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Keystone Pipeline Project

Keystone Pipeline Project
Progress Report for Wetland Surveys
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Executive Summary

Wetlands, waterbodies (including rivers, streams, lakes, and ponds), and riparian areas have been identified along the proposed Keystone Pipeline Project right-of-way (ROW) through ongoing field surveys and the review of aerial photographs for areas where reroutes have been developed. The purpose of this report is to review the methodologies being used to collect wetland and waterbody data, summarize the data that were collected for wetlands during the summer 2006 field effort, provide an update of ongoing (fall 2006) wetland surveys and discuss projected wetland survey needs for 2007.

1.0 Introduction

As part of federal regulatory requirements under the Clean Water Act, wetland and other waters of the U.S. (WUS) field surveys were completed to assist in estimating project surface disturbance. Information gathered during the inventories will be used to complete notification and permitting requirements under Section 401 and 404 of the Clean Water Act, as managed by the U.S. Army Corps of Engineers (USACE) and applicable state agencies. The Keystone Pipeline Project crosses four USACE districts including the Omaha, Kansas City, St. Louis, and Tulsa districts. Each of these districts has slightly different surveying and permitting requirements. Meetings were held in 2006 with the Omaha (February 6, March 29), Tulsa (March 13), Kansas City (March 27), and St. Louis Districts (February 17, May 24, and July 14), to discuss surveying, permitting, and construction requirements.

Consultation with the various USACE Districts resulted in the following general survey requirements:

- Omaha District (North Dakota, South Dakota, Nebraska): Field surveys along the Keystone Mainline ROW route will be conducted only at specific locations (larger wetland complexes, larger stream systems). Information will be provided to the USACE on other crossings, such as ephemeral streams, using remote sensing (aerial photography).
- Kansas City District (Kansas and the majority of Missouri): The Keystone Mainline ROW through Kansas and Missouri parallels an existing pipeline ROW and the proposed Rockies Express Pipeline ROW. Field data obtained from the Rockies Express Pipeline Project surveys has been used to identify wetlands and other WUS crossed by the Keystone Pipeline Project in these states. All wetland and drainage crossings along the Cushing Extension in Kansas will require ground surveys.
- St. Louis District (eastern Missouri and Illinois): All wetland and drainage crossings along the Mainline Route in eastern Missouri and in Illinois will require ground surveys.
- Tulsa District (Oklahoma): All wetland and drainage crossings along the Cushing Extension in Oklahoma will require ground surveys.

More specific information regarding discussions with the USACE districts' personnel, level of effort, wetland and other WUS delineation methodology and permitting requirements has been provided in a submittal to the Department of State (September 16, 2006). In partial fulfillment of USACE requirements, field surveys commenced in the summer of 2006 and will be completed by summer 2007. The remainder of this report provides a summary of data collection efforts for wetlands through October 2006 and discusses projected wetland survey needs for the spring/summer of 2007.

2.0 Data Collection Methods for Wetlands and other WUS

To initiate this project, ENSR completed a review of U.S. Geological Survey (USGS) topographic maps, National Wetland Inventory (NWI) maps, available soil surveys, and 2005 aerial photographs pertaining to the proposed ROW. The objectives of this data review were to identify wetlands and other WUS intercepted by the proposed pipeline route, including intermittent and ephemeral streams, and to identify specific wetlands and other WUS that will require field evaluation to confirm their status. Areas identified for field verification included: 1) NWI-mapped wetlands intercepted by the pipeline route that are not farmed; 2) areas that appear

to meet the wetlands three-parameter criteria (discussed below), but are not mapped on NWI maps; and 3) forested areas where wetland boundaries could not be estimated from aerial photographs. Additional areas to be field verified were included if recommended by the various USACE districts.

ENSR coordinated with USACE representatives regarding features requiring field verification and delineation. Preliminary survey areas were identified on maps of the proposed ROW previously provided by the district offices. For each site surveyed, a decision was made by the field team regarding the presence of wetlands and other WUS. For drainages with no wetland characteristics (e.g., unvegetated channel, defined bed and bank), a Stream Data Form developed by ENSR was completed to evaluate stream crossing characteristics. This form applied to stream crossings whether or not it supported adjunct wetland plant communities. If both wetlands and other WUS were present, a Stream Data Form and a Routine Wetland Determination Form was completed for the survey site.

The methods and techniques used to evaluate and delineate wetlands and other WUS on the maps of the proposed route corresponded to those specified for "routine on-site delineations" in the Corps of Engineers Wetlands Delineation Manual (Manual; USACE 1987). The Manual identifies a "three-parameter" approach used for defining wetlands which requires that all three of the conditions listed below be met under normal circumstances for an area to be defined and delineated as wetland.

1. The prevalent vegetation consists of hydrophytic plants that have the ability to grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content and depleted soil oxygen levels.

2. Soils are present and are classified as hydric or possessing characteristics that are associated with reducing soil conditions. Hydric soils are poorly drained and have a seasonal high water table within 6 inches of the surface.

3. The area is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation (usually 12.5 percent of the growing season) (USACE 1987).

Vegetation, soil, and hydrology data was collected at each sample point within the wetlands and immediately adjacent uplands and was entered onto a standardized wetland delineation field data form. The form also included a field sketch, which illustrated the wetlands and uplands. Wetland/upland boundaries were delineated using a handheld Global Positioning System (GPS) receiver. Photographs showing a representative view of each wetland visited also were taken. In addition to collecting sufficient data for "routine on-site delineations" and channel characteristics data for drainage crossings, wetland survey teams collected sufficient data (e.g., defined bed and bank and connectivity to navigable waters) for the USACE to make jurisdictional determinations for all wetlands and drainage crossings surveyed in the field.

Wetlands and other WUS along the proposed route were delineated in accordance with the direction provided by the USACE – Omaha, Kansas City, St. Louis, and Tulsa districts. The requirements and level of effort to complete wetland other WUS delineations differed within each district. The level of effort completed within each of the respective states has been provided below.

Keystone Mainline

- North Dakota: Key wetlands and other WUS were field delineated; key wetlands and other WUS along a reroute in southeastern North Dakota were identified based on the review of aerial photographs; the delineation of wetlands and other WUS along the reroute will be completed by summer of 2007.
- South Dakota: Key wetlands and other WUS were field delineated; key wetlands and other waters of U.S. along a reroute in northeastern South Dakota were identified based on the review of aerial photographs; the delineation of wetlands and other WUS along the reroute will be completed by summer of 2007.

- Nebraska: Key wetlands and other WUS were field delineated; key wetlands and waters of U.S. along a reroute were identified based on the review of aerial photographs; the delineation of wetlands and other WUS along the reroute will be completed in the fall of 2006.
- Kansas: Delineations were completed for wetlands and other WUS except where survey access was unavailable.
- Missouri: Delineations were completed for wetlands and other WUS crossed by the Keystone Mainline, except where survey access was unavailable.
- Illinois: Delineations were completed for wetlands and other WUS from the Mississippi River to the Patoka Terminal, except where survey access was unavailable.

Cushing Extension

- Nebraska: Preliminary identification of wetlands and other WUS was based on the review of aerial photographs. Delineations of wetlands and other WUS will be initiated and completed in 2007.
- Kansas: Preliminary identification of wetlands and other WUS was based on the review of aerial photographs. Delineations of wetlands and other WUS will be initiated and completed in 2007.
- Oklahoma: Preliminary identification of wetlands and other WUS was based on the review of aerial photographs. Delineations of all wetlands and other WUS will be initiated and completed in 2007.

3.0 Results of Summer 2006 Wetland Surveys

Maps of the proposed route, including USGS topographic maps and high resolution aerial photography overlaid with NWI wetland polygons, were evaluated for wetland crossings. Based on this evaluation, priority wetland survey areas were identified for that portion of the ROW occurring in UTM Zone 14 under Omaha District (USACE) jurisdiction, where the majority of wetlands along the proposed route occur. The boundaries of lower priority areas in UTM Zone 14 were delineated using aerial photo interpretation. The remainder of the ROW outside of the Omaha District requires 100 percent on-the-ground field surveys to evaluate wetlands crossed by the proposed project. Wetland data for the Project thus represents a combination of data collected through delineations in the field recorded with a GPS unit, and data digitized from maps and high-resolution aerial photography overlaid with NWI polygons. A total of 2,472 wetlands have been identified along the Keystone Mainline ROW, which cross 57.4 linear miles of the route. Of these wetland areas, 12.8 miles (22 percent) have been field delineated and the boundaries accurately captured with a GPS receiver, while wetlands that cross 44.6 miles (78 percent) have been delineated using high quality aerial photography where survey access was unavailable or survey protocol allowed this delineation approach as discussed with the USACE.

Palustrine emergent (PEM) wetlands represent 71 percent of the total wetland miles (**Figure 1**). PEM wetlands are dominated by persistent and nonpersistent grasses, rushes, sedges, forbs and other herbaceous and grass-like plants. Open water (OW) represents 16 percent of the total wetland miles crossed by the Project. OW is a broad category that describes lakes, ponds, streams, and rivers, as well as associated vegetation found within their geomorphologic boundaries (i.e., stream banks). Thus, this category represents surface waters found within wetlands or in defined channels, as well as riverine or seasonally flooded wetlands associated with open water. Palustrine forested wetlands (PFO) occur along 9 percent of the wetland miles identified along the route. PFO wetlands are dominated by woody vegetation, generally greater than ten feet in height. The remaining 4 percent of wetlands crossed by the Keystone Mainline are classified a palustrine scrub-shrub (PSS), which are typically dominated by shrubs and other short, woody plants.

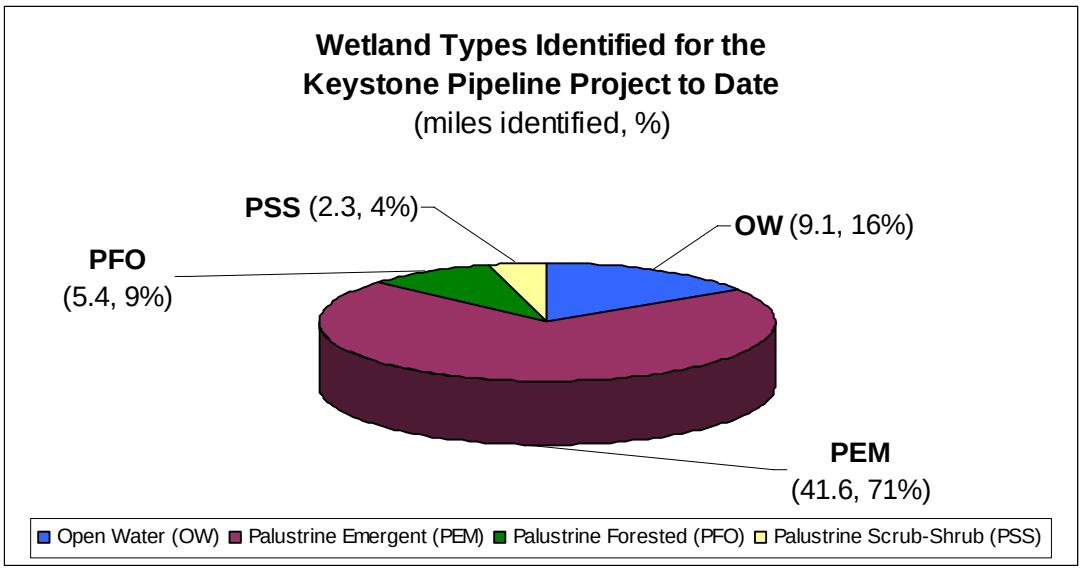

Figure 1 Wetland Types Identified for the Keystone Pipeline Project to Date

Wetland surveys for the Mainline of the Keystone Pipeline Project are approximately 80 to 90 percent complete (**Table 1**). The current wetland survey status by state is provided below.

- North Dakota: Wetland delineations are approximately 79 percent complete. Of 107 total locations requiring survey, 85 have been successfully completed. By the end of the 2006 field season in November approximately 93 percent of wetland surveys should be complete, depending on available access. The Hecla Sandhills area in extreme southern North Dakota will not be surveyed in 2006, thus wetland surveys for North Dakota will resume in the spring/summer of 2007 for this area and those tracts where access is not yet available.
- South Dakota: Wetland delineations are approximately 81 percent complete. Of 52 total locations requiring survey, 42 have been successfully completed. By the end of the 2006 field season in November approximately 90 percent of wetland surveys should be complete, depending on available access. The Hecla Sandhills in northern South Dakota will not be surveyed in 2006, thus wetland surveys for South Dakota will resume in the spring/summer of 2007 for this area and those tracts where access is not available.
- Nebraska: Wetland delineations are approximately 87 percent complete. Of 39 total locations requiring survey, 34 have been successfully completed. By the end of the 2006 field season in November it is projected that 100 percent of wetland surveys should be complete, depending on available access.
- Kansas: Wetland delineations have been completed for all wetlands and other WUS crossed by the Project, excluding land tracts where survey access was not available. Further wetland surveys for such tracts, or for possible re-routes, may be necessary in 2007.
- Missouri: Wetlands and other WUS from the western Missouri border to the eastern boundary of Audrain County have been completed, excluding land tracts where survey access was not available. Wetland delineations from the eastern boundary of Audrain County to the Mississippi River are currently 83 percent complete. Of 101 total miles requiring survey, 76 miles have been completed.
- Illinois: Of the 56 total miles requiring wetland survey from the Mississippi River to the Patoka Terminal, 50 miles have been completed.

Table 1 Wetlands Survey Progress as of October 13, 2006

State	Locations Requiring Pedestrian Survey[a]	Total Locations or Miles (L/M) Surveyed[a]	Percent Complete
North Dakota	107 (L)	85 (L)	79
South Dakota	52 (L)	42 (L)	81
Nebraska	39 (L)	34 (L)	87
Kansas REX	99 REX data (L)	98 (L)	99
Missouri REX	172 REX data (L)	165 (L)	96
Missouri	101 (M)	76 (M)	75
Illinois	56 (M)	50 (M)	89
Total locations	**469(L)**	**424(L)**	**90**
Total miles	**157(M)**	**126(M)**	**80**

NOTE: L indicates locations surveyed or available for survey; M indicates miles surveyed or available for survey.

[a] Numbers of wetlands for survey subject to verification.

4.0 Projected Survey Needs (Spring/Summer 2007)

Keystone Mainline

Remaining wetland survey work on the Keystone Mainline includes:

- North Dakota, South Dakota, Kansas, Missouri and Illinois: tracts requiring access and re-routes (if there are any changes from the current alignment). This work will be completed in spring/summer 2007
- North Dakota and South Dakota: Hecla Sandhills (discussed in more detail below). This area will be completed by summer 2007.

Hecla Sandhills

The Hecla Sandhills and their associated vegetation and wetland complexes are currently crossed by the Keystone Mainline ROW from approximate milepost 210 in North Dakota south to approximate milepost 224 in South Dakota. The area consists of stabilized sand dunes that are occupied by native grasslands and extensive small wetlands. Wetland delineation surveys will be completed after the pipeline route has been refined across this area.

Cushing Extension

The Cushing Extension has been evaluated for wetlands and other WUS using aerial photographs and NWI maps, but pedestrian surveys of wetlands and drainage crossings will be necessary:

- Nebraska, Kansas, and Oklahoma: Delineations of wetlands and other WUS will be initiated and completed in the spring/summer of 2007.

References

U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. Available online at: http://www.wes.army.mil/el/wetlands/pdfs/wlman87.pdf

Appendix I

Photographs of Wetland Types Delineated Along the Keystone Mainline

Appendix II

Mainline Wetlands Identified for the Keystone Pipeline Project