

Prepared for:  
**Keystone Pipeline Project**



# A Desktop Habitat Assessment of Potentially Suitable King Rail Habitat within the Proposed Keystone Mainline Right-Of-Way in Buchanan, Carroll, Chariton, Lincoln, and St. Charles Counties, Missouri

ENSR Corporation  
March 2007  
**Document No.: 10623-004**

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## 1.0 Introduction

As requested by the Missouri Department of Conservation (MDC) during a conference call on January 4, 2007, ENSR conducted a desktop habitat assessment to determine the potential for occurrence of king rail along the proposed Keystone Mainline route. In accordance with guidance from the MDC, ENSR assessed wetland survey data collected during the summer and fall of 2006, in Buchanan, Carroll, Chariton, Lincoln, and St. Charles counties, Missouri. Wetland data was assessed for the following king rail habitat requirements:

- Diverse wetland complexes with open water; and
- Dominant vegetation consisting of sedges and cattails.

## 2.0 Results

The desktop habitat assessment resulted in a total of 19 sites that may provide suitable king rail habitat. Eighteen sites were field-verified as potentially suitable habitat, while one site was not field-verified due to a land access denial. For this site, wetland/waterbody features were determined through the use of National Wetland Inventory and Environmental Systems Research Institute (ESRI) stream data. Farm ponds and forested wetlands were not considered suitable king rail habitat and were excluded from the desktop analysis. The results of the desktop assessment are presented in the table below (**Table 1**). Color photographs, wetland delineation sheets and maps of each wetland listed in **Table 1** can be found in Appendices A, B, and C, respectively.

## 3.0 Conclusion

MDC will determine, based on their review of the desktop habitat assessment, whether occurrence surveys must be conducted. If so, then ENSR will develop survey protocols in accordance with MDC.

# CONFIDENTIAL

**Table 1 Desktop Habitat Assessment for Suitable King Rail Habitat in Buchanan, Carroll, Chariton, Lincoln, and St. Charles Counties, Missouri**

<b>Wetland ID</b>	<b>County</b>	<b>Keystone MP</b>	<b>REX MP</b>	<b>Photo Available</b>	<b>Data Sheet Available</b>	<b>Dominant Vegetation</b>	<b>Open Water Present</b>	<b>Comments</b>
W3ABC011	Buchanan	756.7	545.2	Yes	Yes	<i>Typha latifolia, Carex atherodes, Phalaris arundinacea</i>	Yes	Poor to marginal habitat due to the surrounding tree line. Trees provide less than 30% cover.
S3ABC072	Buchanan	758.0	551.5	Yes	Yes	NA	Yes	Pond that corresponds to W3ABC011. Poor to marginal habitat.
W3ABC007	Buchanan	763.0		Yes	Yes	<i>Salix nigra, Acer saccharinum, Carex atherodes</i>	Yes	Poor to marginal habitat due to partly palustrine forested vegetation (PFO).
W3ABC007A	Buchanan	763.0	551.5	Yes	Yes	<i>Salix nigra, Acer saccharinum, Carex atherodes</i>	Yes	Poor to marginal habitat due to partly PFO.
S_ESRI_032	Carroll	819.0	607.5	No	No	DENIED ACCESS TO TRACT – UNSURVEYED – Identified on ESRI Maps		
W3ACR010	Carroll	831.2	618.3	Yes	Yes	<i>Carya ovata, Phalaris arundinacea, Carex sp.</i>		Poor to marginal habitat because site is mostly forested.
W4ACI029	Chariton	841.1	629.6	Yes	Yes	<i>Carex atherodes, Eleocharis palustris</i>	Yes	Floodplain along the Grand River.
W4ACI032	Chariton	841.7	630.2	Yes	Yes	<i>Carex sp.</i>	No	Floodplain along the Grand River.
S4ACI133	Chariton	842.0	630.5	Yes	Yes	<i>Carex sp.</i>	Yes	Part of the Grand River floodplain.
W4ACI021	Chariton	849.4	637.9	Yes	Yes	<i>Typha angustifolia, Carex sp., Juncus sp.</i>	Yes	Marginal habitat – portions of pond forested.
W4ACI020	Chariton	850.5	639.0	Yes	Yes	<i>Typha latifolia, Phalaris arundinacea, Carex sp.</i>	Yes	Open water and emergent vegetation.
W4ACI012	Chariton	858.4	656.9	Yes	Yes	<i>Typha latifolia, Carex sp.</i>	No	Poor to marginal habitat - no open water.

# CONFIDENTIAL

**Table 1 Desktop Habitat Assessment for Suitable King Rail Habitat in Buchanan, Carroll, Chariton, Lincoln, and St. Charles Counties, Missouri**

Wetland ID	County	Keystone MP	REX MP	Photo Available	Data Sheet Available	Dominant Vegetation	Open Water Present	Comments
W4ACI010	Chariton	859.8	648.3	Yes	Yes	<i>Polygonum</i> sp., <i>Carex</i> sp., <i>Phalaris arundinacea</i>	No	Route crosses fringing wetlands, no open water. Pond to the south.
WSCIMOLI001	Lincoln	973.8	N/A	Yes	Yes	<i>Ludwigia alternifolia</i>	Yes	Good potential king rail habitat. Open water and emergent vegetation.
WSCIMOLI002	Lincoln	973.8	N/A	Yes	Yes	<i>Leersia oryzoides</i> , <i>Rumex altissimus</i>	No	Poor to marginal habitat; no open water.
WSCIMOLI003	Lincoln	973.9	N/A	Yes	Yes	<i>Leersia oryzoides</i> , <i>Rumex altissimus</i> , <i>Amaranthus luberculatus</i>	Yes	Marginal habitat; adjacent to pond outside of ROW.
WSCIMOSC003	St. Charles	982.8	N/A	Yes	Yes	<i>Cassia fasciculata</i> , <i>boltonia asteroides</i> , <i>carex spp.</i> , <i>Juncus tenuis</i> , <i>Bidens frondosa</i> , <i>Cephalanthus occidentalis</i> , <i>Salix nigra</i>	No	Poor to marginal habitat; no open water.
WSCIMOSC004B	St. Charles	982.8	N/A	Yes	Yes	<i>Sagittaria latifolia</i> , <i>Leersia oryzoides</i> , <i>Polygonum hydropiperoides</i>	Yes	Marginal habitat surrounded by trees and PFO.
WSCIMOSC007	St. Charles	984.9	N/A	Yes	Yes	<i>Leersia oryzoides</i> , <i>Cephalanthus occidentalis</i> , <i>Salix nigra</i> , <i>Phyla lanceolata</i> , <i>Bidens frondosa</i>	Yes	Marginal habitat adjacent to Peruche Creek.



**Appendix A**

**Wetland Photographs**

**Buchanan County, MO**

**Photographs**




ENSR Photographic Record		ENSR	AECOM
Project Name: Keystone Mainline		Project Number: 10623-004	
Wetland ID: W3ABC011			
Direction: South			
County: Buchanan, MO			
Wetland ID: W3ABC007			
Direction: North			
County: Buchanan, MO			



ENSR Photographic Record		ENSR	AECOM
<b>Project Name:</b> Keystone Mainline		<b>Project Number:</b> 10623-004	
<b>Wetland ID:</b> W3ABC007A			
<b>Direction:</b> South			
<b>County:</b> Buchanan, MO			
<b>Waterbody ID:</b> S3ABC072			
<b>Direction:</b> Northwest			
<b>County:</b> Buchanan, MO			

**Carroll County, MO**

**Photographs**

ENSR Photographic Record		ENSR	AECOM
<b>Project Name:</b> Keystone Mainline		<b>Project Number:</b> 10623-004	
<b>Wetland ID:</b> W3ACR010			
<b>Direction:</b> West			
<b>County:</b> Carroll, MO			



**Chariton County, MO**

**Photographs**






ENSR Photographic Record		ENSR	AECOM
<b>Project Name:</b> Keystone Mainline		<b>Project Number:</b> 10623-004	
<b>Wetland ID:</b> W4ACI029			
<b>Direction:</b> South			
<b>County:</b> Chariton, MO			
<b>Wetland ID:</b> W4ACI032			
<b>Direction:</b> West			
<b>County:</b> Chariton, MO			



ENSR Photographic Record		ENSR	AECOM
<b>Project Name:</b> Keystone Mainline		<b>Project Number:</b> 10623-004	
<b>Waterbody ID:</b> S4ACI133			
<b>Direction:</b> North			
<b>County:</b> Chariton, MO			
<b>Wetland ID:</b> W4ACI021			
<b>Direction:</b> East			
<b>County:</b> Chariton, MO			





ENSR Photographic Record		ENSR	AECOM
<b>Project Name:</b> Keystone Mainline		<b>Project Number:</b> 10623-004	
<b>Wetland ID:</b> W4ACI020			
<b>Direction:</b> Southeast			
<b>County:</b> Chariton, MO			
<b>Wetland ID:</b> W4ACI012			
<b>Direction:</b> West			
<b>County:</b> Chariton, MO			

ENSR Photographic Record		ENSR	AECOM
<b>Project Name:</b> Keystone Mainline		<b>Project Number:</b> 10623-004	
<b>Wetland ID:</b> W4ACI010			
<b>Direction:</b> East			
<b>County:</b> Chariton, MO			

**Lincoln County, MO**

**Photographs**



ENSR Photographic Record	
<b>Project Name:</b> Keystone Mainline	<b>Project Number:</b> 10623-004
<b>Wetland ID:</b> WSCIMOLI001	
<b>Direction:</b> S	
<b>County:</b> Lincoln	
<b>Comments:</b> Open water and emergent vegetation. Located in Cuiver River watershed near Campbell Creek.	
<b>Wetland ID:</b> WSCIMOLI001	
<b>Direction:</b> SW	
<b>County:</b> Lincoln	
<b>Comments:</b> Open water and emergent vegetation. Located in Cuiver River watershed near Campbell Creek.	




ENSR Photographic Record	
<b>Project Name:</b> Keystone Mainline	<b>Project Number:</b> 10623-004
<b>Wetland ID:</b> WSCIMOLI002	
<b>Direction:</b> NE	
<b>County:</b> Lincoln	
<b>Comments:</b> Located near Campbell Creek in the Cuiver River watershed.	
<b>Wetland ID:</b> WSCIMOLI003	
<b>Direction:</b> SW	
<b>County:</b> Lincoln	
<b>Comments:</b> Located near Campbell Creek in the Cuiver River watershed.	

**St. Charles County, MO**

**Photographs**



ENSR Photographic Record		ENSR	AECOM
<b>Project Name:</b> Keystone Mainline		<b>Project Number:</b> 10623-004	
<b>Wetland ID:</b> WSCIMOSC003			
<b>Direction:</b> N			
<b>County:</b> St. Charles			
<b>Comments:</b>			
<b>Wetland ID:</b> WSCIMOSC004B			
<b>Direction:</b> N			
<b>County:</b> St. Charles			
<b>Comments:</b>			

ENSR Photographic Record		ENSR	AECOM
<b>Project Name:</b> Keystone Mainline		<b>Project Number:</b> 10623-004	
<b>Wetland ID:</b> WSCIMOSC007			
<b>Direction:</b> S			
<b>County:</b> St. Charles			
<b>Comments:</b> Along Peruche Creek.			

**Appendix B**

**Wetland Data Sheets**



POW/PEM

28789-100

<b>WETLAND DELINEATION FORM (1987 USACE METHOD)</b>				Site ID No.: <b>W3ABC011</b>		Milepost: <b>545.25</b>	
Date: <b>4/27/06</b>		GPS FILE: <b>RO42713A</b>					
Staff: <b>MAG RDW</b>		Client/Project Name: <b>Rockies Express Pipeline Project (REX-West) 04060-018-110</b>					
Logbook Page No's.: <b>B102 PG-120-121</b>		Block/Lot/Tract No.: <b>BC-57</b>		Photo No's.: <b>W3ABC011-042706</b>			
Nearest Waterway: <b>S3ABC072</b>		Watershed: <b>—</b>		Drainage Basin: <b>—</b>			
Loop/Facility: <b>—</b>		State/County/Municipality: <b>Buchanan</b>					
<b>DOMINANT PLANT SPECIES (% Cover)</b>		<b>Stratum</b>	<b>Indicator</b>	<b>NON-DOMINANT PLANT SPECIES (% Cover)</b>		<b>Stratum</b>	<b>Indicator</b>
1. <i>Typha latifolia</i>		H	OBL	1.			
2. <i>Lemna</i> sp.		H	OBL	2.			
3. <i>Myriophyllum spicatum</i>		H	OBL	3.			
4. <i>Phalaris arundinacea</i>		H	FACW+	4.			
5. <i>Salix nigra</i>		T	FACW+	5.			
6. <i>Polygonum amphibium</i>		H	OBL	6.			
7. <i>Impatiens capensis</i>		H	FACW	7.			
8. <i>Carex atherodes</i>		H	OBL	8.			
Per Cent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): <b>100%</b>							
REMARKS: <b>Trees not &gt; 30% dominant; passes fac-neutral test 8/8</b>							
<b>HYDROLOGY</b>							
Recorded Data? <b>NO</b> Describe: <b>several feet (pond)</b>							
Depth of Surface Water: <b>several feet (pond)</b> (in. or cm)				Other Notes: <b>connected to S3ABC072</b>			
Depth to Free Water in Pit: <b>0</b> (in. or cm)							
Depth to Saturated Soil: <b>0</b> (in. or cm)							
<b>Primary Wetland Indicators:</b>				<b>Secondary Wetland Indicators (2 or more required):</b>			
<input checked="" type="checkbox"/> Inundated				<input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches (30 cm)			
<input checked="" type="checkbox"/> Saturated in Upper 12 Inches (30 cm)				<input checked="" type="checkbox"/> Water-Stained Leaves			
<input type="checkbox"/> Water Marks				<input type="checkbox"/> Local Soil Survey Data			
<input type="checkbox"/> Drift Lines				<input checked="" type="checkbox"/> FAC-Neutral Test			
<input type="checkbox"/> Sediment Deposits				<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Drainage Patterns in Wetlands							
Estimate of wetlands or waters within disturbance area							
REMARKS: <b>Aquatic bed (pond) only - doesn't really extend to only small part PEM</b>							
<b>SOILS</b>							
Soil Survey Map Unit (Series and Phase):				Drainage Class:			
Taxonomy (to Subgroup):				Field Observations Confirm Mapped Type?			
<b>Profile Description:</b>				USDA Land Resource Region:			
Depth Range (Inches or cm)	Horizon Desig.	Matrix Color (Munsell Moist)	Mottles (Abundance/Contrast/Color)	Texture, Concretions, Structure, Redox Concen., etc.			
<b>0-8"</b>	<b>B<sub>1</sub></b>	<b>2.5YR3/1</b>	<b>—</b>	<b>silty clay MUCK</b>			
<b>8-12"</b>	<b>B<sub>2</sub></b>	<b>2.5YR3/1</b>	<b>7.5YR5/8</b>	<b>silty clay (fine, common, distinct)</b>			
<input type="checkbox"/> Histosol				<input checked="" type="checkbox"/> Concretions or Redox Concentrations			
<input type="checkbox"/> Histic Epipedon				<input checked="" type="checkbox"/> High Organic Content			
<input type="checkbox"/> Sulfidic Odor				<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime				<input type="checkbox"/> Listed on Local Hydric Soils List			
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors				<input type="checkbox"/> Other USDA Hydric Soil Indicator (Explain in Remarks)			
REMARKS:							
<b>WETLAND DETERMINATION</b>							
Hydrophytic Vegetation Present?		<input checked="" type="radio"/> Yes	No	Is This Sampling Point Within a Wetland? <input checked="" type="radio"/> YES NO			
Wetland Hydrology Present?		<input checked="" type="radio"/> Yes	No				
Hydric Soils Present?		<input checked="" type="radio"/> Yes	No				
REMARKS:							
Normal Circumstances?		Yes		Significantly Disturbed:		No	
				Potential Problem Area?		No	

H<sub>2</sub>O not for

S  
E  
N

cows are able to walk through, but W2 hasn't really suffered from it

WETLAND DELINEATION FORM (1987 USACE METHOD)	SITE ID NO.: <u>W3ABCO11</u>
--	------------------------------

WETLAND sketch plan (include surrounding area and direction arrow) – not required if entered on other sheet

W3ABCO11

POND  
S3ABCO72

N →

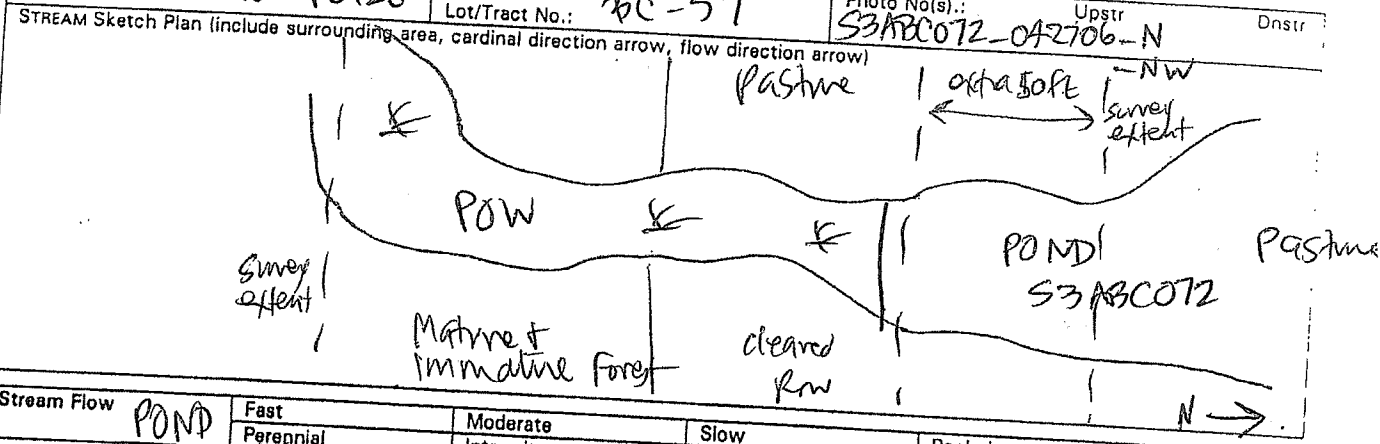
GENERAL COMMENTS (ie. wetland disturbed by landowner, excessive noxious weeds in wetland, weather conditions, landowner issues, etc):

Mostly POW - High quality (except that cows are able to access pond - doesn't seem to affect WL)  
 PEM is small, on bank on E side of WL  
 Trees here are < 30% dominant

28789H00

## WATERBODY DATA - Page 1 of 1

Date: <b>4/27/06</b>	Stream ID No.: <b>S3ABC072</b>	GPS File: <b>RA2713A</b>	MILEPOST: <b>545.25</b>
Staff: <b>MAG RDW</b>	Client/Project Name: <b>Rockies Express Pipeline Project (REX-West)</b>		Project #: <b>04060-018-110</b>
Logbook page No's.: <b>B102 PG120</b>	State/Country/Municipality: <b>Buchanan</b>		LOOP/FACILITY NAME:
Block/Lot/Tract No.: <b>BC-57</b>		Photo No(s.): <b>S3ABC072-042706-N</b>	Upstr Dnstr



Stream Flow: <b>POND</b>	Fast	Moderate	Slow	Pooled	None
Flow Depth (In.): <b>Several feet</b>	Perennial	Intermittent	Ephemeral	Direction of Flow:	
Stream Width at Crossing (ft.): <b>50 ft</b>	0-3	3-6	6-12	12-24	24-36
Top of Banks: <b>50 ft</b>	36-48	48-60	60+	Channel OWHM:	
Stream Substrate %	Bedrock %	Gravel %	Sand %	Water Surface: <b>45'</b>	
Bank Height (ft.) (looking downstream)	Left: <b>0-2</b>	2-4	4-6	Silt/Clay: <b>100%</b>	Organic %
Bank Slope (%) (looking downstream)	Right: <b>0-2</b>	2-4	4-6	6-8	8+
Water Clarity	Left: <b>0-20</b>	<b>20-40</b>	40-60	60-80	80+
Aquatic Habitat	Right: <b>0-20</b>	<b>20-40</b>	40-60	60-80	80+
Undercut Banks	Clear	<b>Slightly Turbid</b>	<b>Turbid</b>	Very Turbid	Color: <b>black-tan/mud</b>
Aquatic Organisms Observed	Sand Bar	Gravel Bar	Mud Bar	Gravel Riffles	Deep Pools
	Overhanging trees/shrubs	In-stream emergent plants	In-stream submergent plants	Bank root systems	Fringing Wetlands
	Waterfowl	Fish (adult)	Fish (juvenile)	<b>Frogs</b>	<b>Turtles</b>
	Snakes	Invertebrates	Other:		

T/E SPECIES / SUITABLE HABITAT  
**N/A**

### RIPARIAN VEGETATION DESCRIPTION

In mixed age forest S of Row - + N of Row - also pasture

Comments (e.g. pipeline crossing angle, construction constraints, erosion potential, existing disturbances, meanders or width variations)

W3ABC072 is attached to pond on S; cattle freely walk in/out of pond in many places

STREAM QUALITY (circle)	<b>High</b>	<b>TO</b>	<b>Medium</b>	Low
<p><b>High Quality</b> - no indication of stress or disturbance in stream or adjacent area - diverse and mature fringing shrub-dominated cover - diverse and stable fish &amp; wildlife habitat - gravel beds, submerged logs, undercut banks, riffles and pools - no channelization -</p> <p><b>Medium Quality</b> - mild to moderate disturbances result in minor recognizable alterations - existing pipeline, road, railroad, other ROWs - provides fair fish and wildlife habitat - some erosion potential - some habitat diversity - fine sediment deposition predominate - flow and depth variation restricted - some channelization - trees, grass, or forbs dominate bank vegetation</p> <p><b>Low quality</b> - disturbances cause significant changes affecting plant species - mechanical alteration of plant species and/or soils - intense grazing activities - stream course channelization or ditching - exotic, nuisance, or invasive species - habitat diversity lacking - high erosion potential - flow and depth variation lacking - does not provide suitable wildlife habitat - grass or forbs dominate bank vegetation</p>				

PEM/PFO

W3ABC007a (PEM) 29/20100

<b>WETLAND DELINEATION FORM (1987 USACE METHOD)</b>				Site ID No.: <b>W3ABC007</b>		Milepost: <b>551.51</b>	
Date: <b>4/25/06</b>		GPS FILE: <b>R042503A</b>					
Staff: <b>MAG RDW</b>		Client/Project Name: <b>Rockies Express Pipeline Project (REX-West) 04060-018-110</b>					
Logbook Page No's: <b>B102 P6 101</b>		Block/Lot/Tract No.: <b>BC-077/76</b>		Photo No's.: <b>W3ABC007-042506</b>			
Nearest Waterway: <b>S3ABC028</b>		Watershed: <b>—</b>		Drainage Basin: <b>—</b>			
Loop/Facility: <b>—</b>		State/County/Municipality: <b>Buchanan</b>					
<b>DOMINANT PLANT SPECIES (% Cover)</b>		<b>Stratum</b>	<b>Indicator</b>	<b>NON-DOMINANT PLANT SPECIES (% Cover)</b>		<b>Stratum</b>	<b>Indicator</b>
1. <b>Salix nigra</b>	<b>T</b>	<b>FACW+</b>	1. <b>Sagittaria latifolia</b>	<b>H</b>	<b>OBL</b>		
2. <b>Acer saccharinum</b>	<b>T</b>	<b>FACW</b>	2. <b>Vitis americana</b>	<b>S</b>	<b>FAC</b>		
3. <b>Hydrophyllum sp.</b>	<b>H</b>	<b>FACW</b>	3. <b>—</b>				
4. <b>Phalaris arundinacea</b>	<b>H</b>	<b>FACW+</b>	4. <b>—</b>				
5. <b>Carex artherodes</b>	<b>H</b>	<b>OBL</b>	5. <b>—</b>				
6. <del><b>Polygonum pennsylvanicum</b></del>	<b>—</b>	<b>—</b>	6. <b>—</b>				
7. <b>Polygonum amphibium</b>	<b>H</b>	<b>OBL</b>	7. <b>—</b>				
8. <b>Unknown Forb</b>	<b>H</b>	<b>FAC-OBL</b>	8. <b>—</b>				
Per Cent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): <b>100%</b>							
REMARKS: <b>Passes fac-neutral test 6/6</b>							
<b>HYDROLOGY</b>							
Recorded Data? <b>NO</b>		Describe:					
Depth of Surface Water: <b>up to 1 ft</b> (in. or cm)		Other Notes: <b>Filled-in old channel</b> <b>High Quality</b> <b>Two bacillus observed</b>					
Depth to Free Water in Pit: <b>0</b> (in. or cm)							
Depth to Saturated Soil: <b>0</b> (in. or cm)							
<b>Primary Wetland Indicators:</b>				<b>Secondary Wetland Indicators (2 or more required):</b>			
<input checked="" type="checkbox"/> Inundated				<input type="checkbox"/> Oxidized Root Channels in Upper 12" Inches (30 cm)			
<input checked="" type="checkbox"/> Saturated in Upper 12 Inches (30 cm)				<input checked="" type="checkbox"/> Water-Stained Leaves			
<input type="checkbox"/> Water Marks				<input type="checkbox"/> Local Soil Survey Data			
<input checked="" type="checkbox"/> Drift Lines				<input checked="" type="checkbox"/> FAC-Neutral Test			
<input type="checkbox"/> Sediment Deposits				<input type="checkbox"/> Other (Explain in Remarks)			
<input checked="" type="checkbox"/> Drainage Patterns in Wetlands							
Estimate of wetlands or waters within disturbance area							
REMARKS: <b>S3ABC028 is next to ML; old channel of Platte River</b>							
<b>SOILS</b>							
Soil Survey Map Unit (Series and Phase):				Drainage Class:			
Taxonomy (to Subgroup):				Field Observations Confirm Mapped Type?			
Profile Description:				USDA Land Resource Region:			
Depth Range (Inches or cm)	Horizon Desig.	Matrix Color (Munsell Moist)	Mottles (Abundance/Contrast/Color)	Texture, Concretions, Structure, Redox Concen., etc.			
<b>0-12+</b>	<b>B</b>	<b>Gley 2.5</b>	<b>10YR 5/8 fine, common, faint</b>	<b>muck</b>			
<input checked="" type="checkbox"/> Histosol				<input type="checkbox"/> Concretions or Redox Concentrations			
<input checked="" type="checkbox"/> Histic Epiedon				<input type="checkbox"/> High Organic Content			
<input type="checkbox"/> Sulfidic Odor				<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input checked="" type="checkbox"/> Aquic Moisture Regime				<input type="checkbox"/> Listed on Local Hydric Soils List			
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors				<input checked="" type="checkbox"/> Other USDA Hydric Soil Indicator (Explain in Remarks) <b>Mottles</b>			
REMARKS: <b>old channel now filled in; high organic content</b>							
<b>WETLAND DETERMINATION</b>							
Hydrophytic Vegetation Present?		<input checked="" type="radio"/> Yes	No	Is This Sampling Point Within a Wetland? <input checked="" type="radio"/> YES NO			
Wetland Hydrology Present?		<input checked="" type="radio"/> Yes	No				
Hydric Soils Present?		<input checked="" type="radio"/> Yes	No				
REMARKS:							
Normal Circumstances?		<b>Yes</b>		Significantly Disturbed:		<b>No</b>	
				Potential Problem Area?		<b>No</b>	

W2 Forb

N  
S  
E  
W

WETLAND DELINEATION FORM (1987 USACE METHOD)	SITE ID NO.: <u>W3ABC007</u>
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WETLAND sketch plan (include surrounding area and direction arrow) – not required if entered on other sheet

N →

GENERAL COMMENTS (ie. wetland disturbed by landowner, excessive noxious weeds in wetland, weather conditions, landowner issues, etc):

OLD FLOW-IN CHANNEL OF THE PATT RIVER  
HIGH QUALITY



PFO/POW

32648150

WETLAND DELINEATION FORM (1987 USACE METHOD)				Site ID No.: W3ACR010		Milepost: 68.34	
Date: 4/10/06		GPS FILE: R041012A		Client/Project Name: Rockies Express Pipeline Project (REX-West) 04060-018-110			
Staff: LEH RDW		Block/Lot/Tract No.: CR-53		Photo No's.: W3ACR010-041006-SW			
Logbook Page No's.: BIO 1 PG 46		Watershed: BIG CREEK		Drainage Basin: B26			
Nearest Waterway: BIG CREEK		State/County/Municipality: CARROLL		-SW -NW -N			
Loop/Facility: -							
DOMINANT PLANT SPECIES (% Cover)		Stratum	Indicator	NON-DOMINANT PLANT SPECIES (% Cover)		Stratum	Indicator
1. Carex ovata		T	FACV	1.			
2. Phalaris arundinacea		H	FACW	2.			
3. Carex sp. (no inflorescence)		H	FAC-OBL	3.			
4. Lemna sp.		it	OBL	4.			
5. Polygonum amphibium		H	FACW	5.			
6. Quercus palustris		T	FACW	6.			
7.				7.			
8.				8.			
Per Cent of Dominant Species that are OBL, FACW, or FAC (excluding FAC): 100%							
REMARKS: Passes Fac-Neutral test 4/5							
HYDROLOGY							
Recorded Data? NO		Describe:		Other Notes:			
Depth of Surface Water: up to several feet in pond		(in. or cm)		low lying area hydrologically connected to Big Creek, along Rt. 65			
Depth to Free Water in Pit: 0		(in. or cm)					
Depth to Saturated Soil: 0		(in. or cm)					
Primary Wetland Indicators:				Secondary Wetland Indicators (2 or more required):			
<input checked="" type="checkbox"/> Inundated				<input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches (30 cm)			
<input checked="" type="checkbox"/> Saturated in Upper 12 Inches (30 cm)				<input checked="" type="checkbox"/> Water-Stained Leaves			
<input checked="" type="checkbox"/> Water Marks				<input type="checkbox"/> Local Soil Survey Data			
<input type="checkbox"/> Drift Lines				<input checked="" type="checkbox"/> FAC-Neutral Test			
<input type="checkbox"/> Sediment Deposits				<input checked="" type="checkbox"/> Other (Explain in Remarks) buttressed tree trunks			
<input type="checkbox"/> Drainage Patterns in Wetlands							
Estimate of wetlands or waters within disturbance area							
REMARKS: B26							
SOILS							
Soil Survey Map Unit (Series and Phase):				Drainage Class:			
Taxonomy (to Subgroup):				Field Observations Confirm Mapped Type?			
Profile Description:				USDA Land Resource Region:			
Depth Range (Inches or cm)	Horizon Desig.	Matrix Color (Munsell Moist)	Mottles (Abundance/Contrast/Color)	Texture, Concretions, Structure, Redox Concen., etc.			
0-1.5	O	10YR 2/1		750% organic matter			
1.5-12+	B	10YR 3/2	10YR 5/6 Common, faint, fine	silty clay			
<input type="checkbox"/> Histosol				<input type="checkbox"/> Concretions or Redox Concentrations			
<input type="checkbox"/> Histic Epipedon				<input checked="" type="checkbox"/> High Organic Content			
<input type="checkbox"/> Sulfidic Odor				<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime				<input type="checkbox"/> Listed on Local Hydric Soils List			
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors				<input checked="" type="checkbox"/> Other USDA Hydric Soil Indicator (Explain in Remarks) Mottled			
REMARKS: rhizobacillus observed; decaying smell							
WETLAND DETERMINATION							
Hydrophytic Vegetation Present?		<input checked="" type="radio"/> Yes	No	Is This Sampling Point Within a Wetland? <input checked="" type="radio"/> YES NO			
Wetland Hydrology Present?		<input checked="" type="radio"/> Yes	No				
Hydric Soils Present?		<input checked="" type="radio"/> Yes	No				
REMARKS:							
Normal Circumstances?		Yes		Significantly Disturbed:		No	
						Potential Problem Area? No	

WETLAND DELINEATION FORM (1987 USACE METHOD)	SITE ID NO.: <u>W3ACR010</u>
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WETLAND sketch plan (include surrounding area and direction arrow) – not required if entered on other sheet

Survey extent      proposed CL      Survey extent

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State Rt - 65

check these flags out w/ the

GENERAL COMMENTS (ie. wetland disturbed by landowner, excessive noxious weeds in wetland, weather conditions, landowner issues, etc):	GPS - this sketch is just a guess
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FROGS & OWL OBSERVED

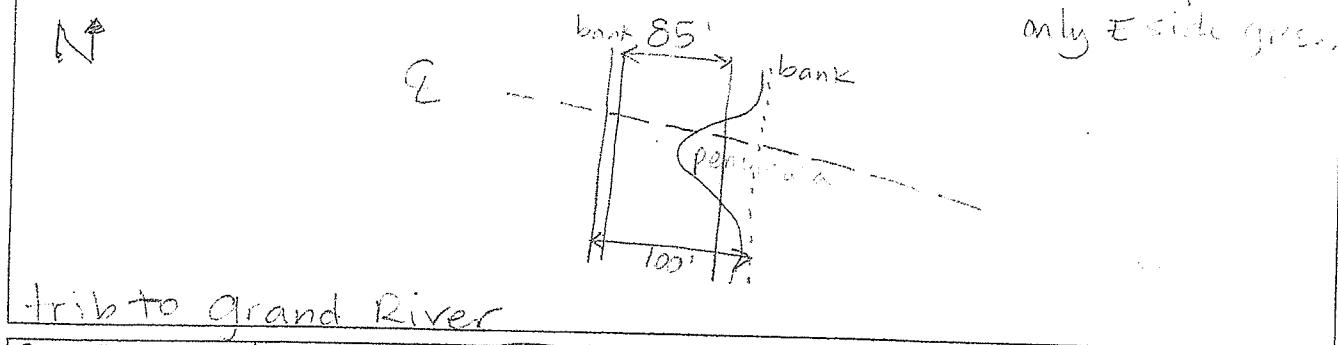
Beautiful, High quality (low plant diversity) PFO

Many dead snags & tree cavities here, many live shagbark hickories in the water

## WATERBODY DATA - Page 1 of 1

Date: 4/25/06	Stream ID No.: C.4A.C1.132	GPS File: R042509A	MILEPOST: 629.6
Staff: 4A	Client/Project Name: Rockies Express Pipeline Project (REX-West)	Project #: 04060-018-110	
Logbook page No's.: Book 2 pg. 50	State/County/Municipality: Chardon Co., Mo	LOOP/FACILITY NAME:	
	Block/ Lot/Tract No.: C1-003	Photo No(s): ① TOP - W ② Up - N ③	Upstr Dnstr

STREAM Sketch Plan (include surrounding area, cardinal direction arrow, flow direction arrow)



Stream Flow	Fast (Perennial)	Moderate (Intermittent)	Slow (Ephemeral)	Pooled	None				
Flow Depth (in.)	0	0-3	3-6	6-12	12-24	24-36 X	36-48	48-60	60+
Stream Width at Crossing (ft.)	Top of Banks: 100'		Channel OWHM: 95'		Water Surface: 85'				
Stream Substrate %	Bedrock %	Gravel %	Sand 70 %	Silt/Clay 30 %	Organic %				
Bank Height (ft.) (looking downstream)	Left Right	0-2 0-2	2-4 2-4	4-6 4-6	6-8 6-8	8+ 8+			
Bank Slope (%) (looking downstream)	Left Right	0-20 0-20	20-40 20-40	40-60 40-60	60-80 60-80	80+ (80+)			
Water Clarity	Clear	Slightly Turbid	Turbid	Very Turbid		Color: brown			
Aquatic Habitat	Sand Bar no	Gravel Bar no	Mud Bar yes	Gravel Riffles no	Deep Pools yes				
Undercut Banks yes	Overhanging trees/shrubs yes	In-stream emergent plants no	In-stream submergent plants no	Bank root systems yes	Fringing Wetlands yes				
Aquatic Organisms Observed	Waterfowl	Fish (adult)	Fish (juvenile)	Frogs	Turtles				
	Snakes	Invertebrates	Other: MUSSEL - see photo on 6'x4'						

### T/E SPECIES / SUITABLE HABITAT

no T/E obs; woodland banks, peninsula w/shrubs

### RIPARIAN VEGETATION DESCRIPTION

Plants: Carex sp, Potentilla sp, Salix nigra

Comments (e.g. pipeline crossing angle, construction constraints, erosion potential, existing disturbances, meanders or width variations)

pipeline crossing angle perpendicular to stream & riverine wetland

STREAM QUALITY (circle)	High	Medium	Low
<p><b>High Quality</b> - no indication of stress or disturbance in stream or adjacent area - diverse and mature fringing shrub-dominated cover - diverse and stable fish &amp; wildlife habitat - gravel beds, submerged logs, undercut banks, riffles and pools - no channelization -</p> <p><b>Medium Quality</b> - mild to moderate disturbances result in minor recognizable alterations - existing pipeline, road, railroad, other ROWs - provides fair fish and wildlife habitat - some erosion potential - some habitat diversity - fine sediment deposition predominate - flow and depth variation restricted - some channelization - trees, grass, or forbs dominate bank vegetation</p> <p><b>Low quality</b> - disturbances cause significant changes affecting plant species - mechanical alteration of plant species and/or soils - intense grazing activities - stream course channelization or ditching - exotic, nuisance, or invasive species - habitat diversity lacking - high erosion potential - flow and depth variation lacking - does not provide suitable wildlife habitat - grass or forbs dominate bank vegetation</p>			

<b>WETLAND DELINEATION FORM (1987 USACE METHOD)</b>				Site ID No.: <u>W.4A.C1.029</u>		Milepost: <u>629.6</u>	
Date: <u>4/25/06</u>		GPS FILE: <u>R042509A</u>					
Staff: <u>4A</u>		Client/Project Name: <u>Rockies Express Pipeline Project (REX-West) 04060-018-110</u>					
Logbook Page No's.: <u>BOOK 2 pg. 58</u>		Block/Lot/Tract No.: <u>C1-004</u>		Photo No's.: <u>DN @ 5</u>			
Nearest Waterway: <u>trib to grand R.</u>		Watershed: <u>grand R.</u>		Drainage Basin:			
Loop/Facility: <u>—</u>		State/County/Municipality: <u>Chariton Co, MO</u>					

DOMINANT PLANT SPECIES (% Cover)			Stratum	Indicator	NON-DOMINANT PLANT SPECIES (% Cover)			Stratum	Indicator
1.	<u>Carex atherodes (75)</u>	<u>H</u>	<u>OBL</u>	1.	<u>unkn. Shrub (10)</u>	<u>H</u>	<u>FAC</u>		
2.	<u>Fleorhiza palustris (15)</u>	<u>H</u>	<u>OBL</u>	2.					
3.				3.					
4.				4.					
5.				5.					
6.				6.					
7.				7.					
8.				8.					

Per Cent of Dominant Species that are OBL, FACW, or FAC (excluding FAC): 2/2 = 100%

REMARKS:

**HYDROLOGY**

Recorded Data? Describe: bermed wetland - assoc. w/ trib to grand R.

Depth of Surface Water: <u>none</u> (in. or cm)	Other Notes:
Depth to Free Water in Pit: <u>none</u> (in. or cm)	
Depth to Saturated Soil: <u>0</u> (in. or cm)	

<b>Primary Wetland Indicators:</b>	<b>Secondary Wetland Indicators (2 or more required):</b>
<input type="checkbox"/> Inundated	<input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches (30 cm)
<input checked="" type="checkbox"/> Saturated in Upper 12 Inches (30 cm)	<input checked="" type="checkbox"/> Water-Stained Leaves
<input type="checkbox"/> Water Marks	<input type="checkbox"/> Local Soil Survey Data
<input type="checkbox"/> Drift Lines	<input checked="" type="checkbox"/> FAC-Neutral Test
<input type="checkbox"/> Sediment Deposits	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Drainage Patterns in Wetlands	

Estimate of wetlands or waters within disturbance area 35' x 200'

REMARKS:

**SOILS**

Soil Survey Map Unit (Series and Phase): —

Taxonomy (to Subgroup): —

Drainage Class: —

Field Observations Confirm Mapped Type? —

Profile Description: moderately deep clay w/ iron reduction

USDA Land Resource Region: —

Depth Range (Inches or cm)	Horizon Desig.	Matrix Color <sup>1</sup> (Munsell Moist)	Mottles (Abundance/Contrast/Color)	Texture, Concretions, Structure, Redox Concen., etc.
<u>0-12"</u>	<u>A1</u>	<u>10YR 4/1</u>	<u>5YR 4/6 10% m</u>	<u>clay in m - platy (fine)</u>

<input type="checkbox"/> Histosol	<input checked="" type="checkbox"/> Concretions or Redox Concentrations
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other USDA Hydric Soil Indicator (Explain in Remarks)

REMARKS:

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	<u>(Yes)</u> Yes	No	Is This Sampling Point Within a Wetland?	<u>(Yes)</u> YES	NO
Wetland Hydrology Present?	<u>(Yes)</u> Yes	No			
Hydric Soils Present?	<u>(Yes)</u> Yes	No			

REMARKS:

Normal Circumstances? <u>yes</u>	Significantly Disturbed? <u>no</u>	Potential Problem Area? <u>no</u>
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<b>WETLAND DELINEATION FORM (1987 USACE METHOD)</b>		<b>Site ID No.:</b> W, 4A, C1, 032		<b>Milepost:</b> 630.2-630.9	
<b>Date:</b> 4/25/06		<b>GPS FILE:</b> R042509A			
<b>Staff:</b> 4A		<b>Client/Project Name:</b> Rockies Express Pipeline Project (REX-West) 04060-018-110			
<b>Logbook Page No's.:</b> Book 2 pg. 51		<b>Block/Lot/Tract No.:</b> C1-004		<b>Photo No's.:</b> ① E ② W ③	
<b>Nearest Waterway:</b> trib to Grand R.		<b>Watershed:</b> Grand R.		<b>Drainage Basin:</b> Grand R.	
<b>Loop/Facility:</b> -		<b>State/County/Municipality:</b> Chariton Co, MO			

DOMINANT PLANT SPECIES (% Cover)			NON-DOMINANT PLANT SPECIES (% Cover)		
Species	Stratum	Indicator	Species	Stratum	Indicator
1. Carex polystachya (10)	F	FACW	1. Solidago gigantea (2)	H	FACW
2. Carex bicolor (10)	F	FACW	2. Galium sp. (8)	H	FACW
3. Ranunculus sp. (5)	F	FACW	3. Epilobium sp. (5)	H/E	FACW
4. Carex acuta (25)	H	OBL	4. Celtis sp. (5)	F	FAC-
5. Eleocharis palustris (5)	H	OBL	5. Phlox sp. (5)	F/H	FAC
6. Ager saccharinum (10)	F	FACW	6. Quercus macrocarpa (3)	F	FAC-
7.			7. Asclepias incarnata (2)	H	OBL
8.			8. Ager nemorosus (5)	F	FACW-

Per Cent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 6/6 = 100%

**REMARKS:**

**HYDROLOGY**

<b>Recorded Data?</b>	<b>Describe:</b>	<b>Other Notes:</b>
Depth of Surface Water: 0 (in) or cm)		- puddling thru row Some bindweed scattered PFO wetland - trans to PEM
Depth to Free Water in Pit: 12" (in) or cm)		
Depth to Saturated Soil: 0 (in) or cm)		

<b>Primary Wetland Indicators:</b>	<b>Secondary Wetland Indicators (2 or more required):</b>
<input type="checkbox"/> Inundated	<input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches (30 cm)
<input checked="" type="checkbox"/> Saturated in Upper 12 inches (30 cm)	<input type="checkbox"/> Water-Stained Leaves
<input type="checkbox"/> Water Marks	<input type="checkbox"/> Local Soil Survey Data
<input type="checkbox"/> Drift Lines	<input checked="" type="checkbox"/> FAC-Neutral Test
<input type="checkbox"/> Sediment Deposits	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Drainage Patterns in Wetlands	

Estimate of wetlands or waters within disturbance area ~ 200' x 3000'

**REMARKS:**

**SOILS**

<b>Soil Survey Map Unit (Series and Phase):</b> -		<b>Drainage Class:</b> -	
<b>Taxonomy (to Subgroup):</b> -		<b>Field Observations Confirm Mapped Type?</b> -	
<b>Profile Description:</b> shallow Dark Clay, Fe reductions		<b>USDA Land Resource Region:</b> -	

Depth Range (inches or cm)	Horizon Desig.	Matrix Color (Munsell Moist)	Mottles (Abundance/Contrast/Color)	Texture, Concretions, Structure, Redox Concn., etc.
0-12	A	10YR 3/2	3% Faint/10YR 5/2	Clay loam, fine crumb

<input type="checkbox"/> Histosol	<input checked="" type="checkbox"/> Concretions or Redox Concentrations
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other USDA Hydric Soil Indicator (Explain in Remarks)

**REMARKS:**

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	<b>Is This Sampling Point Within a Wetland?</b> <input checked="" type="radio"/> YES <input type="radio"/> NO
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	

**REMARKS:**

<b>Normal Circumstances?</b> YES	<b>Significantly Disturbed:</b> NO	<b>Potential Problem Area?</b> NO
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WETLAND DELINEATION FORM (1987 USACE METHOD)	SITE ID NO.: W. 4A. C1. 032
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WETLAND sketch plan (include surrounding area and direction arrow) – not required if entered on other sheet

The sketch plan shows a wetland area with a north arrow pointing towards the top-left. A vertical line on the left side is labeled 'EUS' at the top and 'EUS' at the bottom. A horizontal line is labeled 'E' in the middle. A vertical double-headed arrow between the 'EUS' lines is labeled '135' and '165'. The area to the right of the vertical line is divided into two horizontal sections. The top section is labeled 'PEM' and the bottom section is labeled 'PFO'. A dashed line runs horizontally through the middle of the sketch. In the top right corner, there is a handwritten note: '-- E' and 'C 01/12'.

GENERAL COMMENTS (ie. wetland disturbed by landowner, excessive noxious weeds in wetland, weather conditions, landowner issues, etc):