Proposed Seven Hills Surface Coal Mine, Warrick County, Indiana (IDNR S-00357)
404/401 Permitting Interagency Pre-Application Meeting (12/19/07)
Presentation Document

Applicant:
United Minerals, LLC
P.O. Box 400 (Mailing)
409 Van Buren Street (Shipping)
Huntingburg, Indiana 47542
Office (812) 683-5024
Fax (812) 683-5049

Contact: Rich Montgomery

Agent:
Eco-Tech Consultants, Inc.
102 W. Court Ave.
Jeffersonville, Indiana 47130
Office (812) 280-2200
Fax (812) 280-2201

Contact: Lee Droppelman

---

1. Description of Proposed Project

1.1. Regional Setting

The permit area comprises approximately 2,182 acres of forested and previously mined property located in Warrick County, Indiana, on the eastern shelf of the Illinois Basin. The site is within the Southern Wabash Lowlands of the Interior River Lowland EPA Ecoregion (72c). This Level IV Ecoregion is characterized as having undulating to rolling topography with many wide, shallow valleys. Relict dunes and wind-blown silt deposits occur in the west, and shale and sandstone bedrock is exposed in the east. Ecoregion 72c is further characterized by its long growing season and neutral to acid soils. Originally, oak-hickory forests grew on the well drained upland soils while western mesophytic forests occurred on more poorly-drained soils. Today, the woodland has been mostly cleared for corn, soybean, wheat, livestock, and vegetable farming as well as extensive surface coal mines. Altitude ranges between about 350 to 600 feet above mean sea level regionally and between about 382 and 460 feet within the project area. (Fig 1 - County Map and Fig 2 - Ecoregion Map)

1.2. Surrounding Landuse

Surrounding landuses include previously mined areas to the east and the northeast of the permit area, agricultural areas to the south, west and northwest of the permit area, and forested areas along Pigeon Creek. The permit area lies approximately 13 miles northeast of the City of Evansville, Indiana.
(Fig 3 - Vicinity Map)

1.3. Site Description

The proposed Seven Hills Permit area is located south of Seven Hills Road (CR 750N) and north of Booneville-New Harmony Road (CR 400N) on the Daylight, Lynnville, Booneville, and Elberfeld, Indiana USGS topographic quadrangles. The permit area is largely U-shaped with the western portion located just west of Pigeon Creek and the eastern portion running north /south along Wasson Road. The area lies within the Highland-Pigeon Creek drainage basin (HUC 05140202).
(Fig 4 – Permit Area aerial)

1.3.1. Pre-Mined Area

Within the proposed permit area there are two distinct areas of prior surface mining activity. The areas lie within the southern and eastern sections of the permit area. Peabody Coal Co. conducted the most recent mining in 1996 on the eastern portion of the permit area as part of their surface mining operations of the Lynnville mine. Amax Coal Co. conducted surface mining operations from 1973-1989 on the southern portion of the permit area as a part of their Ayrshire Mine, Millersburg Pit. Ingle Coal Corp conducted underground mining operations at the Ditney Hill mine from 1940 to 1965. Very little information is known about the extent of the underground mining and the associated reclaimed areas. Prior land uses of the mined areas are not known. Given the topography of the area it is assumed the area was originally forested.

Currently, vegetation, where present, is typical of natural succession in mined areas consisting mostly of voluntary grasses, weeds and trees. When mining ceased the land was reclaimed mostly as large vast final cut pit impoundments and wildlife/forest cover types. Most areas appear to have very little if any top soil. (Fig 5 – Pre-Mined Areas)

1.3.2. Un-Mined Area

The currently un-mined section lies in the northwestern portion of the permit area. The majority of the un-mined section is forested, however a small portion is actively farmed. Several remnant Pigeon Creek sloughs are present throughout. In general the western portion lies predominantly within the floodplain of Pigeon Creek and is often flooded. Recreational ATV use is prevalent throughout the area, and numerous trails, tracks, ruts, and mud holes can be observed. In addition, some berm/drainage ditch construction along and parallel to the west top bank of Pigeon Creek has been observed and is assumed to have been associated with past mining in the area.
(Fig 6 – Recoverable Coal Area)

1.4. Purpose and Need

The Seven Hills Mine is a multi-seam surface mine with a high quality economically feasible coal reserve consisting of ~10.2 million recoverable tons. It will provide a source of high quality coal for long term coal supply agreements with regional electric utility companies worth between $250 to $300 million. The Seven Hills mine will provide ~66.75 billion kilowatt hours of electricity, enough energy to power 657,492 households for ten years. Currently, ~50% of the electricity produced in the United States and 95% of the electricity produced in Indiana is generated from coal use. The mining operation will provide continuous employment for approximately 105 employees at United Mineral's declining Somerville mine complex. The annual payroll is approximately $8 million. Additionally, the mine operation will provide approximately $2,265,000 in federal, $260,000 in state, and $55,000 in county revenue taxes per year. County property taxes will be paid in the amount of $125,000 per year. For the five year life of the mine, United Minerals will pay over $13 million in taxes and will be a significant consumer for many local suppliers and vendors.

1.5. Proposed Mining Activities

Overburden and parting removal will be accomplished with a combination of dozers, loaders, hydraulic shovels and haul trucks in a direct haulback operation. Once soils have been removed as required by applicable SMCRA regulations, the overburden and parting will be placed in a previously excavated pit. The pits will usually be 100-200 ft. wide and range in length from 400-4,000 ft. Backfilling and rough

grading will typically be completed within 180 days of pit completion. Mining within the permit area will occur initially in the IC#1 mining sequence. Prior to commencement of mining in the IC#1 sequence, the existing previously mined pit will be partially or completely dewatered. The IC#1 pit will then advance northward and later in a northwesterly direction and will terminate in the location of Final Cut #1 as depicted on Figure 7. The existing previously mined pit will be reclaimed utilizing materials excavated from the IC#1 pit.
(Fig 7 – Mining Plansheet)

1.5.1. Infrastructure

Two haul/access roads will be constructed. The first will be 4,800 ft. in length and the second will be 10,800 ft. in length.

1.5.2. Production

Annual Anticipated Coal Production:	2,000,000 Tons (at full production)
Total Coal Production from Permit:	10,200,000 Tons

1.5.3. Timeline

Production is currently scheduled to begin in 2010 and end in 2016.

1.5.4. Reclamation and Grading

The reclaimed surface configuration will be similar to pre-mining in the floodplain areas with some swell occurring in upland areas and previously-mined areas. Drainage patterns will approximate pre-mining patterns and the mined area will blend with the surrounding terrain. The areas mined will be backfilled and graded to blend with the surrounding area to approximate the pre-mine contours, and complement drainage patterns. On previously mined areas to be affected by mining activity, soil resources from the un-mined areas will be utilized to enhance the capability of the area to support forest and wildlife habitat. Reclamation of these areas will be completed to compliment surrounding un-mined areas and areas that are disturbed and subsequently reclaimed under this permit.

2. <u>On-site Regulated Environmental Features</u>

2.1. Jurisdictional Waters

A jurisdictional waters determination was performed by ETC personnel in June of 2006. Wetlands were delineated according to the 1987 Corps of Engineers Wetland Delineation manual and were characterized according to Cowardin classification. Streams were identified from mapping conventions and walking surveys over the site. Located channels were categorized according to flow regime with geomorphological data collected to determine Rosgen classifications and post-mining restoration goals.
(Fig 8 – JWD Map)

2.1.1. Wetlands

Wetlands were delineated into four groups: palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine aquatic bed (PAB), and palustrine forested (PFO).

Forty-three (43) PEM wetlands totaling 40.75 acres were delineated. These PEM wetlands are persistent, emergent, and semi-permanently flooded/saturated (PEM1F). Hydrologic indicators include

inundation, saturation, water marks, and drainage patterns. PEM soils are generally Orthents, with some Bonnie and Stendal silt loams. Dominate vegetation includes: southern water plantain (*Alisma subcordatum*), Frank's sedge (*Carex frankii*), buttonbush (*Cephalanthus occidentalis*), green ash (*Fraxinus pennsylvanica*), spotted touch-me-not (*Impatiens capensis*), soft rush (*Juncus effusus*), rice cut grass (*Leersia oryzoides*), giant reed (*Phragmites australis*), wool grass (*Scirpus cyperinus*), and broad-leaf cattail (*Typha latifolia).*

Fourteen (14) PSS wetlands totaling 91.40 acres were delineated. These wetlands are classified as palustrine, scrub-shrub, and semi-permanently flooded/saturated (PSS1F). Soils consist of a dark gray matrix (N 6.5/1) with abundant mottles (10YR 5/4). Hydrologic indicators include inundation, saturation, and drainage patterns. Dominate vegetation includes: swamp milkweed (*Asclepias incarnata*), false nettle (*Boehmeria cylindrica*), Frank's sedge (*Carex frankii*), silky dogwood (*Cornus amomum*), buttonbush (*Cephalanthus occidentalis*), green ash (*Fraxinus pennsylvanica*), deciduous holly (*Ilex decidua*), giant reed (*Phragmites australis*), wool grass (*Scirpus cyperinus*), and broad-leaf cattail (*Typha latifolia).*

Four (4) PAB wetlands totaling 7.77 acres were delineated. These PAB wetlands are classified as palustrine, rooted aquatic bed, and permanently flooded (PAB3H) and palustrine, floating bed, permanently flooded (PAB4H). Dominate vegetation includes: lizard's tail (*Saururus cernuus*), long-leaf pondweed (*Potamogeton nodosus*), duckweed (*Lemna minor*), and pickerel weed (*Pontederia cordata*).

Nine (9) PFO wetlands totaling 622.73 acres were delineated. Wetlands are classified as palustrine, broad-leaved deciduous forest, and seasonally flooded/saturated (PFO1E) and palustrine, broad-leaved deciduous forest, and saturated (PFO1B). Soils consist of a gray matrix (10Y 3/1) with mottles (10YR 4/4). Hydrologic indicators include inundation, saturation, and drainage patterns. Dominate vegetation includes: box elder (*Acer negundo*), silver maple (*Acer saccharinum*), green ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*), cottonwood (*Populus deltoides*), and common elderberry (*Sambucus canadensis*).

2.1.2. Streams

There are 16 jurisdictional streams within the permit boundary (ten intermittent, three perennial, and three ephemeral; Table 1). The streams meander through the forested wetland in the upper portion of the western side of the permit area. They are characterized as slow-moving, primarily silt bedded, and with high rates of sinuosity where not channelized. Pigeon Creek located along the east side of the un-mined area, was historically channelized during the operational period of the Wabash and Erie Canal.

2.1.3. Open Water

Seven (7) open water areas, palustrine unknown bottom (PUB) were delineated. Total open water area is 146.22 acres.

Table 1. Jurisdictional Stream Summary within the Seven Hills Permit Area

Stream	Length (ft)	Flow Regime	Channel Substrate	Rosgen Class.
1	10,600	Intermittent	Silt	E6
1.1*	2,630	Intermittent	Silt	E6
1.2*	4,050	Intermittent	Silt	E6
1.3*	440	Intermittent	Silt	E6
1.4*	1,800	Intermittent	Silt	C6
2	3,060	Intermittent	Silt	E6
3	2,150	Intermittent	Silt	E6
4	2,330	Intermittent	Silt	E6
5	590	Intermittent	Gravel	E4
6.0**	1,120	Perennial	Silt	E6
7	1,014	Perennial	Silt	E6
8	221	Ephemeral	Cobble	n/a
9	476	Ephemeral	Silt	n/a
10	210	Intermittent	Silt	E6
11.0**	6,637	Perennial	Silt	E6
12	1,070	Ephemeral	Silt	n/a

*These streams are tributaries of Stream 1.0.
**Two reaches of Pigeon Creek within the permit area.

2.1.4. Jurisdictional Waters Summary

Table 2. Wetlands, Streams, and Open Water within the Seven Hills Permit Area

Waters of the U.S.	Classification	Number	Unit
Wetlands (ac.)	PFO	9	622.7
	PSS	14	91.4
	PEM	43	40.8
	PAB	4	7.8
Subtotal		*70*	*762.7*
Streams (l.f.)	Ephemeral	3	1,767
	Intermittent	10	27,860
	Perennial	3	8,771
Subtotal		*16*	*38,398*
Open Water (ac.)	PUB	7	146.2
Subtotal		*7*	*146.2*

2.2. State/Federal Endangered Species

2.2.1. County List (IDNR/USFWS)

A list of 38 species designated as endangered, threatened, or rare by the USFWS or the state of Indiana and occurring in Warrick County is provided in Table 3 and includes two mussels, two reptiles, 13 birds, two mammals, and 19 vascular plants. Among these, only three species have current (as of 11/22/05) federal status in Warrick County, Indiana; the sheepnose mussel (*Plethobasus cyphyus*) is a candidate for federal listing, the copperbelly watersnake (*Nerodia erythrogaster neglecta*) is listed as federally threatened north of the 40th parallel, and the Indiana bat (*Myotis sodalis*) is listed as federally endangered (www.endangeredwildlife.in.gov, accessed 31 October 2007).

Based on numerous site visits, ETC biologists have additionally designated habitat presence/absence for each species in Table 3.

Table 3. Species designated as endangered, threatened, or rare by the state of Indiana and occurring in Warrick County, Indiana with current Federal and state status.

Species Name	Common Name	Federal Status	State Status	Habitat Present
Mollusks: Bivalvia (Mussels)				
Plethobasus cyphyus	Sheepnose	C	SE	No
Pleurobema cordatum	Ohio Pigtoe	none	SSC	No
Reptile				
Nerodia erythrogaster neglecta	Copperbelly Water Snake	LT (part.)	SE	Yes^
Opheodrys aestivus	Rough Green Snake	none	SSC	Yes
Bird				
Ammodramus henslowii	Henslow's Sparrow	none	SE	Yes^
Asio flammeus	Short-eared Owl	none	SE	Yes*^
Botaurus lentiginosus	American Bittern	none	SE	Yes
Buteo lineatus	Red-shouldered Hawk	none	SSC	Yes
Circus cyaneus	Northern Harrier	none	SE	Yes
Dendroica cerulea	Cerulean Warbler	none	SSC	Yes
Helmitheros vermivora	Worm-eating Warbler	none	SSC	No
Ictinia mississippiensis	Mississippi Kite	none	SSC	No
Ixobrychus exilis	Least Bittern	none	SE	Yes
Lanius ludovicianus	Loggerhead Shrike	none	SE	Yes
Nyctinassa violacea	Yellow-crowned Night Heron	none	SE	No
Rallus limicola	Virginia Rail	none	SE	No
Tyto alba	Barn Owl	none	SE	Yes
Mammal				
Myotis sodalis	Indiana Bat	LE	SE	Yes^
Sylvilagus aquaticus	Swamp Rabbit	none	SE	Yes

Vascular Plant				
Bacopa rotundifolia	Roundleaf Water-hyssop	none	ST	Yes
Carex bushii	Bush's Sedge	none	ST	Yes
Carex socialis	Social Sedge	none	SR	Yes
Catalpa speciosa	Northern Catalpa	none	SR	Yes
Clematis pitcheri	Pitcher Leather-flower	none	SR	Yes
Dicliptera brachiata	Wild Mudwort	none	SE	Yes
Didiplis diandra	Water-purslane	none	SE	Yes
Eleocharis wolfii	Wolf Spikerush	none	SR	Yes
Festuca paradoxa	Cluster Fescue	none	ST	Yes
Hypericum denticulatum	Coppery St. John's-wort	none	ST	Yes
Iresine rhizomatosa	Eastern Bloodleaf	none	SR	Yes
Krigia oppositifolia	Dwarf Dandelion	none	ST	Yes
Nothoscordum bivalve	Crow-poison	none	SR	No
Perideridia americana	Eastern Eulophus	none	SE	
Poa wolfi	Wolf Bluegrass	none	SR	
Stenanthium gramineum	Eastern Featherbells	none	ST	
Taxodium ditichum	Bald Cypress	none	ST	Yes^
Thalictrum puescens	Tall Meadowrue	none	ST	
Trachelospermum difforme	Climbing Dogbane	none	SR	

Federal Status: LE = Endangered; LT = Threatened; C = Candidate; P = Proposed
State Status: SE = State Endangered; ST = State Threatened; SR = State Rare; SSC = State Species of Special Concern
*Non-breeding resident
^Positively identified by ETC biologists

2.2.2. Indiana Bat Surveys

The methods used to conduct summer habitat field surveys for Indiana bats follow the mist netting guidelines (Appendix II) in the Agency Draft Indiana Bat (*Myotis sodalis*) Revised Recovery Plan (USFWS 1999 and 2007), requiring one net site per kilometer (0.6 mile) of stream or two net sites per square kilometer (247 acres) of forested habitat. The total acreage of the study site is 2,150 acres and contains forested areas estimated at 790 acres. The original plan was to survey 10 mist net sites, but due to high rates of Indiana bat capture success, only 6 sites were required by the Bloomington Field Office (BFO) of the USFWS for this study.
(Fig 9 – Indiana Bat Survey Map)

Six mist net sites were surveyed during phase I in 2006. One site was located along an abandoned section of Seven Hills Road at the northern edge of the study area, four sites were located over trails near Pigeon Creek and tributaries within the central portion of the study area, and one site was located within the riparian area along Pigeon Creek near the southern end of the study area. During phase II in 2007, five mist net capture sites were surveyed. Two sites were established over remnants of Seven Hills Road in the vicinity of Pigeon Creek, two sites were established over other dirt roads south of Seven Hills Road near Pigeon Creek, and one site was established over Pigeon Creek and along an adjacent abandoned road berm, south of Seven Hills Road. Capture survey sites included closed-canopy mixed-hardwood stands adjacent to Pigeon Creek, closed-canopy mixed hardwoods wetlands in the vicinity of Pigeon Creek, and a trail adjacent to an unnamed tributary of Pigeon Creek.

A single lactating female Indiana bat was captured at Site 1 in the northern end of the study area on 20 June 2006. Nine lactating female Indiana bats were captured at Site 2 on 19 June within the riparian area near Pigeon Creek in the southern end of the study area. Three lactating female Indiana bats were captured at Site 3 on 20 June within a forested section of Pigeon Creek midway down the study area. A lactating female that had originally been equipped with a transmitter at Site 1 was recaptured at Site 4 after having shed the transmitter on 21 June. In total 13 lactating female Indiana bats were captured at four sites, including one recapture, in 2006 and no Indiana bats were captured in 2007. Three of the four sites where Indiana bats were captured were established over water-filled tire ruts on trails or abandoned roads within forested portions of the study area.

Thirteen reproductive female Indiana bats were trapped in phases I and II; four Indiana bats were radiotracked. Three of these bats used one maternity roost tree and one of them was tracked to the vicinity of a secondary roost tree. The maternity roost was monitored for four consecutive evenings (June 21 – June 24) and resulted in counts of 142 bats (June 21), 106 bats (June 22), 123 bats (June 23), and 111 bats (June 24). Both roost trees used by the bats were located south, but within 2.5 miles, of the Permit Area. Roost #1 was a dead eastern cottonwood (dbh = 32 inches) located in a wetland approximately 0.85 miles south of Site 1 and approximately 820 feet east of Pigeon Creek, which is the nearest available flight corridor. This roost tree had a large amount of exfoliating bark and the majority of the bats roosted under the bark along a 6-foot long horizontal crevice approximately 30 feet above the ground. Other bats were roosting under a smaller portion of exfoliating bark approximately 35 feet above the ground. Evidence from this investigation suggests the Pigeon Creek, its tributaries, and the associated floodplain is suitable summer habitat for reproductive female Indiana bats.

There has been no formal coordination with the USFWS Bloomington Field Office (BFO) to date. However, all capture data has been reported to the Indiana Department of Natural Resources and the BFO as required by the Scientific Collecting Permit.

2.3. Cultural Resources

Approximately 98% of the permit area has been studied for archeology and historic properties. Within the studied area two historical areas were located. One area is Pigeon Creek where it intersects with the former Wabash and Erie Canal and the other area is along the northern permit boundary. No archeological findings are expected in the non-studied portion of the permit area.
(Fig 10 - Cultural Resources)

2.4. Floodplains

Approximately 75% of the western portion of the permit area is contained within the FEMA 100-year floodplain. Flood storage volume reduced by proposed Pigeon Creek control levees constructed as part of the mining operations will be off-set by enhancing the capacity and flow-through capability along a series of abandoned sediment basins along the floodway east of Pigeon Creek.
(Fig 11 - Floodplain Map)

3. Proposed Impacts and Alternatives Analysis

3.1. Site Determination

The Seven Hills site was chosen for the following reasons:

- Low overburden to coal ratio
- High volume of coal per acre of disturbance
- Large surface mineable reserve
- Replaces coal production from other nearby facilities
- Most of the permit area is already controlled
- Existing local market
- Close proximity to multiple transportation options

3.2. Minimization and Avoidance - Proposed On-Site Activities

Three coal seams are present in this reserve. The top two (2) seams are not minable utilizing underground methods due to either restrictive seam thickness and/or the overburden strata being too unstable for safe extraction. With the top seams rendered un-minable, pure economics then do not allow for underground mining of the lowest seam due to a combination of factors which include significant mine development costs(including seam recovery facilities construction, infrastructure and support facilities construction), seam thickness and limited recovery rate approximating 50% or less(common with this method). Auger mining is not a feasible alternative either, as it would still require numerous pits and support areas to be excavated and less than 50% of the coal reserve could be recovered from only one of the seams, as compared to the surface mining method. Augering causes delays and additional costs in reclamation and inconsistent coal production. If this reserve is not mined utilizing surface mining methods, it will likely be sterilized forever.
(Fig 7 – Mining Plan Sheet)

The applicant proposes no direct alterations to the mainstem of Pigeon Creek and the adjacent floodplain within 200 ft from the top of the west bank. The only exception is a maximum width of 300' disturbance for a haul road crossing over Pigeon Creek. Although additional coal recovery is practicable between the proposed levees and Pigeon Creek, the 200 ft buffer will be maintained as is to minimize impacts to aquatic resources and provide an intact, contiguous wildlife corridor to natural areas north and south of the permit area. The buffer to Pigeon Creek is a substantial commitment towards the avoidance of sensitive resources. Levee staging could allow for considerable additional coal recovery and revenue to the operation. The applicant, however, recognizes the importance of maintaining the existing habitat to offset temporal losses that will result from the proposed operation.

Site constraints and economically recoverable coal seam boundaries dictate usage of the remainder of the western permit area for mining activities. Non extraction activities will be minimized to the extent possible by locating sediment basins, diversions, soil stockpiles, etc. as close to the area of extraction as is practical. After careful consideration, no alternatives to the planned disturbance are available without leaving a large volume of high quality coal reserve and additionally incurring very large avoidance costs. The size of the area to be disturbed to facilitate coal removal has been minimized significantly to the degree possible. Mitigation is proposed for all regulated disturbances.

3.3. Proposed Impacts to Waters of the U.S.

Table 4. Summary of proposed impacts to jurisdictional waters

Waters of the U.S.	Classification	Number	Value	Avoided Waters	Proposed Impacts
Wetlands (ac)	PFO	9	622.7	215.5	407.2
	PSS	14	91.4	57.2	34.2
	PEM	43	40.8	37.5	3.3
	PAB	4	7.8	7.8	0.0
Subtotal		*70*	*762.7*	*318.0*	*444.7 ac*
Streams (lf)	Ephemeral	3	1,767	697	1,070
	Intermittent	10	27,860	3,300	24,560
	Perennial	3	8,771	8,771	0
Subtotal		*16*	*38,398*	*12,768*	*25,630 lf*
Open Water (ac)	PUB	7	146.2	121.5	24.7
Subtotal		*7*	*146.2*	*121.5*	*24.7 ac*

4. Compensatory Mitigation of Waters

To the maximum extent possible, attempts have been made to reduce the project footprint on the available jurisdictional features. Where impacts to jurisdictional features are unavoidable, the determination and compensatory mitigation of functions and values attributed to the aquatic feature will be proposed. The applicant is committed to employing current, scientifically-sound methodologies to ensure the proper quantification of impacts and replacement needs.

4.1. Wetlands

4.1.1. Context of Proposed Impacts in the Pigeon Creek Watershed

Within the Pigeon Creek watershed there are approximately 14,600 acres of forested wetlands mapped in the National Wetland Inventory GIS data base. Forested wetlands within the Seven Hills Permit area comprise 4.3% of this total. Proposed impacts make up 2.8%. The area of recoverable coal resources found beneath mapped forested wetlands within Pigeon Creek drainage is approximately 2,530 acres. Proposed impacts at Seven Hills would remove 16.1% of this coal resource. Thus, over 12,000 acres of forested wetland are not proposed for future surface coal mining. Additionally, much of the 2,530 acres of recoverable coal at forested wetland sites is preserved under publically-managed easements and private ownership.
(Fig 12 - Pigeon Creek Recoverable Coal Resources; Fig 13 - Pigeon Creek Wetlands; and Fig 14 - Pigeon Creek Wetlands and Recoverable Coal)

4.1.2. Assessment of Functions and Values - The HGM Process

Ainslie's Hydrogeomorphic (HGM) Assessment for the Western Coal Field Physiographic Province was applied to existing on-site wetland resources and proposed mitigation sites. The HGM approach assesses wetlands and assigns a particular Functional Capacity Index (FCI) for that wetland. Using the measured data for 27 physical and biological parameters (sub-indices) at several representative locations, eight Functional Capacity Indices (FCIs) were calculated to determine baseline quality of wetlands.

Function 1: Temporarily store surface water.
Function 2: Maintain characteristic subsurface hydrology.
Function 3: Cycle nutrients.
Function 4: Remove and sequester elements and compounds.
Function 5: Retain particles.
Function 6: Export organic carbon.
Function 7: Maintain characteristic plant community.
Function 8: Provide wildlife habitat.

HGM Sub-Indices

1. Wetland tract (Vtract)
2. Interior core area (Vcore)
3. Habitat connections (Vconnect)
4. Floodplain slope (Vslope)
5. Floodplain storage volume (Vstore)
6. Macrotopographic features (Vmacro)
7. Overbank flood frequency (Vfreq)
8. Floodplain roughness (Vrough)
9. Soil integrity (Vsoilint)
10. Water table fluctuation (Vwtf)
11. Water table depth (Vwtd)
12. Water table slope (Vwtslope)
13. Subsurface water vel. (Vsoilperm)
14. Subsurface storage vol. (Vpore)
15. Surface water connect. (Vsurfcon)
16. Soil clay content (Vclay)
17. Redoximorphic features (Vredox)
18. Tree biomass (Vtba)
19. Tree density (Vtden)
20. Snag density (Vsnag)
21. Woody debris biomass (Vwd)
22. Log biomass (Vlog)
23. Understory biomass (Vssd)
24. Ground veg. biomass (Vgvc)
25. "O" horizon biomass (Vohor)
26. "A" horizon biomass (Vahor)
27. Plant species comp. (Vcomp)

Data measured from each wetland type at the Seven Hills site was used to obtain an overall quality rating (0.0-100.0) for each wetland. (See Table 5).

A Functional Capacity Unit (FCU) is a measure of the functionality of wetlands. The FCU is used to quantify the amount of gain or loss in wetland function for disturbed, enhanced, and restored wetlands, to establish restoration goals for created or enhanced wetlands, and to determine the amount of credit or deficit resulting from restoration efforts. The deficit or credit FCU units determine the area necessary to mitigate during wetland restoration or enhancement.

Table 5. Seven Hills Wetland FCI and FCU values

Wetland type	Area (ac)	FCI	FCU Impact
PEM 1	3.99	0.68	2.71
PEM 2	0.93	0.68	0.63
PFO 1	407.22	0.89	362.50
PSS 2	1.44	0.79	1.14
PSS 3	0.38	0.79	0.30
PSS 4	0.47	0.79	0.37
PSS 5	2.08	0.79	1.64
PSS 6	11.50	0.79	9.09
PSS 7	18.36	0.79	14.50
Total	**446.37**		**392.89**

A system was developed whereby mean FCI scores for each representative wetland type were multiplied by the total acreage of similar quality wetlands to produce a Functional Capacity Units (FCUs) to be used in the compensatory mitigation process. This system allows the incorporation of quality and acreage into one quantifiable value.

An estimated value (FCU) of loss during the permitted activities was calculated by adjusting each of the 27 variables based on experience and scientific literature. Conversely the same can be performed, but in reverse, at potential mitigation sites. Current conditions at a proposed site would be assessed and then FCI scores predicted based on the proposed restoration plan. Thus, the gain or ecological lift can be quantified. The end result is a FCU loss at impact sites and a FCU gain at mitigation sites. Thus a debit/credit system is developed and a specific framework is available in determining success criteria. In-house test runs involving full-scale restoration of prior-converted farmlands and total loss of on-site wetland function produced an approximate 2:1 acreage ratio.

ETC has reviewed several hundred acres of potential mitigation properties. On-site it is proposed to restore approximately 450 acres (1 : 1 ratio) of forested wetland during post-mining activities. This figure would assume a reasonable loss of suitable restoration potential and the application of current scientific research on the stabilization (physical and chemical) of post-mining soils. Off-site opportunities have been investigated, and, currently, over 200 acres of company owned lands have been identified as ideal for wetland restoration within the Pigeon Creek (HUC 05140202) and Little Pigeon Creek (HUC 05140201) watersheds. We anticipate 250 acres of additional full-scale restoration opportunity will be needed for mitigation.

Below we have provided an example of an off-site restoration initial evaluation used in determining suitability. (Fig 15 - Proposed Mitigation Site 1)

Proposed Mitigation Site 1

Location:
Squaw Creek floodplain south of New Harmony Road, divided north/south by Interrieden Road, and west/north of State Street.

8-Digit Hydrologic Unit Code (HUC):
05140202 – Pigeon Creek

Acreage Evaluated:
Site 1a (pond west of Wasson Road) – 15 acres
Site 1b (central large property) – 200 acres
Site 1c (north of State Street) – 35 acres
Total –250 acres

Soils:
Site 1a is largely impounded. Mapped soil series is altered.

Site 1b is a fairly large agricultural area bisected by several roads, stream channels, a rail line, and poorly defined physical property boundaries. Soils include areas of poorly drained Bonnie and somewhat poorly drained Bartle (very high and high potential), moderately well drained Wilbur (fair potential), and somewhat poorly drained Stendal and Wakeland (moderate potential).

Site 1c is 32 acres of Stendal (moderate).

Hydrology:
Site 1a is impounded. Dam lowering would retain hydrology and potentially provide overbank flooding from access from Pigeon Creek. Site is likely too wet for forest restoration.

Site 1b has numerous stream channels, roadside ditches, swales, and agricultural drainage ditches. Additionally several drainage tile outlets were located. Streams are dredged and bankfull flows do not reach the floodplain. Microtopography easily restored.

Site 1c is bisected by stream channels and roadside ditches are present. No tiles were observed but may be present upon closer inspection.

Site constraints:
Site 1a should only be considered as a last result. Without significant re-grading, the removal/lowering of pond dam will not likely foster development of hardwood wetlands, the type-goal of our restoration need.

Site 1b has undefined property boundaries throughout. Hydrological alterations may adversely affect adjacent property owners. Bisecting road beds appear to be below grade of the floodplain. Berming may be needed.

Site 1c has similar constraints to Site 1b.

Overall Restoration Potential:
App. 180 acres of moderate to very high success potential bottomland hardwood restoration

Additional Properties:
App. 100 acres of restoration opportunity exist in adjacent, un-owned property.

4.2. Streams

All stream channels will be returned to their approximate pre-mine position. Stream designs will be accomplished by Rosgen-trained geomorphologists incorporating natural channel design principles and pre-impact reference data collection. Where pre-mine streams were found to be in a degradational condition, parameters including cross-section, plan, and profile will be evaluated for potential modification prior to construction. We expect that, except for riparian vegetative maturity, stream dimensions will be improved upon during the course of the design phase.

5. Endangered Species Coordination

While the presence of the Indiana bat has been established within the proposed Seven Hills surface mine, tree clearing activities are not expected to reduce the available foraging and maternity habitat for the species to critical levels. Within 1.0 kilometer of the known maternity tree, no impacts are proposed by the Applicant to 776 acres of potential Indiana bat habitat. Within 2.5 kilometers, less than 1% of the 4,851 acres of potential habitat will be affected. Finally, within 5.0 kilometers, just a little over 1% of the 19,406 acres of potential habitat will be affected by the surface mine.
(Fig. 16 - Potential Indiana Bat Summer Habitat Map)

The applicant is committed to the protection and conservation of Indiana bat. As such, several components of an Indiana bat Protection and Enhancement Plan are under consideration pending agency communication, feasibility evaluation, and final permit application preparation.

5.1. Protection and Enhancement Plan

The Applicant's 404 permit application package will contain proposed measures to reduce the potential effect to Indiana bats. These measures will be adapted from Indiana bat Protection and Enhancement Plans (PEP) specific to the coal mining industry in place for the states of Kentucky (draft), West Virginia, and Tennessee. No such plan is currently in use in Indiana. PEP's are designed to aid the coal mining industry in understanding the options and protocol associated with mining in areas containing known or potential habitat for Indiana bats, and to provide guidance in meeting permitting and performance standards as specifically related to Indiana bats.

The guidelines are developed by the USFWS from each state in cooperation with the state fish and wildlife agencies and U.S. Office of Surface Mining. In participating states, the applicant uses these guidelines to create a PEP that best fits the circumstances of the mining operation. Certain objectives will be met when preparing a PEP and include, minimizing potential to take an Indiana bat, and short term habitat replacement lost during the mining operation, long term habitat replacement by enhancing

the Indiana bat habitat that previously existed on the site, and considering foraging and drinking needs. Various forms of habitat preservation, enhancement, and/or preservation are being considered

6. Summary

The proposed Seven Hills surface mine will be an operation with a high quality economically feasible coal reserve consisting of ~10.2 million recoverable tons. With a payroll of more than $8 million, total taxes paid in excess of $13 million, and 66.75 billion kWh of resulting electricity, the mine will have an economic benefit that will be felt not only locally, but throughout southwestern Indiana.

Displaced sensitive and regulated environmental features from the site are of great concern to the Applicant, and, as such, unique measures such as HGM assessment of wetland functions and values are being employed to accurately compensate for their temporary decline. To date over 600 acres of wetland mitigation areas have been identified. Stream channels will be replaced incorporating natural channel design techniques. In many cases, rebuilt stream channels will have better habitat structure and stability parameters than before it was disturbed.

Habitat conservation measures for federally-listed species are being developed, and when implemented are expected to provide a long-term improvement in the quality and quantity of suitable areas for the fulfillment of their life history requirements.

No historical or archeological sites have been identified within the disturbance area of the mine.

FIGURES

Figure 1. Indiana County Map
Figure 2. Indiana Level IV Ecoregion Map
Figure 3. Seven-Hills Vicinity Map
Figure 4. Seven-Hills Permit Area
Figure 5. Pre-Mined Area
Figure 6. Recoverable Coal Area
Figure 7. Mining Plansheet
Figure 8. Seven-Hills Jurisdictional Waters Map
Figure 9. Indiana Bat Survey Map
Figure 10. Archaeology Investigation
Figure 11. Pigeon Creek FEMA 100 Year Floodplain
Figure 12. Recoverable Coal within Pigeon Creek Watershed
Figure 13. Present Day Wetlands within Pigeon Creek Watershed
Figure 14. Present Day Wetlands within Recoverable Coal Area
Figure 15. Potential Mitigation Site 1
Figure 16. Indiana Bat Potential Summer Habitat Map

Figure 1. Indiana County Map

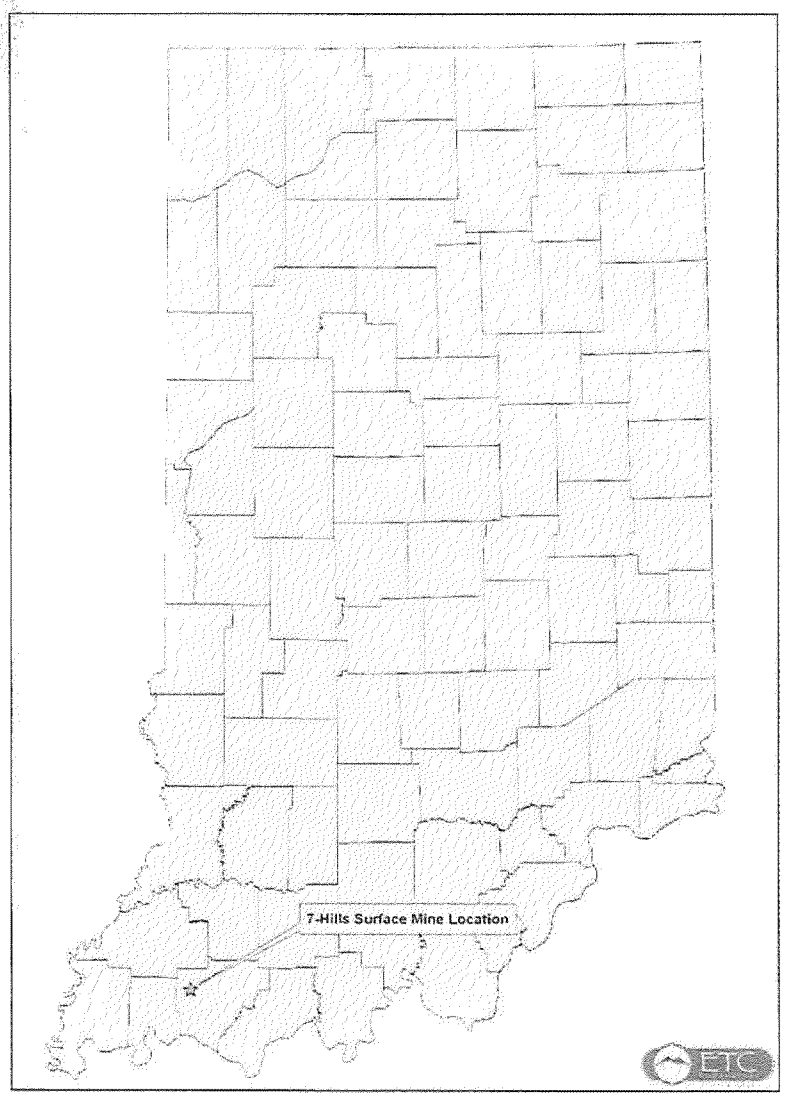
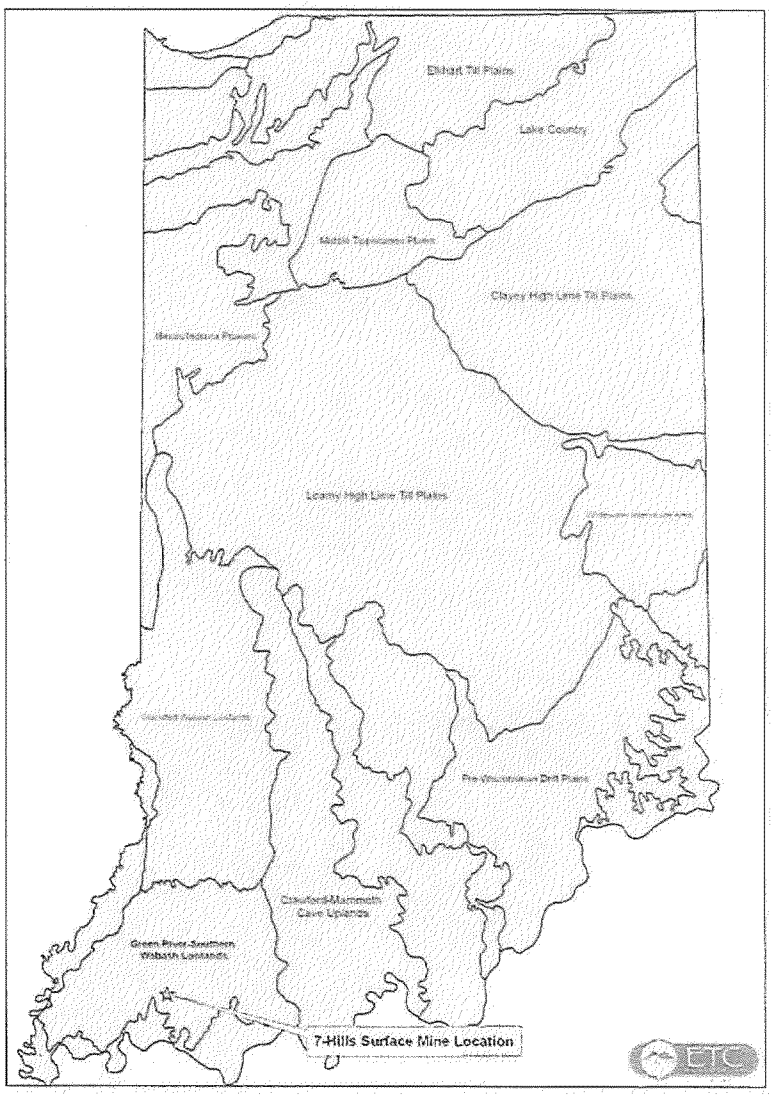


Figure 2. Indiana Level IV Ecoregion Map



EPA-R5-2017-0081491NT_0000088

Figure 3. Seven-Hills Vicinity Map

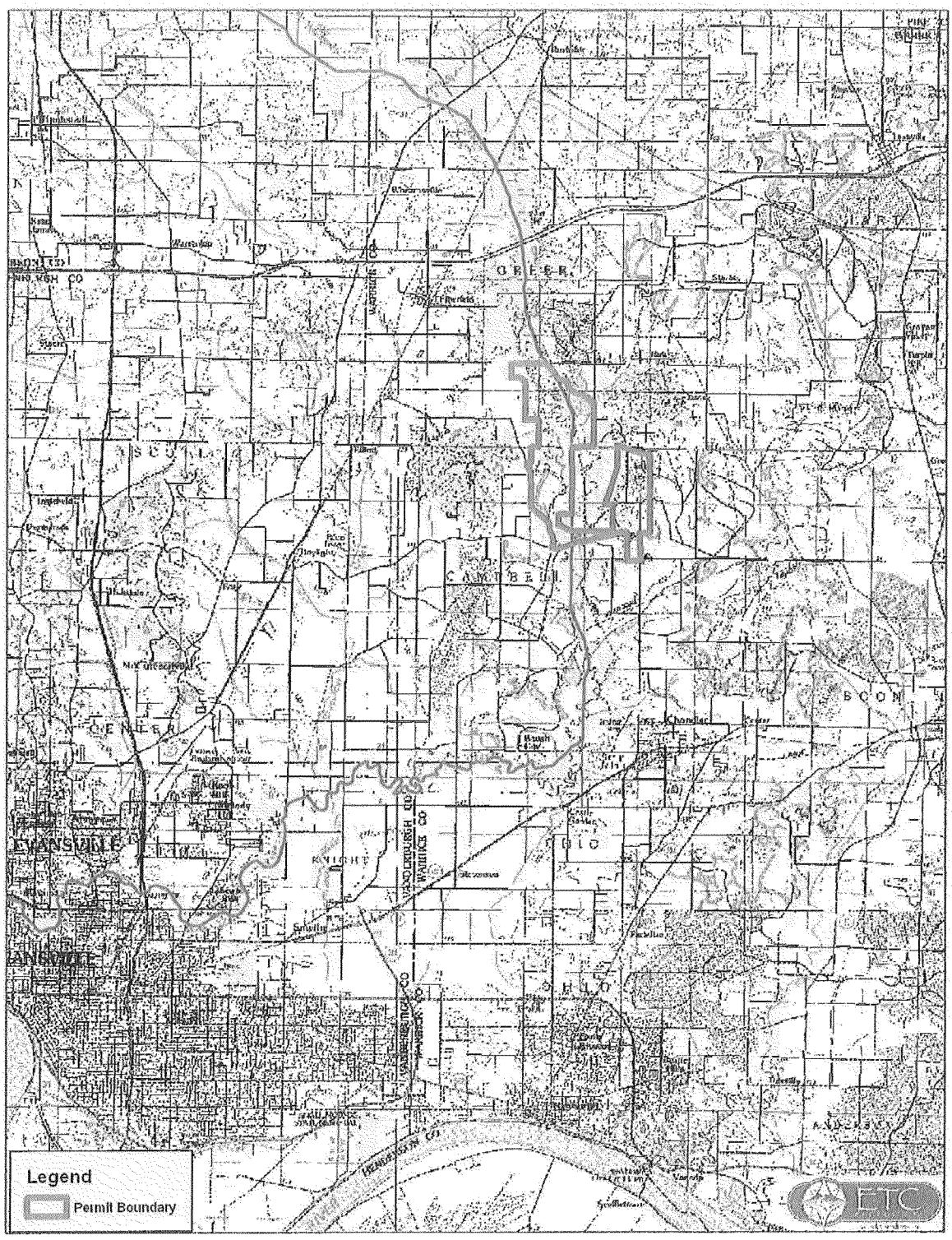


Figure 4. Seven-Hills Permit Area

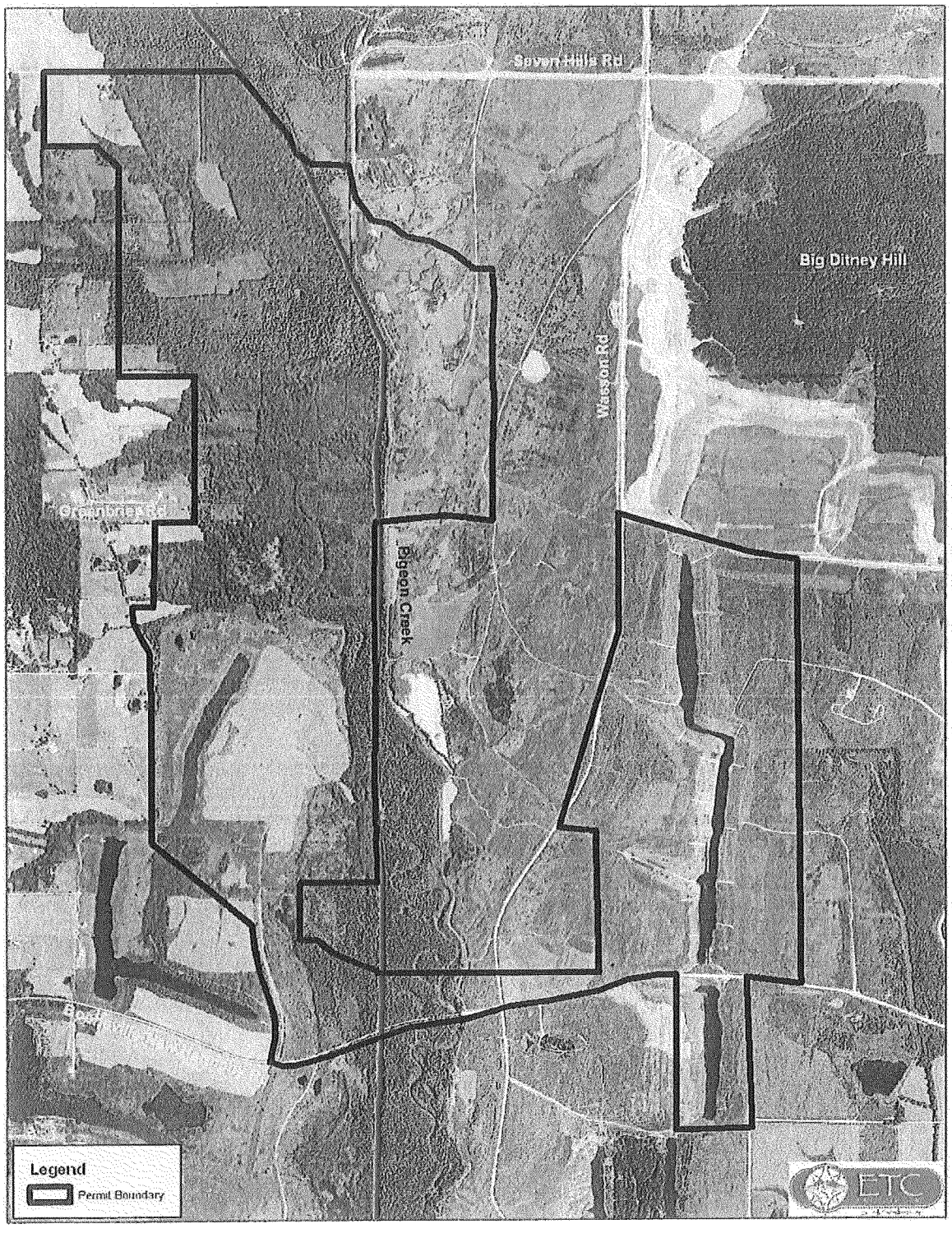


Figure 5. Pre-Mined Area

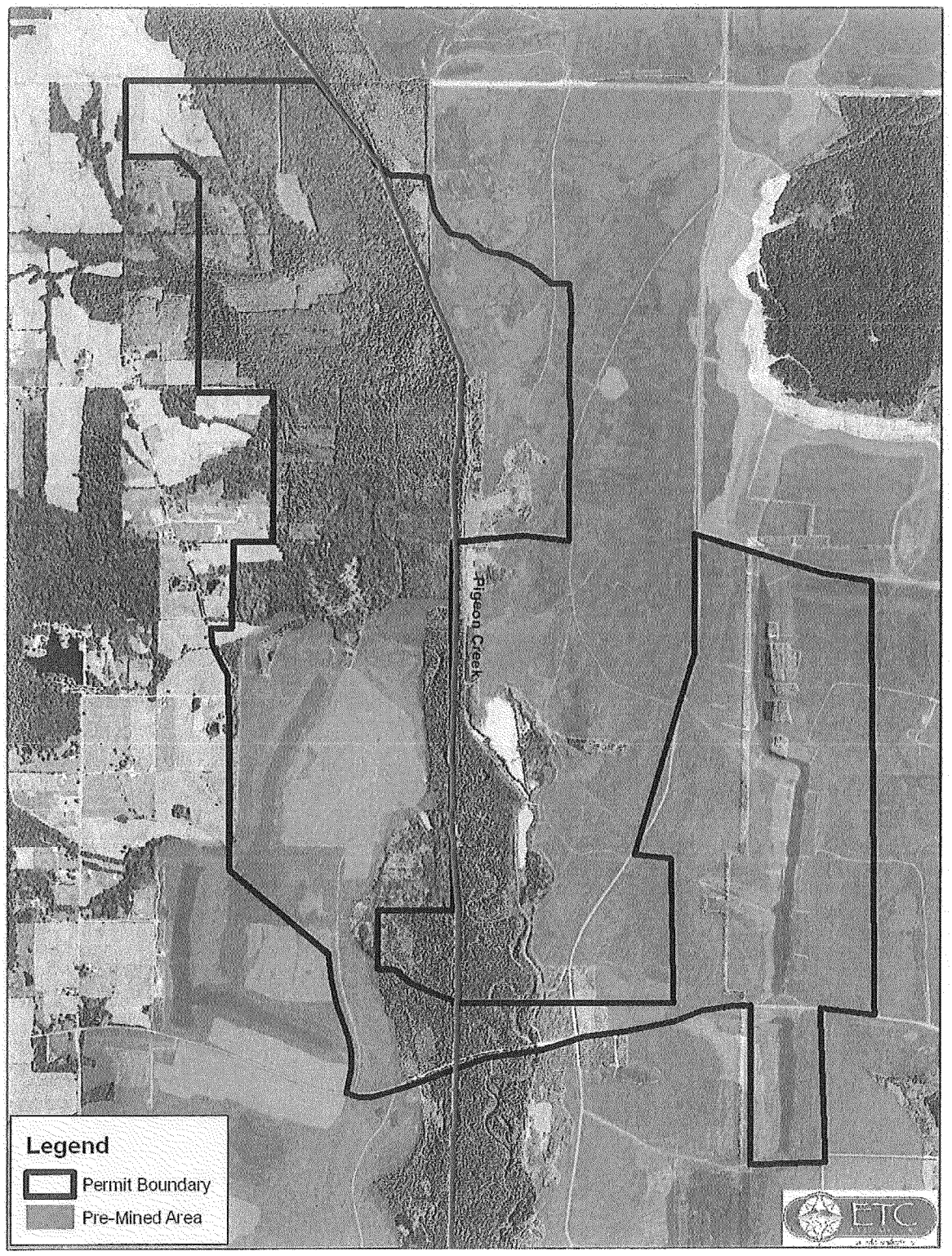
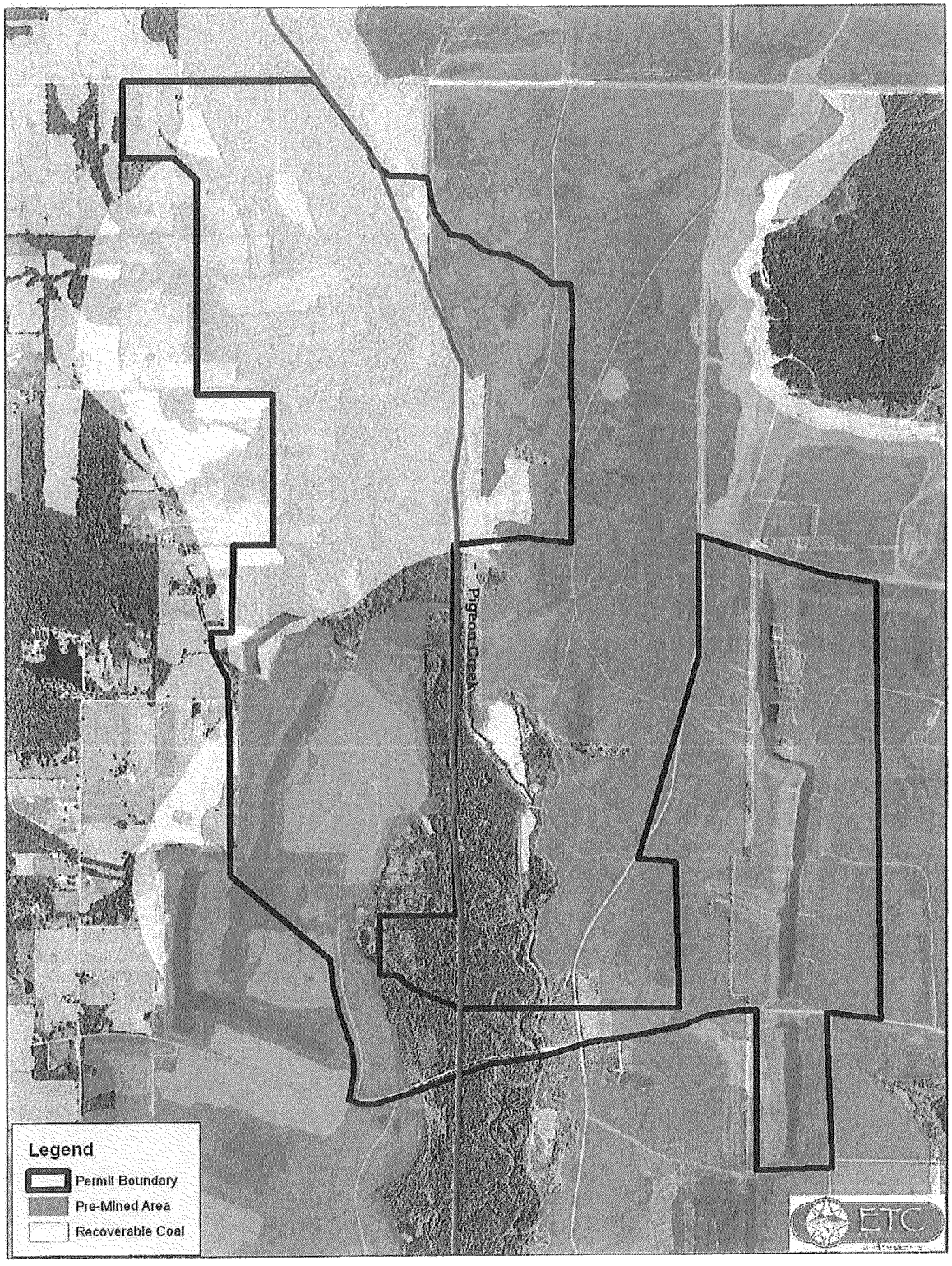


Figure 6. Recoverable Coal Area



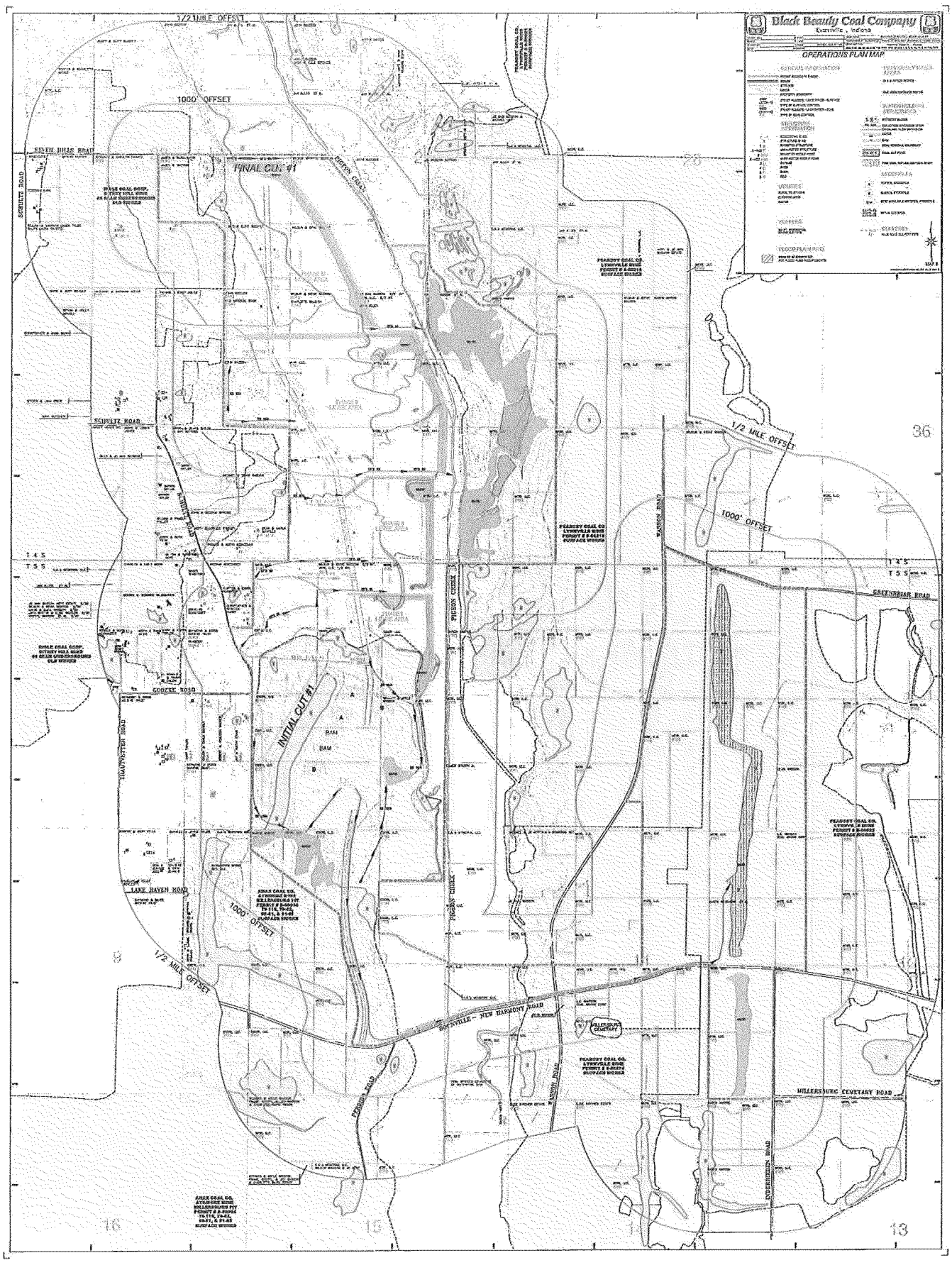

Black Beauty Coal Company
Evansville, Indiana
OPERATIONS PLAN MAP
1/2 MILE OFFSET
1000' OFFSET
SEVEN HILLS ROAD
FINAL CUT #1
SCHULTE ROAD
INITIAL CUT #1
PIGEON CREEK
GREENBRIAR ROAD
LAKE HAVEN ROAD
EVANSVILLE - NEW HARMONY ROAD
MILLERSBURG CEMETARY ROAD
36
9
16
15
13

Figure 8. Seven-Hills Jurisdictional Waters Map

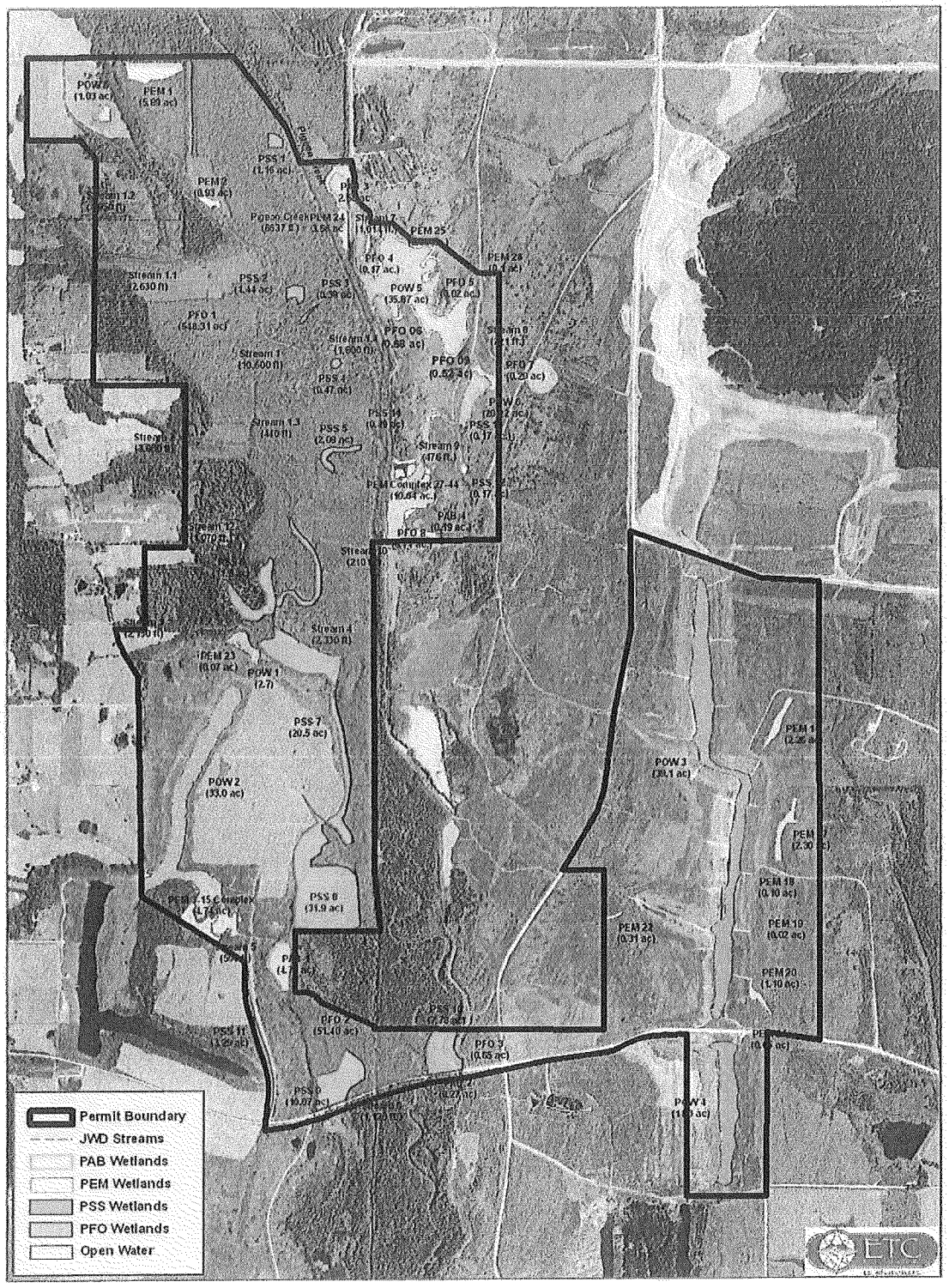


Figure 9. Indiana Bat Survey Map

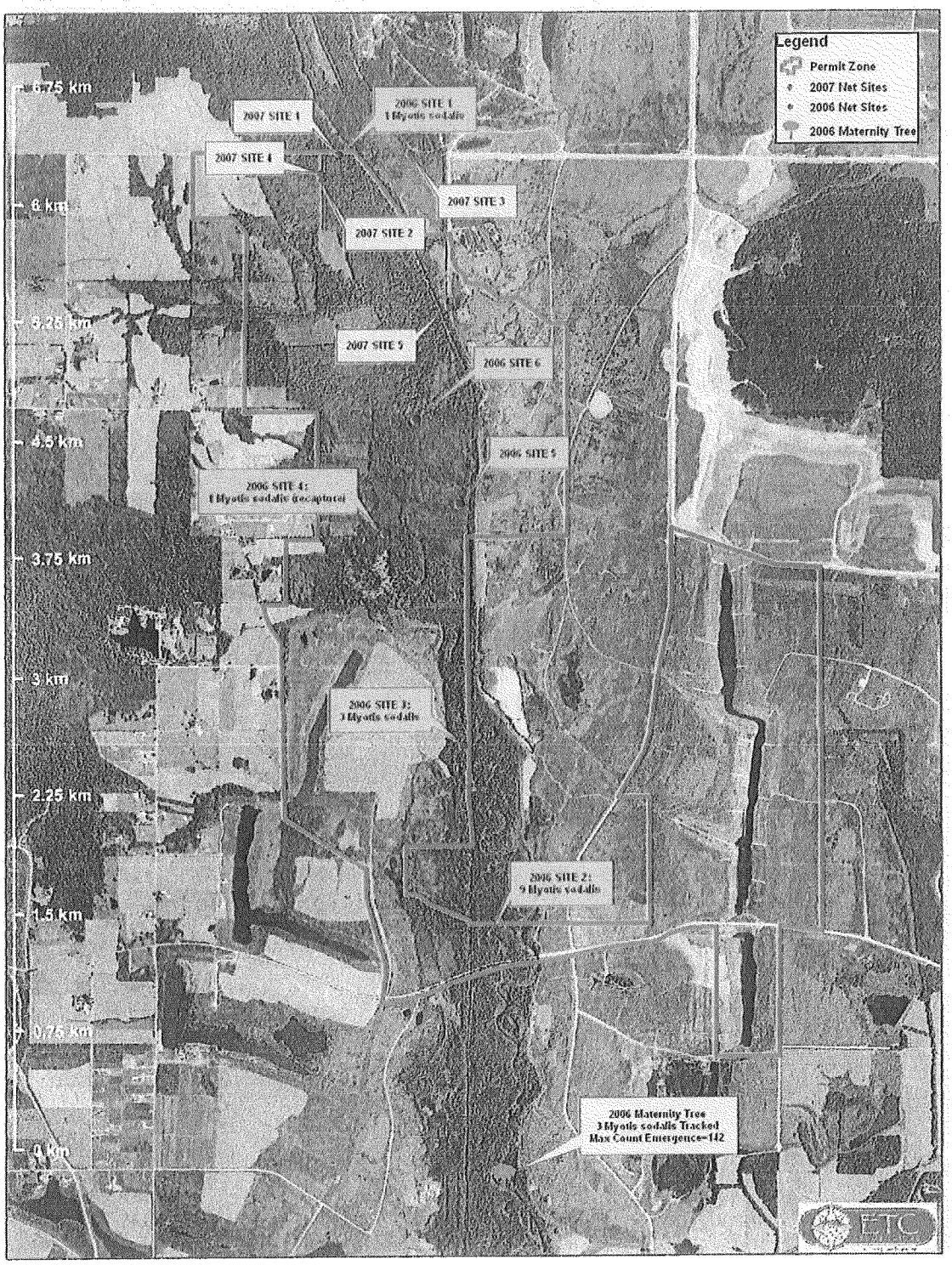


Figure 10. Archaeology Investigation

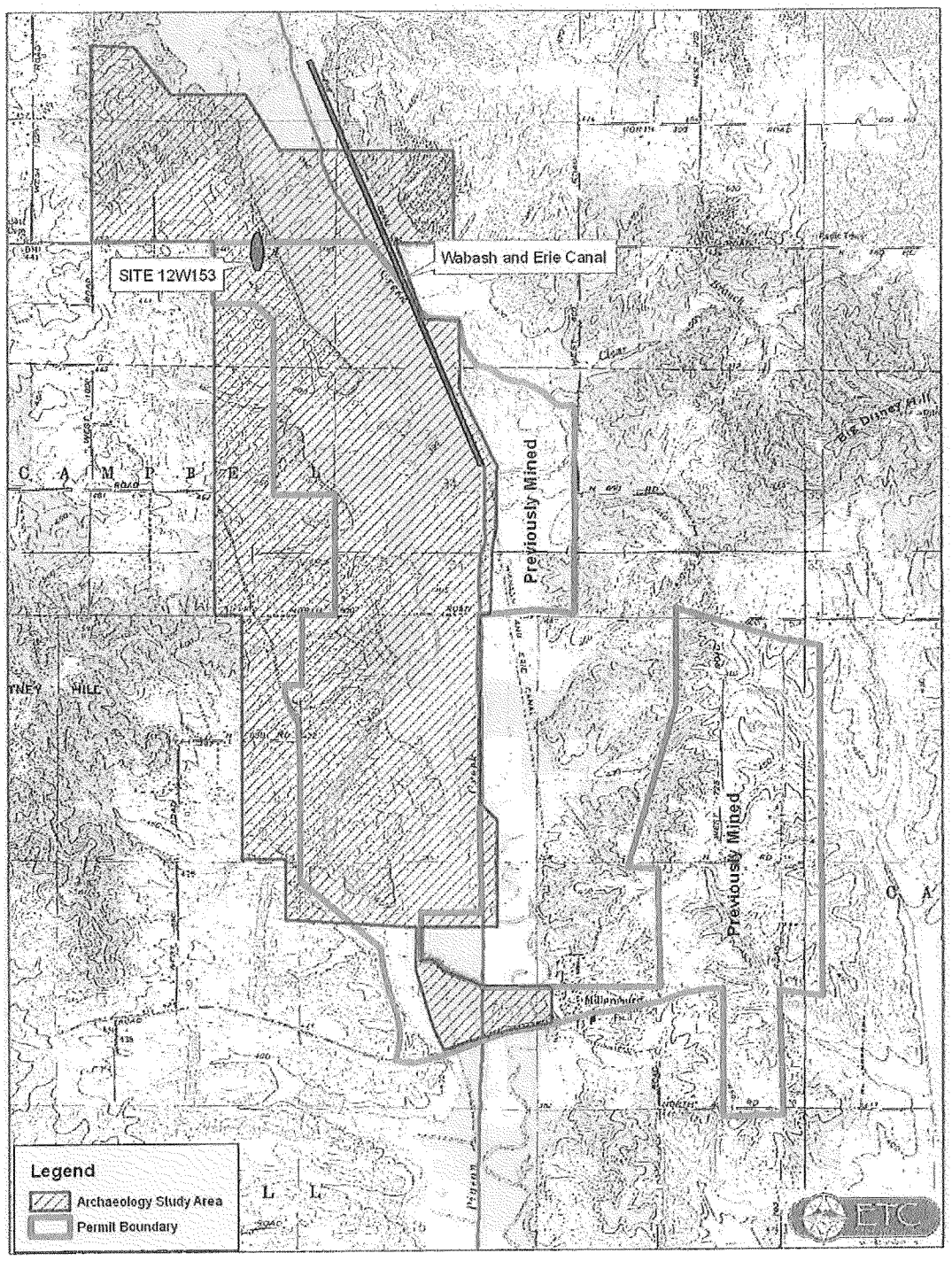


Figure 11. FEMA 100 Year Floodplain within Pigeon Creek Watershed

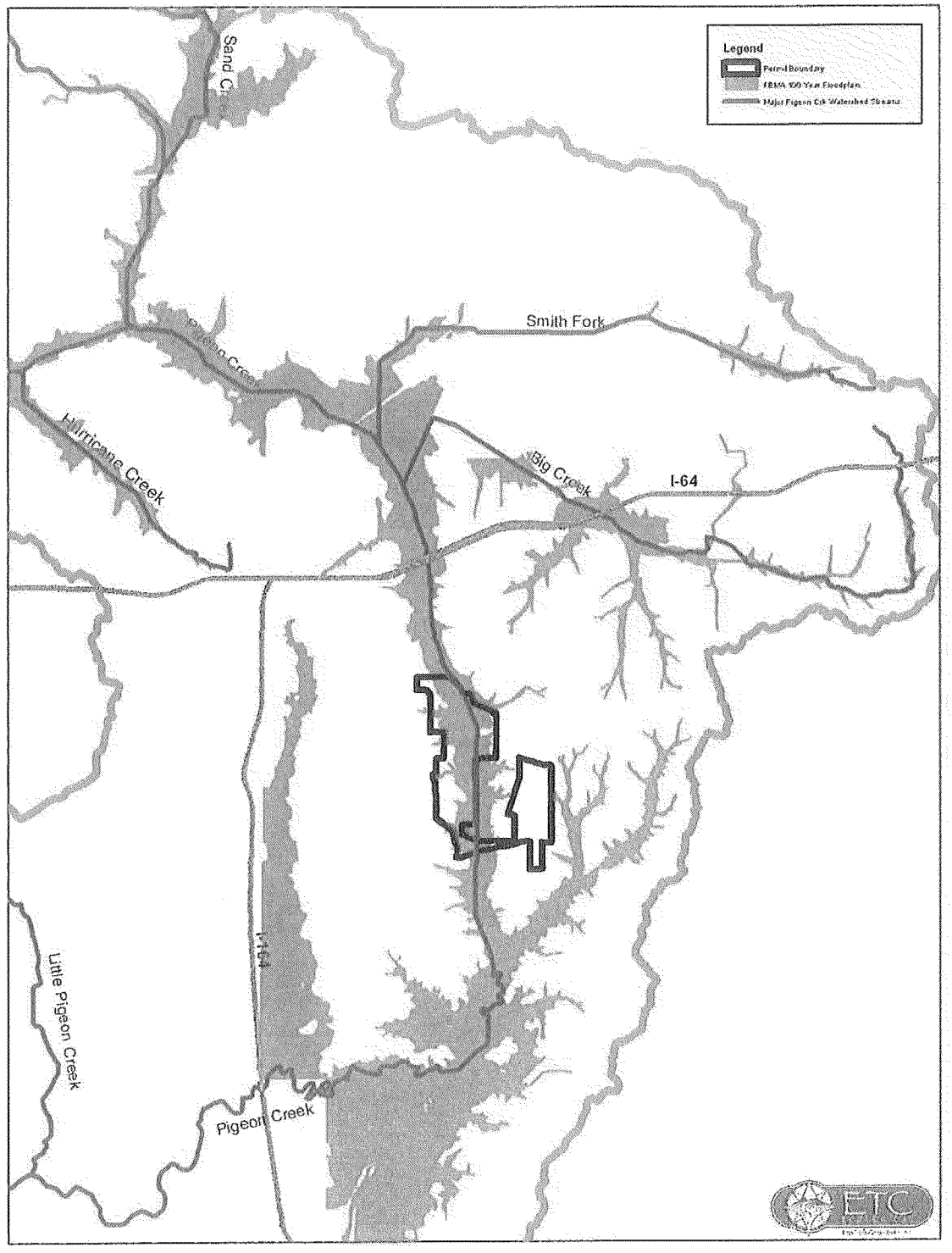


Figure 12. Recoverable Coal within Pigeon Creek Watershed

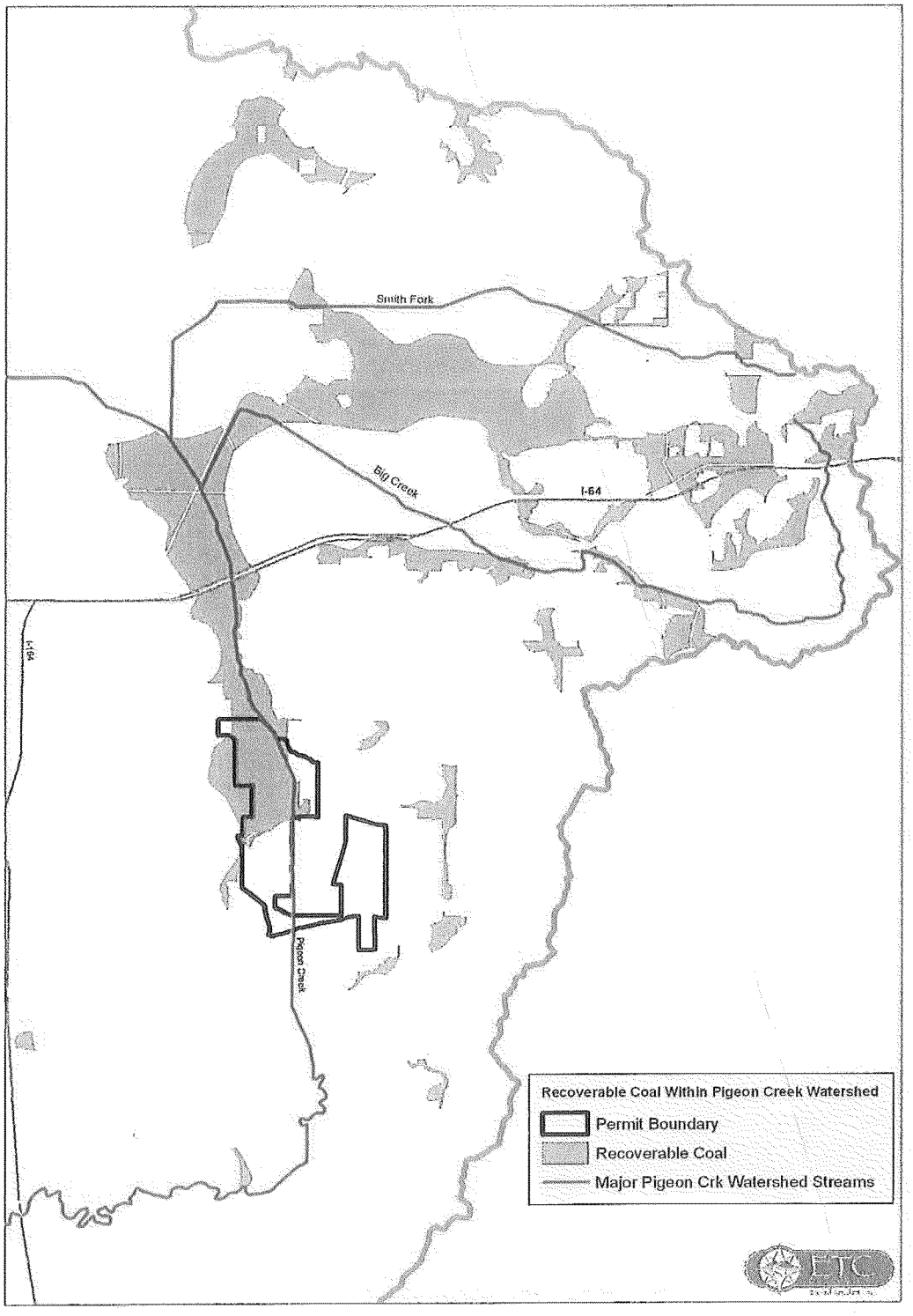


Figure 13. Present Day Wetlands within Pigeon Creek Watershed

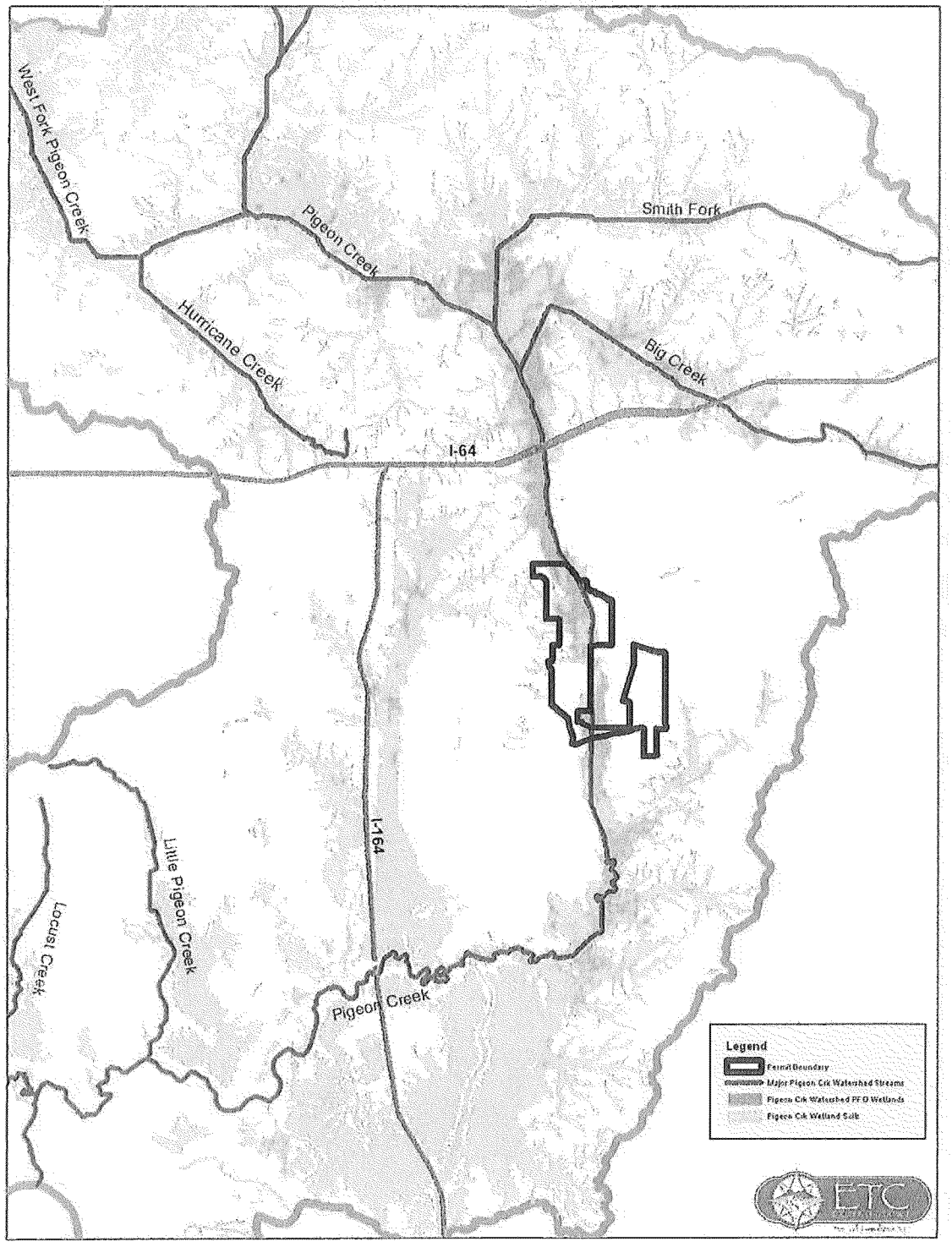


Figure 14. Present Day Wetlands within Recoverable Coal Area

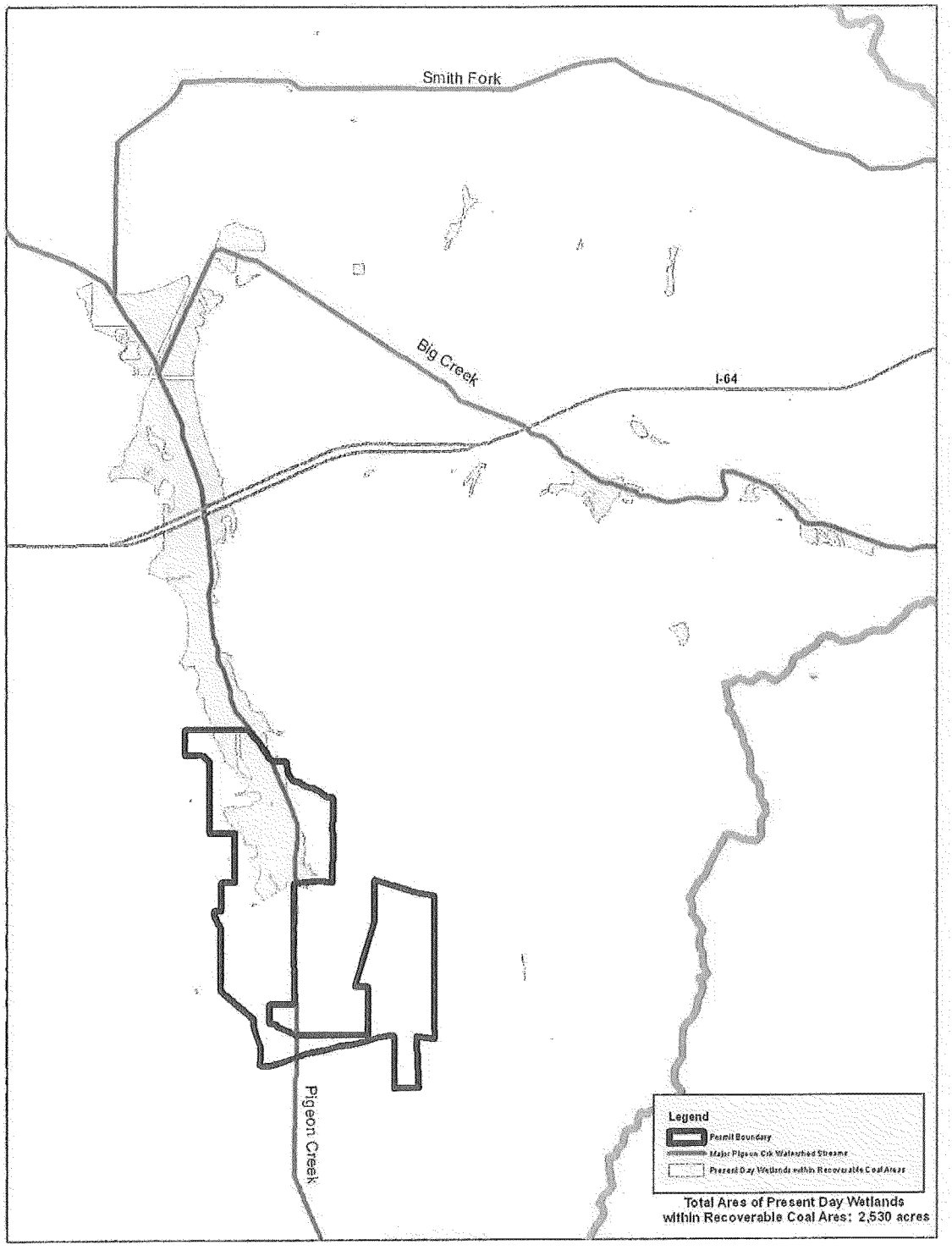


Figure 15. Proposed Mitigation Site 1

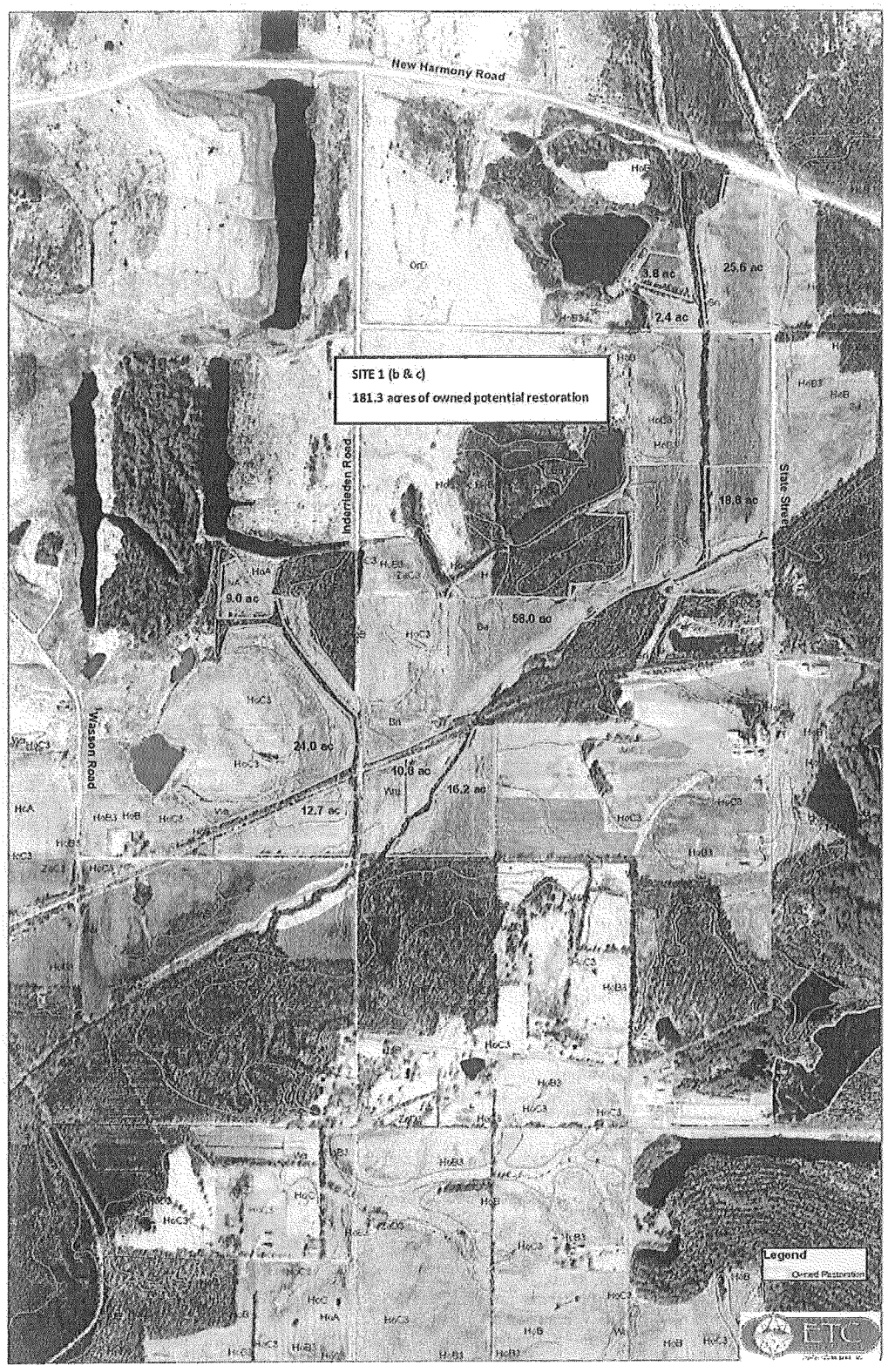
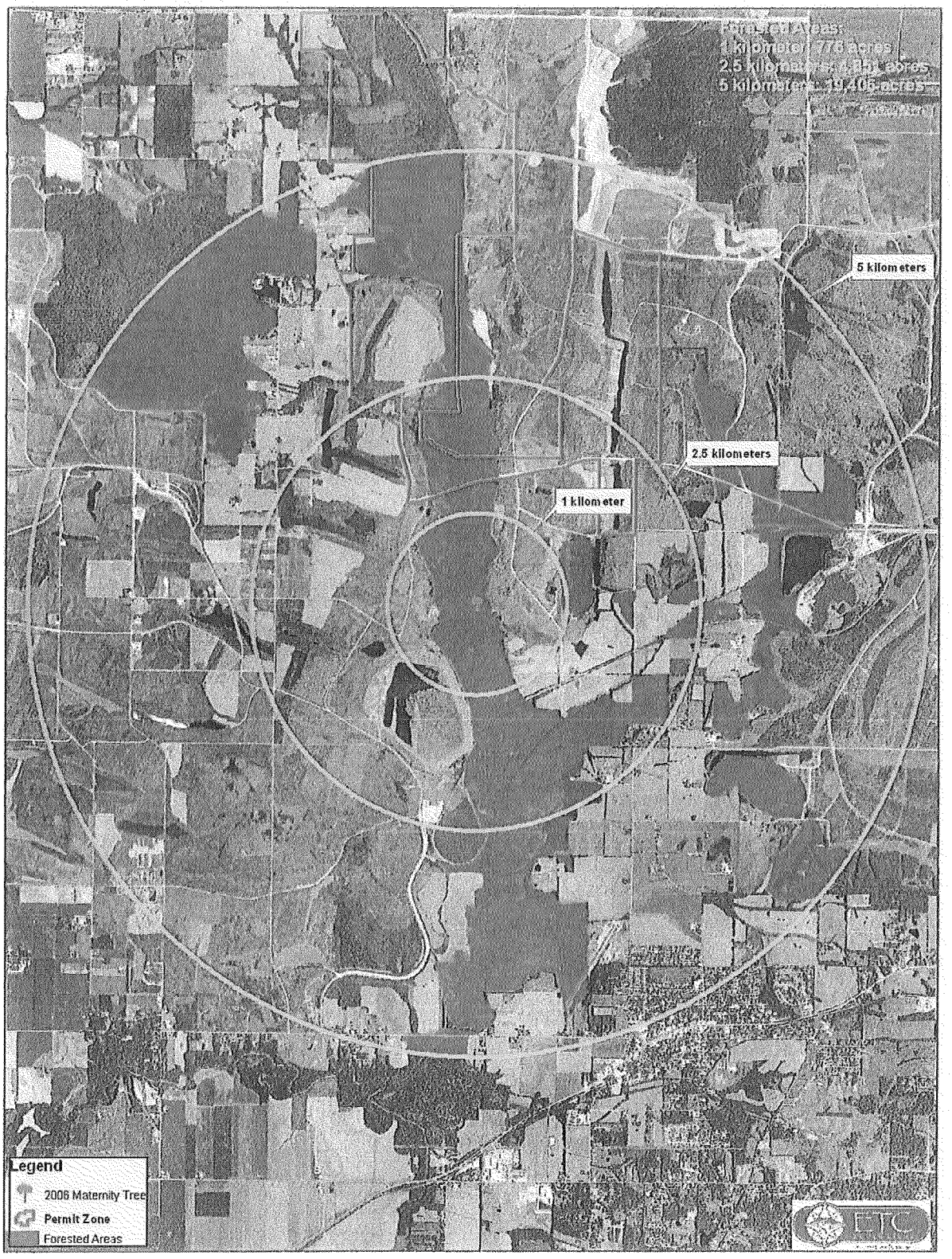



Figure 16. Indiana Bat Potential Summer Habitat Map