

**Mitigation Plan
for
Wetland Impacts**

**P Ridge South Pit Mine Site, Amend. No. 1 Site
Ohio County, Kentucky**

Prepared for:

**Western Kentucky Minerals
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Introduction

The following report describes the wetland mitigation plan for the P Ridge South Pit, Amendment No. 1 Mine Site in Ohio County, Kentucky. This mitigation plan is to be utilized in conjunction with the "Stream Habitat Assessment and Wetland Delineation Report" as well as the Individual 404 Permit Application. Onsite wetland mitigation is proposed to mitigate for the mine site's total of 0.769 acres (ac) of jurisdictional wetland impacts (0.411 ac forested wetland and 0.358 ac emergent wetland). Based on ratios provided in the table below, 1.770 acres of wetland mitigation are required.

Wetland Impact	Mitigation Ratio	Mitigation Required
0.411 ac Forested Wetland	3:1	1.233 ac
0.358 ac Emergent Wetland	1.5:1	0.537 ac
Total		1.770 ac

The goal of the mitigation is to establish a minimum of 1.770 acres of palustrine forested wetlands (PFO), based on the Cowardin Classification. There is one proposed forested wetland which will compensate for each type of wetland impact, including the emergent wetland impacts. The wetland to be constructed is expected to be of higher quality and value than the wetlands to be replaced, by providing more hard mast trees for habitat and food sources in a single large tract that consolidates numerous small existing wetland areas. The proposed wetland will provide a buffer and flood storage for an adjacent stream being restored in its original location.

Location

The proposed wetland site is located on-site at the P Ridge South Pit, Amendment No. 1 Mine Site, which is located along KY2115, a roadway along the western limit of the property, which is accessible from US 231 near the community of Pleasant Ridge, Kentucky. The mine site is located approximately 10 miles north of Hartford in Ohio County (Pleasant Ridge USGS 7.5 minute topographic quadrangles), at Latitude: 37° 35' 24" N, Longitude: 86° 59' 17" W.

Wetland Plan

The wetland established will be a forested wetland (PFO). Wetland 1 will be created in a long relatively flat valley bottom during the mine reclamation (see Exhibits 1, 2 and 3 for the location).

Wetland 1 lies along the left descending floodplain of proposed mitigation stream INT-1DS, which will be sited at the location of an existing tributary to North Fork Barnett Creek. The wetland is situated as far downstream as possible within the permit boundary. The existing valley slope in that area is 0.7% or less. The proposed stream gradient for INT-1DS will range from 0.25% to 0.83%, within a proposed valley slope of 0.3% to 1.0%. Such a gradient along the valley lends itself to develop wetland areas along the stream and in the adjacent floodplain areas due to slower stream flows and the inability of the floodplain to quickly or completely dewater after storm events. Existing stream INT-1 has the largest watershed within the permit boundary, at 180 acres at the downstream permit limit. However, bank overflow from INT-1DS currently does not access the overbank areas frequently since the channel is very incised/entranced; well below the existing bankfull elevation. The restored INT-1 is designed to allow for flows above bankfull to more frequently access the floodplain and proposed wetland, receiving hydrologic input from INT-1's watershed. In addition to headwater flows the wetland will receive runoff from adjacent, relatively steep, valley slopes and precipitation. Although detailed flooding information on North Fork Barnett Creek is lacking, FEMA mapping does designate a floodprone area along the stream not far from the lower permit limit. It may be possible that backwater could reach the area of INT-1DS for another hydrological input for wetland development.

The downslope gradient of the wetland will be similar to the proposed stream gradient, which should make flows in and through the wetland slow enough to promote the formation of hydric conditions. The floodplain access will be improved from the 180 acre watershed flowing into INT-1DS, and running parallel with the proposed wetland, by constructing an adverse slope from the floodprone bench running along the left bank of INT-1DS down to half the maximum bankfull depth in the proposed wetland. The proposed wetland bottom will generally be at half the maximum bankfull depth for its entire length and width with no outlet below the bankfull elevation back into the channel for INT-1DS. Therefore, flow into the wetland will stay until it evaporates, drains into the groundwater, or overflows into INT-1DS when the bankfull elevation is reached in the wetland. For construction details see Exhibit 4 for proposed wetland profiles and cross-sections and Exhibit 5 for planting details.

The existing soil mapping unit on the proposed wetland site is Steff silt loam and Zanesville silt loam. The Steff silt loam, occasionally flooded (Sf), is often found in association with Stendal silt loam, a map unit known to have inclusions of hydric soils. The Steff silt loam soil is

described as deep, and moderately well drained, occurring on floodplains and the base of slopes. The available water capacity is high, and the soil has a seasonal high water table. The soil is well suited to woodlands. Soils from this area will be stockpiled during topsoil management, for use in mitigation. A layer of topsoil will be loosely placed over the proposed wetland area to allow for root development. The Zanesville silt loam (ZaC3) is a deep soil, moderately well drained, and found on hilltops and side slopes. The available water capacity is low, and the organic matter content is low. Although excess water is limited, it is also suited to woodlands. This soil will not be stockpiled for use in the wetland area.

Monitoring wells will be installed per TN WRAP 05-02 (USACE 2005)¹ to establish flooding frequency and wetland boundaries. Two monitoring wells will be installed at an upstream and downstream location in Wetland 1. Guidelines for well installation and interpretation as detailed in the USACE technical document will be followed. See Exhibits 2, and 3 for approximate locations of monitoring wells.

Planting Plan

It is the intention of the design to create a wetland that will be forested at maturity. A successful implementation of the plan should exhibit a trend toward a forested classification by the end of the monitoring period. See Exhibit 5 for the planting plan.

Trees will be planted in the wetland at a rate of 60 Root Production Method (RPM) trees per acre, or 120 non-RPM 3-gallon container trees (minimum height - 30 inches) per acre, or bare root seedlings with a minimum height of 30 inches planted at a rate of 300 trees per acre. If RPM trees are purchased, trees should be planted in mounds of soil to increase survivability (see detail on Exhibit 6). RPM or non-RPM 3-gallon container trees will have a 25 X 25-foot or 19 X 19-foot spacing, respectively. Bare-root seedlings will be planted on 12 X 12-foot spacing. The five tree species listed below shall be planted.

The forested planting zone covers at least 1.8 acres and will be planted in trees and a herbaceous mix. The wetland is anticipated to be seasonally flooded. Selected trees must tolerate inundated conditions for part of the year. Due to cost and availability constraints, any

¹ U.S. Army Corps of Engineers. 2005. "Technical Standard for Water-Table Monitoring of Potential Wetland Sites," *WRAP Technical Notes Collection* (ERDC TN-WRAP-05-2), U.S. Army Engineer Research and Development Center, Vicksburg, MS.

tree or shrub species may be substituted with a USACE-approved appropriate species, provided that overall species diversity is maintained.

Trees

Shellbark hickory (*Carya laciniosa*)
Cherrybark oak (*Quercus pagoda*)
Pin oak (*Quercus palustris*)
Swamp white oak (*Quercus bicolor*)
Overcup oak (*Quercus lyrata*)

A seed mix, such as Cardno JFNew's "Wooded Wetland Establishment" is suggested. As an alternative, the following species lists shall be followed to provide sufficient diversity and ground cover. A minimum of six species shall be used to provide sufficient diversity and ground cover throughout the entire growing season. Other appropriate species may be substituted as cost and availability allows, provided similar diversity is maintained and approved by the USACE. No single species shall constitute more than twenty-five percent of the entire mix; an even distribution and diversity of genera is advised.

Herbaceous seed mix

Green bulrush (*Scirpus atrovirens*)
Virginia wild rye (*Elymus virginicus*)
Fox sedge (*Carex vulpinoidea*)
Soft rush (*Juncus effusus*)
Woolgrass (*Scirpus cyperinus*)
Common sneezeweed (*Helenium autumnale*)

Maintenance Plan

Invasive, exotic, or undesirable volunteer species will be removed from the mitigation site during annual maintenance.

Performance standards

Standards for assessing wetland mitigation goals include:

- Success will be based on the USACE 2009 Draft Interim Regional Supplement to the Corps of Engineers' Wetland Delineation Manual: Eastern Mountains and Piedmont Region.
- If bare root seedlings are planted, no single species may comprise more than twenty-five percent of the surviving plantings, not including volunteers. Of the initial planting, fifty percent of bare root seedlings must survive. Before release from monitoring, regardless of

the time required, fifty percent of the surviving trees must reach 15 feet in height and a 3 inch dbh. If RPM or container trees are used, no one species may comprise more than 25 percent of surviving plantings. Ninety percent of the planted RPM or non-RPM 3-gallon container grown trees must survive. Herbaceous plantings must provide a minimum of 70 percent ground cover with no one species accounting for more than 40 percent of ground cover.

- The wetlands will meet the proposed Cowardin Classification (PFO) at the end of the monitoring period.
- At least 1.770 acres of wetland will develop in order to fully meet mitigation requirements.
- Wetland hydrology will be achieved through the measurement of 14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10, as stated in the USACE Regional Supplement². Monitoring wells will be installed at locations near the perimeter of the wetland to measure the level of saturation. Two will be installed at Wetland 1.
- Three hydrogeomorphic (HGM) variables will be measured during biannual monitoring to assess the restoration of wetland functions. Water table fluctuation, redoximorphic features, and ground vegetation biomass will be measured per the regional HGM guidebook³. These variables will determine the wetland's ability to maintain a characteristic plant community, remove and sequester elements and compounds, and cycle nutrients.

Monitoring Requirements

The wetland mitigation site will be monitored in accordance with the Mitigation Final Rule, 2008. In general, the following guidelines will be used:

- The monitoring period must be sufficient to demonstrate that the compensatory mitigation has met success criteria. The monitoring period length shall be 10 years; however, the applicant can petition for early release after 5 years if success is assured.
- Biannual inspections will be conducted each year during the first and last two months of the growing season.

² U.S. Army Corps of Engineers. 2010. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region, ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-XX. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

³ Ainslie, W. B., Smith, R. D., Pruitt, B. A., Roberts, T. H., Sparks, E. J., West, L., Godshalk, G. L., and Miller, M. V. (1999). "A regional guidebook for assessing the functions of low gradient, riverine wetlands in western Kentucky," Technical Report WRP-DE-17, U. S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

- The first monitoring report will be due after the first full growing season following the initial planting.
- Monitoring reports are due to USACE by January 31 for the previous year.
- Two permanent monitoring/photo stations are proposed for Wetland 1. A Regional Supplement wetland delineation form will be filled out at each station.
- Monitoring wells will be installed, per TN WRAP 05-02 to measure saturation. Monitoring wells will be installed at two locations for Wetland 1.

Long-Term Management Plan

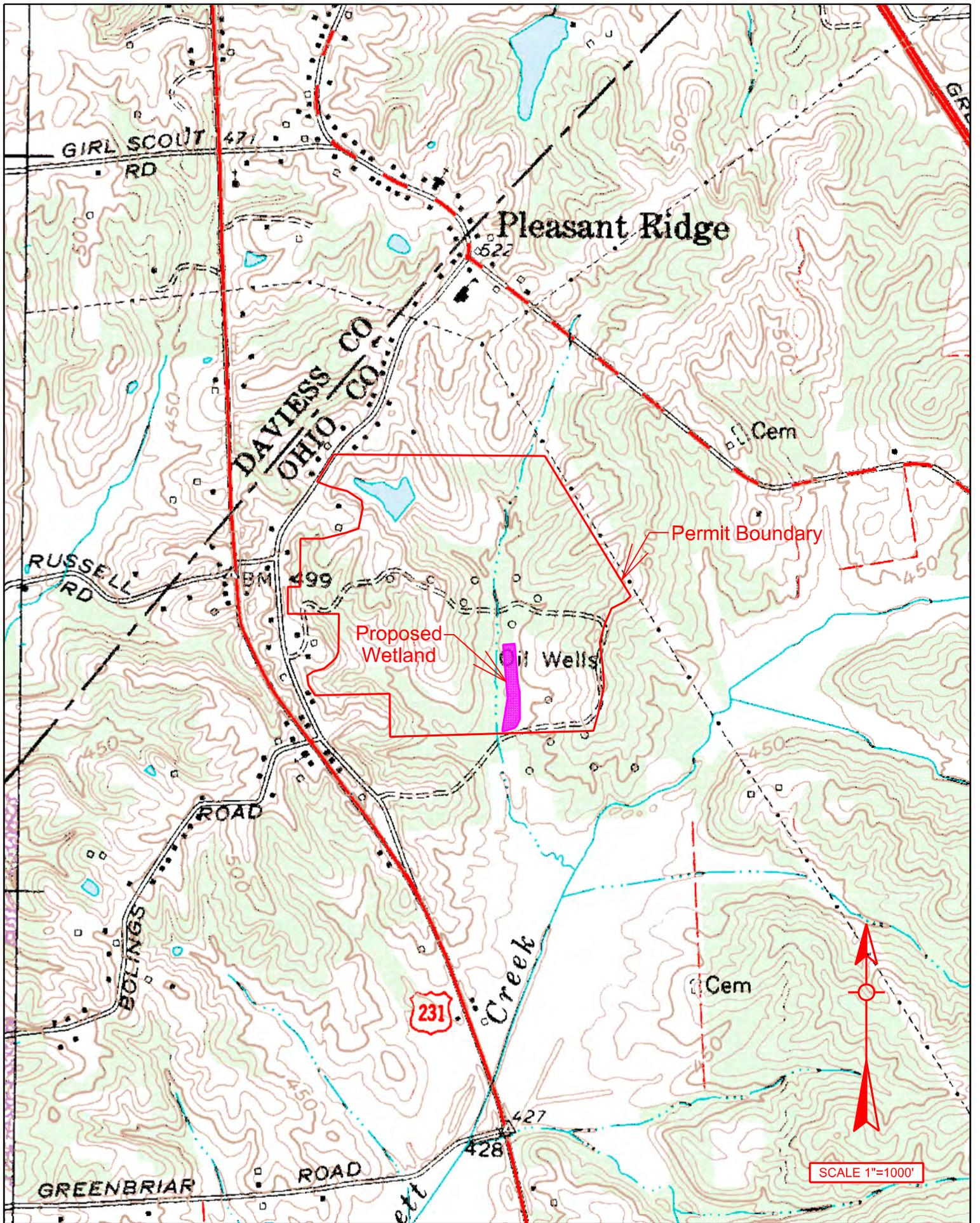
The applicant will be responsible for accomplishing, maintaining, and monitoring all mitigation sites. The mitigation sites will be integrated into the reclamation plan, with site access limited. Site protection will be provided through the use of a restrictive covenant to be recorded with property deeds. The restrictive covenant for wetland mitigation areas shall be recorded within 60 days after mitigation construction is complete, with proof of recording submitted to USACE at the time of execution.

Adaptive Management Plan

If success criteria are not met for any portion of the monitoring year and / or final success criteria are not satisfied, an analysis of the contributing conditions will be conducted and documented. Remedial action, if required by USACE, will be performed and documented by the applicant. Remedial actions may include replanting trees, reseeding vegetation, restoring hydrology, and repairing constructed features. These actions will be performed at least three times at the same location. Should these efforts not show indications of success, another alternative off-site location will be found to off-set failed sections of the mitigation site and a mitigation plan proposed. The payment of an in-lieu fee is another option to compensate for sections of wetlands that do not meet performance standards.

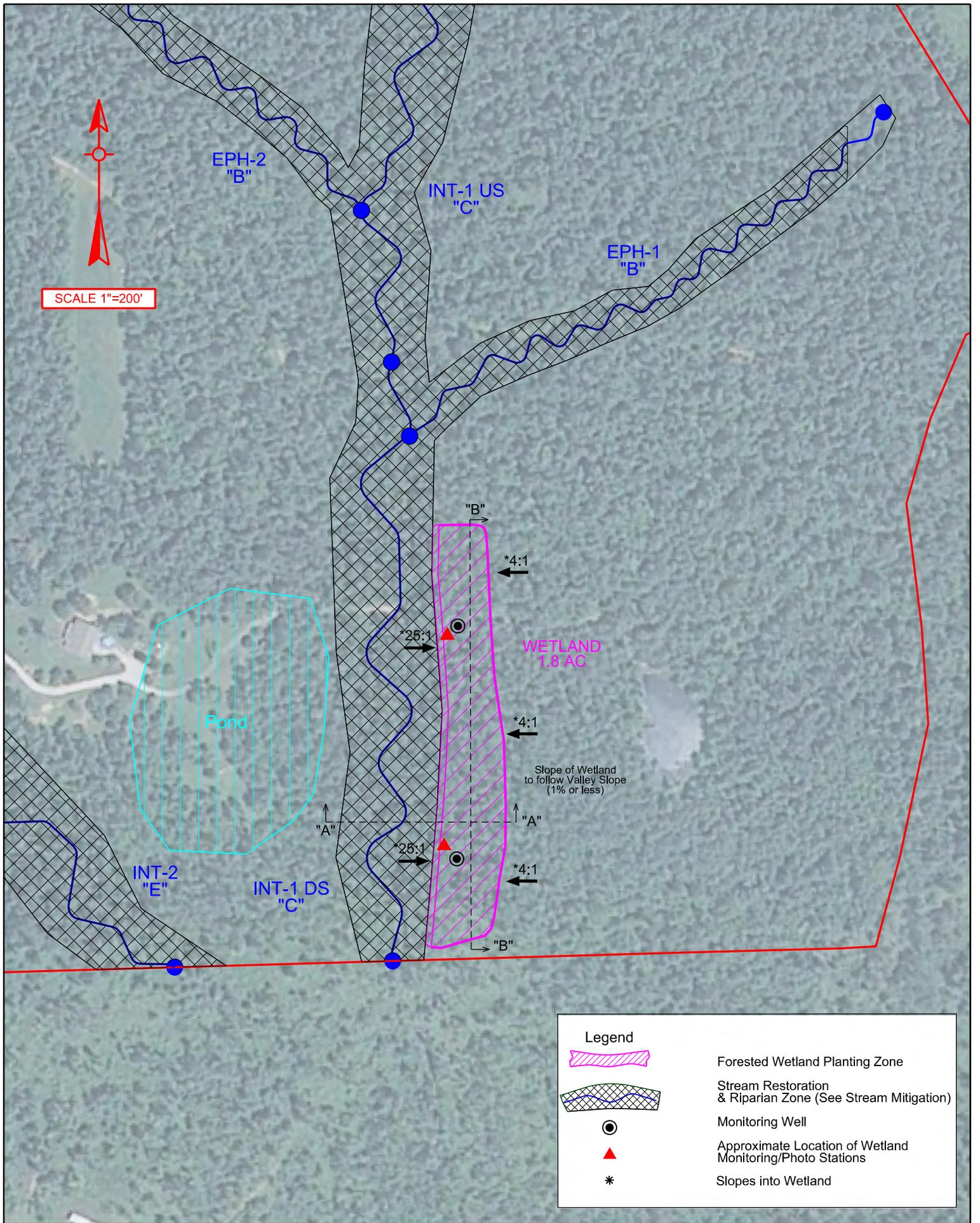
Financial Assurances

The applicant will be responsible for managing any financial assurances and contingency funds set-aside for remedial measures. The USACE, Louisville District, currently does not have the means to handle financial assurances; therefore, no USACE-managed financial assurances are proposed for this project.



T.H.E. Engineers, Inc.	PROJECT: P RIDGE SOUTH PIT, AMEND. *1 MINE SITE - PROPOSED WETLAND MITIGATION	STREAMS: UT'S OF NORTH FORK BARNETT CREEK		
	COUNTY: OHIO	STATE: KY	NEAR: PLEASANT RIDGE	ITEM: VICINITY MAP
				EXHIBIT 1

DATE:

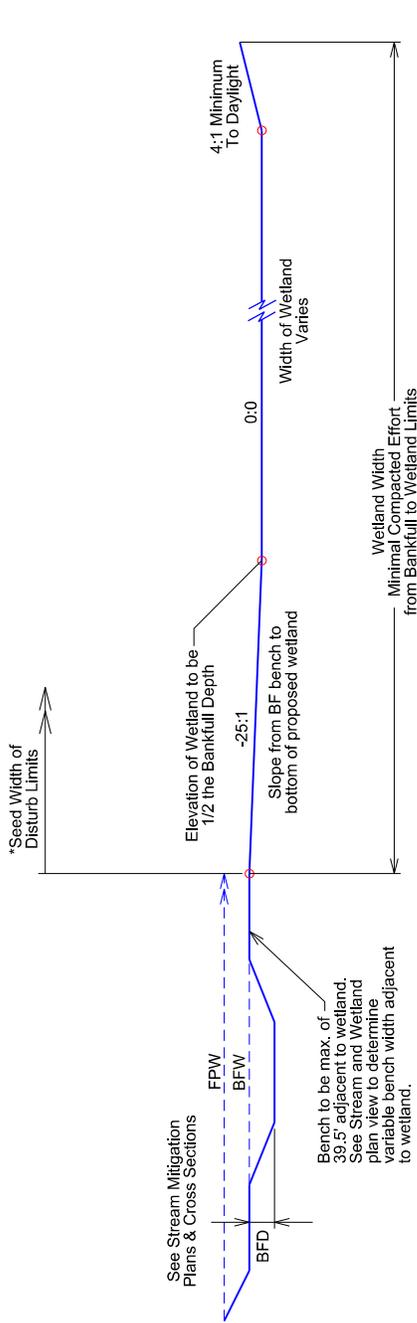


SCALE 1"=200'

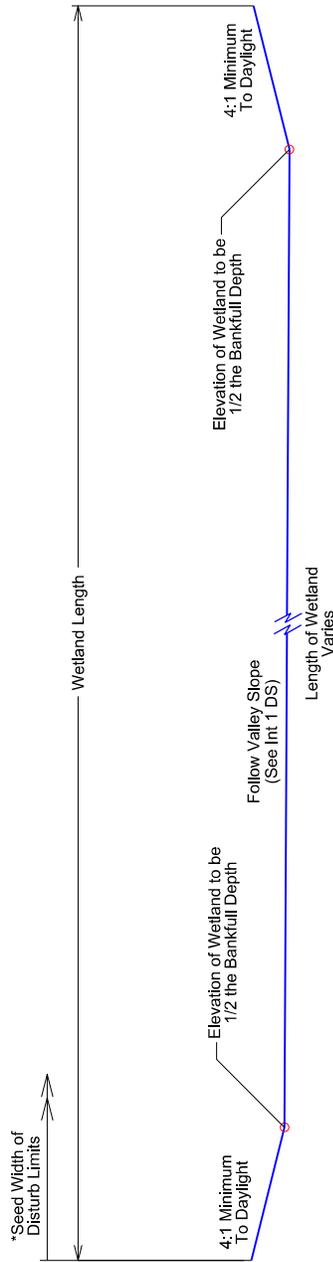
Legend	
	Forested Wetland Planting Zone
	Stream Restoration & Riparian Zone (See Stream Mitigation)
	Monitoring Well
	Approximate Location of Wetland Monitoring/Photo Stations
	Slopes into Wetland

T.H.E. Engineers, Inc.	PROJECT: P RIDGE SOUTH PIT, AMEND. *1 MINE SITE - PROPOSED WETLAND MITIGATION			STREAM: UT's OF NORTH FORK BARNETT CREEK	
	COUNTY: OHIO	STATE: KY	NEAR: PLEASANT RIDGE	ITEM: AERIAL MAP	EXHIBIT 2

DATE:



Typical Cross Section "AA"
Wetland
Not To Scale



Typical Profile "BB"
Wetland
Not To Scale

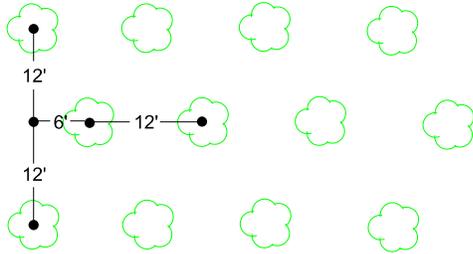
See Plan Sheets for limits of Proposed Wetlands.
*See Wetland Planting Details for seeding mixes.

T.H.E. Engineers, Inc.	PROJECT: P RIDGE SOUTH PIT, AMEND. #1 MINE SITE - PROPOSED WETLAND MITIGATION			PROPOSED WETLAND	
	COUNTY: OHIO	STATE: KY	NEAR: PLEASANT RIDGE	ITEM: PROPOSED WETLAND CROSS SECTION	EXHIBIT 3

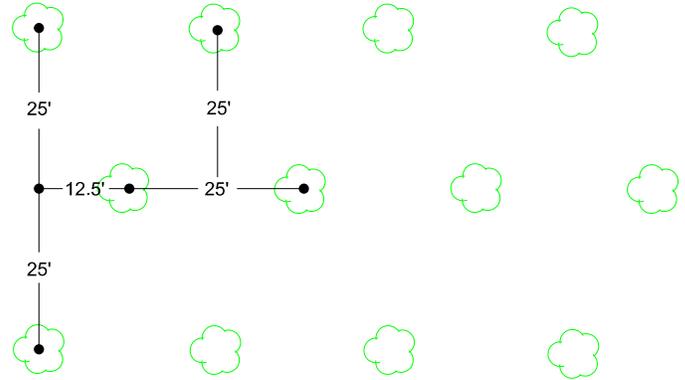
DATE:

WETLAND PLANTING DETAILS

If using tree seedlings, use 12 foot spacing.



If using RPM trees, use 25 foot spacing.
(non-RPM 3-gal. trees, use 19 foot spacing)



Planting Quantities Shall Meet Densities Stated In The Wetland Mitigation Planting Plan. Plant Locations Shall Be Irregularly Spaced And Distributed Such That No Area Is Dominated By Any Single Species

WETLAND PLANTING SPECIES LIST

TREES

Shellbark hickory (*Carya laciniosa*)
Cherrybark oak (*Quercus pagoda*)
Pin oak (*Quercus palustris*)
Swamp white oak (*Quercus bicolor*)
Overcup oak (*Quercus lyrata*)

HERBACEOUS SEED MIX

Cardno JFNew's "Wooded Wetland Establishment" seed mix
OR
Green bulrush (*Scirpus atrovirens*)
Virginia wild rye (*Elymus virginicus*)
Fox sedge (*Carex vulpinoidea*)
Soft rush (*Juncus effusus*)
Woolgrass (*Scirpus cyperinus*)
Common sneezeweed (*Helenium autumnale*)

RECOMMENDED PROCEDURES FOR PLANTING RPM TREES

1. Site preparation - trees are to be planted on a raised mound of existing soil. The mound shall be 8-10 inches high after mild compaction. The base of the mound shall have a minimum width of seven feet with a flat crown (top) approximately three to four feet in width.
2. The hole shall be approximately the same size as the container (10 inch diameter-8 inch depth) or slightly larger.
3. After unloading trees, they shall be watered thoroughly and protected from excessive heat or cold. Do not allow rootball to freeze or dry out.
4. If the trees are not to be planted for several days or weeks, they should be watered every 3-4 days and again immediately before planting.
5. Remove the plastic container in which the trees have been growing prior to planting. Rough up the sides and bottom of planting hole so roots can penetrate the soil. Position tree in hole with top of root mass level with top of mound. Backfill hole with loose soil.
6. Trees planted between October 1 and December 10, will require the application of a slow release fertilizer after trees are dormant in late fall or winter. 1 tablespoon of Scottfield fertilizer 27-3-6 with IBDU or equal applied to the soil around the base of the trees is recommended.
7. Install 4'x4' weed mat, if desired.
8. Install 24" tree guard around tree, if desired.
9. Planted trees should be watered daily for 7 to 10 days, then watered every other day for the next 2 weeks (or the equivalent in rainfall).

RPM TREE PLANTING DETAIL

