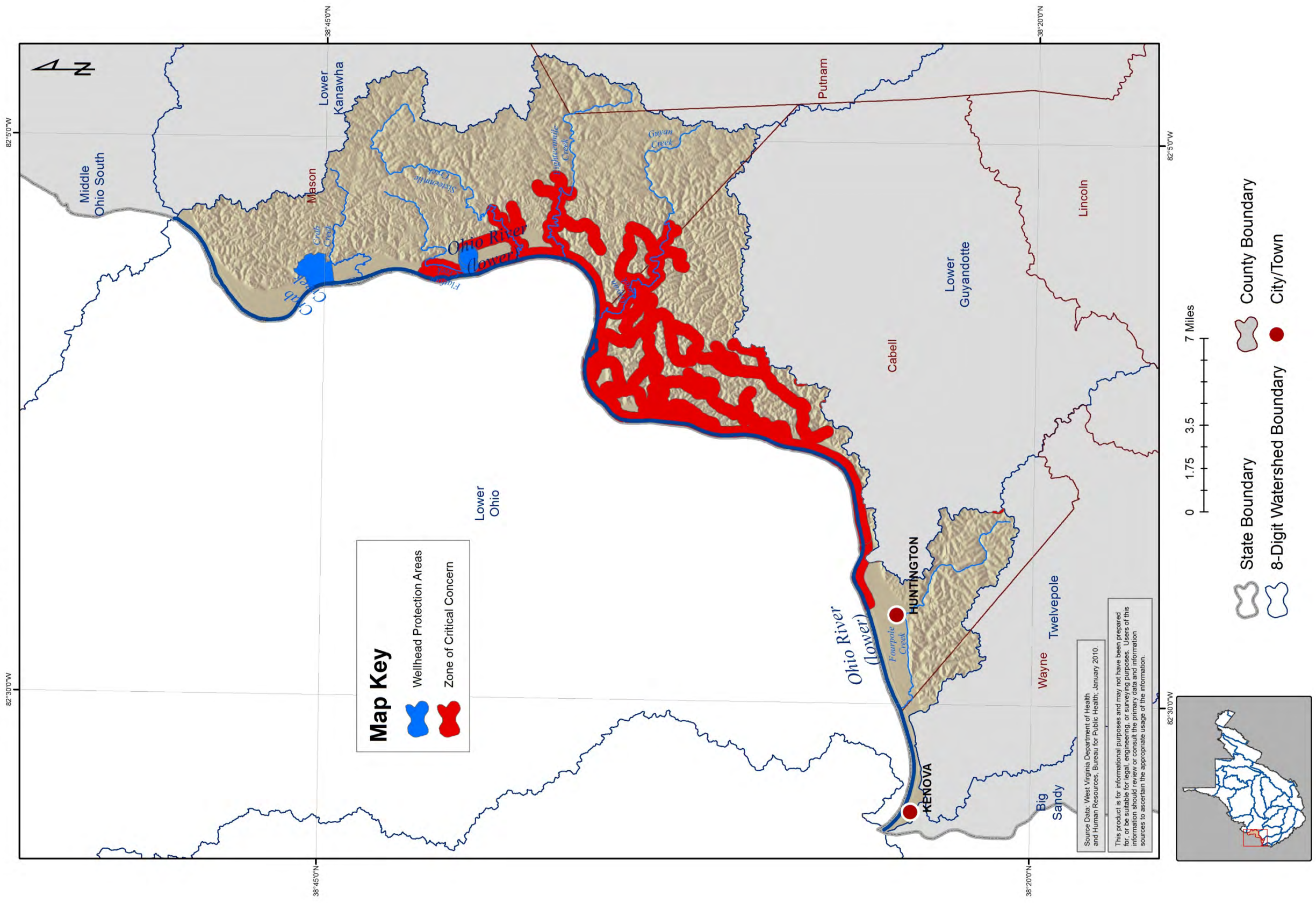
Source Data: U.S. Geologic Survey, West Virginia Water Science Center, 15 Aug 2013.

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- State Boundary (Grey outline)
- 8-Digit Watershed Boundary (Blue outline)
- County Boundary (Red outline)
- City/Town (Red dot)

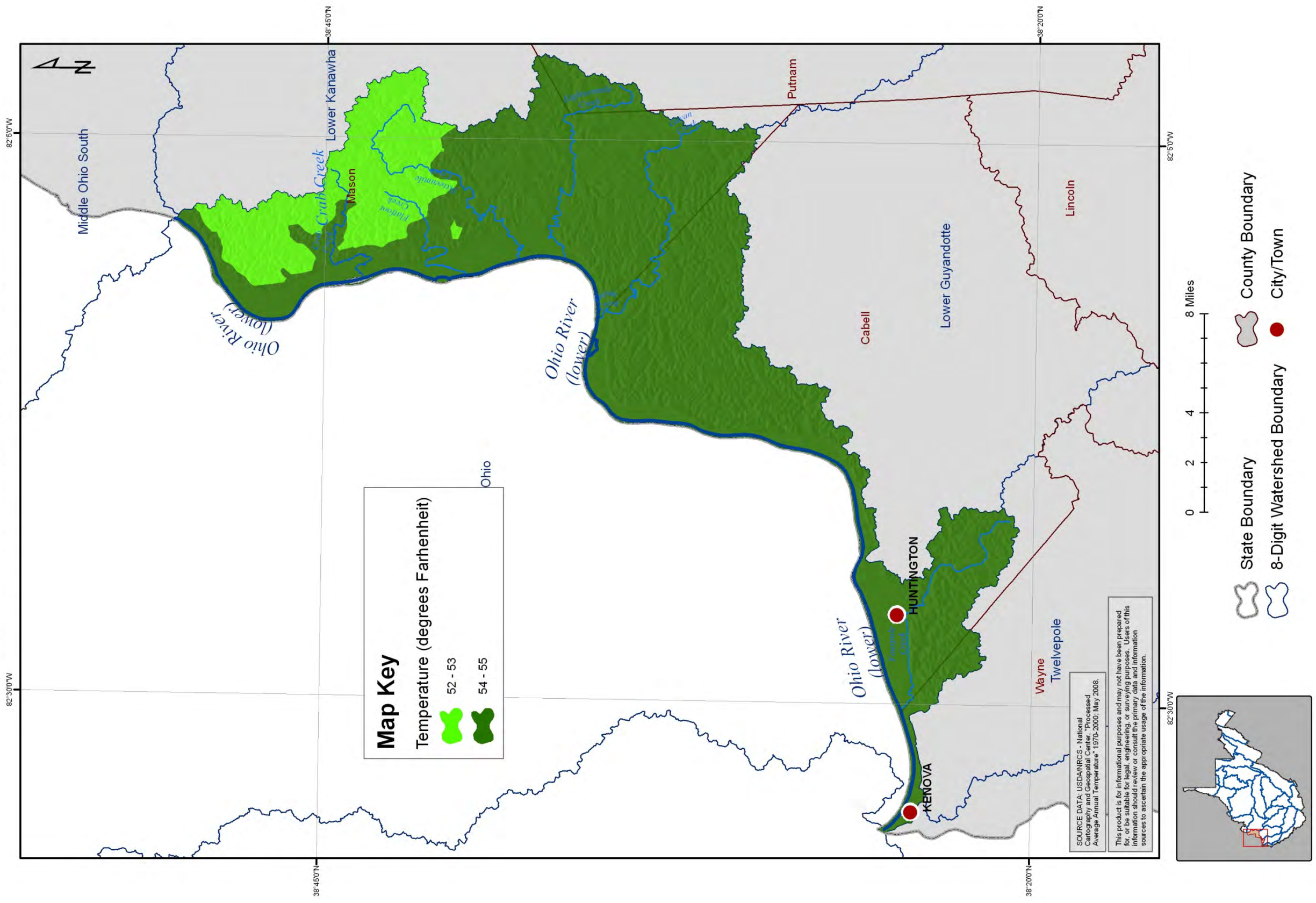
Lower Ohio HUC-8 Watershed

Source Water Assessment and Wellhead Protection Programs



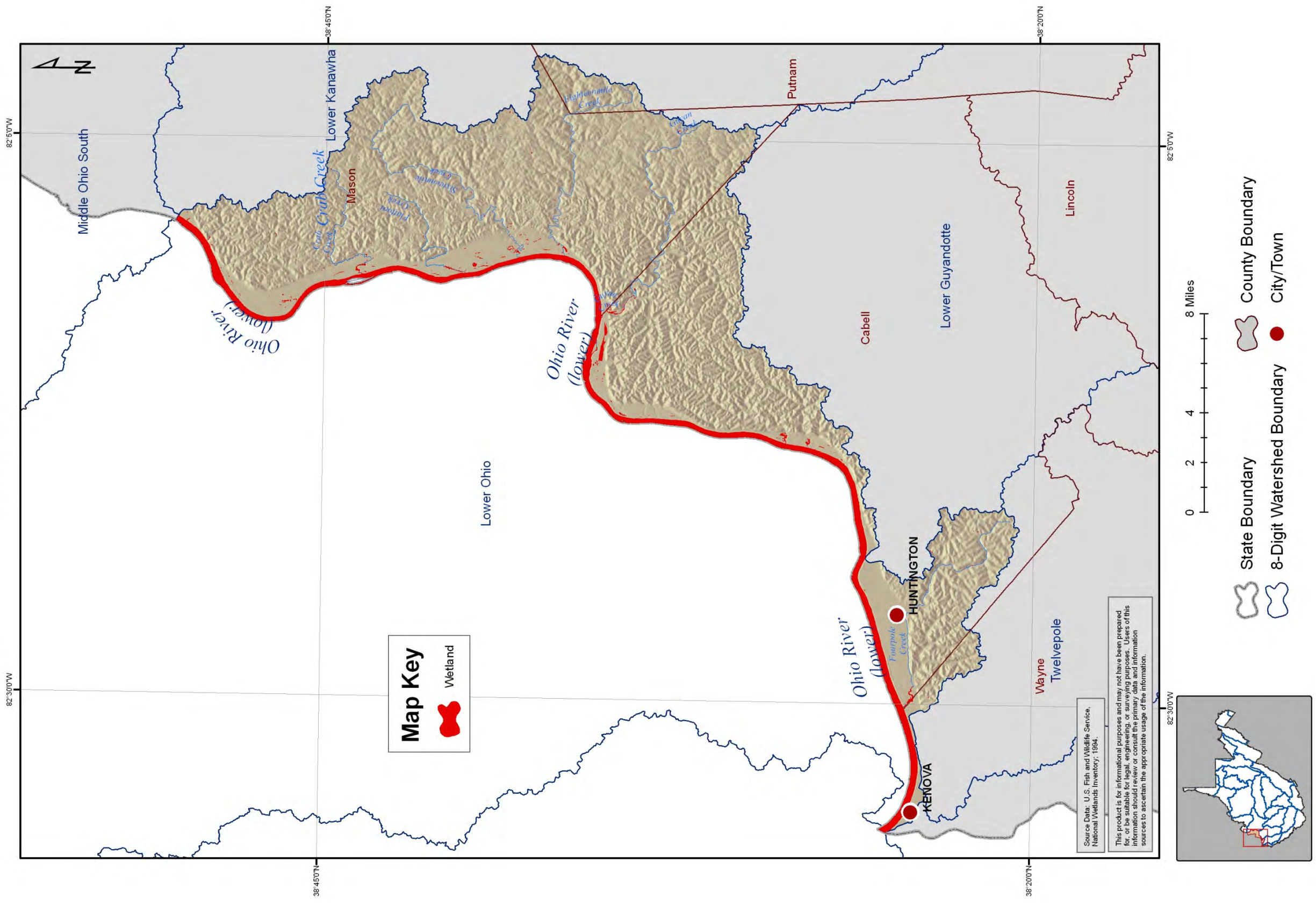
Lower Ohio HUC-8 Watershed

Average Annual Temperature (1971-2000)



Lower Ohio HUC-8 Watershed

Wetlands



Map Key

- Wetland

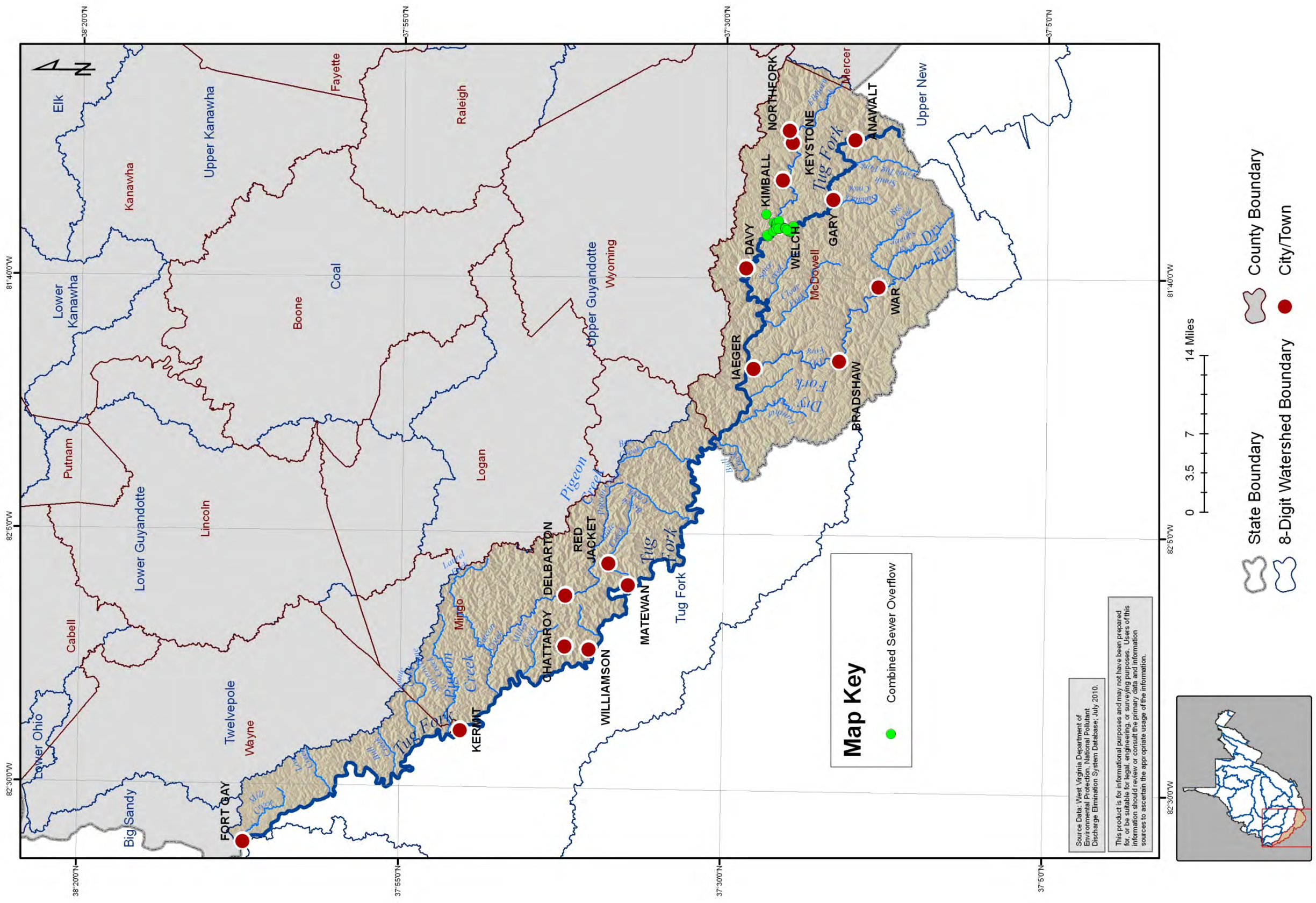
Source Data: U.S. Fish and Wildlife Service, National Wetlands Inventory, 1994.

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- 8-Digit Watershed Boundary
- County Boundary
- City/Town

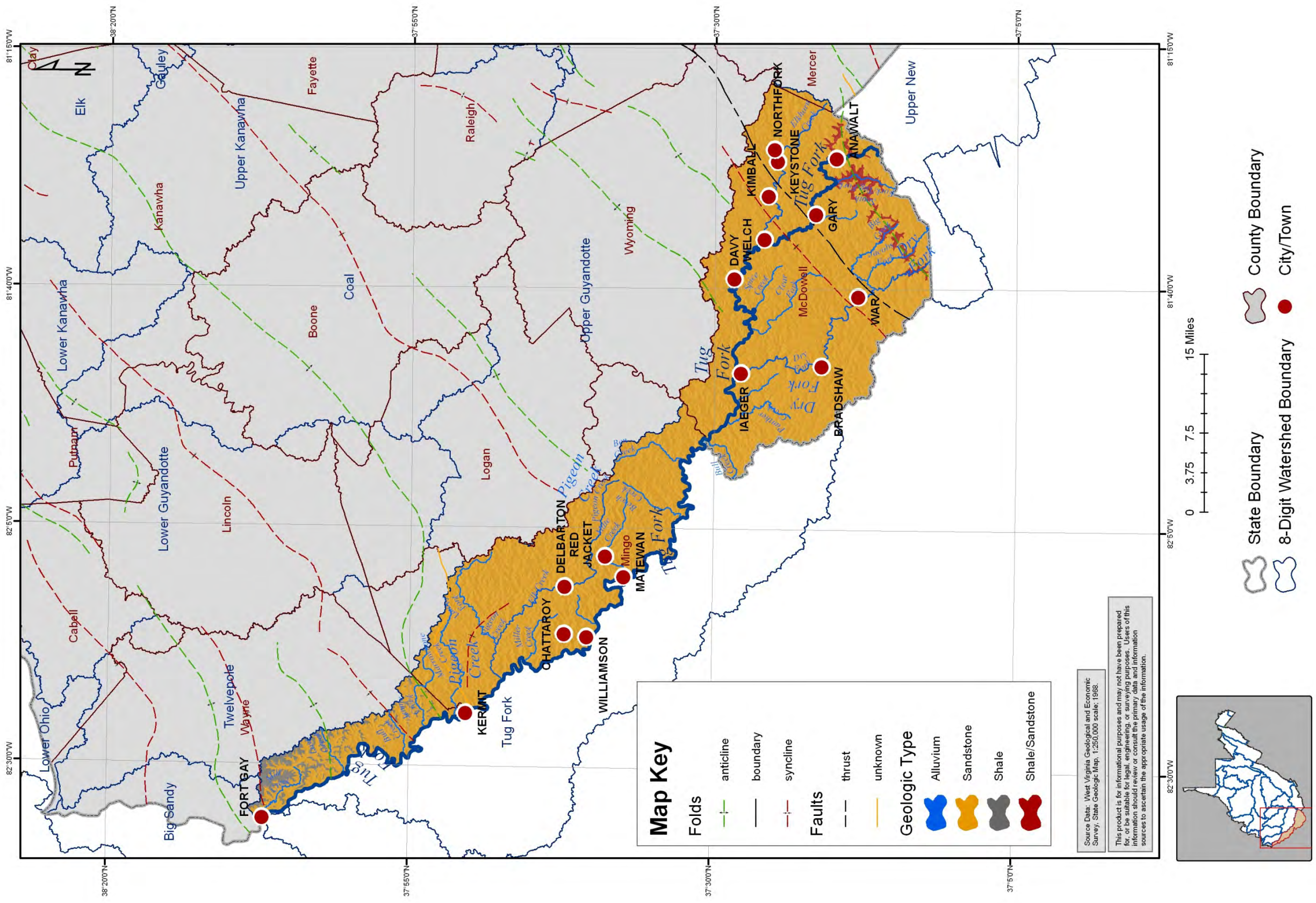
Tug Fork HUC-8 Watershed

Combined Sewer Overflows



Tug Fork HUC-8 Watershed

Surface Geology



Map Key

Folds

- anticline
- boundary
- syncline

Faults

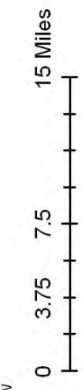
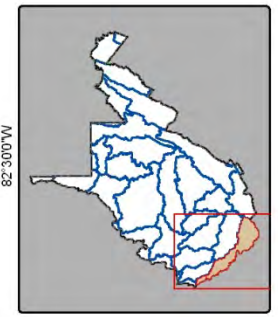
- thrust
- unknown

Geologic Type

- Alluvium
- Sandstone
- Shale
- Shale/Sandstone

Source Data: West Virginia Geological and Economic Survey, State Geologic Map, 1:250,000 scale, 1988.

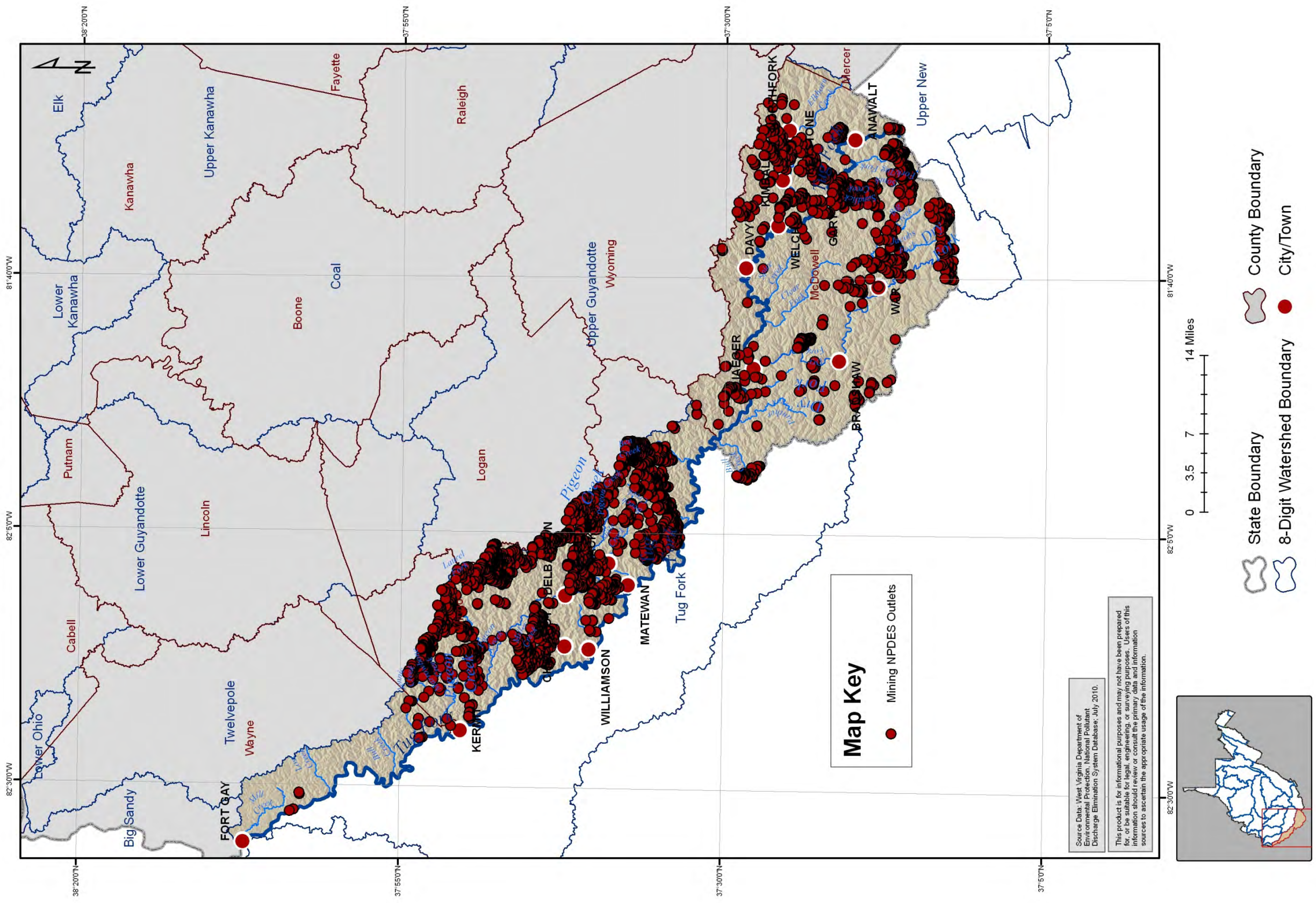
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- State Boundary
- 8-Digit Watershed Boundary
- County Boundary
- City/Town

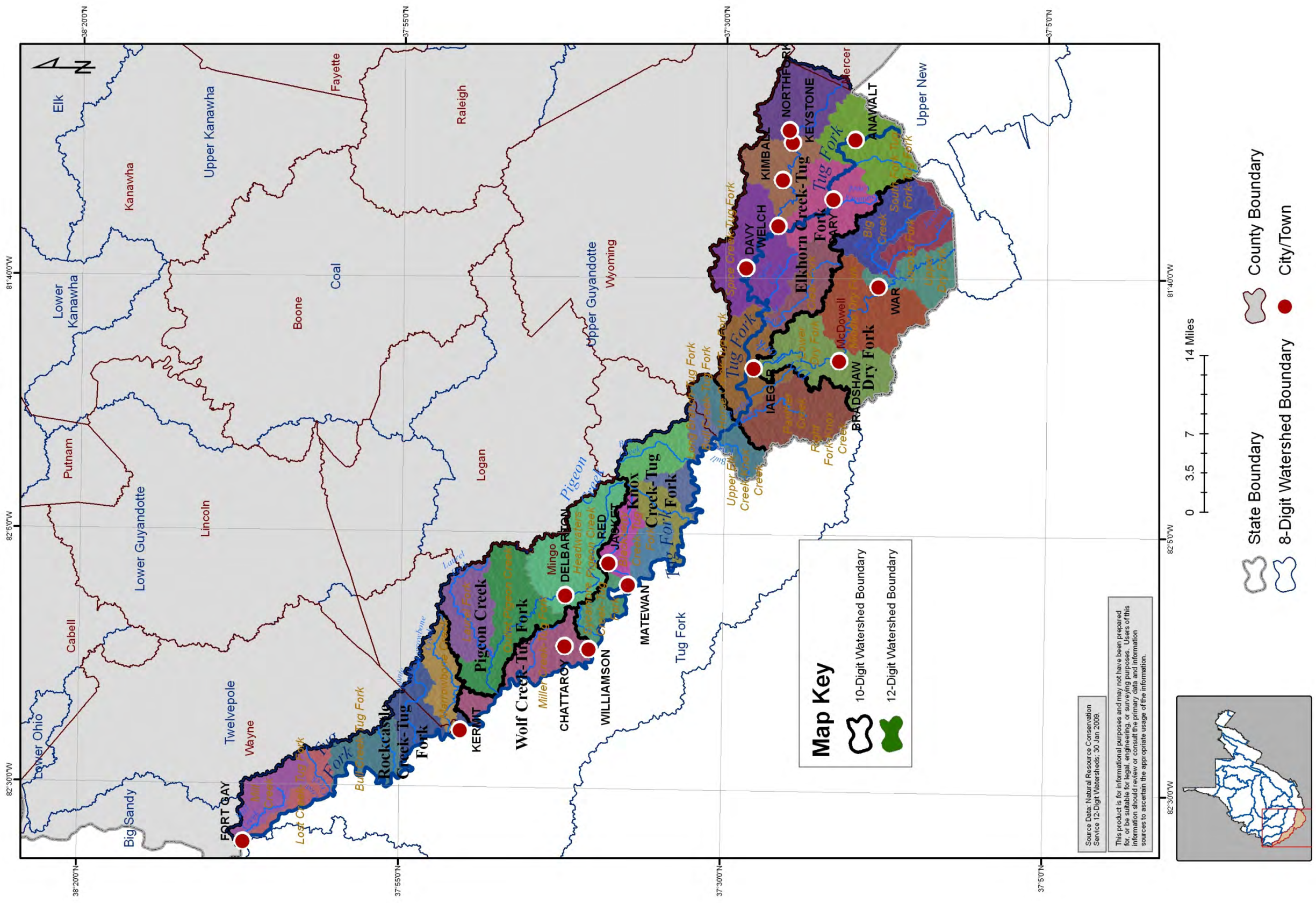
Tug Fork HUC-8 Watershed

Mining Related NPDES Outlets



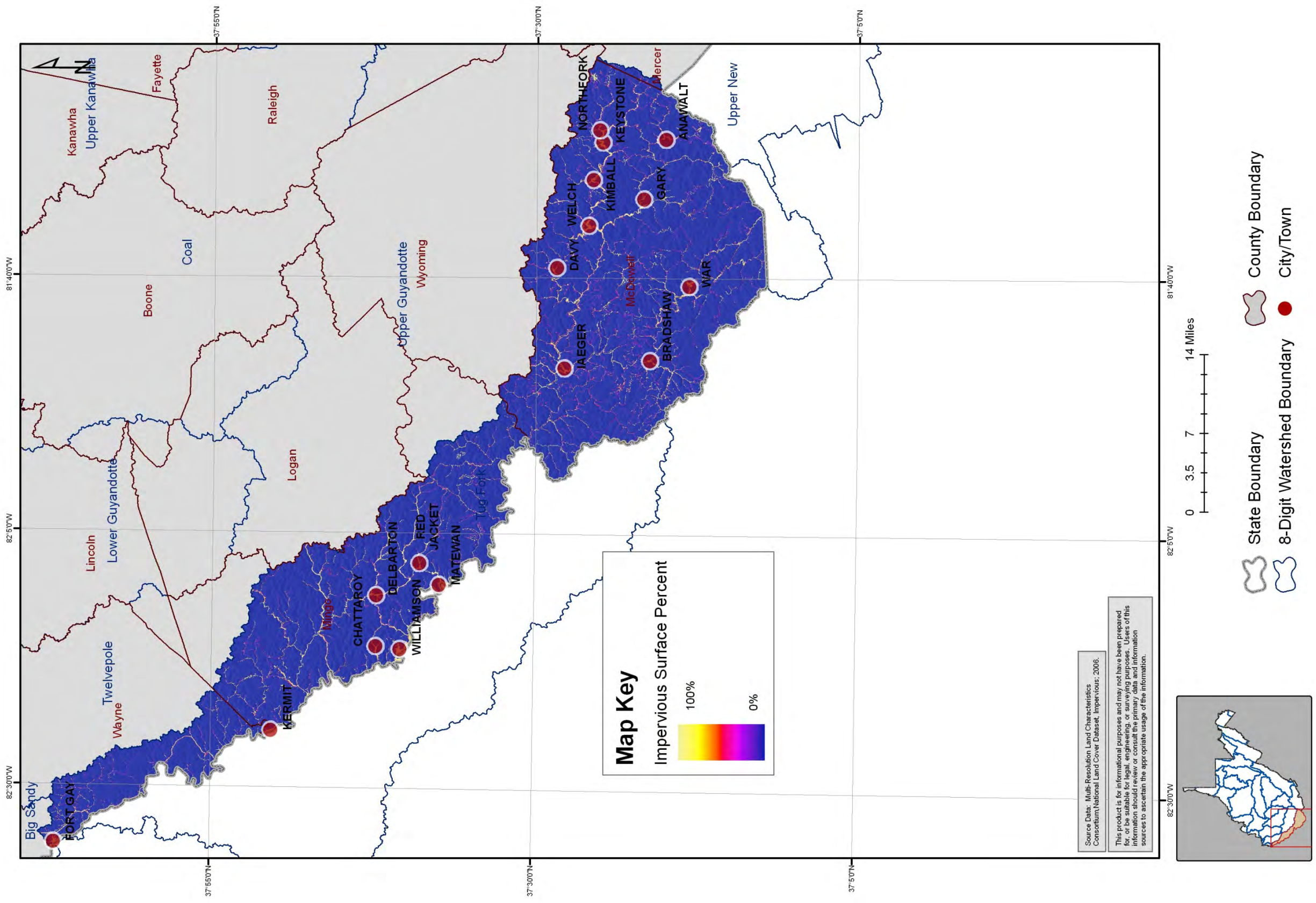
Tug Fork HUC-8 Watershed

HUC 10 and HUC 12 Watersheds



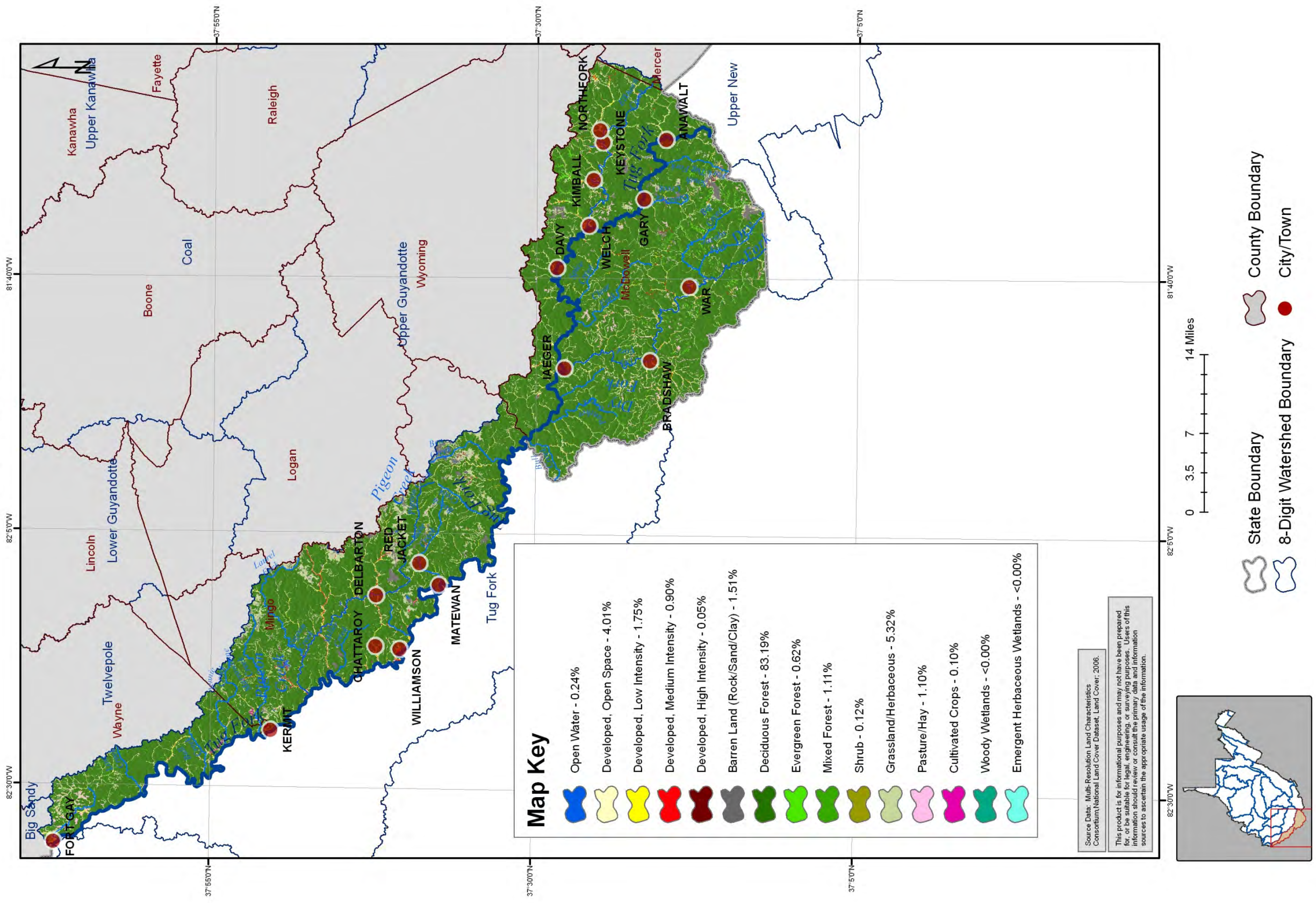
Tug Fork HUC-8 Watershed

2006 Impervious



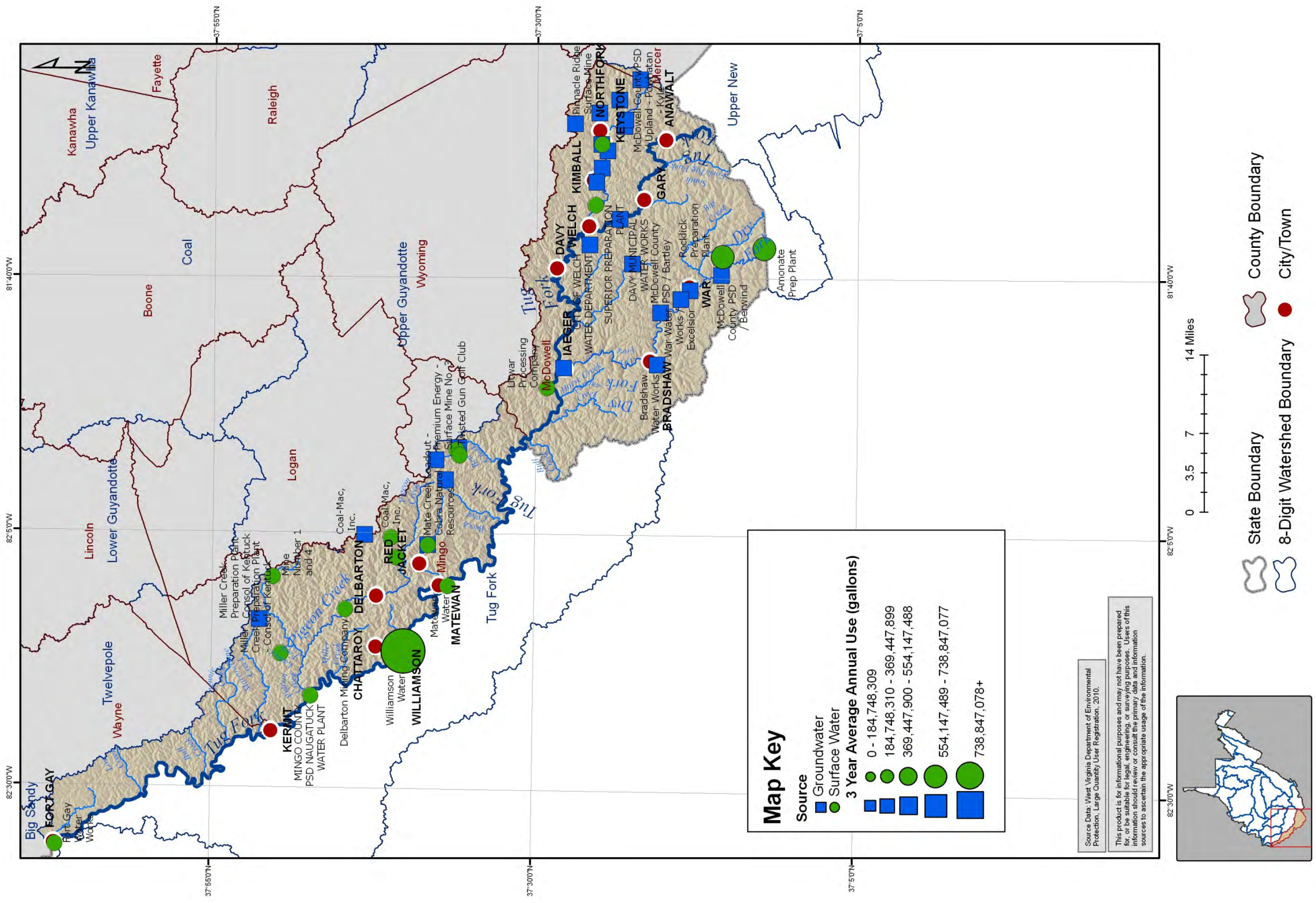
Tug Fork HUC-8 Watershed

2006 Land Cover



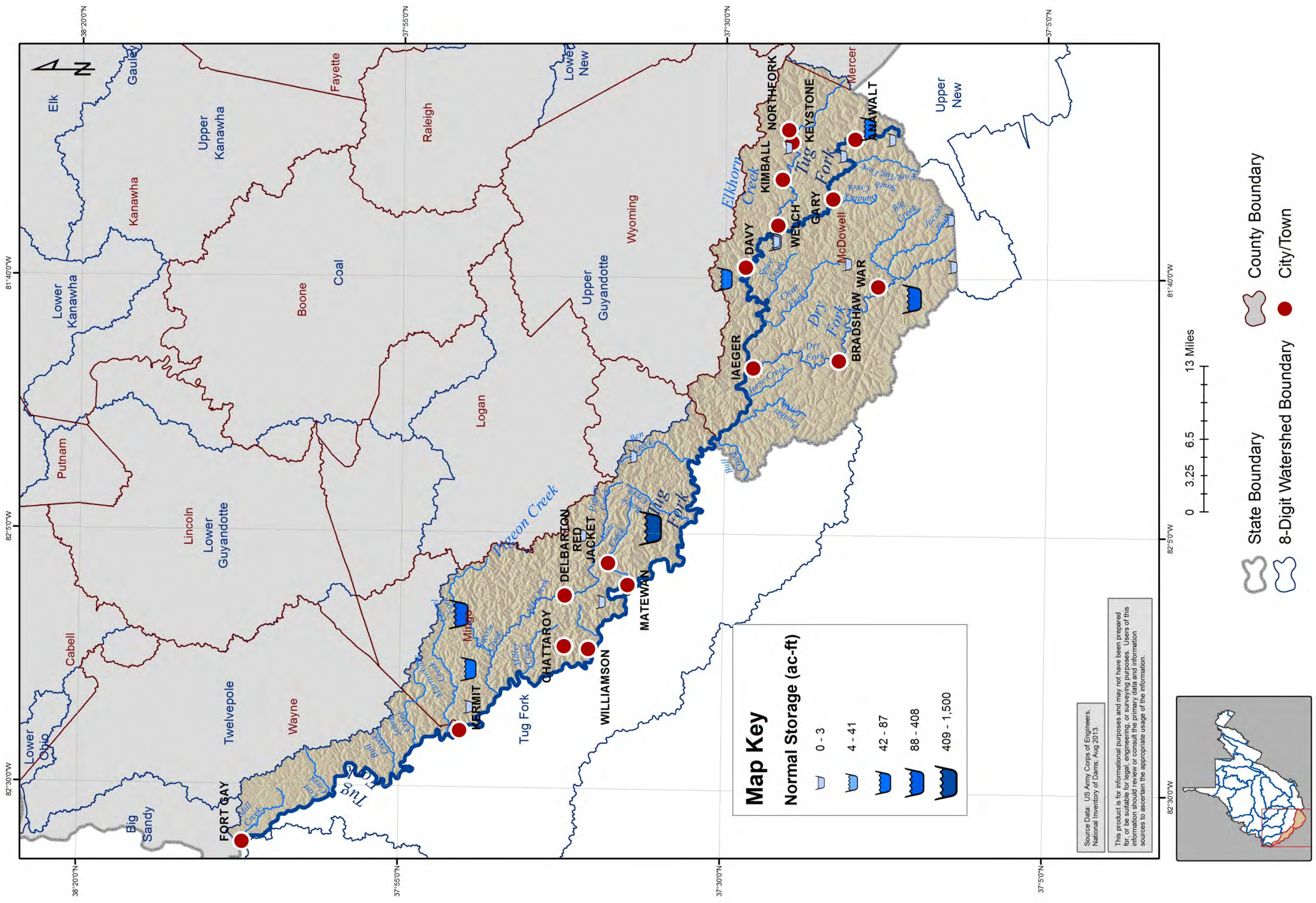
Tug Fork HUC-8 Watershed

Large Quantity Users



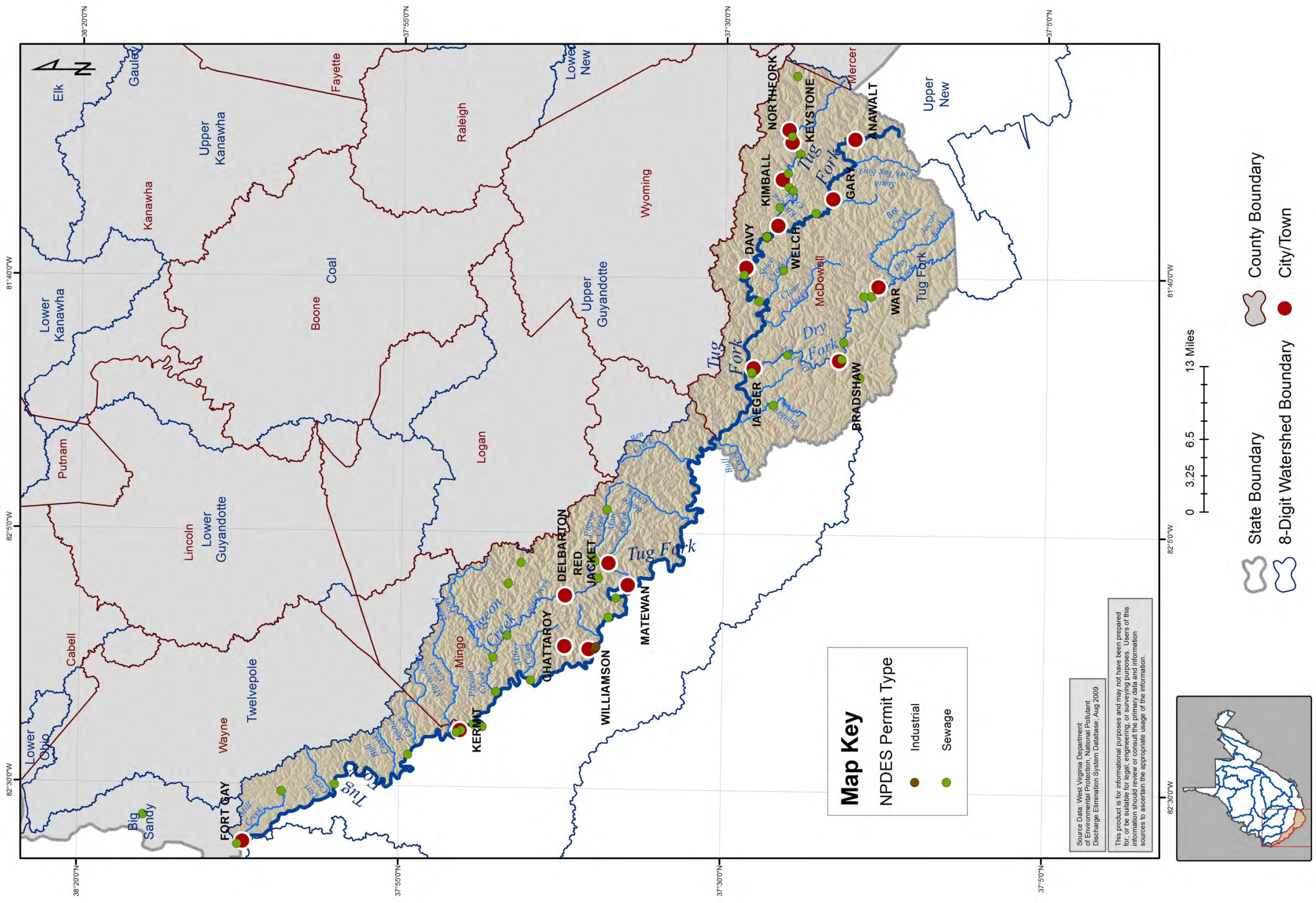
Tug Fork HUC-8 Watershed

Permitted Dams



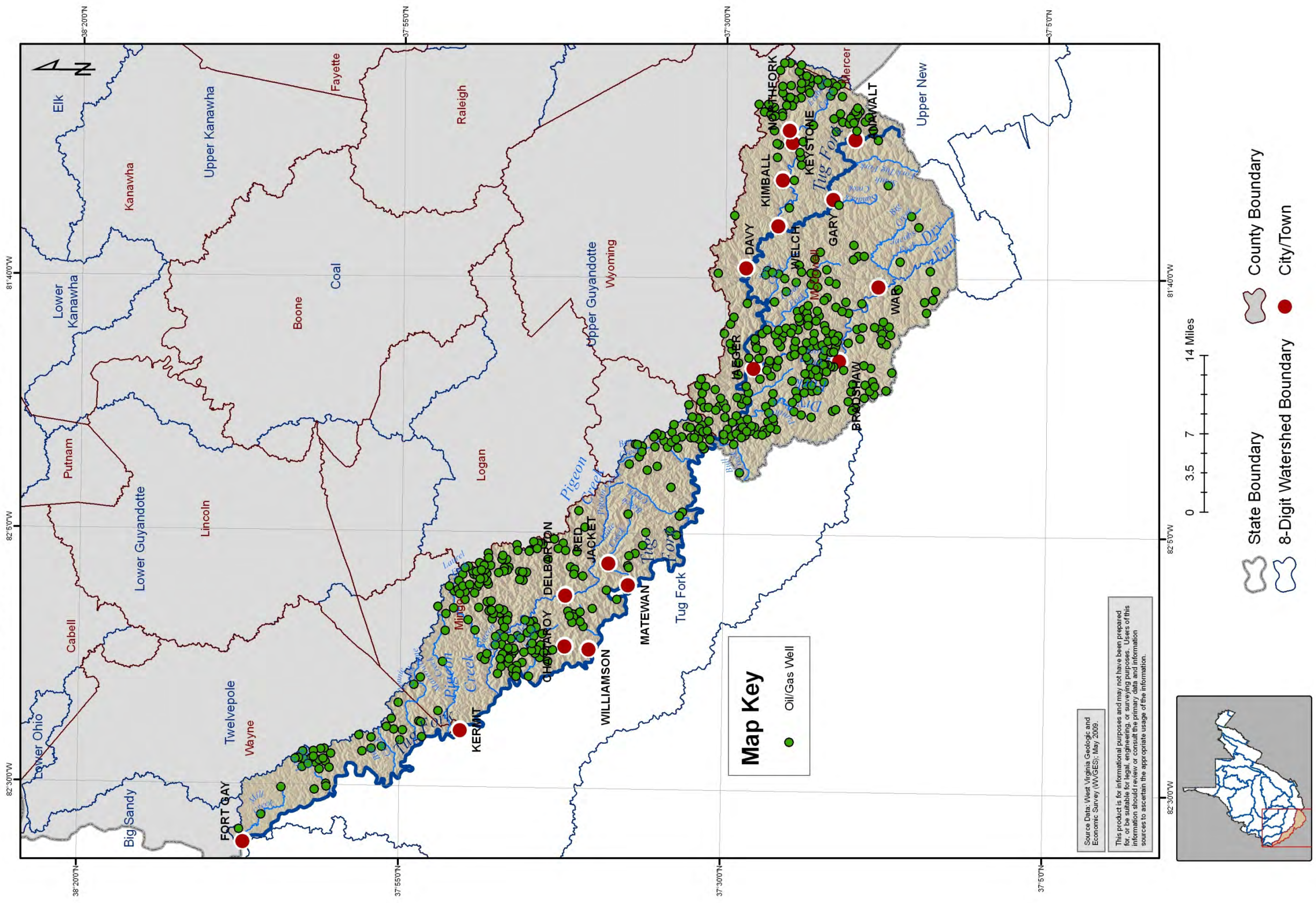
Tug Fork HUC-8 Watershed

Non-Mining NPDES Outlets



Tug Fork HUC-8 Watershed

Well Logs with Gamma Rays and Water Shows

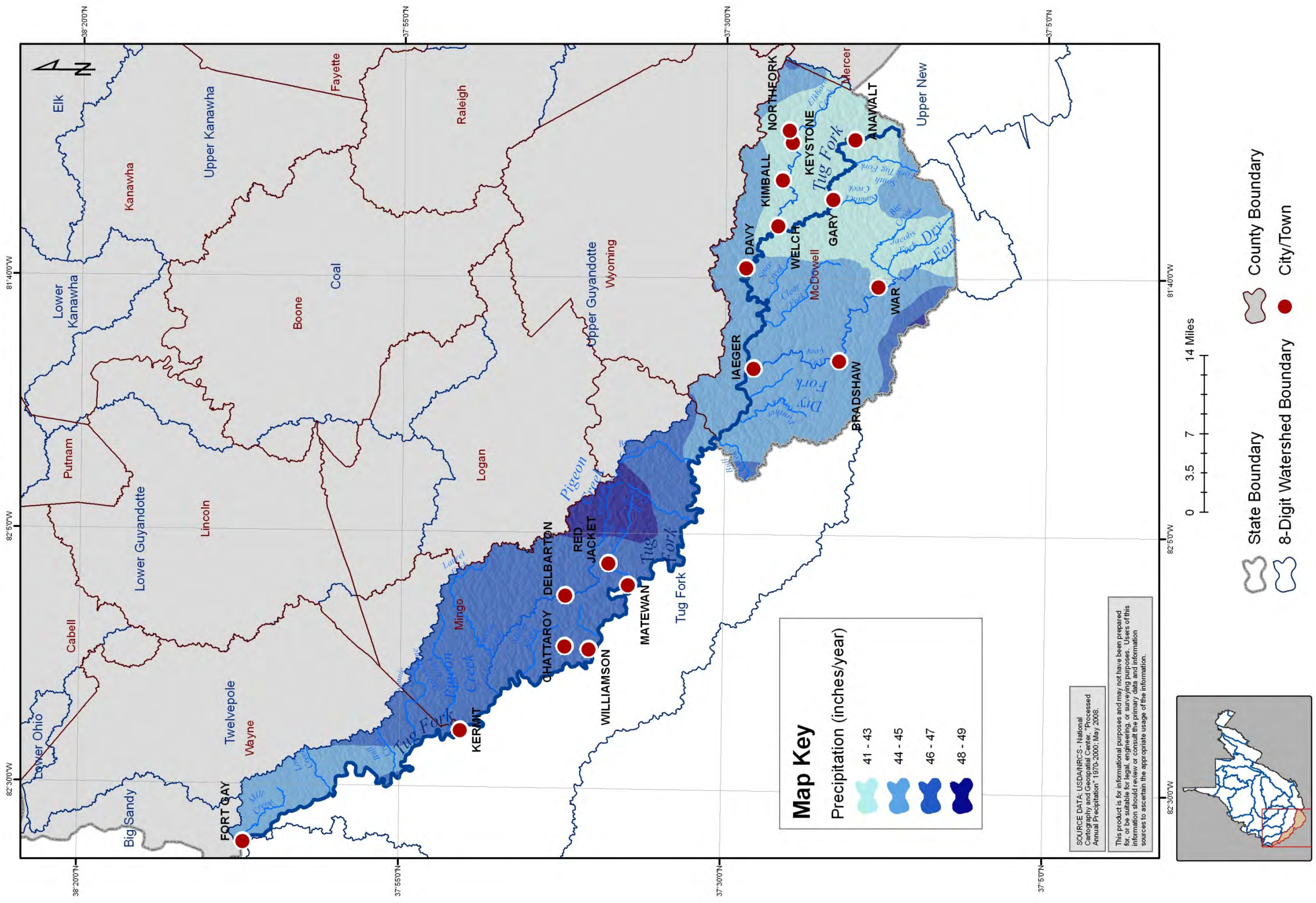


Source Data: West Virginia Geologic and Economic Survey (WVGES); May 2009.

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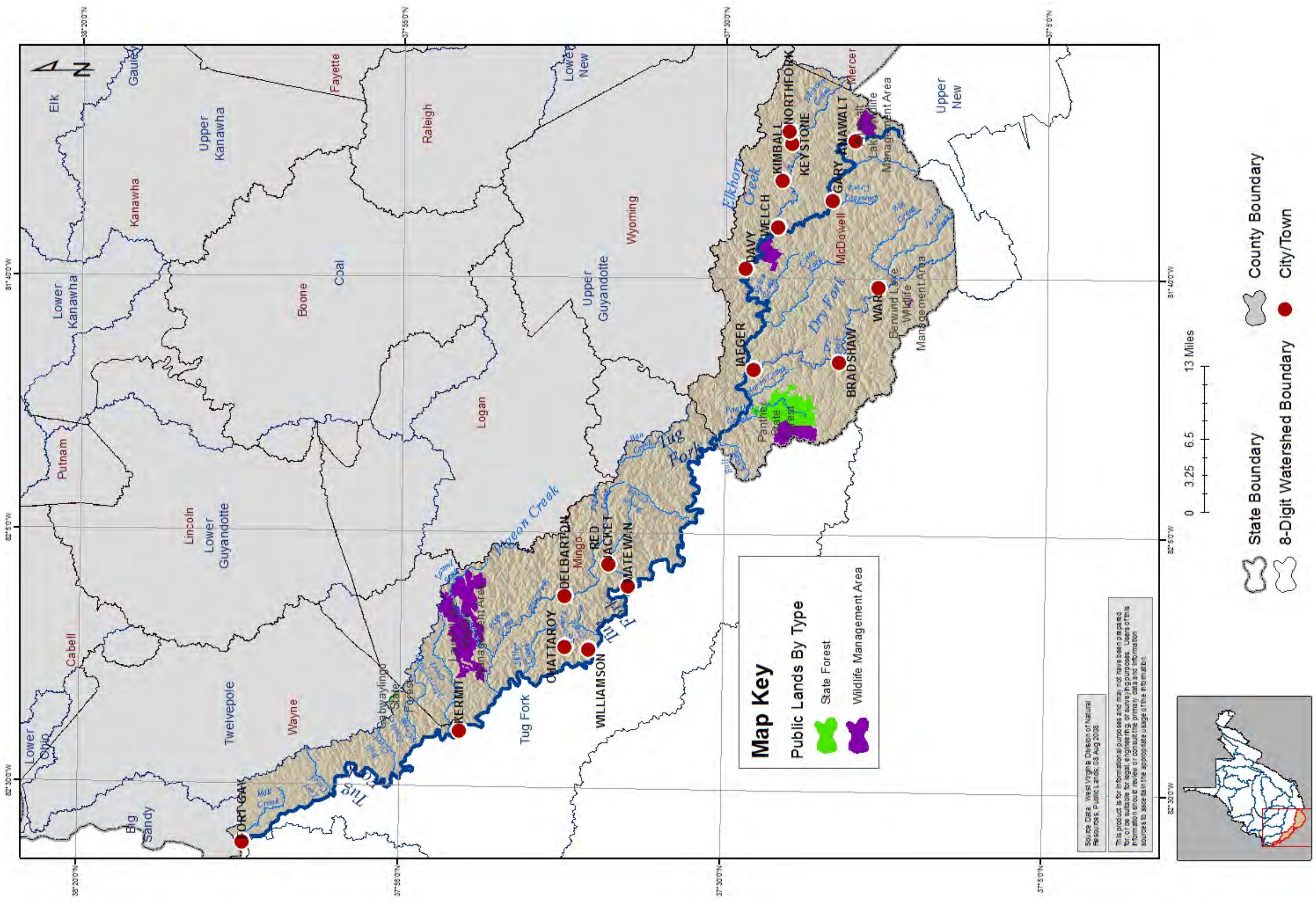
Tug Fork HUC-8 Watershed

Average Annual Precipitation (1971-2000)



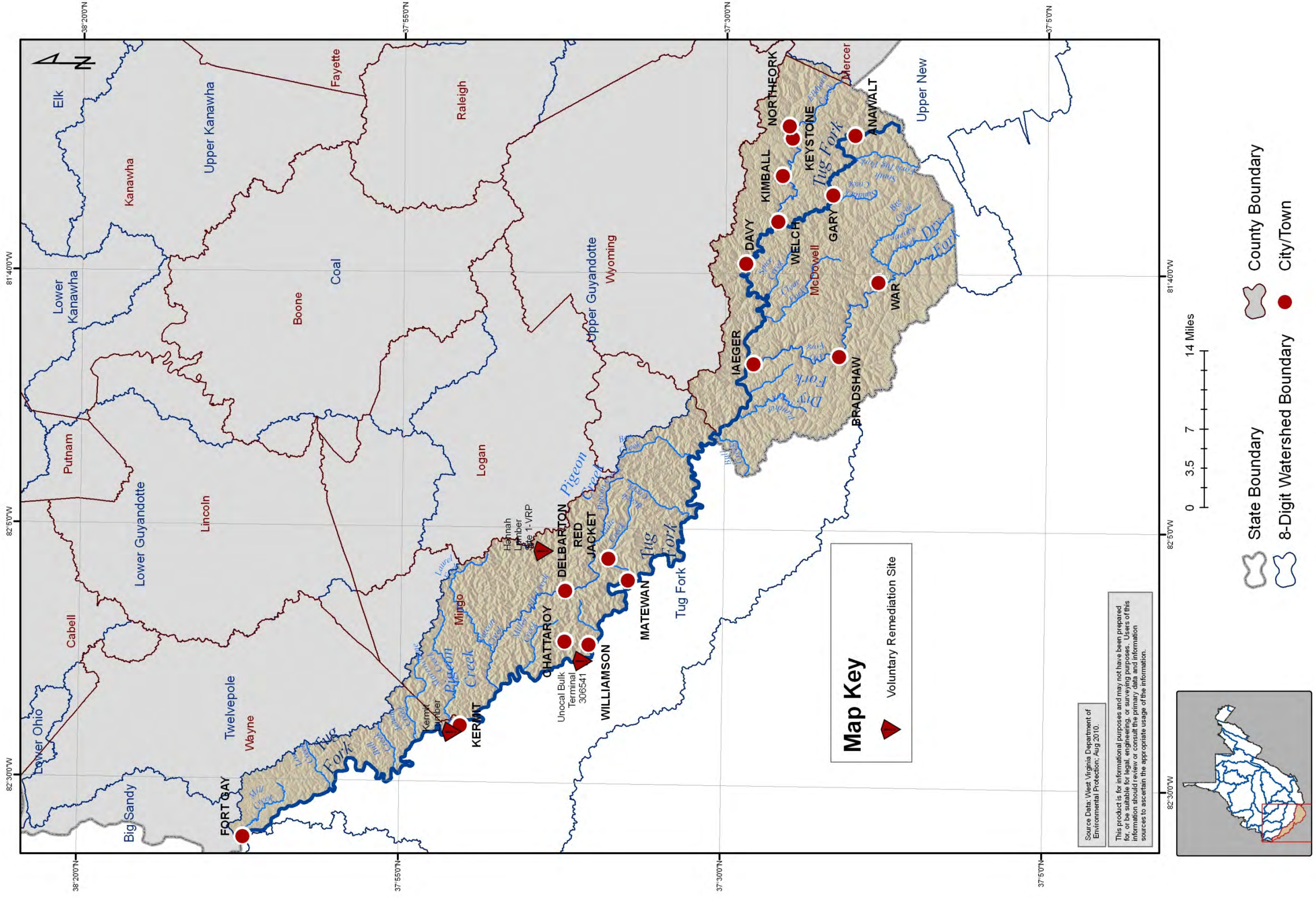
Tug Fork HUC-8 Watershed

Public Lands



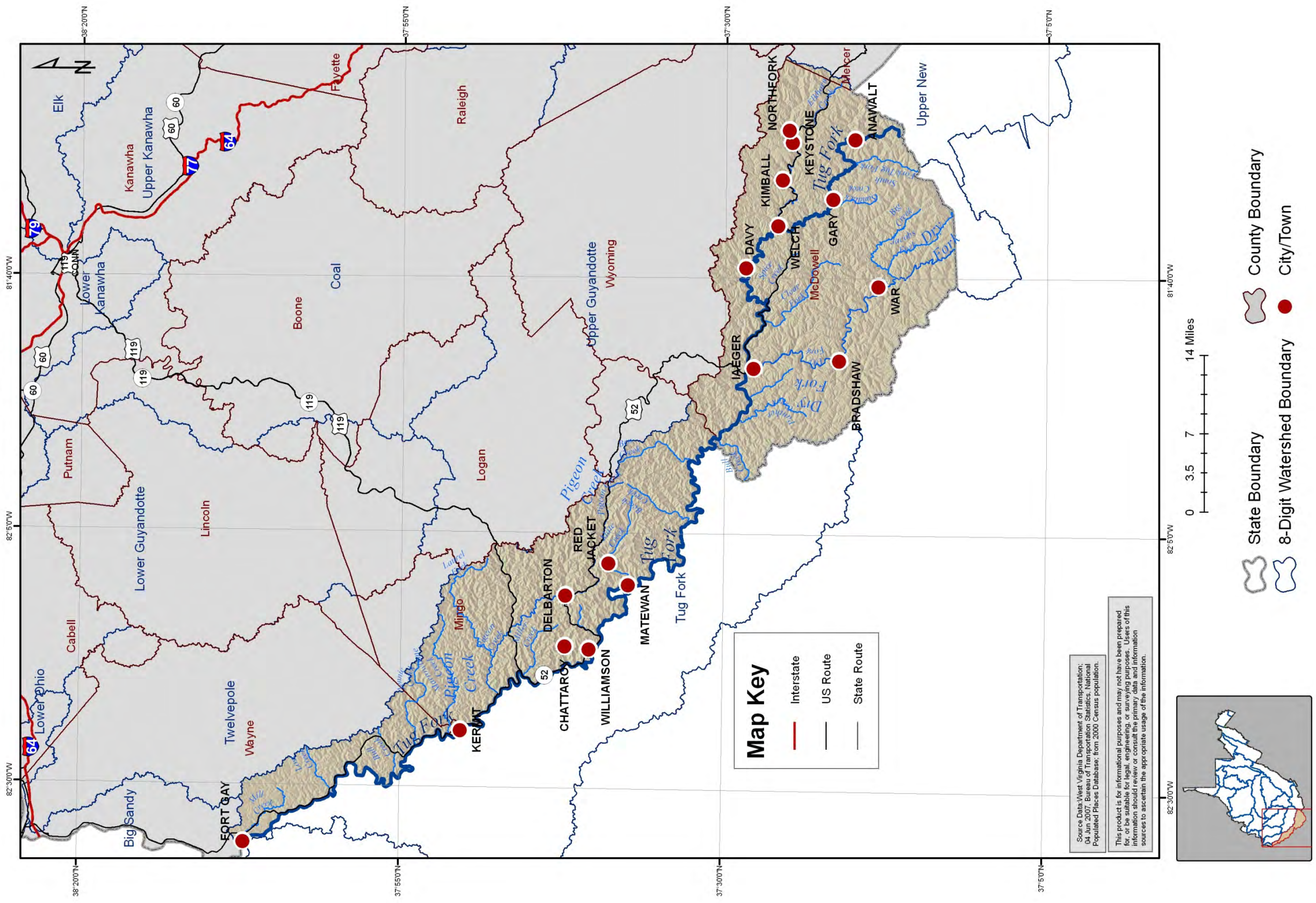
Tug Fork HUC-8 Watershed

Remediation Sites



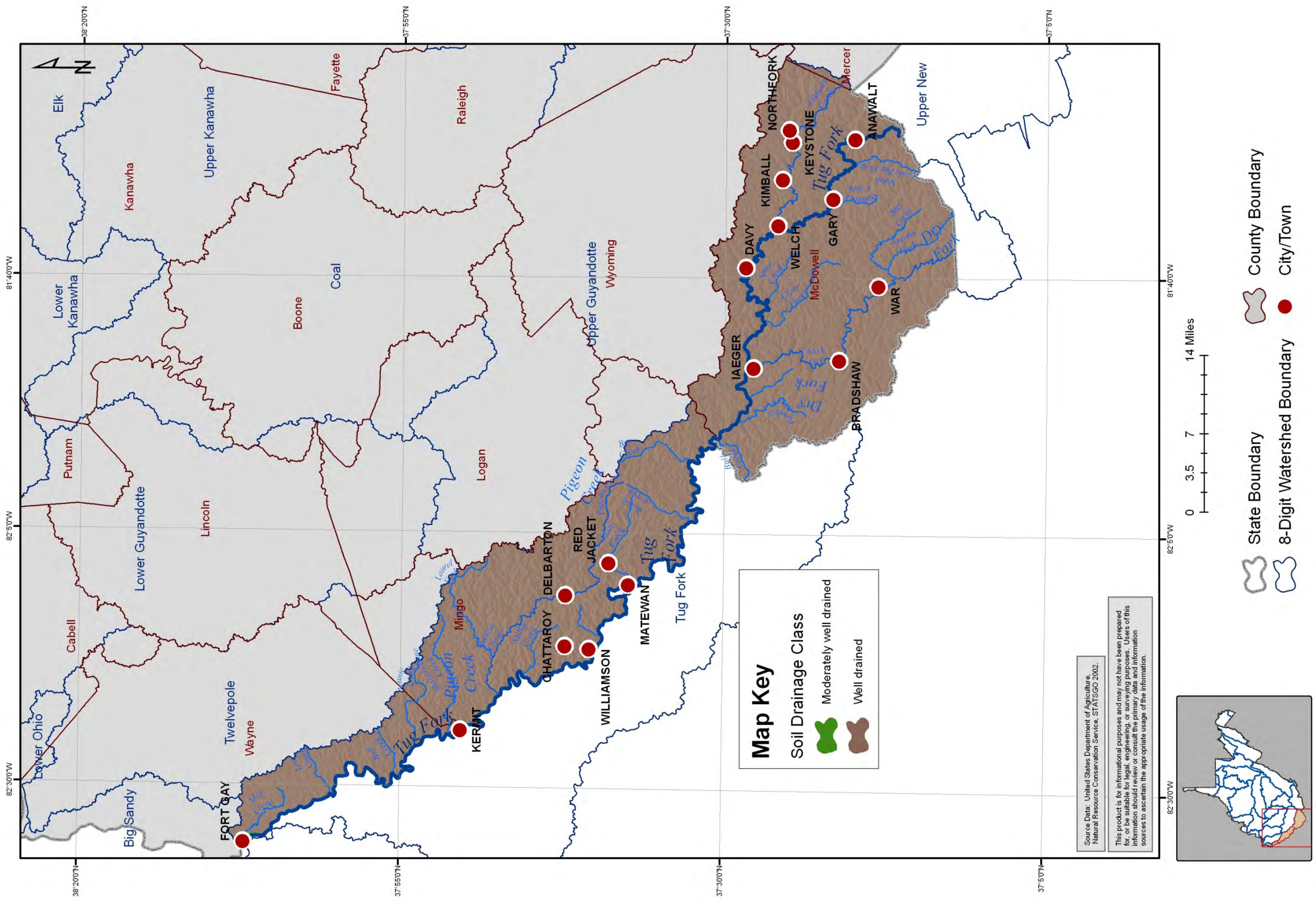
Tug Fork HUC-8 Watershed

Major Roads and Cities



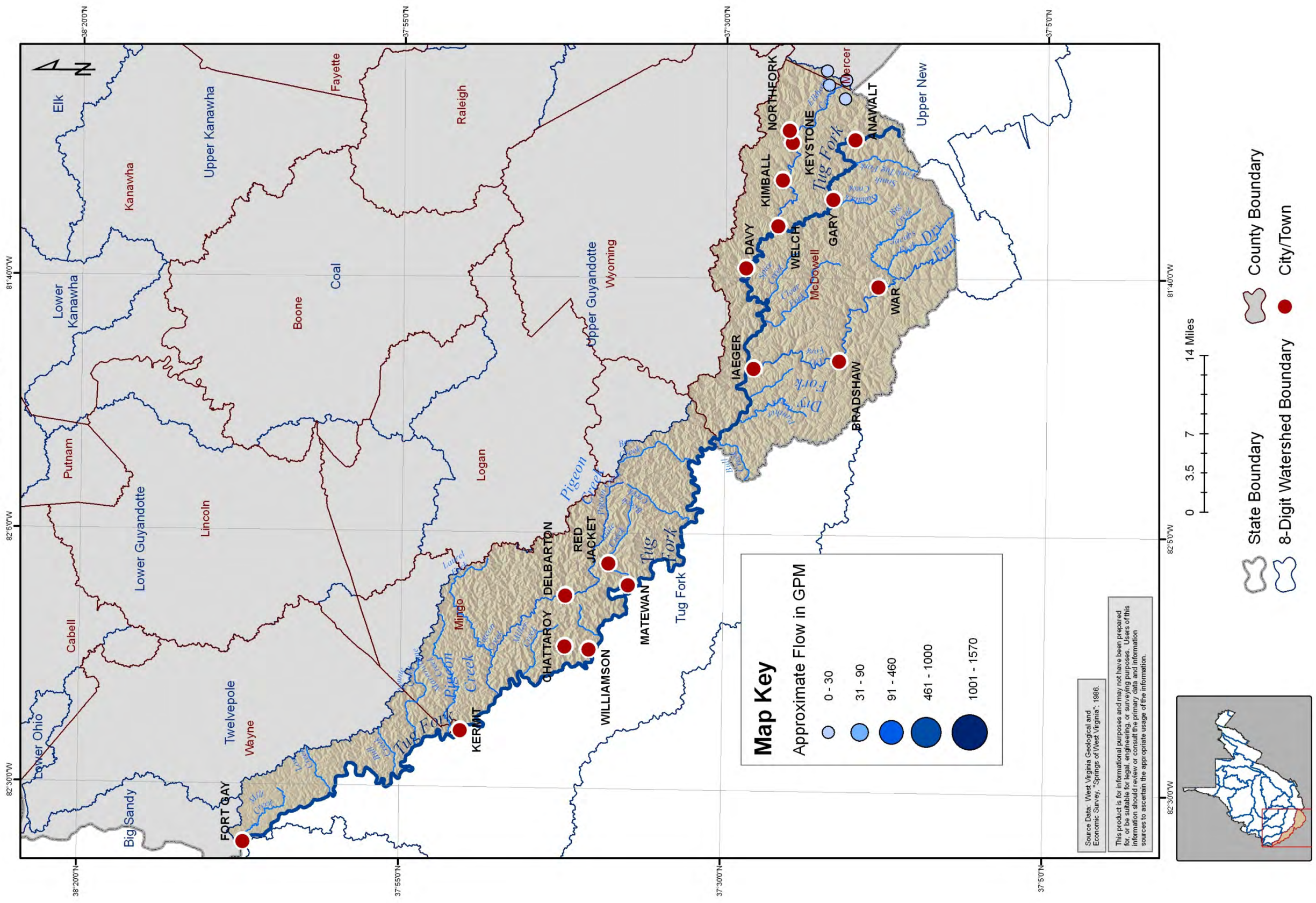
Tug Fork HUC-8 Watershed

Soil Drainage



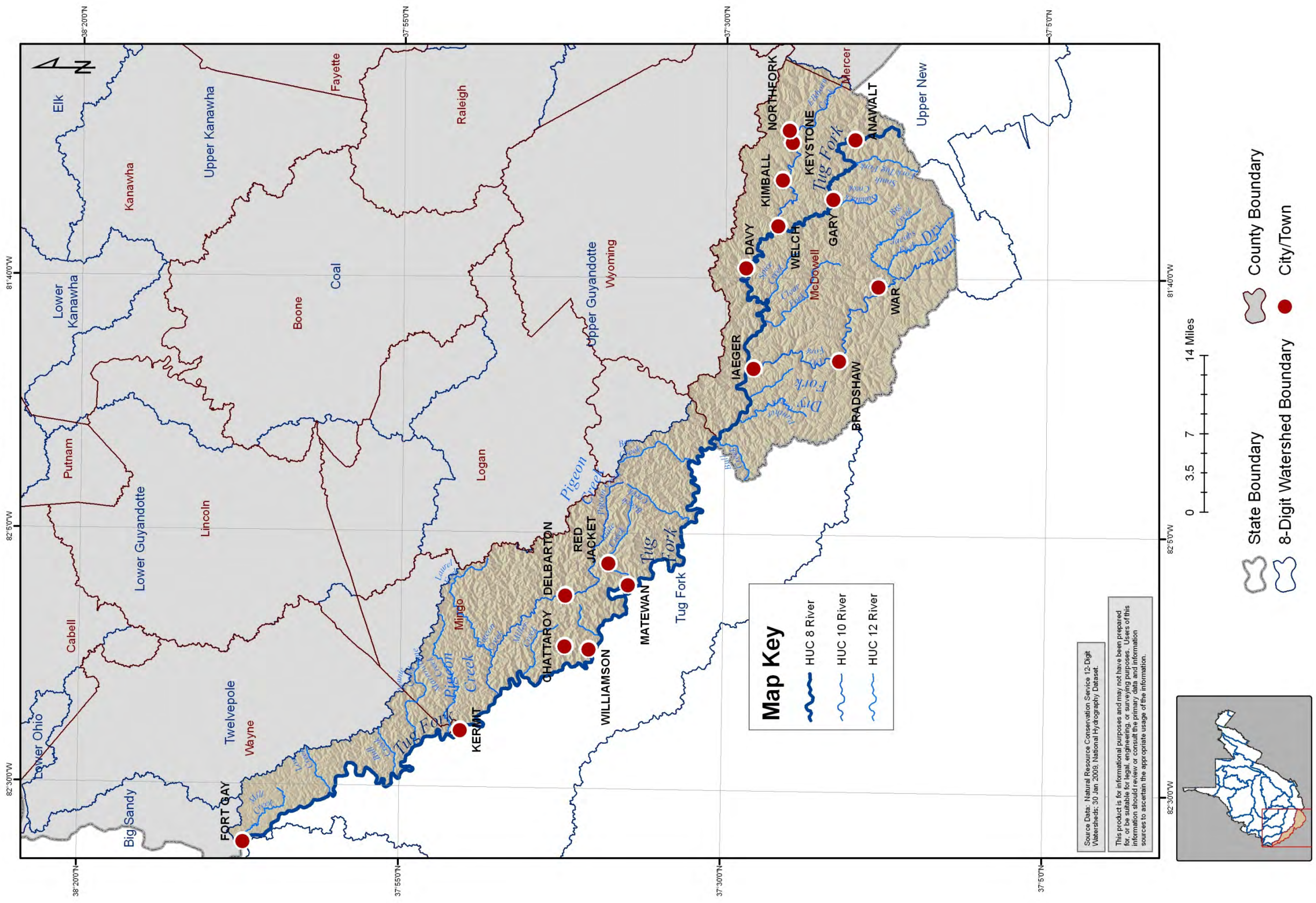
Tug Fork HUC-8 Watershed

Documented Springs



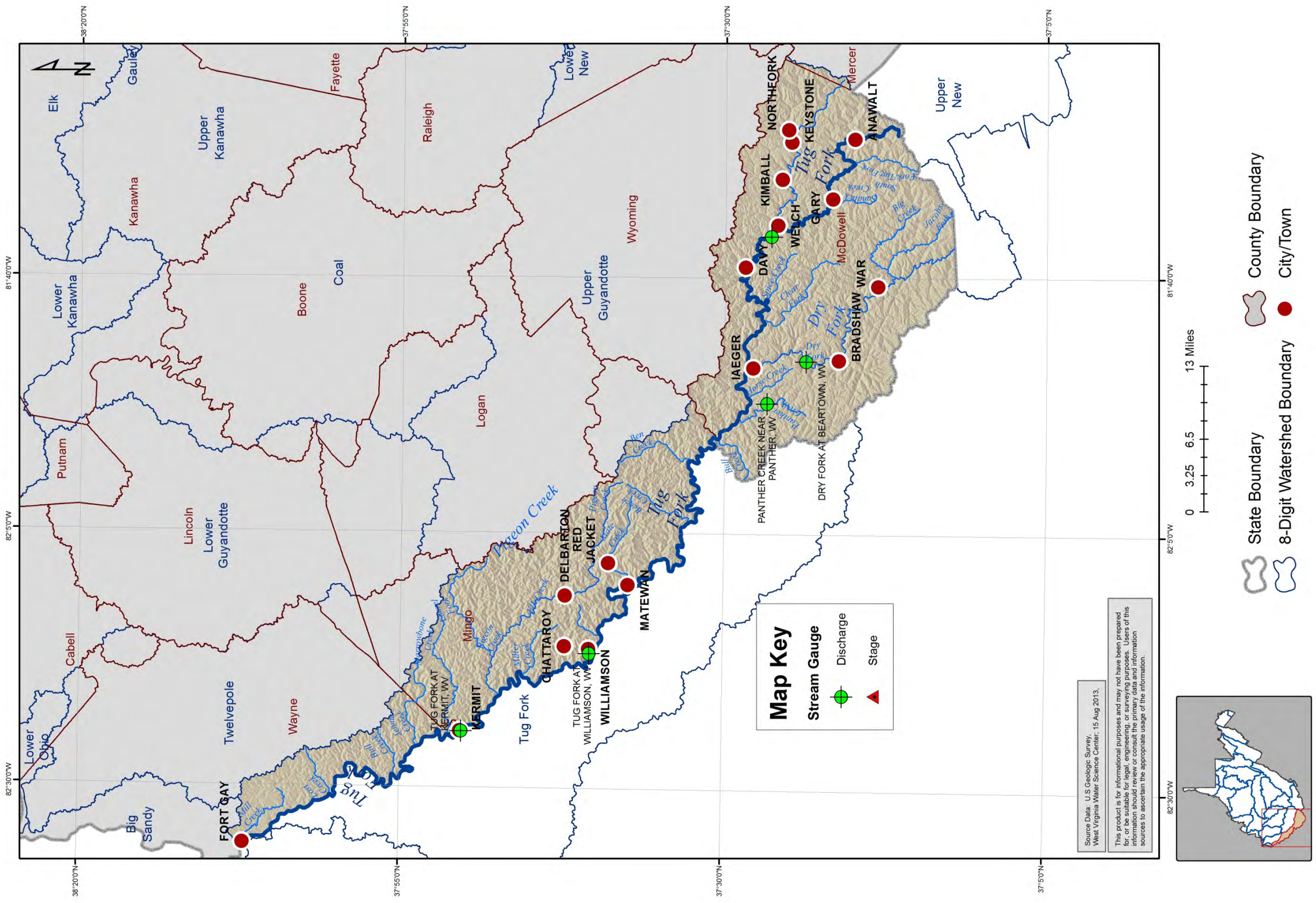
Tug Fork HUC-8 Watershed

Stream Connections



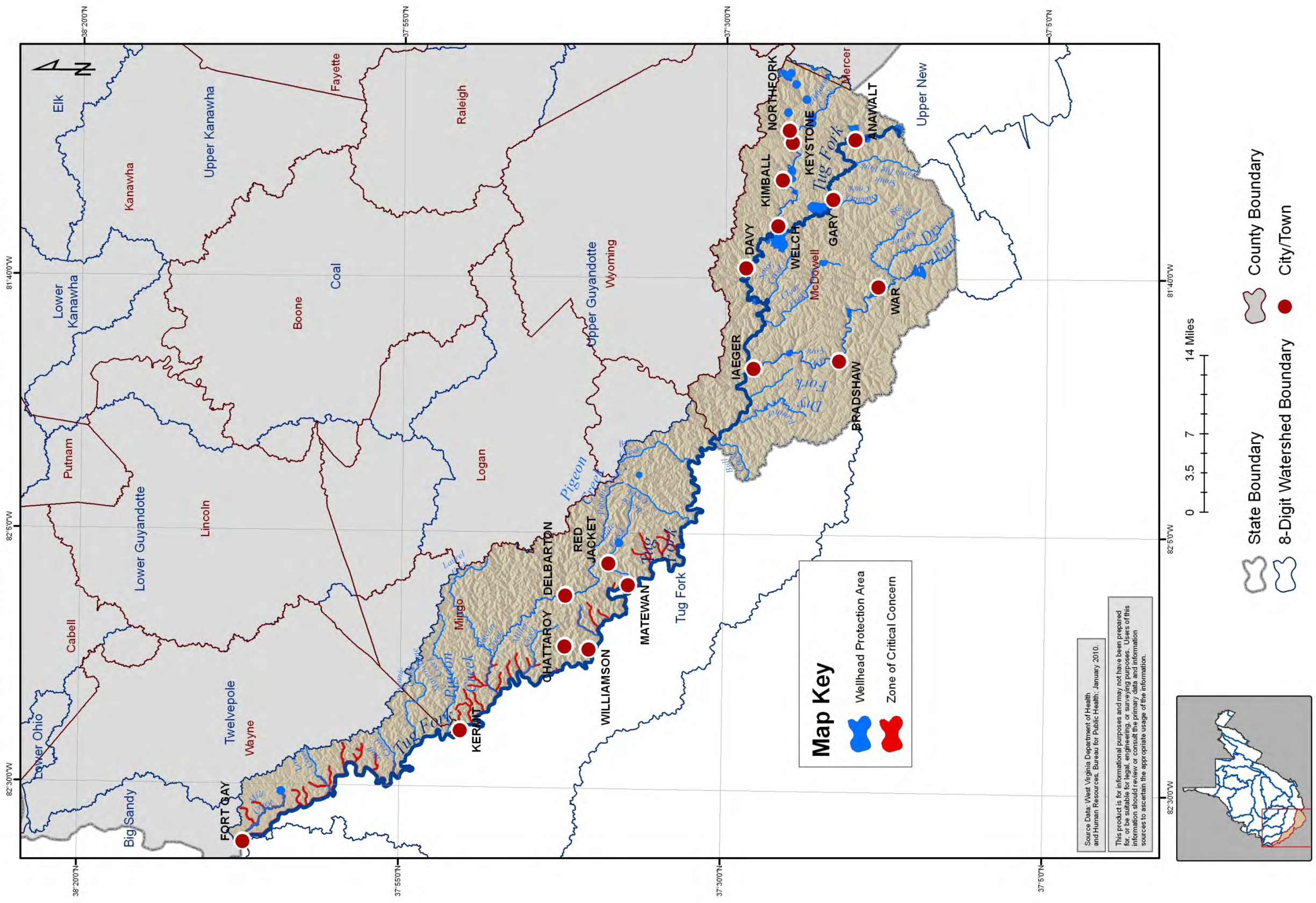
Tug Fork HUC-8 Watershed

Stream Gauges



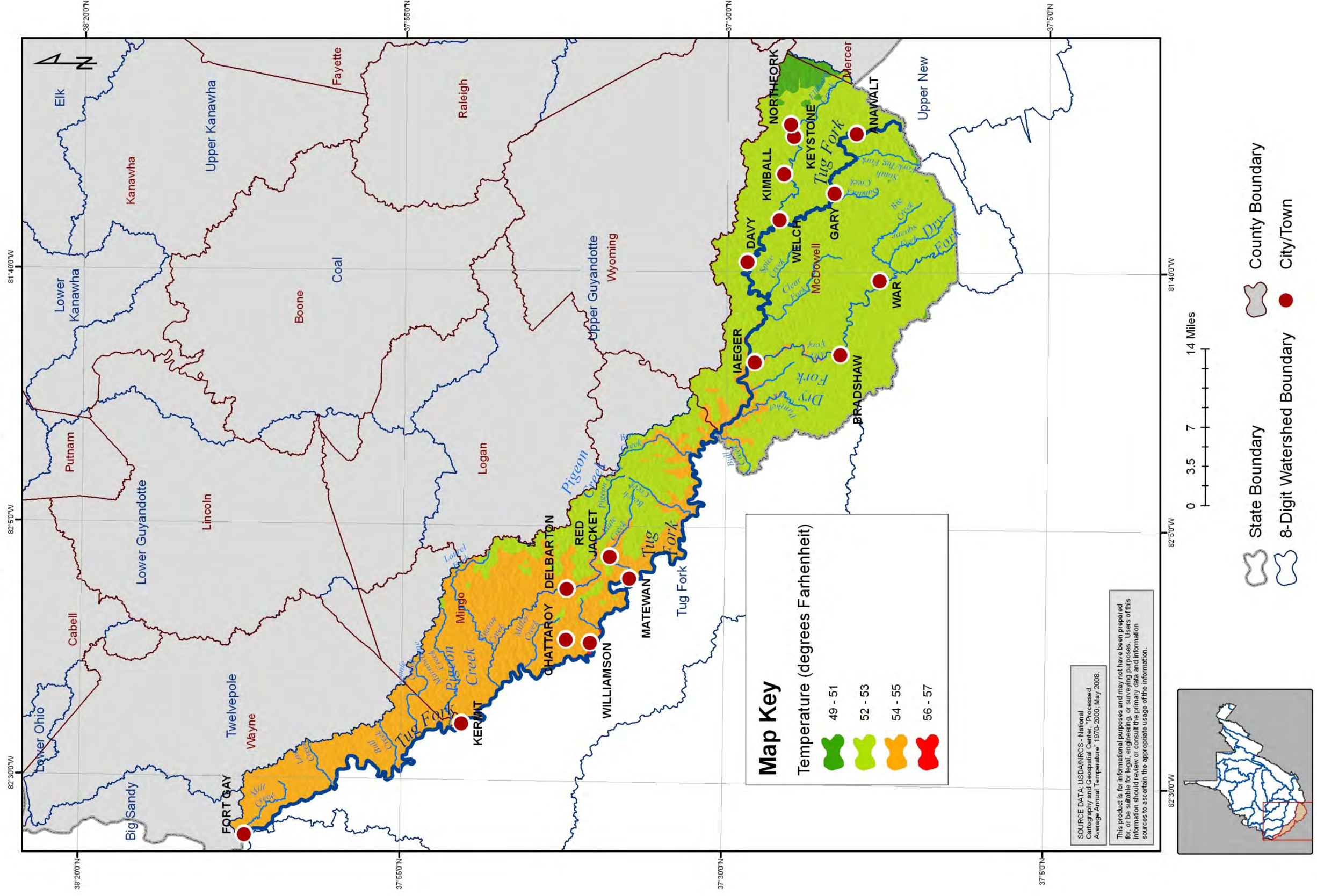
Tug Fork HUC-8 Watershed

Source Water Assessment and Wellhead Protection Programs



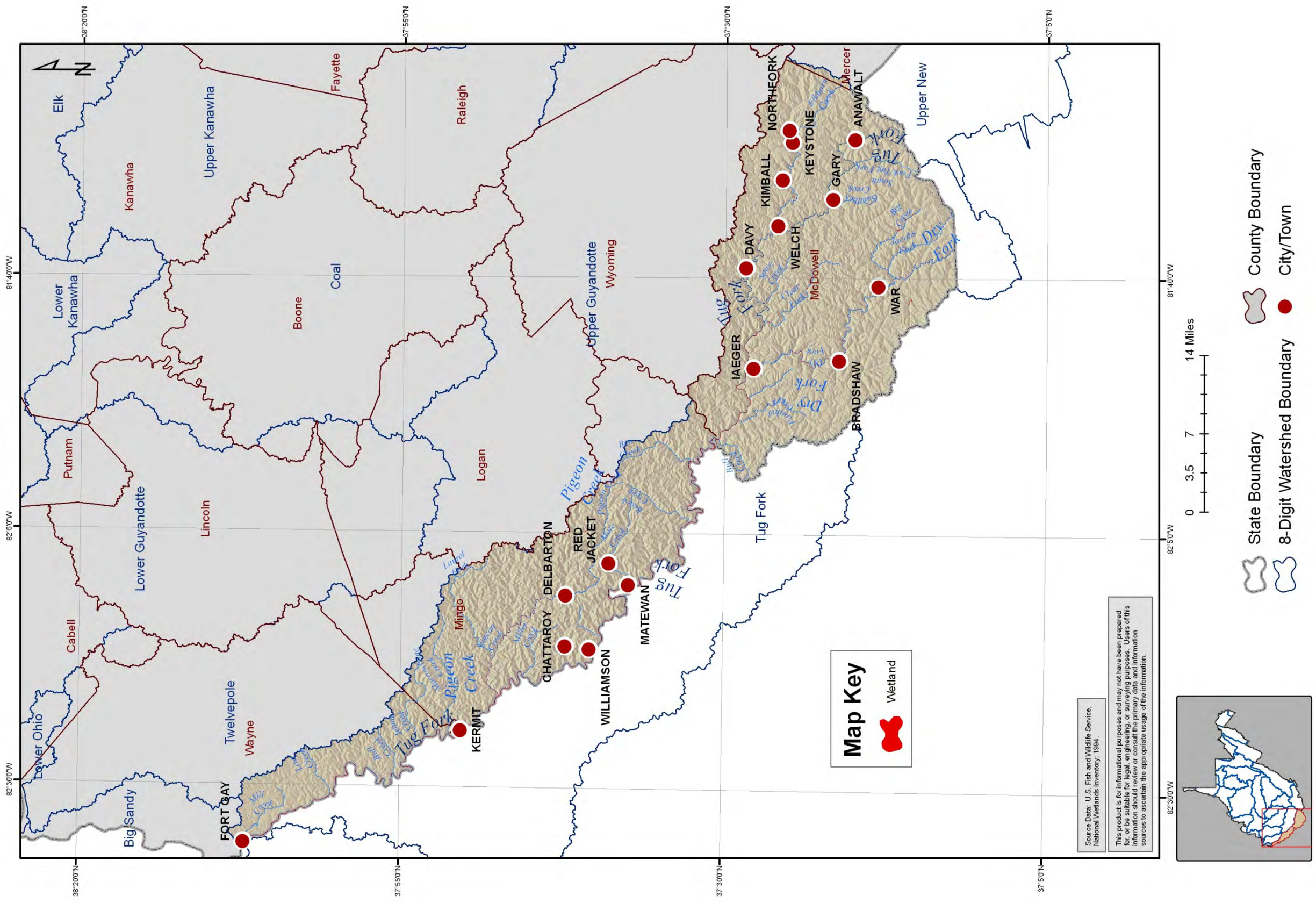
Tug Fork HUC-8 Watershed

Average Annual Temperature (1971-2000)



Tug Fork HUC-8 Watershed

Wetlands



Map Key

- Wetland

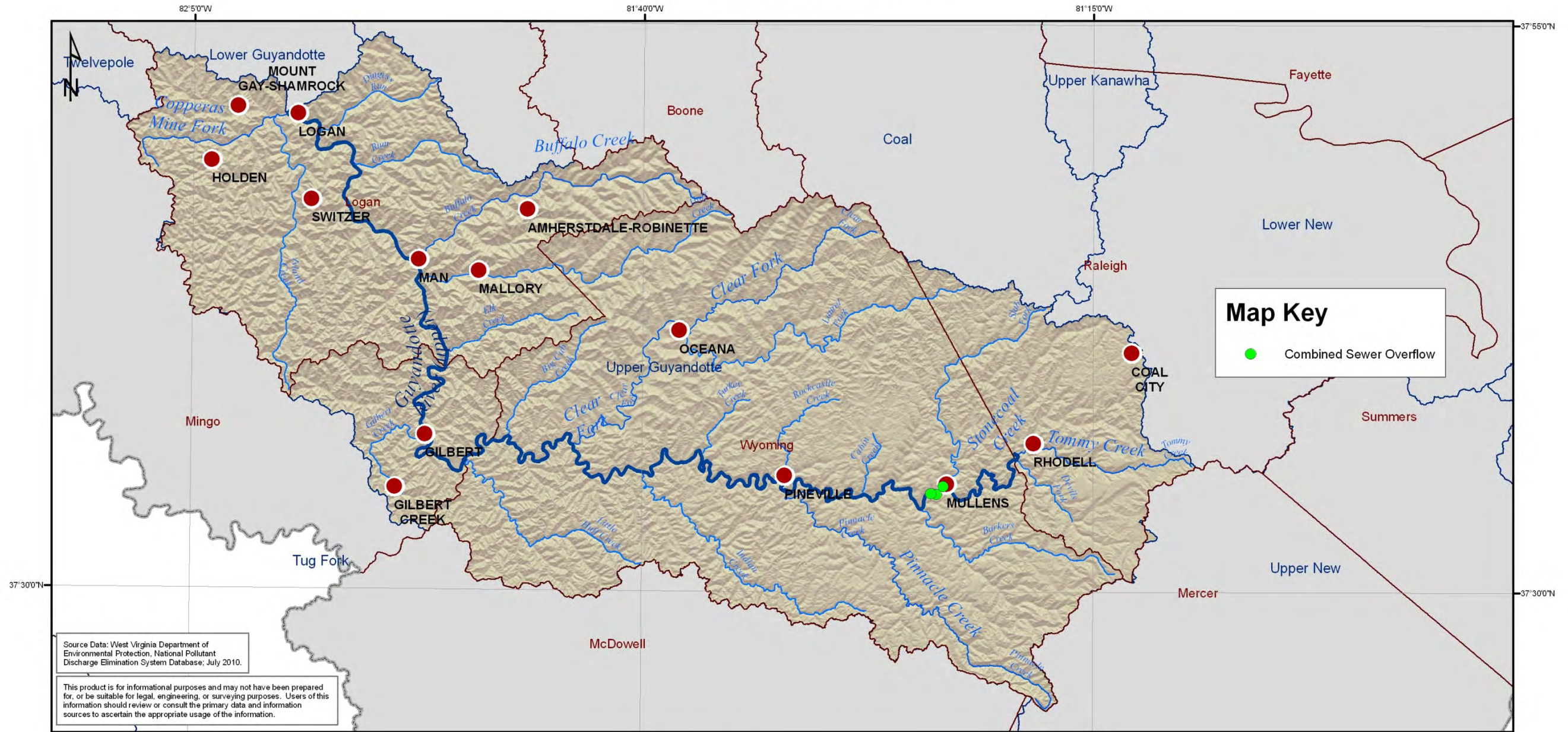
Source Data: U.S. Fish and Wildlife Service, National Wetlands Inventory: 1984.

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- State Boundary
- 8-Digit Watershed Boundary
- County Boundary
- City/Town

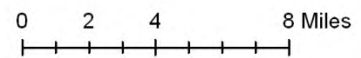
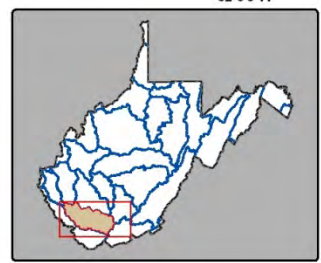
Upper Guyandotte HUC-8 Watershed

Combined Sewer Overflow



Source Data: West Virginia Department of Environmental Protection, National Pollutant Discharge Elimination System Database; July 2010.

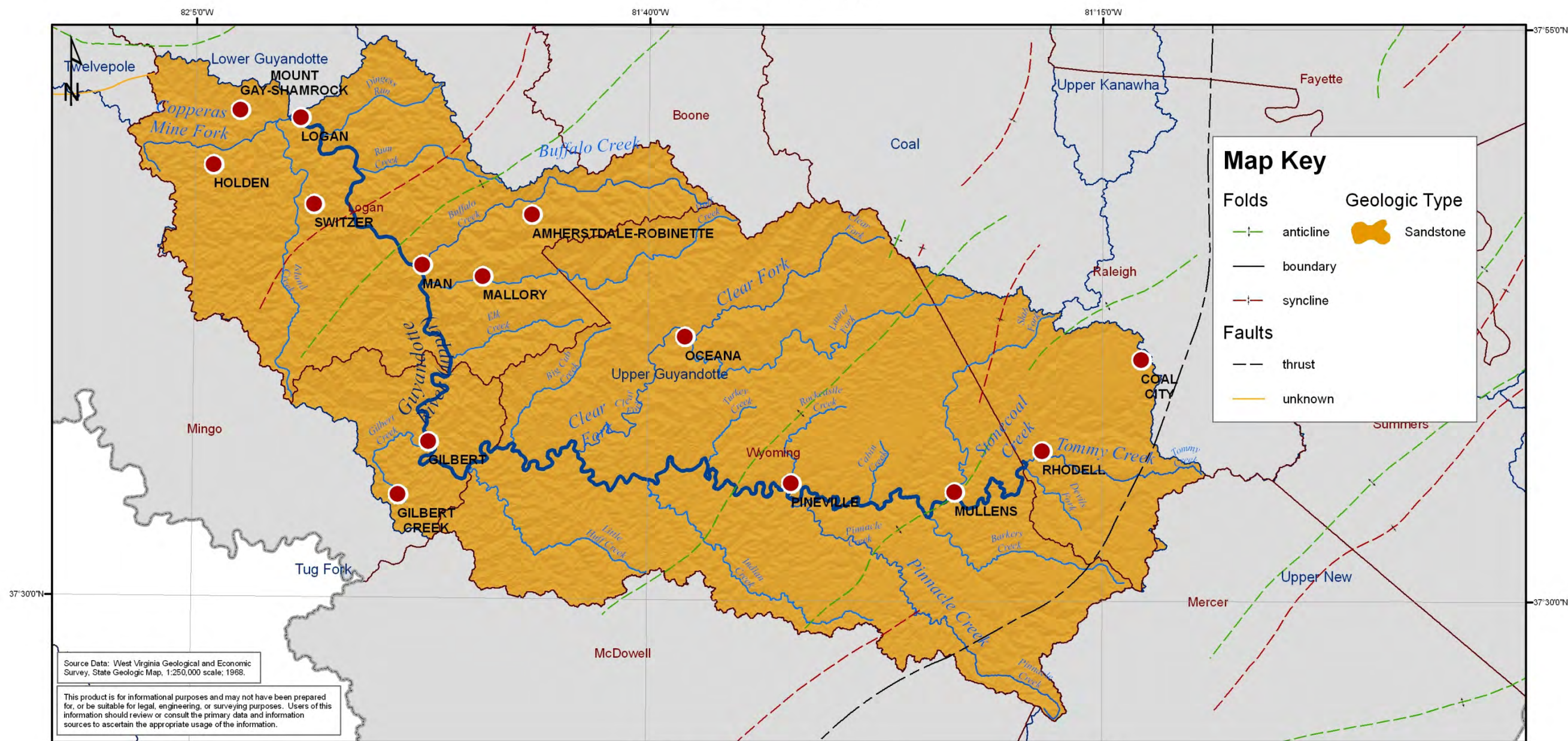
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- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

Upper Guyandotte HUC-8 Watershed

Surface Geology



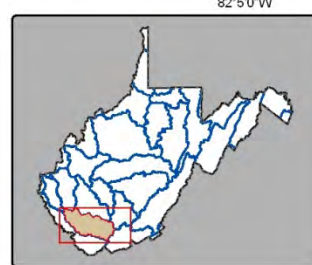
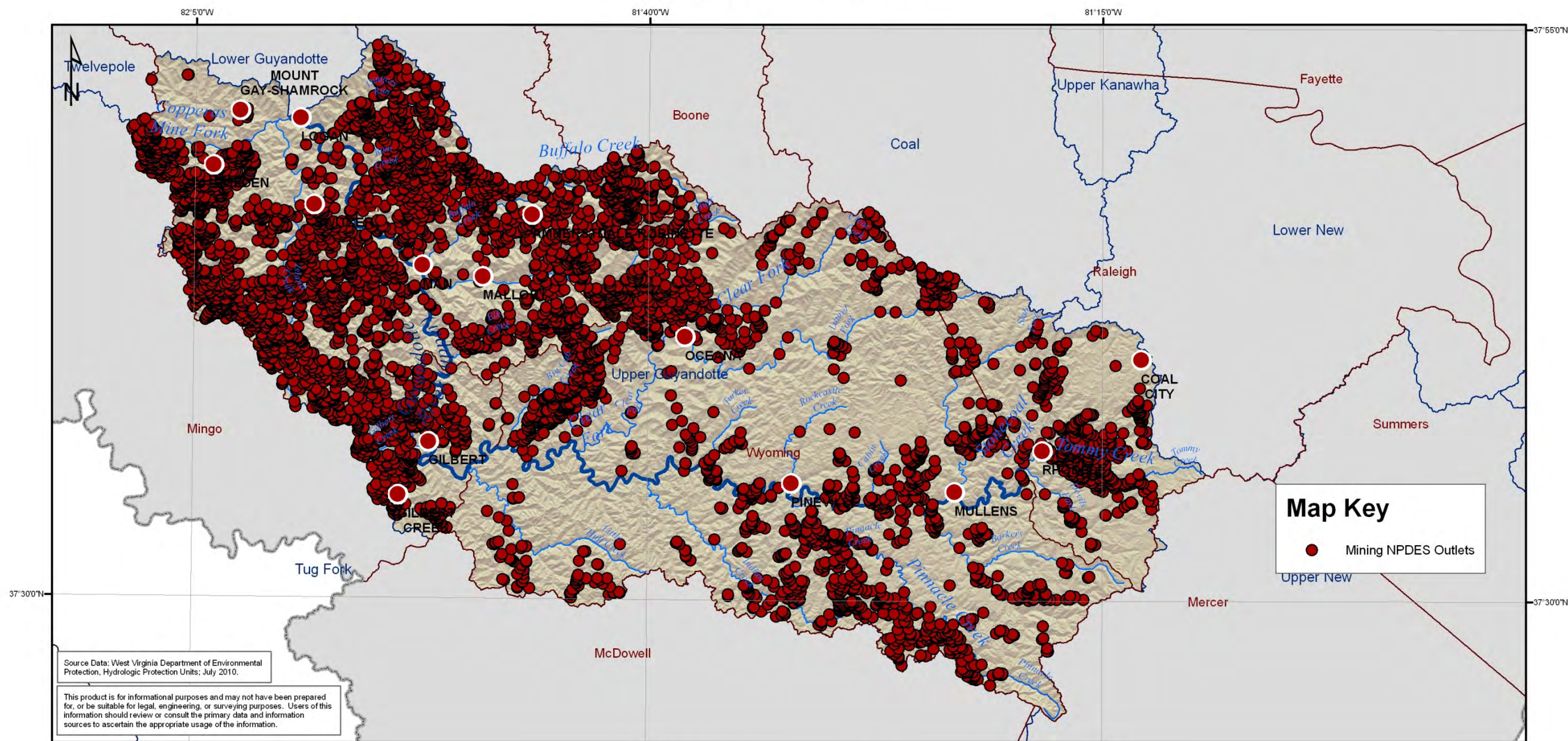
Source Data: West Virginia Geological and Economic Survey, State Geologic Map, 1:250,000 scale; 1988.

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- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

Upper Guyandotte HUC-8 Watershed

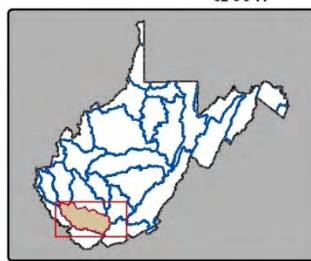
Mining Related NPDES Outlets



- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

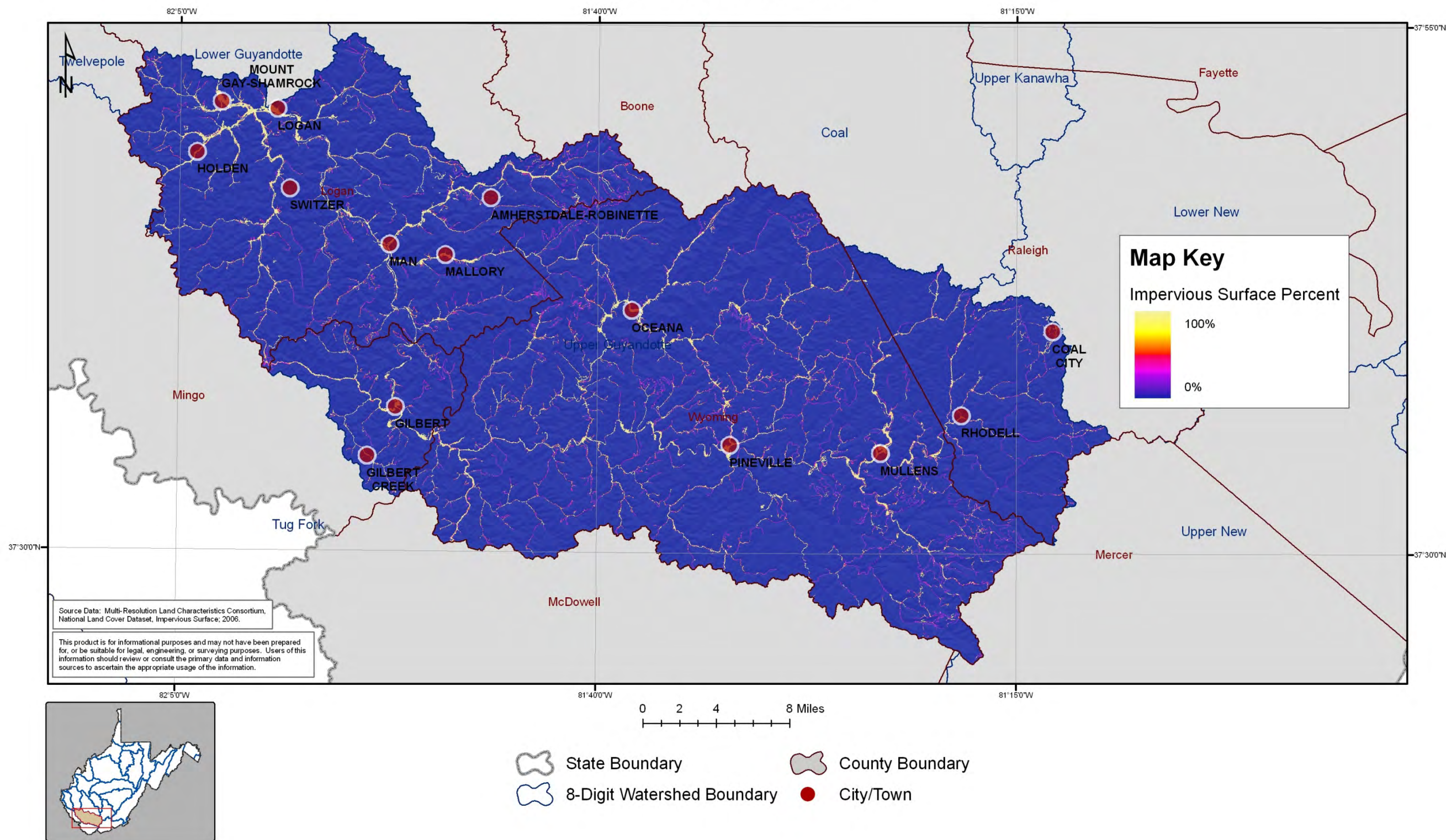
Upper Guyandotte HUC-8 Watershed

HUC 10 and HUC 12 Watersheds



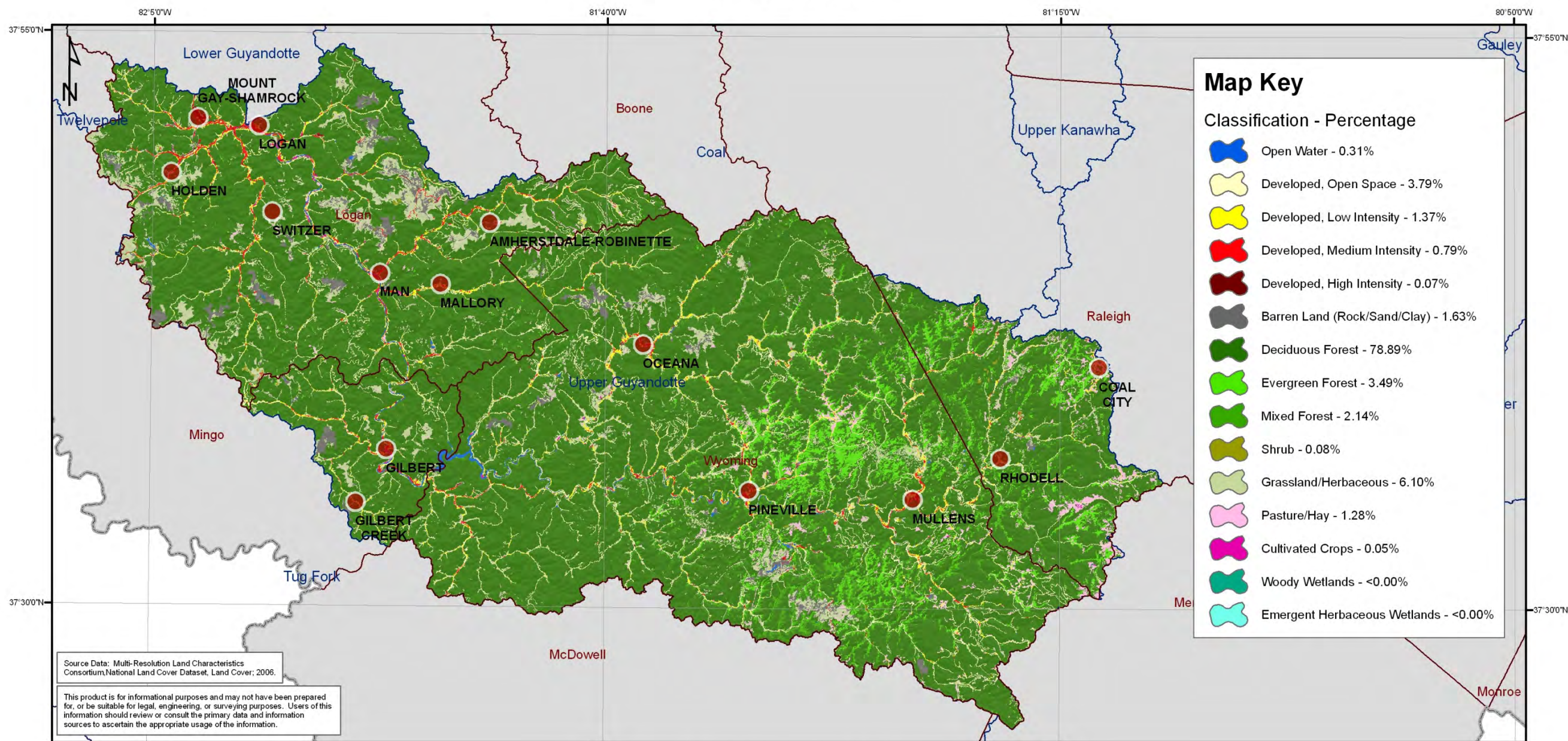
Upper Guyandotte HUC-8 Watershed

2006 Impervious Surfaces



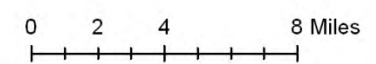
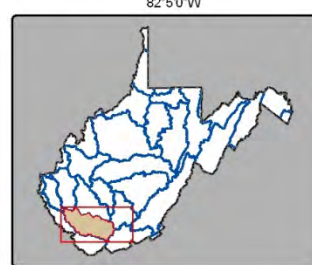
Upper Guyandotte HUC-8 Watershed

2006 Land Cover



Source Data: Multi-Resolution Land Characteristics Consortium, National Land Cover Dataset, Land Cover, 2006.

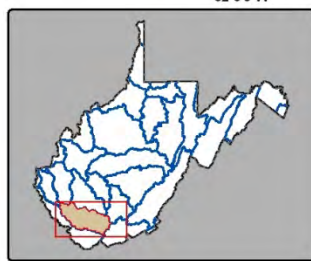
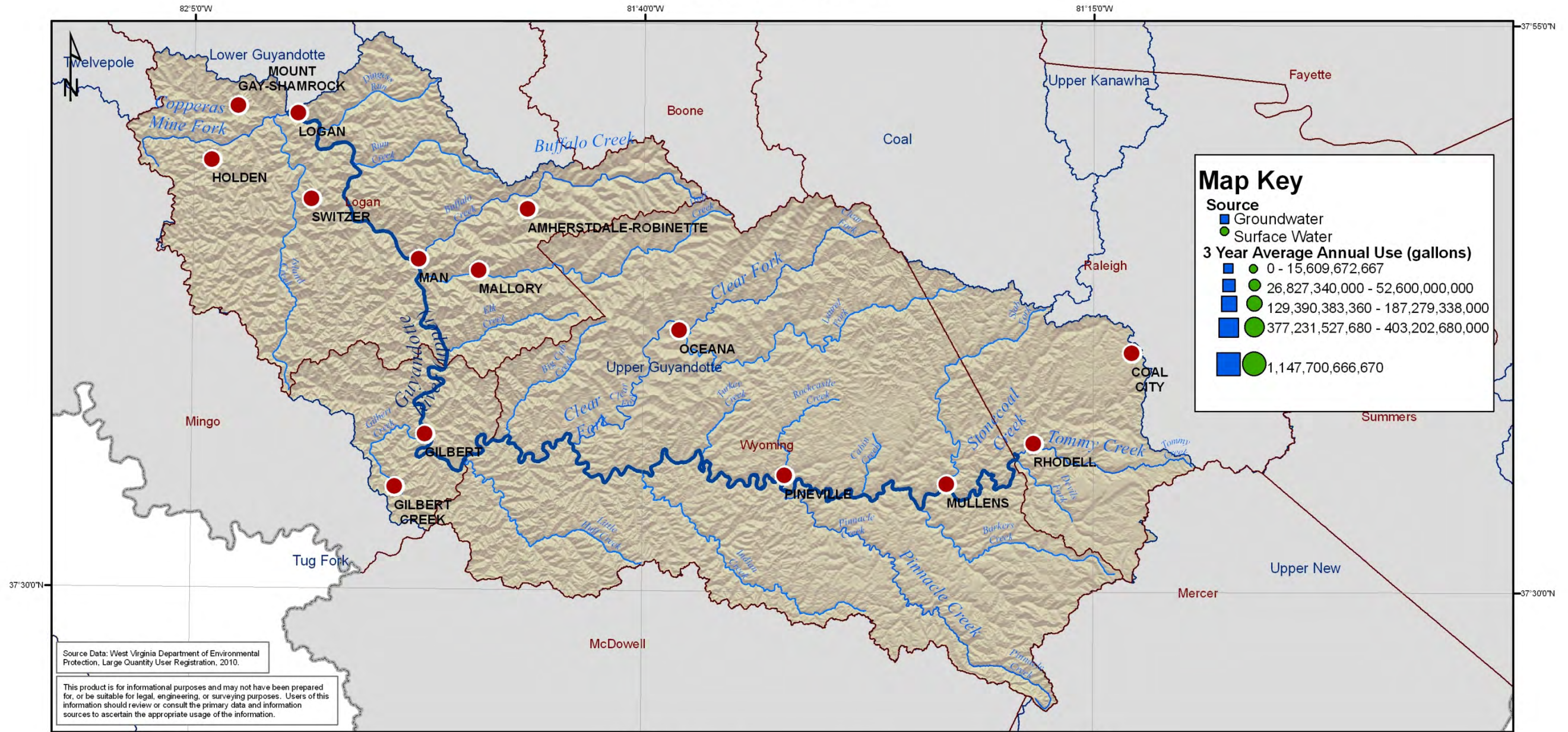
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- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

Upper Guyandotte HUC-8 Watershed

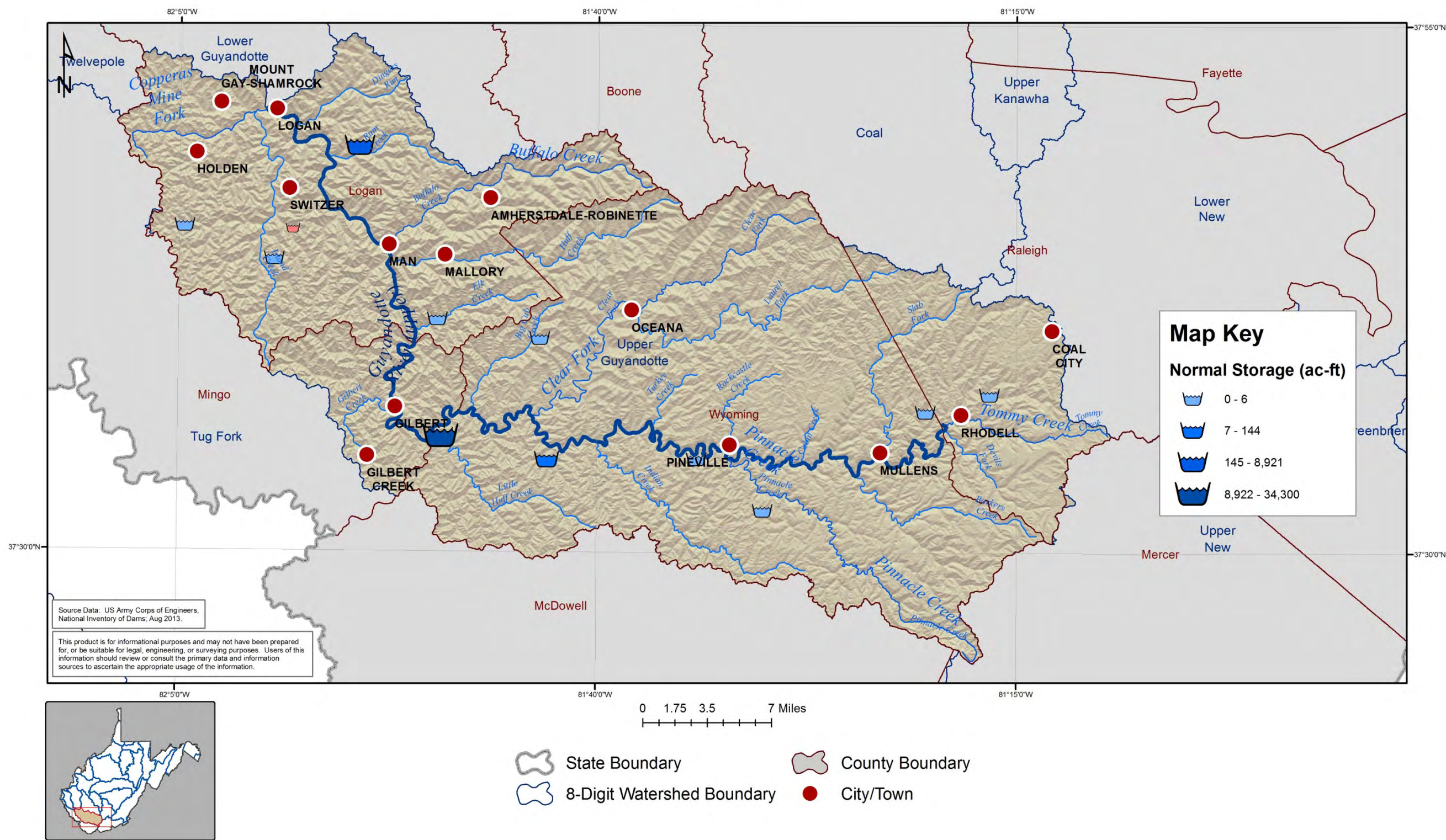
Large Quantity Users



- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

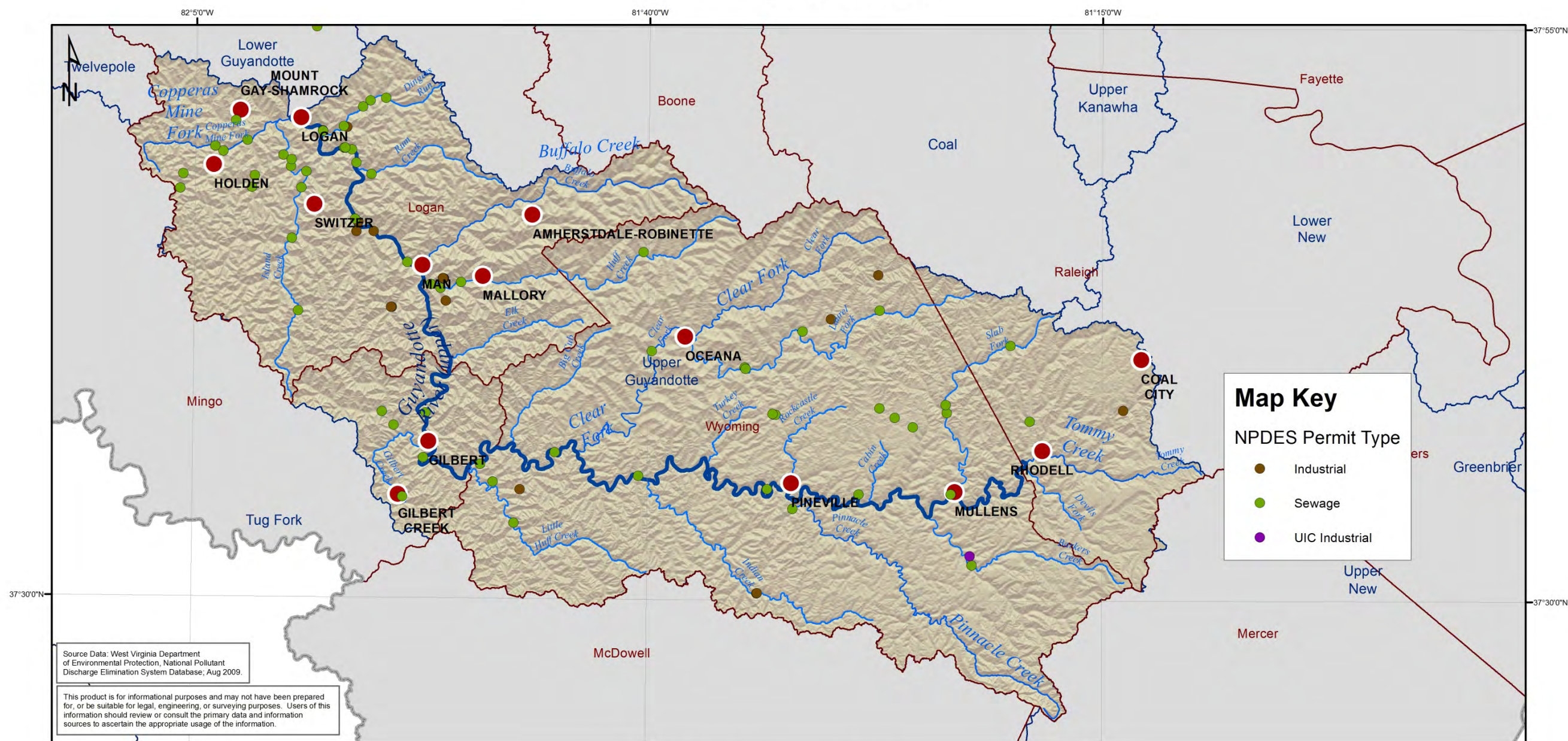
Upper Guyandotte HUC-8 Watershed

Permitted Dams



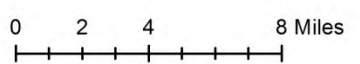
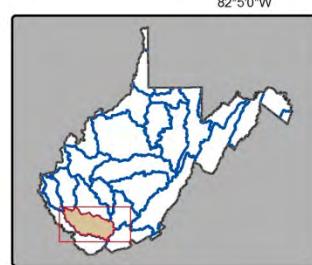
Upper Guyandotte HUC-8 Watersheds

Non-Mining NPDES Outlets



Source Data: West Virginia Department of Environmental Protection, National Pollutant Discharge Elimination System Database; Aug 2009.

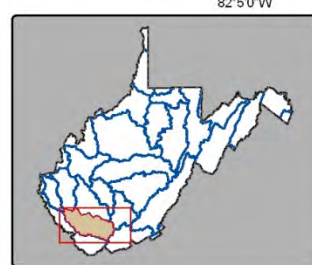
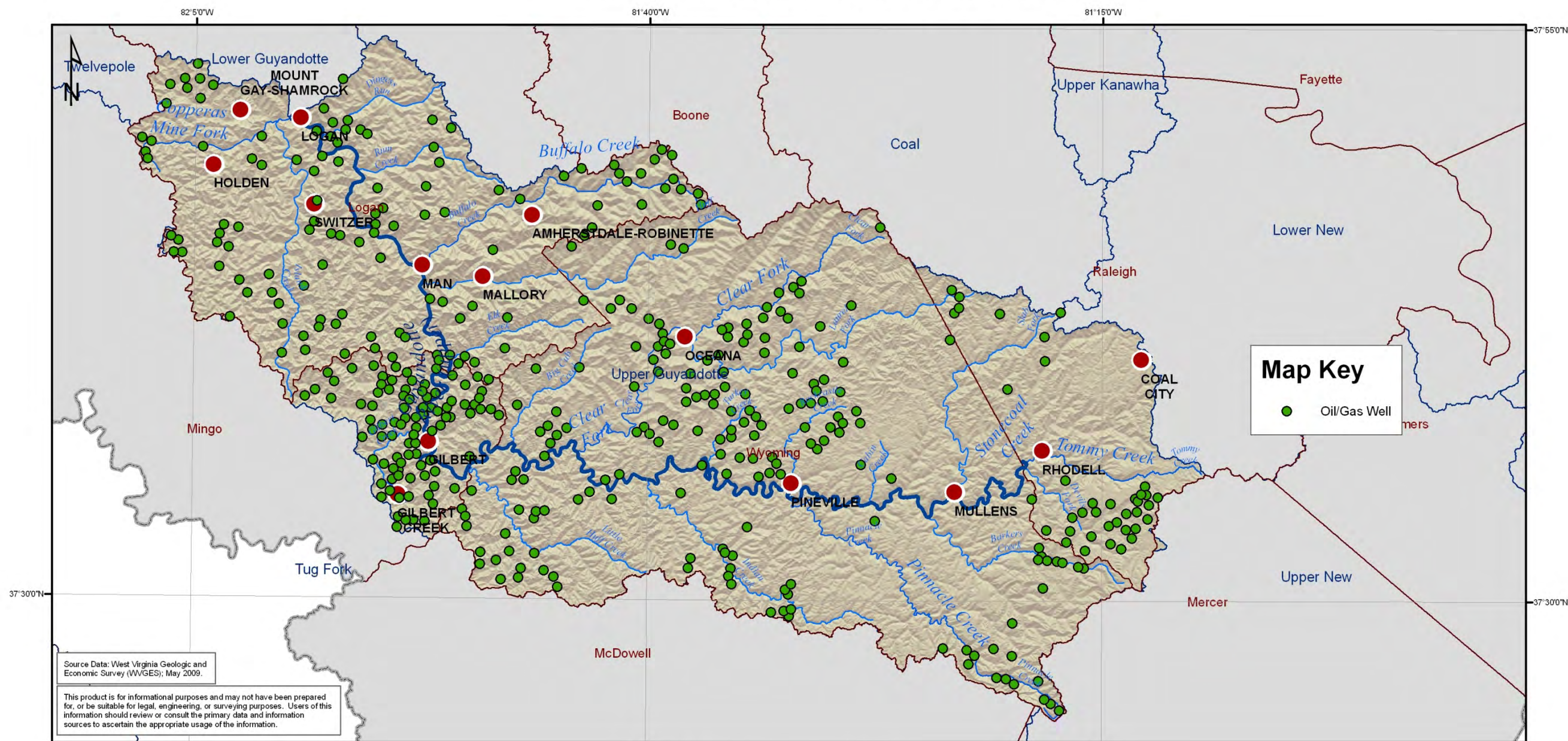
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- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

Upper Guyandotte HUC-8 Watersheds

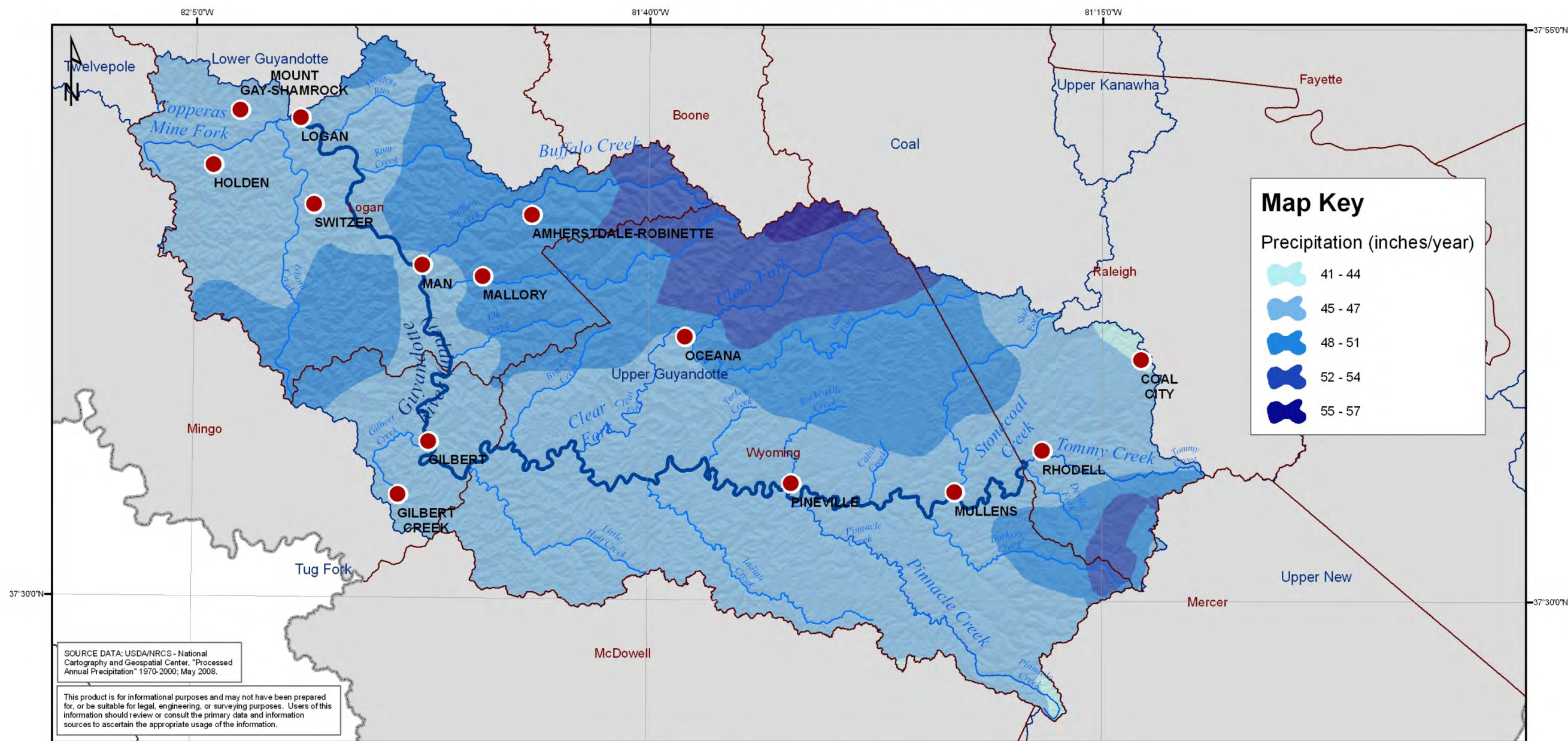
Well Logs with Gamma Rays and Water Shows



- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

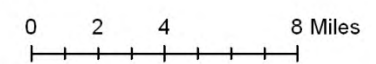
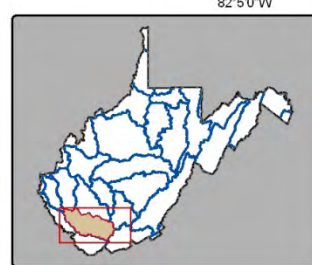
Upper Guyandotte HUC-8 Watersheds

Average Annual Precipitation (1971-2000)



SOURCE DATA: USDA/NRCS - National Cartography and Geospatial Center, "Processed Annual Precipitation" 1970-2000; May 2008.

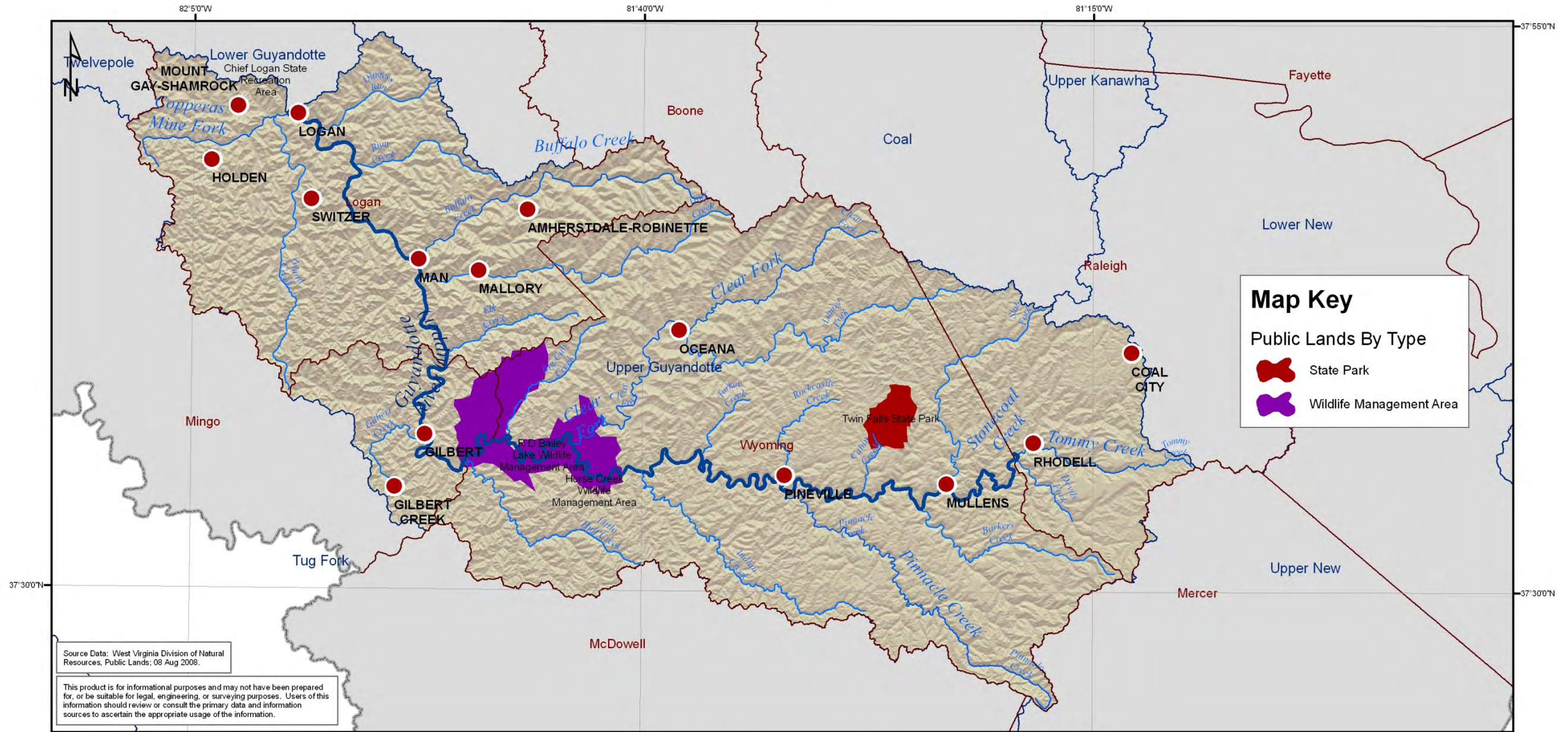
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- State Boundary
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- City/Town

Upper Guyandotte HUC-8 Watershed

Public Lands



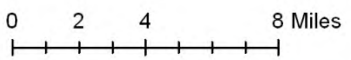
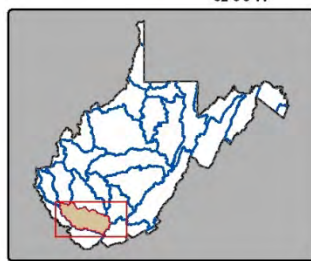
Map Key

Public Lands By Type

- State Park
- Wildlife Management Area

Source Data: West Virginia Division of Natural Resources, Public Lands, 08 Aug 2008.

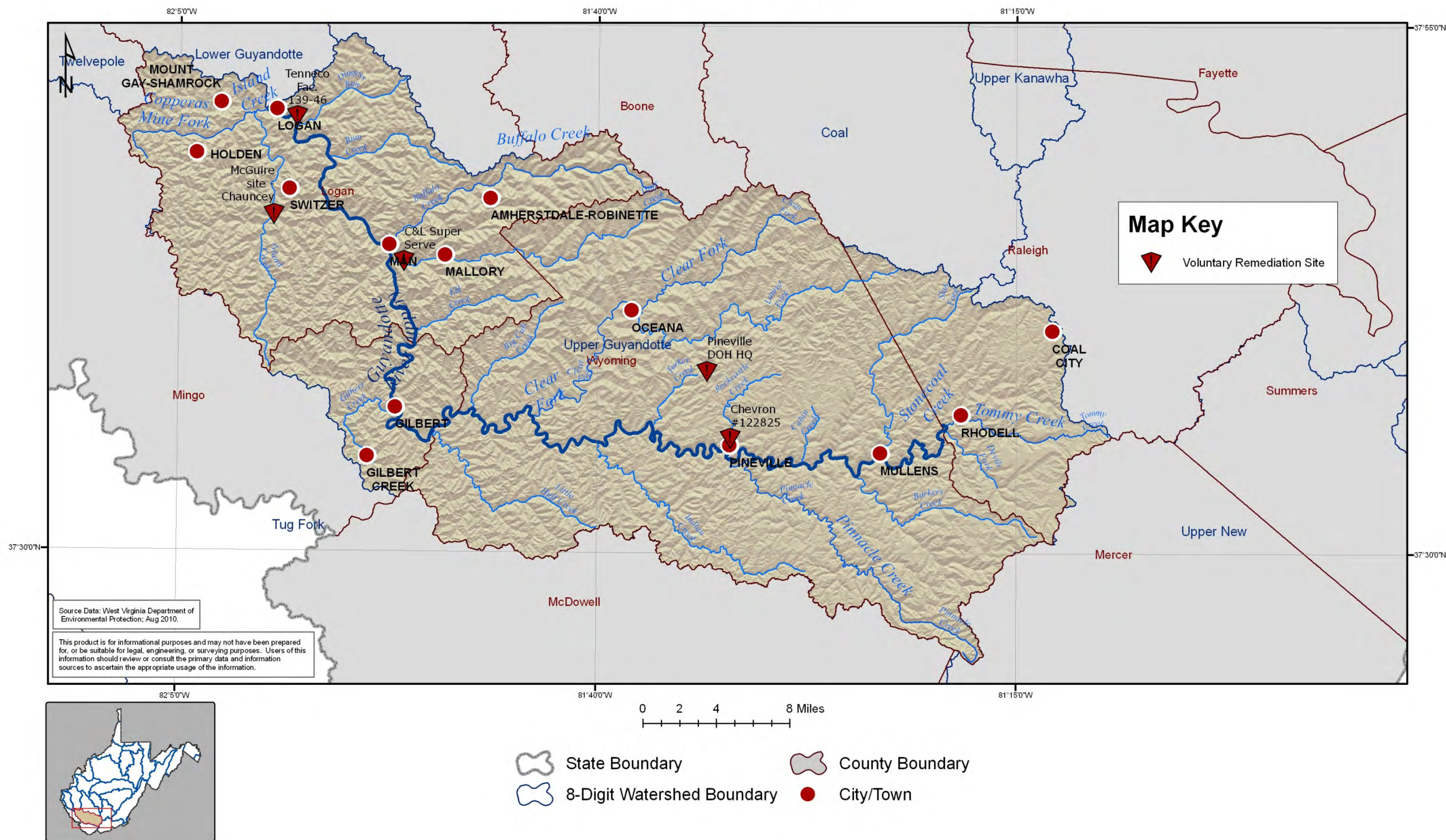
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- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

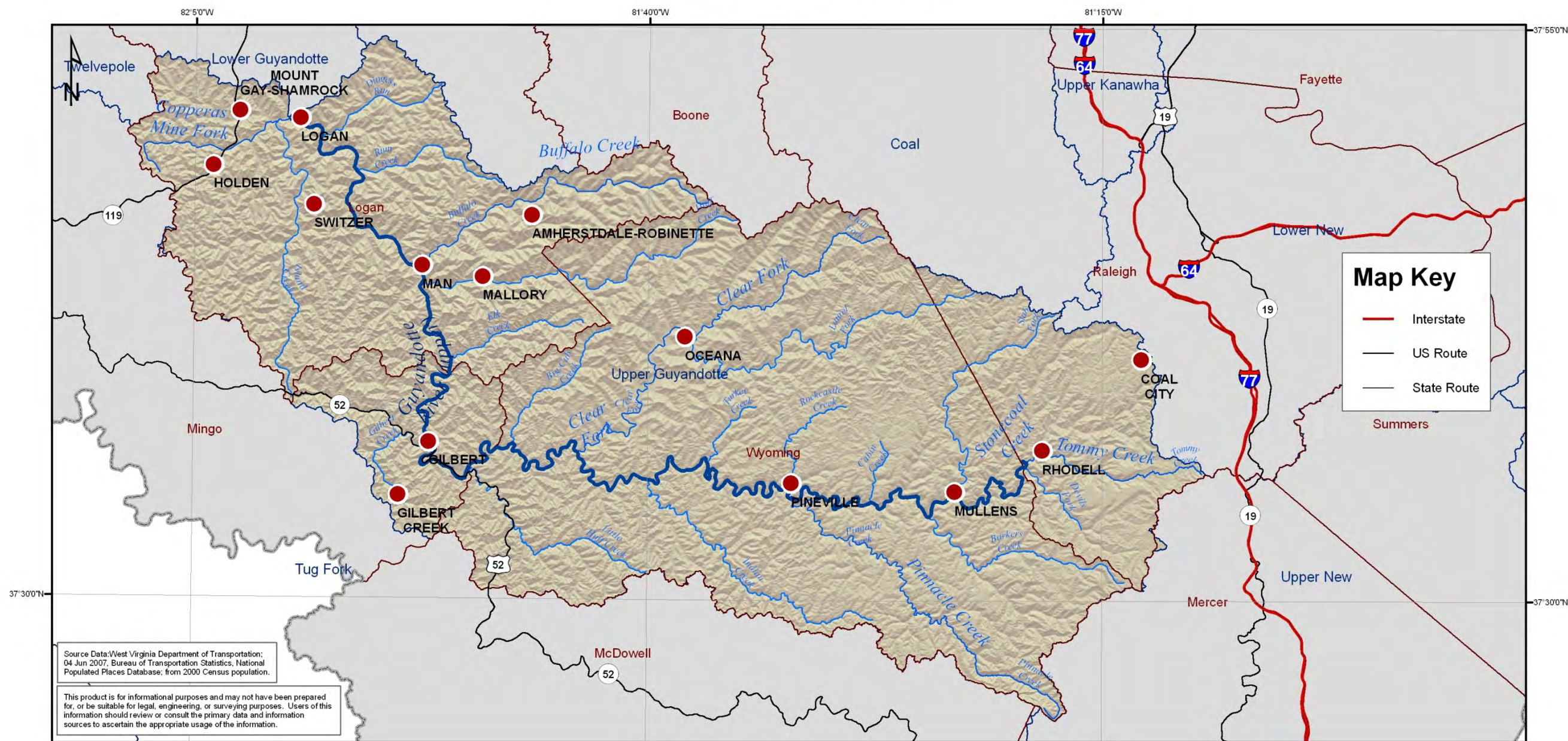
Upper Guyandotte HUC-8 Watershed

Remediation Sites



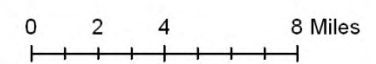
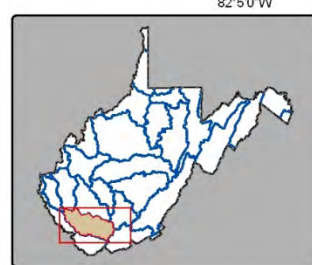
Upper Guyandotte HUC-8 Watershed

Major Roads and Cities



Source Data: West Virginia Department of Transportation; 04 Jun 2007, Bureau of Transportation Statistics, National Populated Places Database; from 2000 Census population.

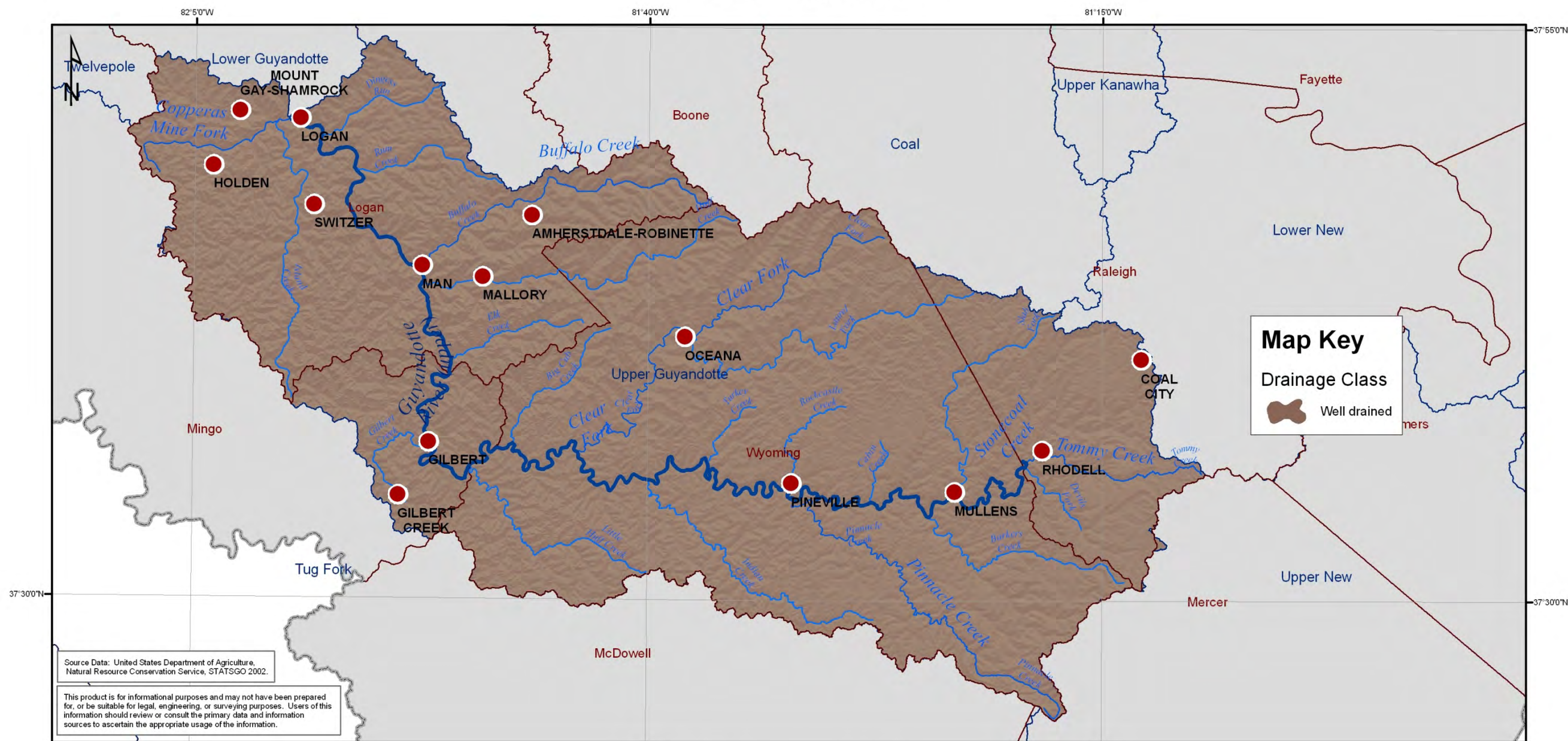
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- State Boundary
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- 8-Digit Watershed Boundary
- City/Town

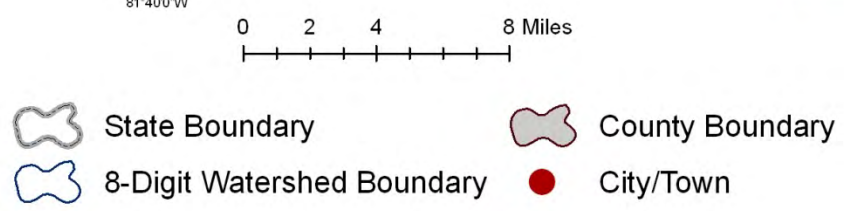
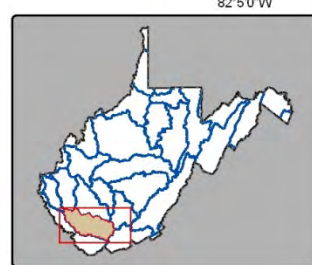
Upper Guyandotte HUC-8 Watershed

Soil Drainage Classes



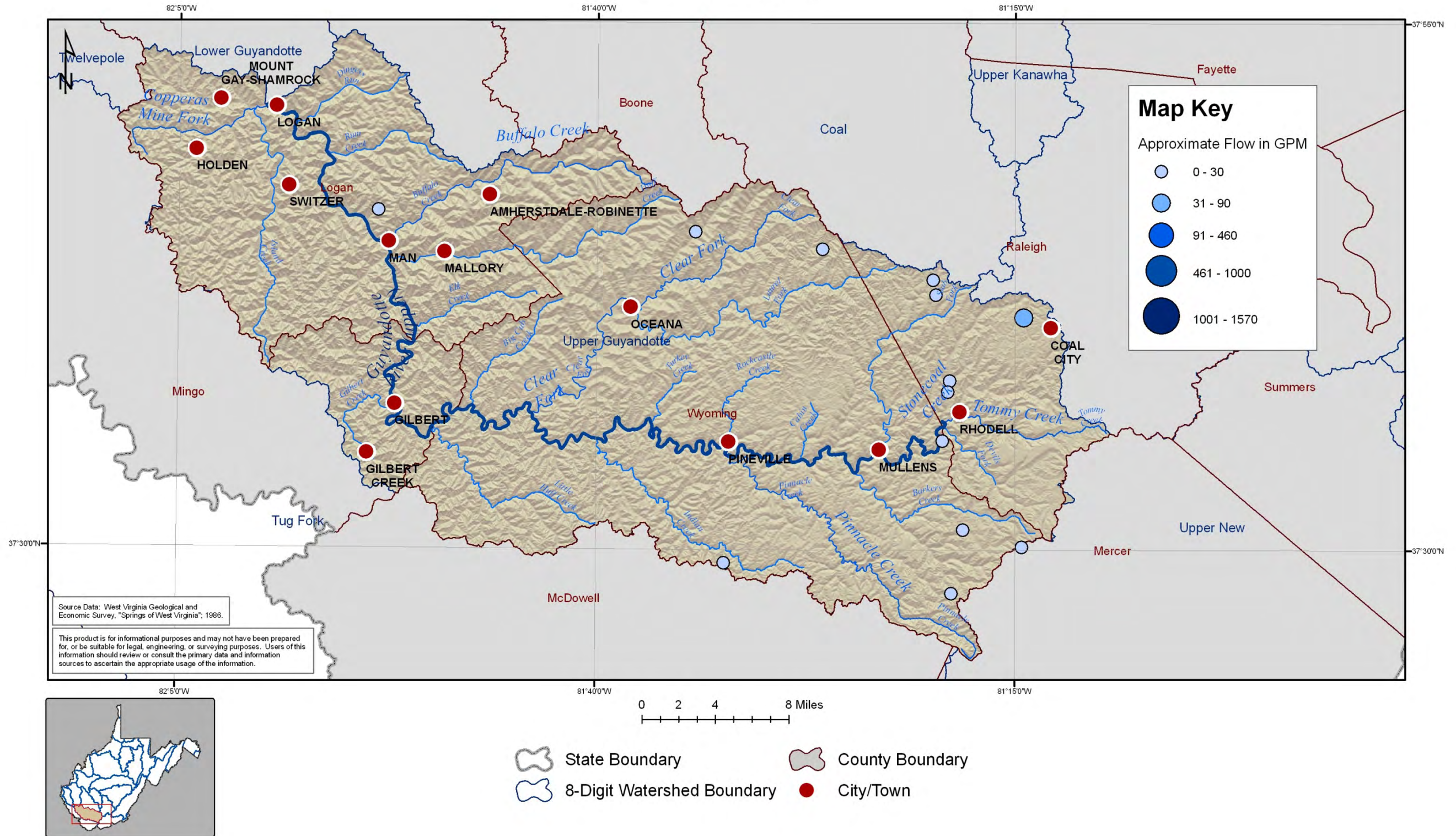
Source Data: United States Department of Agriculture, Natural Resource Conservation Service, STATSGO 2002.

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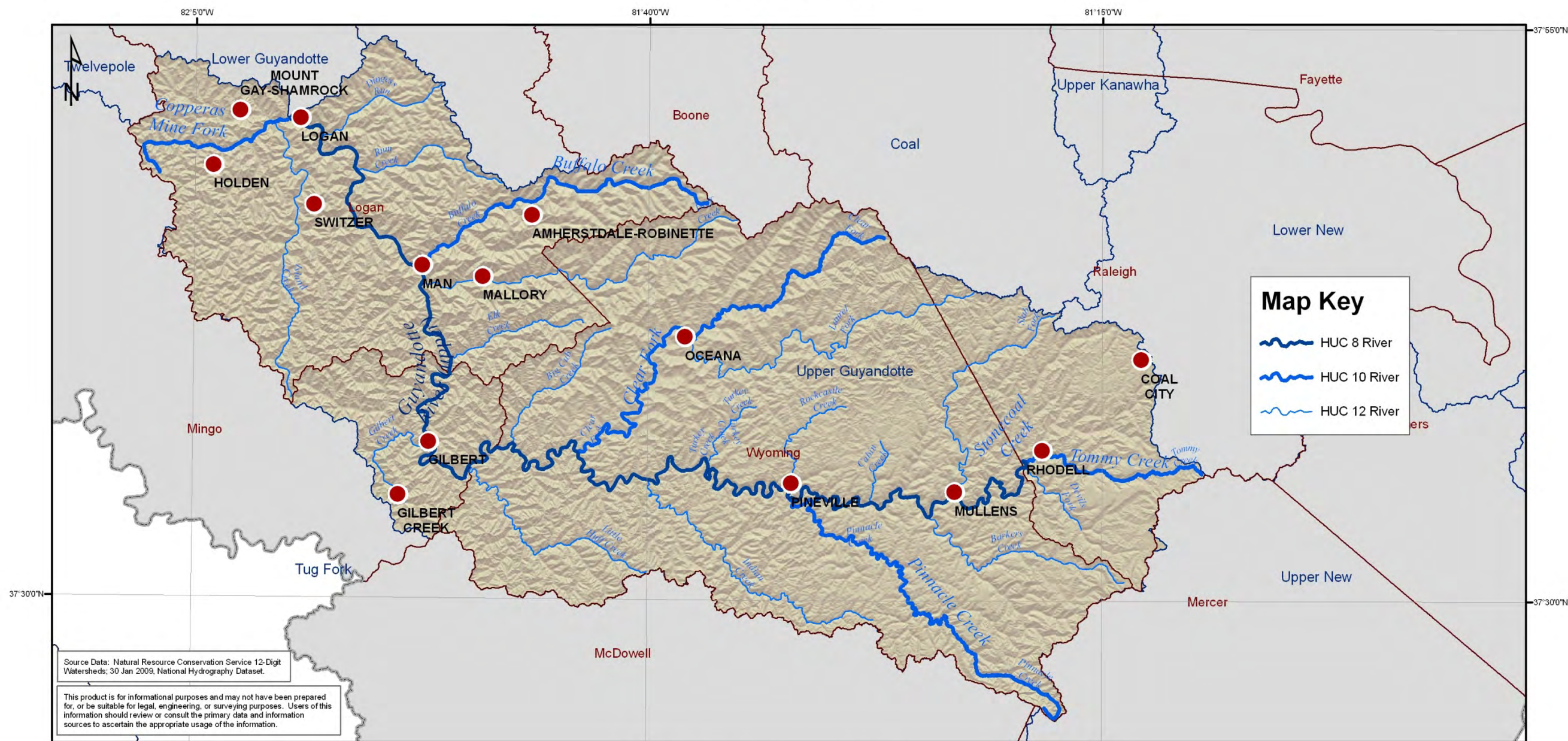
Upper Guyandotte HUC-8 Watershed

Documented Springs



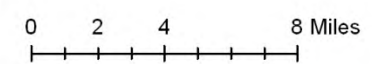
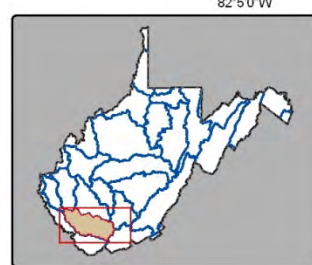
Upper Guyandotte HUC-8 Watershed

Stream Connections



Source Data: Natural Resource Conservation Service 12-Digit Watersheds; 30 Jan 2009, National Hydrography Dataset.

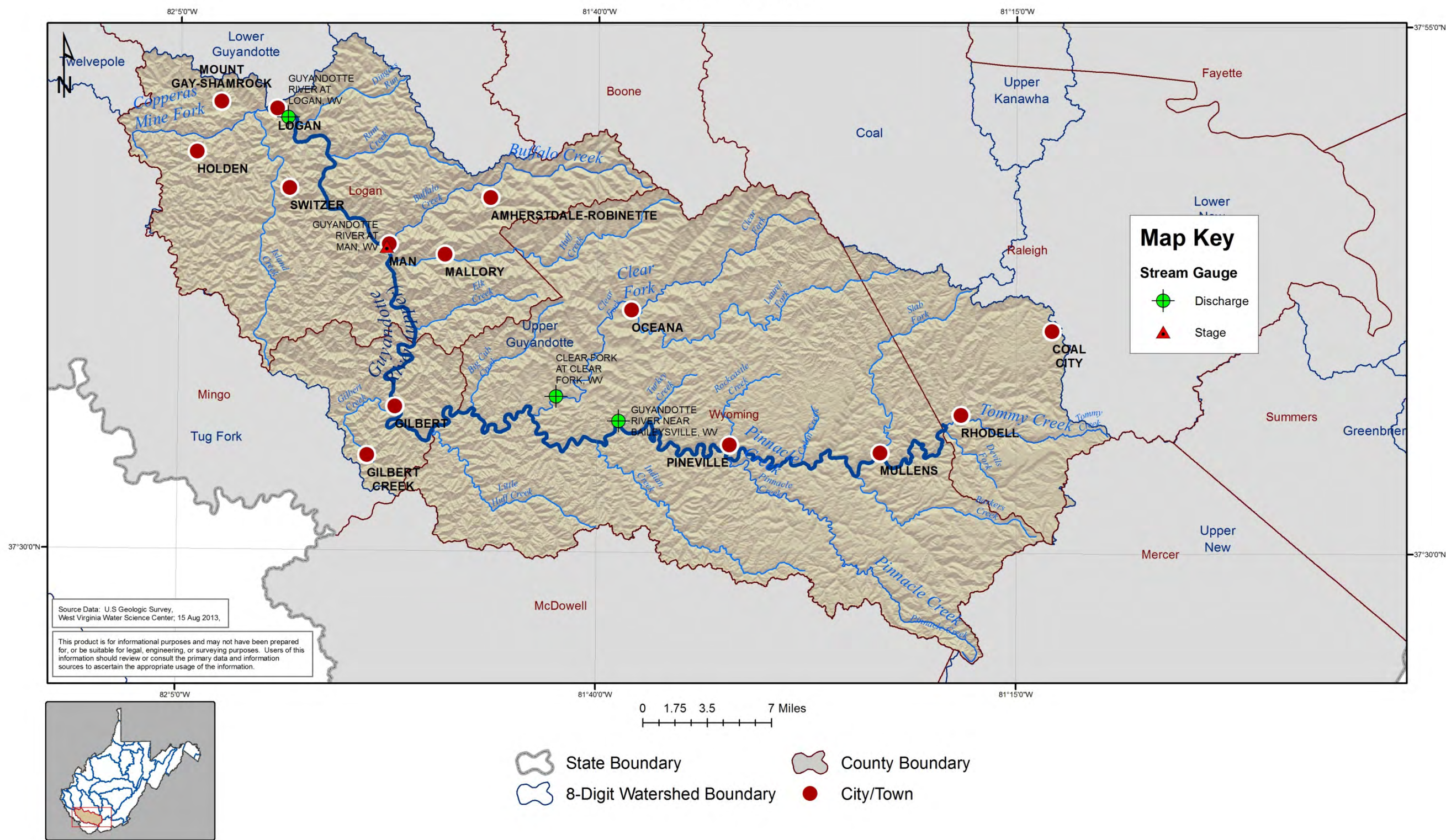
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- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

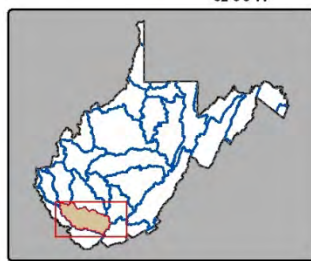
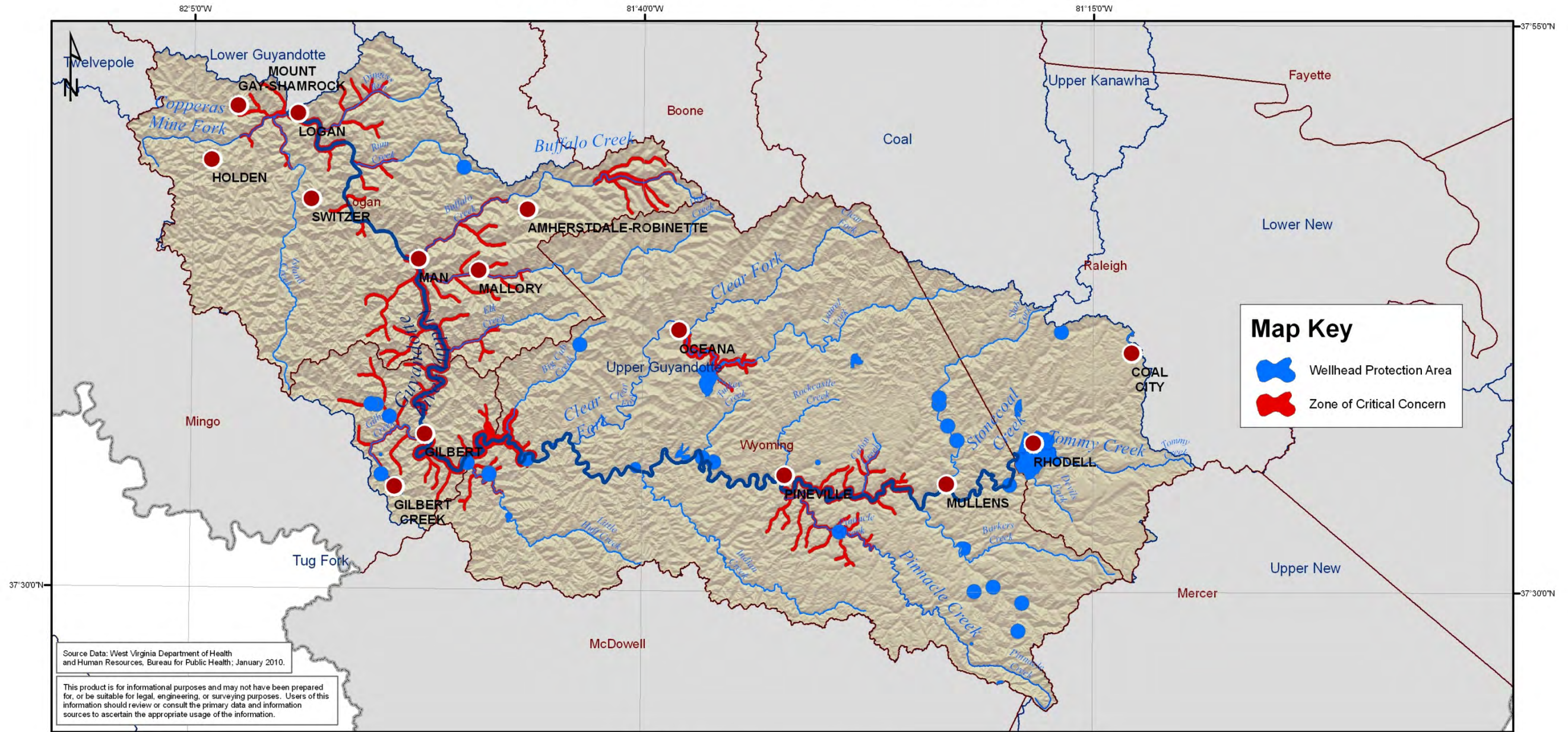
Upper Guyandotte HUC-8 Watershed

Stream Gauges



Upper Guyandotte HUC-8 Watershed

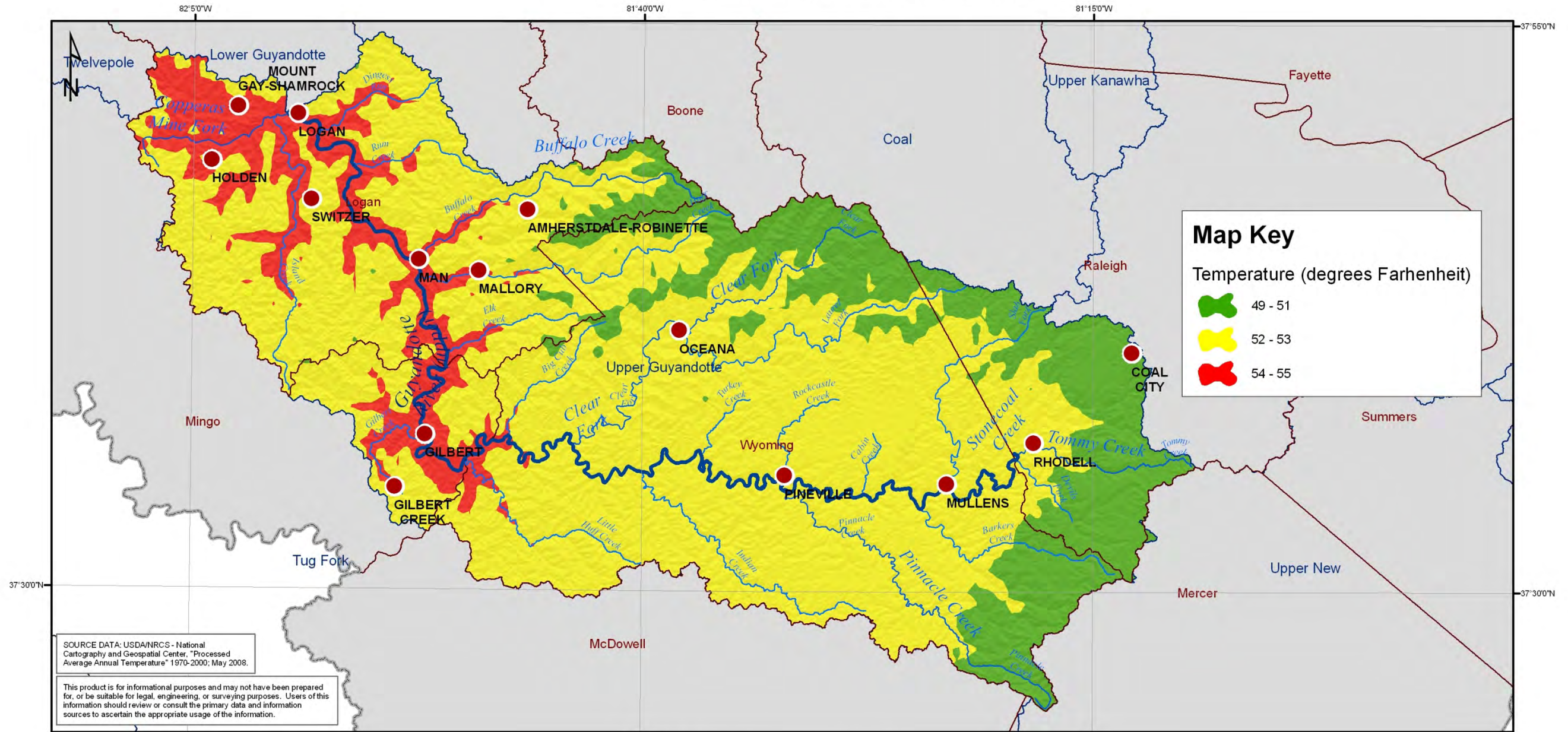
Source Water Assessment and Wellhead Protection Programs



- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town

Upper Guyandotte HUC-8 Watershed

Average Annual Temperature (1971-2000)



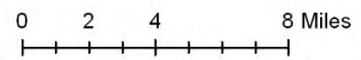
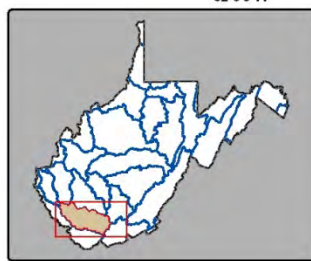
Map Key

Temperature (degrees Fahrenheit)

- 49 - 51
- 52 - 53
- 54 - 55

SOURCE DATA: USDA/NRCS - National Cartography and Geospatial Center, "Processed Average Annual Temperature" 1970-2000; May 2008.

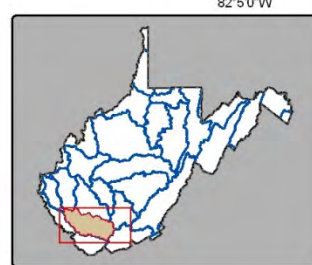
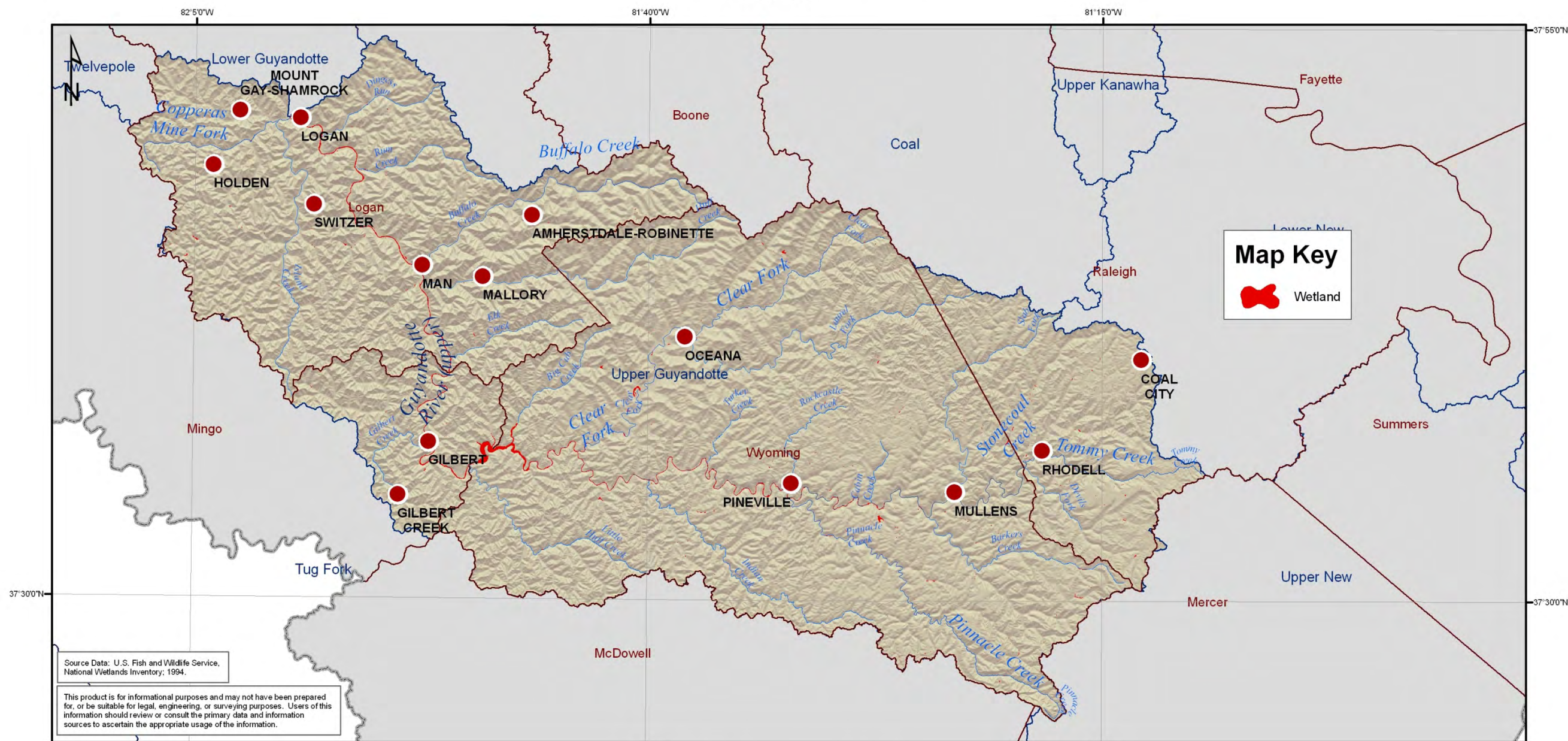
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- State Boundary
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- City/Town

Upper Guyandotte HUC-8 Watershed

Wetlands



- State Boundary
- County Boundary
- 8-Digit Watershed Boundary
- City/Town