Section 401/404 Permit Application

Wendell H. Ford Airport Access Road

Perry County, Kentucky

KYTC Item No. 10-80100

Prepared for:

Kentucky Transportation Cabinet

Division of Environmental Analysis

and District 10

Palmer ENGINEERING

TEAM KENTUCKY TRANSPORTATION CABINET

Prepared by:

Palmer Engineering

May 2023

See PDF Attachment for USACE Form 4345 and ORM Upload Sheet

APPENDIX A

LOP Transportation Projects Complete Application Checklist

LOP Transportation Projects Complete Application Check List.

Project Name: Wendell H. Ford Airport Access Road	**Corps I. D. -**		**Corps PM:**
Applicant: Kentucky Transportation Cabinet	**Agent:** Jacob Travelstead		**KTC Item No.** 10-80100
Application Information		**Completed**	
	N/A	**Yes**	**No**
D.A. Application w/signature		**X**	
Alt. Analysis		**X**	
Maps		**X**	
Agency Coordination		**X**	
Site Visit		**To be Scheduled**	
Approved JD		**X**	
Section 106 Concurrence		**X**	
Section 7 Concurrence		**X**	
Wetland Data Sheets		**X**	
Stream Functional Assessment/RBP Sheets		**X**	
Final Mitigation Plan (In lieu fee)		**X**	
Cumulative Impacts Table		**X**	
Individual WQC		**X**	
Other:			
Public Interest/Environmental Effects		**Addressed**	
	N/A	**Yes**	**No**
Economics		**X**	
Aesthetics		**X**	
Special Aquatic Sites		**X**	
Fish and Wildlife Values		**X**	
Flood Hazards		**X**	
Land Use Classification		**X**	
Navigation		**X**	
Shore Erosion/Accretion Patterns		**X**	
Recreation		**X**	
Existing and Potential Water Supplies, Conservation		**X**	
Water Quality		**X**	
Energy Needs		**X**	
Safety		**X**	
Food and Fiber Production		**X**	
Mineral Needs		**X**	
Section 4(f)/6(f) Resources		**X**	
Other:			

APPENDIX B

Application For Water Quality Certification

COMMONWEALTH OF KENTUCKY
ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER

APPLICATION FOR PERMIT TO CONSTRUCT ACROSS OR ALONG A STREAM AND / OR WATER QUALITY CERTIFICATION

Chapter 151 of the Kentucky Revised Statutes requires approval from the Division of Water prior to any construction or other activity in or along a stream that could in any way obstruct flood flows or adversely impact water quality. *If the project involves work in a stream, such as bank stabilization, dredging or relocation, a 401 Water Quality Certification (WQC) from the Division of Water will be required.* This completed form will be forwarded to the Water Quality Branch for WQC processing. The project may not start until all necessary approvals are received from the KDOW. For questions concerning the WQC process, contact the WQC section at 502/564-3410.

If the project will disturb more than 1 acre of soil, A Notice of Intent for Storm Water Discharges will also be required. Forms can be obtained at http://water.ky.gov/permitting/pages/generalpermits.aspx

1. **OWNER:** Kentucky Transportation Cabinet
   Give name of person(s), company, governmental unit, or other owner of proposed project.
   MAILING ADDRESS: 200 Mero Street, Frankfort KY 40602
   TELEPHONE #: 502-564-7250 **EMAIL:** **Jacob.travelstead@ky.gov**

2. **AGENT:** David Waldner, Palmer Engineering
   Give name of person(s) submitting application, if other than owner.
   ADDRESS: 400 Shoppers Drive, Winchester KY 40392-0747
   TELEPHONE #: 859-744-1218 **EMAIL:** dwaldner@palmernet.com

3. **ENGINEER:** David Waldner **P.E. NUMBER:** 15035
   Contact Division of Water if waiver can be granted.
   TELEPHONE #: 859-744-1218 **EMAIL:** dwaldner@palmernet.com

4. **DESCRIPTION OF CONSTRUCTION:**
   List the items to be constructed in the floodplain
   The construction of Wendell H. Ford Access Road (KYTC 10-80100). The project is approximately 1.74 miles in length through mountainous terrain.

5. **COUNTY:** Perry **NEAREST COMMUNITY:** Hazard

6. **USGS QUAD NAME:** Krypton & Hazard North **LATITUDE/LONGITUDE:** 37.360117 N; -83.258871 W

7. **STREAM NAME:** Tributaries to Rockhouse Fork and Lost Creek
   WATERSHED SIZE (in acres): Rockhouse Fork 282 ac

8. **LINEAR FEET OF STREAM and/or ACRES OF WETLAND IMPACTED:** intermittent 1,200 lf and perennial 450 lf; 0.50 ac. Wetlands.

9. **DIRECTIONS TO SITE:** From the intersection of Hal Rogers Pkwy (KY 80) and KY 15, travel north on KY 15 approximately 6.8 miles to Trus Joist Lane which is the southern terminus of the project. The northern terminus connects into Wendell H Ford Terminal Rd near the airport.

10. **IS ANY PORTION OF THE REQUESTED PROJECT NOW COMPLETE?** ☐ Yes ☒ No If yes, identify the completed portion on the drawings you submit and indicate the date activity was completed. DATE: _____

11. **ESTIMATED BEGIN CONSTRUCTION DATE:** January 2024

12. **ESTIMATED END CONSTRUCTION DATE:** Summer 2025

13. **HAS A PERMIT BEEN RECEIVED FROM THE US ARMY, CORPS of ENGINEERS?** ☐ Yes ☒ No If yes, attach a copy of that permit.

14. **THE APPLICANT *MUST* ADDRESS PUBLIC NOTICE:**

(a) PUBLIC NOTICE HAS BEEN GIVEN FOR THIS PROPOSAL BY THE FOLLOWING MEANS:

____ **Public notice in newspaper having greatest circulation in area (provide newspaper clipping or affidavit)**

____ **Adjacent property owner(s) affidavits (Contact Division of Water for requirements.)**

(b) ____ I REQUEST WAIVER OF PUBLIC NOTICE BECAUSE:

LOP satisfied public notice requirements; Public meeting for project conducted 10-11-22

Contact Division of Water for requirements.

15. **I HAVE CONTACTED THE FOLLOWING CITY OR COUNTY OFFICIALS CONCERNING THIS PROJECT:**

Give name and title of person(s) contacted and provide copy of any approval city or county may have issued.

16. **LIST OF ATTACHMENTS:** Aerial and topographic mapping and photographs of the impacted waters.

List plans, profiles, or other drawings and data submitted. Attach a copy of a 7.5 minute USGS topographic map clearly showing the project location.

17. **I,** KYTC **(owners Initials) CERTIFY THAT THE OWNER OWNS OR HAS EASEMENT RIGHTS ON ALL PROPERTY ON WHICH THIS PROJECT WILL BE LOCATED OR ON WHICH RELATED CONSTRUCTION WILL OCCUR (for dams, this includes the area that would be impounded during the design flood).**

18. **REMARKS:**

I hereby request approval for construction across or along a stream as described in this application and any accompanying documents. To the best of my knowledge, all the information provided is true and correct.

SIGNATURE: Jacob Travelstead

Owner or Agent sign here. (If signed by Agent, a Power of Attorney should be attached.)

DATE: 05/15/2023

SIGNATURE OF LOCAL FLOODPLAIN COORDINATOR:

Permit application will be returned to applicant if not properly endorsed by the local floodplain coordinator.

DATE: _____

SUBMIT APPLICATION AND ATTACHMENTS TO:

Floodplain Management Section
Division of Water
300 Sower Boulevard
Frankfort, KY 40601

APPENDIX C

Purpose and Need Statement and Alternative Analysis

PURPOSE AND NEED

For Letter of Permission (LOP)
Wendell H. Ford Airport Access Road Project
Perry County, Kentucky
KYTC Item No. 10-80100
LRL-

The purpose of the project is to improve access to the Wendell H. Ford Airport in Hazard, Perry County, Kentucky. The need for this project arises from substandard conditions of the existing access road, including narrow lanes, little to no shoulders, steep grades, and slope failures. These geometric deficiencies limit fuel deliveries to the airport, especially during winter months, when road conditions sometimes become impassable, forcing closure of the road and the airport and isolating area residents reliant on the road for access to KY 15, the principal arterial road that serves the area.

The selected alternative begins at the KY15/Trus Joist Lane intersection and is approximately 1.74 miles long. It was developed using a design speed of 40 mph with a maximum grade of 5%. From the Trus Joist Lane intersection it traverses north easterly across an undeveloped forested mountainside. The alignment lies to the north of a residential development near the intersection with Fly By Hazard Road, and ties-in with Terminal Road just south of the airport taxiway and east of Twin Engine Road.

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (Corps) federal permit program requires all permit applicants to avoid and minimize impacts to the waters of the U.S. (WOTUS). Under the National Environmental Policy Act (NEPA) and the Clean Water Act Section *(33 CFR Part 325 Appendix B, 40 CFR 230.5(c) and 40 CFR 1501.5(c))*, the Corps is required to evaluate a proposed project's alternatives. The permit applicant is required to prepare and submit information regarding project alternatives.

NEPA requires the Corps to evaluate reasonable alternatives that would accomplish a proposed project's underlying purpose and need. Under NEPA, the Corps must also evaluate a "no action" or "no build" alternative, which is an alternative resulting in construction not requiring a permit. An evaluation of alternatives is required under Section 404(b)(1) Guidelines for projects that include the discharge of dredged or fill material into the WOTUS. Under Section 404(b)(1) Guidelines, the practicability of alternatives is considered and no alternative may be permitted if there is a less environmentally damaging practicable alternative.

2.0 PROJECT NEED

The Wendell H. Ford Airport was established in the 1990s. There are approximately 30 take-off and landing operations daily. The airport is accessed via Wendell Ford Terminal Road (Terminal Road), a narrow two-lane road with steep grades exceeding 16% in some locations. The roadway exhibits slope failures that have required extensive maintenance and costly repairs. Due to the steepness of the grades and substandard curvature, fuel delivery trucks cannot deliver full loads of fuel to the airport. In addition, during winter months, even after treatment, the road conditions often remain so treacherous that the road and the airport are frequently closed. With plans to extend the runway to better serve corporate customers and small cargo aircraft, such closures undermine the reliability of the airport to serve existing and future patrons. Furthermore, closing of the road isolates residents of nearly 150 homes that rely upon the road to access KY 15 and the community. Thus, the need for this project arises from the substandard conditions of the existing access road, including narrow lanes, little to no shoulders, steep grades, and slope failures. Improving access to the airport is necessary to provide a safe travel route for both passenger cars and airport delivery vehicles and to maintain dependable air service at the facility.

3.0 PROJECT PURPOSE

The proposed project is approximately 1.74 miles long, beginning at mile point (MP) 21.9 on KY 15, south of Trus Joist Lane, following KY 15 to MP 23.0. It then extends easterly to include Wendell Ford Terminal Road and the undeveloped land south of Fly By Hazard Road, roughly encompassing the entire parcel of forest south to MP 21.9. The purpose of the project is to improve access to the Wendell H. Ford Airport and area residents that live in the surrounding neighborhood to KY 15. Additionally, the new access road will connect to the Industrial Park and provide turn lanes at the intersection of Trus Joist Lane with KY 15.

4.0 PROJECT DEVELOPMENT

The existing intersection of Trus Joist Lane and KY 15, south of the airport, was identified as the location where the new access road, if constructed, would depart from KY 15. Four alternatives were initially developed, using maximum 10% grades and a 35 mph design speed. Corridors for improving access to the airport were initially developed with several objectives in mind, including:

- Accommodate fully-loaded fuel trucks (48', five-axle semi-trailer) to transport aviation fuel to the airport at all times throughout the year;
- Avoid impacts to existing housing developments near the airport;
- Avoid impacts to any FAA required navigation equipment supporting airport operation;
- Avoid encroachment of the proposed access road on areas for potential runway or taxiway expansion; and
- Meet a design speed of 35-40 mph with a maximum 10% grade (8% preferred) and have 11-foot lanes with 4-foot shoulders.

5.0 ALTERNATIVE EVALUATION

The Wendell H. Ford Airport Access Road Scoping Study, Perry County, Kentucky (November 2018) evaluated five alternatives and a no-build to provide a new connection between KY 15 and the airport. The five alternatives (Figure 1) were distinguished by color: green (ALT 1), yellow (ALT 2), red (ALT 3), orange (ALT 4), and blue (ALT 5). All build alternatives addressed the geometric deficiencies along the access road, using a 35-40 mph design speed, with a maximum 10% grade, and 11-foot lanes with 4-foot shoulders. Alternatives 1, 2, and 3 all terminate at Fly By Hazard Road near a subdivision development along Terminal Road. Alternative 4 intersects with Fly By Hazard Road further to the east and continues northward to tie-in with Terminal Road just west of the airport, avoiding the subdivision. Alternatives 1 and 2 were dismissed due to their similarities with other alternatives. Alternative 5 was later developed with maximum 5% grades and a 40 mph design speed. Its alignment crosses between Alternatives 3 and 4 and is coincidental with Alternative 4 between Fly By Hazard Road and its terminus with Terminal Road near the airport. The scoping study recommended that Alternative 5 be advanced for further study and preliminary engineering as the Preferred Alternative.

5.1 No Build Alternative

Selecting the No Build alternative would leave the existing Terminal Road, with its 20 mph design speed, as the primary access for the airport. The narrow lanes, steep grade, and substandard horizontal curves would continue to present an obstacle to fuel delivery trucks destined for the airport. Closure of the road and the airport during inclement winter weather would also be expected to continue, rendering the airport unreliable for airport patrons and receipt/delivery of cargo, and isolating area residents. There are no construction costs associated with the No Build alternative; however, high maintenance costs would continue to be incurred due to the instability of cuts and embankments along the road. Additionally, the No Build alternative does not satisfy the purpose and need of the project.

5.2 Alternatives 1-5 Discussion

Alternatives 1 and 2 were preliminarily developed to assess the scale of the project. Alternatives 1 and 2 originated at the KY 15/Trus Joist Lane intersection. Alternatives 1 and 2 followed slightly different corridors to the airport, with both terminating at Fly By Hazard Road, northeast of its intersection with Terminal Road. These alternatives essentially would have created an offset intersection for those travelling from KY 15 to the airport. In an effort to minimize grades, earthwork and costs, Alternatives 1 and 2 were refined to create Alternatives 3 and 4. Alternative 3 ties into Terminal Road near the Fly By Hazard Road intersection. This location lies to the north of the section of Terminal Road with the steep substandard grades and sharp horizontal curves. Traffic for this alternative would continue to be funneled through the residential development near the intersection. Alternative 4 intersects with Fly By Hazard

Road north of the residential development on Terminal Road and Justin Lane and continues northwest until it ties into Terminal Road just east of Twin Engine Drive and southeast of the airport taxiway. All of the alternatives would require the acquisition and relocation of two residences near the KY 15 intersection. Due to their similarity with Alternatives 3 and 4, Alternatives 1 and 2 were formally dismissed from further evaluation.

While a marked improvement to the 16% grades that exist on Terminal Road, Alternatives 3 and 4 include significant lengths with 10% grades. It was desired to explore opportunities for a cost-effective alignment that met the objectives set forth for the other alignments and reduced grades to a maximum of 5%, which resulted in the development of Alternative 5.

Previous mining activity was also a consideration for each of the alternatives. To an extent, previous mining activities will have a degree of influence on all of the alternatives. Alternatives 4 and 5 both cross an area of previous mining northeast of their intersection with Fly By Hazard Road before tying into Terminal Road near the airport. Alternative 4 also crosses an area further to the south that is suspected of previous surface mining activity. The alignment of Alternative 3 stays to the west of past surface mining activity but, like all of the alternatives, may be affected by underground mining.

Alternative 5 was developed using a design speed of 40 mph with a maximum grade of 5%. From the Trus Joist Lane intersection it traverses north easterly across an undeveloped forested mountainside. The alignment lies to the north of a residential development near the intersection with Fly By Hazard Road, and ties-in with Terminal Road just south of the airport taxiway and east of Twin Engine Road (Figure 1).

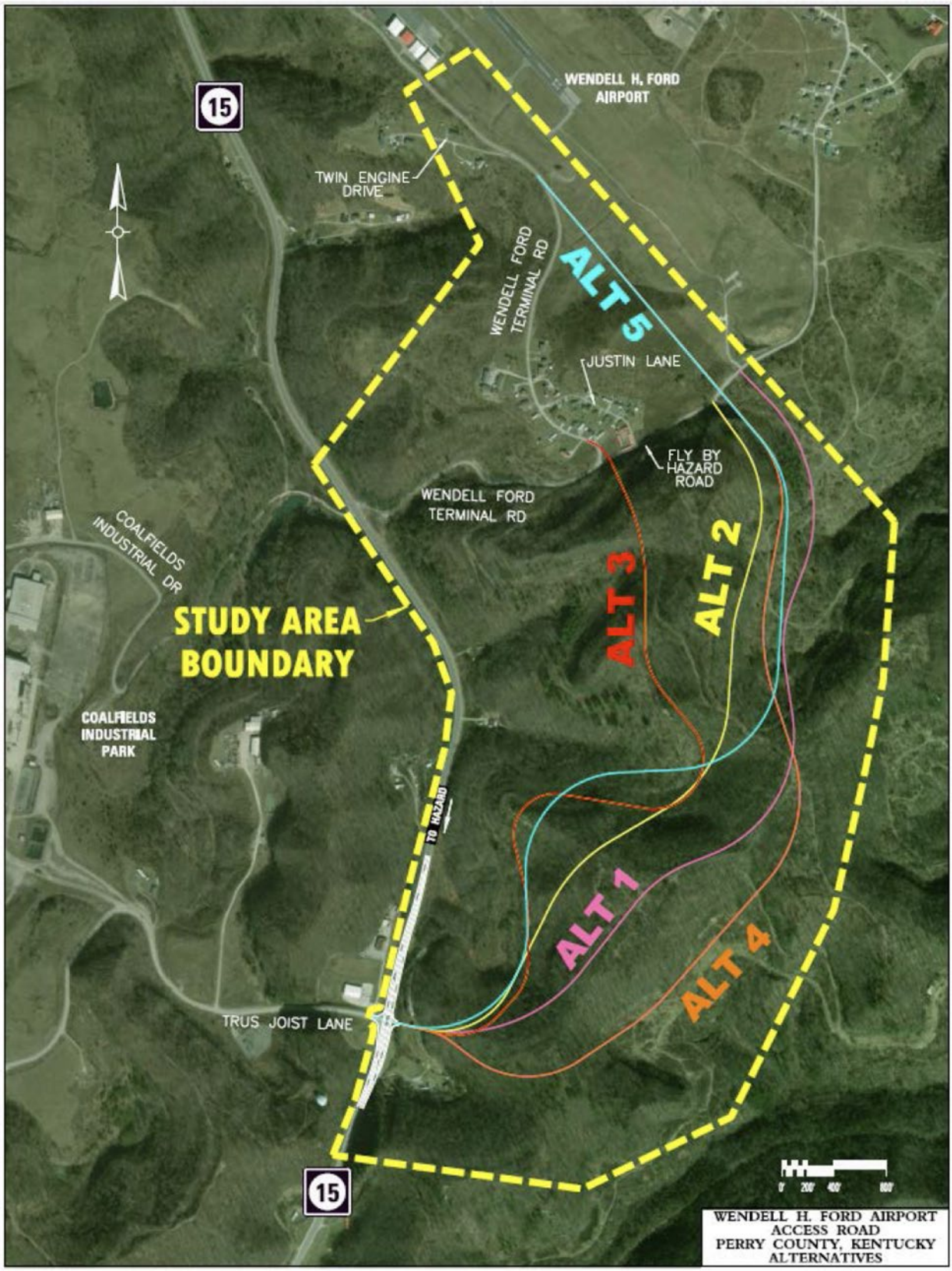


Figure 1: Study Area and Potential Alternatives.

5.3 Alternative 3

Alternative 3 is 1.22 miles long and was developed using a 35 mph design speed (Figure 2). It has maximum grades of 10% for 820 feet of the alignment. It would require more than 1.7 million cubic yards of excavation and generate more than 1.4 million cubic yards of excess material. Three excess material sites would be required, which would result in additional environmental impacts to WOTUS and forested habitat. By terminating at the Terminal Road and Fly By Hazard Road intersection, traffic would continue to pass through the residential development south of the airport. Though no relocations in the neighborhood are required, the continued routing of traffic through this area does not meet the objective of "avoiding impacts to existing housing developments" as suitably as other alternatives.

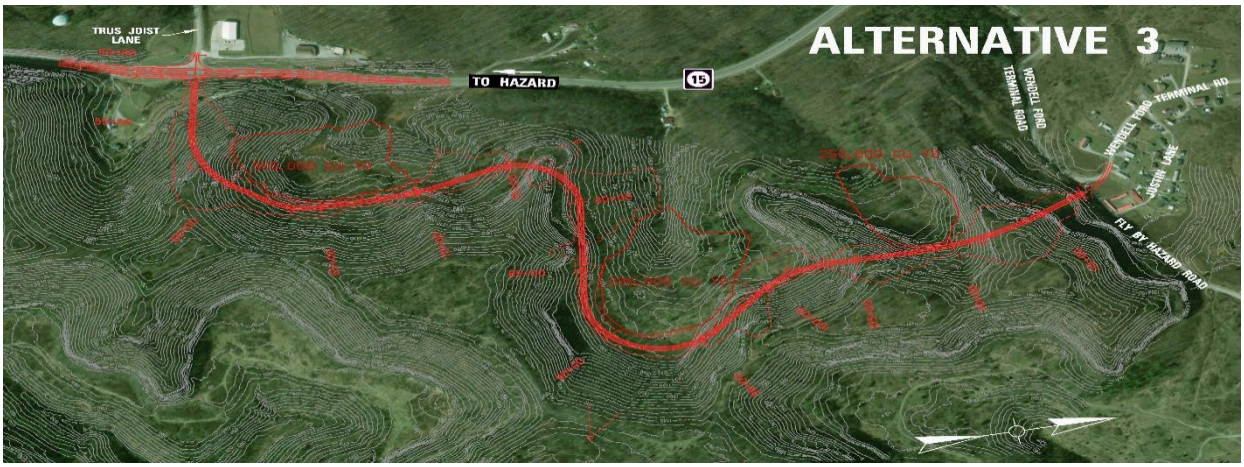


Figure 2: Alternative 3.

5.4 Alternative 4

Alternative 4 is 1.85 miles long and was also developed using a 35 mph design speed (Figure 3). It has a series of 10% grades stretching across the first mile of the alignment nearest KY 15. The alignment lies to the north of the residential development near the Fly By Hazard Road intersection and ties-in with Terminal Road just south of the airport taxiway and east of Twin Engine Road. Construction would require more than 2.1 million cubic yards of excavation and generate over 1.1 million cubic yards of excess material. Three excess material sites would be required, which would result in additional environmental impacts to streams and forested habitat, and mitigation costs to construct this alternative.

Figure 3: Alternative 4.

5.5 Alternative 5 (Preferred Alternative)

Alternative 5 is 1.74 miles long and was developed using a design speed of 40 mph with a maximum grade of 5% (Figure 4). Like Alternative 4, the alignment lies to the north of the residential development near the Fly By Hazard intersection, and ties-in with Terminal Road just south of the airport taxiway and east of Twin Engine Road. Earthwork is much more balanced than the other alternatives. Construction would require approximately 1 million cubic yards of excavation and 1.1 million cubic yards of fill. Given the uncertainty of accurately predicting swell, this alternative is considered balanced.

Figure 4: Alternative 5.

6.0 AQUATIC ECOSYSTEM IMPACTS

Aquatic resources within the project area were located and assessed as part of the Environmental Overview (2018). The three alternatives evaluated along the existing alignment all impact jurisdictional WOTUS. Permanent impacts to streams would be expected for all build alternatives. After consideration of stream and wetland impacts, as well as other factors such as minimizing area residential impacts, improving geometry, safety, and cost, Alternative 5 (Blue) was identified as the Preferred Alternative. Alternative 5 meets the purpose and need and provides the overall best and most practicable alternative. An assessment of the impacts on aquatic resources identified 22 streams within the proposed right-of-way limits of Alternative 5, totaling approximately 4,364 linear feet of stream channel. However, due to past mining activities, the streams within the project study area have been degraded and score poorly for

the bioregion (KDOW 2022). Area streams have been impacted by acid mine drainage and/or occur on reclaimed or abandoned mine lands. Additionally, conductivity taken within perennial and intermittent streams within the study corridor ranged from 464 to 567 micro Seimens per centimeter (uS/cm).

6.1 Aquatic Organism Passage (AOP)

Stream corridors provide habitat for a wide variety of aquatic organisms, many of which depend on the ability to move freely upstream and downstream to complete their life cycles. The ability to accommodate aquatic organism passages is an important design consideration at some culvert locations. Per the U.S. Department of Transportation, Federal Highways Administration's Hydraulic Design Series No. 5 *Hydraulic Design of Highway Culverts* (Pub. No. FHWA-NHI-01-020)*, s*imulating the natural stream bottom conditions in a culvert is the most desirable design option to accommodate fish passage. However, when simulation of the natural stream bottom condition is unrealistic or unnecessary, criteria for maintaining minimum depths and maximum velocities are the most important factor. For some intermittent and perennial stream crossings, a bottomless or buried culvert, open bottom box culvert, or bridge may be installed/constructed to allow for aquatic organism passage. Open bottom culverts, such as arches, have apparent advantages if adequate foundation support exists. Oversized depressed culverts have the advantage of a natural bottom while overcoming the problem of poor foundation material. Typically, a buried culvert means that approximately 10% of the bottom by dimension is buried below the existing streambed elevation. When practicable, culverts are designed and sized to accommodate bank-full discharge and match the existing depth of flow to facilitate the passage of aquatic organisms. Additionally, as practicable, culverts are installed at the existing streambed slope to allow for the natural movement of the stream's bed load and aquatic organisms.

The culverts proposed for the project are for ephemeral or intermittent streams. These streams have such small drainage areas that they are considered unsuitable for the type of aquatic life (primarily fish) that would be impacted due to low flow through culverts. The structures recommended will not "substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the proposed affected waterbodies." One perennial stream channel, an unnamed tributary to Rockhouse Fork is anticipated to be impacted (filled) by the Preferred Alternative. However, this stream is of poor quality primarily due to acid mine drainage and habitat.

7.0 LEAST ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVE

To identify reasonable alternatives, KYTC screened potential alternatives for their ability to meet the stated Purpose and Need and other evaluation criteria such as minimizing impacts to natural resources, property impacts, relocations, utility impacts, etc. The final evaluation criteria consisted of the following:

- Consistency with the project's purpose and need;
- Potential physical environment effects, including impacts on natural resources (streams, wetlands, fish, wildlife, vegetation, stormwater runoff) during project construction and operation;
- Potential social environment effects, including impacts to cultural and historical properties, private property, economics, subsistence, and consistency with local, regional, statewide, and Federal plans;
- Potential transportation-related effects, including impacts on vehicle traffic during construction and operation;

- Cost factors, including total project costs; and
- Engineering feasibility, including constructability and MOT.

While considering multiple alternatives evaluated during the NEPA process, KYTC solicited public and agency review and comment. The Evaluation Criteria, as well as public and agency input, were considered in the selection of the Preferred Alternative. Impacts of the Preferred Alternative are documented in the Categorical Exclusion (CE) developed and approved for the project.

Table AA-1 summarizes the impacts of the various alternatives. Alternative 5 minimizes residential property impacts, historic property impacts, endangered bat habitat loss (forested habitat), and will allow traffic to be maintained during construction. Due to the excess excavation generated from Alternatives 3 and 4, significant disturbance beyond the right of way would be necessary for their construction. The disturb limits for Alternative 5 are just more than half that of Alternative 4 and 30% less than Alternative 4. Stream impacts among the alternatives are essentially equal with wetland impacts being slightly higher for Alternative 5 than for Alternative 4 but less than for Alternative 3. The impacts to perennial and intermittent streams by the Preferred Alternative will be mitigated by acquiring mitigation credits from the EIP-KSWMBI-III North Fork Stream Mitigation Bank (LRL-2015-00322), if available at the time of project letting. There being no wetland credits available at mitigation banks within the service area, payment to the Kentucky Department of Fish and Wildlife Resources' Fee In Lieu Of (FILO) program will be made to address wetland impacts.

In addition, Alternative 5 does not require the excess materials sites needed to construct Alternatives 3 and 4. Impacts to forested acres and federally-listed bat habitat are approximately 30% less for Alternative 5 than the other alternatives. Furthermore, Alternative 5 would convert significantly less acreage to transportation use.

Table AA-1. Alternative Comparison Summary.

Potential Impact Feature	Alternative 3 (Red)	Alternative 4 (Orange)	Alternative 5 (Blue Preferred)
Earthwork (cu yd)			
Cut (incl 12% swell)	1,725,000	2,104,000	1,063,000
Fill	282,000	988,000	1,113,000
Net	1,443,000	1,116,000	-50,000
Disturbance Limits (acres)	58.5	80	42
Stream Impacts (linear feet)	4,305	4,455	4,364
Wetland Impacts (acres)	2.3	0.04	0.5
Ponds (#)	0.0	0.0	0.0
Forested (acres)	52.4	50.0	37.8
Right-of-Way			
Number of Parcels	5	10	9
Acquisitions (acres)	83	105	62
Residential Takings	2	2	2
Neighborhood Impact	Yes	No	No
Mine Impacts	Yes	Yes	Yes
Total Costs	$14,344,000	$18,052,000	$13,239,000

Weighing the totality of environmental factors, Alternative 5 (Blue Alternative) is considered the Least Environmentally Damaging Practicable Alternative (LEDPA).

APPENDIX D

Summary of Section 404/401 Impacts

SUMMARY OF SECTION 404 IMPACTS
For Letter of Permission (LOP)
Wendell H. Ford Airport Access Road Project
Perry County, Kentucky
KYTC Item No. 10-80100
LRL-

TABLE 1: Wendell H. Ford Airport Access Road Project (KYTC 10-80100); Perry County.

Crossing	Station	Name	River Basin[1]	HUC 14	Lat / Long	WOTUS	Impact Type	Impact Dimensions (ft)			Acreage of Impact	Volume of Impact (CY)	RBP Score	Water Quality / Sp. Cond.	Wetland AMU / AMU for Mitigation Upper Kentucky EIU / EIU for Mitigation	
								L	W	D					AMU	EIU
1	500+90	STR 1	UPKY	05100201-120-610	37.36040 / -83.25867	Intermittent	Culvert	596	3	0.3	0.041	19.9	81	Poor / 567		59.6
2	510+50	EPH 3	UPKY	05100201-120-610	37.36080 / -83.25577	Ephemeral	Culvert	182	2	0.3	0.008	4.0	94	Poor		
	510+50	WET 6	UPKY	05100201-120-610	37.26126 / -83.25626	Wetland	Fill	NA	NA	NA	0.197	635.6	NA	NA	0.4 / 0.5	
3	514+25	EPH 4	UPKY	05100201-120-610	37.36170 / -83.25529	Ephemeral	Culvert	120	1	0.2	0.003	0.9	109	Poor		
	517+25	WET 5	UPKY	05100201-120-610	37.36262 / -83.25548	Wetland	Fill	NA	NA	NA	0.036	116.2	NA	NA	0.1 / 0.1	
4	526+00	STR 3	UPKY	05100201-120-610	37.36593 / -83.25470	Perennial	Fill	450	4	0.5	0.041	33.3	120	Poor / 464		108
	530+00	STR 4	UPKY	05100201-120-610	37.36572 / -83.25305	Intermittent	Fill	163	3.3	0.5	0.012	10.0	95	Poor / 523		16.3
	532.00	STR 5	UPKY	05100201-120-610	37.36551 / -83.25219	Intermittent	Fill	207	2	0.3	0.010	4.6	122	Poor / 514		43.5
	535+25	STR 6	UPKY	05100201-120-610	37.36506 / -83.25127	Intermittent	Fill	132	2.5	0.6	0.008	7.3	116	Poor / 514		23.8
	536+50	STR 7	UPKY	05100201-120-610	37.36506 / -83.25127	Intermittent	Fill	102	1	0.2	0.002	0.8	97	Poor / 514		10.2
	526+00	EPH 6	UPKY	05100201-120-610	37.36594 / -83.25420	Ephemeral	Fill	71	1.5	0.3	0.002	1.2	85	Poor		
	530+00	EPH 7	UPKY	05100201-120-610	37.36581 / -83.25311	Ephemeral	Fill	128	1.5	0.3	0.004	2.1	117	Poor		
	531+00	EPH 8	UPKY	05100201-120-610	37.36570 / -83.25283	Ephemeral	Fill	140	1.5	0.3	0.005	2.3	95	Poor		
	531+00	EPH 9	UPKY	05100201-120-610	37.36561 / -83.25279	Ephemeral	Fill	103	3	0.3	0.007	3.4	101	Poor		
	532+00	EPH 10	UPKY	05100201-120-610	37.36541 / -83.25229	Ephemeral	Fill	104	3	0.3	0.007	3.5	114	Poor		

Crossing	Station	Name	River Basin[1]	HUC 14	Lat / Long	WOTUS	Impact Type	Impact Dimensions (ft)			Acreage of Impact	Volume of Impact (CY)	RBP Score	Water Quality / Sp. Cond.	Wetland AMU / AMU for Mitigation Upper Kentucky EIU / EIU for Mitigation	
								L	W	D					AMU	EIU
4 (con't)	534+00	EPH 11	UPKY	05100201-120-610	37.36510 / -83.25165	Ephemeral	Fill	197	1.5	0.2	0.007	2.2	101	Poor		
	534+90	EPH 12	UPKY	05100201-120-610	37.36502 / -83.25144	Ephemeral	Fill	86	1	0.2	0.002	0.6	105	Poor		
	537+00	EPH 13	UPKY	05100201-120-610	37.36518 / -83.25071	Ephemeral	Fill	150	1	0.2	0.003	1.1	103	Poor		
	537+00	EPH 14	UPKY	05100201-120-610	37.36512 / -83.25055	Ephemeral	Fill	106	2	0.3	0.005	2.4	76	Poor		
	537+00	EPH 15	UPKY	05100201-120-610	37.36531 / -83.25062	Ephemeral	Fill	174	1	0.2	0.004	1.3	92	Poor		
	533+25	WET 3A	UPKY	05100201-120-610	37.36536 / -83.25198	Wetland	Fill	NA	NA	NA	0.085	274.3	NA	NA	0.2 / 0.2	
	536+50	WET 3B	UPKY	05100201-120-610	37.36513 / -83.25091	Wetland	Fill	NA	NA	NA	0.142	458.2	NA	NA	0.3 / 0.3	
5	552+00	EPH 16	UPKY	05100201-120-600	37.36926 / -83.24795	Ephemeral	Culvert	309	2	0.3	0.014	6.7	94	Poor		
	552+75	EPH 17	UPKY	05100201-120-600	37.36901 / -83.24809	Ephemeral	Culvert	844	1	0.2	0.019	6.2	96	Poor		
	550+00	WET 1	UPKY	05100201-120-600	37.36803 / -83.24812	Wetland	Fill	NA	NA	NA	0.035	112.9	NA	NA	0.1 / 0.1	
6	569+25	WET 2	UPKY	05100201-120-600	37.37287 / -83.24970	Wetland	Fill	NA	NA	NA	0.005	16.1	NA	NA	**0.0 / 0.0**	
							Total Perennial	450			0.041	33.3				**108**
							Total Intermittent	1,200			0.073	42.6				**153.4**
							Total Ephemeral	2,714			0.090	37.9				**NA**
							Combine Total	4,364			0.204	113.8				**261.4**
							Total Wetland	NA			0.500	1,613			**1.1 / 1.2**	

(1) Upper Kentucky River Basin [(1)]

SUMMARY OF SECTION 404 IMPACTS
For Letter of Permission (LOP)
Wendell H. Ford Airport Access Road Project
Perry County, Kentucky
KYTC Item No. 10-80100
LRL-

[Please note: Impacts are arranged below in the order that the sites occur moving along the project from south to north. Site numbers are not necessarily in numerical order. The reason for this is that the site numbers which were assigned during field investigations have been retained to avoid errors which often occur when field site numbers are changed during document preparation. The permit sheets which follow this Summary are arranged in that same order.]

Crossing 1	**Station 500+90** **Site STR 1** **Sheet R4**	The existing intermittent channel will be filled with a 42-inch pipe along KY 15. **596 lf of intermittent** stream will be permanently impacted for a total of **0.041 acre**. **Latitude 37.36040, Longitude -83.25867**
Crossing 2	**Station 510+50** **Site EPH 3** **Sheet R6**	The existing ephemeral channel will be filled and relocated to a 24-inch pipe. **182 lf of ephemeral** stream will be permanently impacted for a total of **0.008 acre**. **Latitude 37.36080, Longitude -83.25577**
	Station 510+50 **Site WET 6** **Sheet R6**	**0.197 acre** of the current 2.07 acre PEM wetland will be filled during construction. This wetland is located on reclaimed mine fill. **Latitude 37.26126, Longitude -83.25626**
Crossing 3	**Station 514+25** **Site EPH 4** **Sheet R6**	The existing ephemeral channel will be filled and relocated to an 18-inch pipe. **120 lf of ephemeral** stream will be permanently impacted for a total of **0.003 acre**. **Latitude 37.36170, Longitude -83.25529**
	Station 517+25 **Site WET 5** **Sheet R6**	**0.036 acre** of the current 0.036 acre SS/PEM wetland will be filled during construction. This wetland is located on reclaimed mine fill. **Latitude 37.36262, Longitude -83.25548**

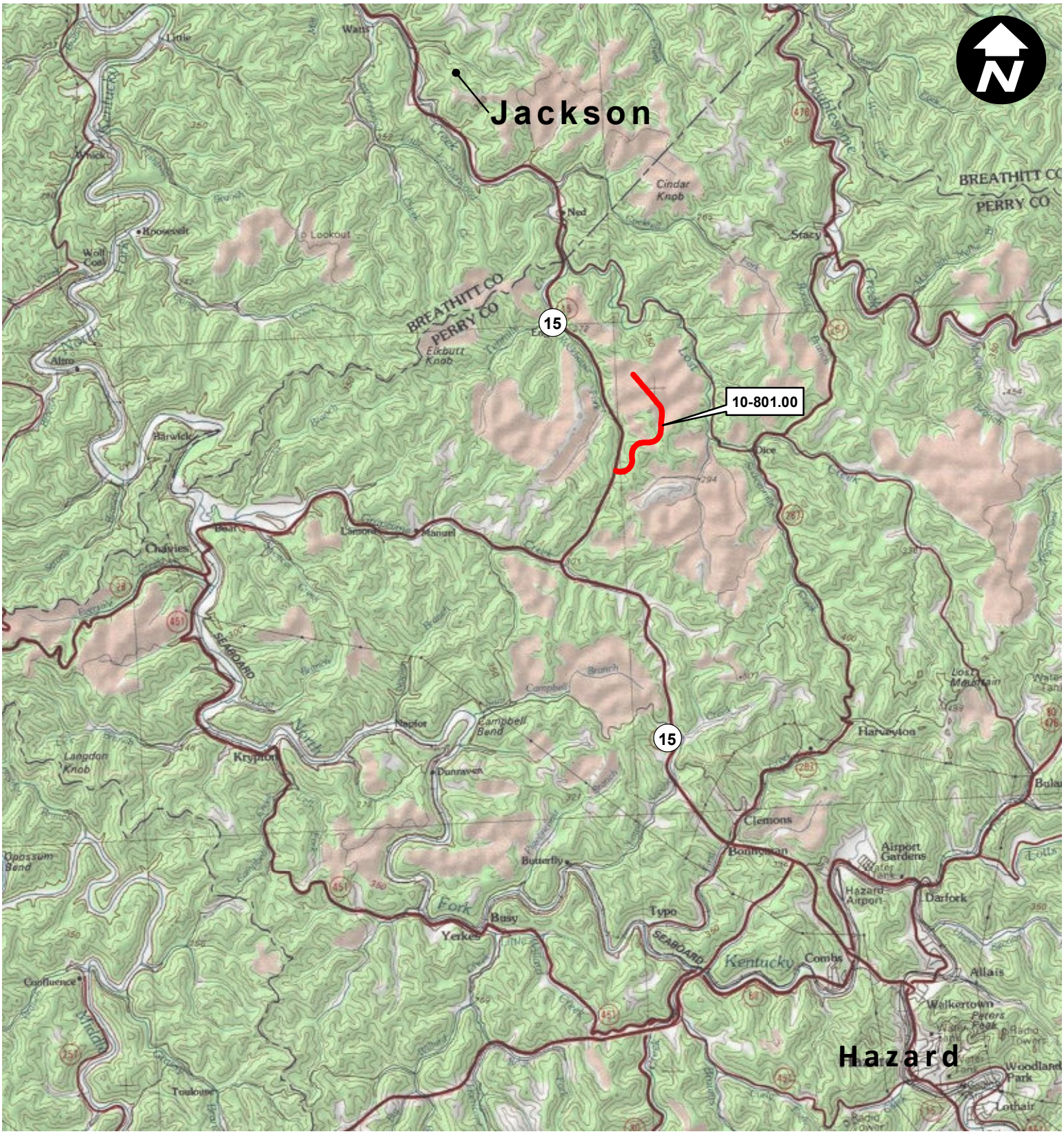
Crossing 4	**Station 526+00** **Site STR 3** **Sheet R8**	The existing perennial channel will be filled. **450 lf of perennial** stream will be permanently impacted for a total of **0.041 acre**. **Latitude 37.36593, Longitude -83.25470**
	Station 530+00 **Site STR 4** **Sheet R8**	The existing intermittent channel will be filled. **163 lf of intermittent** stream will be permanently impacted for a total of **0.012 acre**. **Latitude 37.36572, Longitude -83.25305**
	Station 532+00 **Site STR 5** **Sheet R8**	The existing intermittent channel will be filled. **207 lf of intermittent** stream will be permanently impacted for a total of **0.010 acre**. **Latitude 37.36551, Longitude -83.25219**
	Station 535+25 **Site STR 6** **Sheet R8**	The existing intermittent channel will be filled. **132 lf of intermittent** stream will be permanently impacted for a total of **0.008 acre**. **Latitude 37.36506, Longitude -83.25127**
	Station 536+50 **Site STR 7** **Sheet R8**	The existing intermittent channel will be filled. **102 lf of intermittent** stream will be permanently impacted for a total of **0.002 acre**. **Latitude 37.36506, Longitude -83.25127**
	Station 526+00 **Site EPH 6** **Sheet R8**	The existing ephemeral channel will be filled. **71 lf of ephemeral** stream will be permanently impacted for a total of **0.002 acre**. **Latitude 37.36594, Longitude -83.25420**
	Station 530+00 **Site EPH 7** **Sheet R8**	The existing ephemeral channel will be filled. **128 lf of ephemeral** stream will be permanently impacted for a total of **0.004 acre**. **Latitude 37.36581, Longitude -83.25311**

Crossing 4 (cont.)	**Station 531+00** **Site EPH 8** **Sheet R8**	The existing ephemeral channel will be filled. **140 lf of ephemeral** stream will be permanently impacted for a total of **0.005 acre**. **Latitude 37.36570, Longitude -83.25283**
	Station 531+00 **Site EPH 9** **Sheet R8**	The existing ephemeral channel will be filled. **103 lf of ephemeral** stream will be permanently impacted for a total of **0.007 acre**. **Latitude 37.36561, Longitude -83.25279**
	Station 532+00 **Site EPH 10** **Sheet R8**	The existing ephemeral channel will be filled. **104 lf of ephemeral** stream will be permanently impacted for a total of **0.007 acre**. **Latitude 37.36541, Longitude -83.25229**
	Station 534+00 **EPH 11** **Sheet R8**	The existing ephemeral channel will be filled. **197 lf of ephemeral** stream will be permanently impacted for a total of **0.007 acre**. **Latitude 37.36510, Longitude -83.25165**
	Station 534+90 **EPH 12** **Sheet R8**	The existing ephemeral channel will be filled. **86 lf of ephemeral** stream will be permanently impacted for a total of **0.002 acre**. **Latitude 37.36502, Longitude -83.25144**
	Station 537+00 **EPH 13** **Sheet R8**	The existing ephemeral channel will be filled. **150 lf of ephemeral** stream will be permanently impacted for a total of **0.003 acre**. **Latitude 37.36518, Longitude -83.25071**
	Station 537+00 **EPH 14** **Sheet R8**	The existing ephemeral channel will be filled. **106 lf of ephemeral** stream will be permanently impacted for a total of **0.005 acre**. **Latitude 37.36512, Longitude -83.25055**
	Station 537+00 **EPH 15** **Sheet R8**	The existing ephemeral channel will be filled. **174 lf of ephemeral** stream will be permanently impacted for a total of **0.004 acre**. **Latitude 37.36531, Longitude -83.25062**

Crossing 4 (cont.)	**Station 533+25** **WET 3A** **Sheet R8**	**0.085 acre** of the current 0.085 acre SS/PEM wetland will be filled during construction. This wetland is located on reclaimed mine fill. **Latitude 37.36536, Longitude -83.25198**
	Station 536+50 **WET 3B** **Sheet R8**	**0.142 acre** of the current 0.142 acre SS/PEM wetland will be filled during construction. This wetland is located on reclaimed mine fill. **Latitude 37.36513, Longitude -83.25091**
Crossing 5	**Station 552+00** **EPH 16** **Sheet R12**	The existing ephemeral channel will be filled and relocated to a 36-inch pipe. **309 lf of ephemeral** stream will be permanently impacted for a total of **0.014 acre**. **Latitude 37.36926, Longitude -83.24795**
	Station 552+75 **EPH 17** **Sheet R12**	The existing ephemeral channel will be filled and relocated to a 36-inch pipe. **844 lf of ephemeral** stream will be permanently impacted for a total of **0.019 acre**. **Latitude 37.36901, Longitude -83.24809**
	Station 550+00 **WET 1** **Sheet R10**	**0.035 acre** of the current 0.035 acre SS/PEM wetland will be filled during construction. This wetland is located on reclaimed mine fill. **Latitude 37.36803, Longitude -83.24812**
Crossing 6	**Station 569+25** **WET 2** **Sheet R14**	**0.005 acre** of the current 0.005 acre SS/PEM wetland will be filled during construction. This wetland is located on reclaimed mine fill. **Latitude 37.37287, Longitude -83.24970**

APPENDIX E

Figures

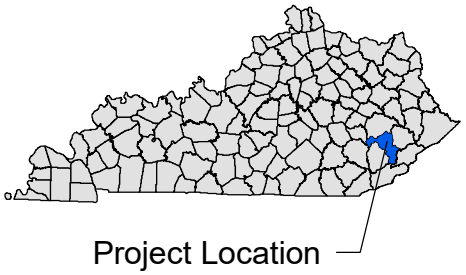


Wendell Ford Airport Access Road
Perry County, KY
KYTC Item No. 10-801.00

FIGURE 1: LOCATION MAP

Legend

STUDY AREA



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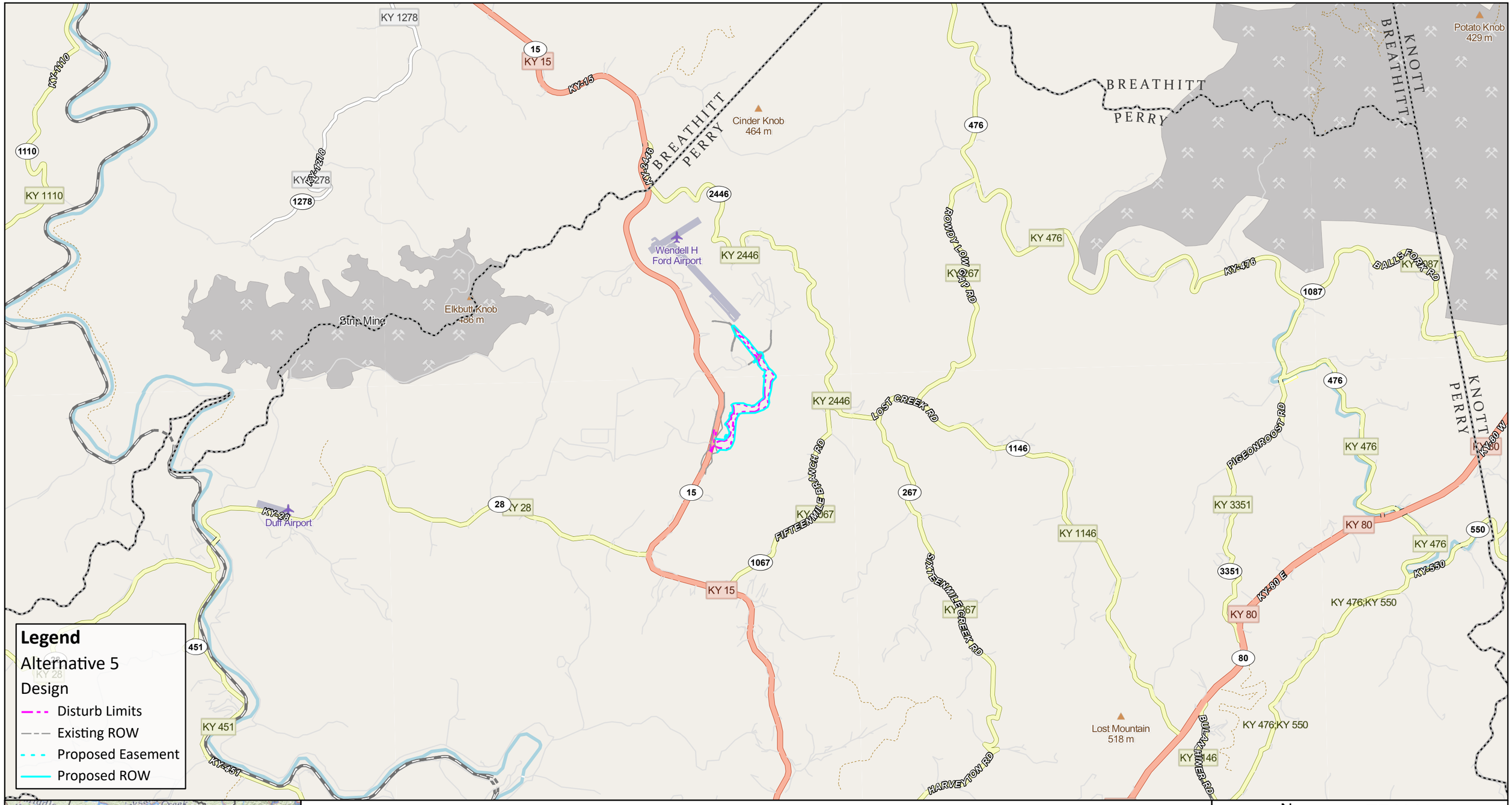

Legend

Alternative 5 Design

- Disturb Limits
- Existing ROW
- Proposed Easement
- Proposed ROW

Wendell H. Ford Airport Access Road

Location Map
Perry County, Kentucky
KYTC Item No. 10-80100

Credits: Esri OpenStreetMap; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

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TEAM KENTUCKY TRANSPORTATION CABINET

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Miles

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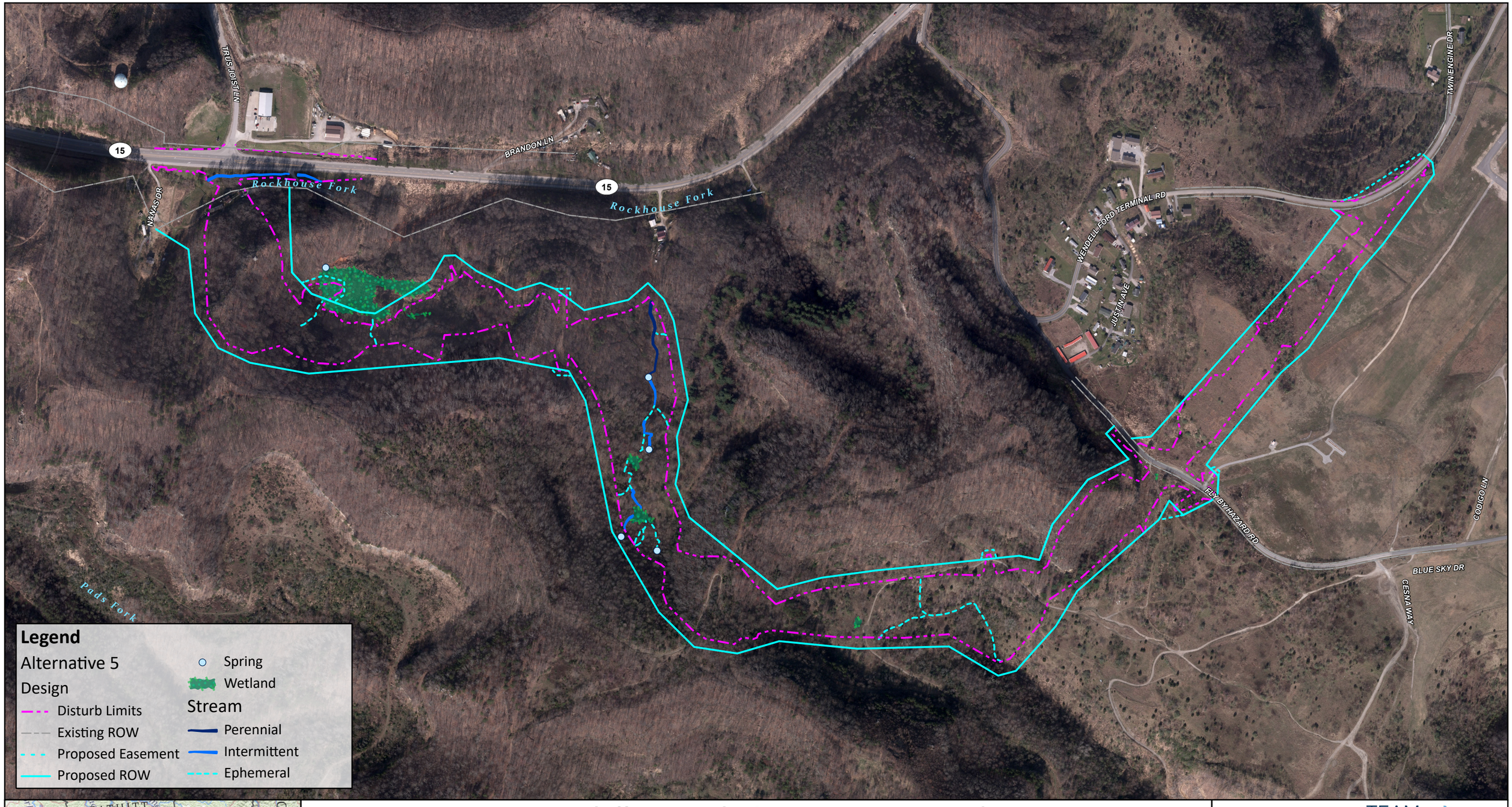

Wendell H. Ford Airport Access Road
Jurisdictional Waters
Overview
Perry County, Kentucky
KYTC Item No. 10-80100

Credits: KyFromAbove Partners; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

TEAM KENTUCKY TRANSPORTATION CABINET

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Palmer ENGINEERING

TRUS JOSH LN

NAMAS DR

STR 1
0.041 ac
500+90 STA

WET 6
0.197 ac
510+50 STA

WET 5
0.036 ac
517+25 STA

EPH 4
0.003 ac
514+25 STA

EPH 3
0.008 ac
510+50 STA

Legend

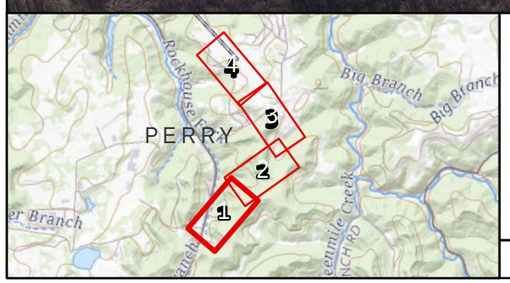
Alternative 5 Design

- Disturb Limits
- Existing ROW
- Proposed Easement
- Proposed ROW

- Spring
- Wetland

Stream

- Perennial
- Intermittent
- Ephemeral



Wendell H. Ford Airport Access Road

Jurisdictional Waters

Page 1 of 4

Perry County, Kentucky

KYTC Item No. 10-80100

Credits: KyFromAbove Partners; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

TEAM KENTUCKY TRANSPORTATION CABINET

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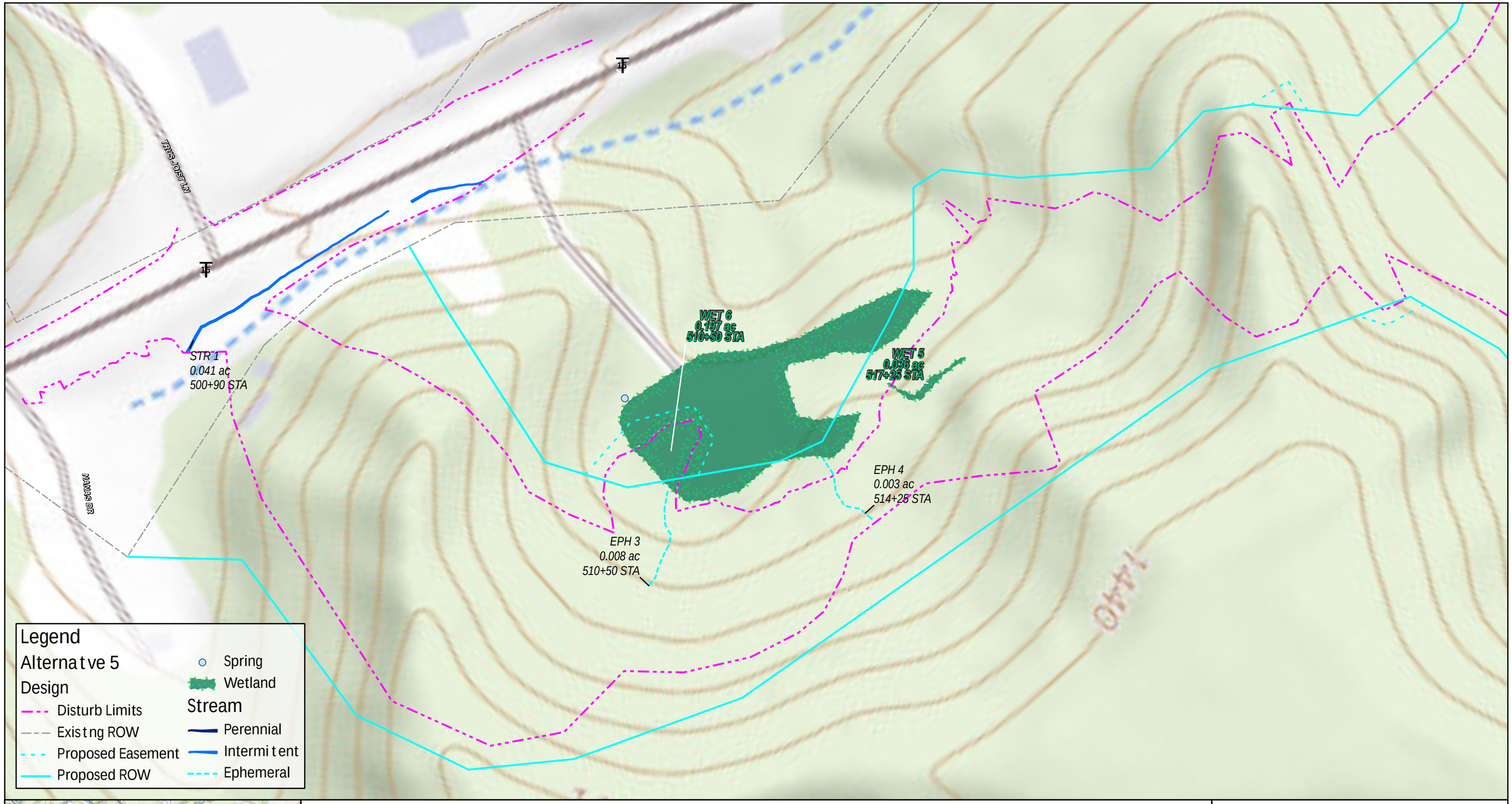
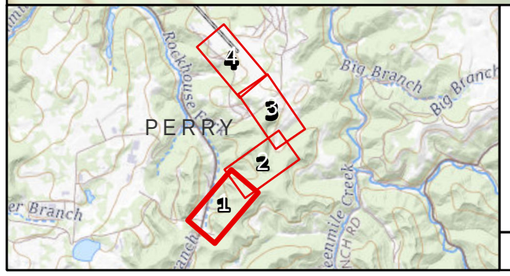
Palmer ENGINEERING





Wendell H. Ford Airport Access Road

Jurisdictional Waters

Page 1 of 4

Perry County, Kentucky

KYTC Item No. 10-80100

Credits: USGS The National Map; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

TEAM KENTUCKY TRANSPORTATION CABINET

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STR 3
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526+00 STA

EPH 6
0.002 ac
526+00 STA

STR 4
0.012 ac
530+00 STA

EPH 8
0.005 ac
531+00 STA

EPH 9
0.007 ac
531+00 STA

STR 5
0.01 ac
532 STA

EPH 10
0.007 ac
532+00 STA

WET 3A
0.085 ac
533+25 STA

STR 6
0.008 ac
535+25 STA

EPH 11
0.007 ac
534+00 STA

EPH 12
0.002 ac
534+90 STA

WET 3B
0.142 ac
536+50 STA

EPH 15
0.004 ac
537+00 STA

STR 7
0.002 ac
536+50 STA

EPH 13
0.003 ac
537+00 STA

EPH 14
0.005 ac
537+00 STA

EPH 16
0.014 ac
552+00 STA

EPH 17
0.019 ac
552+75 STA

WET 1
0.035 ac
550+00 STA

Legend

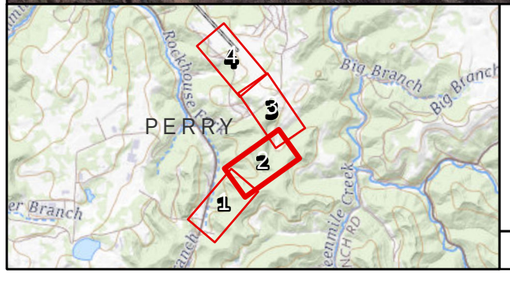
Alternative 5 Design

- Disturb Limits
- Existing ROW
- Proposed Easement
- Proposed ROW

- Spring
- Wetland

Stream

- Perennial
- Intermittent
- Ephemeral



Wendell H. Ford Airport Access Road

Jurisdictional Waters

Page 2 of 4

Perry County, Kentucky

KYTC Item No. 10-80100

Credits: KyFromAbove Partners; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

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TEAM KENTUCKY TRANSPORTATION CABINET

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Feet

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STR 3
0.041 ac
526+00 STA

EPH 6
0.002 ac
526+00 STA

STR 4
0.012 ac
530+00 STA

EPH 8
0.005 ac
531+00 STA

EPH 9
0.007 ac
531+00 STA

STR 5
0.01 ac
532 STA

EPH 10
0.007 ac
532+00 STA

WET 3A
0.035 ac
533+25 STA

STR 6
0.008 ac
535+25 STA

EPH 11
0.007 ac
534+00 STA

EPH 12
0.002 ac
534+90 STA

WET 3B
0.142 ac
536+50 STA

STR 7
0.002 ac
536+50 STA

EPH 13
0.003 ac
537+00 STA

EPH 14
0.005 ac
537+00 STA

EPH 15
0.004 ac
537+00 STA

EPH 16
0.014 ac
552+00 STA

EPH 17
0.019 ac
552+75 STA

WET 1
0.035 ac
530+00 STA

1440

Legend

Alternative 5

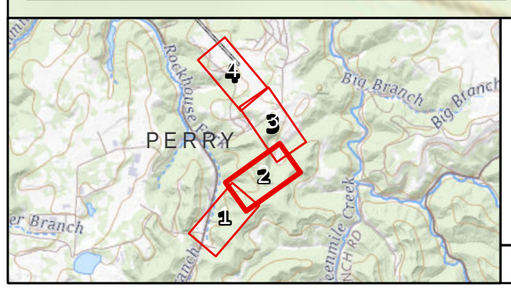
Design

- Disturb Limits
- Existing ROW
- Proposed Easement
- Proposed ROW

- Spring
- Wetland

Stream

- Perennial
- Intermittent
- Ephemeral



Wendell H. Ford Airport Access Road

Jurisdictional Waters

Page 2 of 4

Perry County, Kentucky

KYTC Item No. 10-80100

Credits: USGS The National Map; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

TEAM KENTUCKY TRANSPORTATION CABINET

0 250 500
Feet

Palmer ENGINEERING

EPH 16
0.014 ac
552+00 STA

EPH 17
0.019 ac
552+75 STA

WET 2
0.005 ac
569+25 STA

FLY BY HAZARD RD

Legend

Alternative 5

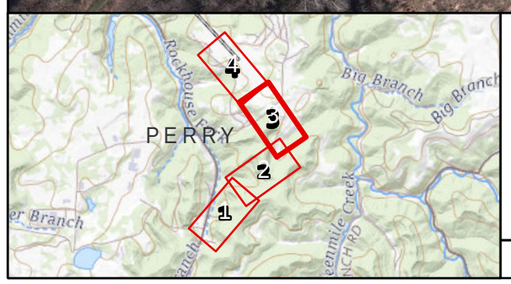
Design

- Disturb Limits
- Existing ROW
- Proposed Easement
- Proposed ROW

- Spring
- Wetland

Stream

- Perennial
- Intermittent
- Ephemeral



Wendell H. Ford Airport Access Road

Jurisdictional Waters

Page 3 of 4

Perry County, Kentucky

KYTC Item No. 10-80100

Credits: KyFromAbove Partners; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

TEAM KENTUCKY
TRANSPORTATION CABINET

0 250 500
Feet

Palmer ENGINEERING

EPH 16
0.014 ac
552+00 STA

EPH 17
0.019 ac
552+75 STA

WET 2
0.005 ac
569+25 STA

FLY BY HAZARD RD

1280
1360
1400
1240

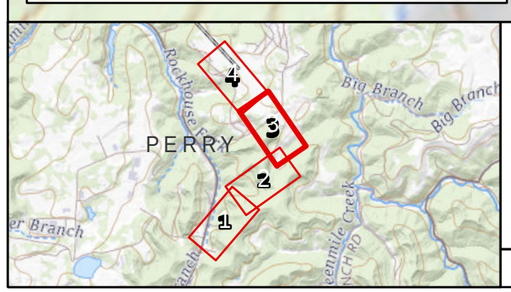
Legend

Alternative 5 Design

- Disturb Limits
- Existing ROW
- Proposed Easement
- Proposed ROW
- Spring
- Wetland

Stream

- Perennial
- Intermittent
- Ephemeral



Wendell H. Ford Airport Access Road

Jurisdictional Waters

Page 3 of 4

Perry County, Kentucky

KYTC Item No. 10-80100

Credits: USGS The National Map; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

TEAM KENTUCKY TRANSPORTATION CABINET

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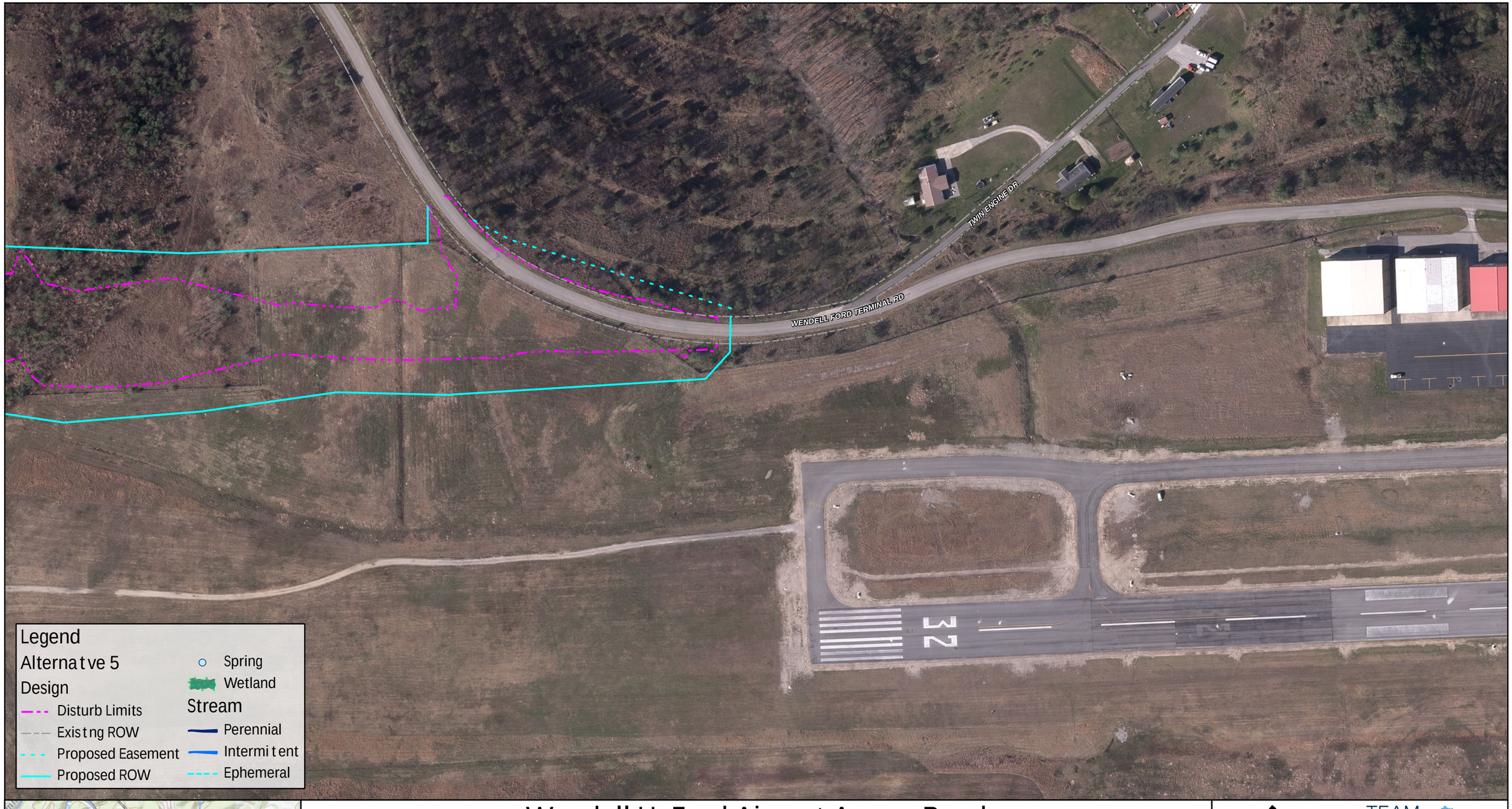


Legend

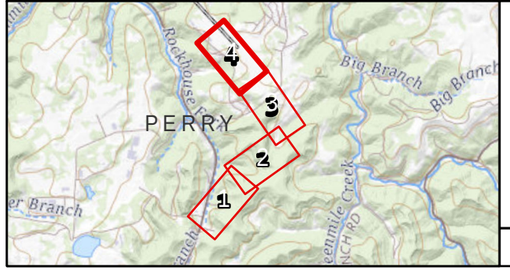
Alternative 5 Design

- Disturb Limits
- Existing ROW
- Proposed Easement
- Proposed ROW

- Spring
- Wetland

Stream

- Perennial
- Intermittent
- Ephemeral



Wendell H. Ford Airport Access Road

Jurisdictional Waters

Page 4 of 4

Perry County, Kentucky

KYTC Item No. 10-80100

Credits: KyFromAbove Partners; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

TEAM KENTUCKY TRANSPORTATION CABINET

0 250 500

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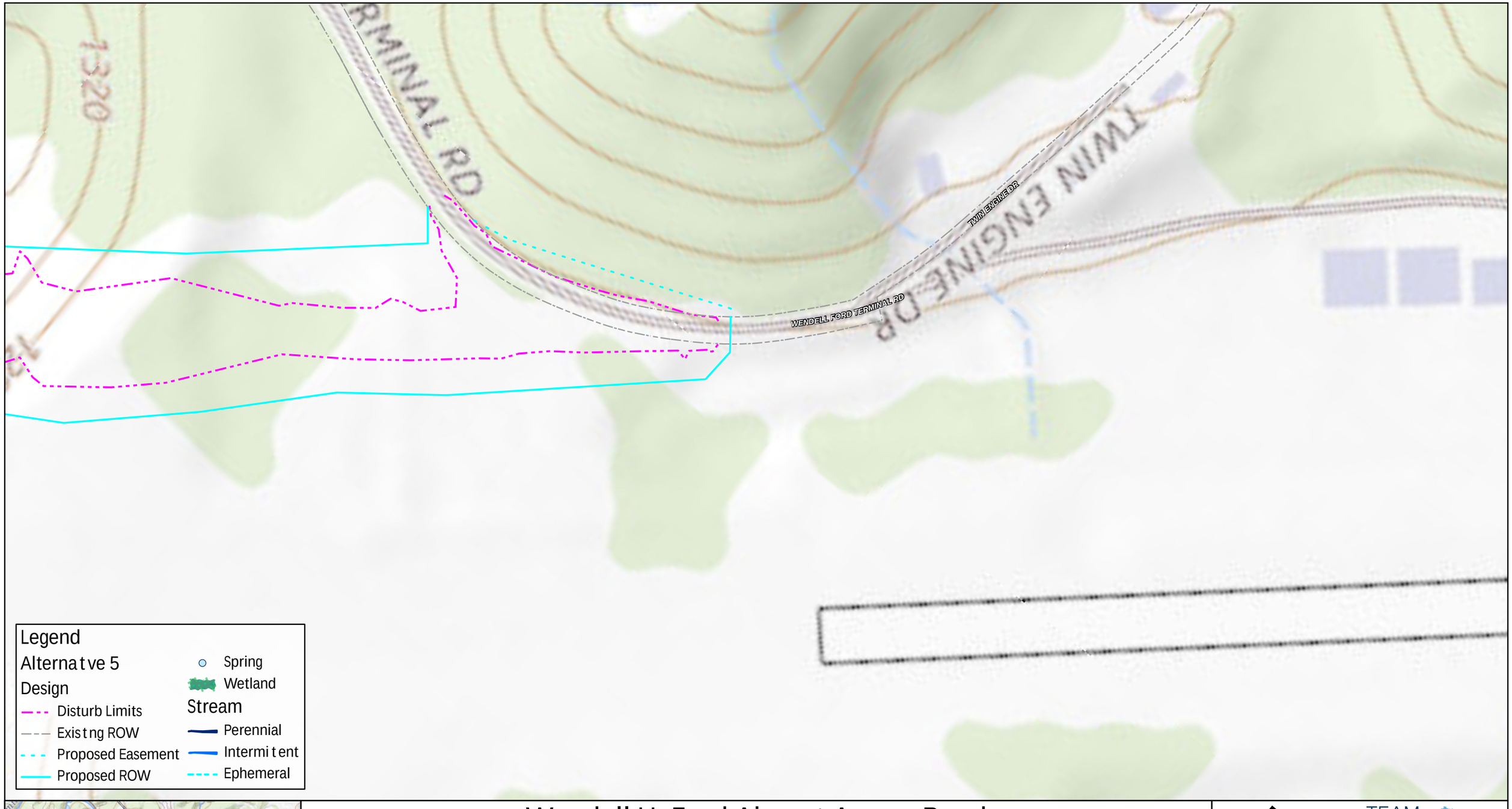
Palmer ENGINEERING



Legend

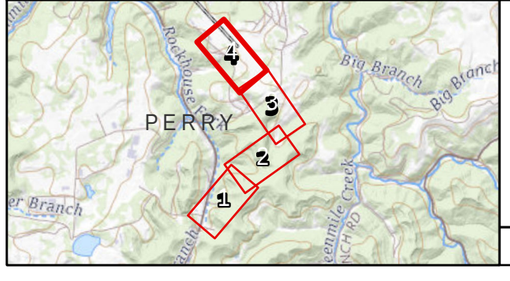
Alternative 5 Design

- Disturb Limits
- Existing ROW
- Proposed Easement
- Proposed ROW

- Spring
- Wetland

Stream

- Perennial
- Intermittent
- Ephemeral



Wendell H. Ford Airport Access Road

Jurisdictional Waters

Page 4 of 4

Perry County, Kentucky

KYTC Item No. 10-80100

Credits: USGS The National Map; Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

TEAM KENTUCKY TRANSPORTATION CABINET

0 250 500

Feet

Palmer ENGINEERING

APPENDIX F

Preliminary JD Form

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: February 21, 2023

B. NAME AND ADDRESS OF PERSON REQUESTING PJD: Jacob Travelstead, KYTC, 200 Mero Street, Frankfort KY 40602

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Louisville

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: KY County/parish/borough: Russell/Clinton Counties City:

Center coordinates of site (lat/long in degree decimal format):

Lat.: 36.87317 Long.: 85.16125

Universal Transverse Mercator: KY State NAD83 Single Zone

Name of nearest waterbody: Tributaries to Salt Lick, Rock Lick & Cumberland River

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:

☑ Field Determination. Date(s): July 14-15 & 18-19, 2022

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
			see included table		

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- [x] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
  Map: _____.
- [x] Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - [ ] Office concurs with data sheets/delineation report.
  - [ ] Office does not concur with data sheets/delineation report. Rationale: _____.
- [ ] Data sheets prepared by the Corps: _____.
- [ ] Corps navigable waters' study: _____.
- [ ] U.S. Geological Survey Hydrologic Atlas: _____.
  - [ ] USGS NHD data.
  - [ ] USGS 8 and 12 digit HUC maps.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: Wolf Creek Dam, Creelsboro.
- [ ] Natural Resources Conservation Service Soil Survey. Citation: _____.
- [ ] National wetlands inventory map(s). Cite name: _____.
- [ ] State/local wetland inventory map(s): _____.
- [ ] FEMA/FIRM maps: _____.
- [ ] 100-year Floodplain Elevation is: _____.(National Geodetic Vertical Datum of 1929)
- [x] Photographs: [x] Aerial (Name & Date): _____.
  or [ ] Other (Name & Date): _____.
- [ ] Previous determination(s). File no. and date of response letter: _____.
- [ ] Other information (please specify): _____.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

_____	Jacob Travelstead 05/15/2023
Signature and date of Regulatory staff member completing PJD	Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

PRELIMINARY JURISDICTIONAL DETERMINATION
AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION

Wendell H. Ford Airport Access Road Project
Perry County, Kentucky
KYTC Item No. 10-80100

Site #	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (length / ac)	Type of aquatic resource (i.e. wetland vs. non-wetland	Geographic authority to which the aquatic resource "may be" subject (i.e. Section 404 or Section 10/404
STR 1	37.36040	-83.25867	596 / 0.041	Non-wetland	Section 404
EPH 3	37.36080	-83.25577	182 / 0.008	Non-wetland	Section 404
WET 6	37.26126	-83.25626	0.197	Wetland	Section 404
EPH 4	37.36170	-83.25529	120 / 0.003	Non-wetland	Section 404
WET 5	37.36262	-83.25548	0.036	Wetland	Section 404
STR 3	37.36593	-83.25470	450 / 0.041	Non-wetland	Section 404
STR 4	37.36572	-83.25305	163 / 0.012	Non-wetland	Section 404
STR 5	37.36551	-83.25219	207 / 0.010	Non-wetland	Section 404
STR 6	37.36506	-83.25127	132 / 0.008	Non-wetland	Section 404
STR 7	37.36506	-83.25127	102 / 0.002	Wetland	Section 404
EPH 6	37.36594	-83.25420	71 / 0.002	Non-wetland	Section 404
EPH 7	37.36581	-83.25311	128 / 0.004	Non-wetland	Section 404
EPH 8	37.36570	-83.25283	140 / 0.005	Non-wetland	Section 404
EPH 9	37.36561	-83.25279	103 / 0.007	Non-wetland	Section 404
EPH 10	37.36541	-83.25229	104 / 0.007	Non-wetland	Section 404
EPH 11	37.36510	-83.25165	197 / 0.007	Wetland	Section 404
EPH 12	37.36502	-83.25144	86 / 0.002	Non-wetland	Section 404
EPH 13	37.36518	-83.25071	150 / 0.003	Non-wetland	Section 404
EPH 14	37.36512	-83.25055	106 / 0.005	Non-wetland	Section 404
EPH 15	37.36531	-83.25062	174 / 0.004	Non-wetland	Section 404
WET 3A	37.36536	-83.25198	0.085	Wetland	Section 404
WET 3B	37.36513	-83.25091	0.142	Wetland	Section 404
EPH 16	37.36926	-83.24795	309 / 0.014	Non-wetland	Section 404
EPH 17	37.36901	-83.24809	844 / 0.019	Non-wetland	Section 404
WET 1	37.36803	-83.24812	0.035	Wetland	Section 404
WET 2	37.37287	-83.24970	0.005	Wetland	Section 404

APPENDIX G

Section 106 Consultation

ANDY BESHEAR
GOVERNOR

JACQUELINE COLEMAN
LT. GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL
THE STATE HISTORIC PRESERVATION OFFICE
410 HIGH STREET
FRANKFORT, KENTUCKY 40601
(502) 564-7005
www.heritage.ky.gov

MICHAEL E. BERRY
SECRETARY

CRAIG A. POTTS
EXECUTIVE DIRECTOR &
STATE HISTORIC PRESERVATION OFFICER

January 3, 2023

Mr. Daniel R. Peake
Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street Frankfort, KY 40622

Re: Revised Cultural Historic Survey of the Wendell H. Ford Airport Access Road Project, Perry County, Kentucky
KYTC Item No. 10-80100

Dear Mr. Peake,

Thank you for your digital submission of a letter, revised cultural historic survey, revised site forms and photographs for the above-listed project which is pursuant to Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. Sec. 470f) and implementing regulations at 36 C.F.R. Part 800.

Our office understands that the above proposed project involves the construction of a new road between Terminal Road just south of the Airport taxiway and east of Twin Engine Road and the intersection of Trus Joist Lane and KY 15. We also understand that a total of four resources (PE-128, PE-129, PE-130, and PE-131) were identified within the APE and that KYTC has determined that all are ineligible for listing on the National Register of Historic Places (NRHP).
We also understand that KYTC has determined a finding of No Historic Properties Affected.

Based on our review, our office understands that PE-128, PE-129, PE-130, and PE-131 do not appear to retain sufficient integrity or significance, and as a result, appears to be **Not Eligible** for listing on the NRHP and and as a result, we **Concur** with your official eligibility determinations and with your determination of **No Historic Properties Affected.**

Should you have any questions, please feel free to contact Matt Yagle of my staff at matthew.yagle@ky.gov.

Sincerely,

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

CP: my, KHC #220526; 65851
CC: B. Baker (D-10), C. Ouellette (DEA), S. Lechert (DEA)

ANDY BESHEAR
GOVERNOR

JACQUELINE COLEMAN
LT. GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL
THE STATE HISTORIC PRESERVATION OFFICE
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MICHAEL E. BERRY
SECRETARY

CRAIG A. POTTS
EXECUTIVE DIRECTOR &
STATE HISTORIC PRESERVATION OFFICER

October 28, 2022

Mr. Daniel R. Peake, Director
Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, Kentucky 40601

Re: *An Archaeological Survey for the Proposed Wendall H. Ford Airport New Improved Access Road in Perry County, Kentucky* by Silas Chapman
(KYTC Item No. 10-80100.00)

Dear Mr. Peake,

Thank you for an electronic copy of the above-referenced archaeology report. The report discusses a survey of Areas of Potential Effect (APE) proposed for new improved access road located near KY 15. Field methods included pedestrian survey and shovel test excavation of approximately 83.4 acres. No archaeological sites were documented.

KYTC presents a determination of *No Historic Properties Affected.* We concur with the recommendation of *No Historic Properties Affected* and accept this report without revision.

In the unlikely event that human remains are found during construction for this project, work should cease immediately, and the county coroner and the Kentucky Heritage Council should be contacted. Should project plans change or should there be any future concerns or questions regarding cultural resources in the vicinity of this project area, please do not hesitate to contact Stephanie Dooley of my staff via email at stephanie.dooley@ky.gov.

Sincerely,

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

CP: sd
KHC # 220121
e-cc: Phil Mink (OSA); Susan Neumeyer (KYTC)

APPENDIX H

Section 7 Consultation

United States Department of the Interior

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

December 27, 2022

Mr. Danny Peake
Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, Kentucky 40601

Re: FWS 22-0082346; KYTC Item No. 10-80100; Wendell Ford Airport New Alignment Access Road in Perry County, Kentucky

Dear Danny Peake:

The U.S. Fish and Wildlife Service's (Service) Kentucky Field Office (KFO) has reviewed the above referenced project information and request for concurrence received on November 2, 2022. The KFO offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq*.).

Project Description
According to the information provided, the Kentucky Transportation Cabinet (KYTC) proposes to construct a new access road to Wendall Ford Airport. Impacts to the landscape include typical road construction activities, tree removal for construction access, and grading to allow for proper drainage.

Federally Listed Species
The KYTC has determined that the proposed action has the potential to affect the gray bat *(Myotis grisescens)*, Indiana bat *(Myotis sodalis)*, and northern long-eared bat (NLEB) *(Myotis septentrionalis)*.

Gray Bat
Field assessments identified 55 abandoned mine portals within one-half mile of the proposed project area. However, assessment of these portals determined that none were suitable as a summer roost and/or hibernaculum. Furthermore, it was concluded that no caves or karst features suitable for summer or winter gray bat roosting would be affected by the proposed project. Therefore, the proposed project is not likely to impact gray bat hibernacula or roosting habitat.

KYTC utilized the processes identified in the Federal Highway Administration Kentucky Division's (FHWA) 2020 Programmatic Consultation on the effects of transportation projects on the gray bat to evaluate potential adverse effects on foraging and commuting habitat for the gray

bat. The KFO agrees with the ESA compliance process and we concur with the determination that the proposed action may affect, but is not likely to adversely affect the gray bat.

Indiana Bat

According to the biological assessment (BA), no impacts to suitable winter habitat for this species would occur. The proposed project requires removal of approximately 37.76 acres of potential habitat that is suitable as summer roosting habitat by the Indiana bat. The KYTC believes that this species is reasonably certain to utilize these forested habitats and has determined that the action "may affect, is likely to adversely affect" the Indiana bat. The KYTC proposes to account for potential adverse effects to the Indiana bat and its habitat through the processes identified in the FHWA's 2020 Programmatic Consultation and accompanying biological opinion on the effects of transportation projects on the Indiana bat. The Service concurs with the effects determination for the Indiana bat and agrees with the proposed ESA compliance process.

Northern Long-eared Bat

Based on the information available to us, this project may affect the NLEB, but with no effects beyond those previously evaluated in the Service's programmatic biological opinion for the NLEB final 4(d) rule dated January 5, 2016 (FWS Log# 03E00000-2016-F-0001). Any taking that may occur incidental to this project is not prohibited under the final 4(d) rule (50 CFR §17.40(o)). Therefore, the KYTC may fulfill its responsibilities under ESA section 7(a)(2) relative to the NLEB for this project by requesting reliance on the Service's programmatic biological opinion for the 4(d) rule.

Conclusion

In view of these findings, we believe that the requirements of section 7 of the ESA have been fulfilled for this project. The KYTC should reconsider their section 7 obligations, if: (1) new information reveals that the proposed action may affect listed species in a manner or to an extent not previously considered, (2) the proposed action is subsequently modified to include activities that were not considered during this consultation, or (3) new species are listed or critical habitat designated.

If you have any questions, please contact Phil DeGarmo at (502) 695-0468 extension 46110 or Phil_DeGarmo@fws.gov.

Sincerely,

VIRGIL ANDREWS

Digitally signed by VIRGIL ANDREWS
Date: 2022.12.27 11:39:01 -05'00'

Virgil Lee Andrews, Jr.
Field Supervisor

cc: Mr. Andrew Logsdon, KYTC, Frankfort

APPENDIX I

Field Data Sheets
Rapid Bioassessment Protocol Stream Data Sheets and Wetland Data Sheets

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fk.	Project:	Wendell Ford Airport	Trip:		County:	Perry
Station ID:	STR-1	Loc. Desc.:				Visit Date:	1/31/22
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	S. Schuler, L. Carolan	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36040	Y | N	Y | N		K-WADE Field	Staff:
Long:	-83.25867					Date:

WEATHER

Scouring Rain In Last 14 Days? YN: Y | N

Now: HR | SR | IS
Circle 1: CS | CO | SSH

Past 24hr: HR | SR | IS
CS | CO | SSH

Stream Shading

Leafed Out? Y/N: Y | N

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry | Pooled | Low
Seasonal Normal
Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	1.0
Maximum Depth (m):	0.1016
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	X	Construction		Pasture/Grazing	
Deep Mining	X	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential	X	Forest	X	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N

Channelization: F | P | N

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs | Grasses | Shrubs | Trees

# of Strata: 3

Dom. Taxa: Virginia Pine, Yellow Popular

HYDRAULIC STRUCTURES (Check all that are present)

Dams:		Bridge Abutments:		Fords:		Islands:		Waterfalls:		Berms:	

FIELD METER DATA

Temp (°C):	6.8	DO (mg/l):		DO %Sat:		pH (SU):	7.8	Sp. Cond (µS/cm):	567	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?		Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)							
Algae:			QualMHC:		Visual Form:		R4MULTI:		Other:	
Fish:			Equip.:	BPEF | Seine | Barge		EF Seconds:		Seine Minutes:	
Habitat:	X	R. Schuler	Habitat data other than RBP?							
Invertebrate:			1m² riffle + MH:		MACS 20-Jab:		Other:			
Multihabs Sampled Y/N or # Jabs		Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:								
Chemistry:			H_2SO_4 Lot #:				HNO_3 Lot #:			
Multi-Probe:	X	Hanna - Combo pH&EC	Inst. ID:				Cal. Date:	1/31/2022		
Discharge:			Inst. ID:				Beam Check:			
Other:			Other Desc:							

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle: 75	% Run: 10	% Pool: 15	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description: Intermittent stream channelized into roadside ditch with signs of acid mine drainage (orangish-yellow color substrate).

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 8	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 7	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 6	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 11	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 14	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 5	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 11	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 7 / RB 4	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 1 / RB 4	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 1 / RB 2	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

81

Notes/Comments:

General Notes: No fish were observed.

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	U.T. Rockhouse Fk.	Project:	Wendell Ford Airport	Trip:		County:	Perry
Station ID:	STR-3	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Oney	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Oney, S. Schuler	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.365931	Y | N	Y | N		K-WADE Field	Staff:
Long:	-83.254707					Date:

WEATHER

Scouring Rain In Last 14 Days? YN: **Y** | N

Now: Circle 1	HR | SR | IS	CS | CO | SSH	
Past 24hr:	HR | SR | IS	CS | CO | SSH	

Stream Shading

Leafed Out? Y/N: Y | N

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry | Pooled | Low | Seasonal Normal | Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	1.2192
Maximum Depth (m):	0.1524
Reach Length (m):	100

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	X	Construction		Pasture/Grazing			
Deep Mining		Commercial		Silviculture			
Oil Wells		Industrial		Urban Runoff			
Land Disposal		Row Crops		Storm Sewers			
Residential		Forest	X	Permitted Outfalls			

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N

Channelization: F | P | N

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs | Grasses | Shrubs | Trees

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:		Bridge Abutments:		Fords:		Islands:		Waterfalls:		Berms:	

FIELD METER DATA

Temp (°C):	10.7	DO (mg/l):		DO %Sat:		pH (SU):	7.8	Sp. Cond (µS/cm):	464	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?		Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)							
Algae:			QualMHC:		Visual Form:		R4MULTI:		Other:	
Fish:			Equip.:	BPEF | Seine | Barge		EF Seconds:		Seine Minutes:	
Habitat:	X	R. Oney	Habitat data other than RBP?							
Invertebrate:			1m² riffle + MH:		MACS 20-Jab:		Other:			

Multihabs Sampled Y/N or # Jabs: Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge:
Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:

Chemistry:			H_2SO_4 Lot #:	HNO_3 Lot #:	
Multi-Probe:	X	Hanna - Combo pH&EC	Inst. ID:	Cal. Date:	03/08/2022
Discharge:			Inst. ID:	Beam Check:	
Other:			Other Desc:		

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle: 75	% Run: 10	% Pool: 15	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:	Date Entered:

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 13	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 9	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 11	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 10	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 14	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 13	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 17	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 5 / RB 5	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 8 / RB 8	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 4 / RB 3	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

120

Notes/Comments:

General Notes: Conductivity believed to be higher during normal flow. Flow believed to elevated at time of sampling event bc of recent heavy rains. Substrate within lower section of reach displays acid mine drainage. No fish were observed.

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	U.T. Rockhouse Fk.	Project:	Wendell Ford Airport	Trip:		County:	Perry
Station ID:	STR-4	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Oney	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Oney, S. Schuler	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36572	Y | N	Y | N		K-WADE Field	Staff:
Long:	-83.25305					Date:

WEATHER

Scouring Rain In Last 14 Days? YN — Y | N

Now:	HR	SR	IS
Circle 1	CS	CO	SSH
Past 24hr:	HR	SR	IS
	CS	CO	SSH

Stream Shading

Leafed Out? Y/N — Y | N

General Shading Circle 1 — Full | Partial | None

STREAM FLOW Circle 1

Dry | Pooled | Low | Seasonal Normal | Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	1.0
Maximum Depth (m):	0.1524
Reach Length (m):	100

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	X	Construction		Pasture/Grazing			
Deep Mining		Commercial		Silviculture			
Oil Wells		Industrial		Urban Runoff			
Land Disposal		Row Crops		Storm Sewers			
Residential		Forest	X	Permitted Outfalls			

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N — Channelization: F | P | N

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs | Grasses | Shrubs | Trees

# of Strata: 3

Dom. Taxa: Platanus occidentalis

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	
8.7			8.0	523		

FIELD ACTIVITIES

Activity Completed?		Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)					
Algae:			QualMHC:		Visual Form:		R4MULTI:	Other:
Fish:			Equip.:	BPEF | Seine | Barge	EF Seconds:		Seine Minutes:	
Habitat:	X	R. Oney	Habitat data other than RBP?					
Invertebrate:			1m² riffle + MH:		MACS 20-Jab:		Other:	

Multihabs Sampled Y/N or # Jabs — Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: | Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:

Chemistry:			H_2SO_4 Lot #:	HNO_3 Lot #:	
Multi-Probe:	X	Hanna - Combo pH&EC	Inst. ID:	Cal. Date:	03/08/2022
Discharge:			Inst. ID:	Beam Check:	
Other:			Other Desc:		

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle: 85	% Run: 5	% Pool: 10	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 10	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 6	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 9	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 6	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 7	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 11	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 16	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 5 / RB 5	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 8 / RB 8	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 2 / RB 2	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

95

Notes/Comments:

General Notes: Conductivity believed to be higher during normal flow. Flow believed to elevated at time of sampling event bc of recent heavy rains. No fish were observed.

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	U.T. Rockhouse Fk.	Project:	Wendell Ford Airport	Trip:		County:	Perry
Station ID:	STR-5	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Oney	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Oney, S. Schuler	Stream Perm.	Eph | **Int** | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.365518	Y | N	Y | N		K-WADE Field	Staff:
Long:	-83.252191					Date:

WEATHER

Scouring Rain In Last 14 Days? YN — **Y** | N

Now:	HR	SR	IS			
Circle 1	CS	**CO**	SSH			
Past 24hr:	HR	**SR**	IS			
	CS	CO	SSH			

Stream Shading

Leafed Out? Y/N — Y | **N**

General Shading Circle 1 — Full | **Partial** | None

STREAM FLOW Circle 1

Dry | Pooled | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	0.61
Maximum Depth (m):	0.1
Reach Length (m):	~100

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	X	Construction		Pasture/Grazing	
Deep Mining		Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	X	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | **N** — Channelization: F | P | **N**

RIPARIAN VEGETATION

Dom. Veg. Type: **Herbs** | Grasses | **Shrubs** | **Trees**

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.
8.9			7.8	514	

FIELD ACTIVITIES

Activity Completed?		Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)					
Algae:			QualMHC:		Visual Form:		R4MULTI:	Other:
Fish:			Equip.:	BPEF | Seine | Barge	EF Seconds:		Seine Minutes:	
Habitat:	X	R. Oney	Habitat data other than RBP?					
Invertebrate:			1m² riffle + MH:		MACS 20-Jab:		Other:	

Multihabs Sampled Y/N or # Jabs — Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge:
Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:

Chemistry:			H_2SO_4 Lot #:	HNO_3 Lot #:	
Multi-Probe:	X	Hanna - Combo pH&EC	Inst. ID:	Cal. Date:	03/08/2022
Discharge:			Inst. ID:	Beam Check:	
Other:			Other Desc:		

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle: 85	% Run: 5	% Pool: 10	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | **CO = Cloudy Overcast** | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 11	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 11	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 10	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 12	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 16	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 11	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 11	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 8 / RB 8	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 7 / RB 7	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 5 / RB 5	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

122

Notes/Comments:

General Notes: Flow believed to elevated at time of sampling event bc of recent heavy rains. No fish were observed.

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	U.T. Rockhouse Fk.	Project:	Wendell Ford Airport	Trip:		County:	Perry
Station ID:	STR-6	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Oney	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Oney, S. Schuler	Stream Perm.	Eph | **Int** | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.365067	**Y | N**	**Y | N**		K-WADE Field	Staff:
Long:	-83.251270					Date:

WEATHER

Scouring Rain In Last 14 Days? YN **Y | N**

Now: Circle 1	HR | SR | IS	CS | **CO** | SSH	
Past 24hr:	HR | **SR** | IS	CS | CO | SSH	

Stream Shading

Leafed Out? Y/N **Y | N**

General Shading Circle 1: Full | **Partial** | None

STREAM FLOW Circle 1

Dry | Pooled | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	0.76
Maximum Depth (m):	0.2
Reach Length (m):	~50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	X	Construction		Pasture/Grazing	
Deep Mining		Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	X	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | **N** Channelization: F | P | **N**

RIPARIAN VEGETATION

Dom. Veg. Type: **Herbs** | **Grasses** | **Shrubs** | **Trees**

# of Strata: 4

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.		

FIELD ACTIVITIES

Activity Completed?		Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)					
Algae:			QualMHC:		Visual Form:		R4MULTI:	Other:
Fish:			Equip.:	BPEF | Seine | Barge	EF Seconds:		Seine Minutes:	
Habitat:	X	R. Oney	Habitat data other than RBP?					
Invertebrate:			1m² riffle + MH:		MACS 20-Jab:		Other:	

Multihabs Sampled Y/N or # Jabs

Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge:

Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:

Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:	
Multi-Probe:		Inst. ID:		Cal. Date:	
Discharge:		Inst. ID:		Beam Check:	
Other:		Other Desc:			

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle: 50	% Run: 15	% Pool: 35	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | **CO = Cloudy Overcast** | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:	Date Entered:

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 11	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 10	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 10	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 10	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 16	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 13	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 10	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 6 / RB 6	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 7 / RB 7	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 5 / RB 5	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

119

Notes/Comments:

General Notes: Flow believed to elevated at time of sampling event bc of recent heavy rains. No fish were observed.

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	U.T. Rockhouse Fk.	Project:	Wendell Ford Airport	Trip:		County:	Perry
Station ID:	STR-7	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Oney	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Oney, S. Schuler	Stream Perm.	Eph | **Int** | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.365067	**Y | N**	**Y | N**		K-WADE Field	Staff:
Long:	-83.251270					Date:

WEATHER

Scouring Rain In Last 14 Days? YN: **Y** | N

Now: Circle 1	HR | SR | IS	CS | **CO** | SSH	
Past 24hr:	HR | **SR** | IS	CS | CO | SSH	

Stream Shading

Leafed Out? Y/N: Y | **N**

General Shading Circle 1: Full | **Partial** | None

STREAM FLOW Circle 1

Dry | Pooled | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	0.3
Maximum Depth (m):	0.05
Reach Length (m):	~50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	X	Construction		Pasture/Grazing	
Deep Mining		Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	X	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | **N** Channelization: F | P | **N**

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs | Grasses | **Shrubs** | **Trees**

# of Strata: 2

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:		Bridge Abutments:		Fords:		Islands:		Waterfalls:		Berms:	

FIELD METER DATA

Temp (^{o}C):		DO (mg/l):		DO %Sat:		pH (SU):		Sp. Cond (µS/cm):		Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?		Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)							
Algae:			QualMHC:		Visual Form:		R4MULTI:		Other:	
Fish:			Equip.:	BPEF | Seine | Barge		EF Seconds:		Seine Minutes:	
Habitat:	X	R. Oney	Habitat data other than RBP?							
Invertebrate:			1m^2 riffle + MH:		MACS 20-Jab:		Other:			

Multihabs Sampled Y/N or # Jabs: Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge:
Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:

Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:	
Multi-Probe:		Inst. ID:		Cal. Date:	
Discharge:		Inst. ID:		Beam Check:	
Other:		Other Desc:			

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle: 70	% Run: 5	% Pool: 25	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:	Date Entered:

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 4	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 6	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 6	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 9	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 8	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 13	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 13	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 8 / RB 8	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 7 / RB 7	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 4 / RB 4	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

97

Notes/Comments:

General Notes: Flow believed to elevated at time of sampling event bc of recent heavy rains. No fish were observed.

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

High Gradient Habitat Assessment Datasheet

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 5	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 6	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 12	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 11	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 8	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 5 / RB 5	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 8 / RB 8	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 7 / RB 7	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

94

Notes/Comments:

General Notes: This are is in the process of being logged

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 3	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 5	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 3	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 15	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 17	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 5	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 9 / RB 9	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 10 / RB 10	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

109

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 6	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 5	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 10	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 17	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 7	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 2 / RB 2	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 4 / RB 4	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

85

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 9	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 8	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 10	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 18	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 12	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 8 / RB 8	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 8 / RB 8	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

117

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 5	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 6	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 10	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 18	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 10	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 5 / RB 5	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 4 / RB 4	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

95

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 8	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 10	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 10	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 18	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 13	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 3 / RB 3	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 4 / RB 4	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

101

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

High Gradient Habitat Assessment Datasheet

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 10	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 8	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 13	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 12	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 11	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 8 / RB 8	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 8 / RB 8	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

114

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 5	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 6	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 13	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 13	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 6	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 7 / RB 7	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 8 / RB 8	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

101

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

High Gradient Habitat Assessment Datasheet

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 3	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 5	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 15	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 13	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 5	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 9 / RB 9	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 9 / RB 9	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

105

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH5 [illegible]	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	Eph | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36[illegible]	Y | N	Y | N		Field K-WADE	Staff:
Long:	-83.25[illegible]					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now:	HR	SR ✓	IS	Circle 1	CS	CO	SSH
Past 24hr:	HR	SR ✓	IS		CS	CO	SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled ✓ | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	3.5'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs ✓ | Grasses | Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		
Multihabs Sampled Y/N or # Jabs	Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge: Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:					
Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:		
Multi-Probe:		Inst. ID:		Cal. Date:		
Discharge:		Inst. ID:		Beam Check:		
Other:		Other Desc:				

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

High Gradient Habitat Assessment Datasheet

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 3	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 5	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 13	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 13	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 5	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 9 / RB 9	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 9 / RB 9	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

103

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH 14	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	(Eph) | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36512	Y | N	Y | N		K-WADE Field	Staff:
Long:	-83.25055					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now: Circle 1	HR | SR | IS	CS | CO | SSH	
Past 24hr:	HR | SR ✓ | IS	CS | CO ✓ | SSH	

Stream Shading

Leafed Out? Y/N: Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry ✓ | Pooled | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	2'
Maximum Depth (m):	4"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs | Grasses ✓ Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		

Multihabs Sampled Y/N or # Jabs: Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge:
Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:

Chemistry:		H_2SO_4 Lot #:	HNO_3 Lot #:
Multi-Probe:		Inst. ID:	Cal. Date:
Discharge:		Inst. ID:	Beam Check:
Other:		Other Desc:	

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 5	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 3	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 6	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 8	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 12	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 5	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 3 / RB 3	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 4 / RB 4	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

76

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Rockhouse Fork	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH 15	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	(Eph) | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36531	Y | N	Y | N		K-WADE Field	Staff:
Long:	-83.25062					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ | N

Now: HR | SR ✓ | IS
Circle 1 CS | CO | SSH

Past 24hr: HR | SR ✓ | IS
CS | CO | SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry | Pooled ✓ | Low
Seasonal Normal
Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	1'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing			
Deep Mining	✓	Commercial		Silviculture			
Oil Wells		Industrial		Urban Runoff			
Land Disposal		Row Crops		Storm Sewers			
Residential		Forest	✓	Permitted Outfalls			

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs | Grasses ✓ Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		

Multihabs Sampled Y/N or # Jabs

Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge:
Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:

Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:	
Multi-Probe:		Inst. ID:		Cal. Date:	
Discharge:		Inst. ID:		Beam Check:	
Other:		Other Desc:			

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices:
HR = Heavy Rain | SR = Steady Rain
IS = Intermittent Showers | CS = Clear Sunny
CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 5	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 3	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 6	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 8	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 12	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 5	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 9 / RB 9	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 6 / RB 6	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 9 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

92

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Lost Creek	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH 16	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	(Eph) | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36926	Y | N	Y | N		K-WADE Field	Staff:
Long:	-83.24795					Date:

WEATHER

Scouring Rain In Last 14 Days? YN ✓ Y | N

Now: HR | SR ✓ | IS
Circle 1 CS | CO | SSH

Past 24hr: HR | SR ✓ | IS
CS | CO | SSH

Stream Shading

Leafed Out? Y/N Y | N ✓

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry | Pooled ✓ | Low
Seasonal Normal
Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	2'
Maximum Depth (m):	4"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing			
Deep Mining	✓	Commercial		Silviculture			
Oil Wells		Industrial		Urban Runoff			
Land Disposal		Row Crops		Storm Sewers			
Residential		Forest	✓	Permitted Outfalls			

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N ✓ Channelization: F | P | N ✓

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs | Grasses ✓ Shrubs ✓ | Trees ✓

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.	

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		

Multihabs Sampled Y/N or # Jabs

Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge:
Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:

Chemistry:		H_2SO_4 Lot #:		HNO_3 Lot #:	
Multi-Probe:		Inst. ID:		Cal. Date:	
Discharge:		Inst. ID:		Beam Check:	
Other:		Other Desc:			

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices:
HR = Heavy Rain | SR = Steady Rain
IS = Intermittent Showers | CS = Clear Sunny
CO = Cloudy Overcast | SSH = Snow Sleet

Initial Data Review By:		Initial Data Review Date:		Date Entered:	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover Score 7	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness Score 5	Gravel, cobble, boulder, and bedrock are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, boulder and bedrock are 25-50% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are 50-75% surrounded by fine sediment.	Gravel, cobble, boulder, and bedrock are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 5	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
4. Sediment Deposition Score 11	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 8	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration Score 10	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends) Score 5	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 8 / RB 8	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection LB 6 / RB 6	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 6 / RB 9	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

94

Notes/Comments:

General Notes:

Sediment Notes:

High Gradient Habitat Assessment Datasheet

Station Visit Information

Locale Name:	Lost Creek	Project:	Wendell Fork Airport	Trip:		County:	Perry
Station ID:	EPH 17	Loc. Desc.:				Visit Date:	03/08/2022
Field Lead:	R. Schuler	Primary Bioregion:	Mountains	Secondary Bioregion:		Visit Start Time:	
Team:	R. Schuler, R. Oney	Stream Perm.	(Eph) | Int | Per	Stream Type (HW or WA):	HW	Visit Finish Time:	

STATION POINT VERIFICATION

1) K-WADE Target Point	2) Field GPS Location	Nav. to Target Point Within GPS Error?	Target On Correct Stream?	Field GPS Error (M)	3) GPS Final	K-WADE Station Update
Lat:	37.36901	Y | N	Y | N		K-WADE Field	Staff:
Long:	-83.24809					Date:

WEATHER

Scouring Rain In Last 14 Days? YN: Y | N

Now: Circle 1	HR | SR | IS	CS | CO | SSH	
Past 24hr:	HR | SR | IS	CS | CO | SSH	

Stream Shading

Leafed Out? Y/N: Y | N

General Shading Circle 1: Full | Partial | None

STREAM FLOW Circle 1

Dry | Pooled | Low

Seasonal Normal

Above Normal | Flood

INSTREAM FEATURES

Avgerage Wetted Width (m):	1'
Maximum Depth (m):	2"
Reach Length (m):	50

RIFFLE/RUN/POOL SEQ.

# of riffles in reach	
# of runs in reach	
# of pools in reach	

LOCAL WATERSHED FEATURES (Major Land Use): (Check all that are present)

Surface Mining	✓	Construction		Pasture/Grazing	
Deep Mining	✓	Commercial		Silviculture	
Oil Wells		Industrial		Urban Runoff	
Land Disposal		Row Crops		Storm Sewers	
Residential		Forest	✓	Permitted Outfalls	

CHANNEL ALTERATIONS- Full, Partial or Not/None

Dredging: F | P | N

Channelization: F | P | N

RIPARIAN VEGETATION

Dom. Veg. Type: Herbs | Grasses | Shrubs | Trees

# of Strata: 3

Dom. Taxa:

HYDRAULIC STRUCTURES (Check all that are present)

Dams:	Bridge Abutments:	Fords:	Islands:	Waterfalls:	Berms:

FIELD METER DATA

Temp (°C):	DO (mg/l):	DO %Sat:	pH (SU):	Sp. Cond (µS/cm):	Discharge CFS | Uncert.		

FIELD ACTIVITIES

Activity Completed?	Collectors	Collection Information (Check all that apply and/or enter/circle necessary information)				
Algae:		QualMHC:	Visual Form:	R4MULTI:	Other:	
Fish:		Equip.: BPEF | Seine | Barge	EF Seconds:	Seine Minutes:		
Habitat:	R Schuler	Habitat data other than RBP?				
Invertebrate:		1m² riffle + MH:	MACS 20-Jab:	Other:		

Multihabs Sampled Y/N or # Jabs

Undercuts/Roots: | Sticks/Wood: | Leaf Packs: | *Justicia* : | Aufwuchs: | Edge:

Bedrock/Slab: | Depositional: | Rock Pick: | Em. Veg.: | Wood Pick: | Other:

Chemistry:		H_2SO_4 Lot #:	HNO_3 Lot #:
Multi-Probe:		Inst. ID:	Cal. Date:
Discharge:		Inst. ID:	Beam Check:
Other:		Other Desc:	

SUBSTRATE CHARACTERIZATION

Substrate Category	% Riffle:	% Run:	% Pool:	Reach Total
Silt/Clay (<0.06 mm)				
Sand (0.06 – 2 mm)				
Gravel (2-64 mm)				
Cobble (64 – 256 mm)				
Boulders (>256 mm)				
Bedrock/Hardpan Clay				

Site Not Sampled (Reason)- Please Add Comments

Land Owner Denial
Too Deep/Impounded
Site Not Found
Unsafe
Dry
Other (See Comments)

Reach Location Description:

Weather Choices: HR = Heavy Rain | SR = Steady Rain | IS = Intermittent Showers | CS = Clear Sunny | CO = Cloudy Overcast | SSH = Snow Sleet

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Total Score

94

Notes/Comments:

General Notes:

Sediment Notes:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Wendell H. Ford Airport Access Road City/County: Perry Sampling Date: 03/08/2022

Applicant/Owner: Kentucky Transportation Cabinet State: KY Sampling Point: Wet-1

Investigator(s): Robert C. Oney, Ralph Schuler Section, Township, Range: Hazard, KY

Landform (hillslope, terrace, etc.): terrace (reclaimed mine) Local relief (concave, convex, none): concave Slope (%): 0-5

Subregion (LRR or MLRA): LLR N Lat: 37.36796 Long: -83.24821 Datum: NAD83

Soil Map Unit Name: Fairpoint and Bethesda, 2-70% slopes, benched, stony NWI classification: SS/PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil Y, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:
Area occurs within a small depression on the upslope side of an old mine access road. Area herbaceous vegetation could not be identified because of survey timing outside the growing season and remaining vegetation has been disturbed by ATV/logging activities. Additionally, the areas connection to WOS is believed to have been broken due to new logging activities (road improvements).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No _____	Depth (inches): 12
Water Table Present?	Yes X	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Area meets hydrology criteria of a wetland.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WET-1

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra		Yes	OBL
2. Platanus occidentalis		Yes	FACW
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Salix nigra		Yes	OBL
2. Alnus serrulata		Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft)			
1. Please refer to remarks below.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 30 ft)			
1. Rosa multiflora		No	FACU
2. Rubus spp.		No	NI
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Herbaceous vegetation was unable to be identified due to survey timing (winter) and disturbance to the remaining vegetative structures by ATV/logging activities. Remaining woody vegetation does meet the hydrophyte criteria of a wetland.

SOIL Sampling Point: WET-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	80	7.5YR 5/6	20	D	M	silty/clay loam, stony	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Area soils meet the hydric criteria of a wetland.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Wendell H. Ford Airport Access Road City/County: Perry Sampling Date: 03/08/2022

Applicant/Owner: Kentucky Transportation Cabinet State: KY Sampling Point: Wet-2

Investigator(s): Robert C. Oney, Ralph Schuler Section, Township, Range: Hazard, KY

Landform (hillslope, terrace, etc.): terrace (reclaimed mine) Local relief (concave, convex, none): concave Slope (%): 0-5

Subregion (LRR or MLRA): LLR N Lat: 37.372738 Long: -83.249300 Datum: NAD83

Soil Map Unit Name: Fairpoint and Bethesda, 2-70% slopes, benched, stony NWI classification: SS/PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil Y, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: Area occurs within a small depression of an old mine access road.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
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- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
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- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No _____	Depth (inches): 12
Water Table Present?	Yes X	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area meets hydrology criteria of a wetland.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WET-2

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis		Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Salix nigra		Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5 ft)			
1. Typha latifolia		Yes	OBL
2. Juncus effusus		Yes	FACW
3. Carex spp.		Yes	FAC
4. Scirpus cyperinus		Yes	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30 ft)			
1. Rosa multiflora		No	FACU
2. Rubus spp.		No	NI
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

Area is dominated by hydrophytic vegetation and thus passes the vegetation criteria of a wetland.

SOIL Sampling Point: WET-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	90	7.5YR 4/6	10	C	PL	silty/clay loam, stony	
8-16	10YR 5/1						stony	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Area soils meet the hydric criteria of a wetland.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Wendell H. Ford Airport Access Road City/County: Perry Sampling Date: 03/08/2022

Applicant/Owner: Kentucky Transportation Cabinet State: KY Sampling Point: Wet-3

Investigator(s): Robert C. Oney, Ralph Schuler Section, Township, Range: Hazard, KY

Landform (hillslope, terrace, etc.): terrace (reclaimed mine) Local relief (concave, convex, none): concave Slope (%): 0-5

Subregion (LRR or MLRA): LLR N Lat: 37.36536 Long: -83.25198 Datum: NAD83

Soil Map Unit Name: Fairpoint and Bethesda, 2-70% slopes, benched, stony NWI classification: SS/PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: Area occurs/developed within an old mine sediment pond.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No _____	Depth (inches): 10
Water Table Present?	Yes X	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area meets hydrology criteria of a wetland.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WET-3

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo		Yes	FAC
2. Salix nigra		Yes	OBL
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Salix nigra		Yes	OBL
2. Acer negundo		Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5 ft)			
1. Boehmeria cylindrica		Yes	FACW
2. Rumex crispus		Yes	FAC
3. Persicaria hydropiperoides		Yes	OBL
4. Scirpus cyperinus		Yes	FACW
5. Echinochloa crus-galli		Yes	FAC
6. Carex spp.		Yes	FAC
7.			
8.			
9.			
10.			
11.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30 ft)			
1. Rosa multiflora		No	FACU
2. Rubus spp.		No	NI
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 10 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

Area is dominated by hydrophytic vegetation and thus passes the vegetation criteria of a wetland.

SOIL Sampling Point: WET-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	70	7.5YR 4/6	30	C	PL	silty/clay loam, stony	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Area soils meet the hydric criteria of a wetland.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Wendell H. Ford Airport Access Road City/County: Perry Sampling Date: 03/08/2022

Applicant/Owner: Kentucky Transportation Cabinet State: KY Sampling Point: WET-4

Investigator(s): Robert C. Oney, Ralph Schuler Section, Township, Range: Hazard, KY

Landform (hillslope, terrace, etc.): terrace (reclaimed mine) Local relief (concave, convex, none): concave Slope (%): 0-5

Subregion (LRR or MLRA): LLR N Lat: 37.36536 Long: -83.25198 Datum: NAD83

Soil Map Unit Name: Fairpoint and Bethesda, 2-70% slopes, benched, stony NWI classification: SS/PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil Y, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: Area occurs/developed on an old surface mine bench.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No _____	Depth (inches): 4
Water Table Present?	Yes X	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area meets hydrology criteria of a wetland.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WET-4

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo		Yes	FAC
2. Salix nigra		Yes	OBL
3. Fraxinus pennsylvanica		No	FACW
4. liriodendron tulipifera		Yes	FACU
5. Juniperus virginiana		No	FACU
6.			
7.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Salix nigra		No	OBL
2. Acer negundo		Yes	FAC
3. Cercis canadensis		No	FACU
4. Prunus serotina		No	FACU
5.			
6.			
7.			
8.			
9.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5 ft)			
1. Boehmeria cylindrica		No	FACW
2. Rumex crispus		No	FAC
3. Echinochloa crus-galli		Yes	FAC
4. Miscanthus sinensis		Yes	FACU
5. Solidago gigantea		No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30 ft)			
1. Rosa multiflora		No	FACU
2. Rubus spp.		No	NI
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Area appears to be dominated by hydrophytic vegetation and thus passes the vegetation criteria of a wetland.

SOIL

Sampling Point: WET-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/2	85	7.5YR 4/6	15	C	PL	silty/clay loam, stony	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Area soils meet the hydric criteria of a wetland.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Wendell H. Ford Airport Access Road City/County: Perry Sampling Date: 03/08/2022

Applicant/Owner: Kentucky Transportation Cabinet State: KY Sampling Point: WET-5

Investigator(s): Robert C. Oney, Ralph Schuler Section, Township, Range: Hazard, KY

Landform (hillslope, terrace, etc.): terrace (reclaimed mine) Local relief (concave, convex, none): concave Slope (%): 0-5

Subregion (LRR or MLRA): LLR N Lat: 37.362639 Long: -83.255480 Datum: NAD83

Soil Map Unit Name: Fairpoint and Bethesda, 2-70% slopes, benched, stony NWI classification: SS/PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil Y, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:
Area occurs/developed on an old surface mine bench, within a ditch at the toe of slope of old highway. Area is linear, ranging from about 3-4 ft wide to about 7-9 ft.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- X Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- X Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No _____	Depth (inches): 6
Water Table Present?	Yes X	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Area meets hydrology criteria of a wetland.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WET-5

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Salix nigra		Yes	OBL
2. Alnus serrulata		Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft)			
1. Ludwigia alternifolia		No	FACW
2. Scirpus cyperinus		Yes	FACW
3. Eleocharis spp.		Yes	FACW
4. Miscanthus sinensis		Yes	FACU
5. Solidago gigantea		Yes	FACW
6. Juncus effusus		Yes	FACW
7. Carex spp.		No	FAC
8.			
9.			
10.			
11.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 30 ft)			
1. Rosa multiflora		No	FACU
2. Rubus spp.		No	NI
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Area is dominated by hydrophytic vegetation and thus passes the vegetation criteria of a wetland.

SOIL Sampling Point: WET-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	GLEY 1 5/5 gy	100					fine silty/clay	
3-16	10YR 5/1	90	7.5YR 4/6	10	C	PL	silty/clay loam, stony	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Area soils have a ark organic layer approximately 2-3" thick (peaty-muck).

Area soils meet the hydric criteria of a wetland.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Wendell H. Ford Airport Access Road City/County: Perry Sampling Date: 03/23/2023

Applicant/Owner: Kentucky Transportation Cabinet State: KY Sampling Point: WET-6

Investigator(s): Robert C. Oney, Ralph Schuler Section, Township, Range:

Landform (hillslope, terrace, etc.): slope bench Local relief (concave, convex, none): slope to concave Slope (%): 0-10

Subregion (LRR or MLRA): LLR N Lat: 37.36126 Long: -83.25629 Datum: NAD83

Soil Map Unit Name: Fairpoint and Bethesda, 2-70% slopes, benched, stony NWI classification: emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation Yes, Soil Yes, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Hydrology inputs are surface runoff and a ground water connection to acid mine drainage. Vegetation dominates are mainly an exotic invasive species (see site photographs). Soils are derived from abandoned mine materials - loamy-skeletal coal extraction mine spoil derived from sandstone and shale.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): surface

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Area passes the hydrology criteria of a wetland.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WET-6

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Alnus serrulata		No	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5 ft)			
1. Miscanthus sinensis		Yes	FACU
2. Carex frankii		Yes	OBL
3. Scirpus cyperinus		Yes	FACW
4. Solidage sp.		No	NI
5. Lespedeza cuneata		No	FACU
6. Juncus sp.		No	FAC
7. Juncus effusus		No	FACW
8.			
9.			
10.			
11.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 30 ft)			
1. Rubus arvensis		Yes	FAC
2. Rosa multiflora		No	FACU
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Area vegetation is dominated by hydrophytes, however, due to the timing of field investigation species level identification could not be determined for all species.

SOIL Sampling Point: WET-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 5/2	60	7.5YR 5/6	40	D	M		stony loam, mine spoil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Area soils pass the hydric criteria of a wetland.

APPENDIX J

Mitigation Statement Avoidance and Minimization

MITIGATION STATEMENT
For Letter of Permission (LOP)
Wendell H. Ford Airport Access Road
Perry County, Kentucky
KYTC Item No. 10-80100

Mitigation:

Impacts to Waters of the U.S. (WOUS) will be mitigated in accordance with USACE requirements. Impacted streams are of low habitat quality, with a score of poor. The project is located in the Kentucky Department of Fish and Wildlife Stream and Wetland Program's Upper Kentucky River Service Area. Stream functionality will be replaced with ditches to be incidentally constructed as part of the fill activity.

The USACE's Regulatory In Lieu Fee and Bank Information Tracking System (RIBITS) website (https://ribits.ops.usace.army.mil/ords/) was accessed on April 24, 2023 to identify available mitigation banks within the service area. The EIP-KSWMBI-III North Fork Stream Mitigation Bank (LRL-2015-00322) provides stream mitigation credits within the Service Area but does not have any wetland credits available.

KYTC proposes to acquire stream credits from the EIP Mitigation Bank to address project impacts. Credits to address wetland impacts will be purchased as In Lieu Fees (ILF) from the Kentucky Department of Fish and Wildlife Resources' (KDFWR) Stream and Wetland Program. Should stream credits at the EIP bank be unavailable at the time of project letting, these will also be purchased as ILFs from KDFWR.

Calculated mitigation requirements assume availability of EIP stream credits and, therefore, stream impacts are mitigated at a 1:1 ratio. Since ILFs will be used for wetland mitigation, credits have been calculated assuming a 2:1 mitigation ratio plus an additional 20% to account for temporal loss. Stream and wetland impacts associated with the Wendell H. Ford Airport Access Road are 261.4 EIU's and 1.1 AMU's, respectively. Assuming availability of EIP stream credits, 261.4 EIUs would be acquired to mitigate stream impacts. Should EIP credits be unavailable at the time of project letting, all mitigation requirements would be addressed through ILFs from KDFWR, resulting in a purchase of 1.2 AMUs for wetland impacts and 313.6 EIU's for stream loss.

APPENDIX K

LOP Statement of Findings

ASSESSMENT OF ENVIRONMENTAL, SOCIAL, AND OTHER FACTORS
For Letter of Permission (LOP)
Wendell H. Ford Airport Access Road Project
Perry County, Kentucky
KYTC Item No. 10-80100
LRL-

Threatened and Endangered Species: Proper consultation with the US Fish and Wildlife Service (USFWS) has occurred to satisfy the requirements of Section 7 of the Endangered Species Act. The USFWS maintains an on-line GIS data system (Information for Planning and Conservation (IPAC)) for identification of threatened and endangered species that may be present in a project area. IPAC was consulted, as was the Office of Kentucky Nature Preserves and Kentucky Department of Fish and Wildlife Resources Commission. Based upon this agency coordination, it was determined that the project is an area that could potentially affect the following federally-listed species: Indiana bat, northern long-eared bat, gray bat, and Kentucky arrow darter.

Species for which habitat is present were further investigated by conducting a Biological Assessment (BA). The potential impacts to federally-listed species as a result of this project have been coordinated with the USFWS. The BA was submitted by Resource Environmental Solutions, LLC to USFWS and concurrence was received on December 27, 2022. The Kentucky arrow darter was addressed through a 'No Effect' document prepared by KYTC DEA.

The USFWS comments concerning the listed species are:

Gray Bat - Field assessments identified 55 abandoned mine portals within one-half mile of the proposed project area. However, assessment of these portals determined that none were suitable as a summer roost and/or hibernaculum. Furthermore, it was concluded that no caves or karst features suitable for summer or winter gray bat roosting would be affected by the proposed project. Therefore, the proposed project is not likely to impact gray bat hibernacula or roosting habitat.

KYTC utilized the processes identified in the Federal Highway Administration Kentucky Division's (FHWA) 2020 Programmatic Consultation on the effects of transportation projects on the gray bat to evaluate potential adverse effects on foraging and commuting habitat for the gray bat. The KFO agreed with the ESA compliance process and concurred with the determination that the proposed action *may affect, but is not likely to adversely affect the gray bat*.

Indiana Bat - According to the biological assessment (BA), no impacts to suitable winter habitat for this species would occur. The proposed project requires removal of approximately 37.76 acres of potential habitat that is suitable as summer roosting habitat by the Indiana bat. The KYTC believes that this species is reasonably certain to utilize these forested habitats and determined that the action "*may affect, is likely to adversely affect*" the Indiana bat. The KYTC proposed to account for potential adverse effects to the Indiana bat and its habitat through the processes identified in the FHWA's 2020 Programmatic Consultation and accompanying biological opinion on the effects of transportation projects on the Indiana bat. The Service concurred with the

effects determination for the Indiana bat and agreed with the proposed ESA compliance process.

Northern Long-eared Bat - Based on the information available, this project may affect the NLEB, but with no effects beyond those previously evaluated in the Service's programmatic biological opinion for the NLEB final 4(d) rule dated January 5, 2016 (FWS Log# 03E00000-2016-F-0001). Any taking that may occur incidental to this project is not prohibited under the final 4(d) rule (50 CFR §17.40(o)). Therefore, the KYTC may fulfill its responsibilities under ESA section 7(a)(2) relative to the NLEB for this project by requesting reliance on the Service's programmatic biological opinion for the 4(d) rule.

Note: KYTC is in the process of re-consulting with USFWS to address the recent change of status for the NLEB from Threatened to Endangered. Results of the consultation will be provided when available.

Historical Properties: Impacts to Cultural and Historic Resources have been addressed in accordance with Section 106 of the National Historic Preservation Act. Identification of historic properties within the area of potential effect has been conducted and it has been concluded that there will be No Historic Properties Affected. By letter dated January 3, 2023 the Kentucky Heritage Council (KHC) concurred with the finding.

An archaeological survey has also been conducted. The survey found no evidence of archaeological sites within the project area. By letter dated October 28, 2022 the KHC concurred with a finding of No Historic Properties Affected.

Economics: During construction, the proposed Wendell H. Ford Airport Access Road Project would have a positive impact on the local economy by providing jobs for local citizens, suppliers and contractors. After completion, no indirect or cumulative impacts to the regional economy or businesses are anticipated, the proposed project will enhance the travel efficiency and safety in the region because the proposed project does not include additional capacity.

Aesthetics: The Preferred Alternative 5 will convert some wooded and residential areas to transportation right-of-way; however, the views of and from the new Wendell H. Ford Airport Access Road are expected to be similar to the current views of and from the existing KY 15 and Fly By Hazard Road.

Special Aquatic Sites: There are no Special Aquatic Sites (SAS) present in the project vicinity.

Fish and Wildlife Values: Habitat for fish and wildlife will be affected by the project. A total of 2,714 lf of ephemeral stream, 1,200 lf of intermittent stream, and 450 lf of perennial stream will be filled along with 0.500 ac of wetland. Streams will be mitigated by purchasing 261.4 credits from the EIP North Fork Stream Mitigation Bank. Mitigation for wetland impacts will be via in-lieu fee (ILF) payments to the Kentucky Department of Fish and Wildlife Stream and Wetland Program for projects in the Upper Kentucky River Service Area. Including temporal losses, mitigation would provide 1.2 AMU's for wetland impacts.

Project construction will also result in the loss of 37.76 acres of "Potential" summer roosting habitat for the Indiana and northern long-eared bat. The KYTC proposed to mitigate for take associated with potential direct, indirect, and cumulative effects to the Indiana bat from this habitat loss through a contribution to the Imperiled Bat Conservation Fund, following guidance provided in the *Conservation Strategy for Forest-Dwelling Bats* (Conservation Strategy).

Flood Hazards: The KYTC minimizes, whenever possible, encroachment upon the floodplain, Water control structures within the flood plain are designed and then analyzed using HEC-RAS to assure that these do not adversely affect flood elevations.

Flood Plain Values: No construction will occur within the FEMA designated floodplain.

Land Use Classification: Land use in the project area is rural residential, forested, and historic mining activities. The project will affect land use by conversion of forested, agricultural, and residential to impervious surface and right-of-way use for transportation purposes. No further land development or land use conversion is expected because of the project. However, secondary effects on land use cannot be controlled or predicted by the project. Thus, land use would not be significantly altered as a result of this project.

Navigation: Navigation is not a factor associated with this proposal.

Shore Erosion and Accretion Patterns: Shore erosion and accretion patterns would not be affected by the excess material sites as they are not located on a lake or a major tributary.

Recreation: The project will not affect any publicly-owned park, recreation area, or wildlife or waterfowl refuge.

Existing and Potential Water Supplies; Conservation: The road project would not affect existing water supplies. No construction activities occur within the vicinity of existing water supplies.

Water Quality: This project may have temporary impacts to water quality during the construction phase. This project will minimize those impacts via compliance with the KPDES General Storm Water Permit for Construction and compliance with a 401 Water Quality Certification. Compliance is generally achieved through structural BMPs (silt fence, silt checks, detention basins, etc.) or non-structural BMPs such as mulching, seeding, grading, etc. Such measures will be employed in strict conformance with the erosion control provisions of the KYTC *Specifications for Road and Bridge Construction*. Thus the excess material sites would have minimal impact to water quality.

Energy Needs: This project would result in a short-term increase in energy consumption during construction. Overall, the project would have minimum impact on the energy consumption and will not impact the long-term energy consumption.

Safety: The purpose of the project is to improve transportation network connectivity and correct the substandard conditions of the existing access road, including narrow lanes, little to no shoulders, steep grades, and slope failures.

Food and Fiber Production: The project would have a negligible impact on food and fiber production. The existing land use is currently being harvested for timber otherwise it is mountainous terrain and not suitable for agriculture.

Mineral Needs: This project would have no impact on mineral needs.

Noise: A study of noise impacts was conducted in accordance with KYTC and FHWA policy. The study concluded that there would be no noise impacts to any area receptors.

Wild and Scenic Rivers: According to the Kentucky Environmental and Public Protection Cabinet – Division of Water, no wild and scenic rivers are located in the project area and the project will not impact any wild and scenic river.

UST Hazardous Material: No potential hazardous material sites have been identified in the project areas and the project is not expected to impact any hazardous material sites.

Environmental Justice: No specific environmental justice issues were raised at the Public Meeting (10/11/22) conducted for the project and no comments received indicated any hardship anticipated as a result of the project. An Environmental Justice analysis was conducted in accordance with Executive Order 12898 and FHWA/KYTC Environmental Justice guidance. Based on the results of the analysis, the project is not expected to disproportionately impact minority or low-income populations.

Section 4(f)/6(f) Resources: No publicly-owned parks, recreation areas, wildlife preserves, or historic sites are located in the project area, and no recreational sites developed with Land and Water Conservation Funds are located in the project area. As a result, the project will not impact any Section 4(f) or 6(f) resources.

APPENDIX L

Photographs

Photo 1: Facing northeast across WET-1; March 8, 2022.

Photo 2: Facing north across WET-2; March 8, 2022.

Photo 3: Facing east across WET-3A. WET-3B is identical to 3A; March 8, 2022.

Photo 4: Facing northwest across WET-4; March 8, 2022.

Photo 5: Facing southeast at WET-5; March 8, 2022.

Photo 6: Facing northeast at WET-6; March 23, 2023

Photo 7: Facing upstream (southwest) at STR-1 on 01/31/2022.

Photo 8: Facing downstream (northeast) at STR-1 on 01/31/2022.

Photo 9: Representative substrate of STR-1 on 01/31/2022.

Photo 10: Facing upstream (southeast) at STR-2 on 01/31/2022.

Photo 11: Facing downstream (northwest) at STR-2 on 01/31/2022.

Photo 12: Representative substrate of STR-2 on 01/31/2022.

Photo 13: Facing upstream (east) at STR-3 on 03/08/2022.

Photo 14: Facing downstream (west) at STR-3 on 03/08/2022.

Photo 15: Representative substrate of STR-3 on 03/08/2022.

Photo 16: Facing upstream (southeast) at STR-4 on 03/08/2022.

Photo 17: Facing downstream (northwest) at STR-4 on 03/08/2022.

Photo 18: Representative substrate of STR-4 on 03/08/2022.

Photo 19: Facing upstream (east) at STR-5 on 03/08/2022.

Photo 20: Representative substrate of STR-5 on 03/08/2022.

Photo 21: Facing upstream (northeast) at STR-6 on 03/08/2022.

Photo 22: Facing downstream (southwest) at STR-6 on 03/08/2022.

Photo 23: Representative substrate of STR-6 on 03/08/2022.

Photo 24: Facing upstream (southeast) at STR-7 on 03/08/2022.

Photo 25: Facing downstream (northwest) at STR-7 on 03/08/2022.

Photo 26: Representative substrate of STR-7 on 03/08/2022.

Photo 27: Facing upstream (southeast) at EPH-3 on 03/08/2022.

Photo 28: Facing downstream (northwest) at EPH-3 on 03/08/2022.

Photo 29: Representative substrate of EPH-3 on 03/08/2022.

Photo 30: Facing upstream (east) at EPH-4 on 03/08/2022.

Photo 31: Facing downstream (west) at EPH-4 on 03/08/2022.

Photo 32: Representative substrate of EPH-4 on 03/08/2022.

Photo 33: Facing upstream (north) at EPH-5 (WET-5) on 03/08/2022.

Photo 34: Facing downstream (southwest) at EPH-5 on 03/08/2022.

Photo 35: Facing upstream (northeast) at EPH-6 on 03/08/2022.

Photo 36: Facing downstream (southwest) at EPH-6 on 03/08/2022.

Photo 37: Representative substrate of EPH-6 on 03/08/2022.

Photo 38: Facing upstream (northeast) at EPH-7 on 03/08/2022.

Photo 39: Facing downstream (southwest) at EPH-7 on 03/08/2022.

Photo 40: Representative substrate of EPH-7 on 03/08/2022.

Photo 41: Facing upstream (northeast) at EPH-8 on 03/08/2022.

Photo 42: Facing downstream (southwest) at EPH-8 on 03/08/2022.

Photo 43: Representative substrate of EPH-8 on 03/08/2022.

Photo 44: Facing upstream (southeast) at EPH-9 on 03/08/2022.

Photo 45: Facing downstream (northwest) at EPH-9 on 03/08/2022.

Photo 46: Representative substrate of EPH-9 on 03/08/2022.

Photo 47: Facing upstream (east) at EPH-10 on 03/08/2022.

Photo 48: Facing downstream (west) at EPH-10 on 03/08/2022.

Photo 49: Facing upstream (east) at EPH-11 on 03/08/2022.

Photo 50: Facing downstream (west) at EPH-11 on 03/08/2022.

Photo 51: Representative substrate of EPH-11 on 03/08/2022.

Photo 52: Facing upstream (southeast) at EPH-12 on 03/08/2022.

Photo 53: Facing downstream (northwest) at EPH-12 on 03/08/2022.

Photo 54: Representative substrate of EPH-12 on 03/08/2022.

Photo 55: Facing upstream (southeast) at EPH-13 on 03/08/2022.

Photo 56: Facing downstream (northwest) at EPH-13 on 03/08/2022.

Photo 57: Representative substrate of EPH-13 on 03/08/2022.

Photo 58: Facing upstream (east) at EPH-14 on 03/08/2022.

Photo 59: Facing downstream (west) at EPH-14 on 03/08/2022.

Photo 60: Representative substrate of EPH-14 on 03/08/2022.

Photo 61: Facing upstream (northeast) at EPH-15 on 03/08/2022.

Photo 62: Facing downstream (southwest) at EPH-15 on 03/08/2022.

Photo 63: Representative substrate of EPH-15 on 03/08/2022.

Photo 64: Facing upstream (south) at EPH-16 on 03/08/2022.

Photo 65: Facing downstream (north) at EPH-16 on 03/08/2022.

Photo 66: Representative substrate of EPH-16 on 03/08/2022.

Photo 67: Facing upstream (west) at EPH-17 on 03/08/2022.

Photo 68: Facing downstream (east) at EPH-17 on 03/08/2022.

Photo 69: Representative substrate of EPH-17 on 03/08/2022.

APPENDIX M

Plan Sheets

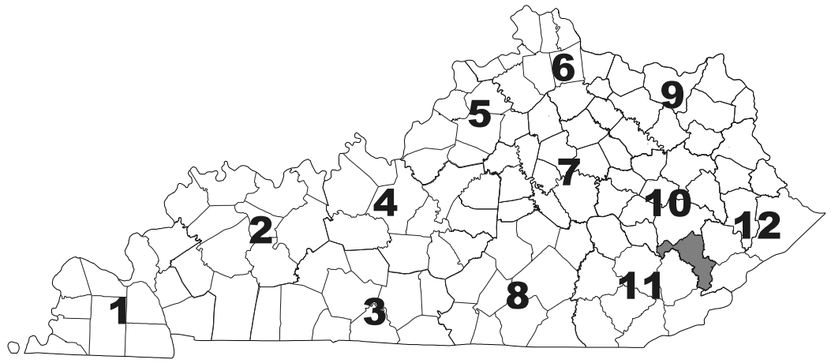
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

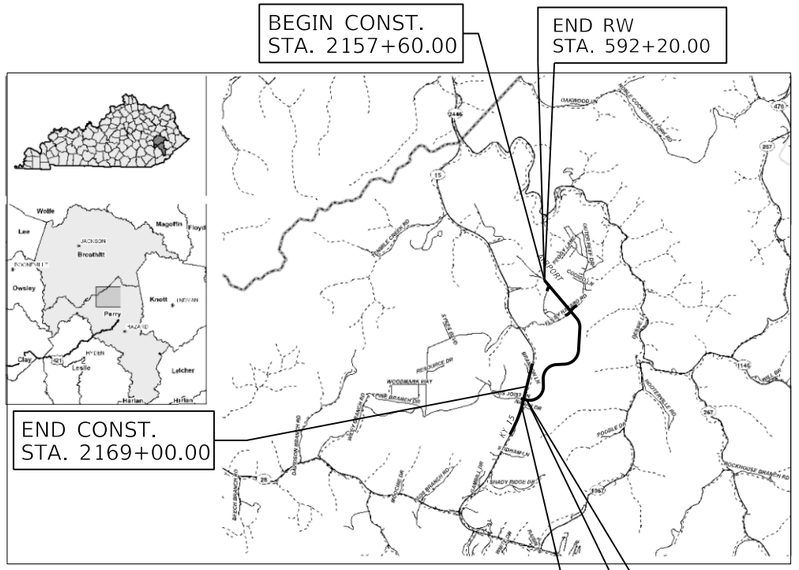
KENTUCKY TRANSPORTATION CABINET

PLANS OF
PROPOSED PROJECT

PERRY County

Wendell H. Ford Airport Access Road





LAYOUT MAP

DESIGN CRITERIA

CLASS OF HIGHWAY	Local
TYPE OF TERRAIN	Mountainous
DESIGN SPEED	40 mph
REQUIRED NPSD	305
REQUIRED PSD	1470
LEVEL OF SERVICE	C
ADT PRESENT (2020)	580
ADT FUTURE (2040)	710
DHV	80
D %	57 / 43
T %	8.6

GEOGRAPHIC COORDINATES

LATITUDE 37 DEGREES 21 MINUTES 33 SECONDS NORTH
LONGITUDE 83 DEGREES 15 MINUTES 17 SECONDS WEST

DESIGNED

% RESTRICTED SD _____
LEVEL OF SERVICE _____
MAX. DISTANCE W/O PASSING _____

INDEX OF SHEETS

STANDARD DRAWINGS

RIGHT OF WAY PLANS

AIRPORT ACCESS ROAD	KY 15	APPROACHES	
LENGTH 9096.89 LIN. FT. 1.72 MILES	LENGTH 0 LIN. FT. 0 MILES	LENGTH 767 LIN. FT. 0.15 MILES	LENGTH X LIN. FT. X MILES
ADDED / DEDUCTED FOR EQUALITIES _____ LIN. FT. NOT INCLUDED	ADDED / DEDUCTED FOR EQUALITIES _____ LIN. FT. NOT INCLUDED	ADDED / DEDUCTED FOR EQUALITIES _____ LIN. FT. NOT INCLUDED	ADDED / DEDUCTED FOR EQUALITIES X LIN. FT. NOT INCLUDED
RAILROAD CROSSINGS NO. _____ LIN. FT.	RAILROAD CROSSINGS NO. _____ LIN. FT.	RAILROAD CROSSINGS NO. _____ LIN. FT.	RAILROAD CROSSINGS NO. X LIN. FT.
BRIDGES _____ LIN. FT.	BRIDGES _____ LIN. FT.	BRIDGES _____ LIN. FT.	BRIDGES X LIN. FT.
			X

PROJECT NUMBER:

PROJECT DESCRIPTION: Wendell H. Ford Airport Access Road

RECOMMENDED BY: _____ PROJECT MANAGER DATE:

PLAN APPROVED BY: _____ STATE HIGHWAY ENGINEER DATE:

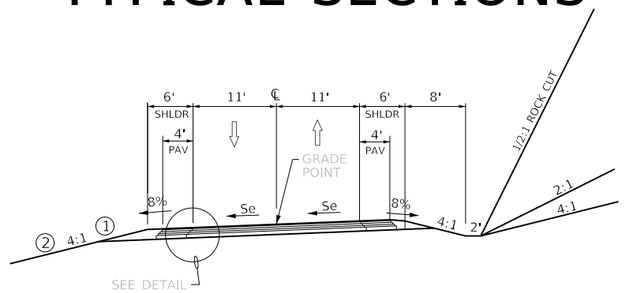
STATE OF KENTUCKY · STEPHEN D. SEWELL · 24030 · LICENSED PROFESSIONAL ENGINEER

LETTING DATE: _

ITEM NO. 10-80100.00 COUNTY OF PERRY

SHEET NO. R1

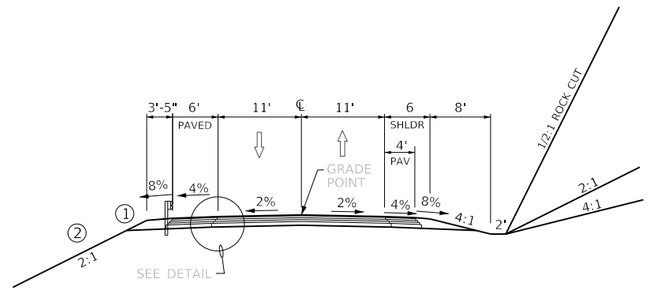
TYPICAL SECTIONS



ACCESS ROAD
SUPERELEVATED SECTION

① ASPHALT SEAL FOR SHOULDERS FROM OUTSIDE EDGE OF PAVEMENT TO A POINT 2 FEET DOWN THE DITCH OR FILL SLOPE.

② SEE CROSS SECTIONS FOR SLOPES OUTSIDE THE LIMITS OF THE SHOULDERS.



ACCESS ROAD
NORMAL CROWN

RIGHT OF WAY
PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

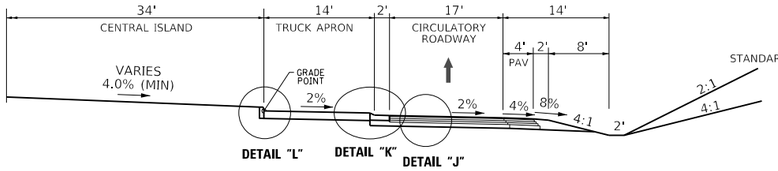
DRAWING TITLE: AIRPORT ACCESS ROAD

ITEM NO. 10-80100.00 COUNTY OF PERRY

SHEET NO. R2

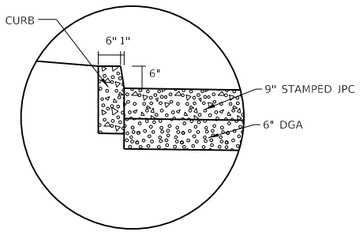
TYPICAL SECTIONS

FLY BY HAZARD ROAD ROUNDABOUT

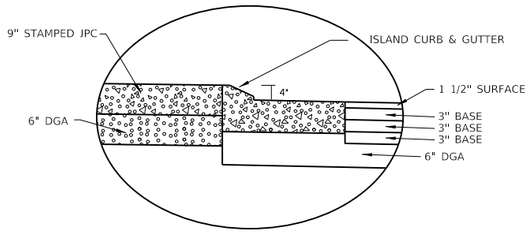


AIRPORT RD ROUNDABOUT

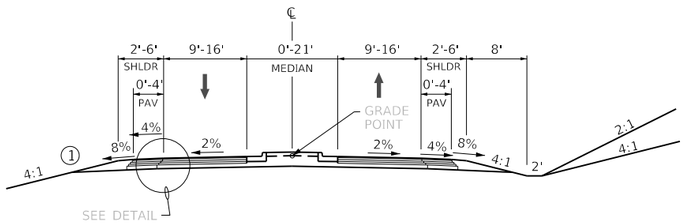
DETAIL "L"



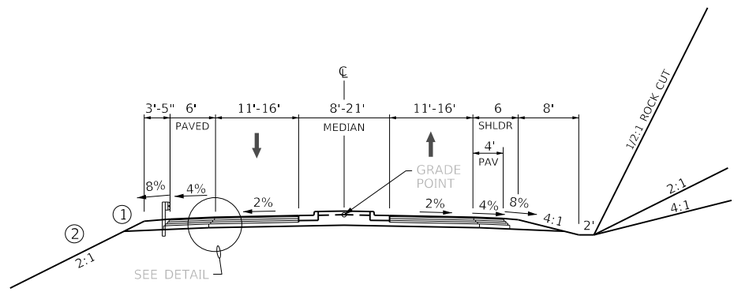
DETAIL "K"



1. SEE CROSS SECTIONS FOR SLOPES OUTSIDE THE LIMITS OF THE SHOULDERS.
4. TREAT CEMENT STABILIZED ROADWAY WITH 2.0 LBS/ SQ YD. OF ASPHALT CURING SEAL AND 5.0 LBS/ SQ YD. OF SAND FOR BLOTTER.



FLY BY HAZARD ROAD AT ROUNDABOUT
NORMAL CROWN



ACCESS ROAD WITH RAISED MEDIAN
NORMAL CROWN

1. ASPHALT SEAL FOR SHOULDERS FROM OUTSIDE EDGE OF PAVEMENT TO A POINT 2 FEET DOWN THE DITCH OR FILL SLOPE.
2. SEE CROSS SECTIONS FOR SLOPES OUTSIDE THE LIMITS OF THE SHOULDERS.

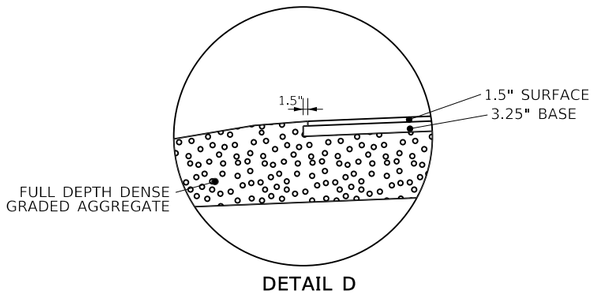
RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

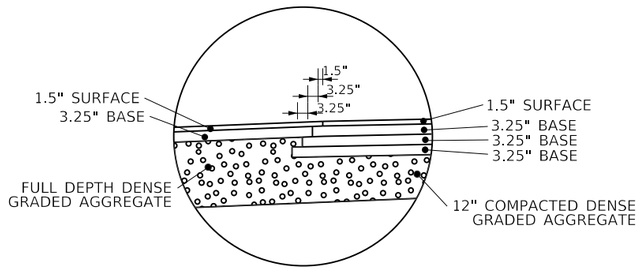
DRAWING TITLE: AIRPORT ACCESS ROAD ROUNDABOUT

ITEM NO. 10-80100.00
COUNTY OF PERRY
SHEET NO. R2A

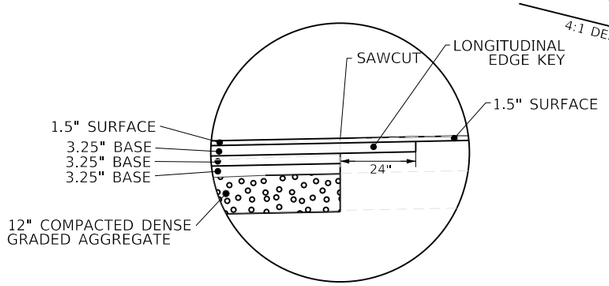
TYPICAL SECTIONS



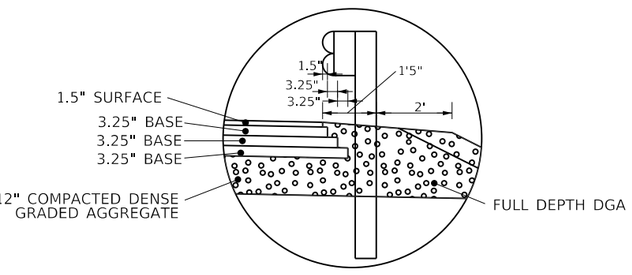
DETAIL D



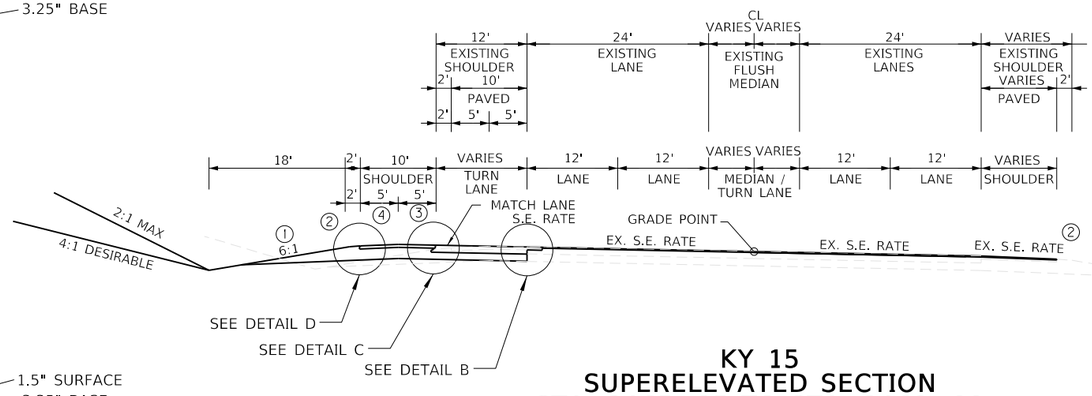
DETAIL C



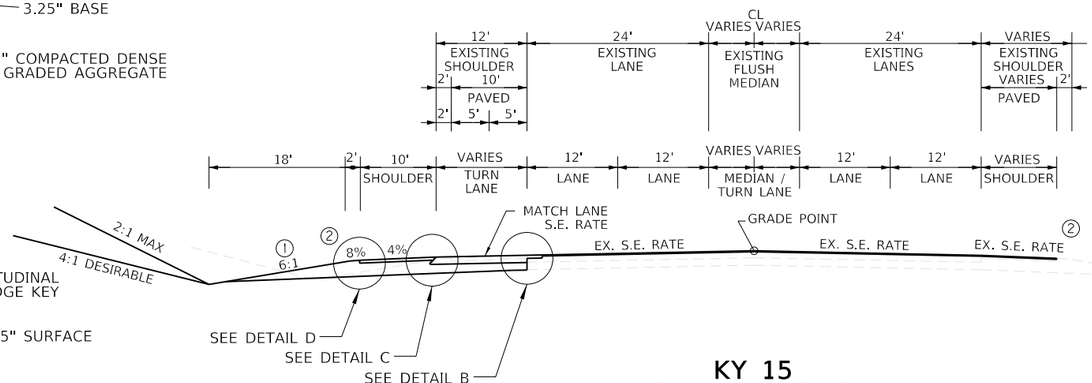
DETAIL B



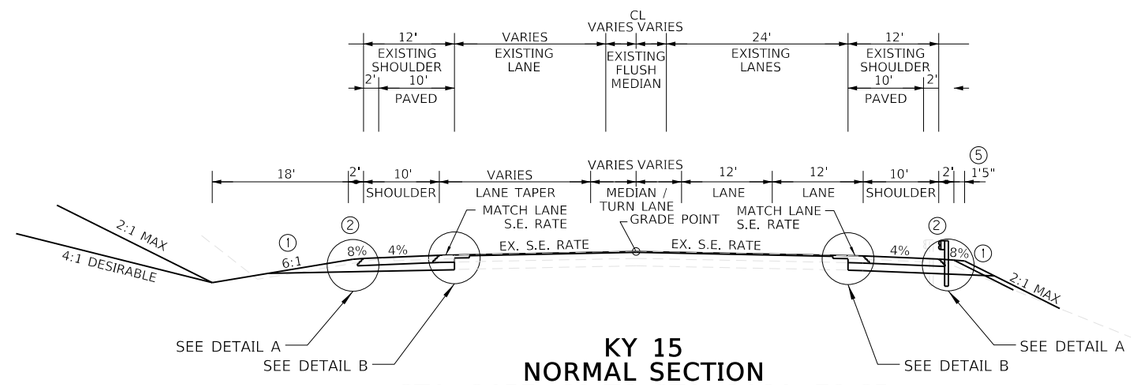
DETAIL A



KY 15
SUPERELEVATED SECTION
STA. 2165+85 TO STA. 2169+00



KY 15
NORMAL SECTION
STA. 2164+79.65 TO STA. 2165+85



KY 15
NORMAL SECTION
STA. 2157+60 TO STA. 2164+79.65

KY 15 MAINLINE AND FULL DEPTH SHOULDER PAVEMENT DESIGN

1.5" SURFACE	1.5" DEPTH CL3 ASPHALT SURFACE 0.38B PG 64-22
9.75" ASPHALT BASE	3.25" DEPTH CL3 ASPHALT BASE 1.00D PG 64-22 3.25" DEPTH CL3 ASPHALT BASE 1.00D PG 64-22 3.25" DEPTH CL3 ASPHALT BASE 1.00D PG 64-22
DGA BASE	12" DEPTH DENSE GRADED AGGREGATE BASE

KY 15 SHOULDER PAVEMENT DESIGN

1.5" SURFACE	1.5" DEPTH CL2 ASPHALT SURFACE 0.38D PG 64-22
3.25" ASPHALT BASE	3.25" DEPTH CL2 ASPHALT BASE 1.00D PG 64-22
DGA BASE	FULL DEPTH DENSE GRADED AGGREGATE BASE

KY 15 MAINLINE MILL & INLAY PAVEMENT DESIGN

1.5" SURFACE	1.5" DEPTH CL3 ASPHALT SURFACE 0.38B PG 64-22

KY 15 SHOULDER MILL & INLAY PAVEMENT DESIGN

1.5" SURFACE	1.5" DEPTH CL2 ASPHALT SURFACE 0.38D PG 64-22

RIGHT OF WAY PLANS

ASPHALT MATERIAL FOR TACK APPLIED AT A RATE OF 0.70 LBS PER SQ YD OR AS DIRECTED BY THE ENGINEER - BETWEEN EACH COURSE - NON TRACKING

PAVEMENT NOTES:

① SEE CROSS SECTIONS FOR SLOPES OUTSIDE THE LIMITS OF THE SHOULDERS

② BIT. SEAL REQUIRED FROM OUTSIDE EDGE OF PAVED SHOULDER TO A POINT 2' DOWN THE DITCH OR FILL SLOPE

③ SHOULDER MATCHES MAINLINE RATE FOR 5'

④ THE ALGEBRAIC DIFFERENCE IN RATE OF CROSS-SLOPE IS NOT TO EXCEED 12.0%

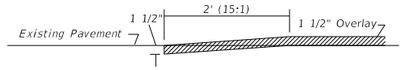
⑤ GUARDRAIL (SEE PLAN SHEETS FOR LOCATION) WIDEN TO PROVIDE 2' BEHIND GUARDRAIL.

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: KY 15

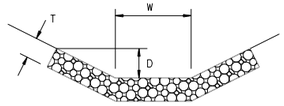
ITEM NO. 10-80100.00
COUNTY OF PERRY
SHEET NO. R2B

TYPICAL SECTIONS



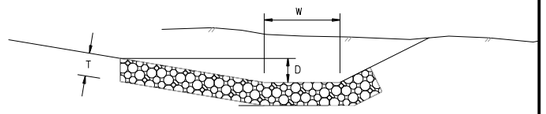
ENTRANCE KEY DETAIL

WORK UNDER THIS ITEM SHALL INCLUDE CUTTING OUT THE EXISTING ASPHALT SURFACE TO A MINIMUM DEPTH AND WIDTH AS SHOWN, SO THE NEW SURFACE MAY HEEL INTO THE EXISTING SURFACE. THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR "EDGE KEY" SHALL INCLUDE ALL NECESSARY MATERIALS, LABOR, EQUIPMENT, ETC. TO PERFORM THE WORK AND DISPOSE OF THE ASPHALT MATERIALS REMOVED.



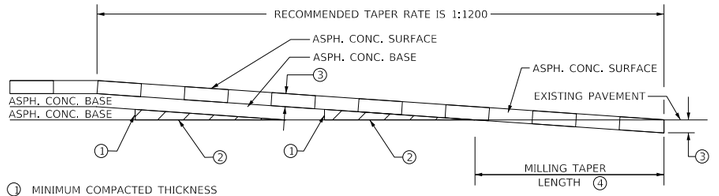
D = DEPTH TO PROTECT
T = THICKNESS (ROCK LINING)
W = WIDTH

TYPICAL SURFACE DITCH SECTION



D = DEPTH TO PROTECT
T = THICKNESS (ROCK LINING)
W = WIDTH

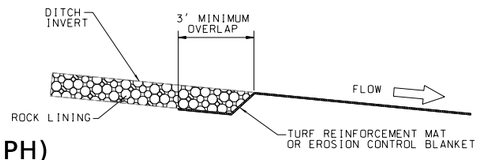
TYPICAL ROADWAY DITCH (NORMAL AND SPECIAL DITCH)



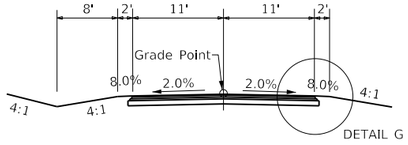
① MINIMUM COMPACTED THICKNESS
② ASPHALT MIXTURE FOR LEVELING AND WEDGING OR NEXT COURSE OF ASPHALT MIXTURE.
③ ASPHALT SURFACE THICKNESS (FULL DEPTH)
④ MILL EXISTING PAVEMENT TO RECEIVE ASPHALT SURFACE FULL DEPTH (EDGE KEY).
TAPER LENGTH (ft) = $\frac{\text{t (in)} \times \text{TAPER RATE}}{12}$

FOR A TAPER RATE OF 1:1200
TAPER LENGTH = 150 FEET WHEN t = 1.50 inches

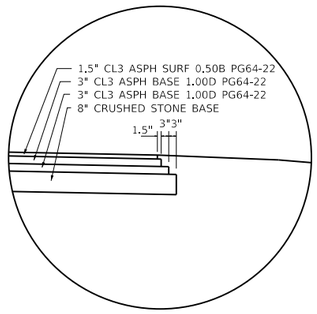
TAPERING OF OVERLAYS ON HIGH SPEED FACILITIES (≥65 MPH)



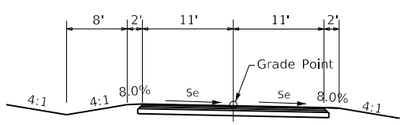
CHANNEL LINING OVERLAP DETAIL



APPROACH NORMAL SECTION
WENDELL FORD ROAD



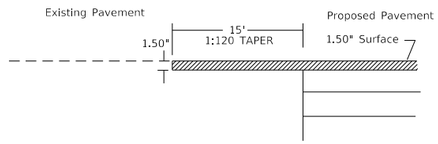
DETAIL G



APPROACH SUPERELEVATED SECTION
WENDELL FORD ROAD

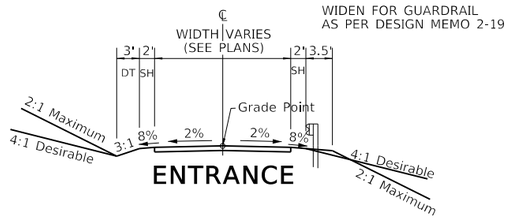
APPROACH PAVEMENT DESIGN

1.50" SURFACE	1.50" DEPTH CL3 ASPHALT SURFACE 0.50B PG64-22
14.00" BASE	6" DEPTH CL3 ASPHALT BASE 1.00D PG64-22 (3.0" + 3.0")
	8" COMPACTED DEPTH CRUSHED STONE BASE



ENTRANCE KEY DETAIL
(LOW SPEED FACILITIES < 45 MPH)

WORK UNDER THIS ITEM SHALL INCLUDE CUTTING OUT THE EXISTING ASPHALT SURFACE TO A MINIMUM DEPTH AND WIDTH AS SHOWN, SO THE NEW SURFACE MAY HEEL INTO THE EXISTING SURFACE. THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR "EDGE KEY" SHALL INCLUDE ALL NECESSARY MATERIALS, LABOR, EQUIPMENT, ETC. TO PERFORM THE WORK AND DISPOSE OF THE ASPHALT MATERIALS REMOVED.



ENTRANCE

ENTRANCE PAVEMENT DESIGN

ASPHALT	1.50" DEPTH CLASS 2 ASPHALT SURFACE 0.38D PG64-22
	3.0" DEPTH CLASS 2 ASPHALT BASE 1.00D PG64-22
	4" COMPACTED DEPTH CRUSHED STONE BASE (RESIDENTAL)
	6" COMPACTED DEPTH CRUSHED STONE BASE (COMMERCIAL)
GRAVEL	4" TRAFFICBOUND BASE

RIGHT OF WAY PLANS

Corporate Limits
County Line
Easement
Fence COA
Mineral Parcel
Property Line
Right of Way Line
All Overhead Utility Lines
Electric Line Underground
Electric Line Underground Duct
Gas Main
Sanitary Force Main
Telephone Underground Cable
Telephone Underground Duct
Fiber Optic Cable
Television Line Underground
Water Main
Storm Sewer
Cable Guardrail
Ditch
Edge of Water
Fence Hedge
Fence
Flow Line/Thalweg/ Int. Stream or Ditch
Guardrail
Railroad
Shrub Line
Sink Hole
Tree Line
Wall (WSM or DSM)
Blue Line Stream
Lakes and Ponds
Regulated Floodway
RDZ Line

ADA Ramp
Anchor Pole
Benchmark
Bike Lane Symbol
Bollard
Centerline
Centerline Stationing
Control Monument
Control Point
Core Hole
Crash Cushion TY 6 D
Crash Cushion TY 6 A
Crash Cushion TY 9A
Crash Cushion TY 9
Cross Notch
Curb Box Inlet
Curb Notch
Combination Pole
Delineator Post
Drop Box
Existing Spring
Electric Manhole
Electric Meter
Electric Pedestal
Electric Pole
Electric Junction Box
Fire Hydrant
Flag Pole
Force Main Sewer Valve
Fuel Tank Inlet
Fuel Tank Vent
Gasline Marker
Gas Meter
Gas Monitoring Well
Gas Valve
Gas Vent
Gas Well
Guidewires & Anchors

Headstone
Interstate Shield
Iron Pin
Light Pole
Low Wire
Mag Nail
Mailbox
Manhole
Mile Marker Post
Mineral Parcel
Misc Location Point
Monitoring Well
Parking Meter
Pedestrian Signal
Pins/Pipes
PK Nail
Point (Misc)
Pole
Pole (Light)
Post
Power Pole
Quarry
Random (Ground Shot)
Railroad Mile Marker
Railroad Spike
Right of Way Marker
Right of Way Monument
RR Traffic Signal Pole
RW Parcel
Sanitary Cleanout
Sanitary Manhole
Satelite Dish
Septic Tank Cleanout
Service Pole
Sewer Air Release Valve
Shrub
Sign
Sign Post (Single)
Sign with 2 posts

Sign group (4)
Station Stamp
Storm Manhole
Stub Power
Stub Telephone
Survey Cross Notch
Survey Curb Notch
Survey Nail
Survey Spike
Survey Stone Marker
Swamp
Telephone Booth
Telephone Junction Box
Telephone Line Overhead
Telephone Manhole
Telephone Pedestal
Telephone Pole
Temporary Benchmark
Traffic Light
Traffic Signal Control Box
Traffic Signal Junction Box
Traffic Signal Pole
Traverse Point
Tree
TV Junction Box
Utility Pole
Underground Storage Tank
Utility Test Hole
Water Line Marker
Water Meter
Water Spigot
Water Valve
Water Well
Yard Light
Yard Sprinkler
Yard Sprinkler Water Valve

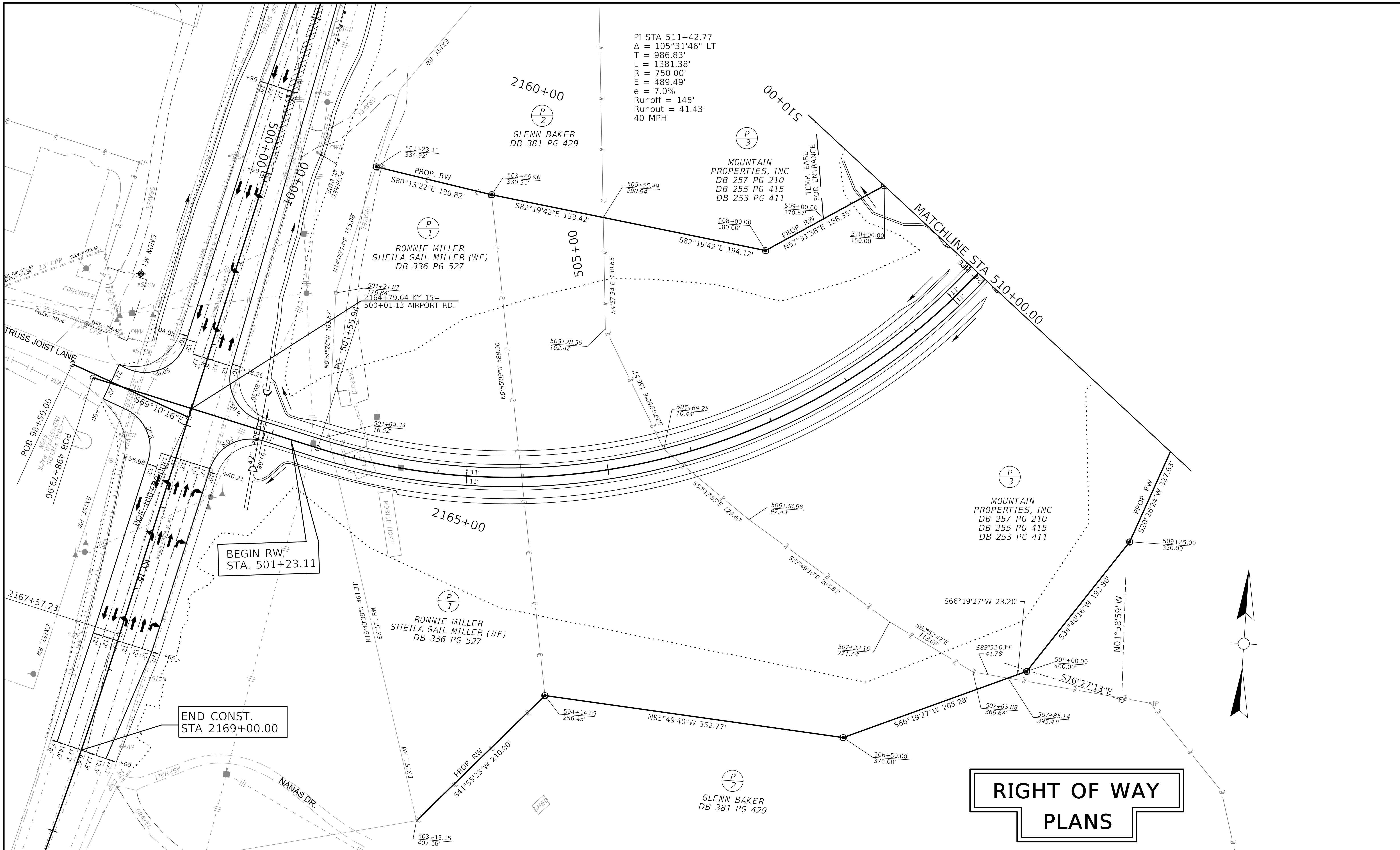
Utility Owners

Utility #1

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

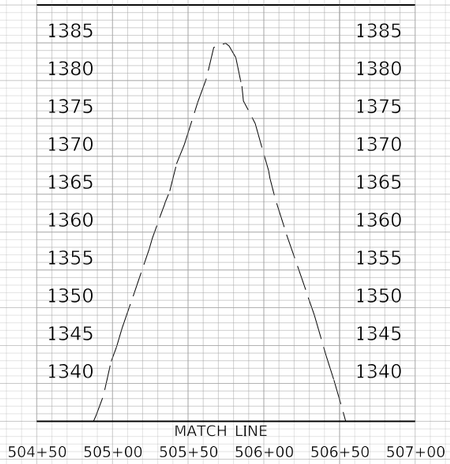
DRAWING TITLE: Roadway Ledgend and Utility Owner Sheet

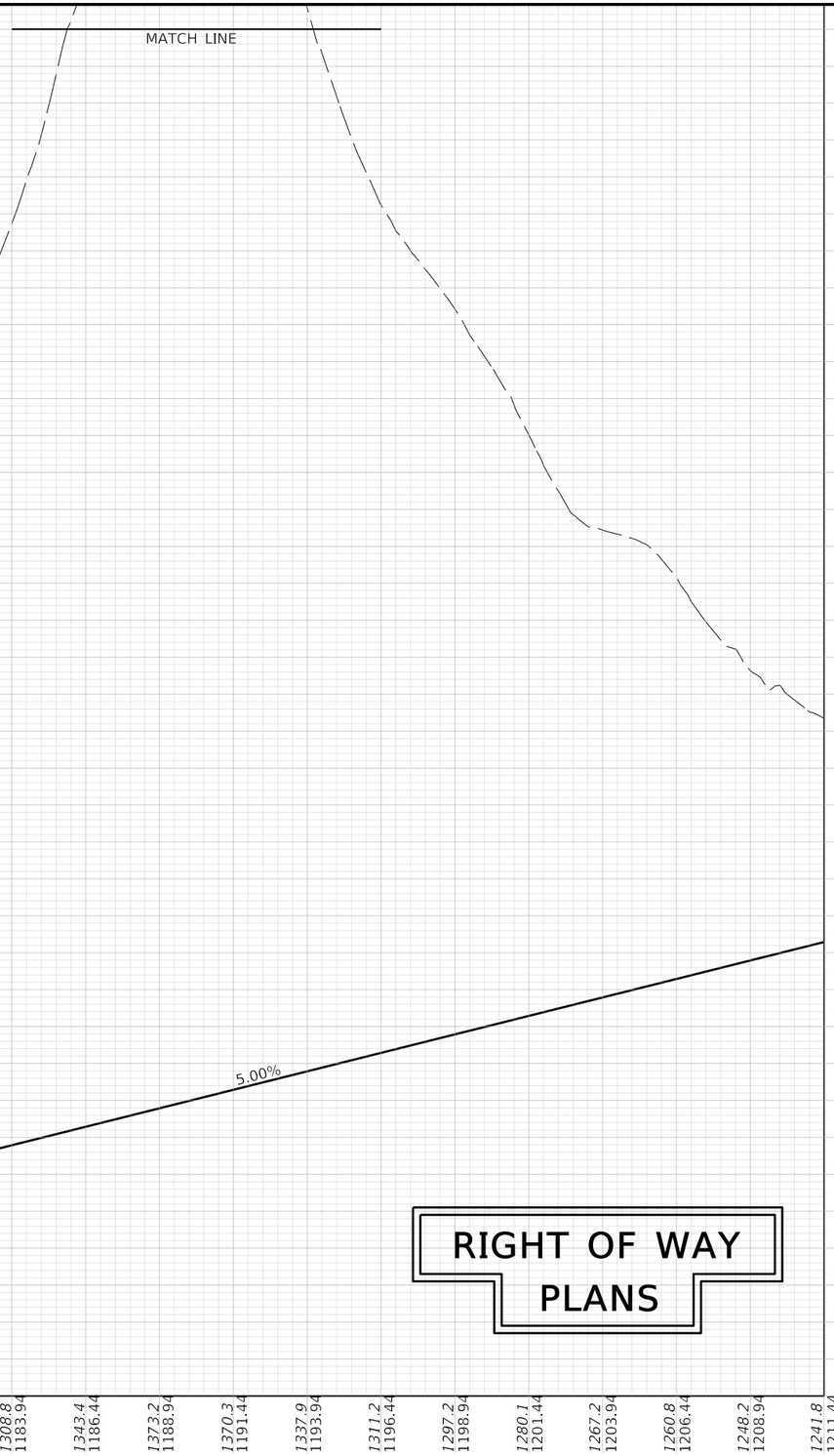
ITEM NO. 10-80100.00
COUNTY OF PERRY
SHEET NO. R3



COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	DRAWING TITLE: AIRPORT ROAD PLAN SHEET	HORIZONTAL SCALE SCALE: 1" = 50'	0' 50' 100' 200'	STA 498+79.90 TO STA 510+00	ITEM NO. 10-80100.00 COUNTY OF PERRY SHEET NO. R4

OpenRoads Designer v10.16.2.267 USER: james-f DATE PLOTTED: 3/31/2023 12:58:41 PM FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PLAN.DGN





RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD PROFILE SHEET

0' 50' 100' 200'
HORIZONTAL SCALE: 1"=50'

0' 10' 20' 40'
VERTICAL SCALE: 1"=10'

STA 498+79.90 TO STA 510+00

ITEM NO. 10-80100.00
COUNTY OF PERRY

SHEET NO. R5

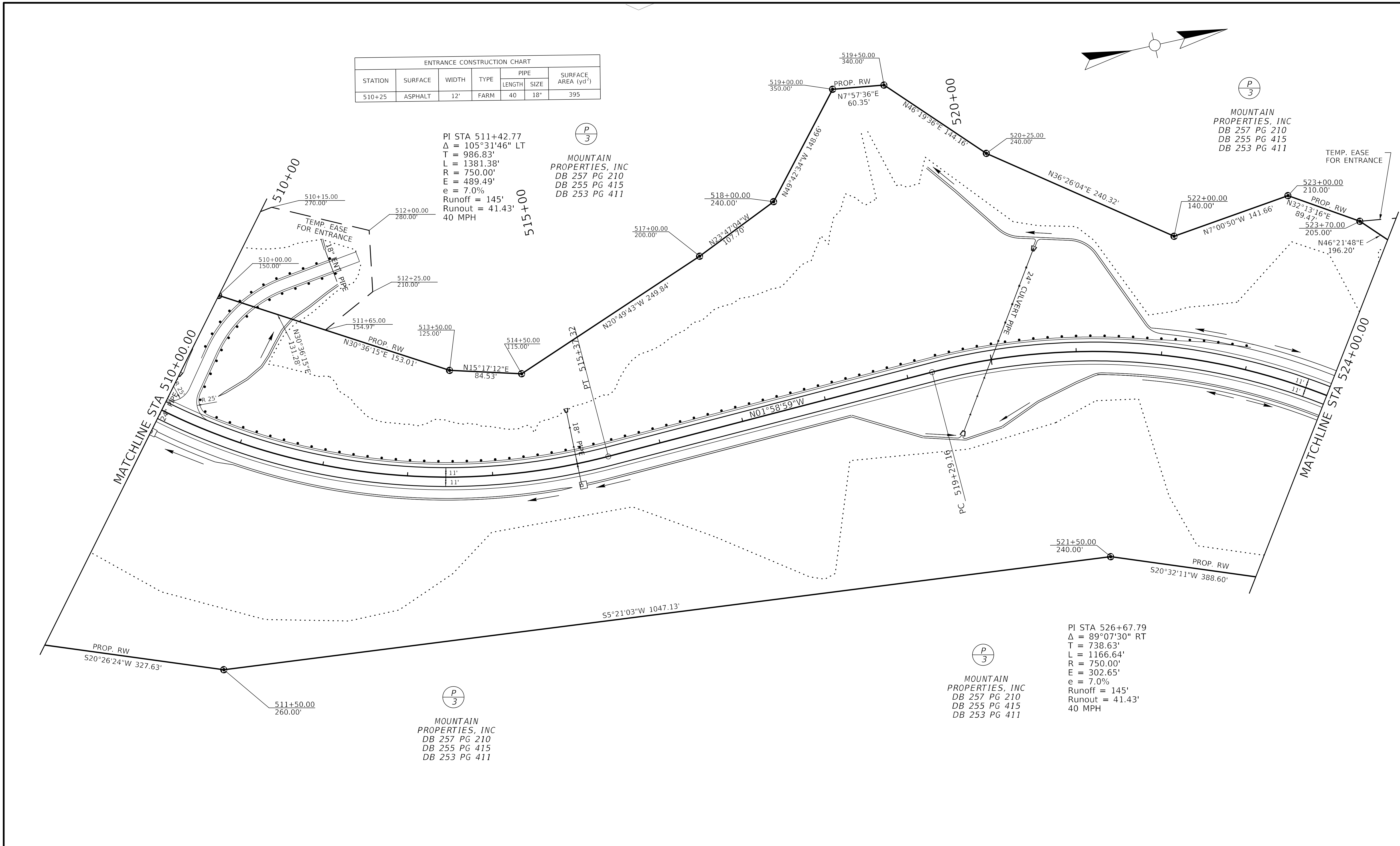
OpenRoads Designer v10.16.2.267

USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PROFILE.DGN

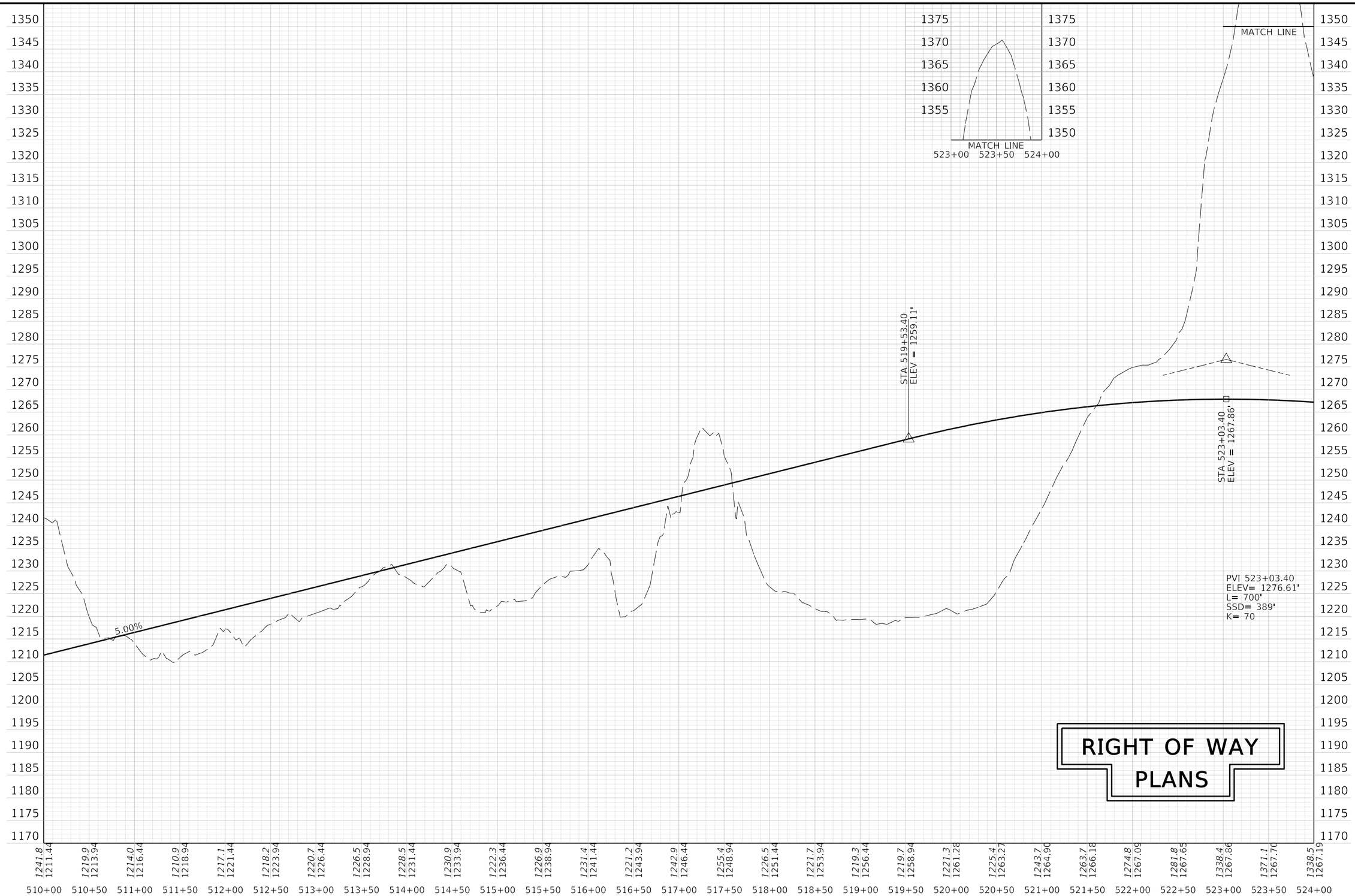
ENTRANCE CONSTRUCTION CHART

STATION	SURFACE	WIDTH	TYPE	PIPE		SURFACE AREA (yd²)
				LENGTH	SIZE	
510+25	ASPHALT	12'	FARM	40	18"	395



COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	DRAWING TITLE: AIRPORT ROAD PLAN SHEET	HORIZONTAL SCALE SCALE: 1" = 50'	0' 50' 100' 200'	STA 510+00 TO STA 524+00	ITEM NO. 10-80100.00 COUNTY OF PERRY SHEET NO. R6

OpenRoads Designer v10.16.2.267 USER: james-f DATE PLOTTED: 3/31/2023 12:58:41 PM FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PLAN.DGN



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD PROFILE SHEET

0' 50' 100' 200'
HORIZONTAL SCALE: 1"=50'

0' 10' 20' 40'
VERTICAL SCALE: 1"=10'

STA 510+00 TO STA 524+00

ITEM NO. 10-80100.00
COUNTY OF PERRY
SHEET NO. R7

ENTRANCE CONSTRUCTION CHART						
STATION	SURFACE	WIDTH	TYPE	PIPE		SURFACE AREA (yd^2)
				LENGTH	SIZE	
525+00 LT.	ASPHALT	12'	FARM	-	-	273
525+00 RT.	ASPHALT	12'	FARM	-	-	255

P/3 MOUNTAIN PROPERTIES, INC DB 257 PG 210 DB 255 PG 415 DB 253 PG 411

526+50.00 510.00'

N55°57'00"E 125.95'

527+25.00 510.00'

N75°13'00"E 128.00'

528+00.00 480.00'

N89°51'49"E 442.21' PROP. R/W

530+75.00 365.00'

S63°23'48"E 212.61'

532+50.00 260.00'

S85°15'48"E 151.33'

534+00.00 240.00'

S68°37'49"E 109.66'

535+00.00 195.00'

537+50.00 210.00'

PROP. RW N77°24'00"E 198.46'

N49°09'46"E 323.43'

N30°49'51"W 140.89'

526+40.00 370.00'

N3°13'00"W 249.67'

525+00

N01°58'59"W

524+25.00 240.00'

525+25.00 175.00'

524+50.00 184.27'

TEMP. EASE FOR ENTRANCE

PROP. RW N46°21'48"E 196.20'

530+00

535+00

MATCHLINE STA 524+00.00

18" CULVERT PIPE

R 15'

R 25'

11'

11'

526+65.00 140.00'

S70°45'07"W 188.08'

TEMP. EASE FOR ENTRANCE

527+00.00 147.68'

529+00.00 165.00'

526+25.00 200.00'

PROP. RW S20°32'11"W 388.60'

525+50.00 190.42'

PT 530+95.80

N87°08'31"E

36" CULVERT PIPE

PC 535+48.69

S88°28'49"W 731.65'

MATCHLINE STA 538+00.00

PROP. RW S69°54'40"W 511.12'

536+50.00 210.00'

P/3 MOUNTAIN PROPERTIES, INC DB 257 PG 210 DB 255 PG 415 DB 253 PG 411

PI STA 526+67.79
Δ = 89°07'30" RT
T = 738.63'
L = 1166.64'
R = 750.00'
E = 302.65'
e = 7.0%
Runoff = 145'
Runout = 41.43'
40 MPH

P/3 MOUNTAIN PROPERTIES, INC DB 257 PG 210 DB 255 PG 415 DB 253 PG 411

RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	DRAWING TITLE: AIRPORT ROAD PLAN SHEET	HORIZONTAL SCALE SCALE: 1" = 50'	0' 50' 100' 200'	STA 524+00 TO STA 538+00	ITEM NO. 10-80100.00 COUNTY OF PERRY SHEET NO. R8

PVI 523+03.40
ELEV= 1276.61'
L= 700'
SSD= 389'
K= 70

STA 526+53.40
ELEV = 1259.11'

STA 527+03.40
ELEV = 1256.61'

-5.00%

PVI 531+03.40
ELEV= 1236.61'
L= 800'
HLSD= 367'
K= 80

STA 531+03.40
ELEV = 1246.61'

STA 535+03.40
ELEV = 1256.61'

5.00%

1338.5 1267.19 | 1284.5 1266.32 | 1275.4 1265.10 | 1245.4 1263.51 | 1225.0 1261.57 | 1212.7 1259.28 | 1211.6 1256.78 | 1203.7 1254.41 | 1194.7 1252.36 | 1188.9 1250.62 | 1186.0 1249.19 | 1186.9 1248.08 | 1182.0 1247.28 | 1175.6 1246.79 | 1173.3 1246.61 | 1175.1 1246.74 | 1176.5 1247.19 | 1186.6 1247.95 | 1190.3 1249.02 | 1189.4 1250.41 | 1197.0 1252.11 | 1207.6 1254.12 | 1208.4 1256.44 | 1207.7 1258.94 | 1208.2 1261.44 | 1210.1 1263.94 | 1212.1 1266.44 | 1214.9 1268.94 | 1219.9 1271.44

524+00 524+50 525+00 525+50 526+00 526+50 527+00 527+50 528+00 528+50 529+00 529+50 530+00 530+50 531+00 531+50 532+00 532+50 533+00 533+50 534+00 534+50 535+00 535+50 536+00 536+50 537+00 537+50 538+00

RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD PROFILE SHEET

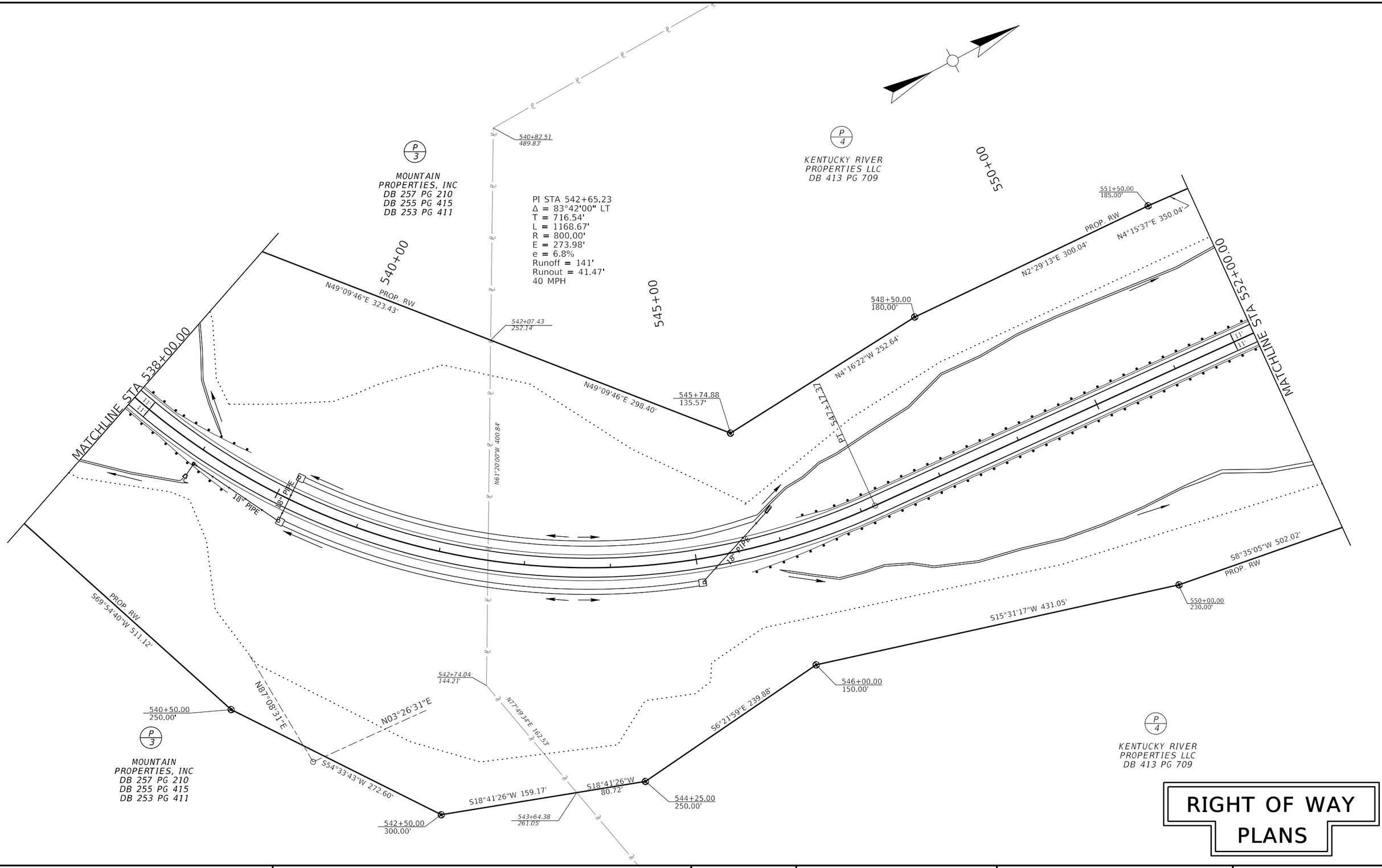
0' 50' 100' 200'
HORIZONTAL SCALE: 1"=50'

0' 10' 20' 40'
VERTICAL SCALE: 1"=10'

STA 524+00 TO STA 538+00

ITEM NO. 10-80100.00
COUNTY OF PERRY
SHEET NO. R9

OpenRoads Designer v10.16.2.267
USER: james-f
FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PROFILE.DGN



RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	DRAWING TITLE: AIRPORT ROAD PLAN SHEET	HORIZONTAL SCALE SCALE: 1" = 50'	0′ 50′ 100′ 200′	STA 538+00 TO STA 552+00	ITEM NO. 10-80100.00 COUNTY OF PERRY SHEET NO. R10

OpenRoads Designer v10.16.2.267 USER: james-f DATE PLOTTED: 3/31/2023 12:58:41 PM FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PLAN.DGN

MATCH LINE

MATCH LINE

STA 538+53.40
ELEV = 1274.11'

STA 543+53.40
ELEV = 1286.61'

STA 546+53.40
ELEV = 1282.11'

STA 550+66.89
ELEV = 1269.70'

PVI 554+66.89
ELEV= 1257.70'
L= 800'
HLSD= 562'
K= 133

5.00%

-3.00%

PVI 542+53.40
ELEV= 1294.11'
L= 800'
SSD= 465'
K= 100

RIGHT OF WAY PLANS

538+00	538+50	539+00	539+50	540+00	540+50	541+00	541+50	542+00	542+50	543+00	543+50	544+00	544+50	545+00	545+50	546+00	546+50	547+00	547+50	548+00	548+50	549+00	549+50	550+00	550+50	551+00	551+50	552+00
1219.9	1231.0	1270.8	1294.8	1320.3	1352.9	1384.2	1417.1	1427.4	1412.6	1389.7	1367.8	1343.4	1325.6	1310.1	1291.0	1278.6	1271.9	1258.5	1246.2	1243.9	1236.7	1229.4	1227.8	1226.6	1229.6	1227.3	1226.7	1225.4
1271.44	1273.94	1276.33	1278.47	1280.36	1282.00	1283.40	1284.54	1285.45	1286.07	1286.46	1286.61	1286.50	1286.14	1285.53	1284.67	1283.57	1282.21	1280.71	1279.21	1277.71	1276.21	1274.71	1273.21	1271.71	1270.21	1268.75	1267.47	1266.37

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD PROFILE SHEET

0' 50' 100' 200'
HORIZONTAL SCALE: 1"=50'

0' 10' 20' 40'
VERTICAL SCALE: 1"=10'

STA 538+00 TO STA 552+00

ITEM NO. 10-80100.00
COUNTY OF PERRY

SHEET NO. R11

ENTRANCE CONSTRUCTION CHART						
STATION	SURFACE	WIDTH	TYPE	PIPE		SURFACE AREA (yd^2)
				LENGTH	SIZE	
557+75	ASPHALT	12'	FARM	-	-	250

PI STA 562+24.21
Δ = 43°44'13" LT
T = 321.09'
L = 610.68'
R = 800.00'
E = 62.03'
e = 6.8%
Runoff = 141'
Runout = 41.47'
40 MP

555+00

560+00

565+00

MATCHLINE STA 552+00.00

MATCHLINE STA 566+00.00

P 4

KENTUCKY RIVER PROPERTIES LLC
DB 413 PG 709

PROP. RW
N4°15'37"E 350.04'

555+00.00
180.00'

557+45.00
225.00'

TEMP. EASE FOR ENTRANCE

557+30.00
177.95'

558+05.00
225.00'

N3°57'13"E 439.74'

558+15.00
177.19'

559+50.00
175.00'

560+75.00
125.00'

N21°46'24"E
113.04'

N59°47'26"W 208.01'

562+75.00
270.00'

PROP. RW
N41°29'59"W 220.07'

N41°29'59"W
92.06'

N2°47'25"W 199.82'

565+07.72
349.92'

565+77.96
298.06'

P 7

PI 565+13.80

11'
11'

N03°26'31"E

36" CULVERT PIPE

R 15'

R 15'

559+03.12

18" STORM SEWER PIPE

18" STORM SEWER PIPE

N40°17'43"W

30" CULVERT PIPE

S31°14'11"E 254.90'

PROP. RW

565+00.00
100.00'

S8°35'05"W 502.02'
PROP. RW

555+00.00
275.00'

S40°40'36"W 314.01'

557+50.00
465.00'

S5°05'20"E
101.12'

558+50.00
450.00'

S38°11'45"E 327.58'

560+50.00
250.00'

S48°36'14"E 227.82'

562+00.00
115.00'

S31°03'28"E 338.64'

RIGHT OF WAY PLANS

P 4

KENTUCKY RIVER PROPERTIES LLC
DB 413 PG 709

COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	DRAWING TITLE: AIRPORT ROAD PLAN SHEET	HORIZONTAL SCALE SCALE: 1" = 50'	0' 50' 100' 200'	STA 552+00 TO STA 566+00	ITEM NO. 10-80100.00 COUNTY OF PERRY SHEET NO. R12

OpenRoads Designer v10.16.2.267 USER: james-f DATE PLOTTED: 3/31/2023 12:58:41 PM FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PLAN.DGN

PVI 554+66.89
ELEV= 1257.70'
L= 800'
HLSD= 562'
K= 133

STA 554+66.89
ELEV = 1263.70'

STA 558+66.89
ELEV = 1269.70'

STA 562+00.00
ELEV = 1279.70'

STA 566+00.00
ELEV = 1288.20'

3.00%

0.00%

PVI 564+00.00
ELEV= 1285.70'
L= 400'
SSD= 817'
K= 229

552+00	552+50	553+00	553+50	554+00	554+50	555+00	555+50	556+00	556+50	557+00	557+50	558+00	558+50	559+00	559+50	560+00	560+50	561+00	561+50	562+00	562+50	563+00	563+50	564+00	564+50	565+00	565+50	566+00
1225.4	1219.8	1205.7	1200.8	1204.1	1206.0	1213.1	1220.5	1216.8	1211.5	1209.6	1211.9	1213.5	1219.8	1228.1	1237.6	1247.5	1268.4	1285.4	1289.1	1321.2	1299.9	1290.1	1289.5	1288.0	1287.9	1288.8	1289.3	1291.1
1266.37	1265.47	1264.75	1264.21	1263.87	1263.71	1263.74	1263.96	1264.37	1264.96	1265.74	1266.71	1267.86	1269.21	1270.70	1272.20	1273.70	1275.20	1276.70	1278.20	1279.70	1281.14	1282.48	1283.70	1284.82	1285.83	1286.73	1287.52	1288.20

RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD PROFILE SHEET

0' 50' 100' 200'
HORIZONTAL SCALE: 1"=50'

0' 10' 20' 40'
VERTICAL SCALE: 1"=10'

STA 552+00 TO STA 566+00

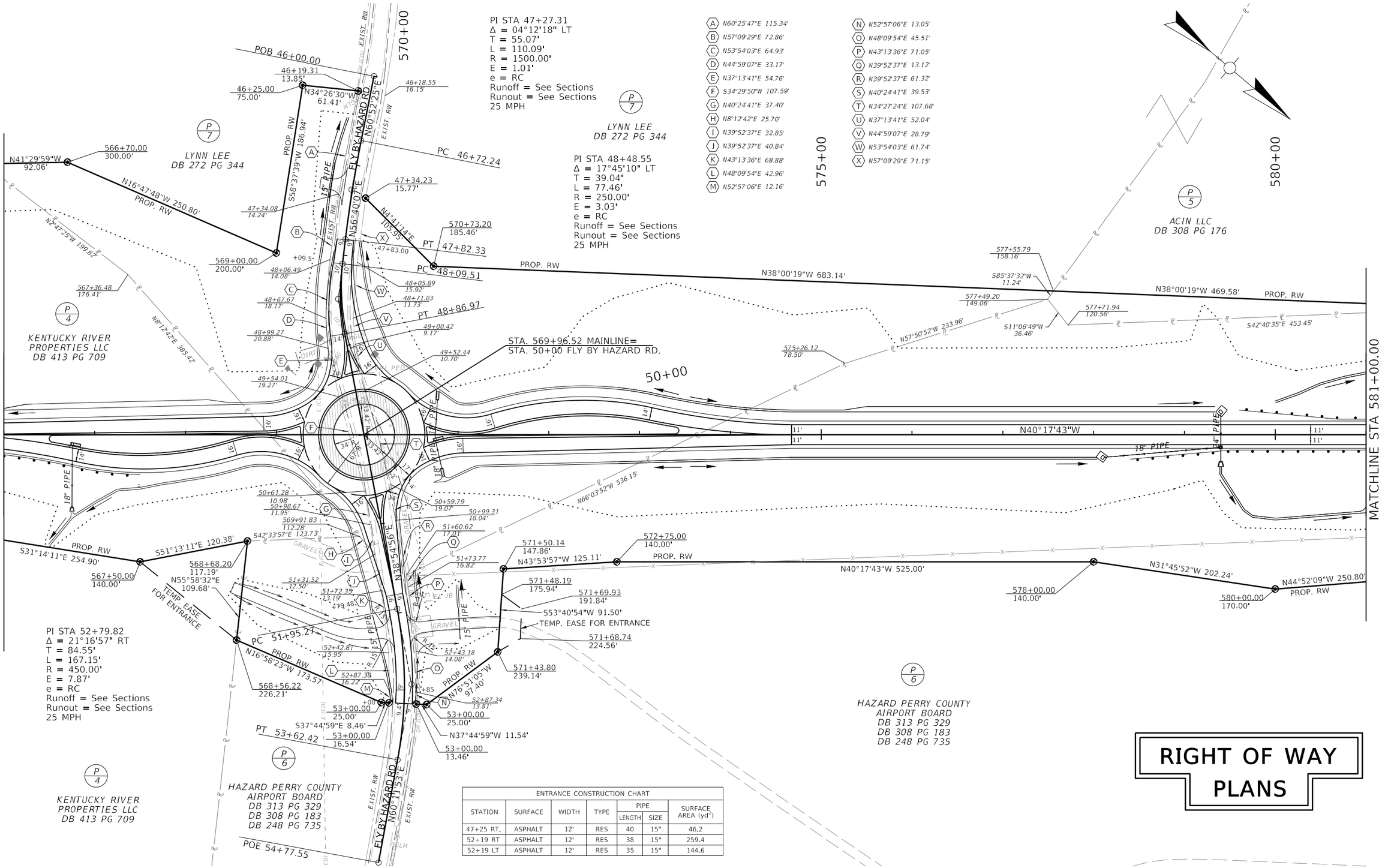
ITEM NO. 10-80100.00
COUNTY OF PERRY

SHEET NO. R13

OpenRoads Designer v10.16.2.267

USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PROFILE.DGN



ENTRANCE CONSTRUCTION CHART						
STATION	SURFACE	WIDTH	TYPE	PIPE LENGTH	PIPE SIZE	SURFACE AREA (yd²)
47+25 RT.	ASPHALT	12'	RES	40	15"	46.2
52+19 RT	ASPHALT	12'	RES	38	15"	259.4
52+19 LT	ASPHALT	12'	RES	35	15"	144.6

RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

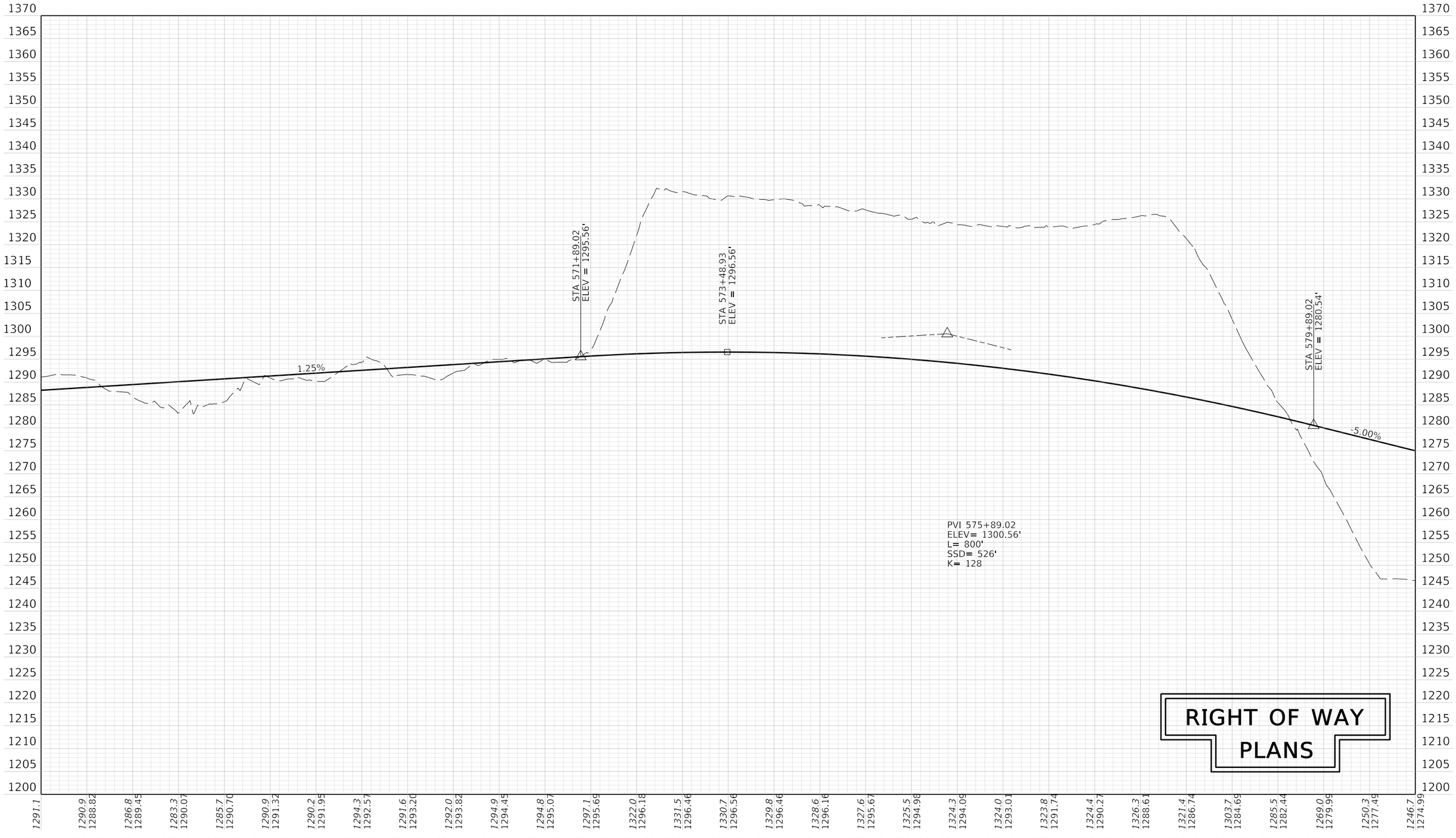
DRAWING TITLE: AIRPORT ROAD PLAN SHEET

HORIZONTAL SCALE
SCALE: 1" = 50'

0′ 50′ 100′ 200′

STA 566+00 TO STA 581+00

ITEM NO. 10-80100.00
COUNTY OF PERRY
SHEET NO. R14



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD PROFILE SHEET

0' 50' 100' 200'
HORIZONTAL SCALE: 1"=50'

0' 10' 20' 40'
VERTICAL SCALE: 1"=10'

STA 566+00 TO STA 581+00

ITEM NO. 10-80100.00
COUNTY OF PERRY

SHEET NO. R15

OpenRoads Designer v10.16.2.267

USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PROFILE.DGN

PI STA 48+58.68
Δ = 34°35'24" RT
T = 77.84'
L = 150.93'
R = 250.00'
E = 11.84'
e = RC
Runoff = See Sections
Runout = See Sections
30 MPH

MATCHLINE STA 581+00.00

585+00

590+00

ER NAPIER
ANNA LEE NAPIER (WF)
153-793
308-168
369-113

P 5
ACIN LLC
DB 308 PG 176

P 7
LYNN LEE INC
255-415

TONY CRAFT
SAMATHA CRAFT (WF)
DB 377 PG 256

MOBILE HOME

A S49°42'20"W 66.32'
B R 484.10' ARC 83.17' N10°14'05"E 83.07'
C N42°40'35"W 52.85'
D R 484.10' ARC 180.85' N5°23'23"W 179.80'
E N16°21'23"W 41.87'
F R 781.88' ARC 324.04' N28°10'20"W 321.72'
G N87°08'17"W 67.27'
H N50°52'29"E 14.85'
I R 731.88' ARC 304.12' N28°12'13"W 301.94'
J N16°21'25"W 41.80'
K R 434.10' ARC 114.60' N8°30'54"W 114.27'
L R 434.10' ARC 53.41' S2°34'21"W 53.38'

582+25.00
139.40'
PROP. RW
N38°00'19"W 469.58'

N42°40'35"W 441.77'

47+47.00
24.56'
POB 47+06.59

N15°06'53"E 104.47'

47+47.04
25.44'

48+11.45
32.93'
587+50.79
199.20'

48+52.87
54.97'
587+89.91
162.89'

48+58.26
80.40'
588+16.23
163.98'

586+66.39
157.75'
PROP. RW

PC 47+80.83

587+19.19
159.95'
48+32.82
12.09'

PT 49+31.76

588+87.05
102.71'

589+25.25
85.75'

588+66.65
57.06'

589+04.92
40.07'

END CONST.
STA 591+97.63

TEMP. EASE FOR BACKSLOPES

HAZARD PERRY COUNTY
AIRPORT BOARD
DB 313 PG 329
DB 308 PG 183
DB 248 PG 735

592+20.00
40.00'

592+20.00
24.86'

592+20.00
25.15'

592+20.00
40.00'

END RW
STA. 592+20.00

36" EXIST. PIPE

18" PIPE

12" PIPE

POE 50+00.00

N40°17'43"W

N39°07'31"W

WENDELL FORD TERMINAL RD.

TWIN ENGINE DR.

EXIST. RW

WM (CD)

18" CMP

50' TAPER

N44°52'09"W 250.80'
PROP. RW

582+50.00
150.00'

N48°15'53"W 252.44'

585+00.00
115.00'

N38°51'47"W 200.06'

587+00.00
120.00'

N43°45'10"W 474.01'

PROP. RW

590+43.61
PC

591+66.13
PT

591+97.63
POE

591+75.00
90.00'

STA. 587+50.00 MAINLINE=
STA. 50+00 WENDELL FORD TERMINAL RD.

MON13

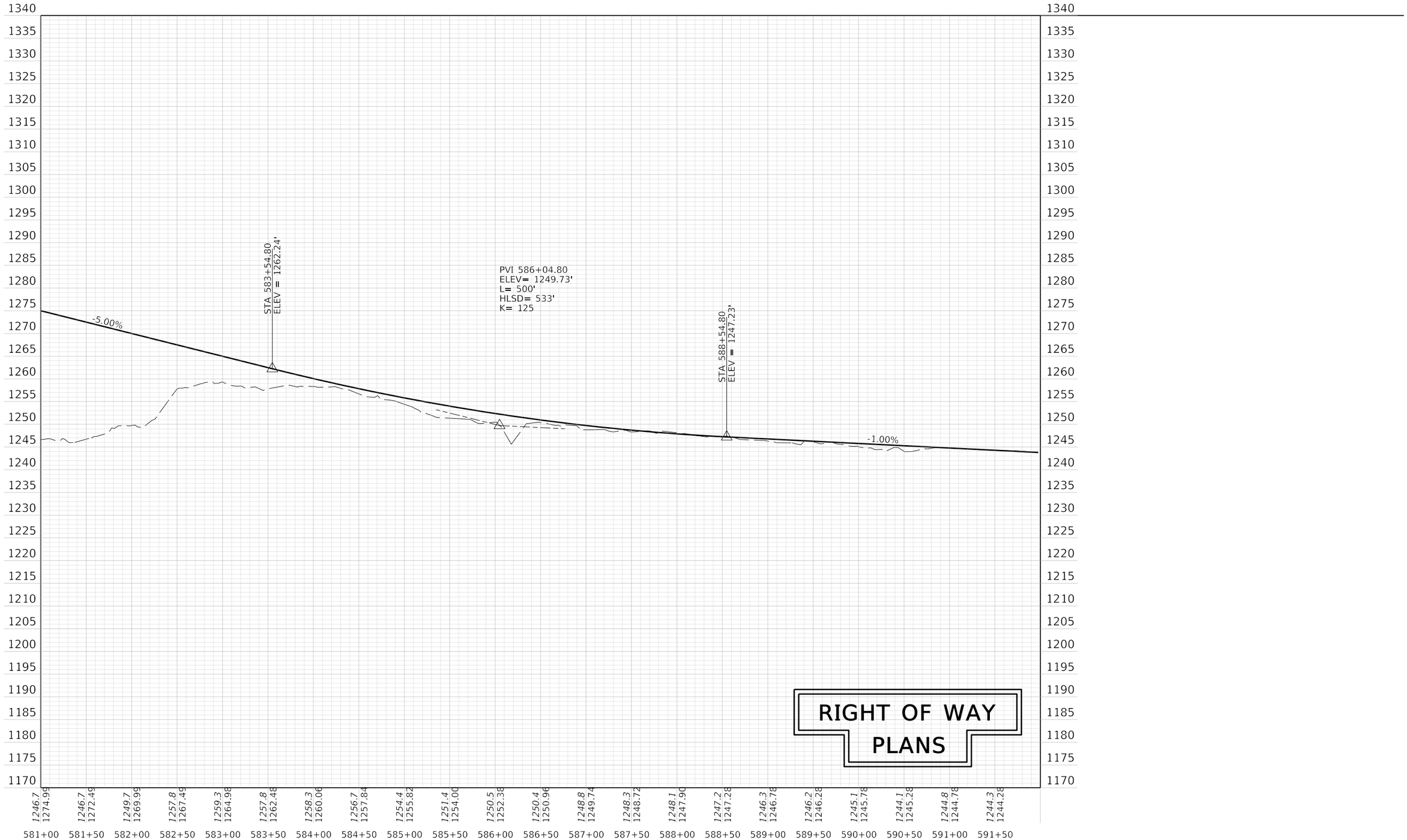
PI STA 591+04.87
Δ = 01°10'12" RT
T = 61.26'
L = 122.52'
R = 6000.00'
E = 0.31'
e = NC
40 MPH

P 6
HAZARD PERRY COUNTY
AIRPORT BOARD
DB 313 PG 329
DB 308 PG 183
DB 248 PG 735

RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	DRAWING TITLE: AIRPORT ROAD PLAN SHEET	HORIZONTAL SCALE SCALE: 1" = 50'	0' 50' 100' 200'	STA 581+00 TO END OF PROJECT	ITEM NO. 10-80100.00 COUNTY OF PERRY SHEET NO. R16

OpenRoads Designer v10.16.2.267 USER: james-f DATE PLOTTED: 3/31/2023 FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PLAN.DGN



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD PROFILE SHEET

0' 50' 100' 200'
HORIZONTAL SCALE: 1"=50'

0' 10' 20' 40'
VERTICAL SCALE: 1"=10'

STA 581+00 TO END OF PROJECT

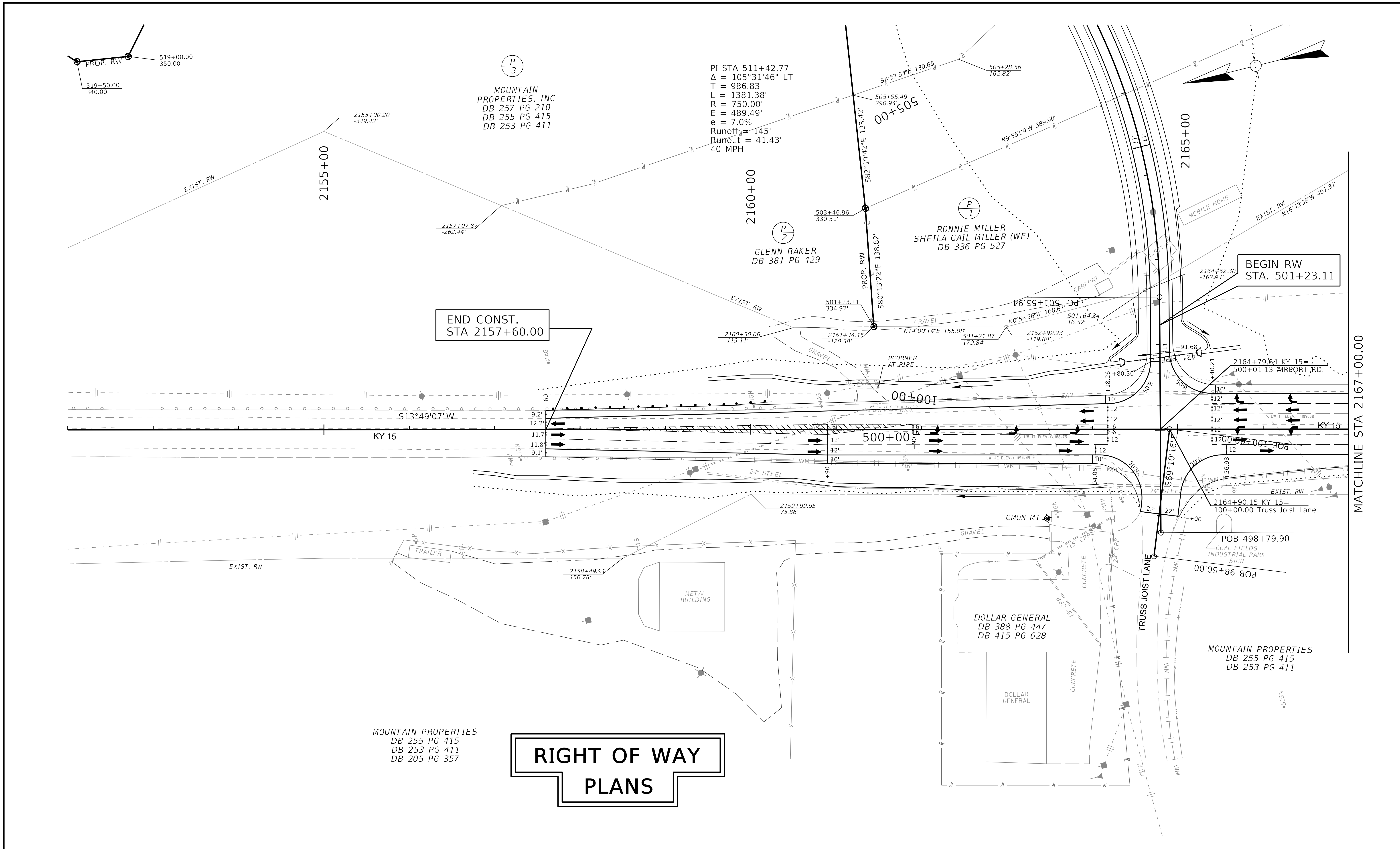
ITEM NO. 10-80100.00 COUNTY OF PERRY

SHEET NO. R17

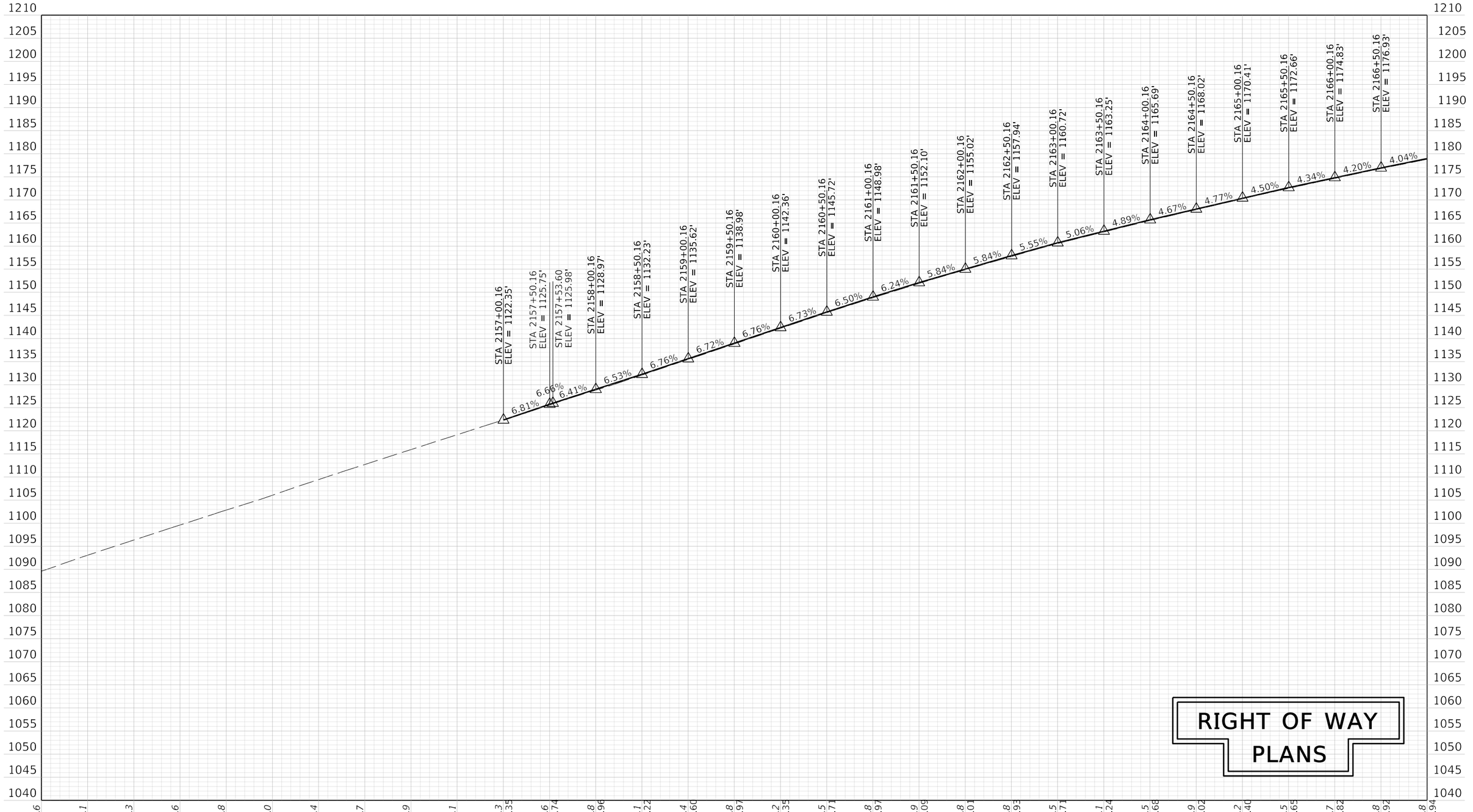
OpenRoads Designer v10.16.2.267

USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PROFILE.DGN



COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	DRAWING TITLE: KY 15 PLAN SHEET	HORIZONTAL SCALE SCALE: 1" = 50'	0' 50' 100' 200'	STA 2157+00 TO STA 2167+00	ITEM NO. 10-80100.00 COUNTY OF PERRY SHEET NO. R18



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: KY 15 PROFILE SHEET

0' 50' 100' 200'
HORIZONTAL SCALE: 1"=50'

0' 10' 20' 40'
VERTICAL SCALE: 1"=10'

STA 2157+00 TO STA 2167+00

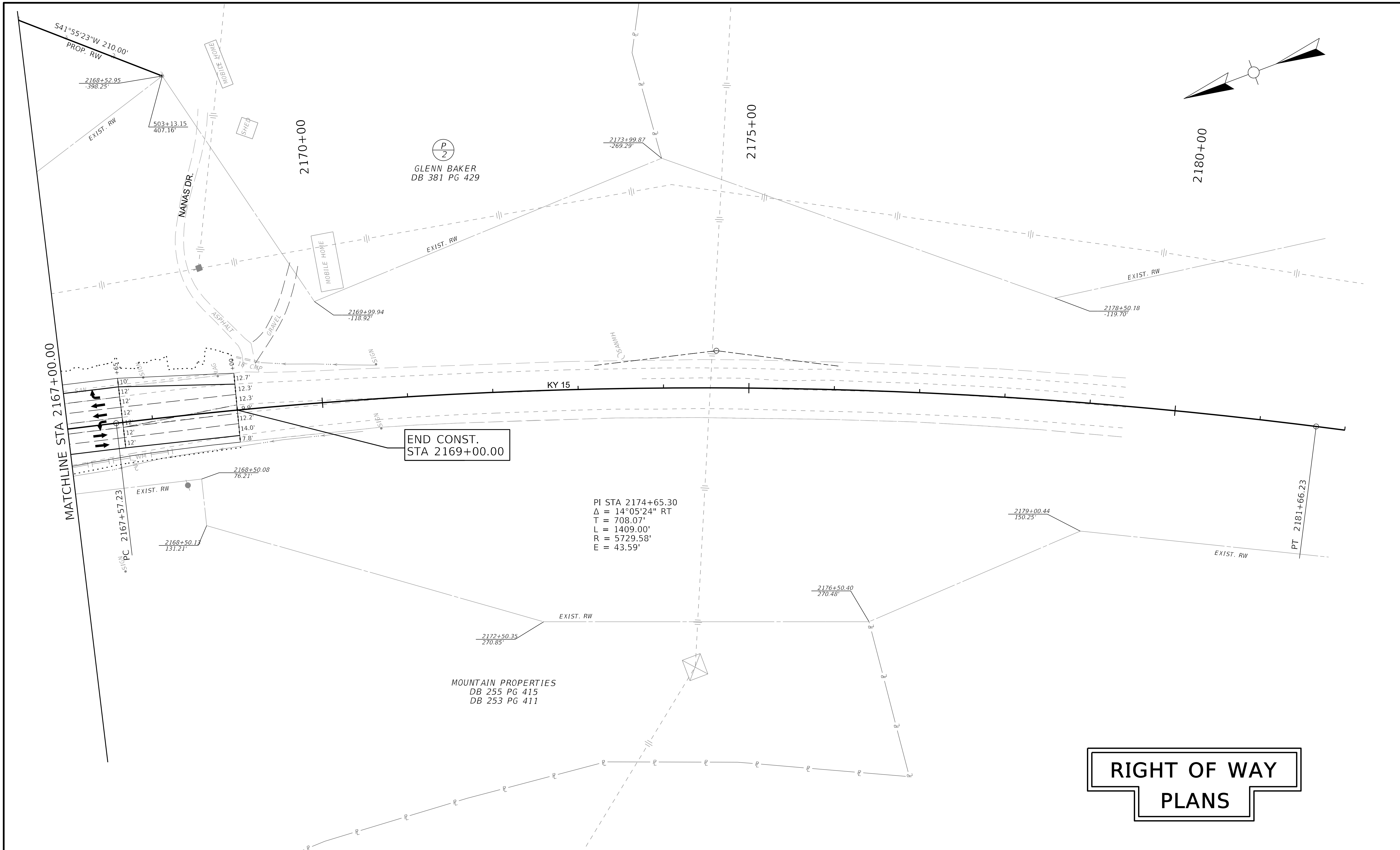
ITEM NO. 10-80100.00
COUNTY OF PERRY

SHEET NO. R19

OpenRoads Designer v10.16.2.267

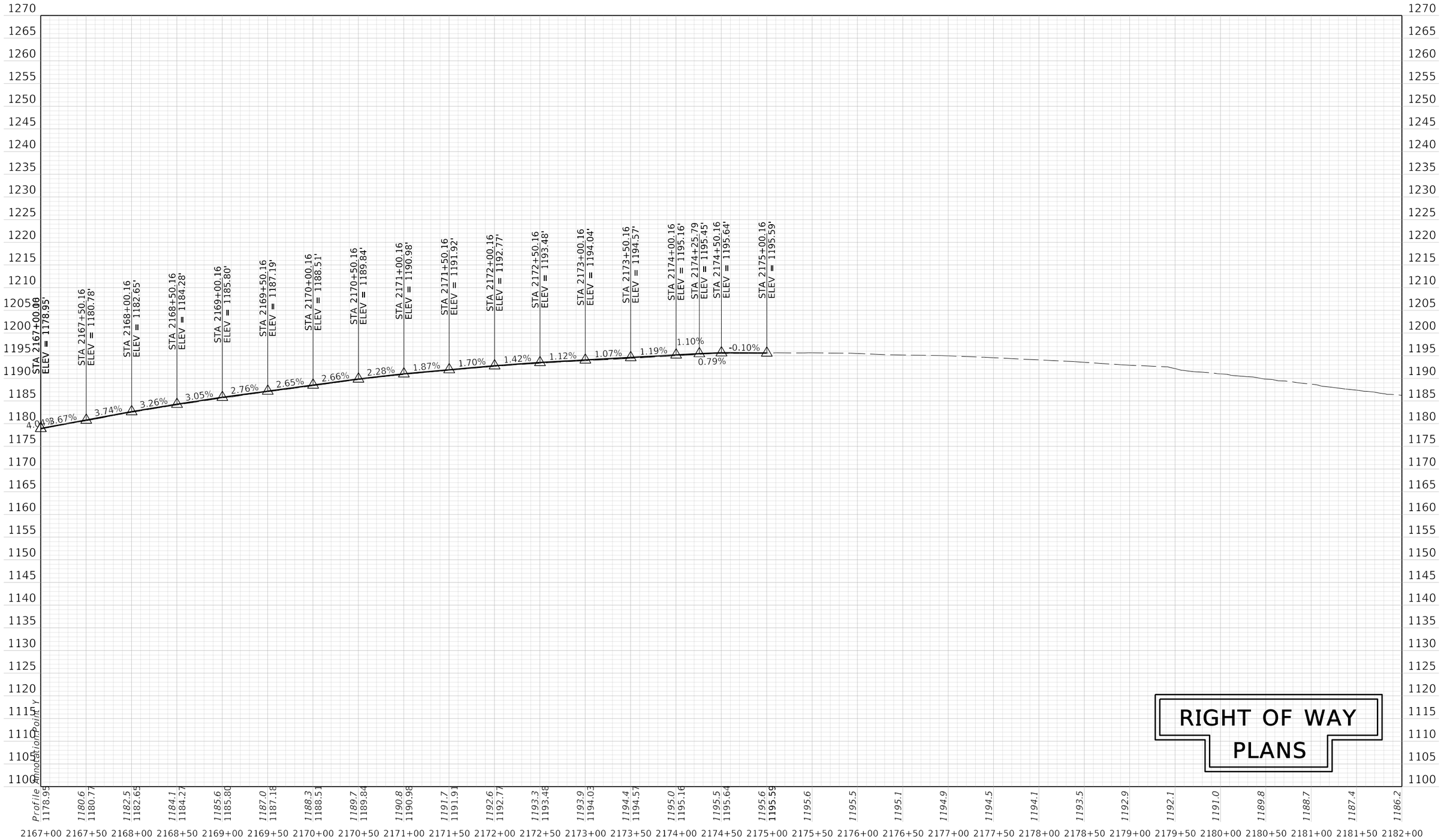
USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PROFILE KY15.DGN



COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	DRAWING TITLE: KY 15 PLAN SHEET	HORIZONTAL SCALE SCALE: 1" = 50' 0' 50' 100' 200'	STA 2167+00 TO STA 2175+00	ITEM NO. 10-80100.00 COUNTY OF PERRY SHEET NO. R20

OpenRoads Designer v10.16.2.267 USER: james-f DATE PLOTTED: 3/31/2023 12:51:22 PM FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PLAN.DGN



RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: KY 15 PROFILE SHEET

0' 50' 100' 200'
HORIZONTAL SCALE: 1"=50'

0' 10' 20' 40'
VERTICAL SCALE: 1"=10'

STA 2167+00 TO STA 2175+00

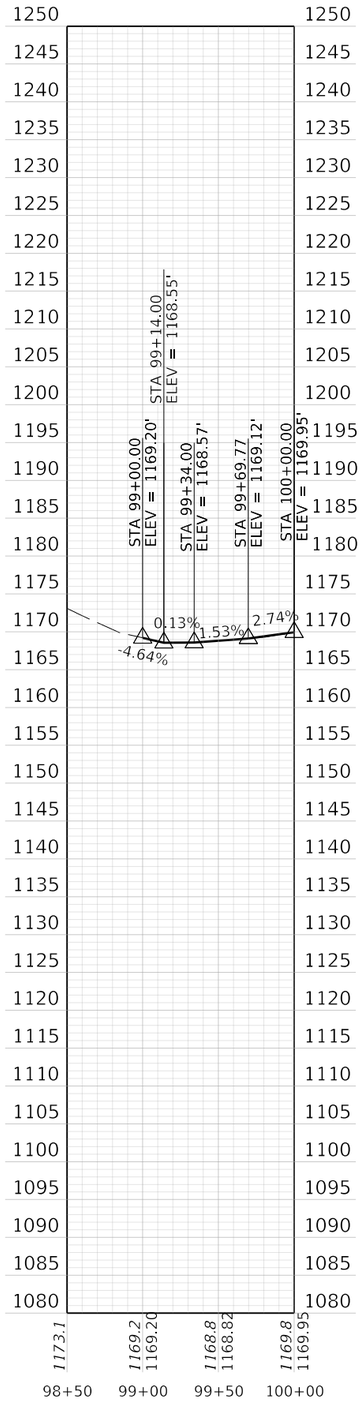
ITEM NO. 10-80100.00
COUNTY OF PERRY

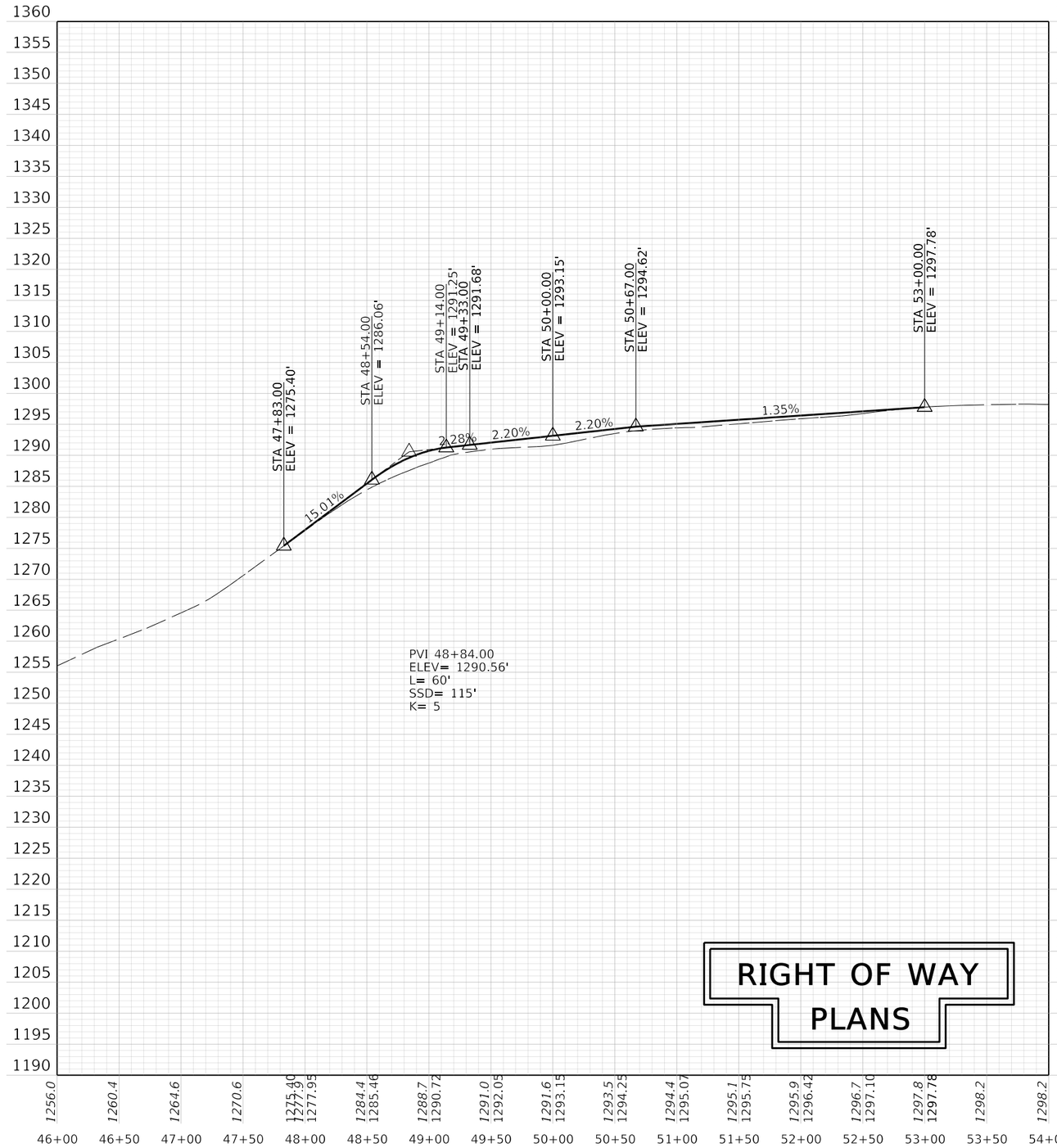
SHEET NO. R21

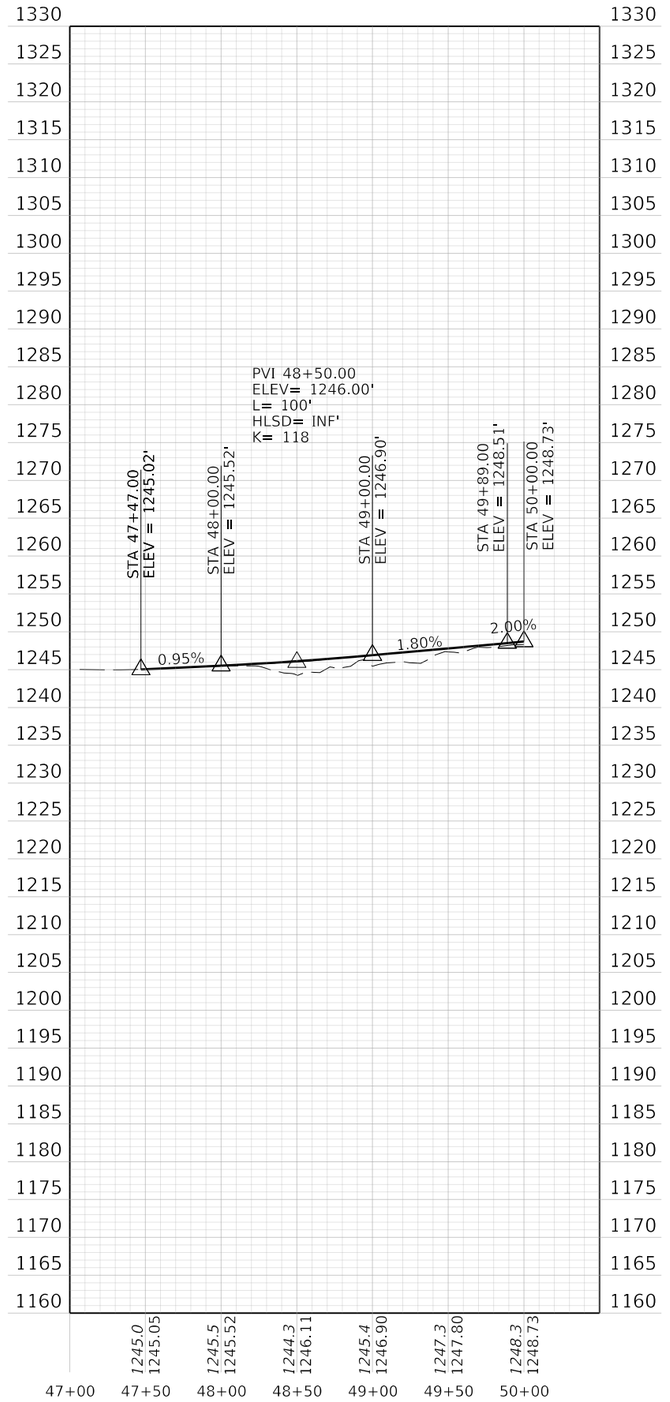
OpenRoads Designer v10.16.2.267

USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PROFILE KY15.DGN







RIGHT OF WAY PLANS

APPROACH STA. 2164+90.51
TRUSS JOIST LANE

APPROACH STA. 569+96.52
FLY BY HAZARD ROAD

APPROACH STA. 587+50.00
WENDELL FORD ROAD

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: APROACH PROFILE SHEET

HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=10'

ITEM NO. 10-80100.00
COUNTY OF PERRY
SHEET NO. R22

OpenRoads Designer v10.16.2.267
USER: james-f
FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_PROFILE.DGN

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: ENTRANCE PROFILES

0′ 10′ 20′ 40′
HORIZONTAL SCALE: 1"=10′

0′ 10′ 20′ 40′
VERTICAL SCALE: 1"=10′

ITEM NO. 10-9017.00
COUNTY OF Morgan

SHEET NO. R23

RIGHT-OF-WAY SUMMARY

PARCEL NO.	OWNER(S)	TOTAL AREA OF TRACT		PERMANENT R/W ACQUIRED		EASEMENTS		AREA SEVERED				EXCESS PURCHASED		PORTION REMAINING		SEWER SYSTEM TYPE	SEWER SYSTEM AFFECTED BY PROJECT		BUILDINGS ACQUIRED NUMBER				SOURCE OF TITLE	REMARKS
						PERMANENT	TEMPORARY	LEFT		RIGHT														
		ACRES	SQ. FT.	ACRES	SQ. FT.	SQ. FT.	SQ. FT.	ACRES	SQ. FT.	ACRES	SQ. FT.	ACRES	SQ. FT.	ACRES	SQ. FT.		YES	NO	C	R	F	S		
1	RONNIE MILLER SHEILA GAIL MILLER (WF) (C)	3.026		3.026				0		0				0.0000		1	X			2	1		DB 336 PG 527	TOTAL TAKE
2	GLEN BAKER (C)	25.039		3.423				1.447		20.169				21.616		5		X					DB 381 PG 429	
3	MOUNTAIN PROPERTIES, INC (C)	383.220		40.889			27,182	59.989		282.342				342.331		5		X					DB 257 PG 210 DB 255 PG 415	DB 253 PG 411
4	KENTUCKY RIVER PROPERTIES LLC (C)	116.159		25.069			9,747	20.268		70.822				91.090		5		X					DB 413 PG 709	
5	ACIN LLC (C)	8.451			10520			8.210						8.210		5		X					DB 308 PG 176 DB 272 PG 344	DB 208 PG 266 DB 155 PG 340
6	HAZARD PERRY COUNTY AIRPORT BOARD (C)	632.217		11.043			17,182	2.139		619.035				621.174		5		X					DB 313 PG 329 DB 308 PG 183	DB 248 PG 735
7	LYNN LEE (C)	19.084		4.418			528	14.666						14.666		5		X					DB 272 PG 344 DB 255 PG 415	

NOTE: PERMANENT R/W ACQUIRED + AREA SEVERED = TOTAL AREA OF TRACT

BASIS FOR DETERMINATION OF AREA
a. P.V.A.
b. DEED
c. CALCULATED
d. PLAT

TYPE SEWER SYSTEM
1. PRIVATE - INDIVIDUAL
2. PRIVATE - MULTI PARTY
3. PUBLIC
4. NONE
5. NOT APPLICABLE

BUILDING ACQUIRED CODE
C - COMMERCIAL
R - RESIDENTIAL
F - FARM
S - STORAGE

RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: ROW SUMMARY

ITEM NO. 10-80100.00
COUNTY OF PERRY
SHEET NO. R24

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: KY 15 STRIP MAP

HORIZONTAL SCALE
SCALE: 1"=200'

0′ 200′ 400′ 800′

STA 500+00 TO 526+00

ITEM NO. 10-80100.00
COUNTY OF PERRY

SHEET NO. R25

OpenRoads Designer v10.16.2.267

USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_STRIP MAPS.DGN

MATCHLINE STA 565+00.00

MATCHLINE STA 526+00.00

530+00
535+00
540+00
545+00
550+00
555+00
560+00

PC 550+03.32

PROP. RW

TEMP. EASE. FOR ENT.

P 4

KENTUCKY RIVER PROPERTIES LLC

P 3

MOUNTAIN PROPERTIES, INC

PROP. RW

PC 535+48.69

PT 541+17.37

PROP. RW

PROP. RW

TEMP. EASE. FOR ENT.

PT 550+95.80

PROP. RW

P 4

KENTUCKY RIVER PROPERTIES LLC

MOUNTAIN PROPERTIES, INC

P 3

MOUNTAIN PROPERTIES, INC

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD STRIP MAP

HORIZONTAL SCALE
SCALE: 1"=200'

0′ 200′ 400′ 800′

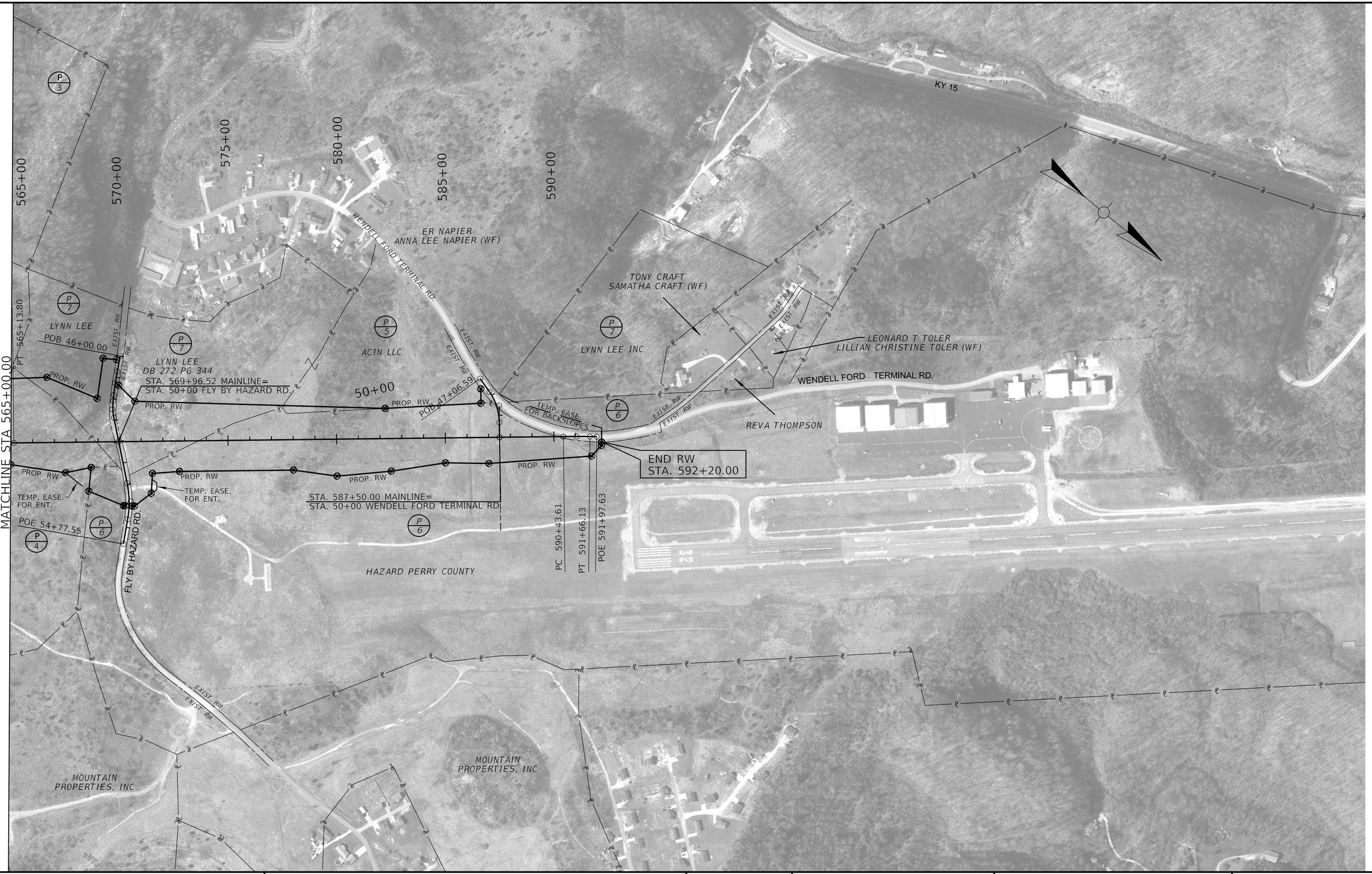
STA 526+00 TO 565+00

ITEM NO. 10-80100.00 COUNTY OF PERRY

SHEET NO. R26

OpenRoads Designer v10.16.2.267 USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_STRIP MAPS.DGN



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD STRIP MAP

HORIZONTAL SCALE
SCALE: 1"=200'

0′ 200′ 400′ 800′

STA 565+00 TO END OF PROJECT

ITEM NO. 10-80100.00
COUNTY OF PERRY

SHEET NO. R27

OpenRoads Designer v10.16.2.267

USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_STRIP MAPS.DGN

COORDINATE CONTROL POINTS

POINT	DESCRIPTION	State Plane Coordinates			STATION and OFFSET
		NORTH (Y)	EAST (X)	ELEV. (Z)	
M1	CONTROL MONUMENT	3664529.474	5645055.853	1171.185	2163+47.05, 104.45' RT
M2	CONTROL MONUMENT	3665726.768	5645490.527	1080.625	2150+80.57, 32.03' LT
M3	CONTROL MONUMENT	3669706.719	5648311.899	1286.536	570+11.97, 839.55' RT
M4	CONTROL MONUMENT	3670914.454	5648393.583	1248.349	578+80.31, 1682.92' RT
M5	CONTROL MONUMENT	3671090.398	5645882.157	1230.075	
M6	CONTROL MONUMENT	3671608.096	5645277.664	1247.455	
M13	CONTROL MONUMENT	3670893.716	5646530.544	1257.271	590+70.48, 248.47' RT

AIRPORT ROAD ALIGNMENT POINTS

POINT	STATION	State Plane Coordinates	
		NORTH (Y)	EAST (X)
START	498+79.90	3664404.167	5645007.745
PC	501+55.94	3664339.509	5645276.111
HPI	511+42.77	3664108.362	5646235.486
PT	515+37.32	3665094.598	5646201.336
PC	519+29.16	3665486.198	5646187.777
HPI	526+67.79	3666224.389	5646162.216
PT	530+95.80	3666261.219	5646899.931
PC	535+48.69	3666283.801	5647352.259
HPI	542+65.23	3666319.529	5648067.908
PT	547+17.37	3667034.778	5648110.926
PC	559+03.12	3668218.393	5648182.113
HPI	562+24.21	3668538.901	5648201.390
PT	565+13.80	3668783.802	5647993.734
PC	590+43.61	3670713.340	5646357.643
HPI	591+04.87	3670760.065	5646318.024
PT	591+66.13	3670807.589	5646279.368
END	591+97.63	3670832.032	5646259.486

MATCHLINE STA 526+00.00

525+00

520+00

PC 519+29.16

515+00

510+00

505+00

PROP. RW

PT 515+37.32

EXIST. RW

PC 501+55.94

KY 15 STA. 2164+79.64 =
AIRPORT RD STA. 500+01.13

KY 15 STA. 2164+90.51 =
TRUSS JOIST LANE 100+00.00

CONCRETE MON M2

CONCRETE MON M1

KY 15

BRANDON LANE

POB 498+79.90

POB 98+50.00

TRUSS JOIST LANE

PC 2167+57.23

PT 2181+66.23

POE 2185+47.88

POB 2144+82.66

2145+00

2150+00

2155+00

2160+00

2165+00

2170+00

2175+00

2180+00

2185+00

KY 15 ALIGNMENT POINTS

POINT	STATION	State Plane Coordinates	
		NORTH (Y)	EAST (X)
START	2144+82.66	3666314.953	5645602.584
PC	2167+57.23	3664106.214	5645059.303
HPI	2174+65.30	3663418.636	5644890.181
PT	2181+66.23	3662792.916	5644558.758
END	2185+47.88	3662455.659	5644380.124

TRUSS JOIST LANE ALIGNMENT POINTS

POINT	STATION	State Plane Coordinates	
		NORTH (Y)	EAST (X)
START	98+50.00	3664418.556	5644982.814
END	100+00.00	3664365.219	5645123.011

RIGHT OF WAY PLANS

COORDINATE SYSTEM

Coordinates for horizontal control were obtained from GPS methods and adjusted to the National NAD83/FBN System.

Coordinates are based on State Plane Coordinate System Single Zone and in U.S. Survey Feet.

BASIS OF ELEVATIONS

Elevation for Monument #1 were derived from GPS methods and are adjusted to the NAVD88 Vertical Datum. Geoid model used was Geoid 12B. Spirit Levels were run through the remainder of the Control Points and the adjusted elevations are shown.

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: KY 15 COORDINATE CONTROL SHEET

HORIZONTAL SCALE
SCALE: 1"=200'

0' 200' 400' 800'

STA 500+00 TO 526+00

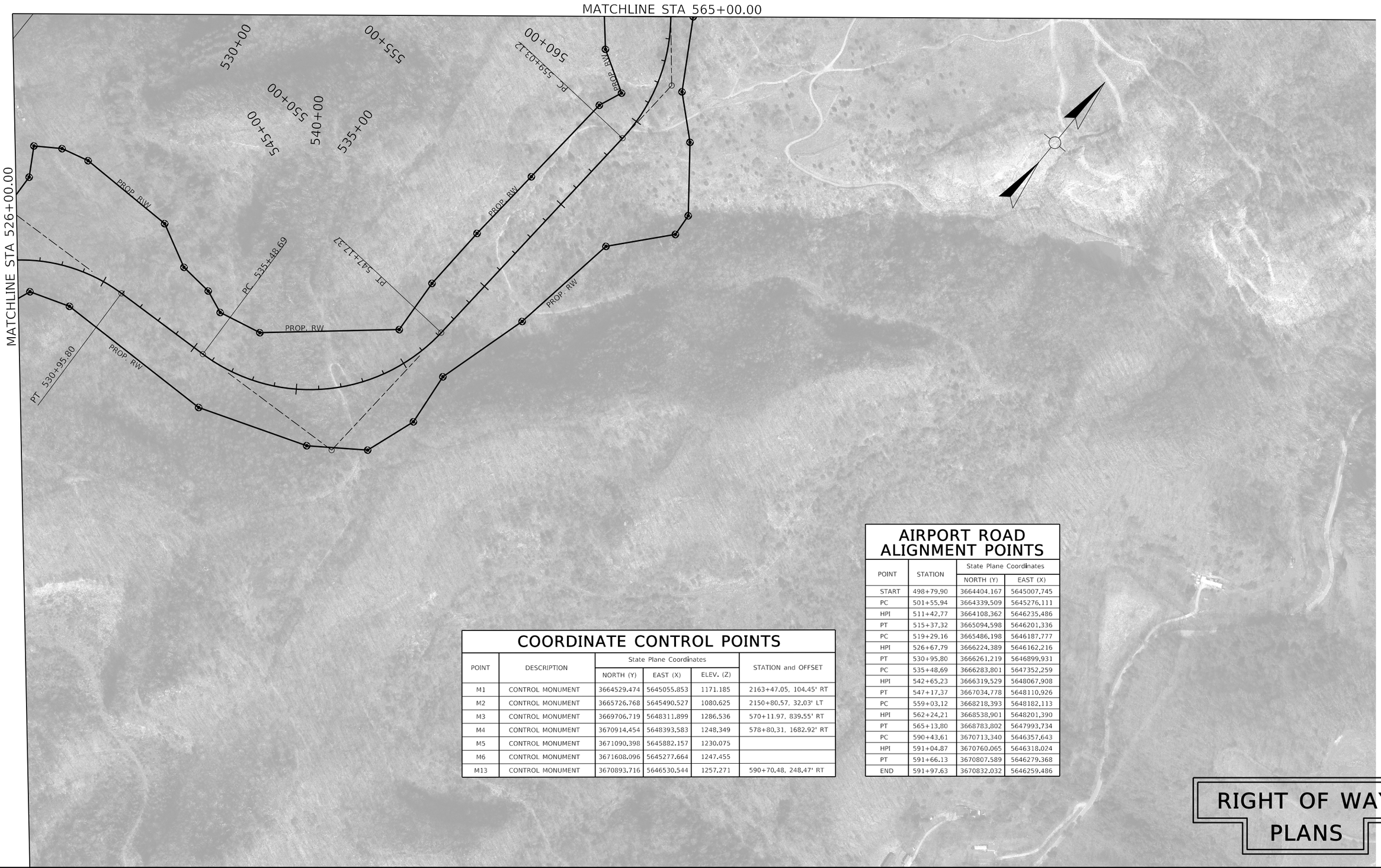
ITEM NO. 10-80100.00
COUNTY OF PERRY

SHEET NO. R28

OpenRoads Designer v10.16.2.267

USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_COORD_CONTROL.DGN



COORDINATE CONTROL POINTS

POINT	DESCRIPTION	State Plane Coordinates			STATION and OFFSET
		NORTH (Y)	EAST (X)	ELEV. (Z)	
M1	CONTROL MONUMENT	3664529.474	5645055.853	1171.185	2163+47.05, 104.45' RT
M2	CONTROL MONUMENT	3665726.768	5645490.527	1080.625	2150+80.57, 32.03' LT
M3	CONTROL MONUMENT	3669706.719	5648311.899	1286.536	570+11.97, 839.55' RT
M4	CONTROL MONUMENT	3670914.454	5648393.583	1248.349	578+80.31, 1682.92' RT
M5	CONTROL MONUMENT	3671090.398	5645882.157	1230.075	
M6	CONTROL MONUMENT	3671608.096	5645277.664	1247.455	
M13	CONTROL MONUMENT	3670893.716	5646530.544	1257.271	590+70.48, 248.47' RT

AIRPORT ROAD ALIGNMENT POINTS

POINT	STATION	State Plane Coordinates	
		NORTH (Y)	EAST (X)
START	498+79.90	3664404.167	5645007.745
PC	501+55.94	3664339.509	5645276.111
HPI	511+42.77	3664108.362	5646235.486
PT	515+37.32	3665094.598	5646201.336
PC	519+29.16	3665486.198	5646187.777
HPI	526+67.79	3666224.389	5646162.216
PT	530+95.80	3666261.219	5646899.931
PC	535+48.69	3666283.801	5647352.259
HPI	542+65.23	3666319.529	5648067.908
PT	547+17.37	3667034.778	5648110.926
PC	559+03.12	3668218.393	5648182.113
HPI	562+24.21	3668538.901	5648201.390
PT	565+13.80	3668783.802	5647993.734
PC	590+43.61	3670713.340	5646357.643
HPI	591+04.87	3670760.065	5646318.024
PT	591+66.13	3670807.589	5646279.368
END	591+97.63	3670832.032	5646259.486

RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD COORDINATE CONTROL SHEET

HORIZONTAL SCALE
SCALE: 1"=200'

0′ 200′ 400′ 800′

STA 526+00 TO 565+00

ITEM NO. 10-80100.00
COUNTY OF PERRY

SHEET NO. R29

OpenRoads Designer v10.16.2.267

USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_COORD_CONTROL.DGN

AIRPORT ROAD ALIGNMENT POINTS

POINT	STATION	State Plane Coordinates	
		NORTH (Y)	EAST (X)
START	498+79.90	3664404.167	5645007.745
PC	501+55.94	3664339.509	5645276.111
HPI	511+42.77	3664108.362	5646235.486
PT	515+37.32	3665094.598	5646201.336
PC	519+29.16	3665486.198	5646187.777
HPI	526+67.79	3666224.389	5646162.216
PT	530+95.80	3666261.219	5646899.931
PC	535+48.69	3666283.801	5647352.259
HPI	542+65.23	3666319.529	5648067.908
PT	547+17.37	3667034.778	5648110.926
PC	559+03.12	3668218.393	5648182.113
HPI	562+24.21	3668538.901	5648201.390
PT	565+13.80	3668783.802	5647993.734
PC	590+43.61	3670713.340	5646357.643
HPI	591+04.87	3670760.065	5646318.024
PT	591+66.13	3670807.589	5646279.368
END	591+97.63	3670832.032	5646259.486

APPROACH FLY BY HAZARD ROAD ALIGNMENT POINTS

POINT	STATION	State Plane Coordinates	
		NORTH (Y)	EAST (X)
START	46+00.00	3668905.041	5647373.470
PC	46+72.24	3668940.204	5647436.576
HPI	47+27.31	3668967.008	5647484.682
PT	47+82.33	3668997.268	5647530.693
PC	48+09.51	3669012.203	5647553.402
HPI	48+48.55	3669033.656	5647586.023
PT	48+86.97	3669064.035	5647610.549
PC	51+95.27	3669303.913	5647804.214
HPI	52+79.82	3669369.699	5647857.327
PT	53+62.42	3669411.721	5647930.696
END	54+77.55	3669468.939	5648030.595

APPROACH WENDELL FORD TERMINAL ROAD ALIGNMENT POINTS

POINT	STATION	State Plane Coordinates	
		NORTH (Y)	EAST (X)
START	47+06.59	3670248.101	5646396.452
PC	47+80.83	3670319.774	5646415.811
HPI	48+58.68	3670394.923	5646436.108
PT	49+31.76	3670445.266	5646495.480
END	50+00.00	3670489.398	5646547.528

COORDINATE CONTROL POINTS

POINT	DESCRIPTION	State Plane Coordinates			STATION and OFFSET
		NORTH (Y)	EAST (X)	ELEV. (Z)	
M1	CONTROL MONUMENT	3664529.474	5645055.853	1171.185	2163+47.05, 104.45' RT
M2	CONTROL MONUMENT	3665726.768	5645490.527	1080.625	2150+80.57, 32.03' LT
M3	CONTROL MONUMENT	3669706.719	5648311.899	1286.536	570+11.97, 839.55' RT
M4	CONTROL MONUMENT	3670914.454	5648393.583	1248.349	578+80.31, 1682.92' RT
M5	CONTROL MONUMENT	3671090.398	5645882.157	1230.075	
M6	CONTROL MONUMENT	3671608.096	5645277.664	1247.455	
M13	CONTROL MONUMENT	3670893.716	5646530.544	1257.271	590+70.48, 248.47' RT

RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD COORDINATE CONTROL SHEET

HORIZONTAL SCALE
SCALE: 1"=200'

0' 200' 400' 800'

STA 565+00 TO END OF PROJECT

ITEM NO. 10-80100.00 COUNTY OF PERRY

SHEET NO. R29

OpenRoads Designer v10.16.2.267 USER: james-f

FILE NAME: C:\PW_WORKDIR\JAMES-F\D0124389\10_80100_00_R_COORD_CONTROL.DGN

RIGHT OF WAY MONUMENT POINTS

ALIGNMENT	STATION	OFFSET	TYPE	DESCRIPTION	State Plane Coordinates	
					NORTH (Y)	EAST (X)
AIRPORT ACCESS RD.	501+23.11	334.92' LT	1	-	3664672.800	5645322.635
AIRPORT ACCESS RD.	503+46.96	330.51' LT	1	-	3664649.226	5645459.442
AIRPORT ACCESS RD.	504+14.85	256.45' RT	1	-	3664068.147	5645561.055
AIRPORT ACCESS RD.	506+50.00	375.00' RT	1	-	3664042.482	5645912.890
AIRPORT ACCESS RD.	508+00.00	400.00' RT	1	-	3664134.231	5646122.138
AIRPORT ACCESS RD.	508+00.00	180.00' LT	1	-	3664605.500	5645784.047
AIRPORT ACCESS RD.	509+25.00	350.00' RT	1	-	3664293.617	5646232.383
AIRPORT ACCESS RD.	510+00.00	150.00' LT	1		3664690.521	5645917.643
AIRPORT ACCESS RD.	511+50.00	260.00' RT	1		3664600.619	5646346.801
AIRPORT ACCESS RD.	513+50.00	125.00' LT	1		3664935.210	5646062.376
AIRPORT ACCESS RD.	514+50.00	115.00' LT	1		3665016.748	5646084.661
AIRPORT ACCESS RD.	517+00.00	200.00' LT	1		3665250.257	5645995.827
AIRPORT ACCESS RD.	518+00.00	240.00' LT	1		3665348.813	5645952.390
AIRPORT ACCESS RD.	519+00.00	350.00' LT	1		3665444.947	5645838.995
AIRPORT ACCESS RD.	519+50.00	340.00' LT	1		3665504.717	5645847.353
AIRPORT ACCESS RD.	520+25.00	240.00' LT	1		3665604.265	5645951.622
AIRPORT ACCESS RD.	521+50.00	240.00' RT	1		3665643.187	5646444.448
AIRPORT ACCESS RD.	522+00.00	140.00' LT	1		3665797.611	5646094.349
AIRPORT ACCESS RD.	523+00.00	210.00' LT	1		3665938.209	5646077.051
AIRPORT ACCESS RD.	523+70.00	205.00' LT	1		3666013.903	5646124.757
AIRPORT ACCESS RD.	525+25.00	175.00' LT	1		3666149.300	5646266.756
AIRPORT ACCESS RD.	526+40.00	370.00' LT	1		3666398.576	5646252.746
AIRPORT ACCESS RD.	526+50.00	510.00' LT	1		3666519.559	5646180.538
AIRPORT ACCESS RD.	526+65.00	140.00' RT	1		3666007.095	5646580.772
AIRPORT ACCESS RD.	527+25.00	510.00' LT	1		3666590.079	5646284.892
AIRPORT ACCESS RD.	528+00.00	480.00' LT	1		3666622.742	5646408.659
AIRPORT ACCESS RD.	529+00.00	165.00' RT	1		3666069.097	5646758.338
AIRPORT ACCESS RD.	530+75.00	365.00' LT	1		3666623.795	5646850.871
AIRPORT ACCESS RD.	532+50.00	260.00' LT	1		3666528.584	5647040.974
AIRPORT ACCESS RD.	534+00.00	240.00' LT	1		3666516.088	5647191.784
AIRPORT ACCESS RD.	535+00.00	195.00' LT	1		3666476.131	5647293.904
AIRPORT ACCESS RD.	536+50.00	210.00' RT	1		3666088.500	5647489.727
AIRPORT ACCESS RD.	537+50.00	210.00' LT	1		3666519.423	5647487.581
AIRPORT ACCESS RD.	540+50.00	250.00' RT	1		3666264.060	5647969.754
AIRPORT ACCESS RD.	542+50.00	300.00' RT	1		3666422.121	5648191.855
AIRPORT ACCESS RD.	544+25.00	250.00' RT	1		3666649.363	5648268.731
AIRPORT ACCESS RD.	545+74.88	135.57' LT	1		3666926.042	5647958.037
AIRPORT ACCESS RD.	546+00.00	150.00' RT	1		3666887.763	5648242.132
AIRPORT ACCESS RD.	548+50.00	180.00' LT	1		3667177.979	5647939.214

RIGHT OF WAY MONUMENT POINTS

ALIGNMENT	STATION	OFFSET	TYPE	DESCRIPTION	State Plane Coordinates	
					NORTH (Y)	EAST (X)
AIRPORT ACCESS RD.	550+00.00	230.00' RT	1	-	3667303.094	5648357.479
AIRPORT ACCESS RD.	551+50.00	185.00' LT	1	-	3667477.738	5647952.233
AIRPORT ACCESS RD.	555+00.00	180.00' LT	1	-	3667826.806	5647978.237
AIRPORT ACCESS RD.	555+00.00	275.00' RT	1	-	3667799.490	5648432.416
AIRPORT ACCESS RD.	557+50.00	465.00' RT	1	-	3668037.632	5648637.082
AIRPORT ACCESS RD.	558+50.00	450.00' RT	1	-	3668138.353	5648628.113
AIRPORT ACCESS RD.	559+50.00	175.00' LT	1	-	3668265.501	5648008.556
AIRPORT ACCESS RD.	560+50.00	250.00' RT	1		3668395.796	5648425.555
AIRPORT ACCESS RD.	560+75.00	125.00' LT	1		3668370.480	5648050.487
AIRPORT ACCESS RD.	562+00.00	115.00' RT	1		3668546.446	5648254.654
AIRPORT ACCESS RD.	562+75.00	270.00' LT	1		3668475.143	5647870.727
AIRPORT ACCESS RD.	565+00.00	100.00' RT	1		3668836.543	5648079.947
AIRPORT ACCESS RD.	566+70.00	300.00' LT	1		3668708.918	5647663.902
AIRPORT ACCESS RD.	567+50.00	140.00' RT	1		3669054.495	5647947.761
AIRPORT ACCESS RD.	568+56.22	226.21' RT	1		3669191.265	5647944.825
AIRPORT ACCESS RD.	568+68.20	117.19' RT	1		3669129.892	5647853.920
AIRPORT ACCESS RD.	569+00.00	200.00' LT	1		3668949.016	5647591.427
FLY BY HAZARD RD.	46+25.00	75.00' RT	1		3668851.693	5647431.814
FLY BY HAZARD RD.	46+19.31	13.85' RT	1		3668902.342	5647397.080
FLY BY HAZARD RD.	47+34.23	15.77' LT	1		3668984.933	5647481.849
FLY BY HAZARD RD.	53+00.00	25.00' RT	1		3669357.278	5647894.156
FLY BY HAZARD RD.	53+00.00	16.54' RT	1		3669363.969	5647888.975
FLY BY HAZARD RD.	53+00.00	13.56' LT	1		3669387.692	5647870.607
FLY BY HAZARD RD.	53+00.00	25.00' LT	1		3669396.813	5647863.545
AIRPORT ACCESS RD.	570+73.20	185.46' LT	1		3669090.527	5647490.507
AIRPORT ACCESS RD.	571+43.80	239.14' RT	1		3669418.969	5647768.700
AIRPORT ACCESS RD.	571+50.14	147.86' RT	1		3669364.778	5647694.977
AIRPORT ACCESS RD.	572+75.00	140.00' RT	1		3669454.924	5647608.230
AIRPORT ACCESS RD.	578+00.00	140.00' RT	1		3669855.353	5647268.699
AIRPORT ACCESS RD.	580+00.00	170.00' RT	1		3670027.300	5647162.235
AIRPORT ACCESS RD.	582+25.00	139.40' LT	1		3669998.817	5646780.738
AIRPORT ACCESS RD.	582+50.00	150.00' RT	1		3670205.046	5646985.299
AIRPORT ACCESS RD.	585+00.00	115.00' RT	1		3670373.091	5646796.923
AIRPORT ACCESS RD.	586+66.39	157.75' LT	1		3670323.601	5646481.283
WENDELL FORD TERMINAL RD.	586+66.39	224.07' LT	1		3670280.709	5646430.696
AIRPORT ACCESS RD.	587+00.00	120.00' RT	1		3670528.869	5646671.391
AIRPORT ACCESS RD.	591+75.00	90.00' RT	1		3670871.265	5646343.587
AIRPORT ACCESS RD.	592+20.00	40.00' RT	1		3670874.623	5646276.403
AIRPORT ACCESS RD.	592+20.00	25.15' RT	1		3670865.252	5646264.882

RIGHT OF WAY PLANS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

KENTUCKY TRANSPORTATION CABINET

DRAWING TITLE: AIRPORT ROAD RIGHT OF WAY MONUMENT SHEET

HORIZONTAL SCALE
SCALE:

0' 200' 400' 800'

ITEM NO. 10-80100.00 COUNTY OF PERRY

SHEET NO. R31