2.0 DESCRIPTION OF PROPOSED ACTION

2.1 PROPOSED FACILITIES

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

2.1.1 Pipeline Facilities

Table 2.1-1 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 (TETCO) 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 2.1-1.

Rockies Express' proposed route is shown on figure 1.0-1 in section 1 of this EIS.

2.1.2 Aboveground Facilities

Table 2.1-2 presents a list of the aboveground facilities proposed. These facilities are further described below.

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 41,000 hp of compression using two gas turbines.

- The *Hamilton Compressor Station*, at MP 473.3 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.

Table 2.1-1

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 2.1-2
REX East 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	41,000	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 Entrega route.
c/ Milepost represents distance along the REX West route.

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[1] launcher/receiver under Docket No. CP04-413-000.

[1] 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.

The seventh compressor station would be located along the route of the Rockies Express Pipeline – Western Phase Project (Docket No. CP04-413-000). 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 1.4.

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, 5 of which would be located within compressor station sites, 1 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, to 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.)

2.2 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 2.2-1.

The location of new access roads and existing roads to be modified are provided on the accompanying CD (CD Document I), as well as appendix B, and the associated impacts are discussed in section 4.

2.2.1 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. We believe that a 75-foot-wide right-of-way is sufficient for all wetland areas and have recommended its use in 2.3.2. Rockies Express proposes to retain a 50-foot-wide permanent right-of-way during pipeline operation.

Table 2.2-1
REX East 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 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 193.3 miles, approximately 30 percent of its length. In the area where the 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 the REX pipeline 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 currently 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 less than 65 feet, and incorporate these revisions in 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 additional 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 Office of Energy Projects (OEP) the proposed use and site-specific justification for the size of each of its proposed additional 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 additional 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 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 additional 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 (CD Document I). 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: 1 in Missouri, 2 in Illinois, 2 in Indiana, and 6 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 2.2-2 gives the acreage and location for each temporary pipe storage/contractor yard. The locations of the temporary pipe storage/contractor yards are shown on maps included in appendix B.

Table 2.2-2
REX East 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**		

2.2.2 Aboveground Facilities

Table 2.2-3 provides the land requirements for the 7 compressor station sites and 13 meterstation 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).

Table 2.2-3

REX East 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.

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 permanent 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.

2.3 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 Plan and Procedures, with certain proposed modifications that Rockies Express believes appropriate to the Project (CD Documents A, B). A summary of the proposed modifications to the FERC Plan and Procedures is provided in tables 2.3-1 and 2.3-2. Our Plan and Procedures are included on the accompanying CD.

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 2.3-1 and 2.3-2 of this EIS. Rockies Express should file its revised Plan and Procedures with the Secretary prior to the start of construction.**

2.3.1 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 2.3.1-1. 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 proposes to use seven construction spreads for the Project.

The REX East Procedures require that a site-specific explanation be filed for Commission review and approval for each additional workspace that is within 50 feet of a waterbody or wetland. Rockies

Table 2.3-1

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

Section Number of the 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	Generally 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 2.3-2

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.
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.

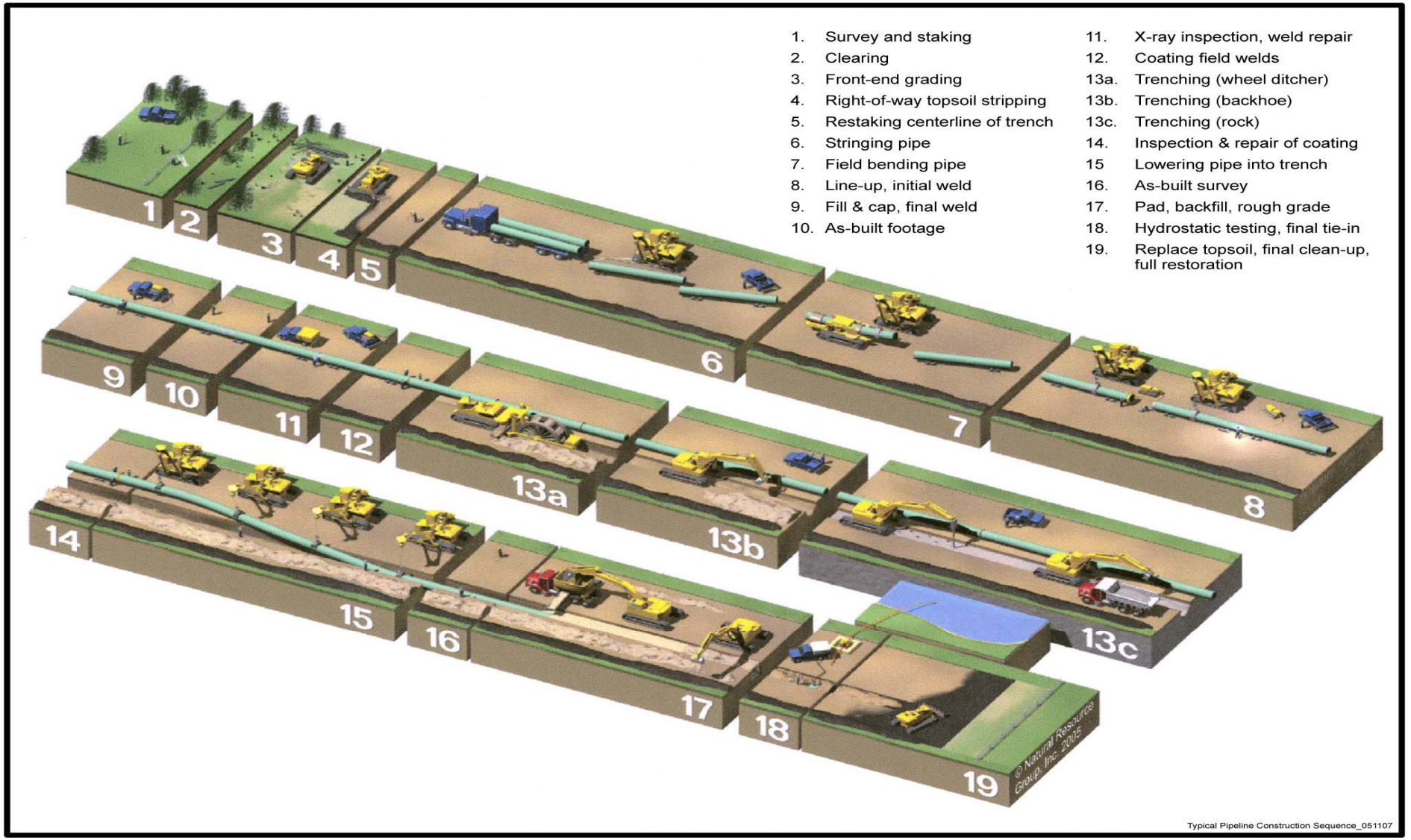

Figure 2.3.1-1
Typical Pipeline Construction Sequence in Uplands

Express has identified over 100 additional 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 additional workspace that is within 50 feet of a wetland or waterbody, prior to the start of construction.**

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.

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 (CD Document C) and with all applicable laws and company standards (see section 2.3.2). 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 3 feet of cover over the pipeline. In consolidated rock areas at least 2 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 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 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 (MAOP), 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 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.

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 timeframes, Rockies Express would maintain temporary erosion controls (temporary slope breakers and sediment barriers) until conditions allow completion of clean-up 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 Rockies Express' Plan, recommendations of the NRCS 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.

2.3.2 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. Horizontal boring is a method that would involve pushing the pipe through a hole below a surface feature such as a road, railroad or canal. First, a bore pit would be dug on one side of the crossing and a receiving pit on the other. The bore pit would be excavated to a depth such that the bore would be at the proper depth for installation of the pipe. A boring machine would then be lowered to the bottom of the bore pit and placed on supports. The boring machine would cut a horizontal shaft by means of a cutting head mounted on an auger. The pipe would then be pushed through behind the auger. This method may be used for small waterbody crossings.

Most smaller, unpaved roads and drives would be crossed by open trenching and then restored to 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 additional 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 1 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 3 years after construction or until wetland revegetation is successful. Additional information on wetland crossings is presented in section 4.3.7.

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 Drill Method

A horizontal directional drill (HDD) construction method is a trenchless installation process by which a pipeline is installed beneath obstacles or sensitive areas. The primary advantage to the HDD method 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 the HDD method depends on factors such as access to the entry and exit points, subsurface conditions (geology), and pipe diameter.

Rockies Express proposes to install 21 HDDs crossings on 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 RR 2032-MP 242.9+4.0), 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).

An HDD method 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 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.

Table 2.3.2-1
HDD Drill Spoil and Drill Fluid Volumes

HDD Location	Volume (cubic feet)	
	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

Table 2.3.2-1 (continued)
HDD Drill Spoil and Drill Fluid Volumes

HDD Location	Volume (cubic feet) Drill Spoil	Drill Fluid
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**

Microtunneling

To ensure that the proposed crossings of Big Darby Creek and the Little Miami River are conducted in accordance with NPS requirements and the NPS oversight of these waterbodies pursuant to the WSR, Rockies Express has agreed to use microtunneling as a contingency crossing method if the HDD method is unsuccessful. This technique was developed as an alternative to Rockies Express' preferred contingency of using an open-cut method for these two waterbodies.

Microtunneling is a technique for installing underground pipes, ducts, and culverts. It is similar to the HDD method in that it places the pipeline underneath the waterbodies, but the method of placement is similar to that of a "bore" of a roadway, rather than the bending of pipe done with the HDD method.

Microtunneling is currently the most accurate pipeline installation method available. Microtunneling uses a remotely controlled microtunnel boring machine combined with the pipejacking technique to directly install pipelines underground in a single pass. Pipejacking is a method of installing pipe where the section of pipe is placed at the opening of the excavation and is jacked, or pushed, into the bore hole towards the advancing boring machine. A typical microtunnel equipment spread consists of a microtunnel boring machine matched to the expected subsurface conditions and the pipe diameter to be installed; a hydraulic jacking system to pipejack the pipe segments; a closed loop slurry system to remove the excavated tunnel spoil; a slurry cleaning system to remove the spoil from the slurry water; a lubrication system to lubricate the exterior of the pipeline during installation; a guidance system to provide installation accuracy; and an electrical supply and distribution system to power all of the above equipment. Topside equipment used to support the tunneling operation typically includes a crane, pile driving and dewatering equipment for shaft construction, backhoe and front end loader for shaft excavation and spoil handling, and truck transport for equipment moves. We have been unable to ascertain exactly what fluids would be used for lubrication and cutting return in this process. We believe that an inert, nontoxic material should be used in order to protect the groundwater and other resources. Therefore **we recommend that:**

- **Prior to the use of the micotunneling technique, Rockies Express file with the Secretary for review and written approval a list of fluids that would be used during the tunneling process. No microtunneling should take place until the list has been approved by the Director of OEP.**

Stovepipe and Drag Section Construction

The stovepipe and drag section construction techniques would be used to minimize the duration and area of impacts to residences where driveways would be crossed by the pipeline route. Stovepipe construction requires digging a short section of trench, placing a section of pipe into the trench, welding it into place, and then backfilling the trench immediately. This technique minimizes the period of time that the trench is open and the size of the construction work area. The drag section construction technique involves the trenching, installation, and backfill of a prefabricated length of pipe containing several segments all in one day. At the end of each day, after the pipe is lowered in, the trench is backfilled and/or covered with steel plates or timber mats. Use of the drag section technique requires adequate staging area outside of the residential location for assembly of the prefabricated sections.

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 impacts to residences. For locations of these residences, see section 4.8.3. 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 1 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 4.8.2. An example of an AIMP is provided as appendix I; the Plan describes the following:

- Provision of Agricultural Inspectors (AI) 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 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 1,333.9 acres of the soils that would be affected by construction contain bedrock within 60 inches of the surface.[2] 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 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.

[2] Based on a 125-foot-wide construction right-of-way in upland areas and a 75-foot-wide construction right-of-way in wetland areas.

Foreign Pipeline and Electric Transmission Line Crossings

Crossings of foreign pipelines would be installed at the depth necessary to meet normal soil cover and separation requirements. Temporary additional 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.

Where the proposed pipeline would cross electric transmission lines, Rockies Express would maintain minimum clearances between the power line and pipeline construction equipment to avoid accidental contact. Also, pipelines crossing or constructed parallel to electric power transmission lines may be subject to electrostatic and electromagnetic induced voltages and currents. Therefore, additional protection would be used to prevent damage due to fault currents and induced voltages. These measures may include proper grounding and insulation of all equipment operating near power lines.

We received several comments during the draft EIS comment period expressing safety concerns relating to the close proximity of the pipeline to electric transmission lines. Safety concerns exist during construction with the use of equipment near the power lines and during operation when the pipeline could be subject to electrostatic and electromagnetic induced voltages and currents, which could increase corrosion, due to the close proximity of the pipeline and power line. Because Rockies Express has not identified any special construction or operational techniques for these areas, **we recommend that:**

- **Rockies Express, in consultation with DOT and the power company, develop a construction plan for all locations where the REX East Pipeline would cross or be constructed along or with power line rights-of-way. In addition, the plan should include any additional measures that would be used in these areas during operation to prevent damage to the pipeline that could be caused by fault currents and induced voltages. Rockies Express should file this plan with the Secretary, prior to the start of construction.**

2.3.3 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 into 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 station 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.

2.4 CONSTRUCTION SCHEDULE

Rockies Express proposes to begin construction of Project facilities in June 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.

2.5 ENVIRONMENTAL INSPECTION, COMPLIANCE MONITORING, AND POST-APPROVAL FOR ALTERNATIVE MEASURES

2.5.1 Environmental Inspection

Under the NGA, the FERC may impose conditions on any Certificate it grants for the REX East Project. These conditions could include additional requirements and mitigation measures recommended in this EIS to minimize the environmental impacts that would result from Project construction and operation.

Rockies Express would assign Environmental Inspectors (EIs) to each construction spread during construction. The EI responsibilities are outlined in the Rockies Express Plan and Procedures and are summarized below. Rockies Express would also augment its inspection program by using third-party agency environmental monitors (see section 2.5.2).

Rockies Express would construct its facilities using 7 construction spreads that would range in length from 52.1 to 123.1 miles. To adequately inspect all construction and mitigation activities of the

right-of-way and perform the other duties outlined above, Rockies Express has agreed to employ a team of EIs (i.e., two or more) on each construction spread. The EIs:

- Would monitor and ensure compliance with all mitigation measures required by the Commission's Order and other grants, permits, certificates, or other authorizing documents;
- Would be responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract and any other authorizing document;
- Would have authority to order correction of acts that violate the environmental conditions of the Commission's Order and any other authorizing document;
- Would hold full-time positions, separate from all other inspector positions;
- Would document compliance with the environmental conditions of the Commission's Order, as well as any environmental conditions/permit requirements other federal, state, or local agencies impose;
- May oversee cultural resource monitors and/or biological monitors that may be required to monitor and evaluate construction impacts on resources as specified in this EIS;
- Would be responsible for maintaining status reports that would be available to agencies for review;
- Would report to the Rockies Express Chief Inspector, but have independent status; and
- Would have stop-activity authority if a noncompliance issue requires corrective action.

In addition, Rockies Express would retain a qualified AI on each construction spread that crosses agricultural land. The AI positions would be separate and in addition to the EI positions, and would include many of the same duties. The AI would inspect onsite construction and restoration efforts in agricultural areas and would be knowledgeable of midwestern agricultural practices, such as terracing, pivot irrigation, and drain tile repair. The AI would report directly to the lead EI. Inspectors from the FERC would conduct field inspections during construction. Other federal and state agencies also may oversee or monitor inspection to the extent determined necessary by the individual agency.

After construction is completed, the FERC would continue to oversee inspection and monitoring. If any of the proposed monitoring timeframes are determined to be inadequate to assess the success of restoration, Rockies Express would be required to extend post-construction monitoring programs.

We believe that environmental compliance must start with every person who sets foot on the worksite. Our standard mitigation measure in section 5.2 requires that all personnel receive environmental training for this Project, including those who worked on the REX West Project.

2.5.2 Compliance Monitoring

Rockies Express has agreed to fund a third-party environmental monitoring program for the FERC. We believe that the third-party independent Environmental Compliance Monitoring and Reporting Program (ECMR Program) provides several benefits, both to agencies and to Rockies Express. The overall objective of an ECMR Program is threefold: (1) to assess environmental compliance during

construction so that a high level of environmental compliance is achieved throughout the project, (2) to assist the FERC's staff in screening and processing variance requests during construction, and (3) to create and maintain a database of daily reports documenting compliance and instances of noncompliance. In order to fully evaluate any issues associated with environmental compliance monitoring, **we recommend that:**

- **Rockies Express file with the Secretary for review and written approval by the Director of OEP a draft third-party environmental monitoring program and obtain proposals from potential contractors to provide monitoring services, and file the program and proposals with the Secretary for review and written approval by the Director of OEP at least 60 days prior to the anticipated start of pipeline construction. The monitoring program should include:**

  a. The employment by the contractor of one or two full-time onsite monitors per construction spread;

  b. The employment by the contractor of at least one full-time onsite monitor with knowledge of agricultural practices in the Project area;

  c. The employment by the contractor of a full-time compliance manager to direct and coordinate with the monitors, manage the reporting systems, and provide technical support to the FERC staff;

  d. A systematic strategy for the review and approval by the contract compliance manager and monitors of variances to certain construction activities as may be required by Rockies Express based on site-specific conditions;

  e. The development of an Internet Web site for posting daily or weekly inspection reports submitted by both the third-party monitors and Rockies Express' EIs; and

  f. A discussion of how the monitoring program can incorporate and/or be coordinated with the monitoring or reporting and other ongoing communication that may be required by other federal, state, and local agencies.

2.5.3 Post-approval Process for Alternative Measures

Surface disturbance locations and acreages identified in this EIS and through our recommendations are anticipated to be sufficient for construction and operation (including maintenance) of the REX East Project and all ancillary improvements. However, route alignments and other Project refinements often continue past the project review phase and into the construction phase. As a result, work area locations and disturbed acreages described in this EIS may require refinement after Project approval. These changes frequently involve minor route realignments or shifting approved additional workspace, adding new temporary workspace, and adding access roads to work areas and associated temporary workspace areas. This section describes the procedure used for assessing impacts on workspace areas outside those evaluated in this EIS and the procedure for obtaining OEP approval for their use.

Analyses in this EIS cover more area than would be required for the proposed facilities. When an additional workspace is shifted along the right-of-way or additional workspace is requested, it would typically be within the previously surveyed area. Such requests would be analyzed using a variance process.

The request for new or additional temporary workspace locations and a copy of the survey results would be documented and forwarded to the FERC in the form of a "variance request." The FERC would then take the lead on reviewing the request and deciding whether to approve it. Typically no further agency consultation is required if the request is within previously surveyed areas. At the conclusion of the Project, as-built drawings would be provided to the FERC.

The procedures for assessing impacts on workspace areas outside those evaluated in this EIS and for approving their use are similar. Additional inventory and evaluation would be performed to ensure that impacts on biological, cultural, and other resources would be avoided or minimized to the maximum extent practicable and that landowner approval has been obtained. After any additional consultations are completed, the new workspace location and survey results would be documented and forwarded to the FERC in the form of a variance request, which would be evaluated in the manner described above. Appropriate agency consultations and approvals would be conducted and obtained prior to approval of the variance. At the conclusion of the Project, as-built drawings would be provided to the FERC.

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 FWS and 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 for 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 Part 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 Part 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 FUTURE PIPELINE AND FACILITY PLANS AND ABANDONMENT

At the time of the publication of this EIS, public information was available on several potential pipeline projects that may connect to the REX East pipeline, if built. This following discussion of possible future projects is not meant to be exhaustive, but represents an indication of publicly expressed interests by the companies indicated below. Most of these projects have yet to initiate pre-filing with the FERC. Any plans for these additional pipelines would require a separate environmental review and a separate authorization from the Commission.

Williams Inc.[3] held an "open season" from September 26 to October 29, 2007 to obtain shipper interest in a proposed interstate pipeline, the "Rockies Connector Pipeline," that would extend approximately 250 miles from Williams' Transco Station 195 in York County, Pennsylvania to connect to the eastern terminus of the REX East pipeline. In November 2007, Williams reported that the open season demonstrated significant interest in the project, which would transport approximately 688,000 dekatherms per day (Dth/d). Williams plans to pre-file with the FERC in spring 2008, and would follow with an application in late 2008. Williams' planned in-service date for this project is November 2010.

Tennessee Gas Pipeline Company, a subsidiary of El Paso Corporation, has proposed the Northeast Passage Project.[4] This proposed 36-inch pipeline would stretch 471 miles from Clarington, Ohio to Pleasant Valley, New York. This project is designed to provide new transportation service between the terminus of the REX East pipeline and northeastern markets. An open season was held from December 2007 to January 2008. El Paso has stated that it plans to file all necessary applications for the

[3] http://www.williams.com/gas_pipeline/rockiesconnector.aspxwww.williams.com/newsroom

[4] http://www.elpaso.com/northeastpassage/presentation.shtm

project in late 2008. The company hopes to commence construction in 2010, and to bring the pipeline expansion into service in the fall of 2011.

In August 2007, Dominion announced that it had secured firm, long-term commitments from Rockies Express to receive gas from the REX East pipeline in Ohio and deliver it to points in the Northeast or Mid-Atlantic regions. The proposed pipeline projects are called Dominion Hub I and Dominion Hub III. A report on Dominion's Web site[5] states that Dominion Hub I would move up to 200,000 Dt/d of supplies to the northeastern market. Dominion has entered into interconnect agreements with Rockies Express and has filed an application with the FERC seeking approval of Dominion Hub I. Dominion aims to begin firm service of Dominion Hub I in November 2009.

National Fuel Gas Supply Corporation is currently evaluating a project to transport additional volumes of gas through its existing system by developing additional new routes from its westside system (including Rockies Express) to eastern points including Leidy, Ellisburg, Independence, and the Millennium Pipeline. At the time of publication of this EIS, this project did not have a name, proposed route, or timeline.

Spectra Energy has proposed a project called the Northern Bridge that would transport up to 500 million cubic feet of natural gas per day from Clarington, Ohio to Oakford, Pennsylvania.[6] Spectra also states that Northern Bridge would offer strategic interconnections with all transmission pipelines and several storage markets along its path. Spectra has indicated that this project would probably consist of 11 miles of replacement pipeline and additional compression at 2 existing compressor stations all in Pennsylvania. Spectra held an open season for the pipeline in September 2007. The pipeline is expected to begin operations in late 2009. Spectra plans to file with the FERC in late 2008 or early 2009.

Southern Star Central Gas Pipeline, Inc., has proposed the Highland Trails Pipeline, which would connect the Fayetteville Shale gas supplies in Arkansas with the Rockies Express pipeline in Audrain County, Missouri.[7] No details as to the exact location of the proposed link in Audrain County are available. The company held a non-binding open season for the pipeline in June and July 2007. If the company determines that there is sufficient interest in the project, it could hold a binding open season, and, based on the level of interest, may proceed by filing an application with the FERC. A proposed project timeline is currently not available.

Kinder Morgan Energy Partners and Sempra Energy, the Rockies Express partners, have proposed a 375-mile extension of the REX East pipeline from its terminus in Clarington, Ohio to Princeton, New Jersey.[8] In December 2007, the companies announced that they had completed a successful non-binding open season. Rockies Express has proposed an in-service date of late 2011. No indications of a timeline for pre-filing with the FERC have been given for this project.

Rockies Express projects a minimum 50-year useful life for the Project. Regardless of the duration of operation of the Project, abandonment of any Project facilities would be subject to applicable federal, state, and local regulations.

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[5] http://www.dom.com/news/gas2008/pr0108.jsp

[6] http://www.spectraenergy.com/businesses/projects/northern_bridge/

[7] http://www.sscgp.com/News/archive/2007/NonBindingOpenSeason.htm

[8] http://news.moneycentral.msn.com/ticker/article.aspx?Feed=PR&Date=20071212&ID=7934463&Symbol=SRE