

## Appendix B – Geotechnical Overview

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**MEMORANDUM**

**TO:** Keith Dotson  
Division of Planning

**BY:** Bart Asher, P.E., P.L.S.  
Geotechnical Branch Manager

**DATE:** September 25, 2013

**SUBJECT:** **McCracken County**  
**Ohio River Megapark Connector**  
**Item # 1-8702.00**  
**MARS # 8684501P**  
**Preliminary Geotechnical Assessment**

The Division of Planning is conducting a study for a new alignment. The Ohio River Megapark Connector will extend from either Bobo Road or Palestine School Road to KY 305 in McCracken County, KY as depicted on the site maps. This abbreviated review will discuss some general geotechnical concerns with the area.

The study area is located in the Mississippian Embayment or Jackson Purchase Physiographic Region. The Kentucky Geological Survey web site states that:

*The Jackson Purchase, or Mississippi Embayment Region is located in western Kentucky where Cretaceous and Tertiary sediments occur at the surface. The Jackson Purchase is the northeastern part of the upper Mississippi Embayment, a part of the Gulf Coastal Plain. The Mississippi River Valley is situated along the axis of the embayment. Because most of the Cretaceous, Tertiary and Quaternary deposits are unconsolidated sediment instead of rock, they are easily eroded, and, consequently, this part of Kentucky is relatively flat lying, with numerous lakes, ponds, sloughs, and swamps. Local relief is generally less than 100 feet, and the lowest spot in the State, at only 260 feet above sea level, is found here.*

The approximate coordinates for the center of this site are : 37.104488 degrees North and -88.727069 degrees West. The site is located in the Paducah West (657) and Heath (561) Geologic Quadrangles.

Available mapping indicates that the study area may have a fault running through the northwest portion of the area. The mapping indicates the material in the area consists of alluvium, Lacustrine Deposits, loess, continental deposits, artificial fill and silt and sand deposits. Bank Gravel may have been mined in the area.

Foundations for bridges in this area would typically be founded on deep foundations such as steel or concrete friction piles. Culverts and walls are typically supported on shallow (yielding) foundations.

Soils in the area are generally suitable for embankment construction. Generally, embankments built from the native soils can be constructed to a height of 60 feet with 2H:1V side slopes if the foundation is suitable and proper compaction methods are used. Soil cuts over approximately 10

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**McCracken County**  
**Ohio River Megapark Connector**

feet often require analyses to design proper side slopes. In no case should soil cuts be steeper than 2H:1V. Soils in the area are considered erodible. Embankment settlement could be an issue in this area for embankment over 10 feet tall.

A review of the area indicates that there are ponded, wet or potentially swampy areas in the proposed corridors. The area is prone to flooding and this will need to be evaluated when determining the proper embankment materials and fill slopes to utilize. Embankment stabilization with durable rock may be required. These areas would require site specific investigations in order to determine suitability for design of the embankments. Additional structures or lengthening of structures may be required to alleviate flooding issues.

California Bearing Ratio (CBR) values used in pavement design generally range from 2-5 for soils subgrades in the area. Chemical modification of subgrade is sometimes used in the area. Wet areas could require undercutting and replacement of soils. Working platforms may be needed to construct in the swampy areas.

Previously completed Geotechnical Investigations within the study area are:

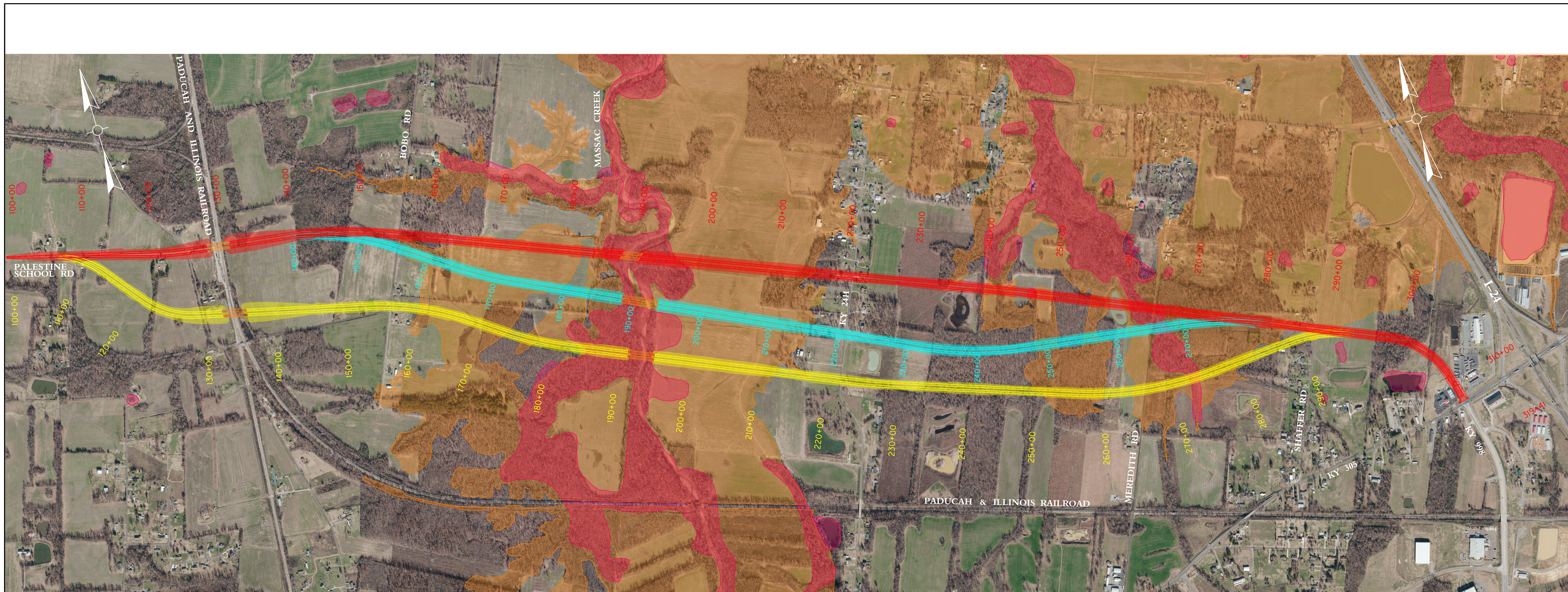
<u>Report No.</u>	<u>Route</u>	<u>Structure Over</u>	<u>Report Type</u>	<u>Description</u>
R-025-2000	KY-998		Roadway	From Station 12+50 to Station 53+50.25
S-088-1981	KY-1420	P&I Railroad	Structure	Bridge located 0.6 miles North of KY-305
S-047-2001	KY-998		Structure	Box Culvert @ Sta. 52+25.00
S-026-1995	KY-2411	Massac Creek	Structure	Bridge is located 0.6 miles northwest of the junction of KY-1420 and KY-2411

The reports are located on the KYTC Geotechnical Branch Database which can be accessed through the KYTC Division of Structural Designs home page (Click on Geotech and Search KYTC Completed Projects).

Site specific Geotechnical investigations are critical in this region for design.

Please feel free to contact this office for additional information.

**Attachments:**  
**Site Map**  
**GQ Site Map**



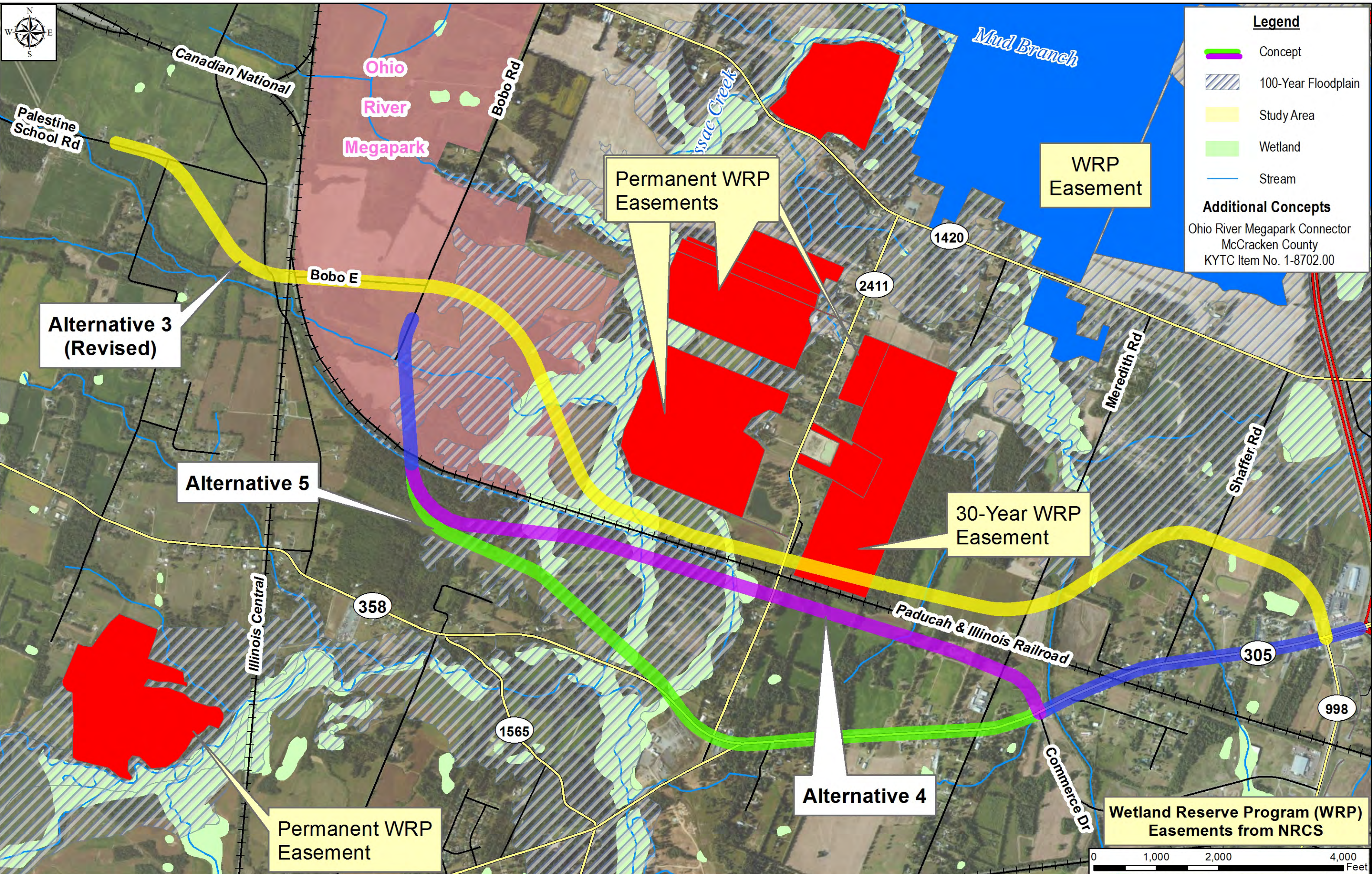
	ALT 1		100 YR FLOODPLAIN (FEMA)
	ALT 2		WETLANDS (NWI)
	ALT 3		

SCALE = 1" = 400'

**OHIO RIVER MEGAPARK CONNECTOR  
CONCEPTUAL ALTERNATIVES  
MCCRACKEN COUNTY - ITEM NO.1-8702.00  
PUBLIC MEETING - JUNE 27, 2013**

	ALT 1		100 YR FLOODPLAIN (FEMA)
	ALT 2		WETLANDS (NWI)
	ALT 3		

SCALE = 1" = 400'



**Legend**

- Concept
- 100-Year Floodplain
- Study Area
- Wetland
- Stream

**Additional Concepts**

Ohio River Megapark Connector  
 McCracken County  
 KYTC Item No. 1-8702.00

**Alternative 3  
(Revised)**

**Alternative 5**

**Permanent WRP  
Easements**

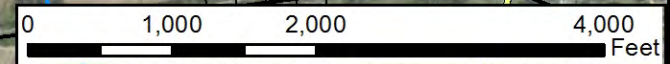
**WRP  
Easement**

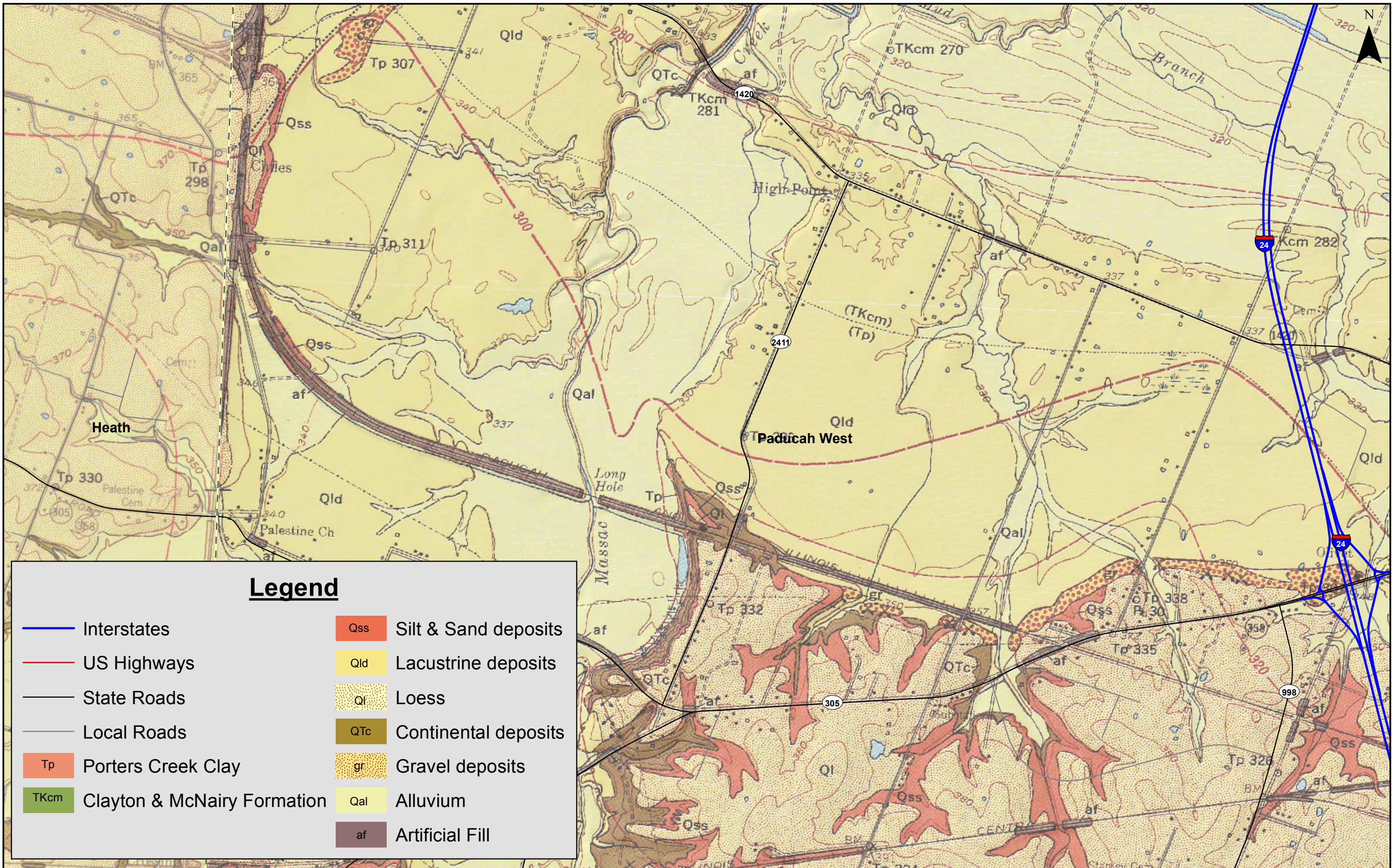
**30-Year WRP  
Easement**

**Alternative 4**

**Permanent WRP  
Easement**

**Wetland Reserve Program (WRP)  
Easements from NRCS**





0 1,250 2,500 5,000 Feet