REX East Project

Biological Assessment

Rockies Express Pipeline, LLC **Docket No. CP07-208-000**

Federal Energy Regulatory Commission
Office of Energy Projects
Washington, DC 20426

March 2008

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Environmental Review and Compliance Branch II
888 First Street, NE
Washington, DC 20426

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ACRONYMS

BA	biological assessment
BCF/D	billion cubic feet per day
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973, as amended
ESO	Ecological Field Service Office
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
HDD	Horizontal Directional Drilling
MLV	Mainline Valve
MMS	Minerals Management Service
MP	Milepost
NEPA	National Environmental Policy Act
NHI	Natural Heritage Inventory
NOAA Fisheries	National Marine Fisheries Service
NWR	National Wildlife Refuge
OEP	Office of Energy Projects
PEPL	Panhandle Eastern Pipeline Company
Plan	Upland Construction Plan
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
Project	Rockies Express East Pipeline Project
REX East	Rockies Express East Pipeline Project

1.0 INTRODUCTION

On April 30, 2007, Rockies Express Pipeline, LLC (Rockies Express), a joint venture among Kinder Morgan Energy Partners, L.P., Sempra Pipelines and Storage, and Conoco-Phillips (an equity partner), filed an application with the FERC in Docket Number CP07-208-000 under Section 7 of the Natural Gas Act (NGA), as amended, and Parts 157 and 284 of the Commission's regulations. Rockies Express is seeking a Certificate of Public Convenience and Necessity (Certificate) for its proposed Rockies Express East Pipeline Project (REX East Project) that would include the construction and operation of a pipeline in Missouri, Illinois, Indiana, and Ohio, and construction and operation of compression and ancillary facilities in Wyoming, Nebraska, Missouri, Illinois, Indiana, and Ohio.

On November 23, 2007, the FERC published a draft Environmental Impact Statement (EIS) for the construction and operation of the natural gas pipeline facilities proposed by Rockies Express in Docket No. CP07-208-000. The U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service (FWS), Natural Resources Conservation Service, and Illinois Department of Agriculture are cooperating agencies for the development of the EIS.

Section 7 of the Endangered Species Act of 1973, as amended (ESA) requires federal agencies to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed or proposed species. Under Section 7, the FERC, as the lead federal agency, is required to consult with FWS and the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA Fisheries) to determine whether any federally listed or proposed endangered or threatened species, or their designated critical habitat, occur in the vicinity of a proposed project subject to FERC jurisdiction.

In the event that a federally listed or proposed endangered or threatened species or its designated critical habitat occurs in the vicinity of a "major construction activity" the FERC must prepare a biological assessment (BA) to determine whether the proposed action would affect the listed species. If the BA determines that the proposed action would affect a federally listed or proposed species, then the FERC must enter into formal consultation and obtain a biological opinion from the FWS before taking final agency action.

As the lead federal agency, the FERC is responsible for compliance with the Section 7 consultation process with FWS. However, in accordance with Section 380.13(b) of the FERC's Order 603, the project sponsor is designated as the FERC's non-federal representative for purposes of informal consultation with FWS. As the non-federal representative, Rockies Express has informally consulted with FWS to:

- Clarify whether and which listed, proposed, and candidate species or designated or proposed critical habitats may be in the action area;
- Consider what effect the action may have on these species or critical habitats; and
- Explore ways to modify the action to reduce or remove adverse effects on the species or critical habitats.

As part of informal consultation, Rockies Express submitted a draft Biological Assessment (BA) to the FERC and to FWS in October 2007. Both FWS and the FERC reviewed the draft BA and provided comments to Rockies Express. Rockies Express revised the draft BA and submitted it to the FERC in

February 2008. The FERC reviewed the information and analysis contained in the revised BA, consulted with the FWS on the preliminary findings and ways to modify the action to reduce or remove adverse effects, and prepared this version of the BA for submission to the FWS for their review and concurrence.

The determinations presented in this BA are based on the FERC's independent analysis, commitments and mitigation measures proposed by Rockies Express to reduce or remove adverse effects on the species or critical habitats, and additional conditions developed by the FERC. The FERC determinations of *no effect* or *may affect, not likely to adversely affect* require the written concurrence of FWS. If the FWS does not concur with the FERC determinations, the FERC must enter into formal consultation and obtain a biological opinion from the FWS before taking final agency action.

In accordance with Section 7 of the ESA, through informal consultation with the FWS, Rockies Express initially identified 23 federally listed threatened, endangered, or candidate species as potentially occurring in the Project area. However, since the initial review, 10 of the 23 species identified are no longer being evaluated for the following reasons:

- The bald eagle has become delisted and is now a state-listed species only.
- There is no habitat for the black-footed ferret, Canada lynx, blowout penstemon, and Ute ladies'-tresses orchid at the Arlington Compressor Station in Carbon County, Wyoming, where these species could occur.
- There is no habitat for the black-footed ferret, interior least tern, piping plover, or pallid sturgeon at the Bertrand Compressor Station in Phelps County, Nebraska, where these species could occur.
- The pink mucket pearly mussel and the sheepnose are no longer being evaluated, because the Project would no longer cross Morgan County, OH, where these species could potentially occur.

Detailed information concerning the location of the 13 federally listed or proposed species was obtained based on consultation with federal and state natural resource management agencies, field surveys performed by Rockies Express, and biological assessment reports prepared by Rockies Express and filed with the FERC and FWS. Table 1-1 lists the remaining 13 federally listed or candidate species that may occur in the project area. The state status of these species is also provided in Table 1-1. This BA examines the potential impact of the construction and maintenance of the REX East Project on these 13 species.

TABLE 1-1

Federally Listed Species That Potentially Occur in the Counties Crossed by the REX East Project Pipeline

Species	Federal Status	State Status	Locations Where Species May Potentially Occur
Mammals			
Indiana bat (*Myotis sodalis*)	E	OH/E	All counties crossed by the pipeline route
Birds			
Whooping crane (*Grus americana*)	E	NE/E	Phelps/NE; and IN and OH a/
Mussels			
Fat pocketbook (*Potomalus capax*)	E		Pike, Ralls/MO
Clubshell (*Pleurobema clava*)	E	OH/E	Greene, Pickaway, Fairfield/OH
Fanshell (*Cyprogenia stegaria*)	E	OH/E	Muskingum/OH
Northern riffleshell (*Epioblasma torulosa rangiana*)	E	OH/E	Pickaway/OH
Plants			
Decurrent false aster (*Boltonia decurens*)	T		Pike (MO and IL), Scott/IL
Eastern prairie fringed orchid (*Platanthera leucophaea*)	T	IL, OH/E	All counties crossed by the pipeline in IL
Prairie bush clover (*Lespedeza laptostachya*)	T		All counties crossed by the pipeline in IL
Running buffalo clover (*Trifolium stoloniferum*)	E		Warren/OH
Candidate Species			
Eastern massasauga (*Sistrurus catenatus catenatus*)	C	MO, IL, IN, OH/E	Clinton, Fayette, Greene, and Warren/OH
Rayed bean (*Villosa fabalis*)	C	OH/E	Pickaway, Warren/OH
Spectaclecase (*Cumberlandia monodonta*)	C	IL/T	Pike /MO and IL

a/ This includes an experimental migratory population.

T = Threatened
E = Endangered
C = Candidate for listing as Threatened or Endangered

2.0 PROJECT DESCRIPTION

2.1 PURPOSE

The purpose of the REX East Project is to provide natural gas transportation service for gas produced in the Rocky Mountain gas region from the terminus of the Rockies Express Western Phase Project (REX West Project) (Docket No. CP04-413-000) in Audrain County, Missouri to markets in the midwestern and eastern United States.[1] The terminus of the REX East Project would be in Monroe County, Ohio. The Project pipeline would deliver up to 1.8 billion cubic feet (bcf) per day of gas to other interstate natural gas pipelines. The Project would provide access to an additional 16 inter- and intra-state natural gas pipeline systems at 20 interconnect points. These pipelines serve markets throughout the Midwest and eastern United States. Additional information on the purpose is presented in Section 1.1 in the EIS.

2.2 PROPOSED FACILITIES

The REX East Project would involve construction and operation of both pipeline and aboveground facilities. The environmental analysis presented in this BA evaluates the facilities proposed by Rockies Express as detailed below.

2.2.1 Pipeline Facilities

Table 2.2-1 presents a listing of the pipeline facilities Rockies Express proposes. The REX East Project would comprise approximately 639.1 miles of 42-inch-diameter natural gas pipeline. The pipeline would begin at the proposed Mexico Compressor Station in Audrain County, Missouri (milepost [MP] 0.0), proceed eastward through Illinois and Indiana, and terminate at the proposed interconnect with the pipeline facilities that Dominion Transmission, Inc., Dominion East Ohio, and Texas Eastern Transmission Company operate at the Clarington Hub in Monroe County, Ohio (MP 639.1).

Rockies Express is also proposing to construct laterals and interconnects in order to deliver gas to the customers. The lengths of the laterals and interconnects are included in table 2.2-1.

2.2.2 Aboveground Facilities

Table 2.2-2 presents a list of the aboveground facilities proposed. These facilities are further described below.

[1] Gas from the Rocky Mountains would be transported from the Cheyenne Hub to Audrain County, Missouri by the REX West Pipeline. The REX West Pipeline was approved by the Commission in Docket Nos. CP06-354-000, CP06-401-000, and CP06-423-000 and is currently under construction. When completed, this pipeline will deliver gas from the Rocky Mountain region to Audrain County, Missouri.

TABLE 2.2-1

REX East Pipeline Facilities

Facility and Location (State)	Diameter (inches) a/	Length (miles) b/	MPs c/
Missouri			
Mainline	42	43.1	0.0 – 43.1
Subtotal		**43.1**	
Illinois			
Mainline	42	195.2	43.1 – 238.2
Lateral and Interconnect: Natural Gas Pipeline Company d/	42	0.2	Near 178.7
Interconnect: Ameren Power Company	42	0.1	Near 180.4
Lateral and Interconnect: Trunkline Gas Company	42	<0.1	Near 195.7
Lateral and Interconnect: Midwestern Gas Transmission Company	42	0.2	Near 231.9
Subtotal		**195.7**	
Indiana			
Mainline	42	166.2	238.2 – 404.7
Lateral and Interconnect: Panhandle Eastern Pipeline Company	42	<0.1	Near 274.5
Lateral and Interconnect: Citizen Gas and Coke Utility	42	0.2	Near 305.9
Lateral and Interconnect: Indiana Gas Company	42	<0.1	Near 316.4
Lateral and Interconnect: ANR Pipeline Company	42	<0.1	Near 342.3
Subtotal		**166.4**	
Ohio			
Mainline	42	234.6	404.7 – 639.1
Lateral and 5 Interconnects: Lebanon Hub: includes Columbia Gas, Dominion Transmission, Texas Eastern Transmission, Texas Gas Transmission, and Vectren	42	1.8	Near 444.0
Lateral: Columbia Gas Transmission Company	42	<0.1	Near 539.6
Lateral and Interconnect: Tennessee Gas Company	42	0.7	Near 592.4
Lateral and Interconnect: Dominion Transmission, Inc.	42	<0.1	Near 612.3
Lateral and 3 Interconnects: Clarington Hub: includes Dominion Transmission, Dominion East, and Texas Eastern Transmission Company	42	0.4	Near 639.1
Subtotal		**237.5**	
Project Total		**642.7**	

a/ Diameter of the lateral is 42 inches, the diameter of the interconnects will vary between 8 inches and 24 inches

b/ Length includes the length of all laterals and interconnects at this location

c/ Distance between mileposts does not necessarily equal a mile due to topography and changes in the route.

d/ A lateral is a pipeline which connects the REX East pipeline to the meter station. An Interconnect is a pipeline which connects the meter station to the third-party pipeline.

TABLE 2.2-2 Proposed Aboveground Facilities			
Facility	**Horsepower (hp)**	**MP a/**	**Location (County, State)**
Compressor Stations			
Arlington Compressor Station	19,794	237.0 b/	Carbon, WY
Bertrand Compressor Station	34,210	286.8 c/	Phelps, NE
Mexico Compressor Station	41,000	0.0	Audrain, MO
Blue Mound Compressor Station	35,174	144.1	Christian, IL
Bainbridge Compressor Station	31,654	277.3	Putnam, IN
Hamilton Compressor Station	35,000	437.3	Warren, OH
Chandlersville Compressor Station	19,538	575.0	Muskingum, OH
Meter Stations			
Natural Gas Pipeline Company of America	–	178.7	Moultrie, IL
Ameren Power Company	–	180.4	Moultrie, IL
Trunkline Gas Company	–	195.7	Douglas, IL
Midwestern Gas Transmission Company	–	231.9	Edgar, IL
Panhandle Eastern Pipe Line Company	–	274.5	Putnam, IN
Citizen Gas and Coke Utility	–	305.9	Morgan, IN
Indiana Gas Company	–	316.4	Morgan, IN
ANR Pipeline Company	–	342.3	Shelby, IN
Columbia Gas Transmission Corporation	–	444.0	Warren, OH
Dominion Transmission, Inc.	–	444.0	Warren, OH
Texas Eastern Transmission Company	–	444.0	Warren, OH
Texas Gas Transmission, LLC	–	444.0	Warren, OH
Vectren Company	–	444.0	Warren, OH
Columbia Gas Transmission Corporation	–	539.6	Fairfield, OH
Tennessee Gas Company	–	592.4	Guernsey, OH
Dominion Transmission, Inc	–	612.3	Noble, OH
Dominion Transmission, Inc.	–	639.1	Monroe, OH
Dominion East Ohio	–	639.1	Monroe, OH
Texas Eastern Transmission Company	–	639.1	Monroe, OH

a/ Distance between mileposts does not necessarily equal a mile due to topography and changes in the route.
b/ Milepost represents distance along the REX West route.
c/ Milepost represents distance along the REX Entrega route.

Rockies Express proposes to construct seven new compressor stations as part of the REX East Project. Five would be constructed along the route of the proposed pipeline:

- The *Mexico Compressor Station*, at MP 0.0 in Audrain County, Missouri would provide 41,000 hp of compression using two gas turbines.

- The *Blue Mound Compressor Station*, at MP 144.1 in Christian County, Illinois would provide 35,174 hp of compression using five gas reciprocating units.

- The *Bainbridge Compressor Station*, at MP 277.3 in Putnam County, Indiana would provide 31,654 hp of compression using two gas turbines.

- The *Hamilton Compressor Station*, at MP 437.4 in Warren County, Ohio would provide 35,000 hp of compression using two electric-driven centrifugal units.

- The *Chandlersville Compressor Station*, at MP 575.0 in Muskingum County, Ohio would provide 19,538 hp of compression using three gas reciprocating units.

The sixth compressor station would be located along the route of the Rockies Express Pipeline – Entrega Project (Docket No. CP06-354-000). The *Arlington Compressor Station*, at MP 237.0 in Carbon County, Wyoming would provide 19,794 hp of compression using three gas reciprocating units. The site on which the compressor station would be located has been certificated for the installation of a pig[2] launcher/receiver under Docket No. CP04-413-000.

The seventh compressor station would be located along the route of the REX West Project. The *Bertrand Compressor Station*, at MP 286.8 in Phelps County, Nebraska, would provide 34,210 hp of compression using five gas reciprocating units.

Each compressor station would consist of a compressor building, a utility building (including control room, utility room, and storage/shop room), valves, and piping. The Hamilton Compressor Station would receive electricity for its compressors and station utilities from Duke Energy (Ohio) by means of two 138 kilovolt (kV) transmission lines. For a further discussion of Duke Energy's facilities see section 1.5 of the EIS.

Rockies Express would construct 19 meter stations and associated interconnecting pipeline facilities at 13 locations along the proposed pipeline route. Rockies Express would also install 42 mainline valves (MLV) along the route, five of which would be located within compressor station sites, one within the Clarington Hub, and the remaining 36 within the operations right-of-way. Rockies Express has attempted to position its aboveground facilities (compressor stations, meter stations, and MLVs) adjacent to roads, wherever possible, in an attempt to reduce disruption to land uses, and to facilitate access.

In order to enable periodic cleaning and inspection of the REX East pipeline by pigging, Rockies Express would construct facilities for the periodic attachment of portable pig launchers and/or receivers to the pipeline at the five compressor stations along the route of the proposed pipeline. A facility to accommodate a portable pig launcher would be installed at the Mexico Compressor Station; a facility to accommodate a portable pig receiver would be installed at the Chandlersville Compressor Station; and one of each such facilities would be installed at the Blue Mound, Bainbridge, and Hamilton Compressor Stations. (Pigs, pig launchers, and pig receivers would be transported by truck and trailer and attached and operated as needed.)

[2] A pig is a mechanical cleaning and inspection device that passes through the interior of a pipeline from a launcher attached to the pipeline at one location to a receiver attached to the pipeline at another location.

2.3 LAND REQUIREMENTS

Rockies Express has stated that up to 14,334.4 acres would be required during the Project construction phase. After construction, 4,049.2 acres would be retained for Project operation. Land requirements are summarized in table 2.3-1.

TABLE 2.3-1

Land Requirements

Project Component		Construction (acres)	Operations (acres)
Pipeline			
Mainline right-of-way		9,678.5	3,871.7
Laterals and interconnects		36.7	24.4
Additional temporary workspace		4,163.1	0.0
Pipe storage/contractor yards		303.1	0.0
	Subtotal	**14,181.4**	**3,896.2**
Aboveground Facilities			
Facilities		153.0 a/	153.0 a/
Project Total		14,334.4	4,049.2

a/ Includes compressor stations, meter stations (and access roads to them), valves, and pig launcher and receiver facilities.

The location of new access roads and existing roads to be modified are provided online in the E-library (FERC eLibrary, 2007i).

2.3.1 Areas Disturbed by Pipeline Construction

Rights-of-Way

During construction, Rockies Express proposes to use a 125-foot-wide temporary construction right-of-way in upland areas, a 100-foot-wide temporary construction right-of-way for non-saturated herbaceous and shrub/scrub wetlands, and a 75-foot-wide right-of-way for forested and saturated wetlands. Maps of the proposed route are provided in appendix B. Rockies Express proposes a wider than normal construction right-of-way because of the large pipeline (42-inch-diameter) and the larger equipment that would be used during construction. Rockies Express proposes to retain a 50-foot-wide permanent right-of-way during pipeline operation.

The pipeline would be adjacent to existing utility rights-of-way for about 377.1 miles, approximately 59 percent of its length. When paralleling existing pipelines other than those of the Panhandle Eastern Pipeline Company (PEPL), Rockies Express would use part of the existing pipeline's permanent right-of-way for storage, which would reduce the amount of new disturbance.

The REX East pipeline would parallel PEPL lines for about 193.5 miles, approximately 30 percent of its length. In the area where two systems would be parallel, PEPL has four pipelines, the 100, 200, 300, and 400 lines. The 100 and 200 lines were built in the early twentieth century using mechanical couplings (Dresser coupling), to join the pipes. Lines 300 and 400 were constructed using modern welding techniques. The pipeline parallels different PEPL lines depending on the location. PEPL has

raised concerns that earth movement due to trenching, topsoil segregation, and use of heavy construction equipment in close proximity to the 100 and 200 lines could have adverse affects. Because of these concerns, Rockies Express proposes to use an 8-foot right-of-way overlap and a 65-foot separation between its pipeline and PEPL's lines. Although there may be a reason for this increased separation when paralleling the 100 and 200 lines, these precautions are not necessary for pipeline sections adjacent to the newer 300 and 400 lines. Using Rockies Express' proposed construction method while paralleling all portions of the PEPL system would result in expanding the width of the pipeline unnecessarily. The width of these corridors can be an issue on some properties that could end up with five pipelines. Although, the existence of the easements may not affect all activities on the property, it does place restrictions on the use. In order to reduce impacts on the landowner while maintaining the integrity of the existing pipelines, we have modified our recommendation from the draft EIS to limit the increased overlap of rights-of-way to areas where Rockies Express would parallel PEPL's 300 and 400 lines. Therefore, **we recommend that:**

- **In areas where the pipeline parallels PEPL's 300 and 400 lines (MP 33.8 to MP 69.2); MP 98.3 to MP 128.0; MP 194.1 to MP 220.1; and MP 259.0 to MP 274.4), Rockies Express revise its construction plans in order to overlap, for spoil storage purposes, 15 feet of the existing PEPL permanent right-of-way.**

In addition, Rockies Express would offset its pipeline within the proposed permanent right-of-way so that it would be 10 feet from the outer edge and 40 feet from the edge nearest PEPL's permanent right-of-way. This would result in a 65-foot-wide unused space between the two pipelines. When paralleling other pipelines, Rockies Express would center its pipeline within the proposed permanent right-of-way, resulting in the proposed pipeline being placed 50 feet from the existing pipeline. The purpose of the permanent right-of-way is to provide a buffer between the pipeline and third-party activities. Placing the pipeline near the edge of the permanent right-of-way would allow encroachment within 10 feet of the pipeline. In addition, although we are not aware of any future plans to place additional pipelines in this area, in order to avoid future issues with pipeline placement and the width of construction and permanent rights-of-way, **we recommend that:**

- **Rockies Express revise its construction plans to center the pipeline within the permanent right-of-way in areas where it is presently shown within 10 feet of the edge of the permanent right-of-way, unless this would decrease the separation distance between its pipeline and the PEPL 100 and 200 lines to under 65 feet, and incorporate these revisions to its pre-construction planning, revising the REX East right-of-way configurations as necessary. Rockies Express should file the revised right-of-way configurations with the Secretary prior to the start of construction.**

Additional Temporary Workspace

Temporary workspace would be required at various locations along the construction right-of-way, such as at the beginning of each construction spread (crew and equipment) for mobilizing construction equipment; for stringing truck turnaround areas; where the proposed pipeline crosses over an adjacent pipeline; where the pipeline crosses under buried features (e.g., foreign pipelines, utility lines); at road crossings, railroads, wetlands, and waterbodies; in residential areas; and at directionally drilled crossings. Additional temporary workspace also would be required in areas with side slopes to create level and safe work areas. The total acreage of additional temporary workspace would be 4,163.1 acres. In general, we do not believe that Rockies Express has filed sufficient site-specific information to justify the number and size of its extra workspaces. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of the Office of Energy Projects (OEP) the proposed use and site-specific justification for the size of each of its proposed extra temporary workspaces.**

Further, Rockies Express has requested 35-foot-wide temporary workspaces in areas where topsoil would be segregated. Rockies Express has stated that the extra 35 feet is necessary to allow for full right-of-way topsoil stripping. The state of Ohio has indicated that it would prefer that full right-of-way topsoil stripping be mandatory.

We do not believe that full right-of-way topsoil segregation is necessarily better than trench-and-spoil side topsoil segregation. Both methods have benefits and drawbacks. Full right-of-way stripping normally disturbs a larger area potentially affecting more drain tiles. Partial right-of-way stripping may reduce impacts to drain tiles, but may also increase the potential for compaction. Mitigation or repair would be required if either of these impacts occurs. We believe that the proposed construction right-of-way width of 125 feet is sufficient to store segregated topsoil in agricultural areas. However, in some cases a landowner may prefer the use of a wider construction right-of-way, which may reduce the potential for commingling of subsoil and topsoil. **Therefore, we recommend that:**

- **Rockies Express should not exercise eminent domain authority granted under Section 7(h) of the NGA to acquire an additional 35-foot-wide temporary workspace for the storage of topsoil. Rockies Express may negotiate for the use of these extra workspaces for topsoil storage.**

Access Roads

Rockies Express would use 87 existing public and private roads and construct 54 new, permanent roads to gain access to the pipeline right-of-way (during construction and operation of the Project) and pipe storage and contractor yards (during construction). The Project would require a total of 141 access roads (FERC eLibrary, 2007i). The length of newly constructed roads would range from 16 to 2,083 feet, with an average length of 216 feet. Based on an average width of 30 feet (compressor and meter stations) and 16 feet (MLV access roads), new permanent roads would occupy approximately 6.7 acres. In addition, two existing roads would provide permanent access to the ANR Pipeline meter station (MP 342.3) and the MLV 12 (MP 233.8).

Pipe Storage and Contractor Yards

Rockies Express has identified 11 potential areas for pipe storage and contractor staging during construction of Project facilities: one in Missouri, two in Illinois, two in Indiana, and six in Ohio. The 11 sites range from commercial/industrial sites to non-disturbed areas, which would be used temporarily during construction. Pipe storage/contractor yards would be used on a temporary basis, for the storage of pipe joints and stationing of construction equipment, and would be restored when construction is completed. The area required for pipe storage and contractor yards would be 303.1 acres in the construction phase.

Table 2.3-2 gives the acreage and location for each temporary pipe storage/contractor yard. Maps of the temporary pipe storage/contractor yards are included in appendix B of the EIS.

TABLE 2.3-2 Pipe Storage/Contractor Yards			
Name of Yard	**Size (acres)**	**Township, Range, Section**	**Location (County, State)**
Bowling Green	35	T-53-N, R-3-W, Sec. 27	Pike, MO
Springfield	35	T-13-N, R-5-W, Sec. 9	Sangamon, IL
Metcalf	35	T-16-N, R-13-W, Sec. 34	Edgar, IL
Green Castle	32	T-14-N, R-4-W, Sec. 4	Putnam. IN
Franklin	31	T-11-N, R-5-E, Sec. 21	Johnson, IN
Middletown	18	T-2-E, R-4-N, Sec. 8	Butler, OH
Hamilton	19	T-2-E, R-2-N, Sec. 29	Butler, OH
Jeffersonville	20	Virginia Military District	Fayette, OH
Pickaway	35	T-11-N, R-21-W, Sec. 31	Pickaway, OH
Lancaster	14	T-15-N, R-19-W, Sec. 27	Fairfield, OH
Guernsey	29	T-2-N, R-2-W, Sec. 0	Guernsey, OH
Total	**303**		

2.3.2 Aboveground Facilities

Table 2.2-3 provides the land requirements for the 7 compressor station sites and 13 meter-station locations (for 19 meter stations in total) during the construction and operations phases. Land requirements for the construction phase total 150.8 acres (114.8 acres for the compressor station sites and 36.0 acres for the meter station sites). Land requirements total 153.0 acres for the operations phase (114.8 acres for the compressor station sites, 36.0 acres for the meter station sites, and 2.2 acres for the MLVs). These land requirement values include the area to be disturbed by access roads to the aboveground facilities.

Each of the 36 MLVs that would not be within the fence line of a proposed compressor or meter station site would be installed in a 50-foot-wide by 50-foot-wide (0.06-acre) fenced-in area, which would be within the operations pipeline right-of-way.

Permanent components of the pig launcher and pig receiver facilities would be located entirely within compressor station sites, and so their land requirements are included in those of the compressor stations.

Rockies Express has attempted to locate aboveground facilities adjacent to roads, wherever possible, to reduce disruption to land uses and to facilitate pipeline operations and maintenance.

TABLE 2.3-3

Land Requirements for Aboveground Facilities

Facility	Location (County, State)	Temporary Construction (acres)	Permanent Operation (acres)
Compressor Stations a/			
Arlington Compressor Station	Carbon, WY	15.0	15.0
Bertrand Compressor Station	Phelps, NE	17.7	17.7
Mexico Compressor Station	Audrain, MO	12.8	12.8
Blue Mound Compressor Station	Christian, IL	12.9	12.9
Bainbridge Compressor Station	Putnam, IN	21.3	21.3
Hamilton Compressor Station	Warren, OH	15.2	15.2
Chandlersville Compressor Station	Muskingum, OH	19.9	19.9
Subtotal		**114.8**	**114.8**
Meter Stations a/			
Natural Gas Pipeline Company of America	Moultrie, IL	5.6	5.6
Ameren Power Company	Moultrie, IL	1.2	1.2
Trunkline Gas Company	Douglas, IL	2.6	2.6
Midwestern Gas Transmission Company	Edgar, IL	1.2	1.2
Panhandle Eastern Pipe Line Company	Putnam, IN	1.2	1.2
Citizen Gas and Coke Utility	Morgan, IN	1.2	1.2
Indiana Gas Company	Morgan, IN	2.0	2.0
ANR Pipeline Company	Shelby, IN	2.2	2.2
Vectren, Texas Gas Transmission, LLC, Dominion Transmission, Inc., Texas Eastern Transmission Company, and Columbia Gas Transmission Corporation	Warren, OH	6.8	6.8
Columbia Gas Transmission Corporation	Fairfield, OH	2.2	2.2
Tennessee Gas	Guernsey, OH	2.2	2.2
Dominion Transmission, Inc	Noble, OH	1.5	1.5
Dominion Transmission, Dominion East Ohio, and Texas Eastern Transmission Company	Monroe, OH	6.1	6.1
Subtotal		**36.0**	**36.0**
Mainline Block Valves b/			
Subtotal		**0.0 c/**	**2.2**
Total		**150.8**	**153.0**

a/ Includes area to be disturbed by permanent access roads.

b/ Includes only the 36 mainline block valves, which would be located outside of the fenced area at proposed compressor stations or meter stations. Block valves located within the fence line of other aboveground facilities are counted with those aboveground facilities.

c/ Areas disturbed during construction are accounted for in the acreage disturbed by the construction pipeline right-of-way.

2.4 CONSTRUCTION PROCEDURES

The proposed facilities would be designed, constructed, operated, and maintained in accordance with 49 CFR Part 192 "Transportation of Natural Gas and Other Gas by Pipeline: Minimum Federal Safety Standards," 18 CFR Part 380.15 "Guidelines to be followed by Natural Gas Pipeline Companies in the Planning, Clearing, and Maintenance of Rights-of-Way and the Construction of Aboveground Facilities," and other applicable federal and state regulations. Rockies Express has submitted its own Upland Construction Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures), which are based on the FERC's Upland Erosion Control, Revegetation, and Maintenance Plan and Procedures, with certain proposed modifications that Rockies Express believes appropriate to the Project (FERC eLibrary, 2007a,b). A summary of the proposed modifications to the FERC Plan and Procedures is provided in tables 2.4-1 and 2.4-2. Our Plan and Procedures can be accessed at the FERC Web site (www.ferc.gov/industries/gas/enviro/guidelines.asp).

TABLE 2.4-1

Differences between the REX East Project's Plan and the FERC's Plan

Section Number of FERC Plan	Alternative Mitigation	Accepted	Reason
I.A	Addition of Agricultural Impact Mitigation Plan	Yes	Adds additional mitigation for construction in agricultural areas.
III.A.2	Wording change to state that Rockies Express has already expanded and will continue to expand the required cultural resources and endangered species surveys	Yes	Adds a more stringent requirement.
III.C	Addition of "as necessary and practical" to the requirement to defer grazing	Yes	Rockies Express would nonetheless have to continue to monitor and maintain the disturbed construction area for revegetation and/or erosion problems resulting from construction.
III.G	Addition of "…where appropriate" to the requirement to make available the Stormwater Pollution Prevention Plan for each construction spread	No	The Stormwater Pollution Prevention plan must be made available for each construction spread.
IV.A.2	Change of construction right-of-way width from 100 feet to 125 feet	Yes	Larger construction equipment necessitates wider right-of-way.
IV.B.1.d	Included Conservation Reserve Program land among the lands where topsoil segregation must be performed	Yes	Adds a more stringent requirement.
IV.E.2	Added the adjective "suitable" to qualify the fabric to be used to support crushed-stone access pads	No	Suitable has not been defined.
IV.F.1.a	Added sediment logs to the list of acceptable slope breakers	Yes	Sediment logs may be better on certain slopes.
V.D.3.g	Removed the word "imprinter" and inserted the word "roller"	No	A "roller" is not specific. An "imprinter" is a type of roller specially designed to assist revegetation.

TABLE 2.4-2 Differences between the REX East Project's Project Procedures and the FERC's Procedures			
Section Number	**Alternative Mitigation**	**Accepted**	**Reason**
I.A	Addition of Agricultural Impact Mitigation Plan	Yes	Adds additional mitigation for construction in agricultural areas.
I.B.1.a, b, c	Replacement of "…at the time of crossing…" with "…at the time of construction…"	Yes	Adds a more stringent requirement.
II.B.3	Removal of requirement to limit construction right-of-way width to 75 feet unless specific construction plans are filed	No	The FERC recommends that Rockies Express use a 75-foot-wide right-of-way for wetlands. See section 2.3.2 of the EIS.
IV.A.1.D	Addition (to the requirements on parking and refueling) of the requirement that no refueling occur within 200 feet of a private well nor within 400 feet of a municipal well	Yes	Adds a more stringent requirement.
V.B.7 and V.B.8	Allow pipe segments to be welded and strung above and across a waterbody prior to installation (in order to expedite installation)	No	Welding materials may fall into the waterbody. There is no indication how high above the waterbody the pipe would be strung.
VI.A.3	Widening the limit on right-of-way width from 75 feet to 100 feet	No	The FERC recommends that Rockies Express use a 75-foot-wide right-of-way for wetlands. See section 2.3.2 of the EIS.

We have reviewed the differences between the FERC's Plan and Procedures and the REX East Project Plan and Procedures. We do not agree with all of the alternative mitigation proposed by Rockies Express. Therefore, **we recommend that:**

- **Rockies Express revise its Plan and Procedures to be consistent with tables 2.4-1 and 2.4-2 of this EIS. Rockies Express should file its revised Plan and Procedures with the Secretary prior to the start of construction.**

2.4.1 General Construction Procedures

In upland areas, Rockies Express would use conventional overland construction techniques. Construction would follow a set of sequential operations shown on figure 2.4-1. The construction spread would proceed along the pipeline right-of-way in one continuous operation; construction at any single point along the pipeline, from initial surveying and clearing to backfilling and finish grading, would typically last approximately 8 to 12 weeks. The entire process would be coordinated to minimize the total time that a given tract of land is disturbed, exposed to erosion, and temporarily unavailable for normal use. Rockies Express anticipates seven construction spreads for the Project.

Rockies Express' Procedures require that a site-specific explanation be filed for Commission review and approval for each extra workspace that is within 50 feet of a waterbody or wetland. Rockies Express has identified over 100 extra workspaces that would be within 50 feet of waterbodies or wetlands but has provided no site-specific justification. Therefore, **we recommend that:**

- **Rockies Express file with the Secretary for review and written approval by the Director of OEP a site-specific justification for each extra workspace that is within 50 feet of a wetland or waterbody prior to the start of construction.**

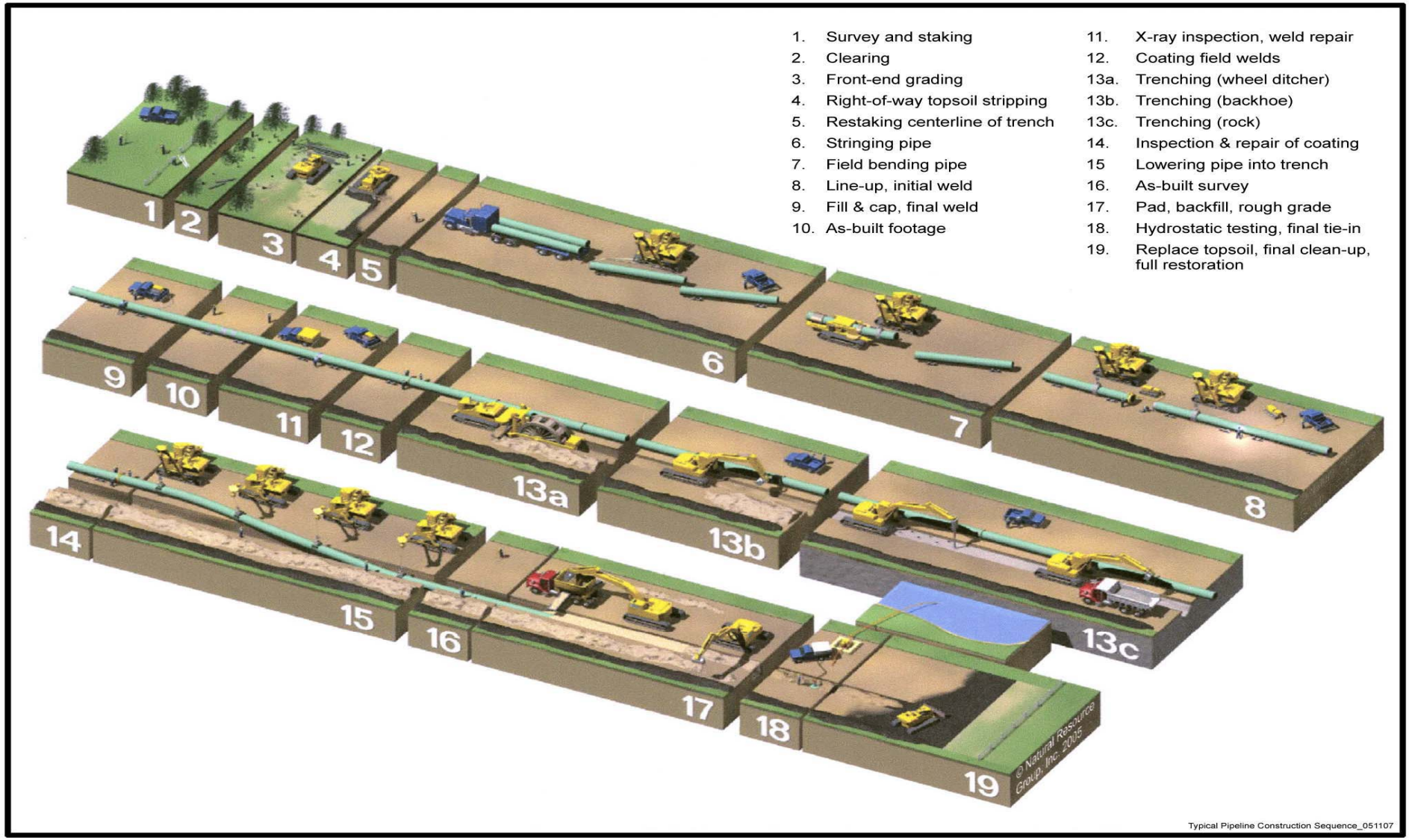

FIGURE 2.4-1

Typical Pipeline Construction Sequence in Uplands

Staking the Construction Right-of-Way

The initial step in preparing the right-of-way for construction would be to stake the outside limits of the construction right-of-way, the centerline of the proposed pipeline trench, and additional temporary workspaces. Sensitive areas to be avoided would be flagged, as appropriate, and wetland boundaries would be clearly marked using readily identifiable flagging and/or temporary signage. Before construction, Rockies Express would contact One-Call systems for the various states so that facility owners can identify and flag buried utilities to prevent accidental damage during pipeline construction. To further ensure protection of utilities, **we recommend that:**

- **Rockies Express file with the Secretary the milepost location of all severed and/or damaged utility lines and documentation of steps taken to ensure the utility was restored in a timely manner to pre-construction or better conditions.**

Clearing and Grading

The construction work area would be cleared of trees, large rocks, brush, and roots. Trees would be removed only when necessary for construction purposes. Timber and other vegetative debris would be chipped for use as erosion-control mulch, burned, cut and stacked along the right-of-way, or otherwise disposed of in accordance with applicable federal and local regulations and landowner requirements. However, we believe more information is required on how material would be disposed of; therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP, a bulk material disposal plan for excess rock, trees, brush, and other construction debris.**

In areas containing livestock, Rockies Express would coordinate with landowners on disposal or removal of shrub and tree waste that might harm livestock. Burning would be conducted in a manner that minimizes fire hazards and prevents heat damage to surrounding vegetation, and would follow appropriate state restrictions. We have recommended in section 4.7.1, that burning not take place within 500 feet of Indiana bat habitat.

Fences would be cut and braced along the right-of-way, and temporary gates would be installed to provide right-of-way access. The construction area would then be graded (i.e., leveled) to enable construction equipment to operate. Segregated topsoil would be placed along the right-of-way in a manner that would not impede access, material transport, and pipe assembly. Sufficient space would be left between separate piles of topsoil and subsoil stored on the same side of the right-of-way so that the subsoil can be returned without disturbing the topsoil pile.

Temporary erosion control measures, such as sediment barriers (silt fencing, staked straw bales) and temporary slope breakers, would be installed during clearing and grading. After installation, the barriers would be regularly inspected and maintained until construction is complete or permanent erosion control measures are installed to replace them.

Trenching

Rockies Express would typically use a rotary ditching machine to excavate trenches. Where rotary ditching is not possible, track-mounted excavators and backhoes or other similar equipment would be used. Rock substrates could be excavated using rippers or hammers. Any required blasting would be consistent with Rockies Express' Blasting Plan (FERC eLibrary, 2007c) and with all applicable laws and company standards (see section 2.3.2 of the EIS). In agricultural or residential areas, subsoil and rock would be stockpiled separately from topsoil. For safety and to minimize sloughing of topsoil into the ditch, the trench sides would be sloped in accordance with the stability of the soils present. Typically, the trench would be excavated to a depth sufficient to provide a minimum of three feet of cover over the pipeline. In consolidated rock areas at least two feet of cover would be provided.

Stringing

Individual sections of pipe would be 40 to 60 feet long and protected with a fusion-bonded, factory-applied epoxy coating. The beveled ends would be left uncoated to facilitate welding. Pipe joints would be shipped to strategically located storage yards, where they would be loaded onto stringing trucks. The stringing trucks would travel along the right-of-way and lay the individual pipe sections on temporary supports (skids) along the working side of the trench in preparation for subsequent bending, line-up, welding, joint coating, lowering-in, backfill, and inspection activities. The amount of pipe required for waterbody crossings would typically be stockpiled in temporary work areas on one or both banks of the waterbody.

Pipe Bending

A hydraulic pipe-bending machine would be used to bend straight pipe joints to enable the pipeline to conform to ground contours and directional changes. Some factory-bent pipe might be used at certain Project locations (e.g., at waterbody crossings).

Pipe Line-up and Welding

Following stringing and bending, the pipe joints would be aligned and welded together using multiple passes to achieve a full penetration weld. Rockies Express intends to use automatic welding. Welders would be qualified according to, and welding procedures would comply with, applicable American National Standards Institute, American Society of Mechanical Engineers (ASME), American Petroleum Institute (API), including API 1104 - Welding of Pipelines and Related Facilities, and Title 49 CFR Part 192 (Transportation of Natural and Other Gas by Pipeline: Minimum Safety Standards).

Radiographic Inspection and Weld Repair

To ensure that the assembled pipe meets or exceeds design strength requirements, the welds would be visually inspected by a qualified inspector and non-destructively examined by means of radiographic (X-ray) or other approved test methods, in accordance with Title 49 CFR Part 192, API 1104, and ASME standards. Defective welds would be repaired or removed, in which case the new weld would be installed and tested.

Coating Field Welds, Inspection and Repair

Following welding, the construction field welds and pipe joint ends would be coated in the field with an approved material compatible with the factory-applied pipeline coating. The pipeline coating

would be inspected for defects, and any damaged areas repaired, before the pipe is lowered into the trench.

Pipe Lowering

Before the pipe is lowered into the trench using track-mounted side booms and/or backhoes, the trench would be inspected to ensure that its size is correct and that all foreign material has been removed. In rocky areas, either the bottom of the trench would be padded or the pipe would be lowered onto sandbag or foam pipe supports ("pillows"). A protective wrap (rock jacket) might be used to protect the pipeline coating from any sharp rocks located on the trench bottom.

If necessary during the lowering process, trench dewatering would be accomplished in a manner designed to prevent heavily silt-laden water from flowing into wetlands or waterbodies, as described in the Rockies Express Plan and Procedures. When dewatering trenches in agricultural and wetland areas, Rockies Express would minimize erosion and/or crop damage by controlling discharge rates, dewatering to filter bags, and discharging to existing canals or ditches.

Padding and Backfilling

After the pipe is lowered into the trench, the trench would be backfilled. Backfill material generally would consist of the material excavated from the trench. Previously excavated subsoil would be pushed back into the trench first by means of bladed equipment or backhoes. Padding or a protective coating would be used to prevent damage to the pipe coating from rocky trench spoil. Padding typically would consist of trench subsoil spoil that has been screened to remove rocks, which would be disposed of in accordance with Rockies Express' Plan, or other approved suitable material (e.g., soil, sand) that would be brought to the site. Topsoil would not be used for padding. After backfilling, a small crown of material might be left to account for any future soil settling.

Trench breakers would be installed around the pipeline in the trench as needed to minimize the potential for subsurface water flow around the pipe. Trench breakers also would be installed at the base of slopes adjacent to waterbodies and wetlands.

Hydrostatic Testing and Final Tie-in

To verify its integrity and to ensure its ability to withstand the maximum allowable operating pressure, the pipeline would be hydrostatically tested before it is put into service. Pipeline test segments would be capped and filled with water. The pipe test section would then be pressurized and hydrostatically tested in accordance with DOT regulations. Loss of pressure that cannot be attributed to specific factors such as temperature changes would be investigated. Detected leaks would be repaired and the test section retested.

Hydrostatic test water would be obtained in compliance with state regulations and existing water rights. Rockies Express would minimize the potential effects of hydrostatic testing on surface water resources by placing a screen on intake hoses to minimize entrainment and entrapment of fish. Topography and the availability of test water would determine the length of each segment to be tested. Table 4.3.6-1 lists the preliminary supply and discharge locations and the estimated volumes of the water that would be used for the hydrostatic testing.

Upon completion of the testing, the water would either be pumped to the next segment for testing or else discharged. Transfer of test water between basins would not be permitted unless previously authorized. Test water would be discharged through energy dissipating devices (e.g., hay bale filters,

sediment bags) in accordance with the requirements of a NPDES hydrostatic discharge permit. Test water would contact only new pipe and no chemicals would be added. Once a segment of pipe has been successfully tested and dried, the test cap and manifold would be removed and the pipe tied in to the remainder of the pipeline.

Both our Procedures and those of Rockies Express require information on hydrostatic test water to be filed before construction (i.e., source or discharge locations, screening of intake structures, maintaining downstream flows). To fully evaluate any issues associated with hydrostatic test water withdrawal and discharge, **we recommend that:**

- **Rockies Express develop a Hydrostatic Testing Plan that includes, but is not limited to, the following information:**

  a. **The screen size proposed for use on intake hoses to prevent entrainment of fish; and**

  b. **Documentation that appropriate federal and state agencies have been consulted regarding the establishment of water withdrawal rates to ensure the withdrawals would have minimal impact on flows, fisheries, and downstream water users.**

  This Hydrostatic Testing Plan should be filed with the Secretary for review and written approval by the Director of the OEP, prior to the start of construction.

Additional recommendations for the Hydrostatic Testing Plan to mitigate impacts to mussels are described in section 4.7.1 of the EIS.

Clean-up and Restoration

Clean-up operations, including final grading, topsoil replacement, and installation of permanent erosion-control structures would begin following backfill operations. We have recommended that Rockies Express file a bulk material disposal plan. If seasonal or other weather conditions, including wet soil conditions, prevent compliance with these time frames, Rockies Express would maintain temporary erosion controls (temporary slope breakers and sediment barriers) until conditions allow completion of cleanup activities.

Construction debris would be removed from the right-of-way and disposed of in accordance with applicable regulations. Rockies Express would grade the construction right-of-way to restore pre-construction contours and leave the soil in proper condition for planting. In areas where Rockies Express places topsoil on its travel lane, the topsoil would be pulled back onto the construction right-of-way when establishing the original contours. Decompaction would be completed as necessary in accordance with the Rockies Express' Plan, recommendations of the National Resource Conservation Service or other agricultural agencies, and landowner requirements. Such decompaction would include any necessary at the contractor/pipe yards and on temporary access roads the Project uses. Permanent erosion- and sediment-control measures, including diversion terraces, would be restored or installed, and any required reseeding or other forms of revegetation would be completed. Private and public property, such as fences, gates, driveways, and roads the pipeline construction disturbs, would be restored to original or better condition.

2.4.2 Special Construction Procedures

Rockies Express would use various special construction procedures for the crossing of roads and railroads, wetlands, waterbodies, residential areas, agricultural areas, commercial and industrial areas,

steeply sloping areas, areas of shallow bedrock, and foreign pipelines. These procedures are described below.

Road and Rail Crossings

Construction of pipelines across major paved highways, railroads, and unpaved roads where traffic cannot be interrupted would be accomplished by boring under the roadbed. Most smaller, unpaved roads and drives would be crossed by open trenching and then restored to the pre-construction or better condition. If a road being crossed by the open-cut method requires extensive construction time, provisions would be made for detours or other measures to permit traffic flow during construction. Rockies Express would work with landowners to determine the least disruptive method to cross privately owned roads. Rockies Express would repair all road damage caused by construction of the pipeline. The pipelines would be buried to the depth required by applicable road crossing permits/approvals and would be designed to withstand anticipated external loadings. Railroad crossings would be installed (typically using a bore) in accordance with the requirements of the railroad.

Wetland Crossings

Wetlands would be crossed following the methods outlined in Rockies Express' Procedures. These wetland construction methods are briefly outlined below.

During clearing, sediment barriers (such as silt fencing and staked straw bales) would be installed and maintained adjacent to all wetlands and within additional temporary workspace areas as necessary to minimize the potential for sediment runoff. Sediment barriers would be installed across the full width of rights-of-way and extra workspaces at the base of slopes that are adjacent to wetland boundaries. The pipeline construction method used in the wetland would depend largely on the soil stability at the time of construction. Where wetlands are saturated and the trench fills with water, the pipeline segment would be assembled in an upland area and installed using the push-pull or float method. Where wetland soils are sufficiently stable to support the pipe, the pipeline segment would be assembled in the wetland using a conventional construction technique. The time that the excavated ditch is kept open would be minimized, as practicable, to minimize the effect on wetland soils. For wetlands located in actively cultivated or rotated cropland, construction techniques would be similar to those used in conventional upland cross-country construction.

The construction right-of-way may be used for access when the wetland soil is firm enough to support equipment or the construction right-of-way has been appropriately stabilized (e.g., with timber riprap, prefabricated equipment mats, or terra mats). In wetlands that cannot be appropriately stabilized, all construction equipment, other than that needed to install the wetland crossing, would use access roads located in upland areas. In areas where no reasonable access exists, construction equipment would be permitted to cross through the wetland once using the construction right-of-way. The top one foot of topsoil would be segregated from the trench area, except where standing water is present or soils are saturated or frozen. Segregated topsoil would be immediately restored to its original location after backfilling is complete.

Restoration of wetland contours to pre-construction levels would be accomplished during backfilling. Prior to backfilling, trench breakers would be installed where necessary to prevent the subsurface drainage of water from the wetland. Rockies Express would monitor and record the success of wetland revegetation annually for the first three years after construction or until wetland revegetation is successful. Additional information on wetland crossings is presented in section 4.3.7 of this EIS.

We do not dictate which construction methods an applicant or contractor should use when constructing through wetlands. Instead, we apply a performance-based standard designed to ensure impacts on wetlands are minimized to the maximum extent practicable. Some standard performance-based measures are qualitative and vary in applicability and are subject to wetland type and other site-specific factors. In general, minimizing impacts on wetlands requires foregoing standard upland-construction methods when in wetlands. It is incumbent upon the applicant to develop a construction plan that meets these performance standards to minimize wetland impacts.

Rockies Express proposes to use a 75-foot-wide construction right-of-way for forested and saturated wetlands and (in order to accommodate the deeper pipeline ditch and the amount of spoil temporarily sidecast during pipe installation) a 100-foot-wide construction right of way for non-saturated herbaceous and scrub/shrub wetlands. Rockies Express is requesting an additional 15 feet (for a total of 40 feet) on the spoil side to accommodate the deeper pipeline ditch and amount of spoil temporarily sidecast due to the fact that a larger diameter pipeline (42-inch) would be installed. Rockies Express anticipates that the large equipment necessary for the installation of the proposed 42-inch diameter pipeline would require the typical 50 feet plus 10 additional feet (60 feet total) of workspace on the access side of the right-of-way. Rockies Express would use only the area needed at each crossing. We disagree. Experience with construction of other 42-inch diameter pipelines has shown us that they can be constructed using a 75-foot wide construction right-of-way. Using this smaller construction right-of-way would reduce disturbance in wetlands by 40 percent. Therefore, **we recommend that:**

- **Rockies Express revise its Procedures to use a 75-foot wide construction right-of-way for wetlands. Rockies Express should incorporate these revisions in its pre-construction planning, revising the REX East construction alignment sheets, as necessary, to accommodate the revised work areas. For wetlands that Rockies Express believes would require a right-of-way width greater than 75 feet, Rockies Express should file with the Secretary, site-specific justification in its implementation plan for the Project for review and written approval by the Director of OEP, prior to the start of construction.**

Waterbody Crossings

Conventional Open-cut Waterbody Crossings

Rockies Express proposes the open-cut crossing method for most minor waterbody crossings. As proposed, these crossings would involve excavation of the pipeline trench across the waterbody, installation of the pipeline, and backfilling of the trench with no effort to isolate flow from construction activities. Excavation and backfilling of the trench would be accomplished using backhoes or other excavation equipment working from the banks of the waterbody. Trench spoil would be stored at least 10 feet from the banks (topographic conditions permitting). A section of pipe long enough to span the entire crossing would be fabricated on one bank and either pulled across the bottom to the opposite bank, floated across the stream, or carried into place and submerged into the trench. The trench would then be backfilled and the bottom of the watercourse and banks restored and stabilized. Sediment barriers, such as silt fencing, staked straw bales, or trench plugs would be installed to prevent spoil and sediment-laden water from entering the waterbody from adjacent upland areas.

Dry Waterbody Crossings

According to Rockies Express' Procedures, a "dry-ditch" crossing method would be used for some minor and intermediate waterbodies.

A flumed crossing involves installation of a temporary dam and a flume pipe to divert the entire stream flow over the construction area and allow for trenching of the crossing in dry or nearly dry conditions. Dams would be constructed of sand bags alone, sand bags with plastic sheeting, inflatable bladders, or similar materials to direct the flow into the flume pipe. Spoil removed during the trenching would be stored at least 10 feet away from the water's edge (topographic conditions permitting). A section of pipe long enough to span the entire crossing would be fabricated on one bank and slipped under the flume pipe to the opposite bank. The trench would be backfilled and the bottom of the watercourse and banks restored and stabilized before the flume pipe and dams are removed. Sediment barriers, such as silt fencing, staked straw bales, or trench plugs would be installed to prevent spoil and sediment-laden water from entering the waterbody from adjacent upland areas.

The dam-and-pump dry-ditch crossing method would involve damming the stream with sandbags or equivalent materials on both sides of the construction work area and pumping the stream flow around the construction zone. Excavation of the trench, installation of the pipeline, and restoration would be similar to that described above for the flumed crossing.

Horizontal Directional Drilling

A horizontal directional drill (HDD) is a trenchless installation process by which a pipeline is installed beneath obstacles or sensitive areas. The primary advantage to HDD is that there is minimal disturbance of the ground surface between the entry and exit points of the HDD. The length of pipeline that can be installed by HDD depends on factors such as access to the entry and exit points, subsurface conditions (geology), and pipe diameter.

An HDD is a multi-stage process that consists of establishing a small-diameter pilot hole along a crossing profile, followed by enlargement of the pilot hole (reaming) to accommodate pullback of the pipeline. The pilot hole is drilled using rotation cutting and/or jetting with a jetting assembly attached to the drill pipe. The cutting action of the drill head is remotely operated to control its orientation and direction. Bentonite drilling fluid (bentonite, a non-toxic, naturally occurring sedimentary clay, is composed of weathered and aged volcanic ash) is delivered to the cutting head through the drill string to provide the hydraulic cutting action, lubricate the drill bit, help stabilize the hole and remove cutting spoil as the drilling fluid is returned to the entry point. Drilling fluid would also be used during the reaming process to remove cutting spoil. The position of the drill string is electronically monitored and directional corrections made as necessary to ensure that the drill string maintains the desired alignment.

Enlarging the pilot hole is accomplished incrementally by multiple reaming passes, depending on the pipeline diameter and subsurface geology, to increase the hole diameter. Upon successful completion of the reaming operation, a cylinder-shaped swab is pulled through the hole to ensure the integrity of the completed hole and prepare for pullback of the pipe. The pre-assembled, hydrostatically tested section of pipeline would then be pulled into the completed hole.

Both our Procedures and those of Rockies Express require site-specific HDD plans for wetland or waterbody crossings to be filed with the Secretary for review and approval by the Director of OEP. Rockies Express has submitted site-specific plans for the HDD crossings that include estimates of the volume of drill spoils and drill fluid and a description of the disposal method. Table 2.3.2-1 lists the

Table 2.3.2-1 HDD Drill Spoil & Drill Fluid Volumes		
	Volume (cubic feet)	
HDD Location	Drill Spoil	Drill Fluid
Salt River (MP 42.3)	57,431	37,475
Mississippi River (MP 43.1)	59,720	38,858
The Sny Canal (MP 47.5)	26,346	18,707
Illinois River (MP 71.2)	63,982	41,430
Embarras River (MP 202.9)	34,106	23,392
Wabash River (MP 247.2)	37,492	25,437
Big Walnut Creek (MP281.5)	33,104	22,787
Pennington Road (MP 312.4)	28,779	20,176
Big Blue River (MP 340.8)	24,295	17,469
White Water River (MP 393.1)	28,382	19,936
Four Mile Creek (MP 421.4)	30,210	21,040
Seven Mile Creek (MP 422.7)	24,804	17,776
Great Miami River (MP 430.7)	31,323	21,712
Little Miami River (MP 451.4)	51,119	33,664
Caesar Creek (MP 459.6)	33,597	23,085
Deer Creek (MP 499.6)	51,596	33,952
Big Darby Creek (MP 509.1)	30,846	21,424
Scioto River (MP 514.6)	23,945	17,258
Walnut Creek (MP 516.0)	25,456	18,170
Bus. Hwy. 33, Canal & RR (MP 534.0)	37,190	25,254
Muskingum River (MP 577.1)	26,823	18,995
HDD Total	**760,546**	**517,997**

volume of spoil and fluid for each HDD site. Disposal of drill fluid and spoils would be in accordance with its Plan at an approved landfill or by mixing with topsoil at an approved site. The disposal sites would be determined by the contractor and submitted to Rockies Express for approval prior to use.

Rockies Express proposes to use 21 HDDs to cross the following 32 waterbodies:

- In Missouri: Salt River (MP 42.5), Tributary to Salt River (MP 42.7);
- In both Missouri and Illinois: Mississippi River (MP 43.2);
- In Illinois: Sny Canal (MP 47.3), Illinois River (MP 71.2), Embarras River (MP 202.9);
- In Indiana: Wabash River (MP 246.9), Tributary to Big Walnut Creek (MP 281.4), Big Walnut Creek (MP 281.5), White Lick Creek (MP 312.4), two tributaries to White Lick Creek (MP 312.5), Open Water Area (MP 312.5), Big Blue River (MP 340.8), Whitewater River (MP 393.1); and
- In Ohio: Four Mile Creek (MP 421.6), Seven Mile Creek (422.7), Great Miami River (MP 430.7), Miami & Erie Canal (MP 430.8), Tributary to Great Miami River (MP 430.8 & MP

430.9), Tributary to Newman Run (MP 451.2), Little Miami River (MP 451.3), Caesar Creek (MP 459.6), Deer Creek (MP 499.6), Tributary to Big Darby Creek (MP 509.1) Big Darby Creek (MP 509.2), Scioto River (MP 514.6), Walnut Creek (MP 515.9), Ohio & Erie Canal (MP 516.0), Hocking Valley Canal (MP 534.0), Tributary to Hocking Valley Canal (MP 534.1), and Muskingum River (MP 577.2).

Residential Areas

Where residences are within 50 feet of the construction work area, Rockies Express would use alternative construction methods and conduct various activities to mitigate impact to residences. For locations of these residences see section 4.8 of the EIS. Such activities would include notifying the landowner before construction and arranging work hours to accommodate landowners' needs. Dust minimization techniques would be used onsite, and all litter and debris would be removed daily from the construction work area. During construction, the edge of the work area would be fenced for safety purposes to a distance of 100 feet on either side of the residence. Mature trees and landscaping would be preserved to the extent possible, while ensuring the safe operation of construction equipment. Site-specific construction drawings showing the temporary and permanent rights-of-way and noting special construction techniques would be prepared for all residential structures within 50 feet of the construction area (see appendix D).

Where residences are less than 25 feet from the construction work area, the pipe section would be welded and inspected, and welds would be coated before trench excavation begins. The trench would not be excavated until the pipe is ready for installation and would be backfilled immediately after pipe installation. Every effort would be made to excavate the trench, lower the pipeline, make tie-ins, and backfill the trench in one day. Immediately after backfilling the trench, all lawn areas and landscaping within the construction work area would be restored.

Agricultural Areas

Rockies Express proposes to use a Project-specific Agricultural Impact Mitigation Plan (AIMP) in conjunction with the Rockies Express Plan and Procedures in agricultural areas. For further discussion of the AIMP see section 4.8 of the EIS. This plan is attached as appendix I and describes the following:

- Provision of agricultural inspectors during and after Project construction;
- Segregation of up to 16 inches of topsoil;
- Minimum covering of 36 inches for the pipeline;
- Repair of any drainage systems damaged during pipeline construction;
- Compensation for any crop damages resulting from construction activities; and
- Negotiation with livestock farmers regarding the exclusion of livestock from the right-of-way.

Commercial and Industrial Areas

Impacts on commercial and industrial areas would be limited to the construction and post-construction restoration periods when construction activities could inconvenience business owners,

employees, and customers. Rockies Express would maintain close coordination with business owners to maintain access to businesses, decrease construction duration, and generally minimize construction-related disruptions.

Steep Slopes

In areas where the Project pipeline would cross steep slopes, additional grading may be required to enable the accommodation and use of pipeline construction equipment. The slopes would be cut and spoils stored temporarily in adjacent additional temporary extra workspace. Temporary sediment barriers and slope breakers such as silt fencing and staked straw bales would be installed during clearing to prevent disturbed soil from moving off the right-of-way. Temporary slope breakers consisting of mounded and compacted soil would be installed across the right-of-way during grading. After the pipeline is installed, the slopes would be reconstructed to their pre-construction contours and permanent slope breakers would be installed. Seed would be applied to steep slopes and the right-of-way would be mulched or covered with erosion-control fabric. Sediment barriers would be maintained across the right-of-way until permanent vegetation is established.

Areas of Shallow Bedrock

Rockies Express anticipates that limited blasting could prove necessary in areas where shallow bedrock or boulders are encountered that cannot be removed using an excavator with a bulldozer or a hoe-ram.

Approximately 1,136.5 acres of the soils that would be affected by construction contain bedrock within 60 inches of the surface. Around half of this bedrock is soft and/or weathered and likely would not require blasting during construction. The softer bedrock could be removed by conventional excavation with an excavator, ripping with a bulldozer followed by trackhoe excavation, or hammering with a trackhoe-attached device (hoe-ram) followed by excavation. The presence of hard bedrock could necessitate blasting or other special construction techniques.

If blasting proves necessary, the strict safety precautions specified in the Rockies Express Blasting Plan would be followed. Blasting mats or soil cover would be used as necessary to prevent the scattering of loose rock. Rock resulting from blasting activities would be hauled off the right-of-way and disposed of properly. In some cases, blast rock would be used placed back into the trench up to the top of the undisturbed surround rock. Care would be exercised to avoid damage to underground structures, cables, conduits, pipelines, and underground watercourses or springs. Rockies Express would provide advance notice of blasting to adjacent landowners or tenants to protect property or livestock. Blasting activity would be performed only during daylight hours.

Foreign Pipeline Crossings

Crossings of foreign pipelines would be installed at the depth necessary to meet normal soil cover and separation requirements. Temporary extra workspace would be required to accommodate the increased excavation depths and, for safety reasons, to avoid placing the spoil or construction equipment over the existing pipelines.

2.4.3 Aboveground Facility Construction

Typical construction activities associated with compressor stations are summarized below. General construction activities and storage of construction materials and equipment would be confined to

areas within the approved compressor station construction sites. Debris and waste generated from construction would be disposed of appropriately.

Installation of the meter stations and MLVs would meet the same standards and requirements established for the compressor stations and pipeline construction. Valves would be installed within the permanent pipeline right-of-way and proposed compressor stations, and would require no additional space.

Foundations

Excavation would be performed as necessary to accommodate the reinforced concrete foundations required for the new compressor units. Forms would be set, rebar installed, and the concrete poured and cured in accordance with applicable standards. Concrete pours would be randomly sampled to verify compliance with minimum strength requirements. Backfill would be compacted in place, and excess soil would be used elsewhere or distributed around the site.

Equipment

The compression equipment typically would be shipped to the site by truck and stored onsite. The compressors would be offloaded and, when ready for installation, positioned on the foundation, leveled, grouted, and secured.

Piping

All pipe connections associated with the new compressors that are not flanged or screwed would be welded. All welders and welding procedures would be qualified in accordance with API Standards. All welds in gas piping systems would be x-rayed (or verified by another nondestructive testing method) to ensure compliance with code requirements.

Hydrostatic Testing

All components in high-pressure natural gas service would be hydrostatically tested prior to being placed into service. Also, before being placed in service, all controls; safety equipment and systems; including emergency shutdown; relief valves; gas and fire detection; engine overspeed; and vibration would be checked or tested.

Launchers and Receivers

All pig launchers and receivers would be located on the compressor stations sites and would require no additional land for construction. The installation of the pig launchers and receivers would meet the same standards and requirements established for the compressor station and pipeline construction.

2.5 CONSTRUCTION SCHEDULE

Rockies Express proposes to begin construction of Project facilities in May 2008 and expects that all facilities would be placed into service by December 2008, except for the Arlington and Chandlersville Compressor Stations, which would be placed into service by June 2009.

2.6 OPERATION AND MAINTENANCE PROCEDURES

Operational activities on the pipeline would be limited to maintenance of the right-of-way and inspection, repair, and cleaning of the pipeline. Periodic aerial and ground inspections by pipeline personnel would assist in identification of the following conditions: soil erosion that may expose the pipe, surface visual clues that may indicate a leak in the line, conditions of the vegetative cover and erosion control measures, unauthorized encroachment on the right-of-way, excavation activities in the vicinity of the right-of-way, and other conditions that could present a safety hazard or require preventative maintenance or repairs. The pipeline cathodic protection system also would be monitored and inspected by pipeline personnel periodically to ensure proper and adequate corrosion protection. Appropriate corrective action to conditions observed during inspection would be taken as necessary.

2.6.1 Right-of-Way Monitoring and Maintenance

To maintain accessibility of the right-of-way and to accommodate pipeline integrity surveys, vegetation on the permanent right-of-way (50 feet wide) would be maintained by mowing, cutting, and trimming in all areas except for active agricultural areas (including rangeland and pasture), Conservation Reserve Program (CRP) areas, and wetlands. The right-of-way would be allowed to revegetate; however, large brush and trees would be periodically removed as described in Rockies Express' Plan and Procedures. Trees or deep-rooted shrubs could damage the pipeline's protective coating, obscure periodic surveillance and inspection, or interfere with potential repairs and thus would not be allowed to grow within 10 feet in uplands (15 feet in wetlands) of either side of the pipeline. In particular, large tree growth would typically be restricted within 25 feet of either side of the pipeline. However, Rockies Express has agreed with the U.S. Fish and Wildlife Service (FWS) and the Indiana Department of Environmental Management (IDEM), in specific areas identified as sensitive by these agencies, to maintain the right-of-way similarly to that described in the Rockies Express' Procedures under forested wetlands. Such vegetation maintenance normally would not be required in agricultural or grazing areas. The pipeline facilities would be clearly marked at line-of-sight intervals and at crossings of roads, railroads, and other key points. Efforts would be made to minimize the number of markers located in actively cultivated fields, particularly those where pivot irrigation is used. Wherever possible, markers would be placed at fence lines or field margins. The markers would clearly indicate the presence of the pipeline and provide a telephone number and address where a company representative can be reached in the event of an emergency or prior to any third-party excavation in the area of the pipeline. Rockies Express would participate in all One-Call systems.

2.6.2 Pipeline and Compressor Station Integrity

Rockies Express' pipeline facilities would be operated and maintained in accordance with the federal safety standards of 49 CFR 192. Operation and maintenance of the REX East Project facilities would be performed by or at the direction of Rockies Express. The pipeline would be inspected periodically from the air and on foot as operating conditions permit, but no less frequently than as required by 49 CFR 192. These surveillance activities would provide information on possible encroachments and nearby construction activities, erosion, exposed pipe, and other potential concerns that may affect pipeline safety and operation. Evidence of population changes would be monitored and class locations changed as necessary. Rockies Express also would inspect MLVs annually and document the results.

Compressor station crews would operate and maintain the station equipment. Station personnel would perform routine checks of the facilities, including calibration of equipment and instrumentation, inspection of critical components, and scheduled and routine maintenance of equipment. Safety

equipment, such as pressure relief, fire detection, and gas detection systems would be tested periodically for proper operation. Rockies Express would take corrective action for any identified problem.

The compressor stations would be equipped with combustible gas and fire detection alarm systems, and with an emergency shutdown system. The compressor stations also would be equipped with relief valves or pressure protection devices to protect the station piping from overpressure if station or unit control systems fail. A telemetry system would notify operations personnel locally and at the gas control headquarters of the activation of safety systems and alarms that would in turn dispatch maintenance personnel to investigate and take proper corrective actions.

2.7 ABOVEGROUND FACILITIES OPERATION

2.7.1 Operation Emissions

Under normal operating conditions, emissions from the proposed REX East Project would typically be attributable to emissions generated by the stationary sources at the compressor stations. Preliminary emissions estimates resulting from the operation of the proposed compressor stations are shown in table 2.7-1.

2.7.2 Operation Noise

Primary operational noise sources at the proposed compressor stations would be reciprocating engines, gas turbines, fuel gas heaters, and associated intakes and exhausts. The noise from emergency generators proposed for installation at the compressor stations is not included in the noise assessment due to the very temporary and intermittent operation of these units. A detailed noise assessment that included both a site ambient sound survey and an acoustical analysis was performed at each proposed compressor station location. The results documented in the noise assessments are shown in table 2.7-2.

The proposed compressor stations with recommended noise mitigation measures implemented are expected to comply with the FERC 55-dBA day-night sound level (L_{dn}) noise limit at the nearest noise sensitive areas (NSA). The attached report for the proposed Blue Mound compressor station also provides results that indicate the noise attributable to the new station should be below the Illinois noise regulations. In addition, Rockies Express' proposed facilities are not expected to have a perceptible increase in vibration at any NSA because a detailed evaluation will be performed to ensure that the system will operate properly once complete.

TABLE 2.7-1

REX East Project Compressor Station Operating Emissions Summary a/,b/

Facility/Emission Unit (Quantity)	NO_X		CO		SO_X		$PM_{10}/PM_{2.5}$		VOC		Single HAP	Total HAP
	lbs/hr	tpy	lbs/hr	Tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	tpy	Tpy
Arlington Compressor Station												
Engines (3)	30.55	133.8	10.69	46.83	0.07	0.3	1.18	5.16	17.46	76.45	9.79	19.68
Fuel Gas Heater (1)	0.08	0.34	0.07	0.29	<0.01	<0.01	0.01	0.03	<0.01	0.02	neg.	neg.
Space Heaters	0.1	0.44	0.08	0.37	<0.01	<0.01	0.01	0.03	0.01	0.02	neg.	neg.
Stand-by Generator (1)	1.7	0.42	2.44	0.61	<0.01	<0.01	0.08	0.02	0.91	0.23	0.16	0.2
Sumps	-	-	-	-	-	-	-	-	2.5	0.27	neg.	neg.
Storage Tanks	-	-	-	-	-	-	-	-	72.4	2.06	neg.	neg.
Fugitive Equipment Leaks	-	-	-	-	-	-	-	-	0.12	0.52	0.04	0.04
Total	32.43	135	13.28	48.1	0.07	0.3	1.28	5.24	93.4	79.57	9.99	19.92
Bertrand Compressor Station												
Engines (5)	55.81	244.45	16.37	71.68	0.12	0.52	2.02	8.84	30.17	132.14	16.7	33.63
Gas Heater (1)	0.07	0.32	0.06	0.27	<0.01	<0.01	0.01	0.02	<0.01	0.02	neg.	neg.
Space Heaters	0.09	0.41	0.08	0.35	<0.01	<0.01	0.01	0.03	0.01	0.02	neg.	neg.
Stand-by Generator (1)	7.14	1.79	5.49	1.37	0.01	<0.01	0.1	0.02	1.65	0.41	0.15	0.2
Sumps	-	-	-	-	-	-	-	-	2.5	0.38	neg.	neg.
Storage Tanks	-	-	-	-	-	-	-	-	80.72	1.96	0.02	0.02
Fugitive Equipment Leaks	-	-	-	-	-	-	-	-	0.34	1.48	0.11	0.11
Total	63.11	246.97	22	73.67	0.13	0.52	2.14	8.91	115.39	136.41	16.98	33.96
Mexico Compressor Station												
Turbines (2)	36.48	80.33	86.87	81.56	1.07	4.55	9.33	39.59	8.69	9.34	3.85	4.28
Gas Heater (1)	0.07	0.32	0.06	0.27	<0.01	<0.01	0.01	0.02	<0.01	0.02	<0.01	<0.01
Space Heaters	0.09	0.41	0.08	0.35	<0.01	<0.01	0.01	0.03	0.01	0.02	<0.01	<0.01
Stand-by Generator (1)	26.58	6.64	1.87	0.47	<0.01	<0.01	0.04	0.01	0.36	0.09	0.02	0.04
Storage Tanks	-	-	-	-	-	-	-	-	84.58	1.99	neg.	neg.
Fugitive Equipment Leaks	-	-	-	-	-	-	-	-	0.12	0.52	<0.01	0.04
Total	63.22	87.7	88.88	82.65	1.07	4.55	9.39	39.65	93.76	11.98	3.87	4.36

TABLE 2.7-1

REX East Project Compressor Station Operating Emissions Summary a/,b/

Facility/Emission Unit (Quantity)	NO_X		CO		SO_X		$PM_{10}/PM_{2.5}$		VOC		Single HAP	Total HAP
	lbs/hr	tpy	lbs/hr	Tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	tpy	Tpy
Blue Mound Compressor Station												
Engines (5)	55.83	244.55	16.28	71.33	0.12	0.53	2.07	9.06	30.24	132.46	16.52	33.88
Gas Heater (1)	0.07	0.32	0.06	0.27	<0.01	<0.01	0.01	0.02	<0.01	0.02	<0.01	<0.01
Space Heaters	0.09	0.41	0.08	0.35	<0.01	<0.01	0.01	0.03	0.01	0.02	<0.01	<0.01
Stand-by Generator (1)	7.14	1.79	5.49	1.37	0.01	<0.01	0.1	0.02	1.65	0.41	0.15	0.2
Sumps	-	-	-	-	-	-	-	-	2.5	0.38	<0.01	<0.01
Storage Tanks	-	-	-	-	-	-	-	-	81.79	1.87	<0.01	<0.01
Fugitive Equipment Leaks	-	-	-	-	-	-	-	-	0.12	0.52	0.04	0.04
Total	63.13	247.07	21.91	73.32	0.13	0.53	2.19	9.13	116.31	135.68	16.71	34.12
Bainbridge Compressor Station												
Turbines (2)	36.26	79.89	86.33	81.03	1.06	4.52	9.27	39.35	8.63	9.29	3.83	4.25
Gas Heater (1)	0.07	0.32	0.06	0.27	<0.01	<0.01	0.01	0.02	<0.01	0.02	<0.01	<0.01
Space Heaters	0.09	0.41	0.08	0.35	<0.01	<0.01	0.01	0.03	0.01	0.02	<0.01	<0.01
Stand-by Generator (1)	26.58	6.64	1.87	0.47	<0.01	<0.01	0.04	0.01	0.36	0.09	0.05	0.07
Storage Tanks	-	-	-	-	-	-	-	-	78.53	1.81	<0.01	<0.01
Fugitive Equipment Leaks	-	-	-	-	-	-	-	-	0.12	0.52	0.04	0.04
Vehicle Traffic	-	-	-	-	-	-	0.57	0.14	-	-	-	-
Total	63.00	87.26	88.34	82.12	1.06	4.52	9.90	39.55	87.65	11.75	3.92	4.36
Hamilton Compressor Station												
Electric centrifugals (2)	--	--	--	--	--	--	--	--	--	--	--	--
Gas Heater (1)	0.07	0.32	0.06	0.27	<0.01	<0.01	0.01	0.02	<0.01	0.02	neg.	neg.
Stand-by Generator (1)	10.39	2.6	2.25	0.56	0.69	0.17	0.74	0.18	0.84	0.21	neg.	neg.
Total	10.46	2.92	2.31	0.83	0.69	0.17	0.75	0.2	0.84	0.23	neg.	neg.
Chandlersville Compressor Station												
Engines (3)	30.15	132.07	9.05	39.62	0.07	0.3	1.15	5.03	15.12	66.22	4.21	12.08
Gas Heater (1)	0.08	.34	0.07	0.29	<0.01	<0.01	0.01	0.03	<0.01	0.02	<0.01	<0.01
Space Heaters	0.1	0.44	0.08	0.37	<0.01	<0.01	0.01	0.03	0.01	0.02	<0.01	<0.01

TABLE 2.7-1

REX East Project Compressor Station Operating Emissions Summary a/,b/

Facility/Emission Unit (Quantity)	NO_X		CO		SO_X		$PM_{10}/PM_{2.5}$		VOC		Single HAP	Total HAP
	lbs/hr	tpy	lbs/hr	Tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	tpy	Tpy
Stand-by Generator (1)	7.14	1.79	5.49	1.37	0.01	<0.01	0.09	0.02	1.65	0.41	0.17	0.22
Storage Tanks	--	--	--	--	--	--	--	--	77.71	1.73	<0.01	<0.01
Sumps	--	--	--	--	--	--	--	--	2.5	0.38	<0.01	<0.01
Fugitive Equipment Leaks	--	--	--	--	--	--	--	--	0.12	0.52	0.04	0.04
Vehicle Traffic	-	-	-	-	-	-	0.57	0.13	-	-	-	-
Total	37.47	134.64	14.69	41.65	0.08	0.30	1.83	5.24	97.11	69.30	4.42	12.34

a/ Based on preliminary engineering design and site-specific equipment specifications. Engine emissions are based on the proposed units being equipped with a catalytic oxidizer. Turbine emissions are based on the proposed units being equipped with the manufacturer's Low NO_x (SoLoNOx™) emission reduction technology.

b/ Annual emissions rates are based on units operating 8,760 hours per year, except for the stand-by generators, which have been assumed to operate a maximum of 500 hours per year.

PM_{10} = Particulate Matter less than 10 microns in aerodynamic diameter
$PM_{2.5}$ = Particulate Matter less than 2.5 microns in aerodynamic diameter
SO_2 = Sulfur Dioxide
NO_X = Nitrogen Oxides
CO = Carbon Monoxide
VOC = Volatile Organic Compound
Single HAP = Highest emission rate of a single hazardous air pollutant (values presented are for Formaldehyde only)
Total HAP = Total emissions of all hazardous air pollutants
lbs/hr = pounds per hour
tpy = tons per year

TABLE 2.7-2

REX East Project Estimated Noise Levels at Noise-sensitive Areas Near the Proposed Compressor Stations

Location / Noise-Sensitive Area (NSA)	Ambient L_{dn} (dBA)	L_{eq} Attributable to New Station (dBA)	L_{dn} Attributable to New Station (dBA)	Post-Construction L_{dn} (dBA)	Noise Increase at NSA (dBA)
Arlington Compressor Station a/					
NSA1	**58.4**	**47.1**	**53.5**	**59.6**	**1.2**
Bertrand Compressor Station b/					
NSA1	**37.8**	**34.1**	**40.5**	**42.4**	**4.6**
NSA2	**41.2**	**42.8**	**49.2**	**49.8**	**8.6**
Mexico Compressor Station c/					
NSA1	**35.5**	**36.9**	**43.3**	**44.0**	**8.5**
NSA2	**38.5**	**31.5**	**37.9**	**41.2**	**2.7**
Blue Mound Compressor Station d/					
NSA1	4	42.0	**48.8**	**50.6**	**4.0**
Bainbridge Compressor Station e/					
NSA1	4	44.0	50.4	51.2	7.7
NSA2	4	40.3	**46.7**	**48.5**	**4.7**
Hamilton Compressor Station f/					
NSA1	5	37.8	44.2	58.4	0.2
NSA2	**55.6**	**33.3**	**39.7**	**55.7**	**0.1**
Chandlersville Compressor Station g/					
NSA1	47.7	43.6	50	52.0	4.3
NSA2	47.3	42.6	**49**	**51.2**	**3.9**
NSA3	**47.0**	**41.6**	**48**	**50.6**	**3.6**

a/ Based on a March 15, 2007 report (No. 2084) entitled "Results of an Ambient Site Sound Survey and Revised Acoustical Analyses for a New Natural Gas Compressor Station Associated with Entrega Gas Pipeline but Being Installed as a Part of the Rockies Express Pipeline – East Project" prepared by Hoover and Keith Inc.

b/ Based on an April 10, 2007 report (No. 2085) entitled "Results of an Ambient Site Sound Survey and Revised Acoustical Analyses for a New Natural Gas Compressor Station Associated with the Rockies Express Pipeline – East Project" prepared by Hoover and Keith Inc.

c/ Based on an June 26, 2007 report (No. 2119) entitled "Results of an Ambient Site Sound Survey and Acoustical Analyses for a New Natural Gas Compressor Station Associated with the Rockies Express Pipeline – East Project" prepared by Hoover and Keith Inc.

d/ Based on a June 27, 2007 report (No. 2120) entitled "Results of an Ambient Site Sound Survey and Revised Acoustical Analyses for a New Natural Gas Compressor Station Associated with the Rockies Express Pipeline – East Project" prepared by Hoover and Keith Inc.

e/ Based on a June 25, 2007 report (No. 2116) entitled "Results of an Ambient Site Sound Survey and Acoustical Analyses for the New Site of the Bainbridge Gas Compressor Station Associated with the Rockies Express Pipeline – East Project" prepared by Hoover and Keith Inc.

f/ Based on a October 6, 2007 report (No. 2150) entitled "Results of a New Ambient Site Sound Survey and Revised Acoustical Analyses for the Hamilton Station Associated with the Rockies Express Pipeline – East Project" prepared by Hoover and Keith Inc.

g/ Based on a October 6, 2007 report (No. 2151) entitled "Results of a New Ambient Site Sound Survey and Revised Acoustical Analyses for the Chandlersville Station Associated with the Rockies Express Pipeline – East Project" prepared by Hoover and Keith Inc.

dBA = decibels of the A-weighted scale
L_{eq} = equivalent sound level
L_{dn} = day-night equivalent sound level

3.0 ASSESSMENT OF IMPACTS

In accordance with Section 7 of the ESA, through informal consultation with the FWS, Rockies Express initially identified 23 federally listed threatened, endangered, or candidate species as potentially occurring in the Project area. However, since the initial review, 10 of the 23 species are no longer being evaluated for the following reasons:

- The bald eagle has become delisted and is now a state-listed species only.
- There is no habitat for the black-footed ferret, Canada lynx, blowout penstemon, and Ute ladies'-tresses orchid at the Arlington Compressor Station in Carbon County, Wyoming, where these species could occur.
- The water needs at the Arlington Compressor Station, up to 1-acre feet, qualifies as an "existing water related activity" under Wyoming's Depletion Plan and the Program[3] because it would be purchase from an entity that holds existing water rights covered under an existing water related activity (the City of Laramie or the Town of Rock River). The FWS issued a Programmatic Biologic Opinion in 2006 that determined that Program implementation, along with existing and a specified amount of new depletions, may adversely affect but would not likely jeopardize the continued existence of the federally endangered whooping crane, interior least tern, and pallid sturgeon, or the federally threatened northern Great Plains population of the piping plover, western prairie fringed orchid, and bald eagle in the central and lower Platte River. The withdrawl from the Platte River associated with the Arlington Compressor Station fall within the assessed water depletions contained in the Programmatic Biologic Opinion, and the FWS has been notified of this determination. Further, the FWS determined that the Program implementation was not likely to destroy or adversely modify designated critical habitat for the whooping crane. (Wyoming State Engineer's Office, 2008)
- There is no habitat for the black-footed ferret, interior least tern, piping plover, or pallid sturgeon at the Bertrand Compressor Station in Phelps County, Nebraska, where these species could occur.
- The pink mucket pearly mussel and the sheepnose are no longer being evaluated, because the Project would no longer cross Morgan County, OH, where these species could potentially occur.

Therefore, these species are not evaluated in the BA. A discussion of the bald eagle is provided in Section 4.3.5, of the EIS. Table 3-1 includes the FERC's determination of the Project's effect on the 10 federally listed endangered or threatened species described above.

In response to concerns raised by federal, state, and local agencies regarding the potential impact of the construction of pipeline projects in general, Rockies Express developed a Plan (appendix C) and Procedures (appendix D). The Plan and Procedures were developed to provide procedures to minimize erosion and sedimentation, and to provide a minimum level of protection for surface waters and wetlands that would be affected by the REX East Project. In addition, we worked with Rockies Express in their

[3] The State of Wyoming has entered into the Platte River Recovery Implementation Program (Program) with the U.S. Department of the Interior and the States of Colorado and Nebraska. The purpose of the Program is to provide compliance with the Endangered Species Act (ESA) for certain historic and future uses in each state. Without such a Program, most water users proposing new projects or rehabilitating or improving existing projects would have to undergo an individual ESA consultation with the U. S. Fish end Wildlife Service.

development of a Conservation Agreement with the FWS. The Conservation Agreement is designed to address concerns relating to migratory birds, forest fragmentation, and other upland forest clearing concerns in Missouri, Illinois, Indiana, and Ohio.

In addition, Rockies Express has proposed to implement the following measures to minimize the impact of the Project on special status species:

- Rockies Express would use a project specific environmental training program before the start of work. All employees and contractors working in the field would be required to complete an environmental training session before beginning work on the right-of-way. The program would include discussions of the biology, distribution, and ecology of special status species within the geographic area of construction; protection afforded for such species under applicable federal and state laws and regulations; all protection measures that must be followed to protect such species during Project related construction and operation activities; penalties for noncompliance; reporting requirements; and the importance of compliance with all protection measures. To ensure proper focus, emphasis would be placed on the specific aspects of compliance applicable to the particular project activities.

- Employees and contractors would be informed during one or more training sessions that they are not authorized to handle or otherwise move wildlife, with emphasis on listed species, at any time including while commuting to work sites or while at a work site.

- Rockies Express would hire and designate at least two Environmental Inspectors (EIs) per construction spread who would be responsible for overseeing Project environmental protection measures, including those for special status species. Environmental inspection procedures would be in compliance with the relevant provisions of Rockies Express' Plan and Procedures.

- Only existing routes of travel and approved access roads would be used to and from construction areas. Cross-country travel by vehicles and equipment would be prohibited.

- Firearms and pets would be prohibited from work sites.

- With the exception of the HDD operation, pipeline construction activities typically would not take place between dusk and dawn and generally would be limited to emergencies only (i.e., issues involving human health and safety).

- If a listed species is located during construction, and a contingency for avoidance, removal, or transplant has not been approved by the FWS or another appropriate agency, Rockies Express would either avoid or not proceed with Project activities in that location until specific consultation with the FERC, FWS, and/or other appropriate agency is completed.

- All encounters with listed species would be reported to the EI, who would record the following information:

    - species;
    - location (narrative and maps) and dates of observations;
    - general condition and health, including injuries and state of healing;
    - diagnostic markings, including identification numbers or markers; and
    - locations moved from and to.

- Upon locating a dead or injured listed species, Rockies Express would notify FWS and the appropriate state agency promptly (within three days). Written notification would be made within 15 days of the date and time of the finding or incident (if known) and would include: location of the carcass, a photograph, cause of death (if known), and other pertinent information.

- In general, the construction right-of-way would be limited to a width of 125 feet with various sized additional temporary workspace locations. The construction right-of-way would be clearly staked and flagged in advance of construction. The construction work area includes approved work areas for the pipelines, compressor stations, and meter stations; access roads; and staging areas.

- If nesting sensitive migratory birds are found on the construction right-of-way, the nest would not be removed until fledging has occurred or unless authorized after consultation with the FWS and the FERC.

- At the conclusion of work, all trenches and holes would be completely filled, surfaces restored, and each site recontoured to match the original profiles as closely as possible.

- With the exception of fenced facilities, all materials and equipment would be removed from the area upon completion of work. All stakes, flagging, and fencing used to delineate and protect any environmental or cultural feature in the construction area would be removed no later than 30 days after construction and restoration are complete, weather and soil conditions permitting.

- In developing its revegetation plan, Rockies Express would consider using native species as recommended by the FWS. Rockies Express would commit to not knowingly plant invasive ground covers during reclamation and restoration.

Rockies Express would restore the area outside the permanent right-of-way in uplands according to its Plan. Wetlands would be restored according to Rockies Express' Procedures and state-specific and agency-approved restoration and mitigation plans. Additionally, Rockies Express would provide compensatory mitigation for wetland impacts, primarily for forested wetlands, resulting in a net benefit in overall wetland area in the general vicinity of the Project route. Rockies Express would adhere to its Procedures (REX-East Procedures, Appendix D) when restoring and mitigating wetlands. As stated in its Procedures, the success of wetland revegetation would be monitored and recorded annually for 3 years after construction or until wetland revegetation is successful. At the end of three years after construction, a report will be filed with the FERC identifying the status of the wetland revegetation efforts, and reports would continue to be filed annually until wetland revegetation is successful. Consistent with the REX East Procedures, wetland revegetation would be considered successful if the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction.

TABLE 3-1

Potential Effect of the REX East Project on Federally Listed Endangered or Threatened Species

Species	Federal Status	Locations Where Species Could Occur	Project Effect	Additional Survey Required	Mitigation/Conservation Measures
Mammals					
Indiana bat (*Myotis sodalis*)	E	All counties crossed by the pipeline route	*Not likely to adversely affect*	Yes	1. For the habitat unit IDs that were surveyed in 2007 and no Indiana bats were found as well as areas that were not recommended for survey and approved by FWS, no additional recommendations or conservation measures would be required. 2. For the habitat unit IDs that were surveyed in 2007 and Indiana bats were identified but no nursery roost trees were identified, the following recommendations and conditions would be implemented to avoid direct effects to Indiana bats roosting in alternative roost trees: a. Remove trees during the inactive season (between October 1 and March 31); **OR** b. Remove trees while bats are foraging under the following conditions: i. Tree removal will occur between 1 hour after sunset and 1 hour before sunrise ii. Temperature must be greater than 50°F iii. No precipitation or strong winds (as before an approaching thunderstorm). 3. For the habitat unit IDs that were surveyed in 2007 and Indiana bats were identified and nursery roost trees were identified, the following recommendations and conditions would apply: a. Rockies Express would reconfirm the location of the nursery roost tree(s) prior to construction to determine if it remains suitable. This applies to all sites in table 3-4, below, where at least one roost tree was identified as well as Habitat Unit IDs MO-3.0; IN-32.0; and OH 10.7. i. If the nursery roost tree remains a suitable nursery roost tree, Rockies Express would avoid the nursery tree and immediate microclimate (as identified by a certified biologist and approved by FWS) by altering the construction area and placement of the pipeline route. A minimum distance of 100 feet would be maintained between the construction area and the nursery roost

TABLE 3-1

Potential Effect of the REX East Project on Federally Listed Endangered or Threatened Species

Species	Federal Status	Locations Where Species Could Occur	Project Effect	Additional Survey Required	Mitigation/Conservation Measures
Indiana bat (*Myotis sodalis*) [Continued]					tree and Rockies Express would (a) erect fencing to delineate the boundary and prevent inadvertent encroachment into the area, and (b) erect signs stating "no trespassing" or "do not disturb – sensitive area". ii. If the nursery roost tree is no longer suitable, Rockies Express would implement one of the following conservation measures: (1.) Conduct a radiotelemetry study in accordance with FWS-approved 2007 procedures to locate new nursery roost tree(s) and if within the action area, avoid the tree(s) and its microclimate in accordance with 3(a)(i); **OR** (2.) Protect all potential nursery trees (Live or standing dead trees or snags over 9 inches in diameter at breast height (dbh) with exfoliating, peeling or loose bark, split trunks and/or branches, or cavities. These characteristics must be plentiful enough to allow the colony to change locations along the tree to aid in thermoregulation. If the habitat characteristics are found only on the branches of the tree, the branches must be at least 8 inches in diameter at the site of the habitat characteristics. These trees must have some solar exposure, and trees must be part of, or connected to, a travel corridor or forested area within the action area; that is, treat all potential nursery roost trees as actual nursery roost trees; **OR** (3.) Identify potential nursery roost trees and conduct exit counts to determine whether it is an occupied nursery roost (if more than 20 bats are observed, the tree would be classified as an occupied nursery tree; if fewer than 20 bats are observed, the tree would be classified as an alternate roost tree.) If a nursery roost tree is documented, avoid the tree and its microclimate per Conservation Measure 3(a)(i). If it is not documented as a nursery roost tree, use applicable alternate roost tree avoidance measures per Conservation Measure 2.

TABLE 3-1

Potential Effect of the REX East Project on Federally Listed Endangered or Threatened Species

Species	Federal Status	Locations Where Species Could Occur	Project Effect	Additional Survey Required	Mitigation/Conservation Measures
Indiana bat (*Myotis sodalis*) [Continued]					4. In all areas that were not surveyed in 2007, including any areas where the alignment has shifted such that unsurveyed habitat may be affected (see table 3-7, below), Rockies Express would survey the areas in accordance with the FWS-approved 2007 procedures to locate new nursery roost tree(s). Prior to construction in an unsurveyed habitat unit ID area, Rockies Express would complete all surveys and submit the findings to the FERC and FWS for review and comment. Rockies Express should not begin construction in the habitat unit ID until it has received written notification from the Director of Office of Energy Projects (OEP) that construction or use of mitigation may begin. Based on the findings of the surveys to be conducted in 2008, Rockies Express would implement one of the following measures: a. If a nursery roost tree is identified, Rockies Express would avoid it and the immediate microclimate (as identified by a certified biologist and approved by FWS) by altering the construction area and placement of the pipeline route. A minimum distance of 100 feet would be maintained between the construction area and the nursery roost tree, and Rockies Express would erect fencing to delineate the boundary and prevent inadvertent encroachment into the area. b. If Indiana bats are captured and a nursery roost tree is not identified, Rockies Express would identify potential nursery roost trees and conduct exit counts to determine whether it is an occupied nursery roost (if more than 20 bats are observed, the tree would be classified as an occupied nursery tree; if fewer than 20 bats are observed, the tree would be classified as an alternate roost tree.) If a nursery roost tree is documented, the tree and its microclimate should be avoided per Conservation Measure 3(a)(i). If the tree is not documented as a nursery roost tree, use applicable alternate roost tree avoidance measures per recommendation and Conservation Measure 2.

TABLE 3-1

Potential Effect of the REX East Project on Federally Listed Endangered or Threatened Species

Species	Federal Status	Locations Where Species Could Occur	Project Effect	Additional Survey Required	Mitigation/Conservation Measures
Indiana bat (*Myotis sodalis*) [Continued]					Additional recommendations and conservation measures to further minimize the potential impacts on the Indiana bat include: - Prior to construction, Rockies Express should submit an updated Table 3-7 and Appendix K to FWS and the FERC that identifies the Habitat Unit IDs that remain to be surveyed and the milepost extent of each Habitat Unit ID. - During construction, trees, limbs, brush, and debris should not be burned in the right-of-way within 500 feet of the entire area of suitable habitat associated with each habitat unit ID. - Rockies Express should not use herbicides or pesticides for maintenance of the permanent right-of-way or adjacent forested areas, regardless of whether Indiana bats are present, for the life of the Project except as allowed by the appropriate land management agency or state agency. - In the event that a trenchless crossing fails at the Mississippi River, Wabash River, Big Walnut Creek, or Big Darby Creek, Rockies Express should halt construction activites at the crossing(s) until Rockies Express files with the Secretary a site-specific alternate waterbody crossing plan developed in consultation with the FERC, COE, and FWS. The plan should include: a. scaled drawings identifying all areas that would be disturbed by an alternative crossing method; and b. a description of the mitigation measures that would be implemented to minimize the extent and duration of disturbance on the river and the Indiana bat. - In addition, Rockies Express should not begin an alternative crossing of the Mississippi River, Wabash River, Big Walnut Creek, or Big Darby Creek until: a. the FERC evaluates the potential impact on the Indiana bat and the Commission staff completes consultation with the FWS; b. the FERC, FWS, and COE determine that the alternative crossing method and mitigation plan are acceptable; and c. the Director of OEP notifies Rockies Express in writing that it may proceed with the alternative river crossing plan.

TABLE 3-1

Potential Effect of the REX East Project on Federally Listed Endangered or Threatened Species

Species	Federal Status	Locations Where Species Could Occur	Project Effect	Additional Survey Required	Mitigation/Conservation Measures
Indiana bat (*Myotis sodalis*) [Continued]					- Rockies Express should use a dry-crossing method for crossing Sugar Creek. - To minimize potential impacts on foraging Indiana bats during construction, Rockies Express should limit specific construction activities (clearing, trenching, welding, backfilling, and grading) within 300 feet of documented nursery roost trees and alternative roost trees identified during the field surveys from one-half hour after dawn to one-half hour before dusk for the period of tree clearing restriction as identified by FWS (April 1 - September 30). This timing restriction would allow ample time for bats to return to roost trees at dawn and time for bats to emerge from roosts at dusk.
Birds					
Whooping crane (*Grus americana*)	E	Phelps/NE; IN; and OH a/	*Not likely to adversely affect*	No	During construction, if any whooping cranes are encountered in the immediate vicinity of pipeline construction or construction of other aboveground facilities, construction should immediately stop in that area, the FWS and the FERC should be contacted, and appropriate protection measures would be developed and implemented. Protection measures would be developed in coordination with the FWS.
Mussels					
Fat pocketbook (*Potomalus capax*)	E	Pike, Ralls/MO	*No effect*	Yes	None; rivers containing know populations would not be crossed and survey in the Mississippi River did not identify any listed species.
Fanshell (*Cyprogenia stegaria*)	E	Muskingum/OH	*Not likely to adversely affect*	Yes	To minimize the potential impacts on the fanshell, clubshell, and northern riffleshell, we recommend that: Prior to the start of construction, Rockies Express file with the Secretary completed mussel survey reports for the federally listed mussel species in Ohio, documentation of its consultation with FWS and ODNR, and conservation measures necessary to minimize impact to mussel beds.
Fanshell					During construction, Rockies Express should not withdraw

TABLE 3-1

Potential Effect of the REX East Project on Federally Listed Endangered or Threatened Species

Species	Federal Status	Locations Where Species Could Occur	Project Effect	Additional Survey Required	Mitigation/Conservation Measures
(*Cyprogenia stegaria*) [Continued]					hydrostatic test water from waterbodies where endangered mussels or glochidia/host fish or juveniles could be directly impacted or from the tributaries to such waterbodies. In the event that a trenchless crossing fails at the Scioto River, Deer Creek in Deer Creek State Park, or Big Darby Creek, Rockies Express should halt construction activities at the crossing(s) until Rockies Express files with the Secretary a site-specific alternate waterbody crossing plan developed in consultation with the FERC, COE, and FWS. The plan should include: a. the specific reasons that the trenchless technique was not successful; b. a description of how Rockies Express would seal the abandoned drill hole; c. scaled drawings identifying all areas that would be disturbed by an alternative crossing method; and d. a description of the mitigation measures that would be implemented to minimize the extent and duration of disturbance on the river and any mussels. In addition, Rockies Express should not begin an alternative crossing of the Scioto River, Deer Creek in Deer Creek State Park, or Big Darby Creek until: a. the FERC evaluates the potential impact on the mussel species and the Commission staff completes consultation with the FWS; b. the FERC, FWS, and COE determine that the alternative crossing method and mitigation plan are acceptable; and c. the Director of OEP notifies Rockies Express in writing that it may proceed with the alternative river crossing plan.
Clubshell (*Pleurobema clava*)	E	Greene, Pickaway, Fairfield/OH	*Not likely to adversely affect*	No	See measures for fanshell.

TABLE 3-1

Potential Effect of the REX East Project on Federally Listed Endangered or Threatened Species

Species	Federal Status	Locations Where Species Could Occur	Project Effect	Additional Survey Required	Mitigation/Conservation Measures
Northern riffleshell (*Epioblasma torulosa rangiana*)	E	Pickaway/OH	*Not likely to adversely affect*	Yes	See measures for fanshell.
Plants					
Decurrent false aster (*Boltonia decurens*)	T	Pike (MO and IL), Scott/IL	*No effect*	No	None. No known occurrences within 1 mile of the Project route and HDD at the Illinois River would avoid suitable floodplain habitat.
Eastern prairie fringed orchid (*Platanthera leucophaea*)	T	All counties crossed by the pipeline in IL	*No effect*	No	None. No known occurrences within 1 mile of the Project route and no suitable habitat along the Project route.
Prairie bush clover (*Lespedeza laptostachya)*	T	All counties crossed by the pipeline in IL	*No effect*	No	None. No known occurrences within 1 mile of the Project route and field surveys in Illinois did not identify any individuals or populations.
Running buffalo clover (*Trifolium stoloniferum*)	E	Warren/OH	*Not likely to adversely affect*	Yes	Prior to construction, Rockies Express file with the Secretary completed survey reports for the running buffalo clover and documentation of its consultation with FWS. If running buffalo clover is identified within the action area during remaining surveys, Rockies Express would implement the following: If plants are located adjacent to or along the edge of the construction right-of-way, fence off the plants and avoid the area. If plants are located within the construction right-of-way, modify the construction right-of-way configuration to avoid plants, retain tree cover in and around plants, and fence off the plants. Use only approved native plant species during restoration of the right-of-way. Prohibit herbicide applications within 200 feet of the plants and avoid mowing between May and June. Prior to construction, should any areas of running buffalo clover be identified, Rockies Express, in consultation with the FWS, should develop site-specific invasive plant control measures to include a monitoring plan. During construction, Rockies Express should not burn in or adjacent to any areas where running buffalo clover has been identified.

TABLE 3-1

Potential Effect of the REX East Project on Federally Listed Endangered or Threatened Species

Species	Federal Status	Locations Where Species Could Occur	Project Effect	Additional Survey Required	Mitigation/Conservation Measures
Candidate Species					
Eastern massasauga (*Sistrurus catenatus catenatus*)	C	Clinton, Fayette, Greene, and Warren/OH	N/A	Yes	To minimize the potential impacts on the eastern massasauga, we recommend that: prior to the start of construction, Rockies Express file with the Secretary, the completed habitat assessment for the eastern massasauga snake along with FWS comments on the habitat survey.
Rayed bean (*Villosa fabalis*)	C	Pickaway, Warren/OH	N/A	Yes	See measures for fanshell
Spectaclecase (*Cumberlandia monodonta*)	C	Pike /MO and IL	N/A	Yes	See measures for fanshell

_____

a/ Includes an experimental migratory population.

T = Threatened
E = Endangered
C = Candidate for listing as Threatened or Endangered

NA = Not applicable – determination does not apply to candidate species

Bald Eagle has been delisted; a discussion of the potential impacts on the bald eagle is presented in Section 4.5.3 of the EIS

3.1 IMPACT ASSESSMENT SUMMARY OF LISTED SPECIES

3.1.1 Wildlife Species

Indiana Bat

Background

The federally endangered Indiana bat is listed as occurring in all counties crossed by the proposed pipeline route. Since this species was first listed as endangered in 1967, populations have declined by nearly 60 percent (FWS, 2002b). The Indiana bat is a temperate, insectivorous, migratory bat that utilizes mines, caves, and wooded habitats. Maternity colonies of the Indiana bat, as well as male and non-reproductive (juvenile) females use a spectrum of forest habitats. Indiana bats can travel up to 300 miles in search of caves that provide the necessary habitat for hibernation. The bat hibernates in mines and caves from mid-October to April and then disperses to reproduce and forage in spring and summer in various forested areas associated with streams. The mines and caves provide stable cold temperatures. In late March to early June, females leave the caves and migrate to roosting areas (ODNR, 2007b). Individuals are known to roost under the bark of trees in riparian and upland forests, generally near perennial waterbodies. During the summer, maternity colonies typically occur behind sloughing bark or in cavities, often in, but not limited to, dead trees. Indiana bats forage on insects in and around the tree canopy of floodplain, riparian, and upland forests. Waterbodies associated with floodplain forests and impounded bodies of water such as ponds, reservoirs, and wetlands are sometimes considered preferred foraging habitats for bats (FWS, 2006e). Population declines are caused primarily by human disturbance during hibernation and the loss of suitable hibernacula (FWS, 2002b).

The FWS has identified important habitat for this species near the Wabash River, Sugar Creek, Big Raccoon Creek, Big Walnut Creek, West Fork White River, and Big Darby Creek along the pipeline route. The FWS also noted that the Indiana bat can be found among the Mississippi River islands and floodplain and within the floodplain areas of the Illinois side of the Mississippi River. The FWS states that summer foraging and roosting habitat is likely to be present throughout the Project area (FWS, 2006b; FWS, 2006c; FWS, 2006d; FWS, 2006e).

Eleven caves/mines are designated as critical habitat for the Indiana bat, including the Blackball Mine in LaSalle County and the Slick Crawl Cave in Pike County, Illinois; the Big Wyandotte Cave in Crawford County and Rays Cave in Greene County, Indiana; Cave 021 in Crawford County, Caves 009 and 017 in Franklin County, Pilot Knob Mine in Iron County, Bat Cave in Shannon County, Frankford Cave in Pike County, and Cave 029 in Washington County, Missouri. In the counties that would be crossed by the REX East Project, there is one record of a Priority IV hibernaculum in Pike County, Missouri (Frankford Cave, located 8.5 miles from the proposed REX East centerline), and one historic winter record of Indiana bats in Pike County, Illinois (Slick Crawl Cave, located 17.4 miles from the proposed centerline); both are designated as critical habitat.

Field Survey Results

Consultations with the Natural Heritage Inventory (NHI) databases of Missouri, Illinois, Indiana, and Ohio identified no known occurrences of the Indiana bat within 1 mile of the proposed pipeline route (MDC, 2006; ILDNR, 2006; INDNR, 2006; ODNR, 2006). Although unidentified by the Ohio NHI, comments received from the FWS dated November 30, 2006, indicate that a maternity colony occurs on Big Darby Creek, approximately 0.5 mile from the proposed crossing (FWS, 2006f) (see appendix E). The FWS states that summer foraging and roosting habitat is likely to be present throughout the Project area (FWS, 2006b; FWS, 2006c; FWS, 2006d). The FWS specifically identified important habitat for this

species surrounding the Wabash River, Sugar Creek, Big Raccoon Creek, Big Walnut Creek, the West Fork White River, and Big Darby Creek (FWS, 2006c; 2006f).

In coordination with the FWS, Rockies Express created a three-step survey protocol, labeled the Indiana Bat Habitat Assessment and Survey Plan, to identify areas of potential Indiana bat habitat and determine which areas may be occupied by bats. As part of step one, Rockies Express conducted preliminary habitat surveys in forested areas along the Project corridor to identify areas of suitable Indiana bat summer roosting habitat. Surveys involved pedestrian meander searches for trees with the appropriate bark structure or cavities to sustain roosting bats. Rockies Express completed this initial assessment of forested areas along the Project route concurrent with the initiation of step two of the approved survey plan. In step two, Rockies Express completed a qualitative habitat assessment of the areas identified as containing potential roost trees, including categorizing habitats by quality. As agreed upon by the FWS Bloomington Ecological Field Service Office (ESO) on February 27, 2007, the quality of each bat habitat site was determined according to site-specific ecology and landscape features in addition to the guidelines set forth by the Indiana Bat Habitat Assessment and Survey Plan (FWS, 2007a). As the final step in the survey protocol, in coordination with Rockies Express, the FWS recommended specific locations where mist net surveys or telemetry were required.

In the spring and summer of 2007, all four ESOs approved state-specific Indiana Bat Mist Net and Radiotelemetry Survey Plans (Appendix F) so that Indiana bat surveys could be initiated in all agreed-upon bat habitat units for the entire proposed REX East Project Route. Results of the 2007 survey effort conducted along the Project route are summarized in a report titled "Mist Net Survey for the Indiana Bat (*Myotis sodalis*) within the Proposed REX East Pipeline Corridor in Four States." This report was provided to the respective FWS field offices on October 1, 2007. Rockies Express conducted mist net surveys for the Indiana bat at 161 sites and radio-tracked captured Indiana bats. Table 3-2 summarizes the mist net surveys completed and Indiana bats captured during 2007 survey efforts. Several modifications have been made to the route alignment since the surveys were conducted. The assessment of Indiana bat impacts has been adjusted to apply to the most current version of the proposed route, and as such, this biological assessment may not agree in entirety with the Indiana Bat Survey Report.

A total of 670 bats of nine species were captured during the survey effort. Twenty-five adult and one juvenile Indiana bats were captured at 12 net site locations along the REX East Project route. Two Indiana bats were captured in Audrain County, Missouri; six in Pike County, Missouri; one in Pike County (juvenile bat), Illinois; three in Vermillion County, Indiana; nine in Putnam County, Indiana; two in Hendricks County, Indiana; one in Franklin County, Indiana; one in Warren County, Ohio; and one in Belmont County, Ohio (table 3-2). Those bats captured in Audrain County, Missouri; Franklin County, Indiana; and Belmont County, Ohio, appear to be the first documented summer occurrences of Indiana bats in those counties. One mist net site in Pike County, Missouri; two mist net sites in Fayette/Pickaway Counties (Deer Creek State Park); and two of five mist net sites (within one habitat unit) in Belmont County, Ohio were not surveyed because landowners denied property access.

When adult female Indiana bats were captured, Rockies Express attached radio transmitters to them and followed them to attempt to locate their roost trees. Any roost trees located were assumed to be maternity roosts and emergent counts were conducted, as possible, to estimate the number of bats using the roost. Radiotelemetry was conducted on 14 female bats associated with 13 roost trees. One roost tree was initially located on the proposed pipeline corridor in Vermillion County, Indiana, but is now offline due to a reroute that would cross the Wabash River at a different location. Overall, radiotelemetry studies identified roost trees for nine of these bats, including more than one roost tree in some instances (table 3-2).

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
MISSOURI										
Audrain	0.9-1.0	MO-1.0	Monoculture stand of shagbark hickory near Littleby Creek	MO-00A	Y: 2 bats: 151.196 and 151.175	Two lactating females	MO-00A (only identified for one of the tracked bats)	Dead oak snag; 15 in. diameter at breast height (dbh); abundant loose bark; no visible cavities	1,454 north-northwest	30: 58: 9
Pike	22.1-22.4	MO-3.0	Forested stand with dense midstory and high density of potential roost trees	MO-22A	Y: 6 bats: 151.109	Four non-reproductive males; one pregnant and one lactating female	No Roost Tree Identified	N/A	N/A	N/A
Pike	28.4-31.4	MO-3.6	Multiple forested corridors separated by agricultural land	MO-29A	N	N/A	N/A	N/A	N/A	N/A
				MO-30A	N	N/A	N/A	N/A	N/A	N/A
				MO-30B	N	N/A	N/A	N/A	N/A	N/A
				MO-30C	N	N/A	N/A	N/A	N/A	N/A
Pike	42.1-42.9	MO-5.0	Palustrine forested wetland associated with the west bank of the Mississippi River and Blackburn Island	MO-42A	N	N/A	N/A	N/A	N/A	N/A
ILLINOIS										
Pike	52.2-52.6	IL-1.0	Small forested stand along Sixmile Creek with open canopy and dense midstory	IL-52A	Y: 1 bat: no transmitter due to size of bat	Juvenile female	N/A	N/A	N/A	N/A
Pike	70.3-70.5	IL-4.0	Large forested area near Illinois River	IL-70A	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
Scott	80.1-80.6	IL-4.2	Well-connected forest system with open understory, mostly shagbark hickory and snags	IL-80A	N	N/A	N/A	N/A	N/A	N/A
Morgan	94.2-95.0	IL-4.4	Well-connected forest system with closed canopy and open midstory; dominated by shagbark hickory	IL-94A	N	N/A	N/A	N/A	N/A	N/A
Douglas	212.5-212.8	IL-6.0	Large forest including snags and diverse large tree species	IL-212A	N	N/A	N/A	N/A	N/A	N/A
INDIANA										
Vermillion	243.2-246.9	IN-0.5 (FWS Site 1)	Large forested area associated with the Wabash River	IN-243A	Y: 3 bats: 172.136 and 172.166	Three post-lactating females	IN-243A	Dead mockernut hickory; 25 in. dbh; 20% bark remaining, 35% of which is exfoliating	1,452 south	17: 4: 0
							IN-243B	Living shagbark hickory; 59 in. dbh; tree has 100% of its bark, 70% of which is exfoliating	495 south	10: 6: 0
							IN-243C	Dead mockernut hickory; 72 in. dbh; 85% of bark intact, 50% of which is exfoliating	819 north	55: 146: 123: 133: 111
				IN-244A	N	N/A	N/A	N/A	N/A	N/A
				IN-246A	N	N/A	N/A	N/A	N/A	N/A
				IN-246B	N	N/A	N/A	N/A	N/A	N/A
Parke	251.7-252.0	IN-3.0	Small stand of unconnected forest	IN-251A	N	N/A	N/A	N/A	N/A	N/A
Parke	253.4-254.2	IN-4.0	Narrow strip of isolated forest patches; dense canopy, open midstory	IN-253A	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
Parke	256.0-256.2	IN-7.0	Forested corridor connecting larger forested areas	IN-256A	N	N/A	N/A	N/A	N/A	N/A
Parke	258.0-259.0	IN-8.0	Large forested area on mesic upland forest around Sand Creek	IN-258A	N	N/A	N/A	N/A	N/A	N/A
Parke	260.0-260.1	IN-9.0	Forest fragment near Little Raccoon Creek; separated from nearby forest stands by agriculture	IN-260A	N	N/A	N/A	N/A	N/A	N/A
Parke	260.6-262.0	IN-10.0	Several forested corridors with dense midstory	IN-261A	N	N/A	N/A	N/A	N/A	N/A
				IN-262A	N	N/A	N/A	N/A	N/A	N/A
Parke	266.5-273.9	IN-11.0	Large forested area with mostly live potential roost trees; mostly open midstory; collocated crossing	IN-267A	N	N/A	N/A	N/A	N/A	N/A
				IN-267B	N	N/A	N/A	N/A	N/A	N/A
Putnam				IN-268A	N	N/A	N/A	N/A	N/A	N/A
				IN-269A	N	N/A	N/A	N/A	N/A	N/A
				IN-270A	N					
				IN-271A	Y: 1 bat	Reproductive male	N/A	N/A	N/A	N/A
				IN-272A	Y: 3 bats: 172.269 and 172.313	Three lactating females	IN-272A	Dead mockernut hickory; 54 in. dbh; has 90% bark, 10% of which is exfoliating	456 south	52: 42: 37: 21: 5

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
							IN-272B	Tree's characteristics recorded from nearest public road: dead mockernut hickory; 59 in. dbh	1,057 south	No emergence counts due to property access denial
							IN-272C	Tree's characteristics recorded from nearest public road: living shagbark hickory; 54 in. dbh; has 100% bark, 75% of which is exfoliating	1,612 south	No emergence counts due to property access denial
				IN-273A	Y: 3 bats: 172.287 and 172.339	One non-reproductive male; two lactating females	IN-273A	Dead black walnut; 48 in. dbh; has 90% of bark, 75% of which is exfoliating	1,397 south	5: 2: 3
							IN-273B	Dead mockernut hickory; 24 in. dbh; has 25% of bark, all of which is exfoliating	1,408 south	18: 16: 32: 12: 10
Putnam	278.7-283.0	IN-18.0 (FWS Site 4)	Fragmented forest mixed with agriculture near Big Walnut and Plum Creeks	IN-279A	N	N/A	N/A	N/A	N/A	N/A
				IN-282A	N	N/A	N/A	N/A	N/A	N/A
				IN-282B	Y: 2 bats: 172.099	One reproductive male; one lactating female	No Roost Tree Identified	N/A	N/A	N/A
				IN-283A	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
Hendricks	290.4-291.0	IN-19.5 (FWS Site 5)	Fragmented forest mixed with agriculture	IN-291A	Y: 2 bats: 172.020	One non-reproductive male; one post-lactating female	IN-291A	Living shagbark hickory; 106 in. at base and split at breast height; entire tree covered with loose bark	154 east	36: 37: 9: 10: 7
							IN-291B	Living shagbark hickory; 106 in. at base and split at breast height; entire tree covered with loose bark	394 west	14: 12: 10
							IN-291C	Mostly dead bitternut hickory; 95 in. dbh; abundant loose bark; numerous splits and few living branches	120 west	22: 0: 0
Hendricks	291 – 291.3	New Site 1	NA	NA	Y: 6 bats	Six lactating females	NA	NA	NA	NA
Hendricks	294.2-295.2	IN-20.0	Narrow forested corridor with dense midstory	IN-294A	N	N/A	N/A	N/A	N/A	N/A
Morgan	303.7-305.5	IN-23.0	Series of forest fragments near residential development; has some connectivity with McCracken Creek corridor	IN-305A	N	N/A	N/A	N/A	N/A	N/A
Morgan	308.3-312.5	IN-27.0 (FWS Site 6)	Large area of fragmented forest near urban development and White Lick Creek	IN-309A	N	N/A	N/A	N/A	N/A	N/A
				IN-311A	N	N/A	N/A	N/A	N/A	N/A
				IN-311B	N	N/A	N/A	N/A	N/A	N/A
Johnson	328.2-328.9	IN-27.5	Minimally forested area with agricultural field and poor connectivity	IN-329A	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

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Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
Decatur	367.3-367.4	IN-29.0	Riparian forest with dense midstory and limited surrounding forest	IN-367A	N	N/A	N/A	N/A	N/A	N/A
Decatur	372.4-372.9	IN-30.0	Isolated forest fragment with dense midstory; some connectivity provided along riparian corridor	IN-373A	N	N/A	N/A	N/A	N/A	N/A
Decatur	376.0-391.8	IN-32.0 (FWS Site 13)	Large Greenfield forest with patches of high quality potential habitat and at least two major rivers, smaller streams, and multiple headwater streams. Somewhat fragmented by residential development	IN-376A	N	N/A	N/A	N/A	N/A	N/A
				IN-377A	N	N/A	N/A	N/A	N/A	N/A
Franklin				IN-378A	N	N/A	N/A	N/A	N/A	N/A
				IN-379A	N	N/A	N/A	N/A	N/A	N/A
				IN-379B	N	N/A	N/A	N/A	N/A	N/A
				IN-380A	N	N/A	N/A	N/A	N/A	N/A
				IN-381A	N	N/A	N/A	N/A	N/A	N/A
				IN-382A	N	N/A	N/A	N/A	N/A	N/A
				IN-382B	N	N/A	N/A	N/A	N/A	N/A
				IN-383A	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
				IN-383B	N	N/A	N/A	N/A	N/A	N/A
				IN-384A	N	N/A	N/A	N/A	N/A	N/A
				IN-385A	N	N/A	N/A	N/A	N/A	N/A
				IN-385B	N	N/A	N/A	N/A	N/A	N/A
				IN-386A	N	N/A	N/A	N/A	N/A	N/A
				IN-387A	N	N/A	N/A	N/A	N/A	N/A
				IN-388A	N	N/A	N/A	N/A	N/A	N/A
				IN-388B	Y: 1 bat: 172.100	Lactating female	No Roost Tree Identified	N/A	N/A	N/A
Franklin	399.7-400.9	IN-37.0	Large forested area that is part of forested drainage to river with moderate by scattered residential development	IN-400A	N	N/A	N/A	N/A	N/A	N/A
OHIO										
Butler	419.0-420.7	OH-5.0	Forest stand with moderately closed canopy and high level of nearby residential development	OH-420A	N	N/A	N/A	N/A	N/A	N/A
				OH-420B	N	N/A	N/A	N/A	N/A	N/A
Butler	430.3-431.2	OH-7.0	Fragmented forest mixed with agricultural and residential development near Great Miami River	OH-431A	N	N/A	N/A	N/A	N/A	N/A
				OH-431B	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
Warren	450.3-455.3	OH-10.3	Large forest connected to Little Miami River	OH-452A	N	N/A	N/A	N/A	N/A	N/A
				OH-453A	N	N/A	N/A	N/A	N/A	N/A
				OH-455A	N	N/A	N/A	N/A	N/A	N/A
				OH-455B	N	N/A	N/A	N/A	N/A	N/A
Warren	457.6-459.8	OH-10.7	Forest connected to Caesar Creek State Park	OH-458A	Y: 1 bat: 172.382	Lactating female	No Roost Tree Identified	N/A	N/A	N/A
				OH-458B	N	N/A	N/A	N/A	N/A	N/A
Fayette	483.6-483.7	OH-12.0	Riparian forest corridor with dense midstory connecting larger forested areas	OH-484A	N	N/A	N/A	N/A	N/A	N/A
Fairfield	537.7-538.5	OH-20.0	Many non-continuous forest fragments with dense midstory	OH-538A	N	N/A	N/A	N/A	N/A	N/A
Perry	557.4-577.1	OH-21.0	Large forested system from north of Perry State Forest to west bank of Muskingum River	OH-558A	N	N/A	N/A	N/A	N/A	N/A
				OH-559A	N	N/A	N/A	N/A	N/A	N/A
				OH-559B	N	N/A	N/A	N/A	N/A	N/A
				OH-560A	N	N/A	N/A	N/A	N/A	N/A
				OH-560B	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
				OH-561A	N	N/A	N/A	N/A	N/A	N/A
				OH-561B	N	N/A	N/A	N/A	N/A	N/A
				OH-562A	N	N/A	N/A	N/A	N/A	N/A
				OH-563A	N	N/A	N/A	N/A	N/A	N/A
				OH-563B	N	N/A	N/A	N/A	N/A	N/A
				OH-564A	N	N/A	N/A	N/A	N/A	N/A
				OH-564B	N	N/A	N/A	N/A	N/A	N/A
				OH-565A	N	N/A	N/A	N/A	N/A	N/A
				OH-565B	N	N/A	N/A	N/A	N/A	N/A
				OH-566A	N	N/A	N/A	N/A	N/A	N/A
Muskingum				OH-567A	N	N/A	N/A	N/A	N/A	N/A
				OH-567B	N	N/A	N/A	N/A	N/A	N/A
				OH-568A	N	N/A	N/A	N/A	N/A	N/A
				OH-568B	N	N/A	N/A	N/A	N/A	N/A
				OH-569A	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
				OH-570A	N	N/A	N/A	N/A	N/A	N/A
				OH-571A	N	N/A	N/A	N/A	N/A	N/A
				OH-571B	N	N/A	N/A	N/A	N/A	N/A
				OH-572A	N	N/A	N/A	N/A	N/A	N/A
				OH-573A	N	N/A	N/A	N/A	N/A	N/A
				OH-573B	N	N/A	N/A	N/A	N/A	N/A
				OH-574A	N	N/A	N/A	N/A	N/A	N/A
				OH-574B	N	N/A	N/A	N/A	N/A	N/A
				OH-575A	N	N/A	N/A	N/A	N/A	N/A
				OH-576A	N	N/A	N/A	N/A	N/A	N/A
				OH-576B	N	N/A	N/A	N/A	N/A	N/A
				OH-577A	N	N/A	N/A	N/A	N/A	N/A
Muskingum	588.9-600.0	OH-30.0	Large forested areas with multiple sites that vary in potential habitat quality	OH-590A	N	N/A	N/A	N/A	N/A	N/A
				OH-591A	N	N/A	N/A	N/A	N/A	N/A
				OH-591B	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
				OH-592A	N	N/A	N/A	N/A	N/A	N/A
Guernsey				OH-594A	N	N/A	N/A	N/A	N/A	N/A
				OH-594B	N	N/A	N/A	N/A	N/A	N/A
				OH-595A	N	N/A	N/A	N/A	N/A	N/A
				OH-595B	N	N/A	N/A	N/A	N/A	N/A
				OH-595C	N	N/A	N/A	N/A	N/A	N/A
				OH-596A	N	N/A	N/A	N/A	N/A	N/A
				OH-596B	N	N/A	N/A	N/A	N/A	N/A
				OH-597A	N	N/A	N/A	N/A	N/A	N/A
				OH-598A	N	N/A	N/A	N/A	N/A	N/A
				OH-598B	N	N/A	N/A	N/A	N/A	N/A
				OH-599A	N	N/A	N/A	N/A	N/A	N/A
Guernsey	603.2-603.6	OH-32.0	Forest contiguous to the east and west of the site	OH-604A	N	N/A	N/A	N/A	N/A	N/A
Guernsey	605.8-612.7	OH-32.6	Large forest system with mostly large, living potential roost trees	OH-606A	N	N/A	N/A	N/A	N/A	N/A
				OH-607A	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
				OH-608A	N	N/A	N/A	N/A	N/A	N/A
				OH-609A	N	N/A	N/A	N/A	N/A	N/A
				OH-609B	N	N/A	N/A	N/A	N/A	N/A
				OH-609C	N	N/A	N/A	N/A	N/A	N/A
				OH-610A	N	N/A	N/A	N/A	N/A	N/A
				OH-610B	N	N/A	N/A	N/A	N/A	N/A
				OH-611A	N	N/A	N/A	N/A	N/A	N/A
				OH-612A	N	N/A	N/A	N/A	N/A	N/A
Noble				OH-613A	N	N/A	N/A	N/A	N/A	N/A
Noble	615.0-618.0	OH-32.8	Connected forest with open canopy and low density of shagbark hickory potential roost trees	OH-616A	N	N/A	N/A	N/A	N/A	N/A
				OH-617A	N	N/A	N/A	N/A	N/A	N/A
				OH-617B	N	N/A	N/A	N/A	N/A	N/A
				OH-618A	N	N/A	N/A	N/A	N/A	N/A
Belmont	618.7-623.0	OH-33.0	Large forest along Slope Creek and adjacent forest fragmentations; dense midstory and multiple	OH-620A	N	N/A	N/A	N/A	N/A	N/A
				OH-621A	Y: 1 bat: 172.435	Pregnant female	OH-621A	Occupied residence	1,490 north	1,200: 1,725: 1,750

TABLE 3-2

Summary Of Mist Net Surveys Completed, Indiana Bats Captured, and Roost Trees Found During 2007 Survey Season

Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
			powerline and riparian corridors	OH-623A	N	N/A	N/A	N/A	N/A	N/A
Belmont	625.1-637.9	OH-37.0	Large forest system where proposed route is both Greenfield and collocated	OH-626A	N	N/A	N/A	N/A	N/A	N/A
				OH-627A	N	N/A	N/A	N/A	N/A	N/A
				OH-628A	N	N/A	N/A	N/A	N/A	N/A
				OH-628B	N	N/A	N/A	N/A	N/A	N/A
				OH-629A	N	N/A	N/A	N/A	N/A	N/A
				OH-629B	N	N/A	N/A	N/A	N/A	N/A
				OH-630A	N	N/A	N/A	N/A	N/A	N/A
				OH-631A	N	N/A	N/A	N/A	N/A	N/A
				OH-632A	N	N/A	N/A	N/A	N/A	N/A
				OH-632B	N	N/A	N/A	N/A	N/A	N/A
				OH-633A	N	N/A	N/A	N/A	N/A	N/A
				OH-633B	N	N/A	N/A	N/A	N/A	N/A
				OH-634A	N	N/A	N/A	N/A	N/A	N/A
				OH-634B	N	N/A	N/A	N/A	N/A	N/A

TABLE 3-2

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Site Description				Survey Results			Radiotelemetry Study			
State/ County	Milepost	Habitat Unit ID (TEH-) (FWS Habitat ID)	Habitat Unit Description	Mist Net Site ID (TEH-MN)	Indiana Bat(s) Captured (Y/N, number, transmitter ID)	Sex/Maturity	Roost Tree ID (if found) (TEH-RT)	Roost Description	Distance and Direction from Proposed Centerline	Emergence Counts (Day 1: Day 2: Day 3: Day 4: Day 5)
				OH-635A	N	N/A	N/A	N/A	N/A	N/A
				OH-636A	N	N/A	N/A	N/A	N/A	N/A
				OH-636B	N	N/A	N/A	N/A	N/A	N/A
				OH-636C	N	N/A	N/A	N/A	N/A	N/A
				OH-637A	N	N/A	N/A	N/A	N/A	N/A
				OH-638A	N	N/A	N/A	N/A	N/A	N/A

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a/ Rockies Express was denied access to the New Site 1 location,; however, An independent survey was completed that documented the presence of Indiana bat, but the survey that was completed did not attempt to locate roost trees.

Sources: Rockies Express, 2008; Clark, 2007

In addition to the surveys completed by Rockies Express, a property owner that denied access commissioned a mist net survey on his property at MP 291 to MP 291.3. The survey was completed by Keramida and Dr. John Whitaker, who is permitted by the FWS to capture and handle Indiana bats. The survey was completed adjacent to a site surveyed by Rockies Express (IN-19.5), which identified 3 roost trees in the area. Appendix J contains the survey report submitted by the property owner. This area is within Habitat Unit ID IN-19.5, which has been designated as containing nursery roost trees and that will be re-surveyed in 2008 to relocate the nursery roost trees (see table 3-5).

Summary of Impacts

Construction of the pipeline through forested areas known to support or be capable of supporting Indiana bats could result in direct and indirect impacts on this species. Potential direct impacts (those that would have immediate impacts on the species or occupied habitat) from the Project on Indiana bats could occur through changes to occupied foraging habitat, removal of or changes in potential roost trees in occupied habitat, injury or harm to individual bats, or disturbance near roosting bats. Potential indirect impacts (those that would be caused by or would result from the Project but later in time) could result from a reduction in potential roost trees, alterations to potential foraging areas or migration corridors, and forest fragmentation in potential roost areas. Potential direct and indirect impacts are addressed generally in the following paragraphs and then on a site-specific basis, as applicable. The discussions below focus on potential Project impacts on maternal roosts or reproductive female Indiana bats. Impacts on non-reproductive female or male Indiana bats would generally be similar, but typically on a lesser scale as these groups normally do not form large colonies and they use a more dramatic range of habitat because they can occupy trees with very limited suitable roost areas.

The FWS has recommended that potential roost trees be removed between October 1 and March 31 to avoid the summer roosting season for Indiana bats along the Project route. Given the market demands and the customer agreements required of Rockies Express, construction of the REX East Project is scheduled for the summer and fall of 2008. Removal by cutting of occupied roost trees between April 1 and September 30, when bats may occur along the proposed route, could injure or kill bats if bats do not leave the tree or cause harm through harassment due to noise disturbance. Based on the surveys completed in 2007, no known maternal colony roost trees are present within the proposed impact area or would otherwise be directly affected by the Project. The two confirmed roost trees (IN-291A and IN-291C, listed in Table 3-2) within the Project action area (250-foot-wide corridor) would be avoided. The microhabitat surrounding these two roost trees also would be preserved. Microhabitat would be assessed on a site-specific basis by a biologist experienced with bat ecology in coordination with the FWS, and would typically encompass a 100-foot radius around a nursery roost tree. To avoid such areas the proposed route would be altered; however, the deviation would likely not exceed more than 100-feet from the originally proposed route. No known maternal colony roost trees identified in 2007 would be directly affected by the Project.

Loss of maternity roost trees due to clearing would result in a loss of potential summer habitat for individuals. Roost trees are, by nature, ephemeral, changing from season to season in condition. As historically used roost trees are lost due to human disturbance or natural events (e.g., wind damage), bats must locate alternative roost trees. Given that locating alternative roost trees is a typical process for Indiana bats and that the bats typically use more than one roost tree per season – and up to 20 alternative sites – roost tree availability for maternal colonies is not likely to be a limiting factor for occupation within an area, even if a primary roost tree is lost. Nonetheless, bats seeking roost trees may be under additional physical stress, potentially during a critical time when females are pregnant. However, this stress is not expected to rise to the level of failed reproduction or death (FWS, 2007d).

Project-related construction activities could directly expose roosting bats to noise and vibration caused by tree clearing activities and pipeline construction equipment. The response of Indiana bats exposed to these disturbances while roosting could range from no perceivable response to avoidance of the area. In the biological opinion developed for the Ohio Department of Transportation's (ODOT) Statewide Transportation Program (FWS, 2007d), the FWS notes that linear ODOT projects that occur in previously disturbed areas within existing roadways would likely have existing vehicle noise, and additional noise from construction would not likely elicit a measurable response from roosting Indiana bats in the surrounding landscape, as discussed below. Although the REX East Project would not be built within road rights-of-way, the proposed route does traverse areas with fairly intensive agricultural use that requires regular use of heavy equipment in open areas surrounding forested stands. Equipment activity in agricultural areas, although not particularly heavy in mid-summer, can be routine during the late spring, when bats are expected to be returning to roost sites and young are born.

Indiana bats were once presumed to be exceptionally sensitive to disturbance. Numerous examples are available now, however, of roosts used by maternity colonies and by males, as well as documented occurrences of foraging Indiana bats, in areas subject to airborne sound. The types of disturbance at these sites range from characteristic residential neighborhoods human activity causes the disturbance, including sporadic residential traffic, to situations where noise levels and related disturbance are profound (see table 3-3).

TABLE 3-3
REX East Project - Studies of Indiana Bats and Noise Disturbances

Colony Type	Location	Distance from Disturbance (meters)	No. of Bat Using Roost	Description of Disturbance	Source
Bachelor	Ste. Genevieve Co., MO	28	3	Roost located next to an active train track. Disturbance is loud and sporadic.	Hendricks et al. 2004
Maternity	southern Indiana	137	64	Roost located adjacent to Highway 37. Disturbance from passing traffic.	Hendricks et al. 2004
Maternity	Blair Co., PA	500	22,000 (59 Indiana bats)	Roost located adjacent to Highway 22. 8,200 vehicles (12% trucks) pass each day. Indiana bats cross highway multiple times per night to reach foraging areas as well as foraged along the road right-of-way.	Butchkoski 2003, Butchkoski and Hassinger 2002
Maternity	Greene Co., OH	not specified	38	Roost located on the Campus of Wright State University. Roost located near a moderately used road and a parking lot. Disturbance is from traffic and pedestrians.	Belwood 2002
Maternity	Jackson Co., MI	100	1	Lactating female Indiana bat mist netted and tracked to a roost tree within 100 m of an occupied house.	Belwood 2002

TABLE 3-3

REX East Project - Studies of Indiana Bats and Noise Disturbances

Colony Type	Location	Distance from Disturbance (meters)	No. of Bat Using Roost	Description of Disturbance	Source
Maternity	Warren Co., OH	25	not specified	30 juveniles were collected after a maternity roost tree was cut. Adults remained in the tree until nightfall. Roost was located in residential front lawn. Disturbance from residential traffic and dogs.	Belwood 2002
Maternity	Vermillion Co., IN	not specified	16 in roost 1 11 in roost 2	Two roosts are located at the southern edge of a 331 ha woodlot surround by roads (US 63 to the east and two-lane road to the north) and agricultural fields. Disturbance from highway and residential traffic and aircraft noise.	Brack and Whitaker 2006
Maternity	Vermillion Co., IN	borders right-of-way (20 m)	1 in roost 1 35 in roost 2	Two roosts are located in a small (0.7 ha) isolated woodlot bounded by US 63 immediately to the west and agricultural field to the north, south, and east. Disturbance from highway and residential traffic and agricultural activities.	Brack and Whitaker 2006
Maternity	Johnson Co., IN	not specified	1	Female Indiana bat roost located in Impact Zone at Camp Atterbury. Disturbance from small and large arms fire, in addition to bombs from airplanes. The radio-tagged bat was repeatedly located in the Impact Zone during the 2+ week life of the telemetry transmitter.	Carter 2007
Maternity	Marion Co., IN	not specified	85, 65, 23, 31, 21, 57 in six different roosts	Six bat boxes were used over three years. The roosts were located on highly developed property owned by the Indianapolis International Airport. Disturbance from residential and commercial traffic as well as airplane traffic.	Whitaker et al. 2006
Maternity	Bond Co., IL	100	7 Indiana bats captured in mist nets	Individual mist netted in a rural/urban interface. Disturbance from residential traffic.	Belwood 2002
Maternity	Jefferson Co., KY	not specified	4 Indiana bats captured in mist nets	Individuals mist netted in a gated community in Louisville, KY. Disturbance from residential traffic.	Belwood 2002

Examples of studies concerning noise disturbance on the Indiana bat include Hendricks et al. (2004), which documented three male Indiana bats in a roost located along a railroad track in Missouri. This roost site experiences high noise levels from passing trains on an irregular schedule. Dr. Tim Carter of Ball State University described a maternity roost in the middle of the Impact Zone at the U.S. Army Reserve Joint Forces Maneuver Training Center at Camp Atterbury (personal communication with Rockies Express). This site is subject to significant levels of disturbance from small and large arms fire, and from aerial bombardment and low-level aircraft overflights. These activities occur nearly every day and throughout the day and night. In addition to roosting in areas with noise disturbance, Indiana bats have been documented foraging in such situations (see numerous studies summarized in Belwood, 2002).

Of the 13 roost locations identified during 2007 survey efforts, 9 are located near a road, active agricultural field, or occupied residence, all of which experience at least some level of equipment use or activity throughout the summer or at least during the spring roost locating stage. In these areas, disturbance associated with construction activity would be unlikely to cause abandonment or even an alteration in bat use of the area. One of the remaining four roosts is within a pasture, the three others are located near the interior of a forested stand. Only roost trees IN-291A and IN-291C occur close enough to potentially be disturbed by construction noise associated with the Project and only roost tree IN-291A would be considered a primary roost tree (at least 30 bats on more than one occasion according to Callahan et al., 1997). See table 3-2 and the *Indiana Bat Survey Report* for more information on emergent counts at the roost trees identified along the proposed route.

Fragmentation of forest habitat used for foraging or migration may contribute to population declines, as it reduces the area individuals can safely traverse without the heightened threat of predation (FWS, 2006c; FWS, 2002d). Also, a reduction in the amount of forest habitat available in the general vicinity of roost trees or foraging areas, if substantial, could alter use patterns in an area or preclude use of an area altogether. To better understand potential landscape-level changes in areas where reproductively active female Indiana bats were captured in 2007 and per a recommendation by the FWS, Rockies Express evaluated the amount of forested area surrounding each mist net site (based on National Land Classification Data, 2001) where a reproductively active female Indiana bat was captured. Specifically, Rockies Express placed a 2.2-mile-diameter circle around the mist net site and calculated the amount of forested area within the circle. Rockies Express then calculated the amount of forested area within the circle that would be affected by construction and operation of the REX East Project (see table 3-4).

Of the surveys completed in 2007 and listed in table 3-4, there were five habitat units where Indiana bats were captured and nursery roost trees were identified and four habitat units where Indiana bats were captured and nursery roost trees were not identified. Table 3-5 summarizes the area of the nursery roost trees, provides the extent of the Habitat Unit ID (by milepost) and lists the number of nursery roost trees located for that habitat. Table 3-6 summarizes the area of the habitat unit IDs were no nursery roost trees were identified and provides the extent of the Habitat Unit ID (by milepost). These habitat units will be resurveyed prior to construction in 2008 at the same intensity (i.e., with the same number of mist net sites) as was conducted in 2007. Habitat unit TEH-OH-10.7 in Warren County, Ohio will not be resurveyed in 2008 based on consultation with the FWS.

As indicated above, some areas were not available for mist net survey during the 2007 effort due to a lack of access. Also, some areas have not yet been evaluated to determine if potential roost trees are present or if mist net surveys are necessary. Areas where mist net surveys are required but surveys were not completed in 2007, including sites recommended by the FWS, are listed in table 3-7. Those forested areas that have not been assessed for potential Indiana bat habitat are also included in table 3-7. Rockies Express evaluated these areas in a manner similar to those containing maternity roost trees, but centered the 2.2-mile-diameter circle on an assigned point on the centerline rather than a maternity roost. Appendix K presents figures of the extent of each site.

TABLE 3-4

Forested Area and Expected Impacts Around Mist Net Sites Where Reproductively Active Female Indiana Bats Were Captured and Associated Roost Trees Along the REX East Project

		Mist Net Sites					Roost Trees				
County/ State	Approx. Milepost	Habitat Unit ID/Unit ID(s) (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Mist Net (acres) b/	Percent of Forested Area within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) a/, b/	Percent of Forested Area Affected by Construction b/, c/	ID (TEH-RT-)	Forested Area Within 2.2-mile diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, c/	Percent of Forested Area Affected by Construction b/, c/
Audrain, MO	0.9	MO-1.0 / MO-00A	331.6	13.6%	3.1	0.9%	MO-00A	224.9	9.2%	0.9	0.4%
Pike, MO	22.3	MO-3.0 / MO-22A	455.1	18.7%	8.9	2.0%			No roost tree identified		
Pike, IL	52.6	IL-1.0 / IL-52A	899.0	37.0%	18.4	2.0%			No roost tree identified		
Vermillion, IL	242.6-242.7	IN-0.5 / IN-243A	666.4	27.4%	5.3	0.8%	IN-243A, IN-243B, IN-243C	984.0	24.7%	11.1	1.1%
Putnam, IN	271.9-274.0.	IN-11.0 / IN-272A and IN-273A	979.7	25.1%	27.7	2.8%	IN-272A, IN-272B, IN-272C, IN-273A, IN-273B	1,235.3	22.4%	27.7	2.2%
Putnam, IN	282.3	IN-18.0 / IN-282B	855.3	35.2%	17.7	2.1%			No roost tree identified		
Hendricks, IN	290.9-291.0	IN-19.5 / IN-291A	355.3	14.6%	3.4	1.0%	IN-291A, IN-291B, IN-291C	377.5	14.2%	3.4	0.9%

TABLE 3-4

Forested Area and Expected Impacts Around Mist Net Sites Where Reproductively Active Female Indiana Bats Were Captured and Associated Roost Trees Along the REX East Project

		Mist Net Sites					Roost Trees				
County/ State	Approx. Milepost	Habitat Unit ID/Unit ID(s) (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Mist Net (acres) b/	Percent of Forested Area within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) a/, b/	Percent of Forested Area Affected by Construction b/, c/	ID (TEH-RT-)	Forested Area Within 2.2-mile diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, c/	Percent of Forested Area Affected by Construction b/, c/
Franklin, IN	388.2	IN-32.0 / IN-388B	1,569.1	64.5%	36.5	2.3%			No roost tree identified		
Warren, OH	457.6	OH-10.7 / OH-458A	922.5	37.9%	13.2	1.4%			No roost tree identified		
Belmont, OH	623.1	OH-32.8 / OH-621A	1,324.0	54.4%	28.0	2.1%	OH-621A[d]	1,032.0	42.4%	17.4	1.7%

a/ Analyses for mist net sites and roost trees were conducted in largely overlapping areas. Impacts were calculated separately such that impact values presented here for mist nets and roost trees are overlapping and should not be considered cumulatively

b/ Forested area is based on National Land Classification Data (NLCD), 2001.

c/ Amount of forest impacts is based on the proposed construction right-of-way combined with the NLCD, 2001 data.

d/ TEH-RT-OH-621A is a residence, not a roost tree.

Rockies Express 2008

As shown in table 3-4, a maximum of approximately 37 acres (TEH-MN-IN-388B) of forest could be removed by construction within 1.1 miles of any single location where a reproductively active female Indiana bat was captured during the 2007 field effort. The loss of the forested area resulting from construction in the areas surrounding successful mist net sites represents a 0.8 to 2.8 percent (averaging 1.7 percent) reduction in the total forest area within 1.1 miles of each successful mist net site. During a field visit with the FWS to one of the sites where a female Indiana bat was captured in Ohio (TEH-MN-OH-458A), the FWS acknowledged that a pipeline corridor through an already fragmented area would not likely alter bat foraging or travel in the area. Similarly, given the fragmented nature of the landscape surrounding most of the other areas where female Indiana bats were captured, this minimal reduction in forest would not be expected to have a measurable effect on bat foraging, travel, or roosting.

Similar to the analysis conducted for mist net sites and to understand potential impacts on identified nursery roost trees along the route, Rockies Express evaluated the amount of forested area surrounding each nursery roost tree within approximately 1 mile of the proposed centerline using the same methodology as that described above for mist net sites (see table 3-4). Although the analyses for mist net sites and roost trees were conducted similarly and in largely overlapping areas, impacts were calculated separately such that impact values presented in table 3-4 for mist nets and roost trees are overlapping and should not be considered cumulatively. Appendix G contains figures representing mist nests, roost trees, and unsurveyed areas, as well as the circular areas for which forested impacts were analyzed.

For the 5 areas where roost trees were identified (table 3-4), the forest area that would be affected by construction ranges from 0.9 acres (TEH-RT-MO-00A) to approximately 28 acres (TEH-RT-IN-272/273 series). The loss of the forested area resulting from construction in the areas surrounding identified nursery roost trees represents a 0.4 to 2.2 percent (averaging 1.3 percent) reduction in the total forest area within 1.1 miles of each nursery roost tree. Similar to successful mist net sites, the minimal reduction in forest around identified roosts would not be expected to have a measurable effect on bat foraging, travel, or roosting. With the exception of activities associated with HDDs of major waterbodies, no lights or noise would occur in any areas after dusk or before dawn. The HDDs would reduce the amount of forested area that would be impacted at the waterbody crossings as drill entry and exit pads would be located generally outside of riparian forests. HDDs could occur 24 hours-a-day for the duration of the drilling, which typically would last three months. Noise and lights are typically associated with the HDD process, which could affect Indiana bats, particularly in areas of limited habitat where bat colonies are already stressed. Due to this disruption, negative fitness consequences could result for both adult female bats and their young. However, effects due to HDD would be temporary in the scope of construction and in the life cycle of the Indiana bat. No negative long-term population effects would be expected due to the light and noise disturbance resulting from HDDs.

TABLE 3-5

Indiana Bat Habitat Units Where Nursery Roost Trees Were Identified in 2007

County, State	Habitat Unit ID	Milepost In and Out (including 1.1-mile buffer)	Number of Nursery Roost Trees Identified in Habitat Unit
Audrain, MO	TEH-MO-1.0	0.0 – 2.1	1
Vermillion, IN	TEH-IN-0.5 a/	N/A	3
Putnam, IN	TEH-IN-11.0	265.4 – 275.0	5
Hendricks, IN	TEH-IN-19.5	289.3 – 292.1	3
Belmont, OH	TEH-OH-33.0 b/	N/A	1

a/ Habitat unit is associated with the Wabash River, and is now offline due to a reroute in the area. The new route associated with this location will be mist net surveyed in 2008.

b/ Habitat unit is associated with the Barnesville Reservoir, and is now offline due to a reroute in the area. The new route associated with this location will be mist net surveyed in 2008.

Rockies Express 2008

TABLE 3-6

Indiana Bat Habitat Units Where Indiana Bats Were Captured and No Nursery Roost Trees Were Identified in 2007

County, State	Habitat Unit ID	Milepost In and Out (including 1.1-mile buffer)
Pike, MO	TEH-MO-3.0	21.0 – 23.5
Putnam, IN	TEH-IN-18.0	277.6 – 284.1
Franklin, IN	TEH-IN-32.0	372.9 – 392.9
Warren, OH	TEH-OH-10.7 a/	456.5 – 460.9

a/ This site will not be resurveyed in 2008 as a result of consultation with the U.S. Fish and Wildlife Service.

Rockies Express 2008

As shown in table 3-7, up to 55.7 acres (UNS-BAR 1, 2, and 3) of forest could be removed due to construction impacts within 1.1 miles of a location where mist net surveys need to be completed during the 2008 field effort. The loss of the forested area resulting from construction in the areas that remain to be surveyed in 2008 represents a 0.8 to 2.6 percent (averaging 1.9 percent) reduction in the total forest area within 1.1 miles of each proposed mist net location. Given the fragmented nature of the landscape surrounding most of the areas where mist netting would occur in 2008, even if Indiana bats are captured at each location, this minimal reduction in forest would not be expected to have a measurable effect on bat use.

TABLE 3-7

Forested Area and Expected Impacts Where Mist Net Surveys and Indiana Bat Habitat Evaluation Are Pending

County/ State	Approx. Milepost	Habitat Unit ID and/or Unsurveyed Mist Net Site ID	Extent of Area by Milepost	Distance of Site from Nearest Mist Net Survey (miles)	Nearest Mist Net Site (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, c/	Percent of Forested Area Affected by Construction b/, c/
Pike, MO	28.9	UNS 1 a/	27.7 – 29.9	1.0	MO-29A	907.6	37.3%	23.7	2.6%
Pike, IL	43.3	UNS 2 a/	Removed	0.7	MO-42A	731.6	30.1%	5.5	0.8%
Pike, IL	54.2	UNS 3	Not defined	1.6	IL-52A	1,491.4	38.1%	18.0	1.2%
Pike, IL	54.8	UNS 4	Not defined	2.1	IL-52A				
Pike, IL	55.3	UNS 5	Not defined	2.6	IL-52A				
Pike, IL	57.6	UNS 6	Not defined	4.8	IL-52A	1,583.7	42.9%	17.7	1.1%
Pike, IL	58.6	UNS 7	Not defined	5.7	IL-52A				
Christian, IL	133.2	UNS 8	Not defined	37.3	IL-94A	548.0	22.5%	3.0	0.5%
Douglas, IL	188.1	UNS 9	Not defined	24.0	IL-212A	151.9	6.2%	2.5	1.6%
Douglas, IL	202.9	UNS 10	Not defined	9.6	IL-212A	228.4	9.4%	1.1	0.5%
Edgar, IL	228.9	TEH-IL-6.5 a/	227.8 - 230	13.0	IN-243C	273.8	11.3%	6.8	2.5%
Vermillion, IN	RR 2032 - 242.9 + 2.0	UNS - WA 1 a/ and UNS WA2	RR 2032 243.7 - 247.9	0.7 1.5	IN-244A IN-246A	2,089.8	46.8%	26.3	1.3%
Parke, IN	250.3	UNS 11 (FWS Site 2)	249.2 - 251.8	1.6	IN-251A	604.5	24.8%	21.7	3.6%
Hendricks, IN	291	New Site 1 f/	291.0 - 291.3	NA	NA	NA	NA	NA	NA
Morgan, IN	314.9	UNS 12	Not defined	3.2	IN-311B	2,165.2	28.3%	24.1	1.1%
Morgan, IN	315.3	UNS 13	Not defined	3.6	IN-311B				
Morgan, IN	316.2	UNS 14	Not defined	4.4	IN-311B				
Morgan, IN	317.4	UNS 15	Not defined	5.5	IN-311B				
Morgan, IN	319.0	UNS 16	Not defined	6.8	IN-311B				
Johnson, IN	336.1	THE-IN-27.8 (UNS 17)	334.8 - 337.3	6.6	IN-329A	557.3	22.9%	6.0	1.1%

TABLE 3-7

Forested Area and Expected Impacts Where Mist Net Surveys and Indiana Bat Habitat Evaluation Are Pending

County/ State	Approx. Milepost	Habitat Unit ID and/or Unsurveyed Mist Net Site ID	Extent of Area by Milepost	Distance of Site from Nearest Mist Net Survey (miles)	Nearest Mist Net Site (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, c/	Percent of Forested Area Affected by Construction b/, c/
Shelby, IN	356.2	UNS 18 (FWS Site 11) d/	361.1 - 363.9	10.8	IN-367A	416.3	17.1%	6.4	1.5%
Decatur, IN	362.7	UNS 19	Not defined	4.5	IN-367A	259.5	10.7%	11.6	4.5%
Decatur, IN	369.4	UNS 20	Not defined	2.0	IN-367A	284.2	8.7%	3.7	1.3%
Decatur, IN	370.0	UNS 21	Not defined	2.6	IN-367A				
Franklin, IN	395.0	UNS-FR-IN-1 e/	393.9 - 396.1						
Franklin, IN	392.5	UNS 22	Not defined	4.0	IN-388B	1,740.2	71.5%	16.6	1.0%
Franklin, IN	397.5	UNS 23	Not defined	2.3	IN-400A	2,093.0	54.9%	31.3	1.5%
Franklin, IN	398.0	UNS 24	Not defined	2.0	IN-400A				
Franklin, IN	398.6	UNS 25	Not defined	1.5	IN-400A				
Butler, OH	408.2	UNS 26	Not defined	7.6	IN-400A	572.1	23.5%	7.4	1.3%
Butler, OH	413.5	UNS 27	Not defined	5.0	OH-420A	390.6	16.1%	6.3	1.6%
Butler, OH	421.3	UNS 28	Not defined	0.9	OH-420B	902.1	37.1%	13.1	1.5%
Butler, OH	434.6	UNS 29	Not defined	2.9	OH-431B	764.1	11.1%	20.5	2.7%
Butler, OH	435.5	UNS 30	Not defined	3.6	OH-431B				
Butler, OH	436.0	UNS 31	Not defined	4.0	OH-431B				
Butler, OH	436.6	UNS 32	Not defined	4.5	OH-431B				
Warren, OH	438.9	UNS 33	Not defined	6.0	OH-431B				
Warren, OH	441.1	UNS-WA-OH-1 e/ UNS 34	439.6 - 441.8	8.2	OH-431B	294.1	12.1%	5.0	1.7%
Warren, OH		UNS-WA-OH-2 e/	442.9 - 445.1						
Warren, OH	447.0	UNS 35	Not defined	4.5	OH-452A	476.5	15.4%	11.3	2.4%
Warren, OH	447.4	UNS 36	Not defined	4.0	OH-452A				

TABLE 3-7

Forested Area and Expected Impacts Where Mist Net Surveys and Indiana Bat Habitat Evaluation Are Pending

County/ State	Approx. Milepost	Habitat Unit ID and/or Unsurveyed Mist Net Site ID	Extent of Area by Milepost	Distance of Site from Nearest Mist Net Survey (miles)	Nearest Mist Net Site (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, c/	Percent of Forested Area Affected by Construction b/, c/
Clinton, OH	466.9	UNS-CT-OH-1 e/ UNS 37	465.5 - 486.2	8.6	OH-458B	426.6	17.5%	8.4	2.0%
Fayette, OH	499.3 499.7	TEH-OH-14.5 (UNS - DCSP 1 a/ UNS - DCSP 2 a/)	498.1 - 501.0	15.2	OH-484A	743.6	26.2%	13.2	1.8%
Muskingum, OH	578.5 578.9 580.3 581.0 581.3 583.4	TEH-OH-22.0 e/ (UNS 38 UNS 39 UNS 40 UNS 41 UNS 42 UNS 43)	577.5 - 584.6	1.0	OH-577B	4,982.5	59.0%	131.1	2.6%
Muskingum, OH		TEH-OH-29.0 e/	586.9 - 588.1						
Guernsey, OH	601.1	UNS-GN-OH-1 (UNS 44)	599.9 - 602.1	2.1	OH-604A	1,158.7	47.6%	26.4	2.3%
Belmont, OH	RR 2010 - 619.4 + 1.8	UNS-BAR/THE- OH-33 UNS - BAR 1 a/ UNS - BAR 2 a/ UNS - BAR 3 a/	RR 2010 MP - 6.20.1 - 624.4	1.0 0.9 0.4	OH-621A OH-623A OH-621A	2,484.2	52.2%	55.7	2.2%

TABLE 3-7

Forested Area and Expected Impacts Where Mist Net Surveys and Indiana Bat Habitat Evaluation Are Pending

County/ State	Approx. Milepost	Habitat Unit ID and/or Unsurveyed Mist Net Site ID	Extent of Area by Milepost	Distance of Site from Nearest Mist Net Survey (miles)	Nearest Mist Net Site (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, c/	Percent of Forested Area Affected by Construction b/, c/
Belmont, OH	618.1	UNS 45	Not defined	0.4	OH-618A	2,486.2	68.6%	45.5	1.8%
Belmont, OH	619.0	UNS 46	Not defined	0.4	OH-620A				
Monroe, OH	638.4	UNS 47	Not defined	0.4	OH-638A	1,816.7	59.8%	16.0	0.9%
Monroe, OH	639.0	UNS 48	Not defined	0.8	OH-638A				

a/ These unsurveyed sites have already been assessed for Indiana bat habitat, but they were not surveyed in 2007 due to a change in route location, property access denial by landowners, or time restrictions. These sites will be surveyed in 2008, but the sites shown on the associated maps may not accurately reflect the exact location of the future mist net survey, which will be determined by certified biologists based on field conditions at the time of survey.

b/ Forested area is based on National Land Classification Data (NLCD), 2001. Areas are combined for multiple UNS sites where circles overlap.

c/ Amount of forest impacts is based on the proposed construction right-of-way combined with the NLCD, 2001 data.

d/ Due to access denial, site has not been assessed for potential roost trees

e/ These areas contain potential roost trees but have not yet been assessed for habitat quality or reviewed with FWS.

f/ Rockies Express was denied access to this area; however, independent analysis identified Indiana bats on the property. Once access is granted, Rockies Express would perform surveys and radiotelemetry studies as appropriate. This area is within Habitat Unit ID THE-IN-19.5.

Rockies Express, 2008

Furthermore, the documented maternal colony near Big Darby Creek is approximately 0.5 mile away from the proposed crossing location of the waterbody, as stated in an email from the FWS – Reynoldsburg, Ohio Ecological Services Field Office on November 30, 2006. As such, lights and noise should have no effect on the roost location. Given that the waterbody is proposed to be crossed using the HDD method, the suspected primary foraging corridor of the creek would not be disturbed and foraging individuals would not be expected to be adversely affected during the HDD operation.

Some blasting would occur in areas where bedrock is located near the surface. Approximately 12.4 percent (79.4 miles) of the pipeline route would cross areas with bedrock at depths of less than 60 inches. (Note: the minimum excavation, even in areas of consolidated rock, would exceed 60 inches to allow for required minimum depth of cover requirements and a minimum of 6 inches of bedding or padding material.) Most of these soils are located along the eastern Ohio portion of the proposed route. Approximately one-half of this bedrock is considered paralithic (soft) and may not require blasting during construction. The remaining areas would cross soils with a lithic contact (hard bedrock) within 60 inches of the surface that may require blasting or other special construction techniques during installation of the proposed pipeline. For each area determined to require blasting, a site-specific blasting plan would be created.

The REX East Project would not affect any known Indiana bat hibernacula. Two known winter hibernacula occur in counties that would be affected by the Project. One is a cave in Pike County, Missouri, located approximately 8.5 miles from the pipeline centerline, and the other is a cave in Pike County, Illinois, located approximately 17.4 miles from the pipeline centerline. As such, blasting for the REX East Project would not affect any known Indiana bat hibernacula.

Blasting in the vicinity of the REX East Project could temporarily affect nearby roosting, foraging, or traveling Indiana bats. However, blasting would be temporary in the scope of construction and in the life cycle of the Indiana bat. No negative long-term population effects would be incurred due to blasting.

Direct effects on Indiana bats would include impacts on bats and occupied bat habitat that occur during construction of the pipeline. Specifically, direct impacts could include changes to occupied foraging habitat, removal of or changes in potential roost trees in occupied habitat, injury or harm to individual bats, or disturbance near roosting bats.

Indirect effects on Indiana bats would include temporary and permanent habitat loss as a result of the Project. FWS has indicated that they "believe the percent change in the amount of habitat is not likely to elicit a measurable response from bats in terms of changes to foraging or travel habits (i.e., the character of the areas affected is not likely to be diminished for foraging and traveling)." As such, the indirect effect of most concern is the loss of potential roosting habitat as a result of the Project.

During habitat assessment surveys conducted within the action area along the proposed route, potential roost trees were identified generally uniformly across forested stands surveyed (data sheets were included with the state-specific habitat assessment documents provided to the FWS field offices before field surveys began in 2007). Although potential roost trees would be removed from the impact area during construction, potential roost trees would remain within the undisturbed portions of the action area, generally in a density equal to those that occur within the impact area. Based on field surveys that extended beyond the construction right-of-way, Rockies Express found that forested stands affected by construction activities contain other potential roost trees outside the impact and action areas similar to their distribution within the action area. In those areas retained in forest, a continuous supply of potential roost trees would be anticipated to be available for future occupation by Indiana bats.

Compensation and Monitoring

To further minimize the potential impacts on the Indiana bat, the FERC and FWS have developed recommendations and conservation measures for specific areas (Habitat Unit IDs) based on the results of the 2007 surveys and the status of the surveys to be completed in 2008. The following recommendations would apply to an entire tract of suitable habitat in an area (the Habitat Unit ID). The Habitat Unit ID is the entire block suitable habitat – not just the immediate location of the survey site.

1. **For the habitat unit IDs <u>surveyed in 2007 for which no Indiana bats were found</u> and for areas that were not recommended for survey and approved by FWS, no additional recommendations or conservation measures would be required.**

2. **For the habitat unit IDs <u>surveyed in 2007 and for which Indiana bats were identified but no nursery roost trees were identified</u>, the following recommendations and conditions would be implemented to avoid direct effects to Indiana bats roosting in alternative roost trees:**
   a. **Remove trees during the inactive season (between October 1 and March 31); <u>OR</u>**
   b. **Remove trees while bats are foraging under the following conditions:**
      i. **Tree removal would occur between 1 hour after sunset and 1 hour before sunrise**
      ii. **Temperature would be greater than 50°F**
      iii. **No precipitation or strong winds (as before an approaching thunderstorm).**

3. **For the habitat unit IDs surveyed <u>in 2007 and for which Indiana bats were identified and nursery roost trees were identified</u>, the following recommendations and conditions would apply:**

   a. **Rockies Express would reconfirm the location of the nursery roost tree(s) prior to construction to determine if it remains suitable. This requirement would apply to all sites in table 3-4 where at least one roost tree was identified, as well as to Habitat Unit IDs MO-3.0, IN-32.0, and OH 10.7.**
      i. **If the nursery roost tree remains a suitable nursery roost tree, Rockies Express would avoid the nursery tree and immediate microclimate (as identified by a certified biologist and approved by FWS) by altering the construction area and placement of the pipeline route. A minimum distance of 100 feet would be maintained between the construction area and the nursery roost tree and Rockies Express would (a) erect fencing to delineate the boundary and prevent inadvertent encroachment into the area, and (b) erect signs stating "no trespassing" or "do not disturb – sensitive area".**
      ii. **If the nursery roost tree is not longer suitable, Rockies Express would implement one of the following conservation measures:**
         (1) **Conduct a radiotelemetry study in accordance with FWS-approved 2007 procedures to locate new nursery roost tree(s) and if within the action area, avoid the tree(s) and its microclimate in accordance with Conservation Measure 3(a)(i); <u>OR</u>**
         (2) **Protect all potential nursery trees (live or standing dead trees or snags over 9 inches dbh with exfoliating, peeling or loose bark, split trunks or branches, or cavities. These characteristics must be plentiful enough to allow the colony to change locations along the tree to aid in thermoregulation. If the habitat characteristics are found only on the branches of the tree, the branches must be at least 8 inches in diameter at**

the site of the habitat characteristics. These trees must have some solar exposure, and trees must be part of, or connected to, a travel corridor, forested area within the action area, that is, treat all potential nursery roost trees as actual nursery roost trees; <u>OR</u>

(3) Identify potential nursery roost trees and conduct exit counts to determine whether it is an occupied nursery roost (if more than 20 bats are observed, the tree would be classified as an occupied nursery tree; if fewer than 20 bats are observed, the tree would be classified as an alternate roost tree.) If a nursery roost tree is documented, avoid the tree and its microclimate per number 3(a)(i). If it is not documented as a nursery roost tree, employ applicable alternate roost tree avoidance measures per recommendation and Conservation Measure 2.

4. In all areas that were not surveyed in 2007 including any areas where the alignment has shifted such that unsurveyed habitat may be affected (see table 3-7), Rockies Express would survey the areas in accordance with FWS-approved 2007 procedures to locate new nursery roost tree(s). Prior to construction in an unsurveyed habitat unit ID area, Rockies Express would complete all surveys and submit the findings to the FERC and FWS for review and comment. Rockies Express should not begin construction in the habitat unit ID until it has received written notification from the Director of OEP that construction or use of mitigation may begin. Based on the findings of the surveys to be conducted in 2008, Rockies Express would implement one of the following measures:

a. If a nursery roost tree is identified, Rockies Express would avoid the nursery tree and immediate microclimate (as identified by a certified biologist and approved by FWS) by altering the construction area and placement of the pipeline route. A minimum distance of 100 feet would be maintained between the construction area and the nursery roost tree and Rockies Express would erect fencing to delineate the boundary and prevent inadvertent encroachment into the area.

b. If Indiana bats are captured and a nursery roost tree is not identified, Rockies Express would identify potential nursery roost trees and conduct exit counts to determine whether it is an occupied nursery roost (if more than 20 bats are observed, the tree would be classified as an occupied nursery tree; if fewer than 20 bats are observed, the tree would be classified as an alternate roost tree). If a nursery roost tree is documented, avoid the tree and its microclimate per Conservation Measure 3(a)(i). If it is not documented as a nursery roost tree, employ applicable alternate roost tree avoidance measures per recommendation and Conservation Measure 2.

Additional recommendations and conservation measures to further minimize the potential impacts on the Indiana bat, would include:

- **Prior to construction, Rockies Express should provide an updated Table 3-7 and Appendix K, as presented in this BA to FWS and the FERC that identifies the Habitat Unit IDs that remain to be surveyed and the milepost extent of each Habitat Unit ID.**

- **During construction, trees, limbs, brush, and debris should not be burned in the right-of-way within 500 feet of the entire area of suitable habitat associated with each habitat unit ID.**

- **Rockies Express should not use herbicides or pesticides for maintenance of the permanent right-of-way or adjacent forested areas, regardless of whether Indiana bats**

are present, for the life of the Project except as allowed by the appropriate land management agency or state agency.

- **In the event that a trenchless crossing fails at the Mississippi River, Wabash River, Big Walnut Creek, or Big Darby Creek, Rockies Express should halt construction activities at the crossing(s) until Rockies Express files with the Secretary a site-specific alternate waterbody crossing plan developed in consultation with the FERC, COE, and FWS. The plan should include:**
    - **a. scaled drawings identifying all areas that would be disturbed by an alternative crossing method; and**
    - **b. a description of the mitigation measures that would be implemented to minimize the extent and duration of disturbance on the river and the Indiana bat.**

- **In addition, Rockies Express should not begin an alternative crossing of the Mississippi River, Wabash River, Big Walnut Creek, or Big Darby Creek until:**
    - **c. the FERC evaluates the potential impact on the Indiana bat and the Commission staff completes consultation with the FWS;**
    - **d. the FERC, FWS, and COE determine that the alternative crossing method and mitigation plan are acceptable; and**
    - **e. the Director of OEP notifies Rockies Express in writing that it may proceed with the alternative river crossing plan.**

- **Rockies Express should use a dry-crossing method for crossing Sugar Creek.**

- **To minimize potential impacts on foraging Indiana bats during construction, Rockies Express should limit specific construction activities (clearing, trenching, welding, backfilling, and grading) within 300 feet of documented nursery roost trees and alternative roost trees identified during the field surveys from one-half hour after dawn to one-half hour before dusk for the period of tree clearing restriction as identified by FWS (April 1 - September 30). This timing restriction would allow ample time for bats to return to roost trees at dawn and time for bats to emerge from roosts at dusk.**

Based on consultation with FWS, Rockies Express has committed to the following:

- **During a visit with FWS to a site where two female bats were captured in 2007 (TEH-MN-MO-00A/TEH-RT-MO-00A), FWS expressed concern about an extra workspace planned for the area that would facilitate the crossing of Littleby Creek. The proposed workspace would be located within the forested stand where the bats were captured and the roost tree was located. Although the workspace would not directly impact the roost tree, FWS indicated that a reduced right-of-way through the forest stand would help minimize potential impacts on the character of the area. After reviewing the crossing location, the construction footprint in the area has been revised from 1.1 acres to 0.5 acre, a reduction of 0.6 acre of potential forest impact.**

- **To facilitate the reestablishment of a diverse forest within the disturbed construction right-of-way, Rockies Express would plant bare root seedlings (both hard-and soft-mast species) in areas of upland forest where Indiana bats were captured and in areas of forest fragmentation concern for migratory birds as identified by FWS. Rockies Express would adhere to the FWS-recommended species mix and planting rate that**

would ensure a 50:50 mix between hard-mast and soft-mast species, unless otherwise approved by FWS.

- **Rockies Express would replant Classified Forests in Indiana and other special use areas where necessary.**

- **Rockies Express would also encourage landowners through easement negotiations to allow forest regeneration to mitigate for impacts on migratory birds and Indiana bats.**

- **Rockies Express is consulting with FWS on a Conservation Agreement to address concerns relating to migratory birds, forest fragmentation, and other upland forest clearing concerns.**

Determination of Effect

Due to Rockies Express' commitment to (1) avoid occupied roost trees and their immediate microclimate, (2) consult with FWS on the protection of the microclimate of a nursery roost tree, and (3) implement the measures outlined above based on the results of the 2008 mist net surveys, as well as the recommendations and conservation measures developed by the FERC and FWS, we have determined that the REX East Project would *not likely adversely affect* the Indiana bat.

Whooping Crane

Background

The whooping crane is a federally endangered species. Populations of whooping cranes utilize the Texas Gulf coast, including Arkansas National Wildlife Refuge (NWR), Texas, and Bosque del Apache NWR, New Mexico, and migration and staging areas through northwestern Montana, the western half of North Dakota, central South Dakota, Nebraska, Oklahoma, and east-central Texas. A non-migratory population occurs in Florida. In addition, a nonessential experimental population of whooping cranes was established by FWS, that according to FWS migrates between Wisconsin where it summers and Florida where it winters (50 CFR 17). Therefore, the whooping crane may have a migratory or staging area presence in the Project area at the proposed Bertrand Compressor Station site in Phelps County, Nebraska, as well as in portions of Ohio and Indiana. Five areas of Critical Habitat are designated for the whooping crane in Idaho, Kansas, Nebraska, Oklahoma, and Iowa, primarily on federal and state wildlife management lands. These areas provide roosting, nesting, and foraging habitat as the birds migrate between their breeding and wintering grounds. Whooping cranes nest in dense vegetation such as sedge and bulrush, in shallow ponds, freshwater marshes, or wet prairies within areas of undisturbed wilderness; the nest is a mound of marsh vegetation rising 8-19 inches above the surrounding water level. They are also known to roost in riverine habitat, most notably the Platte River, Middle Loup River, and Niobrara River in Nebraska; the Cimarron River in Oklahoma; and the Red River in Texas. Cranes also roost on submerged sandbars in wide unobstructed channels that are isolated from human disturbance (Natureserve, 2008).

Whooping cranes generally arrive at their Canadian breeding grounds during late April and conduct their southward migration from the breeding grounds from mid-September to mid-October. They are normally on their wintering grounds in the southern United States by mid-November (NatureServe, 2008). Females lay eggs in late April to mid-May. During migration, whooping cranes eat grains and small plants from agricultural fields, acorns, berries, insects, and crustaceans. Threats to this species include loss of habitat to agriculture, shortened breeding season, collision with obstructions during migration, predation, construction of additional power lines and fences, disease, severe weather,

degradation of coastal ecosystems, and mortality caused accidentally or intentionally by humans (FWS, 2006).

Field Survey Results

Several potentially impacted populations of whooping cranes have been identified. The first population may have a migratory presence at the proposed Bertrand Compressor Station site in Phelps County, Nebraska. A second population may have a migratory presence in the Project areas in Missouri, Illinois, Indiana, and Ohio (FWS, 2001). The proposed Bertrand Compressor Station site is situated on agricultural rangeland, which would be considered marginal foraging habitat, but could be used by individual whooping cranes during migration. However, additional suitable and higher quality foraging habitat is located adjacent to and in the general area surrounding the proposed site. Also, no wetlands or water bodies would be affected by construction of the compressor station. Therefore, whooping cranes are not anticipated to typically use the proposed compressor station site during migration nor would individuals be encountered during construction.

In October of each year, aircraft-led whooping cranes travel on a pre-determined migratory route through seven states between Wisconsin and Florida. The cranes migrate through Indiana during November (FWS 2001). Because the aircraft pilots choose the locations for nightly stopovers, the flock would be unlikely to stop in an area of the Project route where construction is in progress. The cranes also pass over the Project area during the spring migration to Wisconsin, but adjacent lands are more suitable for the cranes' needs.

Summary of Impacts

During migration periods, the endangered population of whooping cranes could be disturbed along its migratory route in Phelps County, Nebraska, during the construction of a compressor station. During the migratory period of the experimental population, the construction of the proposed pipeline in Indiana and Ohio could disturb the whooping cranes. The construction activities could preclude the whooping crane from using the area or drive away whooping cranes that may be in the immediate area.

Compensation and Monitoring

To minimize the potential impacts on the whooping crane, **we recommend that:**

- **During construction, if any whooping cranes are encountered in the immediate vicinity of pipeline construction or construction of other aboveground facilities, construction immediately stop in that area, FWS and the FERC be contacted, and appropriate protection measures be developed and implemented. Protection measures should be developed in coordination with FWS.**

Determination of Effect

Due to the low likelihood of encountering this species during construction, Rockies Express' commitment to halt construction and correspond with FWS to develop appropriate protection measures if an individual is identified near the compressor station and pipeline route during construction, and along with our recommendation, we have determined that the REX East Project would *not likely adversely affect* the whooping crane.

Mussels and Mussel Beds

Background

Four federally listed endangered mussel species (fat pocketbook, clubshell, northern riffleshell, and fanshell) have the potential to occur along the proposed pipeline route. Three of the four federally endangered species are known to occur in Ohio: the clubshell, northern riffleshell, and fanshell. The fourth, the fat pocketbook, is known to occur in Missouri (FWS, 2006c;e). Mussel larvae, or glochidia, attach themselves to the gills or fins of specific fish species. The parasitic relationship minimizes the larval mortality rate by offering protection from increased turbidity and predation, as well as a food supply from the water passing though the gills. Juveniles eventually drop from the host and mature to adults (Bruenderman, 2002). This dispersal of juveniles via mobile species can aid in increasing the range of the species and introduce colonies into new areas. However, it can also increase mortality when the juveniles are dropped in areas with undesirable environmental conditions. Adult mussels typically live on the waterbody floor. Mussels have specific habitat preferences and some cannot withstand bottom types other than preferential substrate. Below are brief overviews of the four types of mussels.

Fat Pocketbook

- The fat pocketbook is known to occur in Pike and Ralls Counties, Missouri. This freshwater mussel is generally found in deep pools of large waterbodies, typically over a mixture of silt, mud, and sand (FWS, 1997d; MDC, 2000a). The fat pocketbook prefers sand, mud, and fine gravel bottoms of large rivers. It buries itself in the substrates in water ranging in depth from a few inches to 8 feet (INHS, 1997a). Within Pike and Ralls counties, Missouri, it is known to occur only in three rivers, none of which would be crossed by the Project. In addition, according to NHI Data supplied by the MDC, there are no known observations of the mussel within 1 mile of the proposed pipeline route (MDC, 2006).

Fanshell

- According to the Ohio natural heritage data, the fanshell is known to occur in Muskingum County, Ohio. This species is found in medium to large rivers with sand or gravel substrate of moderate current (FWS, 1997c). However, no known records of fanshell have been reported within 1 mile of the proposed pipeline route (ODNR, 2006).

Clubshell

- The clubshell, known to occur in only 13 waterbodies throughout its range, has been identified in the following counties that would be crossed by the Project route: Greene, Pickaway, and Fairfield Counties, Ohio. It is sensitive to disturbance and inhabits areas with low turbidity in medium to small waterbodies with loose sand or gravel substrate (FWS, 1997a). This species prefers clean, loose sand and gravel in medium to small rivers and streams. This mussel would bury itself in the bottom substrate to depths up to 4 inches. It has been identified in Sugar Creek, the Flatrock River, Scioto River, and Deer Creek State Park (ODNR, 2006b).

Northern Riffleshell

- The northern riffleshell is known to occur in Pickaway County, Ohio, where it inhabits firm sand or gravel substrates in waterbodies of varying size (FWS, 1997e). This species is found in a variety of streams from small to large. It buries itself in bottoms of firmly packed sand or gravel. Reproduction requires stable, undisturbed habitat and sufficient host fish for food (FWS, 1997e). Dams and reservoirs have flooded most of this mussel's habitat, reducing its preferred gravel sand habitat. Natural heritage data identified it in Big Darby Creek and the Scioto River. Rockies Express' August 2007 survey identified two weathered specimens in Walnut Creek (MP 515.9). According to FWS, northern riffleshell is extirpated from Walnut Creek and it is not unusual to find weathered shells in streams where mussel species once lived.

Field Survey Results

Rockies Express completed surveys for each mussel species along the Project right-of-way in Missouri and Ohio and identified no federally listed mussel species along the Project right-of-way. In May 2007, FWS approved a Proposed Mussel Survey Protocol in Ohio and a Proposed Mussel Survey Protocol in the Mississippi River that were prepared by Rockies Express. Rockies Express completed surveys during the summer of 2007 for listed mussel species in all waterbodies wider than 20 feet that would be crossed by the Project in Ohio. Of the 86 waterbodies in Ohio qualifying for survey, 78 have been surveyed. Of the remaining eight waterbodies; six were not surveyed due to lack of access by landowners, one was not surveyed due to unsafe field conditions (pH equal to 3.9), and the other was not surveyed due to a temperature restriction. No federally listed threatened or endangered mussel species were found during surveys and none of the six waterbodies where survey was denied are known or suspected to contain listed mussel species. In addition, through discussions between Rockies Express and FWS, FWS recommended that Rockies Express not conduct mussel surveys in Big Darby Creek because another pipeline project with a nearby proposed crossing location completed a survey within the waterbody before Rockies Express. FWS later indicated that the other survey did not identify listed mussels at Big Darby Creek. In the Mississippi River, Rockies Express had experienced malacologists survey the dredge site for mussels and mussel beds in May 2007. The survey documented 337 live unionids representing 13 species within the survey area; however, no federally threatened or endangered species were encountered.

Impact Assessment

Mussels are sensitive to heavy loads of silt, which affect mortality by changing the substrate type. Disturbance from construction activities would be short term, as crossing of intermediate waterbodies would take approximately 2 days and minor crossings would take 1 day. All of the perennial waterbodies would be crossed primarily by HDD methods, except for those listed in Appendix G of the EIS, which would avoid/minimize impacts to mussels.

Following pipeline installation, hydrostatic testing would be performed at the waterbodies listed in table 4.3.6-1 of the EIS. To prevent negative impacts on mussels and mussel beds, the test water would be withdrawn close to crossing locations. Intake screens would be used to limit or prevent the entrainment of mussels, and discharged water would be deposited on upland areas or back into the water body. The water uptake rate would be regulated to prevent adverse impacts on the aquatic resources, specifically focused on not notably altering downstream instream flows. Energy dissipating devices such

as hay bale filters or sediment bags would be used to reduce the velocity of the water returning to the streams or rivers and limiting the suspended material and associated turbidity of the water. Rockies Express would comply with all permit requirements. Minor impacts from negligible decreases in instream flows and increases in turbidity are anticipated from withdrawal and release of hydrostatic test water. At test locations with known species sightings, Rockies Express would consult with FWS and implement mitigation measures to avoid adverse impacts on the mussel species.

For the waterbodies that have been surveyed, because mussel surveys conducted following FWS-approved methodologies did not identify listed mussel species in waterbodies that would be crossed by the Project, the REX-East Project would have *no effect* on federally threatened or endangered adult mussels. However, the construction of the REX East pipeline could impact mussel larvae via the water withdrawal for hydrostatic testing or indirectly impact the mussels by impacting the host fish species. Remaining waterbodies to be surveyed prior to construction in 2008 likely would not contain listed mussel species. However, if listed mussel species are encountered during survey prior to construction in 2008, consultation with FWS would be reinitiated. Specific impacts to each mussel species are as follows:

Fat Pocketbook

- No impact.

Fanshell

- Of the perennial waterbodies crossed in Muskingum County, four may be large enough to support fanshell populations. However, no known records of fanshell have been reported within one mile of the proposed pipeline route (ODNR, 2006e).

- Hydrostatic testing of the pipeline would require the intake and discharge of water from the perennial waterbodies. The intake of water from the waterbodies could directly impact the mussels by entrainment of the glochidia, juvenile mussels, or the ichthyoplankton of the host fish, or indirectly impact the mussels due to water quality degradation or reduction in water quantity in the perennial waterbodies.

Clubshell

- According to information provided by the ODNR, clubshell populations have been identified in Big Darby Creek, Sugar Creek, Scioto River, and within Deer Creek State Park, all of which would be crossed by the Project (ODNR, 2006e). Big Darby Creek, the Scioto River, and Deer Creek would be crossed using the HDD method; therefore, no instream impacts associated with pipeline construction are anticipated.

- However, hydrostatic testing of the proposed pipeline would require the intake and discharge of water from Big Darby Creek, Sugar Creek, Scioto River, and Deer Creek. The intake of water from the river and the creeks could directly impact the mussels by entrainment of the glochidia, juvenile mussels, or the ichthyoplankton of the host fish or indirectly impact the mussels due to water quality degradation or reduction in water quantity in the river and creeks.

Northern Riffleshell

- NHI data identified historical populations of the northern riffleshell in the Scioto River and Big Darby Creek (FWS, 2006e). The Scioto River and Big Darby Creek would be crossed using the HDD method and no instream impacts associated with pipeline construction are anticipated.

- However, hydrostatic testing of the proposed pipeline would require the intake and discharge of water from Big Darby Creek and Scioto River. The intake of water from the river and creek could directly impact the mussels by entrainment of the glochidia, juvenile mussels, or the ichthyoplankton of the host fish or indirectly impact the mussels due to water quality degradation or reduction in water quantity in the river and creek.

Compensation and Monitoring

As requested by FWS, Rockies Express would avoid construction activity between April 15 and June 15 in waterbodies containing freshwater mussel beds. Rockies Express would implement its Procedures to reduce turbidity and siltation in all waterbodies crossed by the Project (FERC eLibrary, 2007b). Procedures for reducing turbidity and siltation include installation of sediment barriers across the entire construction right-of-way to prevent the flow of sediments into the waterbody and the use of trench plugs at all waterbody crossings to prevent the diversion of water into upland portions of the pipeline trench. Rockies Express would implement measures in its HDD Contingency and Inadvertent Release Plan (FERC eLibrary, 2007b) at HDD crossings to prevent impacts from unexpected frac-outs during HDD operations.

Fat Pocketbook

- None

Clubshell, Northern Riffle Shell, and Fanshell

To minimize the potential impacts on the Clubshell, Northern Riffle Shell, and Fanshell, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary completed mussel survey reports for the federally listed mussel species in Ohio, documentation of its consultation with FWS and ODNR, and conservation measures necessary to minimize impact to mussel beds.**

- **During construction, Rockies Express not withdraw hydrostatic test water from waterbodies where endangered mussels or glochidia/host fish or juveniles could be directly impacted or the tributaries to such waterbodies.**

- **In the event that a trenchless crossing fails at the Scioto River, Deer Creek in Deer Creek State Park, or Big Darby Creek, Rockies Express should halt construction activities at the crossing(s) until Rockies Express files with the Secretary a site-specific alternate waterbody crossing plan developed in consultation with the FERC, COE, and FWS. The plan should include:**

a. the specific reasons that the trenchless technique was not successful;
b. a description of how Rockies Express would seal the abandoned drill hole;
c. scaled drawings identifying all areas that would be disturbed by an alternative crossing method; and
d. a description of the mitigation measures that would be implemented to minimize the extent and duration of disturbance on the river and any mussels.

- **In addition, Rockies Express should not begin an alternative crossing of the Scioto River, Deer Creek in Deer Creek State Park, or Big Darby Creek until:**
  a. the FERC evaluates the potential impact on the mussel species and the Commission staff completes consultation with the FWS;
  b. the FERC, FWS, and COE determine that the alternative crossing method and mitigation plan are acceptable; and
  c. the Director of OEP notifies Rockies Express in writing that it may proceed with the alternative river crossing plan.

Determination of Effect

Due to the low likelihood of any mussel species being present at any of the river crossings, the construction measures and hydrostatic testing methods that Rockies Express would employ, and our recommendations, we have determined that the REX East Project would have *no effect* on the fat pocket book mussel and *would not likely adversely affect* the clubshell, the northern riffleshell, or the fanshell mussels.

3.1.2 Plant Species

Running Buffalo Clover

Background

The federally endangered running buffalo clover requires moderate, periodic disturbance, and partial shade, but is intolerant of full sun, full shade, or severe disturbance. This species has been known to occur in mowed areas, along streams and trails, and on the fringe of forests and bottomland meadows (FWS, 2007e). Once presumed extirpated within the area affected by the Project, running buffalo clover is now found in isolated populations in Indiana, Missouri, Ohio, West Virginia, and Kentucky (DOI, 2005). This species is known to exist in areas with appropriate habitat within Warren County, Ohio. The proposed pipeline route crossing of Warren County is predominantly comprised of agricultural land, which is unlikely to sustain populations due to severe disturbance and exposure and according to information provided by the ODNR, there are no known occurrences of this species within 1 mile of the proposed pipeline route (ODNR, 2006). Although records of known occurrences for this species are scarce, areas with the appropriate habitat for running buffalo clover may be present along the proposed pipeline route.

Field Survey Results

To determine if the species occurs in the Project area and in accordance with FWS recommendations, Rockies Express conducted a survey of areas of suitable habitat along the proposed route. On April 26, 2007, the Reynoldsburg ESO approved Rockies Express' proposed survey protocol for the running buffalo clover (FWS, 2006g). Following the FWS-approved plan, Rockies Express

completed species-specific surveys during the flowering season in 2007, between mid-April and June, for the entire proposed route in Warren County with the exception of 11 parcels for which property access was denied by landowners. No running buffalo clover individuals or populations were found. As stated in the Running Buffalo Clover Survey Report, submitted to FWS in August 2007 (Civil & Environmental Consultants, 2007), based on the quality of habitat identified within the surveyed portions of the Project area, little potential habitat likely exists in the areas of denied access. Most unsurveyed areas are located west of the Little Miami River. Woodlots and forested areas west of the Little Miami River were found to generally have dense understory of Amur honeysuckle and are therefore considered to have low potential to be suitable habitat for running buffalo clover. Areas of potential running buffalo clover habitat where survey access was denied in 2007 would be surveyed by Rockies Express in early summer 2008, before Project construction.

Summary of Impacts

The construction of the proposed pipeline could impact undocumented individuals or populations of running buffalo clover.

Compensation and Monitoring

To minimize the potential impacts on the running buffalo clover, **we recommend that**:

- **Prior to construction, Rockies Express file with the Secretary completed survey reports for the running buffalo clover and documentation of its consultation with FWS.**

- **If running buffalo clover is identified within the action area during remaining surveys, Rockies Express implement the following:**

  - **If plants are located adjacent to or along the edge of the construction right-of-way, fence off the plants and avoid the area.**
  - **If plants are located within the construction right-of-way, modify the construction right-of-way configuration to avoid plants, retain tree cover in and around plants, and fence off the plants.**
  - **Use only approved native plant species during restoration of the right-of-way.**
  - **Prohibit herbicide applications within 200 feet of the plants and avoid mowing between May and June.**

- **Prior to construction, should any areas of running buffalo clover be identified, Rockies Express, in consultation with FWS, develop site-specific invasive plant control measures to include a monitoring plan.**

- **During construction, Rockies Express not burn in or adjacent to any areas where individuals or populations of running buffalo clover have been identified.**

Determination of Effect

Due to the low likelihood of this species being encountered during construction, Rockies Express' commitment to complete the surveys and implement measures to avoid impacts, and our recommendations, we have determined that the REX East Project would *not likely adversely affect* the running buffalo clover.

Decurrent False Aster

Background

The federally threatened decurrent false aster is a big river floodplain species that primarily inhabits wetlands and borders of marshes, lakes, oxbows, and sloughs. This species reportedly favors sites characterized by moist soil and regular disturbance, which maintains open areas with high light levels. Seeds are dispersed primarily by floodwater (MDC, 2000b). Excessive siltation is a major cause of this species' decline. Highly intensive agricultural activities in the region have increased topsoil runoff, which smothers seeds and seedlings (FWS, 1997e). Habitat destruction from floodplain conversion, channeling of rivers, flood-control measures, and wetland drainage has also contributed to declines of decurrent false aster populations.

Field Survey Results

No field surveys were required by FWS or completed for the decurrent false aster.

The decurrent false aster has been recorded in Pike County, Missouri, and in Pike and Scott Counties, Illinois. NHI database records indicate that the decurrent false aster has not been observed within 1 mile of the proposed pipeline route (MDC, 2006; ILDNR, 2006). However, suitable habitat for this species is present in the counties listed above at the Salt, Mississippi, Sny, and Illinois River crossings and may also occur in non-riparian areas. In a meeting on April 2, 2007, between Rockies Express and FWS, the FWS Marion ESO stated that because the Illinois River, the primary area of concern for this species, would be crossed by the REX East Project using the HDD method and associated floodplain impacts would be avoided, no impacts on the decurrent false aster are expected (FWS, 2007b). An email dated June 27, 2007 from the Columbia ESO to Rockies Express indicated that the REX East Project would be unlikely to affect the decurrent false aster in Missouri and as such, surveys were unnecessary (FWS, 2007c). We concur with FWS that surveys would not be necessary.

Summary of Impacts

Construction activities in aquatic and associated floodplain areas could increase sediment suspension and downstream displacement, and may contribute to reductions in this species' reproductive success. Temporary impacts on floodplain and river-shore wetlands would occur during staging and trenching activities. However, because the REX East Project would cross decurrent false aster habitat areas using HDD, the Project would not affect locations likely to contain individual plants. In addition, HDD would avoid the floodplain area of the Illinois River. Therefore, we believe that the REX East Project would not impact the decurrent false aster.

Compensation and Monitoring

None.

Determination of Effect

Due to avoidance of the floodplain areas associated with the Illinois River, HDD activities avoiding other floodplain areas, and that no documented occurrences of the species occur along the Project corridor, we have determined that the REX East Project would have *no effect* on the decurrent false aster.

Eastern Prairie Fringed Orchid

Background

The eastern prairie fringed orchid is a federally threatened orchid that occurs in a wide variety of habitats, from mesic prairie to wetlands such as sedge meadows, marsh edges, and bogs. This species requires full sun and herbaceous habitat with little or no woody encroachment, and may benefit from disturbances that expose the soil to this orchid's seeds and reduce competition from established plants (FWS, 1999). Mature seed capsules are wind dispersed between late August and late September (FWS, 2005b). Individual plants regenerate from tubers, which are dormant during the winter (FWS, 1989).

Field Survey Results

No field surveys were required by FWS or completed for the eastern prairie fringed orchid.

This orchid is listed as potentially occurring statewide in Illinois, in all counties containing dry/mesic/wet prairies. Historically, Illinois contained the largest population of this species, which extended across 33 counties in the northern two-thirds of the state. Known populations are currently concentrated in the six counties surrounding the Chicago area (FWS, 1989). Historically threatened by the conversion of habitat to cropland, the eastern prairie fringed orchid is currently most threatened by the drainage and development of wetlands, as well as competition from non-native species (FWS, 2005b). According to the ILDNR NHI database, there are no known occurrences of this species within 1 mile of the proposed pipeline route and there are no prairie regions in the general area of the Project (ILDNR, 2006).

Summary of Impacts

In a meeting on April 2, 2007, between Rockies Express and FWS, the FWS Marion ESO confirmed that it had no concerns about the REX East Project affecting listed plant species in Illinois (FWS, 2007b). Because this species is not expected to be present along the proposed project corridor, the REX East Project would not impact the eastern prairie fringed orchid.

Compensation and Monitoring

None.

Determination of Effect

This species is not expected to be present along the Project corridor. Based on our informal consultation with FWS and the informal consultation between Rockies Express and FWS, we have determined that the REX East Project would have *no effect* on the eastern prairie fringed orchid.

Prairie Bush Clover

Background

The federally threatened prairie bush clover is often found on the north-facing slopes of dry upland prairies. It is endemic to the tall-grass prairie region of the upper Mississippi River Valley in Iowa, Illinois, Minnesota, and Wisconsin. Throughout this region, the prairie bush clover is known to occur in 23 counties, where it is restricted to fewer than 40 sites (FWS, 2006h).

Field Survey Results

This clover is listed as potentially occurring statewide in areas containing dry/mesic/wet prairies in Illinois. However, roughly 90 percent of all known plants occur within a "core area" located in Iowa and Minnesota (CPC, 2000). Thirteen populations are known in Illinois with a total of approximately 250 plants. The rarity of this endemic species can be attributed primarily to the loss of tall-grass prairie habitat, specifically mesic to dry prairie (FWS, 2006h). Surviving populations occur primarily in areas that were not converted to cropland because the terrain is too steep or rocky (FWS, 2006h). According to the ILDNR NHI database, there are no known occurrences of this species within 1 mile of the proposed pipeline route and there are no prairie regions in the general area of the Project (ILDNR, 2006).

Field surveys conducted along the proposed route in Illinois during 2006 and 2007 did not identify native prairie communities or remnants along the proposed pipeline route (Rockies Express, 2008).

Summary of Impacts

In a meeting on April 2, 2007, between Rockies Express and the FWS, the FWS Marion ESO confirmed that it had no concerns about the REX East Project affecting listed plant species in Illinois. Suitable habitat for prairie bush clover does not occur along the proposed route (FWS, 2007b). Because this species is not expected to be present along the proposed project corridor, the REX East Project would not impact the prairie bush clover.

Compensation and Monitoring

None.

Determination of Effect

This species is not expected to be present along the Project corridor. Based on our informal consultation with FWS and the informal consultation between Rockies Express and FWS, we have determined that the REX East Project would have *no effect* on the prairie bush clover.

3.1.3 Candidate Species

Eastern Massasauga

Background

The eastern massasauga is a candidate for federal listing as threatened or endangered. This snake species can occur along the route in Clinton, Fayette, Greene, and Warren Counties, Ohio, and is state-listed as endangered in Missouri, Illinois, Indiana, and Ohio. It inhabits marshy areas, wet prairies, sloughs, vegetation around marshes and lakes, and floodplains of major rivers (FWS, 1998). Crayfish burrows are the most common hibernacula for this species. The eastern massasauga has been observed within 1 mile of the Project, in the vicinity of MP 457.9. Hibernacula may exist within 2 miles of a sighting (ODNR, 2003).

Field Survey Results

Areas that could potentially harbor Eastern Massasauga along the proposed pipeline corridor were first determined on a landscape-scale using aerial photographs, topographic maps, and GIS layers of

delineated wetlands and land use/land cover. The species is unlikely to be found in areas consisting entirely of intensive agriculture, urbanized land, or closed-canopy forests, and these areas were eliminated from further investigation. Landscape-scale analysis focused on locating fallow fields, grasslands, and areas of shrub/scrub and adjacent wetlands that could potentially have suitable Massasauga habitat. In addition to the assessment of the physical habitat, a review of the literature and documented and anecdotal accounts of Massasauga occurrence near the proposed corridor was also conducted.

A total of 19 sites along the proposed pipeline corridor were visited October 10 – 17, 2007. Determinations of potentially suitable habitat for the eastern massasauga could not be made at 2 of the 19 sites investigated due to access restrictions. These two sites are located less than 9.8 kilometers (6 miles) from the Spring Valley Wildlife Area, a protected area where eastern massasauga is known to occur. The first of these sites (Clinton County, Chester Township; Tract OH-CT-007.000) consists mainly of a grassy hillside.

The second site (Warren County, Wayne Township; Tract OH-WA-056.000) appeared from the road to have all the necessary components of massasauga habitat (field of forbs, grasses, shrubs, and an embedded wetland) and is located only 1.1 km (0.69 miles) from the Little Miami River. The wetlands associated with this river system are used by the eastern massasauga at the Spring Valley Wildlife Area.

Rockies Express filed a report titled "Report of Assessment of Potential Habitat for the Eastern Massasauga and Eastern Hellbender" with ODNR on November 30, 2007 and with FWS on December 10, 2007. However, two sites were not surveyed due to access denial from the landowner. Once access is granted, Rockies Express would complete the surveys and provide the results to ODNR and FWS.

Summary of Impacts

Landscape fragmentation is expected to result from construction of the Project. As the right-of-way is cleared, open landscape would be present. Although it would be revegetated within 3 years, during those 3 years it is possible that the snake would either not use the land or could be easily open to predation; therefore, we have identified short-term impacts on the eastern massasauga, but because the potentially affected areas would be revegetated no long-term impacts were identified. The operation and maintenance of the pipeline corridor, as described in Section 2, would not be expected to impact the snake population.

Compensation and Monitoring

To minimize the potential impacts on the eastern massasauga, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary the completed habitat assessment for the eastern massasauga snake along with FWS comments on the habitat survey.**

Determination of Effect

We have determined that the REX East Project would not have a significant impact on the eastern massasauga.

Rayed Bean

Background

The rayed bean is a candidate mussel species for federal listing. The rayed bean mussel is a headwater species in Warren and Pickaway Counties, Ohio.

Field Survey Results

See survey discussion related to mussels in Ohio in section 3.1.3 of this BA.

Summary of Impacts

See impact discussion related to mussels in Ohio in section 3.1.3 of this BA.

Compensation and Monitoring

See compensation discussion related to mussels Ohio in section 3.1.3 of this BA.

Determination of Effect

Based on the results of the mussel and mussel bed surveys completed by Rockies Express and the conservation measures developed through consultation with FWS, we believe it is unlikely that the REX East Project would have an adverse impact on the rayed bean.

Spectaclecase

Background

The spectaclecase is a candidate mussel species for federal listing. FWS has identified the spectaclecase as present in the Mississippi River. Its preferred habitat is large rivers with low turbidity.

Field Survey Results

See survey discussion related to mussels in Missouri in section 3.1.3 of this BA.

Summary of Impacts

See impact discussion related to mussels in Missouri in section 3.1.3 of this BA.

Compensation and Monitoring

See compensation discussion related to mussels in Missouri in section 3.1.3 of this BA.

Determination of Effect

Based on the results of the mussel and mussel bed surveys completed by Rockies Express and the conservation measures developed through consultation with FWS, we believe it is unlikely that the REX East Project would have an adverse impact on the spectaclecase.

4.0 CONCLUSIONS

Twenty-three federally listed endangered or threatened species were initially considered by the FERC as potentially occurring in the vicinity of the Project area. Ten of the 23 species were eliminated from detailed review in this BA because there is no habitat or we determined after the initial review that the species would probably not occur in the project area. The remaining 13 federally listed species are addressed in this BA. Of the 13 species, 10 are federally listed threatened or endangered species and three are candidate species. Table 4-1 provides a summary of our determination for the 10 federally listed threatened or endangered species discussed in this BA.

TABLE 4-1

Federally Listed Species That Potentially Occur in the Counties Crossed by the Rockies Express East Pipeline Project and the FERC Impact Determination

Species	Federal Status	State Status	FERC Impact Determination
Mammals			
Indiana bat (*Myotis sodalis*)	E	OH/E	*May affect, not likely to adversely affect*
Birds			
Whooping crane (*Grus Americana*)	E	NE/E	*May affect, not likely to adversely affect*
Mussels			
Clubshell (*Pleurobema clava*)	E	OH/E	*May affect, not likely to adversely affect*
Fanshell (*Cyprogenia stegaria*)	E	OH/E	*May affect, not likely to adversely affect*
Fat pocketbook (*Potomalus capax*)	E		*No effect*
Northern riffleshell (*Epioblasma torulosa rangiana*)	E	OH/E	*May affect, not likely to adversely affect*
Plants			
Decurrent false aster (*Boltonia decurens*)	T		*No effect*
Eastern prairie fringed orchid (*Platanthera leucophaea*)	T	IL, OH/E	*No effect*
Prairie bush clover (*Lespedeza laptostachya*)	T		*No effect*
Running buffalo clover (Trifolium stoloniferum)	E		*May affect, not likely to adversely affect*

a/ Includes an experimental migratory population

T = Threatened
E = Endangered

Based on our analysis contained in this BA, the REX East Project would have *no effect* on four of the 10 federally listed threatened or endangered species (fat pocketbook, decurrent false aster, eastern prairie fringed orchid, and the prairie bush clover). The FERC has determined that with the implementation of Rockies Express' proposed mitigation measures and our recommended mitigation measures contained herein, the REX East Project *may affect, but would not be likely to*

adversely affect **the remaining six federally listed threatened or endangered species (Indiana bat, whooping crane, fanshell, fat pocketbook, northern riffleshell, and the running buffalo clover). We ask for your concurrence with our determinations of effect for these 10 federally listed species. In addition, Rockies Express would still be required to conduct additional preconstruction surveys for the Indiana bat, fanshell, clubshell, northern riffleshell, and the running buffalo clover. In addition, the mitigation / conservation measures included in this BA will be included as recommendations in the Final Environmental Impact Statement, which will be presented to the Commission for their review and adoption in whole or part as conditions in the Certificate.**

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