# Class I Cultural Records Files Search, Research Design, and Survey Methodology for the Nebraska Portion of the Proposed TransCanada Keystone Pipeline

Prepared by

SWCA Environmental Consultants

February 3, 2006

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# Class I Cultural Records Files Search, Research Design, and Methodology for the Nebraska Portion of the Proposed TransCanada Keystone Pipeline

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**SWCA Project No. 10750-169**
**SWCA Cultural Resource Report 2006-62**

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## INTRODUCTION

A cultural resources survey will be conducted for the Nebraska portion of the proposed TransCanada Keystone Pipeline (Figure 1), and this document provides the results of a Class I cultural records files search, outlines a general research design, and provides survey methodology for this phase of the project. The proposed pipeline corridor enters Nebraska in Cedar County south of Yankton, South Dakota and heads southward through Nebraska, leaving the state approximately 3.5 miles (5.63 km) south-southeast of Odell, Nebraska in Gage County. The Nebraska portion of this pipeline is approximately 212.45 miles (341.90 km) long and involves 10 counties (Cedar, Wayne, Stanton, Platte, Colfax, Butler, Seward, Saline, Jefferson, and Gage [north to south]). SWCA has designated arbitrary mileposts (MP) for the entire proposed pipeline corridor in order to have reference points for previously recorded sites and cultural inventories. The MP begin with "0" at the northern extent of the pipeline, and end with "212.5" at the southern extent of the pipeline (Appendix A: Figures A-1 to A-18).

Typically, a combination of information from previously recorded sites and ecosystem variables are used to determine areas where cultural material is likely to be found. For this project, only four previously recorded sites are within 300 ft (91.44 m) of the proposed centerline and 40 sites are within a mile (1.61 km) of the proposed centerline. Because of the lack of previously recorded material within or adjacent to the proposed centerline, ecosystem variables are compared with the few known cultural resources locations to indicate the highest probability for discovering archaeologically sensitive land surfaces and sediments in the project corridor.

A number of ecosystem state factors (i.e., climate, biota, relief, parent material, and time) have been shown to be relevant variables for predicting where the archaeological material is most likely to be located. For example, steep slopes are unlikely to yield in-situ archaeological material because the slopes are generally uninhabitable. Similarly, there can be an inverse relationship between the distance to permanent water sources and both the density of archaeological material and the potential for buried deposits. Ecosystem state factors along the Keystone pipeline are outlined below. Following this, previously conducted archaeological surveys and associated sites recorded along the pipeline are described. Next, both the ecosystem factors and the previously recorded archaeological material are used to predict areas likely to yield the type of archaeological material that is afforded protection under the mandates of the National Historic Preservation Act and the Archaeological Resources Protection Act. These areas are identified by milepost, and the maps showing these areas are available in Appendix A. SWCA has designated arbitrary mileposts (MP) for the entire proposed pipeline corridor in order to have reference points for previously recorded sites and cultural inventories. The MP begin with "0" at the northern extent of the pipeline, and end with "212.5" at the southern extent of the pipeline (Appendix A: Figures A-1 to A-18).

## ECOSYSTEM OVERVIEW

The standard Class III pedestrian survey width will be 300 feet (91.44 m) as the majority of the project area is greenfield (does not parallel previous pipelines). To examine the

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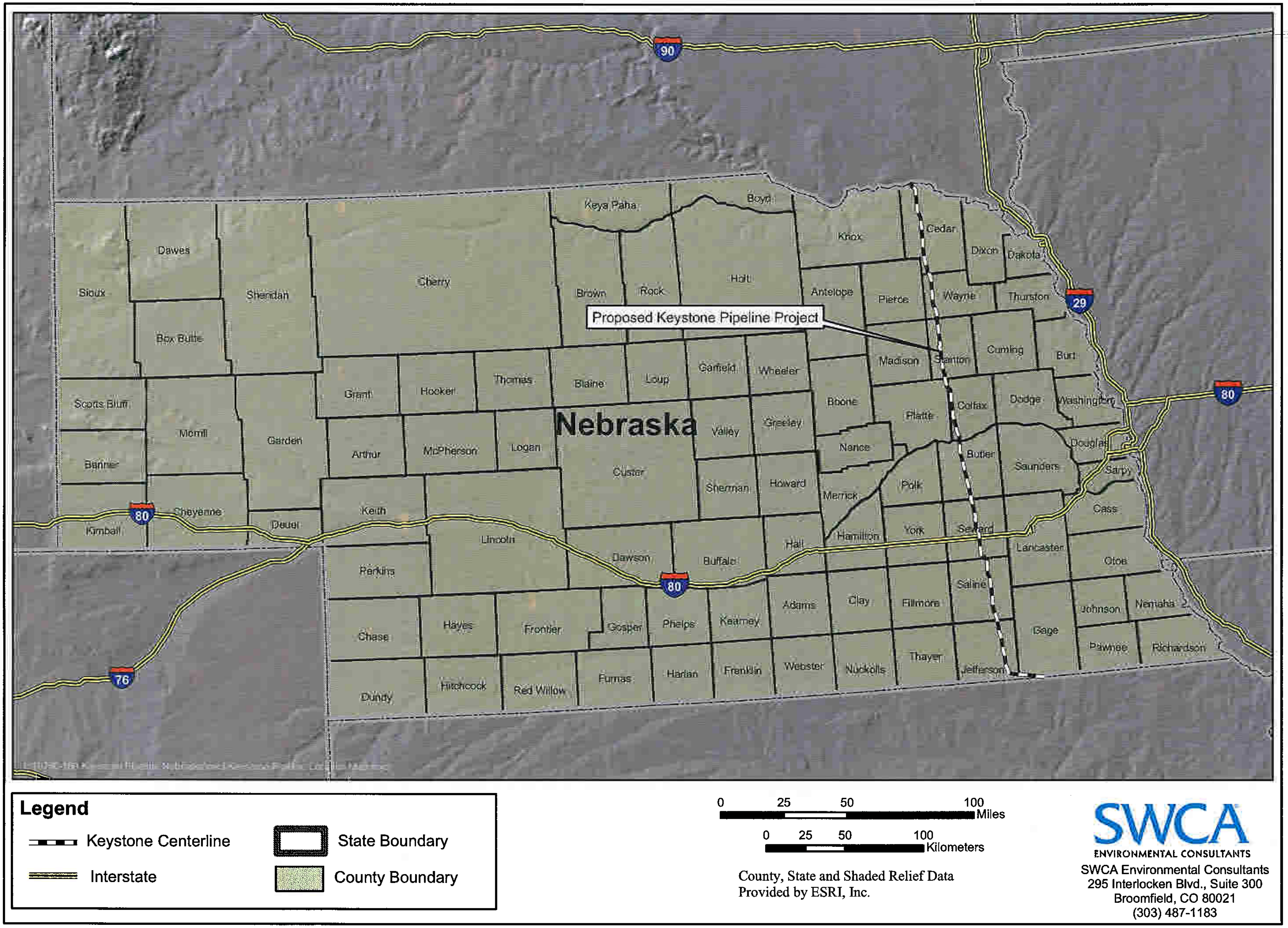



Figure 1. Location of the proposed Keystone Pipeline Project.

**Figure 1. Location of the Proposed Keystone pipeline corridor.**

relationship between ecosystem and archaeological variables, the proposed centerline was projected in a GIS and buffered at a width of 45.72 m (91.44 m [300 ft] total width). This buffered area was then used to facilitate a comparison between the archaeological and ecosystem layers within the proposed Keystone Pipeline survey corridor.

The portion of the state that encompasses the proposed pipeline corridor is classified as the Prairie Parkland Province of the Prairie Division of the Humid Temperate ecoregion, in contrast to the Temperate Steppe Division of the Dry Domain ecoregion that covers the western two-thirds of the state (USDA Forest Service 2004). The northern half of the pipeline corridor is located in the North-central Glaciated Plains Section, and the southern half is located in the Central Loess Plains Section of the Prairie Parkland Province (USDA Forest Service 2004). While the latter is not described as Glaciated Plains, the entire corridor was subjected to Pleistocene continental glaciation.

Cropland and pasture are overwhelmingly the predominant land use type within the proposed pipeline corridor, followed distantly by herbaceous rangeland, mixed rangeland, and numerous smaller land use types.

**Table 1. The 1970's to early 1980's land use types and acreages (and hectares) along the 300 ft (91.44 m) proposed pipeline corridor (EPA 1994).**

| Land Use | Acres | Hectares |
|---|---|---|
| Cropland and Pasture | 7531 | 3049.0 |
| Herbaceous Rangeland | 64.3 | 26.0 |
| Mixed Rangeland | 41.2 | 16.7 |
| Nonforested Wetland | 24.8 | 10.0 |
| Forested Wetland | 13 | 5.3 |
| Deciduous Forest Land | 12.3 | 5.0 |
| Sandy Areas Not Beaches | 9.1 | 3.7 |
| Streams and Canals | 8.2 | 3.3 |
| Other Agricultural Land | 6.6 | 2.7 |
| Confined Feeding Operations | 5 | 2.0 |
| Mixed Urban or Built-up Land | 3.2 | 1.3 |
| Commercial and Services | 2.7 | 1.1 |
| Transportation, Communication, Utilities | 2.6 | 1.1 |

## CLIMATE

There is a north-south and elevational gradient in temperature along the proposed pipeline corridor (Figure 2). Higher elevations of the corridor are cooler than the lower portions, and the upper latitudes tend to be cooler than the lower latitudes. The mean annual temperature (MAT) in Yankton, SD at the north end of the Nebraska portion of the corridor is 47 degrees Fahrenheit ($^{o}$F), or 8.4 degrees Centigrade ($^{o}$C), while the MAT at Beatrice, NE near the south end of the Nebraska portion is 52 $^{o}$F (10.9 $^{o}$C; Vose et al. 1992).

The precipitation gradient in Nebraska trends to the southeast (Figure 2). The mean annual precipitation (MAP) at the north end of the Nebraska portion of the pipeline is 24 in. (608 mm), while the south end has a MAP of 29 in. (747 mm); Vose et al. 1992). Annual variability in both MAT and MAP follow the classic central Plains pattern (Figure 3), where peaks and troughs in precipitation and temperature generally coincide, although the precipitation peak is slightly earlier (June) than the temperature peak (July). Both the coldest and driest month in this region is January.

The northern end of the pipeline experiences more drought stress than the southern end (Figure 3) and also exhibits less overall precipitation. As a result, the net primary productivity (NPP) of the lands in the northern portion is lower than the average NPP of the southern end. However, this difference is lessened by the higher evapotranspiration rates (i.e., water loss) of the warmer southern end. Because of this variability in NPP, there is a higher proportion of bare ground and a lower native plant canopy in uncultivated portions of the northern portion of the proposed corridor, and lower bare ground visibility and higher plant canopy on uncultivated portions of the southern end of the corridor, other things equal (e.g., grazing intensity). This pattern is archaeologically relevant because more cultural material will be obscured from vision during surface surveys in native ecosystems of the southern portion than those of the northern portion.

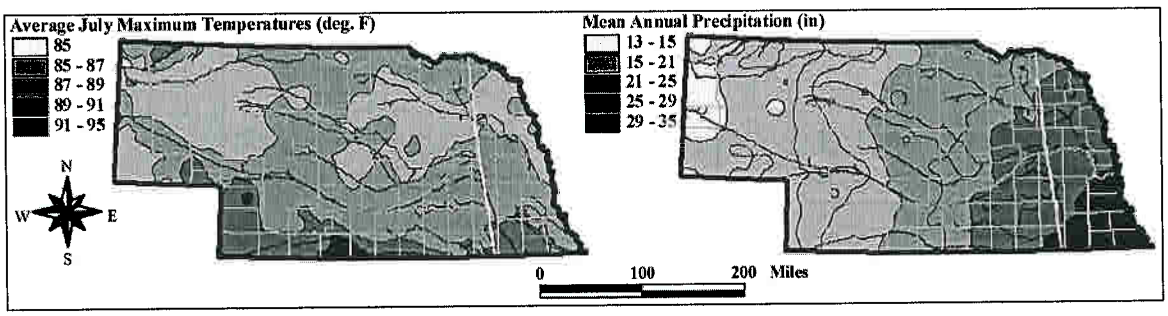
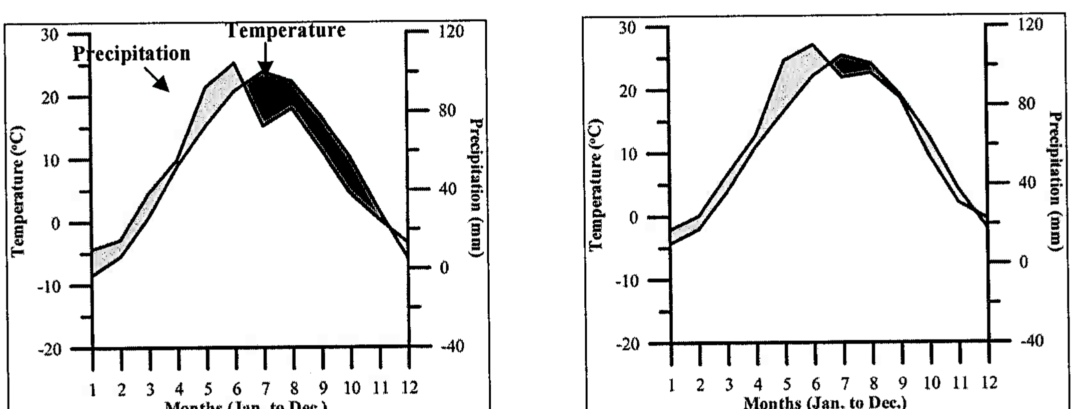



**Figure 2. Average July maximum temperatures and mean annual precipitation (MAP) in Nebraska. The proposed pipeline corridor is the vertical white line.**




a  b

**Figure 3. Climate diagrams for Yankton, SD (a) and Beatrice, NE (b), showing the historic difference in climate on the north and south ends of the pipeline corridor, respectively. Light shaded areas show moisture surplus, and dark shaded areas show moisture deficit (drought stress). Data provided by Vose et al. (1992).**

## HYDROLOGY

The proposed pipeline would pass over five major watersheds: Missouri Tributaries (MP 0.0-27.6), Elkhorn (MP 27.7-84.2), Lower Platte (MP 84.3-112.3), Big Blue (112.4-198.4, 198.6; 204.6-212.3), and Little Blue (198.5, 198.7-204.5; Figure 4). The pipeline crosses three perennial streams in the Missouri Tributaries watershed, including (from north to south) the Missouri River, West Bow Creek, and Bow Creek. The pipeline crosses five perennial streams in the Elkhorn watershed, including an unnamed drainage north-northeast of Randolph, NE., Middle Logan Creek, the Elkhorn River, Union Creek, and the West Fork Maple Creek. Four perennial streams are crossed by the pipeline in the Lower Platte watershed, including Shell Creek, Lost Creek, Platte River, and Deer Creek. Moving southward, the pipeline crosses eight perennial streams in the Big Blue River watershed, including a near miss with the North Branch Big Blue River, the Big Blue River, Lincoln Creek, the West Fork Big Blue River, Turkey Creek, Swan Creek, Cub Creek, and lastly Big Indian Creek. These 20 streams are only interpreted as perennial (http://csd.unl.edu/general/gis-datasets.asp#Streams_-_Simplified), and many of them likely experience episodic drying.

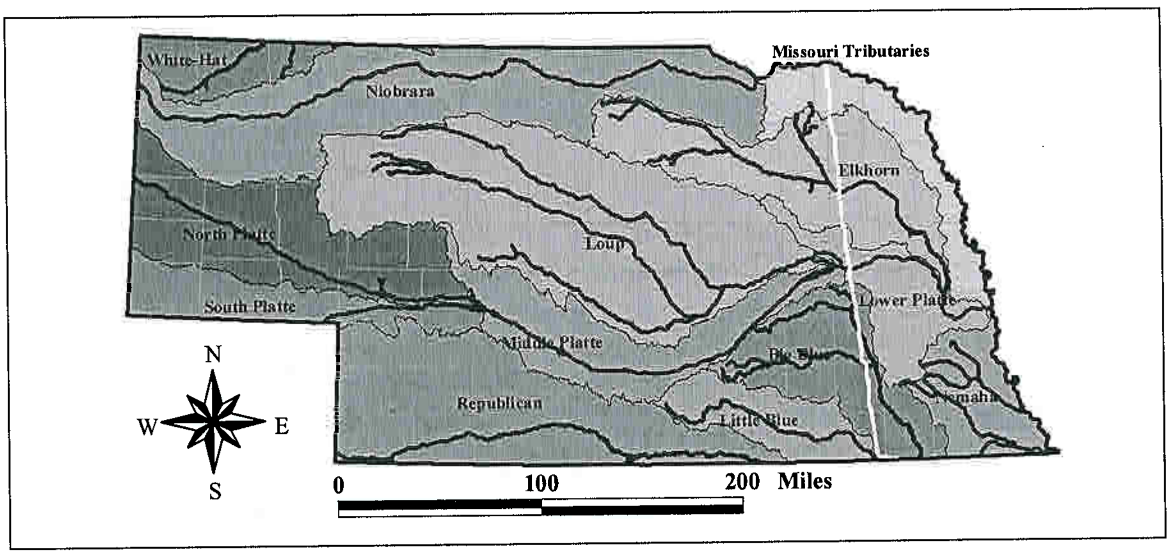



**Figure 4. Major watersheds of Nebraska and the proposed pipeline corridor (white line).**

## GEOLOGY AND SOILS

The proposed pipeline will pass over seven bedrock geological formations/groups, including Cretaceous Carlisle, Dakota, Greenhorn-Graneros, and Niobrara Groups, along with the Cretaceous Pierre Shale, the Permian Chase Group, and the Cenozoic and Miocene Ogallala groups (Table 2; CSD 1996a). In most places, this bedrock is deeply buried by both glacial till from the Pleistocene Nebraskan and Kansan advances and a thick blanket of loess that was episodically deposited in the late Quaternary (late Pleistocene and Holocene).

**Table 2. Geology along the proposed Keystone Pipeline corridor (CSD 1996a).**

| Milepost | Bedrock | Milepost | Bedrock |
|---|---|---|---|
| 0.0-2.2 | Cretaceous Carlisle Group | 76.5-80.5 | Cretaceous Niobrara Group |
| 2.3-7.5 | Cretaceous Niobrara Group | 80.6-100.6 | Cretaceous Carlisle Group |
| 7.6-10.5 | Cretaceous Pierre Shale | 100.7-101.8 | Cretaceous Greenhorn-Graneros Group |
| 10.6-14.4 | Cretaceous Niobrara Group | 101.9-108.7 | Cretaceous Carlisle Group |
| 14.5-17.2 | Cenozoic and Miocene Ogalalla Group | 108.8-110.5 | Cretaceous Greenhorn-Graneros Group |
| 17.3-18.4 | Cretaceous Niobrara Group | 110.6-111.8 | Cretaceous Dakota Group |
| 18.5-28.2 | Cenozoic and Miocene Ogalalla Group | 111.9-116.7 | Cretaceous Greenhorn-Graneros Group |
| 28.3-31.5 | Cretaceous Pierre Shale | 116.8-120.4 | Cretaceous Carlisle Group |
| 31.6-32.6 | Cretaceous Niobrara Group | 120.5-122.4 | Cretaceous Greenhorn-Graneros Group |
| 32.7-35.0 | Cretaceous Pierre Shale | 122.5-126.5 | Cretaceous Dakota Group |
| 35.1-36.8 | Cenozoic and Miocene Ogalalla Group | 126.6-133.1 | Cretaceous Greenhorn-Graneros Group |
| 36.9-38.2 | Cretaceous Niobrara Group | 133.2-148.1 | Cretaceous Dakota Group |
| 38.3-40.7 | Cenozoic and Miocene Ogalalla Group | 148.2-154.3 | Cretaceous Greenhorn-Graneros Group |
| 40.8-43.5 | Cretaceous Niobrara Group | 154.4-162.6 | Cretaceous Dakota Group |
| 43.6-49.7 | Cenozoic and Miocene Ogalalla Group | 162.7-164.3 | Cretaceous Greenhorn-Graneros Group |
| 49.8-53.8 | Cretaceous Niobrara Group | 164.4-165.1 | Cretaceous Dakota Group |
| 53.9-64.3 | Cenozoic and Miocene Ogalalla Group | 165.2-165.9 | Cretaceous Greenhorn-Graneros Group |
| 64.4-66.6 | Cretaceous Niobrara Group | 166.0-166.4 | Cretaceous Dakota Group |
| 66.7-67.1 | Cretaceous Carlisle Group | 166.5-167.2 | Cretaceous Greenhorn-Graneros Group |
| 67.2-67.7 | Cretaceous Niobrara Group | 167.3-205.1 | Cretaceous Dakota Group |
| 67.8-71.5 | Cenozoic and Miocene Ogalalla Group | 205.2-212.3 | Permian Chase Group |
| 71.6-76.4 | Cretaceous Carlisle Group | | |

A mantle of glacial till covered the entire project area in both the early and middle Pleistocene. The continental Nebraskan glaciation was the first to cover the region in the Pleistocene, which began after approximately 1.6 million years ago (mya). Following the Nebraskan glaciation was the Aftonian interstadial. By the middle Pleistocene, the Kansan glaciation extended over the project area (around 400,000 years ago), and Kansan till buried the Nebraskan till. Since the Kansan glaciation, the region has been fluvially eroded by stream action, leaving the till in place only in the broad uplands of the project corridor. This till is a source of toolstone cobbles, but it is buried under thick loess deposits across the majority of the corridor.

Following the Last Glacial Maximum (after ca. 15,000 years ago), eolian deposits began accumulating across the Great Plains. The same forces that deposited the sand hills in western and central Nebraska also deposited the finer-grained silty loess across eastern Nebraska. The late Pleistocene (late Wisconsin) unit of loess deposited throughout Nebraska is referred to as Peoria Loess. The well-known Brady paleosol of the Pleistocene/Holocene transition formed in this loess (Schultz and Stout 1948, Johnson and Willey 2000). Holocene loess deposition began approximately 9,330 ± 130 radiocarbon years before present (RCBP), or 10,540 ± 164 calibrated calendar years before present (cal BP; Mason and Kuzila 2000). This sedimentary unit is known as the Bignell loess, and contains several buried soil horizons dating up to at least 3010 ± 90 RCBP (3218 ± 117 cal BP; Mason and Kuzilla 2000; Johnson and Willey 2000). Numerous short episodes of sedimentation and soil formation occurred after the Bignell loess deposition, including the last 1,000 years. Soil redistribution (e.g., topsoil loss and valley silting) associated with historic land use practices (e.g., plowing) has affected the majority of the project area. Even eolian activity from the 1930s dust bowl has redistributed soils across the project area. As a result, the sedimentary and soil landscapes present today are much different from those present in prehistoric and early historic times.

Upland soils south of the floodplain and terraces of the Missouri River formed in weathered shale, and as a result have considerable clay content. Some of the shallowest sediments within the project corridor are anticipated on these uplands, which are dominated by Entisols and Inceptisols (Table 3). Deeper clay-rich (vertic) soils are found in these Missouri tributary uplands in swales and at the base of slopes where soil has accumulated. However, compared to the remainder of the project area, these uplands have the lowest likelihood of containing interpretable subsurface archaeological contexts. South of the Missouri tributaries, a thick mantle of silty loess covers glacial till in the uplands and also covers alluvium in the lowlands (Table 3). Soils are deep mollisols (typical grassland soils) across the remainder of the project area, with the few exceptions being the sandy sediments adjacent to major river courses (e.g., Gothenburg and Platte soils associated with lands immediately adjacent to the Platte River; Table 3).

Given the depth of the mollisols that cover the vast majority of the project area, along with the fact that the loess deposits have been accumulating throughout the late Quaternary, interpretable subsurface archaeological deposits are possible in most areas of the centerline. However, deposition rate of eolian loess is slower than the deposition rate of streamside alluvium. As a result, a greater diversity of artifact types (including perishables) and a higher degree of preservation is likely in the low-energy alluvium adjacent to streams. Because of this difference, lowland sediments are more likely to yield NRHP Criterion D (research potential)-eligible archaeological contexts. While the uplands may also contain subsurface archaeological deposits, the degree of preservation is anticipated to be much lower than sediments of comparable age in the alluvial lowlands.

**Table 3. Generalized soils along the pipeline corridor. Data provided by Culver and Schaefer (1988) and Kuzila and Mack (no date).**

| Soil Location | Description |
|---|---|
| Northern Border, along Missouri River Valley | **Labu**: Moderately deep, gently sloping to steep, well-drained, clayey soils formed in weathered shale on uplands; Vertic Ustochrepts, fine. |
| | **Bristow**: Shallow, gently sloping to very steep, well-drained, clayey soils formed in weathered shale on uplands; Typic Ustorthents, clayey, shallow. |
| | **Sansarc**: Shallow, gently sloping to very steep, well-drained, clayey soils formed in weathered shale on uplands; Typic Ustorthents, clayey, shallow. |
| Uplands South of Missouri River | **Moody**: Deep, nearly level to strongly sloping, well-drained, silty soils formed in loess on uplands; Udic Haplustolls, fine-silty. |
| | **Thurman**: Deep, nearly level to strongly sloping, somewhat excessively drained, sandy soils formed in eolian sand on uplands; Udorthentic Haplustolls, sandy. |
| Uplands North of Platte River | **Nora**: Very deep, nearly level to moderately steep, well-drained, silty soils formed in loess on uplands; Udic Haplustolls, fine-silty. |
| | **Moody**: Very deep, nearly level to moderately steep, well-drained, silty soils formed in loess on uplands; Udic Haplustolls, fine-silty. |
| | **Judson**: Very deep, nearly level, well-drained, silty soils formed in colluvium on foot slopes; Cumulic Hapludolls, fine-silty. |
| Elkhorn River Valley | **Hord**: Deep, nearly level to gently sloping, well-drained, silty soils formed in loess and alluvium on stream terraces; Cumulic Haplustolls, fine-silty. |

**Table 3. Generalized soils along the pipeline corridor (continued).**

| Soil Location | Description |
|---|---|
| | **Cozad**: Deep, nearly level to gently sloping, well-drained, silty soils formed in loess and alluvium on stream terraces; Fluventic Haplustolls, coarse-silty. |
| | **Boel**: Deep, nearly level, somewhat poorly drained, sandy soils formed in alluvium on bottomlands; Fluvaquentic Haplustolls, sandy. |
| Platte River Valley | **Gibbon**: Deep, nearly level, somewhat poorly drained, silty soils formed in alluvium on bottomlands; Fluvaquentic Haplaquolls, fine-silty. |
| | **Gothenburg**: Shallow over sand and gravel, nearly level, poorly drained, sandy soils formed in alluvium on bottomlands; Typic Psammaquents. |
| | **Platte**: Shallow over sand and gravel, nearly level, poorly drained, sandy soils formed in alluvium on bottomlands; Mollic Fluvaquents, sandy. |
| Uplands South of Platte River | **Hastings**: Very deep, nearly level to gently sloping, moderately well-drained, silty soils on uplands; Udic Argiustolls, fine. |
| | **Crete**: Very deep, nearly level, moderately well-drained, silty soils with clayey subsoils on uplands; Pachic Argiustolls, fine. |
| | **Fillmore**: Very deep, nearly level, poorly-drained, silty soils with clayey subsoils in depressions; Typic Argialbolls, fine. |
| Lower Big Blue and Little Blue in Nebraska | **Crete**: Very deep, nearly level to gently sloping, moderately well-drained, silty soils with clayey subsoils on uplands: Pachic Argiustolls, fine. |
| | **Mayberry**: Very deep, nearly level to strongly sloping, moderately well-drained, loamy soils with clayey subsoils on uplands: Aquic Argiudolls, fine. |
| | **Burchard**: Very deep, nearly level to moderately steep, well-drained, loamy soils with clayey subsoils on uplands; Typic Argiudolls, fine-loamy. |

## BIOTA

The native plant community along the pipeline has been heavily modified by agricultural practices. While the majority of the corridor has been plowed into cropland, the predominant native plant community was the upland tallgrass prairie (Table 4; CSD 1996b). This was interspersed with lowland tallgrass prairies and riparian deciduous forests along stream courses. Loess mixed prairie, gravelly mixed prairie, and upland deciduous forest plant communities were only present in a few isolated portions of the corridor (Table 4).

Following the terminal Pleistocene extinctions, this region was home to sometimes massive herds of bison. Deer also occupied the region but in much lower numbers. Other large fauna that would have inhabited the region include elk and bears, but these populations were likely low and they may have been insignificant with regard to prehistoric subsistence. A wide variety of smaller fauna were and are present in the region, including wolf, coyote, fox, raccoon, several types of snakes, and a wide variety of migratory and resident bird species. Riparian areas were and are home to several types of amphibians, turtles, and fish. Several bird species and most other fauna would have concentrated near the riparian areas because of the water resources.

**Table 4. Native plant communities by milepost along the Nebraska portion of the proposed pipeline (CSD 1996b).**

| Native Plant Community | Milepost | Native Plant Community | Milepost |
|---|---|---|---|
| Riparian Deciduous Forest | 0.0-1.3 | Upland Deciduous Forest | 96.1 |
| Loess Mixed-grass Prairie | 1.4-2.0 | Upland Tallgrass Prairie | 96.2-102.3 |
| Upland Deciduous Forest | 2.1-3.8 | Lowland Tallgrass Prairie | 102.4-104.3 |
| Loess Mixed-grass Prairie | 3.9-4.1 | Riparian Deciduous Forest | 104.4-105.8 |
| Upland Tallgrass Prairie | 4.2-6.6 | Upland Tallgrass Prairie | 105.9-134.8 |
| Gravelly Mixed-grass Prairie | 6.7-7.8 | Lowland Tallgrass Prairie | 134.9-136.2 |
| Upland Tallgrass Prairie | 7.9-12.3 | Riparian Deciduous Forest | 136.3-136.8 |
| Gravelly Mixed-grass Prairie | 12.4-14.9 | Upland Deciduous Forest | 136.9-138.0 |
| Upland Tallgrass Prairie | 15.0-64.8 | Lowland Tallgrass Prairie | 138.1-138.5 |
| Lowland Tallgrass Prairie | 64.9-65.8 | Riparian Deciduous Forest | 138.6-139.0 |
| Riparian Deciduous Forest | 65.9-66.3 | Upland Tallgrass Prairie | 139.1-153.7 |
| Lowland Tallgrass Prairie | 66.4-67.5 | Lowland Tallgrass Prairie | 153.8-154.5 |
| Upland Tallgrass Prairie | 67.6-68.5 | Riparian Deciduous Forest | 154.6-155.3 |
| Upland Deciduous Forest | 68.6-69.3 | Upland Tallgrass Prairie | 155.4-162.7 |
| Upland Tallgrass Prairie | 69.4-91.9 | Lowland Tallgrass Prairie | 162.8-164.0 |
| Upland Deciduous Forest | 92.0-92.4 | Upland Deciduous Forest | 164.1 |
| Upland Tallgrass Prairie | 92.5-94.7 | Upland Tallgrass Prairie | 199.1 |
| Lowland Tallgrass Prairie | 94.8-95.9 | Upland Deciduous Forest | 199.2-199.6 |
| Upland Tallgrass Prairie | 96 | Upland Tallgrass Prairie | 199.7-212.3 |

## PREVIOUS ARCHEOLOGICAL SURVEYS

A Class I files search was conducted by the Nebraska SHPO (Rene Botts) from 1/6/06 to 1/11/06 at the request of SWCA. The GIS centerline shapefile was provided to the Nebraska SHPO on 1/6/06 and a buffer of one mile on either side of the centerline was used to gather the results of the files search. The files search results were provided to SWCA on 1/12/06.

A total of 2755.176 acres (1114.985 hectares) have been previously surveyed within the Class I corridor, amounting for only one percent of the Class I area (see attached maps in Appendix A). A total of 60 separate survey projects have been conducted within this corridor (Table 5 and Appendix A). One survey conducted by John Ludwickson in 1991 (Survey Number 91-0106) has no spatial data available in the Nebraska State Historic Preservation database, and as a result the acreage of this survey is unknown and not listed in the total acreage.

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# APPENDIX A

**Maps showing the previously recorded sites and previous inventories within a 300 ft corridor centered on the proposed pipeline centerline (Figures A1 through A18).**

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# Revised Class I Cultural Records Files Search, Research Design, and Survey Methodology for the Nebraska Portion of the Proposed TransCanada Keystone Pipeline

Prepared by

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## INTRODUCTION

A cultural resources survey will be conducted for the Nebraska portion of the proposed TransCanada Keystone Pipeline, and this document provides revised results of a Class I files search following the adjustment of the proposed centerline. The proposed pipeline corridor enters Nebraska in Cedar County south of Yankton, South Dakota and heads southward through Nebraska, leaving the state south-southeast of Odell, Nebraska in Gage County. The Nebraska portion of this pipeline is approximately 213.01 miles (342.95 km) long and involves 10 counties (Cedar, Wayne, Stanton, Platte, Colfax, Butler, Seward, Saline, Jefferson, and Gage [north to south]). The proposed centerline enters the state at milepost (MP) 432.03 and exits at MP 645.04.

Two Class I files searches were conducted by the Nebraska SHPO (René Botts). The first was conducted between 1/6/06 to 1/11/06 at the request of SWCA. The GIS centerline shapefile was provided to the Nebraska SHPO on 1/6/06 and a buffer of one mile on either side of the centerline was used to gather the results of the files search. The files search results were provided to SWCA on 1/12/06 and a Class I report was produced shortly thereafter (Burnett and Slessman 2006). Following this files search and Class I report, the proposed pipeline centerline was altered slightly and a revised centerline was given to SWCA by ENSR on 3/2/06. A second small files search was required to accommodate this shift, and was conducted on 3/8/06. In addition to the files searches, a General Land Office (GLO) map search was conducted by SWCA (Paul Burnett) to supplement the files search with additional information regarding cultural resources on or near the proposed centerline. The results are presented below.

## PREVIOUS ARCHEOLOGICAL SURVEYS

A total of 56 separate survey projects have been conducted within the current Class I corridor (Table 1), involving approximately one percent of the corridor area. With this small amount of previously surveyed area, the presence or absence of sites in these areas is not particularly informative with regard to predicting the locations of as yet unidentified archeological sites along the proposed corridor.

**Confidential Information removed from document**

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