

# **KENTUCKY 121, GRAVES COUNTY**

From 400 feet south of Harris Lane to KY 945

**ITEM NUMBER 01-8100.00**

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## **ENVIRONMENTAL OVERVIEW**

Prepared for:

**KENTUCKY TRANSPORTATION CABINET  
DIVISION OF PLANNING**

October 2003

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Prepared by:



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**GRAVES COUNTY, KENTUCKY**

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**KENTUCKY TRANSPORTATION CABINET**  
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*Prepared by:*

**William C. Crawford**  
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**October 2003**

## **ENVIRONMENTAL OVERVIEW**

This environmental overview identifies KY 121 project study area issues likely to require consideration during the KY 121 roadway improvement planning study. It summarizes the results of environmental investigations, based primarily upon literature, archival, known database, and map research. Limited amounts of fieldwork were conducted, consisting mainly of windshield surveys to confirm identified sites, and visually identify previously unknown sites. Additional information was collected through correspondence with other state and federal agencies. This environmental overview does not provide a detailed analysis and assessment of any potential impacts. The KY 121 study area is about 4.7 miles long, and 0.8 miles wide, as indicated by the highlighted area on Exhibits 1 and 2. The study area is larger than the project termini, which extend from 400 feet south of Harris Lane to the KY 945 intersection. Refer to Exhibits 1 and 2, and the color photographs of existing KY 121 typical sections, for the following discussions concerning the study area.

### **Environmental Footprint**

**Topography and Geology.** Elevation in the study area ranges from 440 to 540 feet above mean sea level. The study area is within the Loess Plains Ecoregion of the Mississippi Valley Loess Plains Ecoregion of far Western Kentucky, also known as the Jackson Purchase. It is composed of irregular plains, gently rolling hills, and bluffs. It is underlain by unconsolidated coastal plain sediments of Quaternary and Tertiary age that are susceptible to rapid erosion and is covered by thick loess and alluvium. Graves County is located in the Purchase physiographic region, sometimes referred to as the Mississippian Embayment region, which consists of unglaciated, undulating to rolling uplands, broad bottomlands and terraces. The gravel-bearing Lafayette geologic formation largely underlies Graves County. Streams in the ecoregion's western portion are low gradient and have many wetlands along their lower reaches, while more eastern streams form gullies on the sandy gravelly hills. Graves County is drained by a large number of streams, generally flowing to the west or north. The study area's main drainage is provided by the West Fork of Mayfield Creek, and also by Key Creek (a tributary of Mayfield Creek), and Mayfield Creek (a Mississippi River tributary). The study area's terrain consists of rolling hills with small stream valleys and dissected upland. Grasslands and forested wetlands were once common, but most have been converted to cropland.

**Culturally Sensitive Locations.** This preliminary study identified the following culturally sensitive locations in or near the study area: 2 cemeteries (Mount Zion Baptist Church Cemetery and an unnamed cemetery), at least 1 church (New Hope Church), the Jackson Purchase Medical Center, Graves County High School, Gateway Academy High School, and the County War Memorial Fairgrounds. The hospital and fairgrounds are located in the study area's southern tip, south of the Julian M. Carroll Parkway. The schools – including a new elementary school scheduled to open in 2004/2005, and the Graves County Middle School located just outside the study area boundaries – are all located in the northern quadrant of the KY 121 and Julian M. Carroll Parkway intersection. The topographic maps indicate the location of Mt. Zion Baptist Church and Cemetery, however the church building is no longer standing.

These culturally sensitive locations vary from having local community significance, to regional significance with state and/or federal regulations. Any future roadway improvements proposed should thoroughly consider potential impacts to these resources.

**Historic, Archaeological, and Cultural Resources.** The study area contains no National Register of Historic Places (NRHP) listings for historic sites. A windshield survey of the study area located 9 sites, of which one was inaccessible and not evaluated, and 5 were surveyed for overview study documentation only (*i.e.*, no apparent NRHP potential; identified on the exhibits as “Survey”). However, 3 individual building sites were identified with the potential to meet NRHP criteria, and identified on the exhibits with the suffix “NRP” (National Register Potential). (This preliminary assessment was based primarily on Criterion C, architecture). Two NRP sites (Sites A and C, houses) are located in the southern portion, close to the study area’s western boundaries, while the third (Site F, Mt Zion Cemetery) is in the north, about 1,200 feet from existing KY 121. No buildings were inspected in detail. NRHP eligibility determination will require additional research, physical examination, evaluation, and consultation with the State Historic Preservation Office (SHPO). *Kentucky’s Historic Farms* publication listed one historic farm (Andrus Farm) as located in Mayfield, potentially in the vicinity of the study area. The farm’s exact location and property boundaries could not be determined without further research; therefore its relationship and proximity to the study area is unknown.

The archaeological overview identified no previously recorded or otherwise known archaeological sites within the study area, and concluded the area has moderate potential for discovery of significant archaeological deposits. The overview revealed the study area to be largely uninvestigated; and agricultural activity and urban development have resulted in a good amount of ground disturbance. Nevertheless, archaeological sites have been recorded in other county areas, and the area’s topography is typically an ideal location for prehistoric sites. Additionally, within the study area are historic cemeteries, and potential historic structures and resources. Historic mapping review indicated approximately 49 potential archaeological resource sites, with two historic structures (Structures 1 and 2 on the exhibits) tentatively identified in the field and considered to have strong potential for intact archaeological resources. Based upon the background literature review, the likelihood for encountering undiscovered historic and prehistoric archaeological sites is considered strong. If improvements to KY 121 are to be implemented, requiring an environmental document, then the study area should be subjected to a Phase I level archaeological investigation (*i.e.*, shovel test probe excavations in accessible areas), and a historic structures survey performed by an architectural historian.

**Aquatic Resources.** The region is within the Mississippi River drainage system, with a reported 30 surface streams that could potentially be impacted, including Key Creek, Gilbert Creek, the West Fork of Mayfield Creek, numerous unnamed tributaries of these creeks, and one unnamed tributary of Oak Grove Creek. All these streams are tributaries of Mayfield Creek, which is a direct tributary of the Mississippi River. The conversion of grasslands and forests into cropland, the associated agricultural runoff, and the channelization of most streams have resulted in water quality degradation. If KY 121 improvements are implemented, then all 30 streams in the study area may be impacted by sedimentation resulting from roadway construction improvements. Soil from exposed and erodible surfaces may directly enter surface water, temporarily increasing turbidity levels. Surface and ground water may also experience temporary increases in specific conductance, suspended solids, and nutrients. Kentucky Division of Water (KDOW) will require a non-point source pollution control plan, and an erosion control plan. Application of Kentucky Transportation Cabinet’s (KYTC) *Specific Specifications for Road and Bridge Construction* and the Federal Highway Administration’s (FHWA) *Best Management Practices for Erosion and Sediment Control* can be used to alleviate most sedimentation problems.

No nationally listed wild and scenic rivers are located within the study area. No other rivers or streams are listed on the Kentucky Wild River System.

No outstanding resource waters, municipal/public surface water intakes, or recorded water wells were identified in the study area. The KDOW reported that no wellhead protection areas are located within, or adjacent to, the study area. The KDOW recently implemented a policy change and now regards the location of municipal water supplies and groundwater protection areas as classified information. Therefore, only a limited amount of information is available, and mainly originates from other public information sources.

A limited amount of floodplain information is available for the study area. The Graves County Flood Hazard Boundary Maps (dated November 4, 1977) were converted to Flood Insurance Rate Maps (FIRM) on December 1, 1992, by Letter of Map Change (LOMC). New maps were not published, and the existing maps are subject to change “after a more detailed study.” According to the maps, the study area does not cross any special flood hazard areas (*i.e.*, Zone A), and is located entirely within Zone X (areas outside 500-year floodplain).

**Wetlands and Ponds.** National Wetland Inventory (NWI) map reconnaissance revealed 24 wetlands within the study area, ranging in size from 0.1 to 4.6 acres. The wetlands are identified on the exhibits as “WET #.” Palustrine, forested, broad-leaved, deciduous wetlands accounted for 4 sites (Wet sites 5, 7, 10, and 23 on exhibits), each about 0.1 acres. One of these wetlands is located along Key Creek, 2 on unnamed tributaries of Key Creek, and 1 along an unnamed tributary of Oak Grove Creek. Ponded, open water habitats with unknown bottoms accounted for 20 wetland sites, most of which are probably created ponds, although some may have wetland fringes that could be considered jurisdictional. In addition to the 20 NWI probable ponds, another 15 ponds appear on the topographical maps, for a total of 35 ponds. Ponds may be considered jurisdictional if a jurisdictional stream flows through them. More intensive field surveys would be required to confirm and delineate NWI map wetlands, as well as identify any wetlands not appearing on the map.

A specific roadway design is needed before the type of United States Army Corps of Engineers (USACE) permit required (*i.e.*, Nationwide or Individual) can be determined. However, depending upon the specific roadway design, this project may be permitted under *Nationwide Permit 14, Linear Transportation Crossings*, rather than an Individual Permit. The nationwide permit only authorizes activities with minimal adverse effects on the aquatic environment. The KDOW will probably require a Kentucky Pollutant Discharge Elimination System (KPDES) General Stormwater Permit, a Floodplain Construction Permit if filling within the one-hundred-year floodplain, and a Water Quality Certification.

**Terrestrial Resources.** The plant and animal life is considered typical for the area. Historically, the area was covered with grasslands and forested wetlands, but most have been converted to cropland. Numerous small wood lots are scattered throughout the area, consisting of mostly young trees (15 – 30 years old), and dominated by exotic species in the shrub and herbaceous strata. Potential natural vegetation consists of oak-hickory forest, a mosaic of oak-hickory forest and bluestem prairie (barrens), and southern floodplain forest.

**Threatened and Endangered Species.** Coordination with the United States Fish and Wildlife Service (USFWS) indicated there are no federally protected species known to occur in the study area.

Coordination with the Kentucky Department of Fish and Wildlife Resources (KDFWR) indicated the copperbelly water snake (*Nerodia erythrogastor neglecta*) is known to occur in the Hickory, Kentucky quadrangle. The copperbelly water snake is a federally listed threatened species in the northern part of its range. However, in the southern part of its range (includes Kentucky), it is not federally listed, but could require habitat mitigation if suitable habitat land (*i.e.*, wetlands) is impacted. The potential presence of the copperbelly water snake may require more intensive field studies and habitat mitigation if wetlands are filled for the project.

Coordination with the Kentucky State Nature Preserves Commission (KSNPC) identified two state threatened species from the study area. The Compass plant (*Silphium laciniatum* var. *robinsonii*) is known to occur at two sites near the study area, both are located on the south side of KY 121. Bachman's sparrow (*Aimophila aestivalis*) is known to occur at a site northwest and outside of the study area.

**Managed Land Areas.** Managed land areas are under governmental or private regulatory control, typically to encourage environmental protection or resource procurement. No known managed land areas are located within, or adjacent to, the study area. No agricultural districts would be impacted by the project.

**Farmlands.** The Graves County Natural Resources Conservation Service (NRCS) provided prime farmland soil maps encompassing the study area. The predominant soil type in the study area is Purchase loam complex, while Grenada silt loam is the major prime farmland soil type present. Reviewing the soil survey maps, it appears the study area contains 40 to 50 percent prime farmland, and about 31 percent of the existing KY 121 roadway crosses prime farmland. Some of this prime farmland's value has already been compromised due to residential development and roadway construction.

**Hazardous Materials Concerns.** Land use in the study area is predominantly agricultural and residential, with some commercial facilities. Relevant data was collected from numerous sources, including federal and state databases, and a windshield survey of the area within and near the study area. The survey identified 4 possible contamination sites (see Table 1, *Possible Contamination Sites*, and the color photographs of site examples). Three sites involve fuel distribution and/or vehicle/equipment maintenance facilities, and have similar potential contamination concerns (*e.g.*, underground storage tanks (UST's), fuel spills/leaks/soil contamination, waste petroleum products, heavy metals, solvents, corrosives, tires, lacquers/paints, 55-gallon drums, miscellaneous debris piles, etc.). The former gasoline station being used by the local Farmers Co-Op appeared to have significant amounts of waste stock piling, including: building debris and construction materials, abandoned autos and trucks, trailers, farm and construction equipment, repair parts, etc. Structures with suspected asbestos containing building materials (ACBM) were also observed. Additional potential contamination concerns include: pole-mounted electrical transformers (PCB's), aboveground storage tanks (AST's), and pesticide/herbicide use on farms. Construction activities in and near these sites may require special procedures and permits.

**Air Quality.** Graves County is located within the Paducah (Kentucky) – Cairo (Illinois) Interstate Air Quality Control Region. The area is designated as an Attainment Area for all transportation-related pollutants, as per the 1990 Clean Air Act Amendments, and transportation control measures are not required for the project. However, recent information indicates Graves County is on a “watch list” and a small probability exists it may be redesignated as a Non-Attainment Area when the new National Ambient Air Quality Standards (NAAQS) are published in April 2004. The project is listed on page 84 of the *Kentucky Statewide Transportation Improvement Program (STIP), Fiscal Years 2003–2008*, approved September 2002. The project is not expected to adversely impact air quality in the region.

**Traffic Noise.** The study area contains several residences, a motel, 3 schools (with an additional elementary school under construction), churches, cemeteries, a retirement home, and several small businesses. If KY 121 improvements were implemented, then the highest potential for impacts to properties is from additional right-of-way needs. Properties somewhat removed from the roadway are not anticipated to be adversely affected by traffic noise. It is usually unreasonable to construct noise barriers for single, widely spaced residences, and the need to maintain access to the road would render any noise barriers ineffective.

**Other Concerns.** An elevated water tank that appears on the topographic maps, located near the northern study area boundary, was abandoned and removed by the Hickory Water District about 1999.

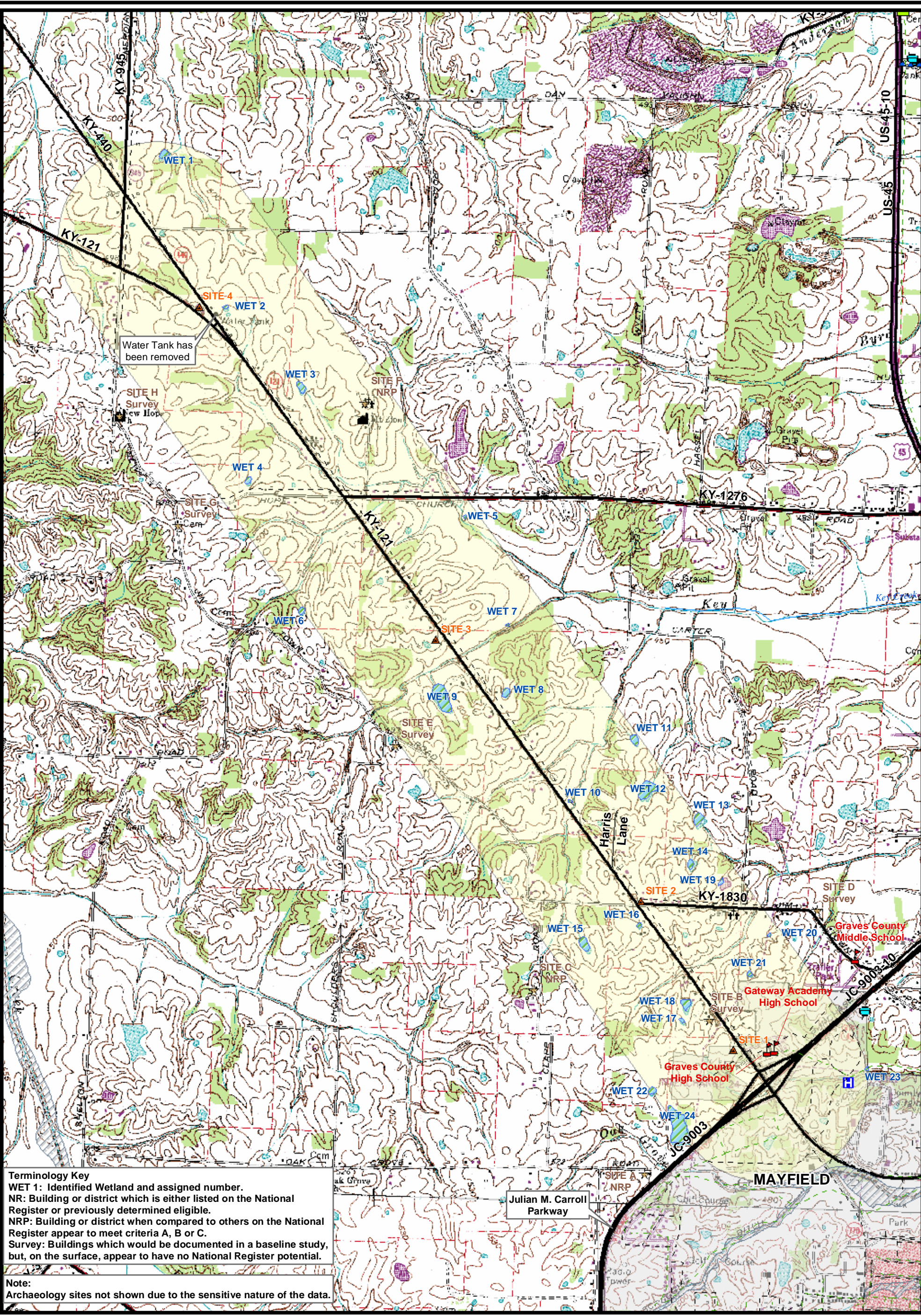
**Environmental Justice.** The Purchase Area Development District (PADD) is preparing the environmental justice section and its related issues/concerns.

**TABLE 1**  
**Possible Contamination Sites**  
**Graves County, KY 121**

Site Number	Site Name or Description	Suspected Contaminant or Area of Concern
1	CITGO Gas Station	USTs, petroleum products, heavy metals, and semi-volatile organic compounds.
2	Vacant Commercial Property	Possible petroleum contamination or hazardous materials from former operations on site, and Asbestos Containing Building Materials (ACBM).
3	Vacant Commercial Property (formerly Turners Body Shop)	Possible petroleum contamination or hazardous materials from former operations on site and Asbestos Containing Building Materials (ACBM).
4	Farmer's Co-Op (former gasoline station)	Petroleum products, heavy metals, semi-volatile organic compounds, oils, greases, waste oils and oil products, solid waste materials, used auto tires, 55-gallon drums with unknown liquid chemical contents, abandoned automobiles, construction debris, heavy equipment, farm machinery, engine parts, possible USTs and linked contamination, and possibly a variety of unknown hazardous materials storage in the interior of the structure on site (i.e., structure interior not inspected).
Not Mapped*	Power Pole Mounted Electrical Transformers	Polychlorinated Biphenyl's (PCB's)
Not Mapped*	Aboveground Storage Tanks (AST's)	Heating fuel oils, gasoline, and liquid propane.
Not Mapped*	Residential Dwellings & Commercial Buildings	Asbestos Containing Building Material (ACBM)

\* Found at various locations throughout study area.





**Terminology Key**  
 WET 1: Identified Wetland and assigned number.  
 NR: Building or district which is either listed on the National Register or previously determined eligible.  
 NRP: Building or district when compared to others on the National Register appear to meet criteria A, B or C.  
 Survey: Buildings which would be documented in a baseline study, but, on the surface, appear to have no National Register potential.

**Note:**  
 Archaeology sites not shown due to the sensitive nature of the data.

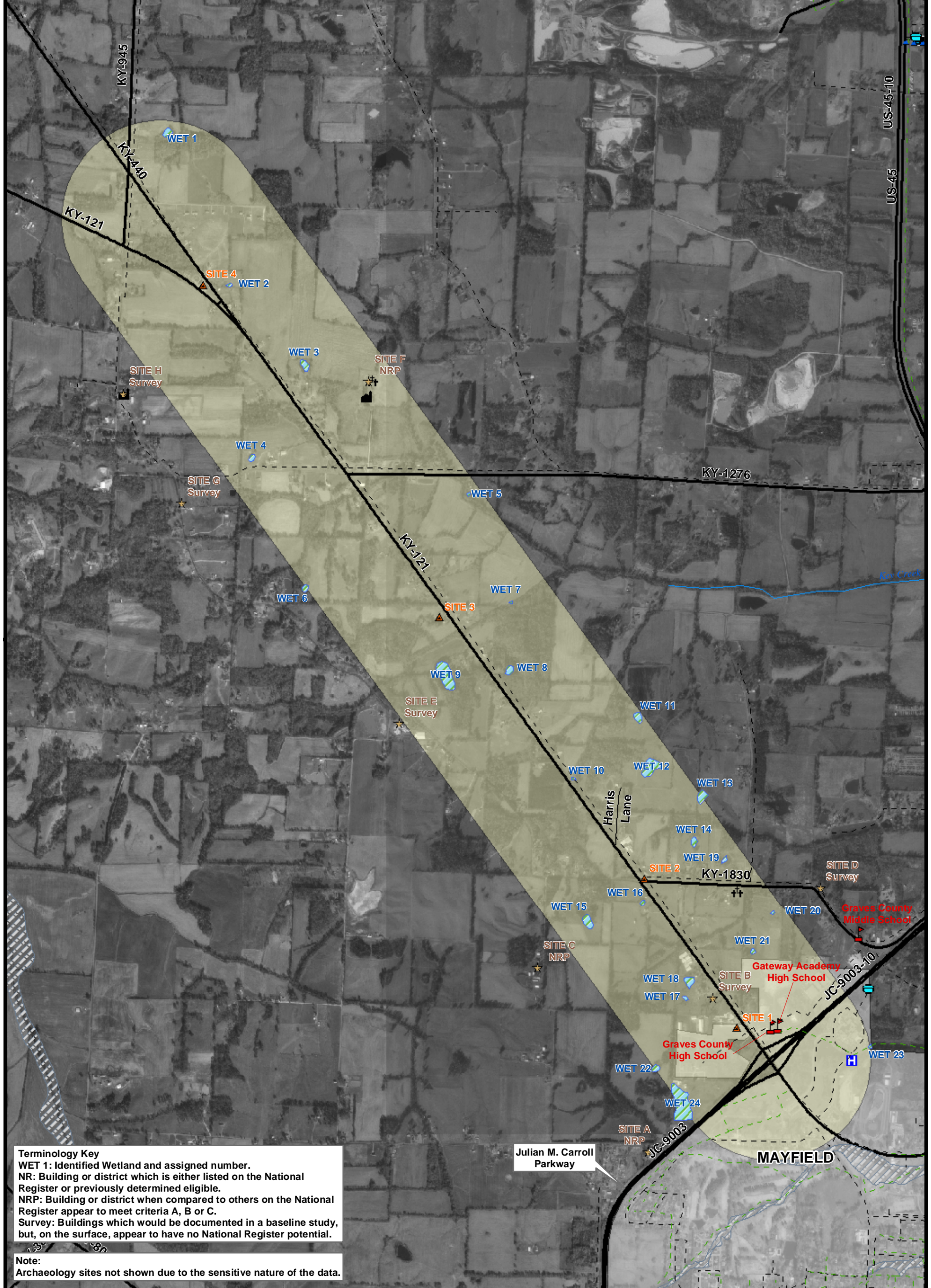
- |                             |                        |                            |                           |
|-----------------------------|------------------------|----------------------------|---------------------------|
| Airport                     | Landfill               | Public Water Source        | State Park                |
| Church                      | Oil Well               | Water Tank                 | Conservation/Natural Area |
| Park                        | Gas Well               | Water Treatment Plant      | PROJECT STUDY AREA        |
| Populated Place             | Combined Oil and Gas   | Sewers                     |                           |
| Cemetery                    | Newly Permitted Well   | Package Plant              |                           |
| School                      | Dry and Abandoned Well | Wastewater Pump Station    |                           |
| Hospital                    | Miscellaneous Well     | Wastewater Treatment Plant |                           |
| Potential Historic Location | Waterline              | Stream                     |                           |
| HAZMAT Site                 | Water Well             | Wetlands                   |                           |
|                             |                        | Potential Flood Risk       |                           |

1,800 900 0 1,800 Feet

Exhibit 1 Sheet 1 of 1

**USGS Topographic Environmental Footprint**  
 KY 121  
 400' South of Harris Lane to KY-945  
 Graves County  
 KYTC Item No. 1-8100.00

VICINITY MAP



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| Park                        | Gas Well               | Water Treatment Plant      | PROJECT STUDY AREA        |
| Populated Place             | Combined Oil and Gas   | Sewers                     |                           |
| Cemetery                    | Newly Permitted Well   | Package Plant              |                           |
| School                      | Dry and Abandoned Well | Wastewater Pump Station    |                           |
| Hospital                    | Miscellaneous Well     | Wastewater Treatment Plant |                           |
| Potential Historic Location | Waterline              | Stream                     |                           |
| HAZMAT Site                 | Water Well             | Wetlands                   |                           |
|                             |                        | Potential Flood Risk       |                           |



1,800 900 0 1,800 Feet

Exhibit 2 Sheet 1 of 1  
**KYOGIS Orthographic Environmental Footprint**  
 KY 121  
 400' South of Harris Lane to KY-945  
 Graves County  
 KYTC Item No. 1-8100.00



**KY 121, Existing  
Typical**

**KY 121 and KY 440 intersection, looking south**



**KY 121 typical section with residential property**



**Entrance to Graves County High School**



**Site 1, Citgo Gas Station**

**KY 121, Possible Contamination Site Examples**



**Site 3, Vacant (formerly Turner's Body Shop)**



**Site 4, Farmers Co-Op**