

Final Environmental Assessment

# Havens to Polk Transmission Line

Polk County Rural Public Power District, Stromsburg, NE

FEMA-DR-1770-NE #0001

*April 2012*



**U.S. Department of Homeland Security**

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# **1. Purpose and Need for Proposed Project**

Polk County Rural Public Power District is an entity that supplies electrical power to consumers in an area that covers the counties of Polk and Merrick in south central Nebraska. Historically, severe winter storms have adversely affected the Polk County Rural Public Power District's service area. These storms have caused long outages for much of the population due to electrical transmission line deficiencies and electrical transmission system radial feeds to substations. A radial feed represents an electrical circuit or feeder that has no redundancy or is lacking a backup in case of an emergency. It consists of a source, which in this case is a Substation, and a segment of conductors, which are utilized to transfer energy from the source to the rural consumers. This can be compared to a road with a dead-end. A Substation converts higher voltage, in this case, 69 kilovolts (kV), to a reduced 12.47 kV distribution type voltage. The higher voltage allows energy to be transferred over longer distance before voltage drop becomes an issue. Once the voltage is lowered to the 12.47 kV it can then be transferred to smaller distribution transformers, which then reduce the voltage to a household or useable voltage of 120 to 240 volts. By this description, one can understand the importance of the higher voltage lines, which in all honesty represent the main backbone of the electrical system for all consumers. The initial event that precluded this project was the severe winter storm dating back to March of 1976.

This proposed project will effectively reduce outages system wide due to the nature of its purpose, which is to tie two segmented, radial fed Substations. Substation 4-4 Havens and 4-5 Polk are currently served via radial feeds in the western portion of the Polk County Service area. This project will tie these two radial feeds completed a loop that would benefit the entire 69 kV system of Polk County RPPD. Any outage that may affect the 115kv source near Silver Creek would have a huge adverse effect as there is currently no redundancy in the area or applicable electrical ties to neighboring districts.

This project will mitigate against the three natural hazards that the District has detailed in its Hazard Mitigation Plan. These hazards include; Severe Winter Storms; Thunderstorms/High Winds; and damage from Tornados. As detailed in the Polk County Rural PPD Hazard Mitigation Plan, Reducing radial feeds to substations and small towns decreases outage time substantially. This project will include critical infrastructure within a 5 mile radius of substation 4-5, increasing reliability and capacity of the electrical distribution circuit, which will also mitigate against storm activity. The twisted pair conductor being proposed performs well in areas subject to ice and high winds reducing outages related to high wind events. Current Polk County RPPD standards require this type of conductor for primary feeds near Substations.

## **2. Proposed Action**

The action, as described in the updated Polk County RPPD Mitigation Plan 2012, page 31.

### **Build 69 kV Sub-Transmission tie between Polk Substation and Haven Substation**

**Description:** Create a looped 69 kV system with this construction

**Hazard(s) Addressed.** Severe Thunderstorms, Tornados/ High Winds, Severe Winter Storms

**Estimated Cost:** \$175,000/mile

**Potential Funding:** Pre-Disaster Mitigation Grant Program, Hazard Mitigation Grant Program, Polk County Rural Public Power District General Funds.

**Timeline:** Ongoing

**Priority:** High – Waiting for FEMA approval

Construction will consist of 8.9 miles of 69 kV transmission line with 3 miles of under-build 12.47 kV distribution line along a direct route. Conductor used for the project will be T2 4/0 ACSR for the transmission line and 3 phase T2 1/0 ACSR for the 12.47 kV distribution under-build portion of the line. The line will utilize single pole construction except for the river crossing area.

The action will provide a 69 kV loop between several Substations, reducing the amount of importance on a single source to the same substations. This loop will bring redundancy to an area that is impacted by damage or maintenance to the existing source feed which runs in the center of the Polk County RPPD service area. Redundancy refers to the fact that with this project, the Polk County RPPD service area will not be reliant on one energy source; there will be a redundancy of electrical service for emergencies. Any storm related damage to this one line causes hours of outage times depending on the severity of the damage. An existing 34.5 kV tie to the east gives some redundancy to a few towns, but currently there is not that redundancy to the 69 kV facilities. In the past, much of the area could be back fed via the 12.47 kV distribution systems. This is no longer the case, since growth in the area has exceeded the back feed capabilities of the 12.47 kV circuits. The heavy reliance on the 69 kV line cannot be over emphasized and the need for the loop feed is crucial to critical facilities in the Polk County RPPD service area.

The project is cost effective as it has a life span of 50 years based on current data. This equates to a long term solution to a persistent issue for the electrical consumers of Polk County RPPD.

An aerial picture showing the route is illustrated in the appendix – pages 26-28 of the Archeological Survey and Assessment.

## **3. Alternatives**

There are no alternatives to consider, except in the case of the proposed route, which was chosen to utilize the least amount of transmission line and also to utilize an existing river crossing and current ROW. Nebraska Public Power District, which does the Sub-Transmission planning for the entire state, concurs.

## **4. No Action Alternative**

A No-Action to the proposed project would mean an increase in issues related to outages caused by weather events in the region. As described in Polk County's RPPD mitigation plan, several critical facilities in the area need to have a power source 24/7. The current 12.47 kV distribution lines cannot back-feed the area due to the existing and projected load.

Probability of outages due to weather related damages is high for this area. The following outages have occurred and are referenced in the FEMA project application.

Historical Data from Polk County Rural PPD on the events referred to in the BCA:

March 9<sup>th</sup> 1976 – Severe Winter Storm

This storm affected the southern portion of the District's service area. Both transmission and distribution lines were affected.

- Cost of damage from storm - \$466,010
- Consumers without electrical power for 96 hours – 1500 \*
- FEMA No. – 500

April 10<sup>th</sup> 1978 - Severe Winter Storm

Distribution line structures were affected by this winter storm.

- Cost of damage from storm – \$4,787
- Consumers without electrical power for 8 hours – 100 \*
- Work Orders 3062 to 3067

November 29<sup>th</sup> 1991 – Severe Winter Storm

- Cost of damage from storm - \$41,311
- Consumers without electrical power for 24 hours – 250 \*
- Work orders 6019 to 6025

December 19<sup>th</sup> 1999 – Severe Winter Storm

This storm consisted of sleet and ice. Some of the outages were due to distribution line slapping into one another.

- Cost of damage from storm - \$50,000 \*
- Consumers without electrical power for 15 hours – 269

December 31<sup>st</sup> 2006 – Severe Winter Storm

Both distribution and transmission lines were damaged in this storm.

- Cost of damage from storm - \$51,123
- Consumers without electrical power for an average of 72 hours – 870
- FEMA no. 1674

October 9<sup>th</sup> 2001 - Tornado

- Cost of damage from tornado - \$16,000
- Consumers without electrical power for 12 hours – 724

#### June 23<sup>rd</sup> 1998 – High Winds

Strong winds pushed down a 69 kV H type structure creating a large outage.

- Cost of damage from storm - \$15,500 \*
- Consumers without electrical power for 8 hours – 2028

#### June 25<sup>th</sup> 2000 - Thunderstorm

This storm affected transmission line feeding town of Clarks.

- Cost of damage from storm - \$10,000 \*
- Consumers without electrical power for 8 hours – 702

#### June 9<sup>th</sup> 2003 – High winds

High winds knocked down a 69 kV structure causing outages near Silver Creek.

- Cost of damage from storm - \$10,000 \*
- Consumers without electrical power for 8 hours – 2342

#### March 30<sup>th</sup> 2006 – High Winds

High winds took tops off two transmission structures causing outages at 4 different substations.

- Cost of damage from storm - \$12,500 \*
- Consumers without electrical power for 5 hours – 2266

As illustrated in the historical storm related outages in the area, it is determined that without this project the historical damages will continue and the cost and outage hours will only increase. The storm of 1976 in today's dollars would be above 1.7 million. Since much of this type of cost is associated with overtime and prioritized scheduling, the cost would be reduced substantially if an alternate source were available.

## **5. Action selection process**

The project and subsequent route was chosen with future projects in mind. The route will utilize the existing Right Of Way (R.O.W.) and connect different distribution circuits via the 12.47 kV under-build line that will run under the 69 kV facilities. The route will also conform to future plans of the District with regard to new facilities. Finally, the route is the most cost effective due to its directness between the beginning and end points. This allowed the District to utilize existing easements and right of way.

The river crossing location was chosen due to the fact that the District currently has an electrical line spanning the river at this same point. The new project will not add to the facilities but merge the existing line with the new 69 kV transmission line. In the end there will be one electrical line crossing that will contain both the 69 kV line and the 12.47 kV line.

## **6. Environmental Impact**

Coordination with the Fish and Wildlife Service has been done and the following report has been issued. No contact with the Army Corp of Engineers has been completed as of this date, as the preliminary route design does not yet constitute that type of coordination. If and when project is approved, all necessary permits and coordination with applicable agencies will be completed.

A letter from John Cochran of the Fish and Wildlife Service summarizes the project's impact on the environment with subsequent recommendations is located in the Appendix of this report.

This section discusses the existing environmental conditions in the general area as well as at the specific site depending on what is applicable.

### **Geology and Soils**

#### *Topography*

The service area of the District is divided into two physiography areas. One is the Platte Valley in the northern part. The other is the nearly level upland plain which comprises the southern two-thirds of the area. Within the Platte River Valley are the bottomland along the river and an alluvial terrace south of the bottomland. Steep upland breaks form the south border.

Elevations in the project area range from approximately 1585 feet in the vicinity of the Platte River to approximately 1724 feet above sea level at the south portion of the project area.

#### *Soils*

Soils of the vicinity are classed under the order known as Mollisols and Entisols.

Mollisols are some of the world's most productive agricultural soils that have developed under prairie grassland vegetation. Mollisols, used for food production wherever they are found in the world, have been moderately to slightly leached and generally have a high base status and slightly acid to alkaline pH. There are nineteen subgroups of the Mollisols in the service area.

Entisols are light colored soils that do not have natural genetic horizons or that have only slightly expressed beginnings of such horizons. There are three subgroups of Entisols in the service area.

#### *Land Use*

The Farmland Protection Policy Act (FPPA) (p.l. 97-98, Sec. 1539-1549; 7 U.S.C. 4201, et seq.) is intended to minimize the impact Federal programs have on unnecessary and irreversible conversion of farmland to nonagricultural uses. FPPA assures that Federal programs are administered to be compatible with various programs to protect farmland. For the purpose of FPPA, farmland definition includes prime farmland, unique farmland, and land of statewide or local importance; it is important to note that these definitions include land such as forest

land, pasture land, or other land that is not in current production. The proposed line route is along ROW for an existing distribution line, except for one mile, which does not have an assessable road. Along this mile there are no known homesteads or any other items or sites of interest. The route along this mile of line will not adversely affect prime farmland as the land is not currently used in that capacity. See figure 1 in the appendix for aerial photo of mile in question.

Although the route crosses primary farmland, the project area is not affected by the project due to an existing electrical line along 90% of the route. This existing line will be replaced with same footprint. The one mile which does not have existing line running along its route is not considered to be prime farmland.

The proposed alternative would not have an impact on geology and soils as it would not disturb areas of prime farmland as the change in route would not have existing electrical ROW.

Geology and soils will not be impacted by the No Action Alternative as no construction activities would occur.

#### Air Quality

Under the Clean Air Act, the United States Environmental Protection Agency has established National Ambient Air Quality Standards (NAAQS) for pollutants harmful to public health and the environment. Primary standards protective of human health (including the health of sensitive populations such as asthmatics, elderly, and children) and secondary standards protective of public welfare (including decreased visibility or impacts to animals, crops, vegetation, and buildings) have been established for ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), lead (Pb), particulate matter with a diameter of 10 microns or less (PM<sub>10</sub>), and particulate matters with a diameter of 2.5 microns or less (PM<sub>2.5</sub>). The proposed action will include short-term construction activities, including soil excavation for pole placements. These activities are not likely to create any issues. Once construction activities are completed, there would be no anticipated source of air emissions.

Air quality would not be impacted by the no action alternative as no construction activities would take place.

#### Water Resources

The United States Army Corps of Engineers (USACE) is responsible for permitting and enforcement functions dealing with building into or discharging dredge or fill material into Waters of the United States (WOUS). USACE regulations for building or working in navigable waters of the United States are authorized by the Rivers and Harbors Act of 1899. These regulations go together with Section 404 of the Clean Water Act (CWA), which establishes the USACE permit program for discharging dredged or fill material into WOUS.

Water related areas along the action route include the Platte River and approximately 50' of a designated wetland.

### *Surface Water Quality*

All soil disturbances along project route will be done so as not to result in erosion and runoff of water. The proposed action will include short-term construction activities, including soil excavation. The minor construction activity will incorporate best management practices to minimize water quality impacts during the construction/erection of the power line; such as minimization of area of disturbance and proper staging of equipment. Once construction activities are completed, there would be no anticipated water quality impacts.

Water quality would not be impacted by the No Action Alternative as no construction activities would take place and no impacts to water quality would occur.

### *Wetlands*

Lands subject to regulation as wetlands under Section 404 of the CWA (jurisdictional wetlands) are defined as: "Those areas that are inundated or saturated by surface of groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Typically, lands that exhibit characteristics of hydrology, support predominantly hydrophytic vegetation, and have a substrate that is predominantly undrained hydric soil are classified as jurisdictional wetlands. The USACE is responsible for administration of Section 404 CWA and the issuance of permits, including the disturbance of jurisdictional wetlands. Under Executive Order 11990, Protection of Wetlands, Federal agencies are required to take action to minimize the destruction or modification of wetlands.

Using maps created by the National Wetlands Inventory website <http://107.20.228.18/Wetlands/WetlandsMapper.html#>, a comprehensive analysis was completed. Figure 2 of the Appendix illustrates an area of approximately 50' of wetlands that is along the action route. Construction of overhead transmission line regularly uses 275' span lengths. This will allow for planned construction to span the wetlands during the engineering phase of the project. Wetlands in the general area are capable of being spanned and so the project will not have an adverse effect on the area's wetlands. The project will not require any interaction with the water ways along the proposed route, such as disposal of dredged material, excavating, or adding fill material.

Wetlands will not be impacted by the No Action Alternative as no construction activities would take place.

## *Floodplains*

Floodplains provide numerous beneficial environmental functions including flood abatement, stream flow mediation, filtering, and water quality enhancement. Executive Order 11988, Floodplain Management, requires federal agencies to take action to minimize occupancy and modification of the floodplain. Specifically, EO 11988 prohibits federal agencies from funding construction in the 100-year floodplain (500-year floodplain for critical facilities) unless there are no practicable alternatives. Flood Insurance Rate Maps (FIRMs) are used to identify the regulatory 100-year Floodplain for the National Flood Insurance Program.

FIRMs were examined during the preparation of this EA. According to FIRM ID #31143C0200C in Polk County, Nebraska, the project route does cross the floodplain as indicated in Figure 3 of the appendix. Construction will be completed to not have an impact on the floodplain area. No staging of equipment will take place within the floodplain, and electrical lines will span floodplain areas. The proposed action will not have an impact on floodplains.

Under the No Action alternative, construction activities would not take place and there would be no potential impacts to floodplains.

## Biological Resources

### *Threatened and Endangered Species and Migratory Birds*

Under the Endangered Species Act of 1973, Federal agencies must review proposed actions to ensure they are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify its critical habitat.

The Migratory Bird Treaty Act of 1918 (MBTA) implemented the 1916 convention between the United States and Great Britain for the protection of birds migrating between the United States and Canada. Similar conventions between the United States and Mexico (1936), Japan (1972), and the Union of Soviet Socialist Republic (1976) further expanded the scope of international protection of migratory birds and have been incorporated into MBTA as amendments. These treaties have established Federal responsibilities for the protection of nearly all species of birds, their eggs, and their nests.

Under MBTA, it is illegal for people to “take” migratory birds, eggs, feathers, or nests. Take is defined as any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof. In total, 836 birds are protected by the MBTA.

The United States Department of interior Fish and Wildlife Service has determined that the following federally listed and proposed threatened and endangered species may occur in the project area.

Endangered: Whooping Crane, Piping Plover and Interior Least Tern

Threatened: River Otter, Finescale Dace, and Small White Lady’s Slipper.

A formal request was sent to FWS to determine if the proposed project would impact T&E species (Appendix). FWS identified one area of concern, migratory

birds, and have recommended bird flight diverters be installed on a portion of the electrical transmission line near the Platte River. Also with regard to migratory birds, FWS request to avoid removal or impacts to vegetation during primary nesting season will also be adhered to.

Other species of concern, as detailed in the FWS response letter, is the caddisfly. The caddisfly, which is being considered to be put on the threatened or endangered list, is known to occur near the project area. To avoid this species, the project will follow the guidelines outlined in the FWS letter by not placing poles in wetlands areas and placing the transmission line on the east side of the Platte River bridge along the project route.

In addition to the above requirements, all recommended best practices for proposed construction activities associated with streams and rivers as depicted in the enclosure of the FWS response, will be followed.

The No Action alternative would have no impact on Biological resources.

## Cultural and Historic Resources

### *Historical Sites*

Under Section 106 of the National Historic Preservation Act (NHPA), Federal agencies are required to consider the potential effects of their actions on historical properties and cultural resources and provide the Advisory Council on Historic Preservation (ACHP) with a reasonable opportunity to comment. The regulations require identifying significant cultural resources that may be impacted. Cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons.

Cultural resources determined to be potentially significant under NHPA are subject to protection from adverse impacts resulting from an undertaking. To be considered significant, a cultural resource must meet one or more of the criteria established by the National Park Service that would make that resource eligible for inclusion in the National Register of Historic Places (NRHP). The term “eligible for inclusion in the NRHP” includes all properties that meet the NRHP listing criteria, which are specified in the Department of Interior regulations Title 36 CFR 60.4 and NRHP Bulletin 15. Therefore, sites not yet evaluated may be considered potentially eligible for inclusion in the NRHP and, as such, are afforded the same regulatory consideration as nominated properties. Whether prehistoric, historic, or traditional, significant cultural resources are referred to as “historic properties.”

The following historical sites in the Polk County Rural Public Power District service area are listed in the National Register of Historic Places.

#### Polk County:

Clarks Site	Osceola vicinity
Charles H. Morrill Homestead	Stromsburg vicinity
Strickland Archeological Site	Polk county
Polk County Courthouse	Courthouse Square, Osceola

Governor John Hopwood Mickey House      S end of State St., Osceola

Victor E. Wilson House                              518 Main, Stromsburg

Based on the above locations along with the Archeological study (Appendix), this project will not adversely impact any historically significant sites.

In the unexpected event that prehistoric artifacts or features are encountered, excavation at that location will be halted and the Nebraska SHPO and FEMA will be contacted.

Under the No Action alternative, construction activities would not take place and there would be no potential impacts to cultural and historic resources.

### Cumulative Impacts

Cumulative impacts represent the impact on either the natural or human environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or nonfederal) or persons undertake such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

There are no known ongoing or planned projects in the vicinity of the proposed project route and no significant cumulative effects are anticipated under the Proposed Action alternative.

Under the No Action alternative, construction activities would not take place and there would be no potential environmental impacts, cumulative or otherwise.

## **7. Permit Requirements and Environmental compliance**

All necessary permits will be completed once the project is approved. As of this writing there are no permits required. During the engineering design appropriate applications will be filed. These may include Public Service Applications, which are used to notify all over area utilities so that the project will be planned accordingly and not adversely affect other facilities.

Environmental compliance as stipulated at the Federal and State levels will be followed. Again, the design and route stipulated in the application currently does not require any additional applications or permits. As the project progresses, this may change and appropriate actions will be taken to stay within compliance of all applicable agencies.

The river span will be approximately 700', eliminating the need for any poles being placed in the river itself. This eliminates several of the water related requirements. The structures will be constructed and installed to reduce or possible eliminate any damage that may be related to flooding. This river crossing will follow, where applicable, the existing electrical facilities crossing. These facilities have been in service for over 20 years without incident. No adverse effects to the flow of the river have been determined and all avenues will be used to avoid that possibility. If and when during the design process, this evaluation changes, the applicable authorities will be contacted. Also, as recommend by FWS bird flight diverters will be installed on a portion of the electrical transmission line near the Platte River crossing.

## **8. Affected Population**

The population affected by this project is limited to electrical consumers of Polk County RPPD. They include residential, irrigation and commercial accounts. Small towns in the vicinity will also benefit. A total population of 1945 people will be affected. The affect will be improved reliability due to the increase contingency options that this project brings to the area. No adverse effects have been determined. During the design process, all land owners along the route will be approached about what is expected and the role they will play in the process. Since almost the entire line lies along existing right of ways this process should be just a formality done in conjunction with the design and construction.

The population will see outage times caused by damage to transmission lines reduced or in most cases eliminated. Redundancy of electrical sources will be utilized during event related outages as well as during routine maintenance of existing facilities. With the project in place additional facilities may be created which would also enhance the electrical services for this region's population.

Environmental Justice; by upgrading electric lines to better withstand natural disasters, the project will benefit everyone within the project area. Therefore, the proposed action, as well as the no action alternative will not have a disproportionate adverse effect on any population, including low-income and minority populations.

## **9. Appendix**

**Figure 1**

**Figure 2**

**Figure 3**

**Fish and Wildlife letter**

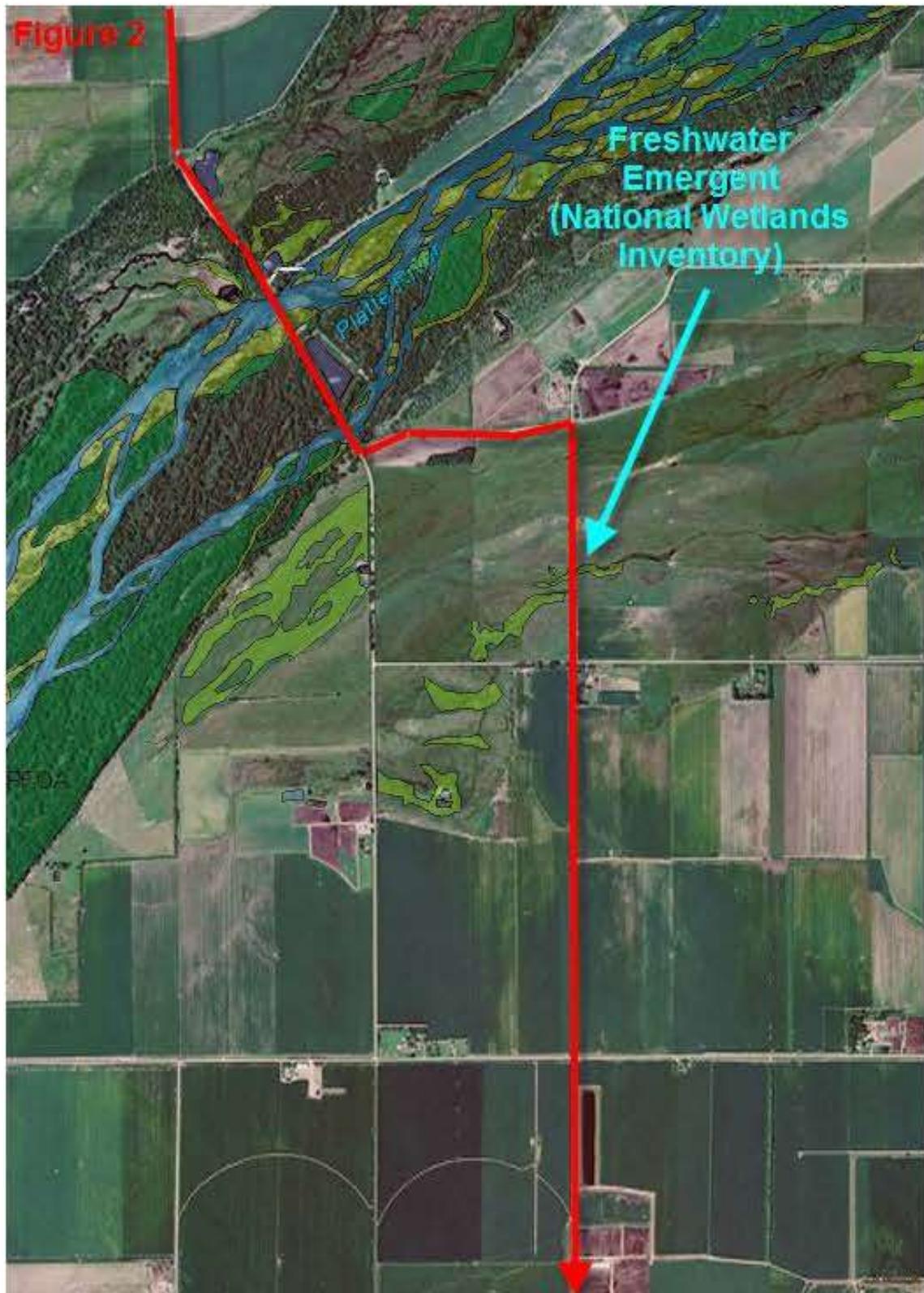
**Archeological Survey and Assessment**

**Nebraska State Historical Response**

**Figure 1**

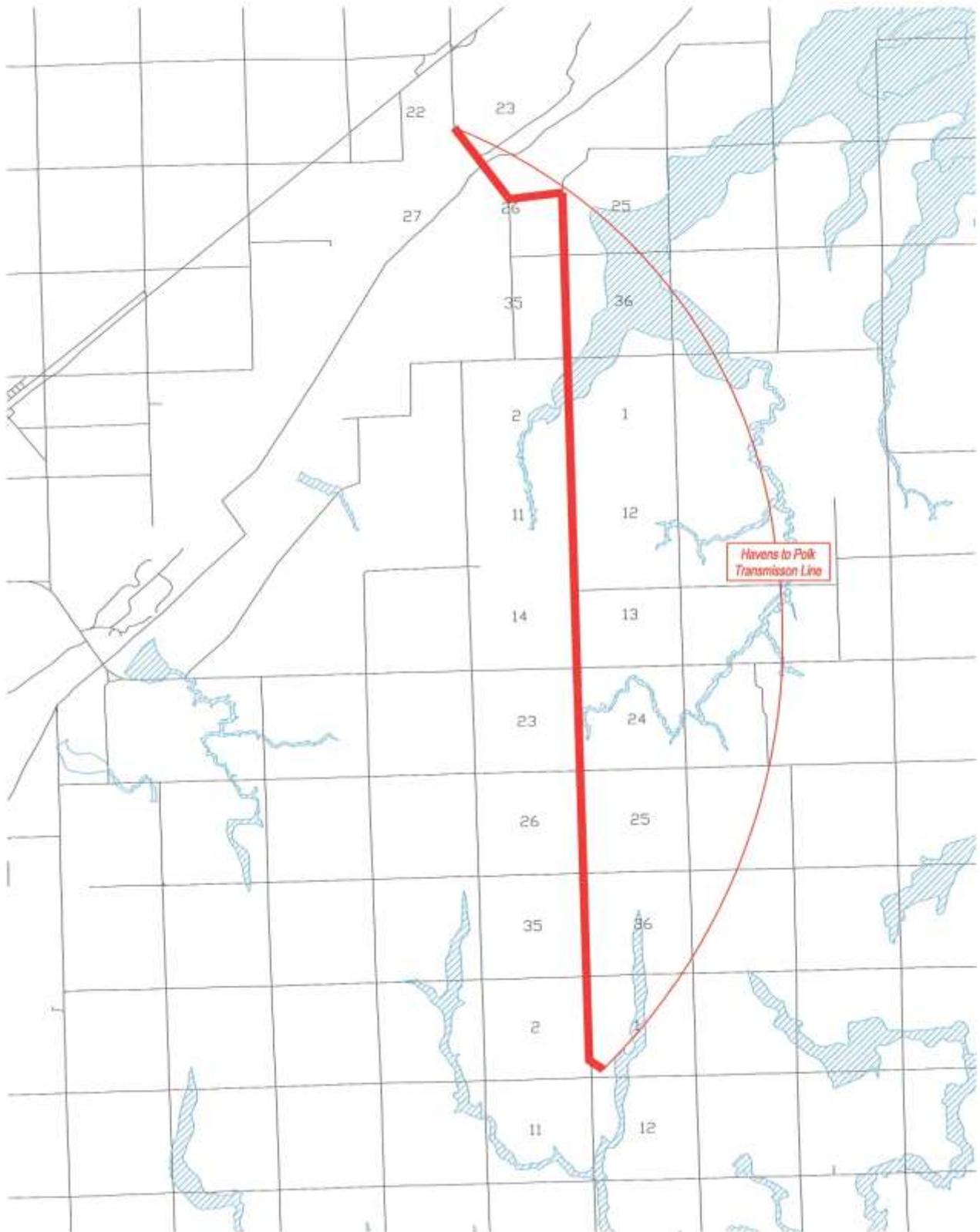


**Figure 2**



**Figure 3**

100 year Flood Plain in Relationship to Project



## Fish and Wildlife Service Response



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
Nebraska Field Office  
203 West Second Street  
Grand Island, Nebraska 68801

March 10, 2011

**FWS-NE: 2011-261**

Sheila Hascall  
State Hazard Mitigation Officer  
1300 Military Road  
Lincoln, NE 68508-1090

**RE: Havens to Polk 69 kV transmission line and 12.47 kV under-build distribution line, Polk County, Nebraska**

Dear Ms. Hascall:

Please make reference to your E-mail dated February 9, 2011 that was sent to Mr. Robert Harms of the U.S. Fish and Wildlife Service (Service) requesting a review of the proposed Havens to Polk 69 kV transmission line project. This letter is in response to your inquiry and provides a review of this project's potential impacts to federal trust species including threatened and endangered species and migratory birds near the project area in Polk County, NE, as requested. The Service has responsibility for conservation and management of fish and wildlife resources for the benefit of the American public under the following authorities: 1) Endangered Species Act of 1973 (ESA), 2) Fish and Wildlife Coordination Act (FWCA), 3) Bald and Golden Eagle Protection Act (Eagle Act), and 4) Migratory Bird Treaty Act (MBTA). The National Environmental Policy Act requires compliance with all of these statutes and regulations. The project proponent and lead federal agency is responsible for compliance with these federal laws.

The Service has special concerns for endangered and threatened species, migratory birds, and other fish and wildlife and their habitats. Habitats frequently used by fish and wildlife species are wetlands, streams, riparian (streamside) woodlands, and grasslands. Special attention is given to proposed developments that include modification of wetlands, stream alteration, loss of riparian habitat, or contamination of habitats. When this occurs, the Service recommends ways to avoid, minimize, or compensate for adverse affects to fish and wildlife and their habitats.

### **ENDANGERED SPECIES ACT (ESA)**

Pursuant to section 7(a)(2) of the Endangered Species Act, every federal agency, shall in consultation with the Service, insure that any action they authorize, fund, or carry out is not

likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. If a proposed project may affect federally listed species or designated critical habitat, section 7 consultation is required.

The proposed project would cross the Platte River and its side channels. Federally threatened and endangered species that may be impacted by this project include the: Interior least tern (*Sternula antillarum athalassos*) and the piping plover (*Charadrius melodus*).

#### Interior Least Tern and Piping Plover

Interior least terns and piping plovers nest on unvegetated or sparsely vegetated sandbars in river channels and can also utilize sandpits. The nesting season for the Interior least tern and piping plover is from April 15 through August 15. Channel constrictions and obstructions that disrupt natural flows in the river and influence sandbar complexes in the river limit potential habitat for these birds. Human activity in the vicinity of feeding and nesting habitats can disturb least terns and piping plovers. Additionally, terns and plovers can collide with power lines crossing river segments where they nest and/or feed.

There are records of Interior least terns and piping plovers upstream and downstream of where the power line will cross the Platte River. Additionally, there is potential for these birds to nest and feed within close proximity of where the transmission line will cross the Platte River. In a call on March 7, 2011, between Mr. George Lyons, General Manager of Polk County Rural Public Power District and Service biologist Ms. Lindsay Vivian, Mr. Lyons agreed to place bird flight diverters on the sections of transmission line crossing the Platte River. This recommendation was made so as to avoid impacts to the Interior least tern and piping plover. To implement this best management practice, both the existing and new transmission line should be marked with yellow, spiral bird flight diverters on the sections of line crossing the entire width of the Platte River. Running north to south, this would be from 41,243708, -97.733333 to 41.254489, -97.752044. Diverters should be placed at intervals not to exceed 30 feet.

**Based on the information you have provided, including agreement by Mr. Lyons to install bird flight diverters; and due to the project type, size, and location, we have determined this project may affect but not likely adversely affect federally listed species or their critical habitats.** However, should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be initiated to assess any potential impacts.

All federally listed species under the ESA are also state listed under the Nebraska Nongame and Endangered Species Conservation Act. However, there are also state listed species that are not federally listed. To determine if the proposed project may affect state-listed species, the Service recommends referring to the letter sent to you on September 10, 2010 by Michelle Koch, Nebraska Game and Parks Commission, 2200 N. 33<sup>rd</sup> Street, Lincoln, NE 68503-0370.

## **OTHER SPECIES OF CONCERN**

Aside from federally listed species, other species of concern are known to occur near the project area. The Platte River caddisfly (*Isonychia plattensis*) is currently a Tier 1 At-risk species as per the Nebraska Natural Legacy Project. The Service is also in the process of considering whether to list the Platte River caddisfly as a federally threatened or endangered species. Currently, a 12-month finding by the Service is underway to determine if listing the Platte River caddisfly is warranted. Surveys conducted since the late 1990s show that populations of the Platte River caddisfly are declining.

The Platte River caddisfly inhabits intermittent wetland and mesic grassland habitat complexes. The insect feeds on wetland vegetation, thereby facilitating nutrient cycling and ensuring healthy and productive wetlands. The species' life cycle is uniquely adapted to the hydrologic regime of the Platte River and its associated groundwater-fed wetland areas. When wetland habitat disappears during late summer, the species moves to adjacent grassland habitat and becomes dormant in a larval case composed of sand grains.

The potential loss of Platte River caddisfly populations between now and completion of the 12-month finding due to construction activities in caddisfly habitat could facilitate listing the species as federally threatened or endangered. An important Platte River caddisfly population has been identified near the project area, on the west side of the southernmost bridge segment. We recommend that the placement of poles be out of any wetland habitats along the river crossing and side channel area and that construction equipment not enter any wet, low lying areas. We are also in support of the current plan that includes construction of the transmission line on the east side of the bridge segment crossing the Platte River. These recommendations were also discussed with Mr. Lyons on March 3, 2011 and March 10, 2011, respectively, and he agreed to implement them.

## **REVIEW, COMMENTS, AND RECOMMENDATIONS ON THE PROPOSED PROJECT ACTION UNDER OTHER FISH AND WILDLIFE STATUTES**

### **Fish and Wildlife Coordination Act (FWCA)**

#### **1. Water Resources**

The FWCA requires consultation with the Service and State fish and wildlife agency for the purpose of giving equal consideration to fish and wildlife resources in the planning, implementation, and operation of federal and federally funded, permitted, or licensed water resource development projects. The FWCA requires that federal agencies take into consideration the effect that water related projects may have on fish and wildlife resources, to take action to avoid impact to these resources, and to provide for the enhancement of these resources.

#### **2. Wetlands, Streams, and Riparian Habitats**

If wetlands or streams will be impacted by the proposed project, a Department of the Army permit from the U.S. Corps of Engineers may be needed. The Service will provide FWCA

comments pursuant to a permit application. The Service recommends that impacts to wetlands, streams, and riparian areas be avoided or minimized, in accordance with the Section 404(B)(1) Guidelines of the Clean Water Act. For projects that do not require access or proximity to, or location within aquatic environments (i.e., non-water dependant project) to fulfill its basic project purpose, it is assumed that practicable alternatives exist that would cause less damage to aquatic resources than projects that are located in aquatic ecosystems. In addition to determining the least environmentally damaging practicable alternative, 40 CFR Part 230.10(a) of the Guidelines also states, no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."

If after an alternatives analysis has been completed in accordance with the Guidelines, and unavoidable impacts are to occur to aquatic habitats, the Service recommends that compensation (i.e., restoration of a degraded wetland or creation) occur.

### 3. Animal Passage and Aquatic Biota

Culverts should be constructed at elevations so as to not impede animal/fish movement (i.e. either new culvert installation or culverts used in a temporary crossing). The Service further recommends that the project proponent not alter or install culverts in any way that would result in reductions in current channel width. We have also enclosed recommended best management practices to minimize potential impacts to native fish and other aquatic resources, including spawning timeframes for Nebraska fish species.

To determine if the proposed project may affect fish and wildlife resources of the State of Nebraska under the FWCA, the Service recommends that the project proponent contact Carey Grell, Nebraska Game and Parks Commission, 2200 N. 33<sup>rd</sup> Street, Lincoln, NE 68503-0370.

### **Bald and Golden Eagle Protection Act (The Eagle Act)**

The Bald and Golden Eagle Protection Act provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*). The golden eagle is found in arid, open country with grassland for foraging in western Nebraska and usually near buttes or canyons which serve as nesting sites. Golden eagles are often a permanent resident in the Pine Ridge area of Nebraska. Bald eagles utilize mature, forested riparian areas near rivers, streams, lakes, and wetlands and occur along all the major river systems in Nebraska. The bald eagle southward migration begins as early as October and the wintering period extends from December-March. Additionally, many eagles nest in Nebraska from mid-February through mid-July. Disturbances within 0.5-mile of an active nest or within line-of-sight of the nest could cause adult eagles to discontinue nest building or to abandon eggs. Both bald and golden eagles frequent river systems in Nebraska during the winter where open water and forested corridors provide feeding, perching, and roosting habitats, respectively. The frequency and duration of eagle use of these habitats in the winter depends upon ice and weather conditions. Human disturbances and loss of wintering habitat can cause undue stress leading to cessation of feeding and failure to meet winter thermoregulatory requirements. These affects can reduce the carrying capacity of preferred wintering habitat and

reproductive success for the species. To comply with the Eagle Act, it is recommended that the project proponent determine whether the proposed project would impact bald or golden eagles. If it is determined that either species could be affected by the proposed project, the Service recommends that the project proponent notify this office as well as the Nebraska Game and Parks Commission (Commission) for recommendations to avoid adverse impacts to bald and golden eagles.

#### **Migratory Bird Treaty Act (MBTA)**

Under MBTA, construction activities in grassland, roadsides, wetland, riparian (stream), shrubland and woodland habitats, and those that occur on bridges or culverts (e.g., which may affect swallow nests on bridge girders) that would otherwise result in the taking of migratory birds, eggs, young, and/or active nests should be **avoided**. Although the provisions of MBTA are applicable year-round, most migratory bird nesting activity in Nebraska occurs during the period of April 1 to July 15. However, some migratory birds are known to nest outside of the aforementioned primary nesting season period. For example, raptors can be expected to nest in woodland habitats during February 1 through July 15, whereas sedge wrens, which occur in some wetland habitats, normally nest from July 15 to September 10.

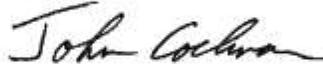
The Service recommends that the project proponent avoid removal or impacts to vegetation during primary nesting season of breeding birds. In the event that construction work cannot be avoided during peak breeding season, the Service recommends that the project manager (or construction contractor) arrange to have a qualified biologist conduct an avian pre-construction risk assessment of the affected habitats (grassed drainages, streamside vegetation) to determine the absence or presence of breeding birds and their nests. Surveys must be conducted during the nesting season. Breeding bird and nesting surveys should use *appropriate* and *defensible* sampling designs and survey methods to assist the proponent in avoiding the unnecessary take of migratory birds. The Service further recommends that field surveys for nesting birds, along with information regarding the qualifications of the biologist(s) performing the surveys, be thoroughly documented and that such documentation be maintained on file by the project proponent (and/or construction contractor) until such time as construction on the proposed project has been completed.

The Service requests that the following be provided to this office prior to the initiation of the proposed project if the above conditions occur.

- a) A copy of any survey(s) for migratory birds done in conjunction with this proposed project, if any. The survey should provide detail in regard to survey methods, date and time of survey, species observed/heard, and location of species observed relative to the proposed project site.
- b) Written description of specific work activity that will take place in all proposed project areas.
- c) Written description of any avoidance measures that can be implemented at the proposed project site to avoid the take of migratory birds.

The Service appreciates the opportunity to review and comment on the subject project and the willingness of Mr. Lyons to assist us in the protection of federal trust fish and wildlife species. Should you have questions regarding these comments, please contact Ms. Vivian within our office at [lindsay\\_vivian@fws.gov](mailto:lindsay_vivian@fws.gov) (308) 382-6468, extension 38.

Sincerely,



John Cochnar  
Acting Nebraska Field Supervisor

Enclosure

cc: NGPC; Lincoln, NE (Attn: Michelle Koch)  
NGPC; Lincoln, NE (Attn: Carey Grell)  
Polk County Rural Public Power District (Attn: George Lyons)  
RVW, Inc. (Attn: Jim Herchenbach)

## ENCLOSURE

### **Recommended Best Management Practices for Proposed Construction Activities Associated with Streams/Rivers**

- Avoid earth moving activities or fill/bank armoring during native fish spawning periods from May 15 – July 31, construct stream crossings or other associated temporary embankments during low flow periods (usually August – October).
- Minimize work area at stream locations. The majority of the work (including heavy equipment and storage sites) should occur above the high bank line. Avoid driving equipment through the streambed.
- Implement comprehensive and effective erosion and sediment controls. These methods should be implemented and maintained for the duration of the project and considered at all stages of the project planning and design. Close attention is warranted for the placement and maintenance of temporary erosion control measures at the construction site to minimize sediment loading. These erosion/sediment control techniques should keep sediments from entering the stream and remain in place until work areas become re-vegetated and stable. Such erosion control measures may include properly placed sediment/silt screens or curtains and hay bales. Proper techniques are important to the placement of these types of structures and include trenching, staking and backfilling as well as using the appropriate number of bales. These techniques are best used in combination with each other rather than separately.
- Erosion and sediment controls should be monitored daily during construction to ensure effectiveness, particularly after storm events, and only the most effective techniques should be utilized. Clean, repair and replace structures as necessary.
- Exposed stream banks must be stabilized immediately after construction activity. Eroded surfaces should not be left exposed for greater than one day. If rain is predicted, no construction should commence unless eroded surfaces are immediately treated with geotextile fabric, mulch, seeding or some techniques that would stabilize the bank or exposed areas from eroding.
- Erosion repair and stream bank restoration should use appropriate bioengineering solutions.
- Develop and implement a hazardous materials safety protocol. This would include that all temporary storage facilities for petroleum products, other fuels and chemicals must be located and protected to prevent accidental spills from entering streams within the project area.

FISRWG. 1998. Stream Corridor Restoration: Principles, Processes, and Practices. By the Federal Interagency Stream Restoration Working Group (FISRWG) (15 Federal agencies of the U. S. Government). GPO item No. 0120-A; SuDocs No. A 57.6/2:EN 3/PT.653. ISBN-0-934213-59-3.

## **Archeological Survey and Assessment**

**ARCHEOLOGICAL SURVEY AND ASSESSMENT:  
POLK COUNTY RURAL PUBLIC POWER DISTRICT  
POWER TRANSMISSION UPGRADE –  
POLK AND MERRICK COUNTIES, NEBRASKA**

**November, 2011**

**An Archeological Resources Report  
by:**

**Stanley M. Parks  
Cultural Resources Consulting  
Hickman Nebraska**

**for:  
RVW Engineering Inc.  
Columbus, Nebraska**

**and:  
Polk County Rural Public Power District  
Stromsburg, NE**

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**ARCHEOLOGICAL SURVEY AND ASSESSMENT:  
POLK COUNTY RURAL PUBLIC POWER DISTRICT POWER TRANSMISSION  
UPGRADE – POLK AND MERRICK COUNTIES, NEBRASKA**

The Polk County Rural Public Power District (PCRPPD) is planning an upgrade of sections of electric transmission lines to better withstand potential natural disasters. The current “Havens to Polk Transmission Line” project will receive partial funding from the Federal Emergency Management Agency (FEMA) (FEMA project #1770-0001).

FEMA requires an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA). Additionally, a portion of the project corridor crosses the Platte River, requiring consultation with the U.S. Army Corps of Engineers and compliance with Section 404 Clean Water Act Permit. The EA must address, among other impacts, Section 106 of the National Historic Preservation Act (NHPA) to determine if there are potential effects to significant cultural resources located within the APE.

The firm of RVW Engineering of Columbus, Nebraska (RVW) has been contracted in part, to complete an environmental impact assessment of portions of the corridor and complete an EA in accordance with FEMA regulations. Compliance with Historic Preservation Law (HPL) was initiated by contact with the Nebraska State Historic Preservation Office (NeSHPO). The NeSHPO reviewed the project and determined that a portion of the corridor is within a setting that has a potential to contain prehistoric and historic archaeological sites.

The NeSHPO therefore requested an intensive Phase I Archaeological Survey of that portion of the corridor extending across the floodplain and terraces of the Platte River, as well as the Platte River crossing to determine if sites are present in the area of potential effect (APE) (Figure 1). If sites are identified, the EA should provide recommendations to avoid or minimize impact to sites, or to recommend evaluatory testing of identified sites within the APE.

RVW subsequently contacted Cultural Resources Consulting of Hickman, Nebraska (CRM) with a Request for Proposal to conduct an archeological investigation of the 9.8 miles of electric transmission line corridor as requested by the NeSHPO. On August 3, 2011, CRM submitted a Project Estimate and Scope of Work to RVW. On November 7, 2011, RVW contacted CRC to accept the proposal and give the Notice to Proceed with the

investigations. This brief cultural resource compliance report is the result of that investigation.

### **Archeological Project Location**

The section of electric transmission line investigated in this 2011 archeological project extends northward from PCRPPD Substation 4-5, located in the Southeast 1/4 of the Southwest 1/4 of the Southwest 1/4 of the Southwest 1/4 of Section 1, Township 13 North, Range 4 West (Figure 2). The substation is at the northeastern corner of the intersection of Polk County Road 126, and County Road F (Latitude 41.120114 Longitude -97.732019).

The corridor follows along Polk County Road F roughly 8-1/5-miles north to the County Road 134 Court. Approximately 1-mile of the Road F ROW near the center of the archeological survey Road F APE is not developed (Figures 3). At Road 134 Court, the corridor turns west and extends approximately 1/2-mile to north-south oriented Havens County Road where the corridor turns north and crosses the Platte River into Merrick County, continuing north roughly 1-mile toward the community of Havens. The archeological survey investigation corridor extends to a point roughly 1/2-mile north of the Platte River between the east-west half-section of Sections 22 and 23, Township 15 North Range 4 West (Latitude 41.258358 Longitude -97.752422) (Figure 4).

### **Transmission Line Upgrade Concept**

Electric transmission lines suspended on wooden poles currently extend along the route scheduled for upgrade. The PCRPPD Power Transmission Upgrade project will involve installation of new, single pole wood structures to support the up-graded electric lines. The newly installed poles will be located approximately 1-foot inside private property using easements from the land owners, placing the poles roughly 34-feet from the edge of the existing roadways. The average pole span will be 250-feet except at the Platte River crossing which will require a greater span. Existing lines along the route will be removed from the existing poles and placed on the new transmission line poles as “underbuild construction.”

## **PHYSICAL SETTING OF POLK AND MERRICK COUNTIES**

Much of Polk County is within a broad region of Loess Plains Topographic Region. The landscape consists of an extensive, nearly-level to gently-undulating, generally

southeasterly sloping plain spreading south from the Platte River. During the last 500,000-years of the Pleistocene Epoch, glacial outwash streams carried deposits of clay, sand, gravel, and small cobbles southwest from the receding glaciers forming an extensive, mostly level alluvial plain across much of region that became eastern and central Nebraska. In the last 150,000-years of the Pleistocene Epoch, windblown silt was carried from the barren, formerly glaciated surfaces, mantling the alluvial plain with loess deposits, leaving a very broad, flat to gently-undulating landscape. On the oldest surfaces, at least three distinct stratigraphically superimposed loess formations are present. The oldest of these, the Loveland Loess Formation, deposited around 140,000-years ago, is typically yellowish-brown silt that reddens toward the top of the unit due to pedogenesis. Overlying the Loveland Loess is the Gilman Canyon Formation. Gilman Canyon is a dark brown, noncalcareous, silt-loam that is typically modified by pedogenesis. Regionally, radiocarbon ages of organics contained in this formation range from around 35,000-years at its base to 20,000-years at the top. The most recent major loess formation in this region is the yellowish-tan to buff-brown colored, typically calcareous silts of Peorian Loess that ranges from about 23,000-years old at its base to 13,000-years old near the top. The Peorian Loess Formation mantels most of the uplands throughout the region, and provided the parental materials for most modern upland surface soils. In most areas, Peorian Loess profiles exhibit primary eolian bedding, indicating rapid deposition without sufficient time for pedogenesis to blur the horizonation.

During the Holocene Epoch (~10,000-years ago to present), precipitation runoff created shallow, entrenchments of tributary drainages that to larger, more deeply entrenched streams. The northern portion of the county drains northward to the Platte River that creates the northern border of Polk County.

The northern portion of Polk County and southern edge of Merrick County are within the Platte River Valley Topographic Region. Throughout the Holocene Epoch, the Platte River channel has tended to migrate laterally across the landscape, alternating between periods of downcutting and deposition, creating the River Valley Topographic Region. During downcutting stages, river meandering removed the thick loess deposits to widen and deepen the valley, exposing the sands and gravels of the glacial till formations on the valley floor and creating a series of stepped, very-gently sloping to nearly-flat stream terraces of varying size. Each terrace level represents a prehistoric floodplain surface. In many

locations, the change in elevation between the floodplain and the lowest stream terraces is so gradually as to be almost imperceptible.

In periods of deposition, layers of stratified Holocene alluvium washed from the valley walls and the uplands overlooking the valley, filling abandoned meanders and back-swamps, aggrading on the floodplains, and building up point bars along the Platte Valley channel, creating a landscape of nearly flat to slightly-undulating bar and swale topography. In this immediate region, the Platte Valley is roughly 12- to 15-miles wide.

Throughout prehistoric times, the valley floor was well to moderately well-drained by small, incised, meandering drains, however in places, abandoned channels were poorly to very-poorly-drained with a great number of seasonally wet-meadows, marshes and open-water oxbow lakes. Once cut off from the river flow, oxbows silted in, becoming marshes and eventually wet-meadows. In some locations, remnants of these old streambed meanders remain visible on the modern surface and aerial photographs.

Subsequent to settlement, many of the meandering tributary drains have been channelized, reduce flood overflow, limit meandering, and produce larger contiguous areas of cultivable fields. Additionally, many of the wetland features have drained and filled to create farm fields.

Along the southern edge of the Platte River Valley, fluvial action has eroded the relatively level plain, creating a region of Bluffs and Escarpments between the Loess Plain and the Platte River floor. The landscape is one of relatively long, narrow, interfluves incised by moderate to steeply eroded slopes and abrupt precipitation drains that are typically “V”-shaped.

### **Modern Regional Surface Soils**

The majority of modern soils in this region developed under a dense grassland cover. Loess is the predominant inorganic parental materials for soil production on uplands, and high terraces. Loess intermixed with glacial till alluvium is the parental materials on many side slopes and lower terraces. Developed soils in these strata are typically mildly- to medium-acidic mollisols that were deep, level to gently-sloping, moderately-well- to well-drained and highly silty. The soils are highly fertile and in areas that have not been seriously eroded. The mollisols are well developed, with dark-brown to black, organic rich

humus A-horizons that are clearly defined from the sterile subsoils. Throughout prehistory they have maintained a rich and fertile humus complex due to the extremely dense root zones of the native vegetation. Surface erosion is the greatest threat to these easily eroded soils. In many areas the majority of the A-horizon was washed from the uplands and slopes and onto the bottomlands subsequent to settlement and the breaking of the native vegetation by cultivation.

The broad Platte River Valley floor is blanketed with many feet of Holocene alluvium washed from the uplands and slopes, as well as from upstream. Soils of the Platte Valley generally include large amounts of sand to gravelly-sand. Developed soils in the Platte Valley alluvium tend to be neutral to mildly-alkaline entisols where mature soil zones have not yet developed due to periodic flooding and continuing erosion, migration and redeposition of surface materials. In many most of the Platte Valley floors, Pleistocene Epoch gravels and sands are evident at the surface, and are rarely more than a few feet below the modern valley surface.

In more recent floodplain deposits along the river channels, larger tributaries, and eroded upland drains where mature soil zones have not yet developed due to flooding, erosion, and migration and redeposition of surface materials, the soils tend to be neutral to mildly-alkaline fluvent-entisols. These are immature soils developing in relatively unstable materials with poor horizonation that merges with sterile substrata, having no clear lines of distinction between the strata. These deposits are often very fertile and organically rich, since the alluvium in which they have formed is, most frequently, eroded topsoils washed from upslope and/or upstream.

### **Native Flora**

In its native state, the physiographic zone, soils, and climate of this region of central Nebraska combined to support three major vegetation zones.

#### **Tallgrass Prairie**

The vast majority of the region was covered with the luxuriant growth of a native Tallgrass Vegetation Zone. Dominant grass species included Big Bluestem, Little-Bluestem, Grama grass, Buffalo grass, wheatgrass, Indiangrass, dropseed, prairie cordgrass, switch grass, June grass, and needle grasses. Shorter grass species were dominant on the

drier, well-drained surfaces, while taller grasses dominated the slightly moister surfaces and depressions. Some grasses grew to nine-feet tall; especially in moist sites and in wet years the vegetation was typically so dense as to obscure the ground.

The grasses were generously interspersed with a rich variety of broadleaf plants and forbs, many having showy flowers. These plants were conspicuous, with their species greatly outnumbering the grass species, but the grasses produced most of the biomass. The more common of these broadleaves and forbs include goldenrods, asters, thistles, smartweeds, beggar-weeds, milkweeds, vetches, phloxes, sunflowers, coneflowers, jimsonweed, Indian paintbrushes, rose mallows, chickweeds, buttercups, clovers, ground-plum, and. As these plants grew, bloomed, and came into fruit, they gave an ever-changing character to the prairie with the passing of the seasons. Low woody shrubs such as leadplant, sandcherry, Jersey tea, eastern wahoo, sumac, elderberry, and meadow rose also dotted the native prairie.

### **Floodplain Forest**

Narrow and discontinuous bands of Floodplain Forest Vegetation Zone extended along portions of the Platte River, extending some distance up major tributaries. These forests were made up of a rich mixture of species, with dominant species being American elm, eastern cottonwood, oak, green ash, box-elder, red cedar, and hackberry. The floors of these forests were thicketed with small tree and shrub species including honey-locust, dogwoods, privet, red-osier, black-current, wild plum, chokecherry, gooseberry, raspberry, and grape. Common vining plants included poison ivy, virgin's bower, western clematis, limber honeysuckle, and woodbine.

### **Wetland Vegetation**

Throughout prehistory, the broad bottomlands of the meandering Platte River was dotted with point bars, oxbow lakes and abandoned channel marshy wetlands where specialized vegetation existed. Prominent species included cattails, water lilies, pond lilies, crowfoot, watercress, water plantain, and rushes. Peach-leaved willow and sandbar willow colonized the edges of the creeks, helping retain the soils with fibrous, matted root systems.

### **Current Vegetation Patterns**

Most of the original grasslands are now under cultivation and remnants of the virgin

prairie are rare. In locations where a few acres of virgin prairie vegetation remain intact, it is typically altered by heavy grazing and the introduction of exotic species.

Before settlement, the forests began to be cut for fuel by the thousands of emigrants travelling west along the Platte River Road. With the arrival of the first military forts, trees were cut for building materials and fuel, and during the building of the transcontinental railroad which ran along the Platte River Valley, cutting the wooded acres continued for use as steam-engine fuel. Finally, upon settlement of the region, cutting the woodlands increased to supply building materials, heating fuel, and fuel for steam-mills, with many acres cleared to create farmland. However, during homesteading of the region, acres were also planted in wood claims, and windbreaks were planted around farmsteads. Both actions introduced non-native species of trees which rapidly mixed into the native forest species. The control of Plains wildfires, which had prevented establishment of extensive forests, together with the removal of bison herds, which often forage on young saplings, has allowed the forested acreage to expand outside the prehistoric boundaries, and contemporary forestation surpasses that amount present in prehistoric times.

Most of the rainwater basins, abandoned oxbow lakes and wetlands, have been drained, filled and plowed for cropland, and few of the natural wetlands remain. Of the existing wetlands, about half are under government protection for wildlife habitat and migrating waterfowl.

### **Native Faunal Species**

The fertile soils, temperate climate, and rich vegetation of the central Platte River Valley and the surrounding region create a diverse ecological system that provides abundant food, water, nesting, and habitat resources for a wide variety of native animal species including large herds of bison, white tailed deer and mule deer. A wide variety of bird species were also common in this region, including a large inventory of resident and migratory waterfowl that made annual stops along the Platte River, as well as in the rainwater basins across much of the region. Songbirds, and predatory or scavenging bird species were also numerous, with upland game bird species common in the grasslands, Animal populations and ranges have been altered due to changes in habitat following settlement.

With a few obvious exceptions, the wildlife species present today are generally

representative of those existing throughout the previous 4- to 5,000-years. Elk, pronghorn, wolves, black bears, and mountain lions, which were likely never abundant in this environment, rapidly disappeared during the fur trade days of the 1700s and 1800s, and were nearly gone by the arrival of Euroamerican settlement. Of those animals no longer present in the environment, most evident are the immense free-ranging herds of Bison. These stately animals disappeared due to over-hunting by both Native and Euroamerican hide-hunters, hunting to supply wagon trains, military personnel, and railroad construction workers, “sport” hunting by wagon train and railroad passengers, as well as the deliberate slaughter brought about by a United States Government policy aimed at bison herd extermination to destroy the Native people’s primary resource base, thereby making tribes completely dependent on the Government’s reservation system.

## **REGIONAL CULTURE HISTORY**

Most archeologists divide human prehistory of the central and eastern Great Plains into 6 separate cultural periods (Figure 5). The dates of these prehistoric cultural periods are somewhat subjective and there is a great deal of overlap in cultural tradition characteristics and technological developments between the periods. As might be expected, archeologists have a much better understanding of the more recent inhabitants than is known for the earlier people.

### **Paleoindian Period**

The Paleoindian Period, which includes all cultural groups dated prior to 8,000-years ago, including dates from both the Late Pleistocene and Early Holocene. Rare when compared to other prehistoric period sites, Paleoindian Period resources have been recorded throughout Nebraska indicating people were residing in this region prior to 12,000-years ago. These most ancient of these people were highly nomadic hunters of big game, including mammoth, mastodon, a giant form of bison and other Pleistocene Mega-fauna.

With the extinction of the Mega fauna at the end of the Pleistocene 10,000-years ago, the hunters continued to be dependent on a giant form of bison (*Bison antiquus*). The hunters appear to have traveled in small bands probably composed along kinship ties. Archeological evidence suggests that Paleoindian hunters moved their families and camps to the vicinity of large kills, rather than moving resources to long-term camps. This resulted in

very high mobility and long range movement as people followed the herds which they relied upon.

### **Archaic Period**

The next cultural division, the Archaic Period, extended from around 8,000-to approximately 2,000-years ago. The environment, which had been warming since the end of the Ice Age, ca. 10,000-years ago, continued to warm and dry over a period of several thousand years, resulting in a change in both plant and smaller animal resources. Human groups were forced to adapt to the declining resources by widen their diet-breadth, switching from near total reliance on only a few species of large-game, to hunting numerous species of smaller-game. An increased reliance on plant food resources also developed during that time period.

Archaic Period mobility patterns also changed. Between roughly 7,000- and 5,000-years ago, the plains suffered an extended period of drought. As small to medium drainages dried or became intermittent, humans became tethered to reliable water sources along large rivers or near springs that outflow from aquifers. This created residence patterns where a semi-sedentary group took residence at water sources for extended periods of time, while the hunters and gatherers traveled out from this home-base to procure resources which were then carried back to the residence.

By roughly 5,000-years ago, the plains cooled and precipitation increased. Large herds of the modern bison species populated the Plains and a dual residential pattern developed on the Plains. In the colder northern and drier western Plains, cultures reverted to the nomadic hunting lifestyle, following the bison herds. This lifestyle continued among the northern and western Plains people with few changes until the historic period arrived on the Plains.

In the central and eastern Plains, cultural groups again became heavily dependent on the bison herds for their primary food source. The people however continued to occupy small semi-sedentary camps along rivers and larger streams and continued utilizing large amounts of gathered plant foods.

### **Plains Woodland Period**

Archeologists recognize that at between 2,500 and 2,000 years ago, a gradual transition from the Archaic Period lifeways to cultural adaptations known as the “Plains Woodland

Period” occurred. The Plains Woodland extended from around 2,250 to 1,000-years ago. The name derives from the recognition that Plains cultures of this Period were greatly influenced by traditions and technologies introduced onto the Plains from Eastern Woodland cultures of the Mississippi River Valley.

It is unknown if the new technologies reached the Plains through the diffusion of ideas between groups, or if migrations of people brought the new methods onto the Plains. What is known is that Woodland Period people were the first American Great Plains people to build permanent structure housing. They introduced the first pottery vessels and also the beginnings of horticulture to the Plains.

At first, the horticulture was incipient, simply embedded in the methods of gathering wild plant resources. Within several generations, however, lifestyles had evolved to include seasonal, semi-sedentary residence on ridges and stream terraces overlooking their small garden plots placed on bottomlands easily tillable utilizing wood digging-sticks, bison scapula hoes, and deer antler rakes, often found in archeological sites in eastern Nebraska.

Although still dependant on bison as their primary food source, plant based foods became increasingly important in their diets. Woodland people continued to gather native wild plant foods, but also began growing semi-domesticated versions of local native plants such as wild potato, chickweeds, plantains, and thistle. People in this region also tended domesticated strains of beans, squash that were introduced onto the Plains through people of the Mississippian Culture. At the very end of the Woodland Period, maize was introduced onto the Plains which brought great changes in their lives.

### **Plains Village Period**

Gradual cultural transformations continued to occur throughout this time period, but the introduction of maize at the very end of the Woodland Period produced dependable yields of high calorie foods, brought increased populations and major cultural changes on the Plains. By 1,000 years ago, these combined changes culminated into what archeologists define as a new cultural stage, the “Plains Village Period.”

Throughout the central and eastern Plains, most people now lived in horticultural based villages of varying sizes typically built on terraces and alluvial fans along both major and minor waterways. Residences on the terraces and fans were above the periodic flooding, but

still near the floodplain that could be farmed with digging sticks, bison scapula hoes, and deer antler rakes. Still heavily dependent on hunting bison for their staple food source, these villages were often virtually abandoned for long periods as the majority of occupants left on annual or biannual bison hunts.

As the Plains Village Period continued, eastern Plains population levels increased dramatically and cultures became more complex. Distinct local and regional cultural and technological variants again developed. Many of these cultural variants are traceable through time as they evolved, to become antecedents of known Historic Plains Native groups.

Around 800-years ago, another climatic shift in the Plains environment brought the “Pacific Climatic Event. Plains peoples were again forced to abandon some areas and migrate to locations of more available food resources. These environmental conditions and the resulting migrations crowded the growing populations into smaller geographic areas. Archeological evidence indicates that many communities of that time were fortified with ditches, earthen walls, or, where available, timber palisades, suggesting greater competition for limited resources and a greatly increased incidence of warfare between Plains groups. These migrations also expedited the exchange of ideas, methods, and technologies, which resulted in temporary cultural uniformity across the central and eastern Great Plains.

Distinct local and regional cultural variants developed during the Plains Village Period that can often be traced to later time periods, continuing to evolve and becoming antecedents of known Historic Plains Native groups. This cultural period lasted until the time that European influence began to impact the peoples of the Plains and the first European explorers on the Plains witnessed first-hand, Plains Village Period life at its pinnacle.

### **Protohistoric Period**

The Protohistoric Period is identified as that relatively brief span of time when European tradegoods came into possession of Native groups, altering their traditional lifestyles, but prior to actual European presence on the Plains. Naturally, in the Eastern States and the American Southwest, this period began significantly earlier due to the relative proximity of the newly arrived European settlers to those Native groups.

On the Central Plains, the Protohistoric Period began around the mid-1600s, as European tradegoods filtered onto the Plains and altered those cultures. The two European introduced trade items that most greatly impacted Native lives were the horse and the gun. The gun was a tradegood willingly supplied by the French to Native groups in the Great Lakes region in exchange for furs. Guns were then traded westward along age-old Native trade routes, or carried there by migrating groups.

Horses came into Native ownership in the mid-1500s, by way of the Spanish settlements of New Mexico. Recognizing that possession of horses would greatly strengthen the military abilities of Native Americans, official Spanish policy outlawed trade of horses to Indians. The Spanish military also directed expeditions to use geldings that, if stolen, or lost, could not be bred. This policy was violated and during Coronado's exploration through the Southwest in 1540, enslaved Pueblo Indians who cared for the horses became familiar with the animals owned by the Spaniards. Occasionally Pueblo slaves would escape, taking with them fertile Spanish horses that were bred and traded north and eastward. Horses came into possession of groups as far north as the Canadian border within 100-years.

The horse fit well in the lifestyles of nomadic Plains people who were living as simple pedestrian hunter-gatherers. Horses gave them greater mobility, a wider range of travel, and the ability to carry more goods. With the arrival of the horse, a number of groups abandoned their centuries-old lifestyles as horticulturalists, and streamed onto the Plains to adopt a nomadic bison hunting lifestyle. Prior to obtaining the horse, the Arapahoe, Cheyenne, and Sioux were all sedentary peoples living in the area that became Minnesota and east to the region of the Great Lakes. The arrival of these groups onto the Central and Western Plains gave rise to the brief fluorescence of the stereotypic bison hunting "Equestrian Nomad Plains Indian" we are all familiar with.

Native groups such as the Pawnee, Omaha, Otoe, and Ponca, who retained their semi-sedentary lives as horticulturalists, also readily adopted horses into their lifestyles. Bison remained a major food staple and the horse enabled them to travel farther, faster, and transport more goods back to their villages.

Tragically, it was also during this Protohistoric Period that occasional contact with European traders began to introduce European diseases that ravaged many Plains people. Once introduced by traders and explorers to one tribe, the diseases often spread between

related or allied groups, many of whom had no direct contact with the European carriers. Onset of diseases such as smallpox, cholera, and measles, often nearly wiped out entire villages of Natives who had no hereditary immunity. Survivors frequently sought help from related tribes, thereby unknowingly spreading the illness among that group.

Because of its geographic, environmental, and cultural situations, the Great Plains, more than any other North American cultural area, underwent radical transformations throughout prehistory. Prehistoric trade routes and migrations brought plains people directly or indirectly into contact with numerous other cultures, technologies, customs, and ideas, including those from cultures well outside the Plains region. For at least 12,000-years, and probably much longer, the Great Plains were home to an evolving series of vibrant aboriginal cultures.

### **Historic Period**

The Historic Period began around AD 1750 when the first Europeans began venturing onto the plains, directly interacting with the Native people and documenting the lifeways of the Native plains people. For Native Americans, this is the brief time period when they frequently interacted directly with Europeans and later Euroamerican traders, explorers, and missionaries, at first during in the fur-trade, and tragically extending into the era of the violent Indian Wars when the might of the U.S. Army focused against the Plains Natives, and into the early Euroamerican settlement period when Native Americans lost their traditional territories and were placed on reservations.

### **2011 PCRPPD ARCHEOLOGICAL PROJECT**

RVW provided CRC with all relevant project concept information and aerial photographs of the proposed electric line upgrade corridors as needed for the archeological investigation and completion of this compliance report. These plans indicate that all power pole installations will be conducted on private property, immediately adjacent to existing public ROWs.

### **Investigation Personnel**

Stanley Parks, the Principle Investigator for CRC, conducted all archival research and field investigations related to this archeological investigation of this 2011 PCRPPD Power Transmission Upgrade project in Polk and Merrick Counties. Two experienced, paid

crewpersons assisted in the field investigations, although the PI was wholly responsible for the all field methods, site assessments, and recommendations contained within this compliance report.

### **Historic Preservation Compliance**

Methods employed by CRC during this investigation meet guidelines as set forth in the National Historic Preservation Act of 1966 - Section 106; the Advisory Council for Historic Preservation's "*Procedures for the Protection of Historic and Cultural Properties*"; the U.S. Department of Interior's "*Archeology and Historic Preservation Standards and Guidelines*" and; the Nebraska State Historic Preservation Office's "*National Historic Preservation Act Archeological Properties Section 106 Guidelines.*"

### **NSHS Site File Search**

During initiation of historic preservation compliance, CRC reviewed the project proposal and installation corridor locations, then conducted a full review of the NSHS archeological site records and perused relevant archival records encompassing the project area. Site files and archives indicate numerous previously recorded archeological sites in this region of Merrick and Polk Counties, and southern Nance County, located 3-miles north of Havens, the northern end of this transmission line upgrade project. Sites representing each of the 6 accepted cultural periods are recorded in this region (Figure 5).

Of these previously recorded sites, the oldest documented resources are Paleoindian Period sites that would date prior to 8,000-years ago. All other cultural periods are represented by documented sites in this immediate region of Nebraska, indicating that the Platte River Valley was occupied throughout all of human prehistory on the Plains (Figure 5). A number of Historic Native American sites have also been recorded, and identified specifically as Pawnee sites. A large number of previously recorded Prehistoric sites have not been investigated and no specific timeperiod or cultural affiliation has been determined.

Previously recorded Euroamerican sites are dominated by early farmstead sites, with a significant number of Euroamerican urban residence sites also documented. Euroamerican Flour Mills are also recorded at, or near many of the communities in this region. Additionally, the "Oxbow Trail," an early route of the Oregon Trail, looped north from

Plattsmouth and followed the southern side of the Platte River westward across Polk County and several trail sites have been.

### **Archival Investigations**

A review of the NSHS Archeological Archives indicates a number of intensive archeological investigations have been conducted in this region, with excavations or significant amounts of evaluative subsurface testing of sites. More recently, the majority of archeological projects in this region of Nebraska have been development driven and funded for Federal Historic Preservation Law compliance, primarily related to flood control measures, and highway projects. In such projects, investigations often occur only in those locations of potential impact from the construction projects.

### **Previously Recorded Sites in the PCRPPD APE Vicinity**

NSHS Site Files contain 10 previously recorded archeological sites located within 1-mile of the PCRPPD Power Transmission Upgrade project corridor. Of the 10 sites, 6 are locations of Native American activities, while the remaining 4 are Euroamerican sites. Nine sites are recorded in Sections 35 and 36, Township 14 North, Range 4 West. The remaining site is recorded in Section 2, Township 13 North, Range 4 West.

#### **Sites 25PK26, 25PK27, 25PK29, and 25PK30**

Site 25PK26, located on a terrace rise roughly 3/4-mile west of the corridor in Section 35; site 25PK27, located at the foot of a terrace in Section 35, 1-mile west of the corridor; site 25PK29, located on a small drainage at the southern edge of Section 35, 1/2-mile west of the corridor, and site 25PK30, located on a small drainage at the northern edge of Section 36, 1/2-mile east of the corridor, are all recorded as Unknown Prehistoric Sites. Such sites are locations where lithic flakes and chipped stone debris were observed, with no culturally or temporally recognizable artifacts to make more specific site identification.

#### **Site 25PK24**

Site 25PK24, located on a terrace edge near the center of Section 35, 1/2-mile west of the corridor, is identified as a Non-specific Ceramic Age site. Lithic tools, lithic debris, and prehistoric pottery were observed at this location, although no culturally identifiable or specific temporal traits were observed in the assemblage. Ceramics first appear on the Plains at the start of the Plains Woodland Period 2,000-years ago and were used until metal

trade goods began to replace traditional pottery during the Protohistoric Period, placing 25PK24 within that broad timeframe (Figure 5).

#### **Site 25PK25**

Site 25PK25, located on a low terrace near the center of Section 35, 1/2-mile west of the project corridor, is identified as a Central Plains Tradition site. At roughly 1,100-years ago, during the Plains Village Period (Figure 5), a number of roughly contemporaneous but archeologically distinct regional variants developed on the plains. Cultural groups located within the central geographic region of the Plains shared an abundance of similar cultural, material, and technological traits that varied from those of cultural groups in other geographic regions of the Plains. These distinctions led archeologists to create a separate, more specific grouping for this group of cultures, the "Central Plains Tradition" which extended to as recently as 500-years ago.

The most obvious traits that unite these archeological cultures are the design of earthlodge structures, residential settlement patterns, and subsistence technologies. All Central Plains Tradition people built square, to large rectangular, multi-family earthlodges ranging in size from 20- to 225-square-meters (215- to 2,422-square-feet). Each had a single extended entryway, located midway along one of the edges and a central fireplace, often dug down as a shallow basin, located within each lodge. Central Plains Tradition structures were supported on central posts that provided support for a heavy roof of timbers, branches, thatch, earth and sod. The lodges were cool in summer and warm in winter. The houses were built at permanent or semi-permanent habitation sites and located either singularly, or clustered in small hamlets along ridges and terraces that overlooked reliable water sources and easily tillable bottomlands. Central Plains Tradition sites represent ancestors of the Historic Period Pawnee people.

#### **Site 25PK5**

Site 25PK5 (the "Strickland Site") is a large site located roughly 1-mile east of the corridor in the northern portion of Section 5. This site is identified as Protohistoric/Early Historic Period (Figure 5) village site associated with the Lower Loup Culture, which appears around 1600 AD. Site 25PK5 is listed on the National Register of Historic Places, added in 1996 (NRHP #96000683) for its potential to contain significant information.

Lower Loup sites are recorded primarily in the valleys of the Lower Loup and Platte Rivers, from central Nebraska, eastward to the Missouri River. Lower Loup people were semi-sedentary horticulturalists who lived much of the year in villages composed of a grouping of large, circular earthlodges. The women tended gardens of corn, beans, and squash, while the men hunted deer and small animals, and birds, as well as catching fish. The mainstay of their diet however, was the bison and in the spring of each year, after the crops were planted, many of the villagers left on the summer bison hunt. They returned to the villages in time to harvest the crops, then in late fall, again set out for the winter hunt. The economic patterns, pottery, tools, and other material culture they produced strongly suggest the Lower Loup culture descended into the Historic Pawnee.

#### **Sites 25PK16, 25PK23, and 25PK31**

Site 25PK16, located near the center of Section 2, 1/2-mile west of the project corridor, 25PK23, located near the center of Section 36, and 25PK31, located at the western edge of Section 35, are historic artifacts associated with Euroamerican Farmstead sites.

#### **2011 PCRPPD Archeological Fieldwork**

Field investigations of the Three River Telco fiber-optic cable installation were conducted on November 9 and 10, 2011. The agreement with RVW called for survey of all sections of the corridor proposed for installation of the electric line upgrade. The installation corridor considered for survey in this archeological investigation totaled approximately 9.8-miles (Figure 1).

Fieldwork began with a vehicle reconnaissance of the project area during which information related to property access, physical settings and landforms, ground cover, and surface disturbances was gathered. In addition, several landowners and residents of property along the project APE were spoken to regarding their knowledge of archeological sites known to exist in the vicinity. Information was gathered regarding potential site locations, although no local informant was aware of artifact finds or sites along the PCRPPD Power Transmission Upgrade corridor.

At the time of this survey, all cropped fields had been harvested and most grassed pastures had been cut and baled. By the early November survey dates, the grassed fields were also dormant.

With the exception of a roughly 1-mile segment near the center of the Road F, archeological survey corridor, all APE sections parallel existing, well maintained, gravel roads. Road F, between Sections 1 and 2, and sections 11 and 12, of Township 14 North, Range 4 West extend across an area of rugged topography in the narrow Bluffs and Escarpment Region and the south edge of the Platte River Valley (Figure 1). It is in this ROW segment that Road F is not developed, although minimally maintained field access roads do extend along most of the segment (Figure 6).

Portions of the roadbeds are constructed on raised earthen berms to cross low-lying areas. Drainage ditches are graded along each side of the road corridors and currently grassed. The bridge crossing the Platte River on Havens Road is concrete, with a heavy gravel covered surface.

That segment of the transmission line APE at the Platte River crossing parallel to Havens Road extends across heavily disturbed surfaces. At some time in the past, sand-and-gravel quarrying was conducted at several locations along both sides of the river, creating small lakes, and leaving mounds of waste material that have since overgrown with thick grassy vegetation and trees (Figure 4).

### **Physical Setting of the PCRPPD Power Transmission Upgrade Corridor**

The southern, roughly 5-miles of the electric transmission line upgrade corridor extend across an area of gently southeasterly sloping Plains Topographic Region. The properties surrounding the electric substation at the south end of the project APE at Polk County Road F and Road 129 (Figure 5), stand at an average elevation of 1,720-feet with limited areas reaching elevations of 1,730-feet. Moving northward along the APE, the elevation gently rises to a general plain elevation of 1,740-feet, with surfaces reaching elevations of 1,750-feet within 1/2-mile of the project corridor (Figure 1).

Roughly 4-miles north of the southern end of the project corridor, at short distance north of Road F and Road 130 (Nebraska Highway 92), the topography becomes rugged with abrupt, steep slopes in the area of Bluffs and Escarpments (Figure 8). Moving northward, the elevation drops 150-feet, from 1,750-feet to 1,600-feet at the base of the bluffs on the southern edge of the Platte valley floor. At the modern channel of the Platte River, the elevation stands at 1,580-feet, rising again to 1,600-feet on the valley floor north of the river (Figure 9).

## **Field Survey Methods**

Field survey commenced at the southern end of the project area at PCRPPD Substation 4-5, near at the intersection of Polk County Road 126, and County Road F, and proceeded northward along Road F. A minimum of 2 transects, spaced at 10-meters (~30-feet) were walked along each side of the road along the APE corridor. In fields with reduced surface visibility, survey was conducted utilizing meandering to allow selection of surfaces with greatest visibility, with care taken to provide adequate coverage. In settings where the corridor extends along terrace rises, survey was conducted with a minimum of 4 transects spaced at 5-meters (~15-feet). Survey was not conducted on landscaped surfaces of farmstead yard along the corridor. Additionally, survey was not conducted on the surfaces of the several cattle feedlots along the corridor.

## **ARCHEOLOGICAL INVESTIGATION RESULTS**

### **Observed Cultural Materials**

Archeological investigations conducted along the PCRPPD Power Transmission Upgrade corridor yielded 3 previously unrecorded archeological sites. Of these 3 sites encountered during this 2011 investigation, 2 are Native American resources, 1 is a Euroamerican farmstead. The NSHS assigned site numbers 25PK38, 25PK39, and 25PK40 to these newly recorded sites.

#### **Site 25PK38**

##### **Description**

Site 25PK38 is a sparse lithic scatter was encountered in the Northeast 1/4 of the Northeast 1/4 of the Southeast 1/4 of Section 2, Township 14 North, Range 4 West (Figure 10). The site is located at an elevation of 1,630-feet, near end of a sloped terrace remnant at the foot of the escarpments leading to the upland plain to the south, reaching elevations of 1,740 immediately south of the site. The slope drops to 1,600-feet north of the terrace slope. The field is cultivated, cropped in corn in 2011 providing surface visibility averaging 30-percent.

The field is cultivated, cropped in corn in 2011, providing on average 40-percent surface visibility at the time of survey. The sparse, diffuse scatter was observed within an area of approximately 150-square-meters (1,600-square-feet). East of Road F, which is

undeveloped at this location, the property is within large cattle feed lot. At the time of survey, the surface along that side of the ROW was muddy, and heavily impacted by cattle, with several low mounds of earth and manure piled a several locations, suggesting occasional grading of the surface. No survey was conducted in that location.

Once lithics were observed, investigation was intensified, with transects reduced to approximately 2-meters (6-feet) and the surface carefully surveyed across the scatter and at minimum, roughly 20-meters (~60-feet) beyond the scatter extent, and roughly 50-meters (~150-feet) upslope. Pin flags were used to mark the location of each artifact to define extent and identify concentrations.

The sparse scatter consisted of 2 lithic flakes, and several fragments of fire-cracked-rock. A decortication flake of light-gray chert with white inclusions, measuring roughly 3-centimeters by 2-centimeters by 1-centimeter in thickness (1-1/4-inch by 3/4-inch by 3/8-inch) was observed. The second flake of light-gray chert with white inclusions was a secondary decortication flake measuring roughly 2-centimeters by 2-centimeters by 1/2-centimeter in thickness (3/4-inch by 3/4-inch by 3/16-inch). No indication of retouch or use edge-wear was observed on either flake.

Concurrent with the intensive surface survey, a total of 10 shovel tests were conducted across the extent of the scatter. Shovel tests were excavated to a diameter of roughly 30-centimeters (12-inches) by 50-centimeters (20-inches) deep. Material excavated from each test was processed through a 1/4-inch shaker screen.

### **Evaluation**

The surface at site 25PK38, a cultivated field on a sloped terrace at the foot of the escarpment along the edge of the Platte Valley, is eroded, with evidence that erosion is continuing with each period of precipitation runoff. The 2 flakes were separated by approximately 15-meters, with the fire-cracked-rock scattered across the surface with no concentration identified. These artifacts have undoubtedly been displaced downslope, although no surface artifacts were observed upslope from the described scatter, and no evidence of an eroding cultural feature or buried soil horizon that may contain archeology was encountered.

This site appears to be a simple lithic surface scatter, possibly a short term occupation such as a hunting camp, although it may also be an outlying activity site associated with the large NRHP 25PK5 site, located 1-1/2-mile northeast of 25PK38. No collection of these artifacts was conducted.

### **Site 25PK39**

#### **Description**

Site 25PL39 is the location of an isolate find of prehistoric pottery observed from an eroded sidewall adjacent to the southern side of the Platte River, and west of Havens Road. The sherd was located in the Northeast 1/4 of the Southeast 1/4 of the Southwest 1/4 of the of the Northwest 1/4 of Section 26, Township 15 North, Range 4 West, roughly 15-meters (45-feet) west of the earthen berm on which Havens Road extends, leading to the Platte River bridge (Figure 11) (UTM 605,248mE, 4,566,498mN, Z14). The surrounding surfaces are mostly grassed, with a moderate cover of trees. Erosion is ongoing along a portion of the slope, with bare sidewalls.

The pottery was observed on the surface of recently deposited materials washing downslope from the sidewall erosion. Inspection of the sidewalls, along a roughly 10-meter (30-feet) stretch each side of the pottery, was conducted in an attempt to locate additional artifactual materials, cultural features, or buried surfaces.

The pottery is a body large sherd, measuring 8-centimeters by 5-1/2-centimeters, and 6-millimeters in thickness (3-1/4-inches by 2-1/8-inches by 1/4-inch). The curvature of the sherd suggests a globular vessel roughly 12-inches in diameter. The sherd exterior is brownish-yellow (10YR6/6 dry) with a dark-grayish-brown (10YR3/2) dry interior. The exterior appears to have been marked with a paddle, then smoothed to leave a mostly smooth exterior (Figure 12).

#### **Evaluation**

This is an isolated pottery find with no additional sherds, lithics, or other cultural materials or features. While this sherd is interesting, and recovered from the surface of secondarily deposited soils suggests additional pottery and possibly other materials may be located nearby.

## **Site 29PK40**

### **Description**

Site 29PK40 is the archeological remnant of a historic farmstead site located in the South 1/2 of the Northwest 1/4 and North 1/2 of the Southwest 1/4 of the Southwest 1/4 of Section 24, Township 14 North, Range 4 West (Figure 13) (UTM 606,345mE, 4,557,988mN, Z14). The site is located on a mostly level plain at an elevation of 1,740-feet. The field is cultivated, cropped in corn in 2011, with crop residue apparently raked and baled, providing surface visibility averaging 75-percent. The diffuse historic scatter included fragments of construction debris, as well as utilitarian items scattered over an area of approximately 4,000-square-meters (43,000-square-feet).

Construction debris included clear flat-glass; frosted flat-glass; various sizes of wire nails; several sizes of wood screws; a door-hinge pin; ceramic “knob-and-tube” insulators; short segments of approximately 14-gauge copper wire with cloth-covering; fragments of red-brick, some containing mortar; concrete fragments; and small pieces of limestone.

Utilitarian materials included clear, light-green, dark-green, brown, and amethyst bottleglass; whiteware ceramics, including undecorated, several with pressed floral decorations, and 2 with floral transfer print; stoneware sherds, small tin-can fragments, including 2 “Church-key opened beverage can tops; and several crown caps.

### **Evaluation**

The 1962 USGS 7.5 minute series Swedehome topographic map covering this location indicates a farmstead once stood at this location (Figure 13). A 1993 aerial photograph shows the structures were removed prior to that date, and the field was under cultivation. The topographic map also indicates a shallow, intermittent drain meandered across the property immediately north of the farmstead. A low area remains at the location of the drain, although it appears some leveling had been conducted in this field. It appears that soil, intermixed with some amounts of structural debris, was used as for fill to partially level the drain meander. Additionally, as is typical of surface scatters, the lateral extent of the artifacts appears to have been spread due to ongoing cultivation. No testing was conducted to determine if intact subsurface content such as foundation remnants remain intact at this site.

This historic 25PK40 scatter meets the minimum 50-year age to make it considered an archeological site and eligible for consideration for nomination to the National Register of Historic Places. The site undoubtedly contains information that would be available using archeological methods and based on the observed surface evidence, it is assumed that excavations at this site would yield a considerable volume of artifacts. Additionally, excavations at the location of the indicated structure may reveal intact features that extend below the plowzone. However there does not appear to be anything special about this farmstead that would make it more significant than the multitude of other demolished farmstead in the vicinity. Most, if not all, of the archeological information this sites would contain would be available in the archives and excavation records of previously investigated historic farmsteads.

#### **PCRPPD POWER TRANSMISSION UPGRADE PROJECT SUMMATION AND RECOMMENDATIONS**

The PCRPPD Power Transmission Upgrade project will involve installation of wooden poles along the corridor. Each support will be a single pole structure with poles installed on 250-foot (~76-meter) centers with the exception of the Platte River crossing which will require a greater span. This installation method, involving drilling of holes for pole installation, will involve very little subsurface impact.

NSHS indicate that no previously recorded archeological sites are located within the narrow PCRPPD Power Transmission Upgrade corridor. All recorded sites within the vicinity of the project are well outside the APE.

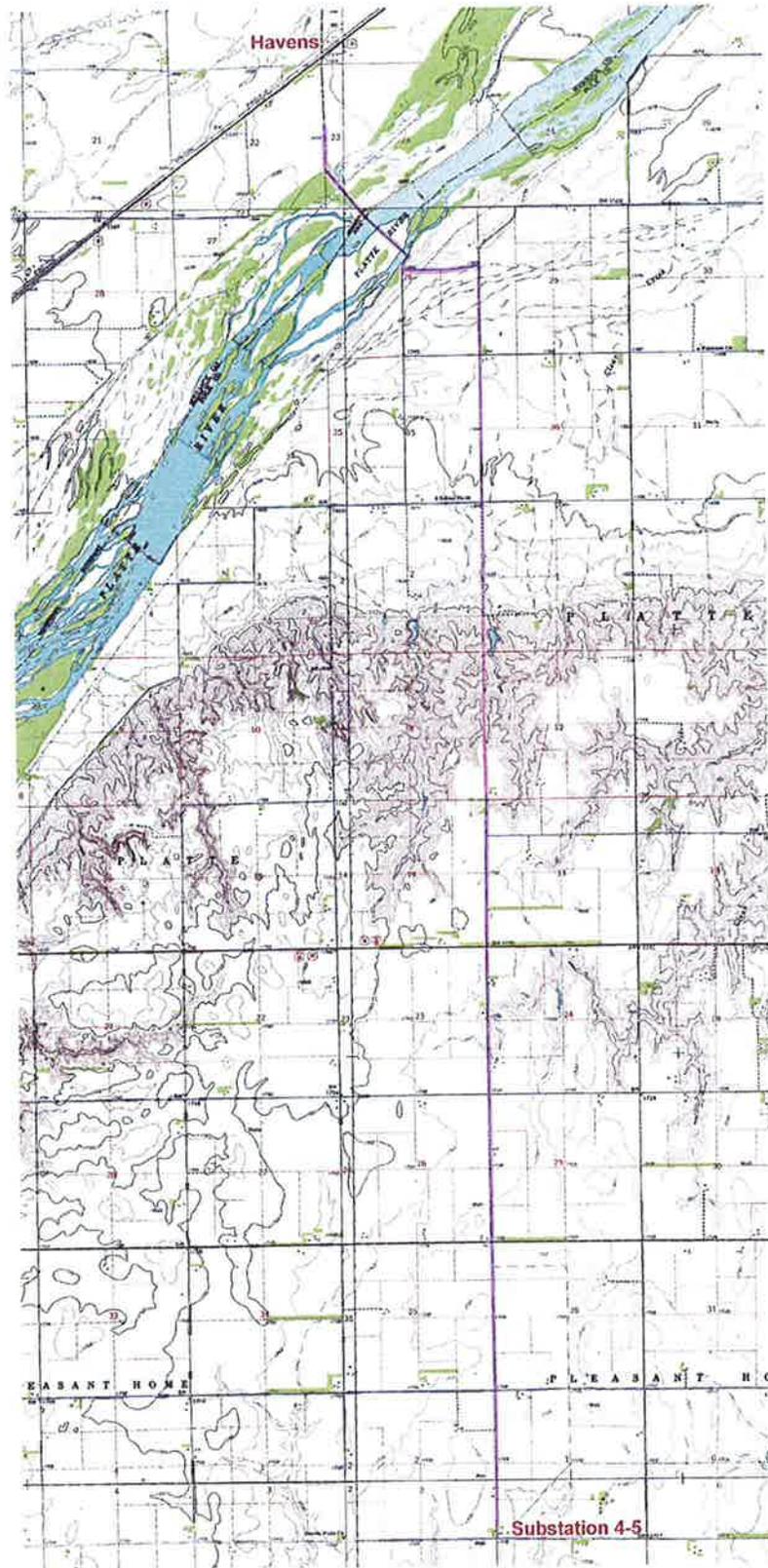
Pedestrian survey was conducted along both sides of nearly all segments of the 9.8-mile corridor, with the exception of heavily disturbed surfaces such as landscaped yards and cattle feedlots. Survey resulted in recordation of 3 previously undocumented archeological sites.

This investigator considers site 25PK38 (Figure 10) to be a simple lithic surface scatter observed on an eroding surface. Intensive surface survey and minimal testing did not yield evidence to suggest a substantial site with intact buried features of soils horizons is present at this location. No additional investigation, mitigation or avoidance is recommended for this site in association with the current PCRPPD Power Transmission Upgrade.

Site 25PK39 is an isolated find of pottery found on the surface of secondarily deposited soils along the face of a cutbank along the edge of the Platte River (Figure 11). Inspection of the cutbank yielded no additional artifacts, features, or buried soils and no additional investigation, mitigation, or avoidance of this location is recommended in association with the current PCRPPD Power Transmission Upgrade.

Site 25PK40 (Figure 13) is a Euroamerican Farmstead site that is recommended not eligible for nomination to the NRHP. No additional investigation, mitigation, or avoidance of this site is recommended in association with the current PCRPPD Power Transmission Upgrade.

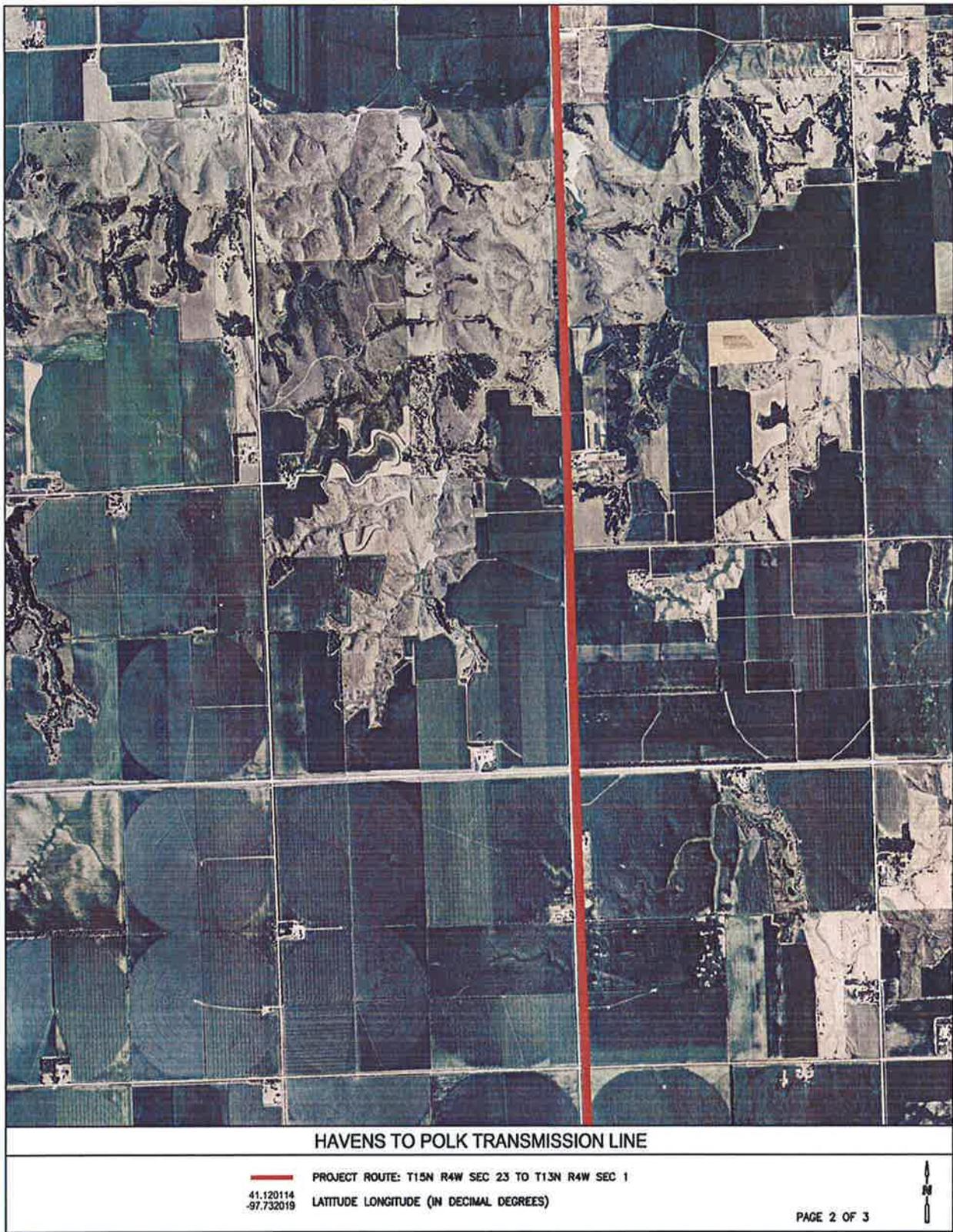
It is the recommendation of this investigator that no further Historic Preservation compliance actions are recommended, and the project be allowed to proceed as currently designed. In the unexpected event that prehistoric artifacts or features are encountered, excavation at that location should be halted and the NeSHPO should be contacted for further advice. Likewise, if the project is altered and will impact areas outside those investigated by CRC during this survey, the NeSHPO should be contacted for advice.



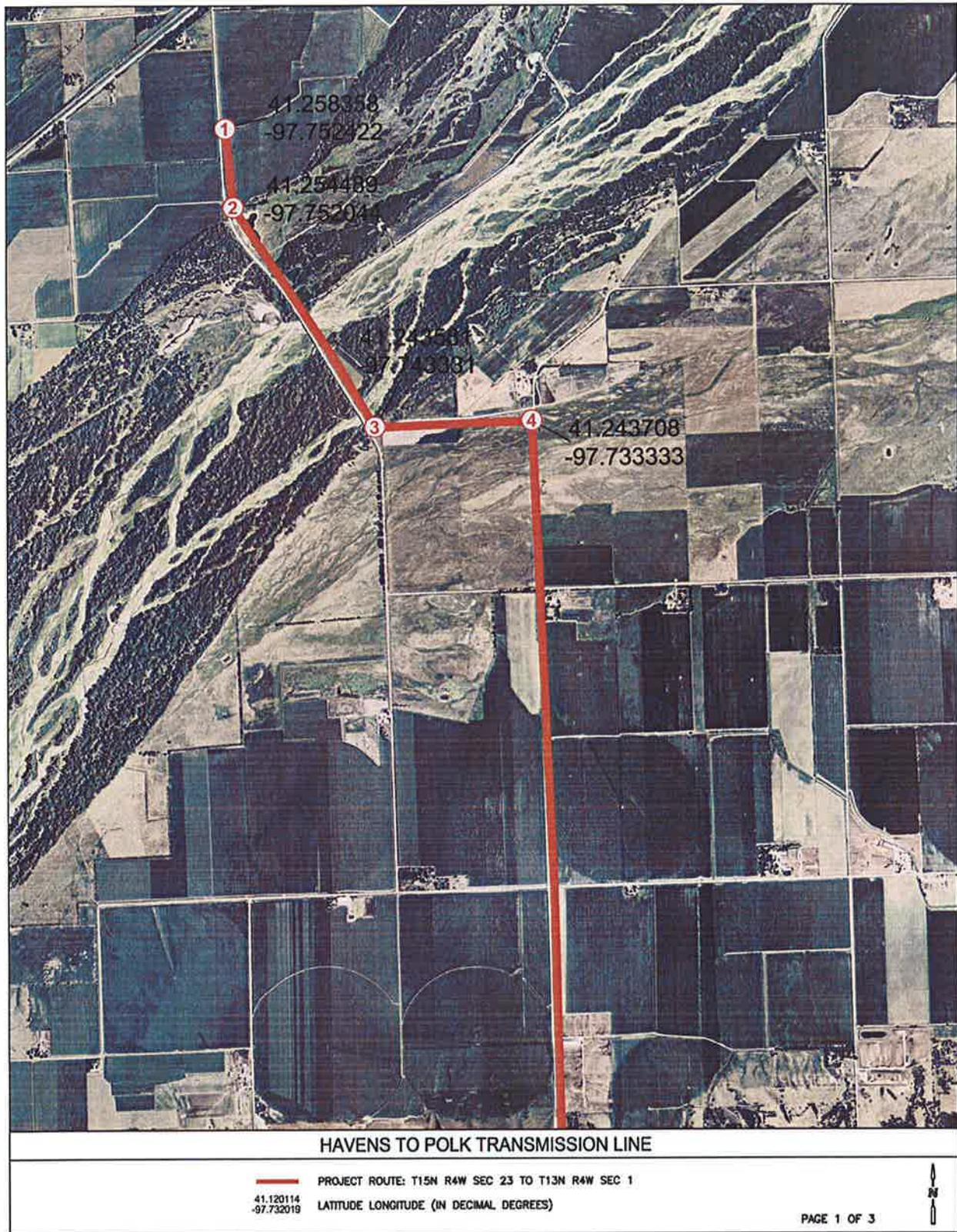
**Figure 1:** Topographic map showing the route of the 9.8-mile PCRPPD Power Transmission Upgrade corridor extending from Substation 4-5, northward to just south of the community of Havens. Map assembled from the USGS Silver Creek, Havens, Clarks, and Swedehome Quadrangles of the 7.5 minute series of USGS topographic maps.



**Figure 2:** Aerial Photograph of the southern portion of the PCRPPD Power Transmission Upgrade area. Line will extend from Substation 4-5, northward. Aerial Photograph shows land use patterns, although some land use has changed since this photograph date. Photograph provided by RVW.



**Figure 3:** Aerial Photograph of the central portion of the PCRPPD Power Transmission Upgrade area. Aerial Photograph shows land use patterns, although some land use has changed since this photograph date. Photograph provided by RVW.



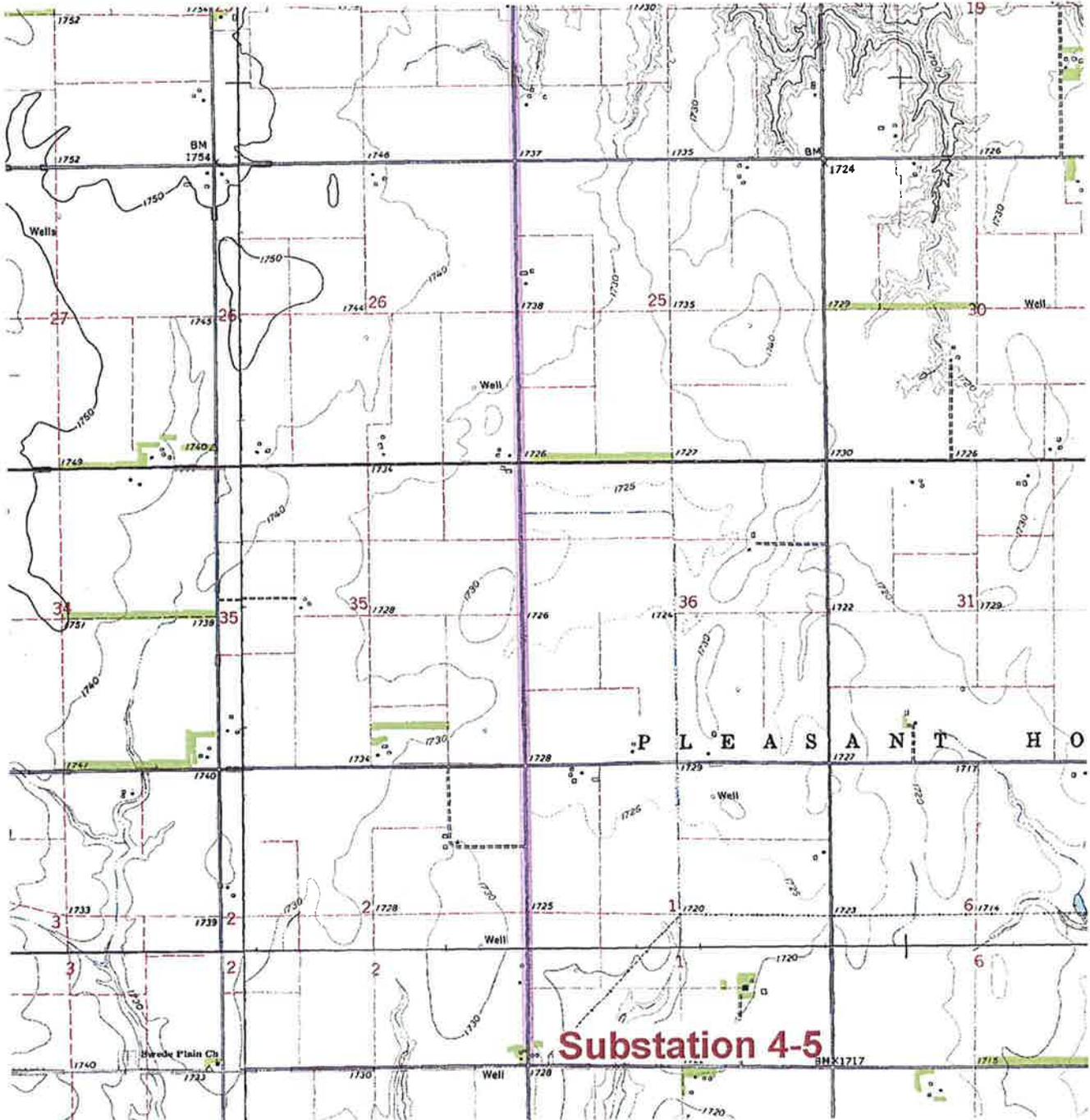
**Figure 4:** Aerial Photograph of the southern portion of the PCRPPD Power Transmission Upgrade area. Line will extend from Substation 4-5, northward. Aerial Photograph shows land use patterns, although some land use has changed since this photograph date. Photograph provided by RVW.

<b>Cultural Period</b>	<b>Accepted Dates</b>	<b>Cultural Features / Events</b>
Paleoindian	12,000(+?) - 8,000 Years Before Present (BP)	<ul style="list-style-type: none"> <li>-Small, highly nomadic “Big Game” hunter groups occupy the Great Plains</li> <li>-Prey on Mammoth, other large Pleistocene Megafauna</li> <li>-Tools are well made and highly specialized</li> <li>-Large lanceolate &amp; fluted spear / dart points</li> </ul>
Archaic	8,000 - 2,000 BP	<ul style="list-style-type: none"> <li>-Environmental decline (Altithermal)</li> <li>-Reduction in plant and animal resources</li> <li>-Broad spectrum hunter - gatherer groups</li> <li>-Heavy reliance on small game &amp; plant food resources</li> <li>-Large variety of crudely made lithic tools</li> </ul>
Woodland	2,000 - 1,000 BP	<ul style="list-style-type: none"> <li>-Beginnings of incipient horticulture on Great Plains</li> <li>-Ceramics and pit houses appear on Plains</li> <li>-Corn (<i>Zea mays</i>) introduced to the Plains</li> </ul>
Plains Village	1,000 - 400 BP	<ul style="list-style-type: none"> <li>-Corn, Bean, Squash horticulture in eastern Plains</li> <li>-Regional and local ceramic traditions flourish</li> <li>-Earthlodge villages established along waterways</li> <li>-Siouan and Athabaskan groups arrive on Plains</li> <li>-Population explosion of Plains horticulturalists</li> <li>-Western Plains tribes still live as nomadic hunters</li> </ul>
Protohistoric	ca. AD 1600 – 1800	<ul style="list-style-type: none"> <li>-Spanish &amp; French explore the Great Plains</li> <li>-Infusion of first White tradegoods</li> <li>-Horses and guns appear on Plains</li> <li>-Increased warfare between Plains tribes</li> <li>-Native Americans are exposed to many deadly European diseases</li> <li>-Populations decrease as disease spreads</li> <li>-Native groups suffer social / cultural decline</li> </ul>
Historic	ca. AD 1800 – 1880	<ul style="list-style-type: none"> <li>-Plains fur trade increases</li> <li>-Permanent White settlements appear on Plains</li> <li>-Increased exposure to disease / drastic loss of Native populations</li> <li>-1804, Louisiana Purchase, U.S. establishes forts across the plains</li> <li>-1854, Nebraska-Kansas Act opens the Territory</li> <li>-1862, Homestead Act, Whites populate Plains</li> <li>-U.S. Government engages in “Indian Wars”</li> <li>-Native Americans forced onto reservations</li> </ul>

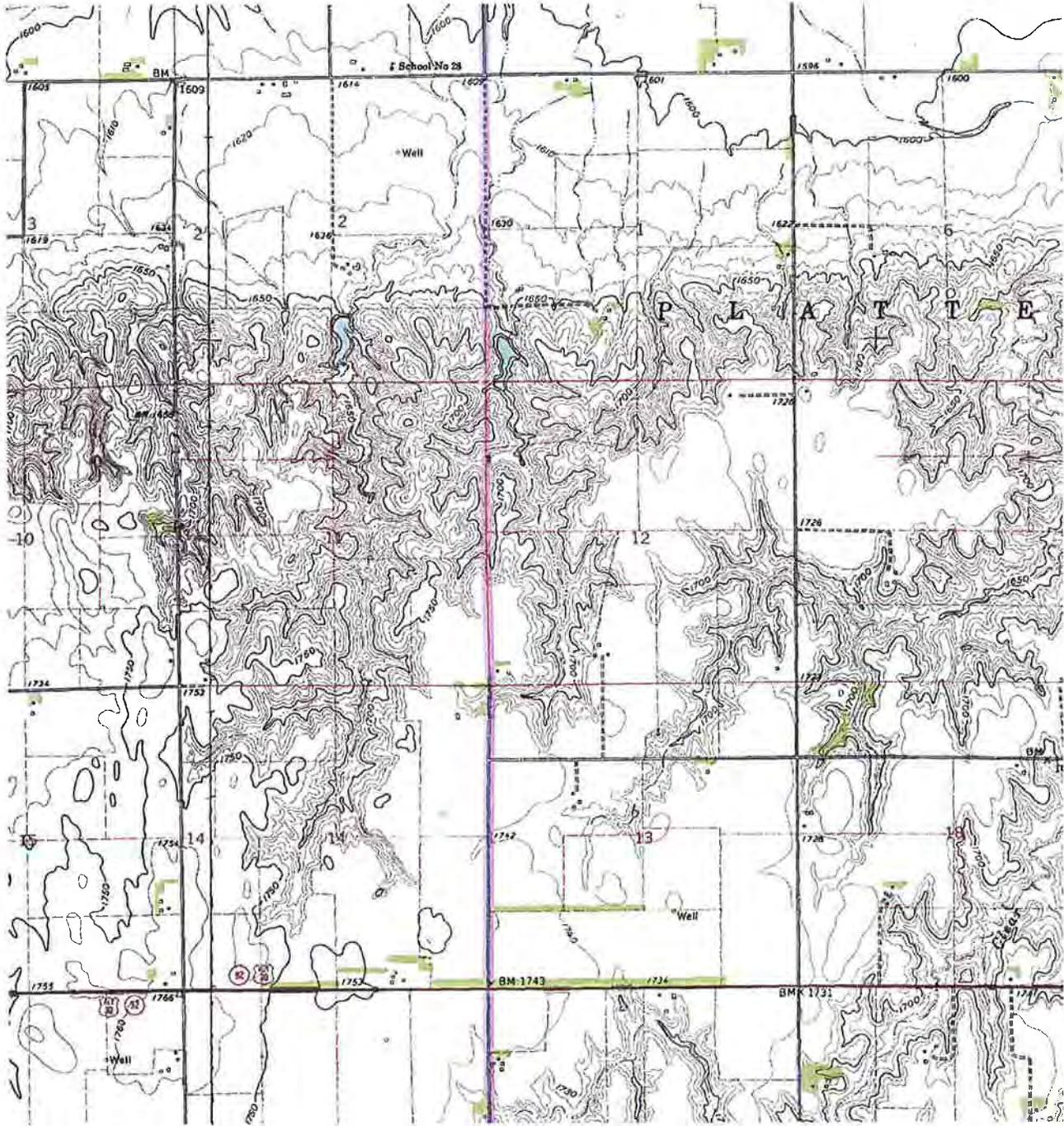
**Figure 5:** Table showing the Cultural Periods recognized in Plains Native American study, and the dates and major cultural features/events of each period.



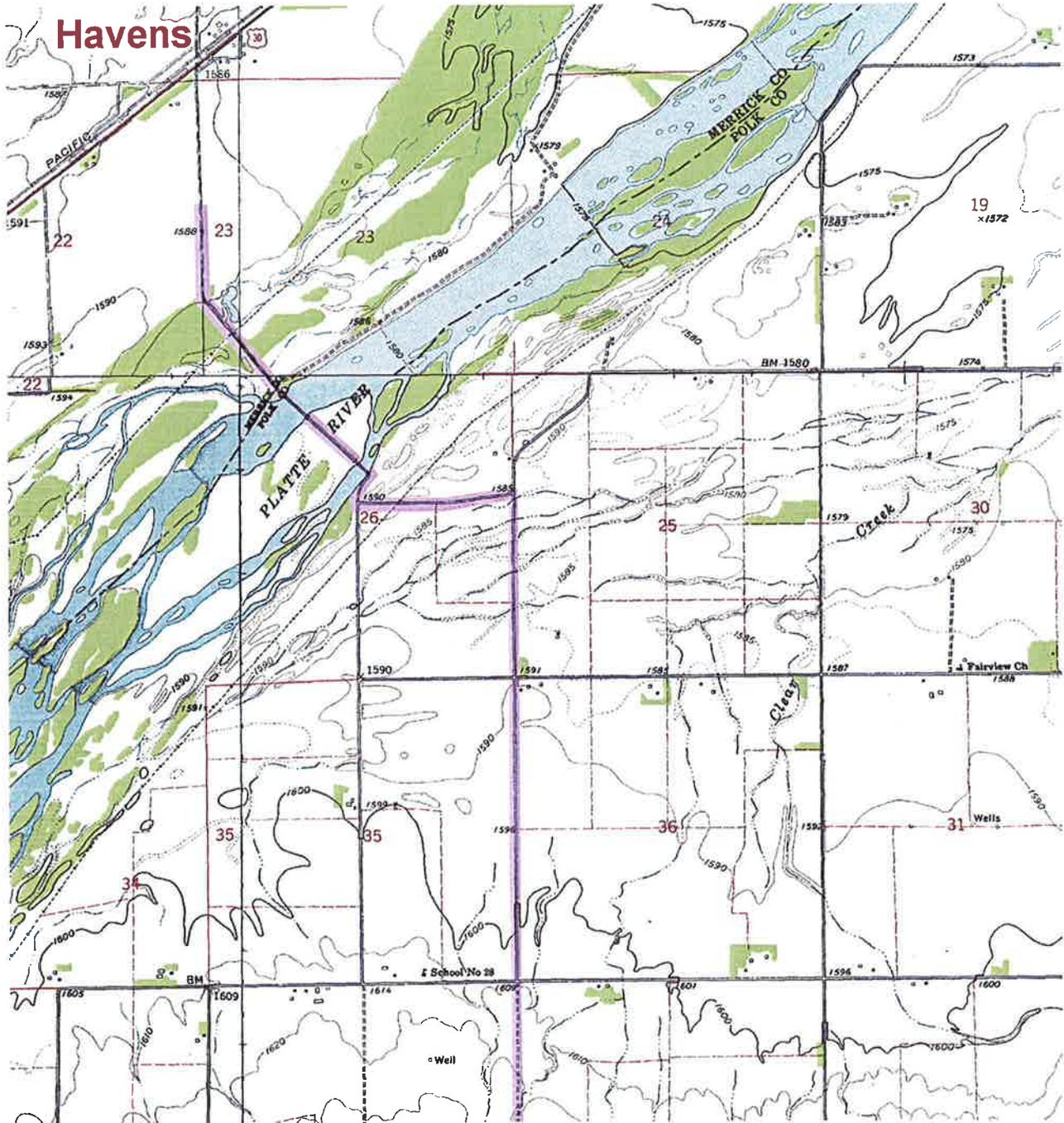
**Figure 6:** Photograph looking south along the Polk County Road F ROW. This portion of the road is the undeveloped section extending across the escarpments portion of the PCRPPD Power Transmission Upgrade corridor, although a field access road extends along this portion.



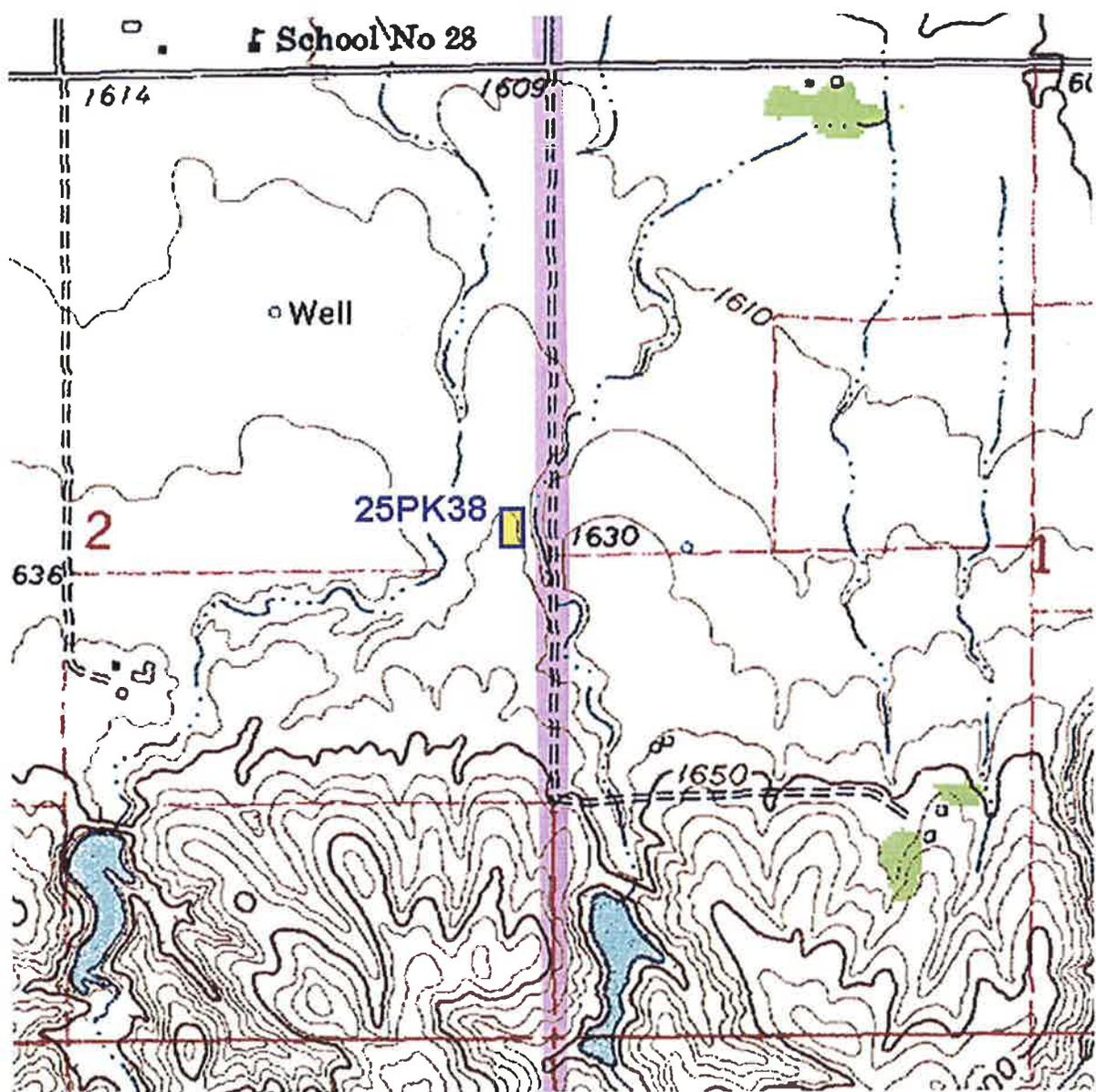
**Figure 7:** Topographic map of the southern portion of the PCRPPD Power Transmission Upgrade area (Compare with Figure 2). Line will extend from Substation 4-5, northward. Note the landscape of the undulating Loess Plains Topographic Region.



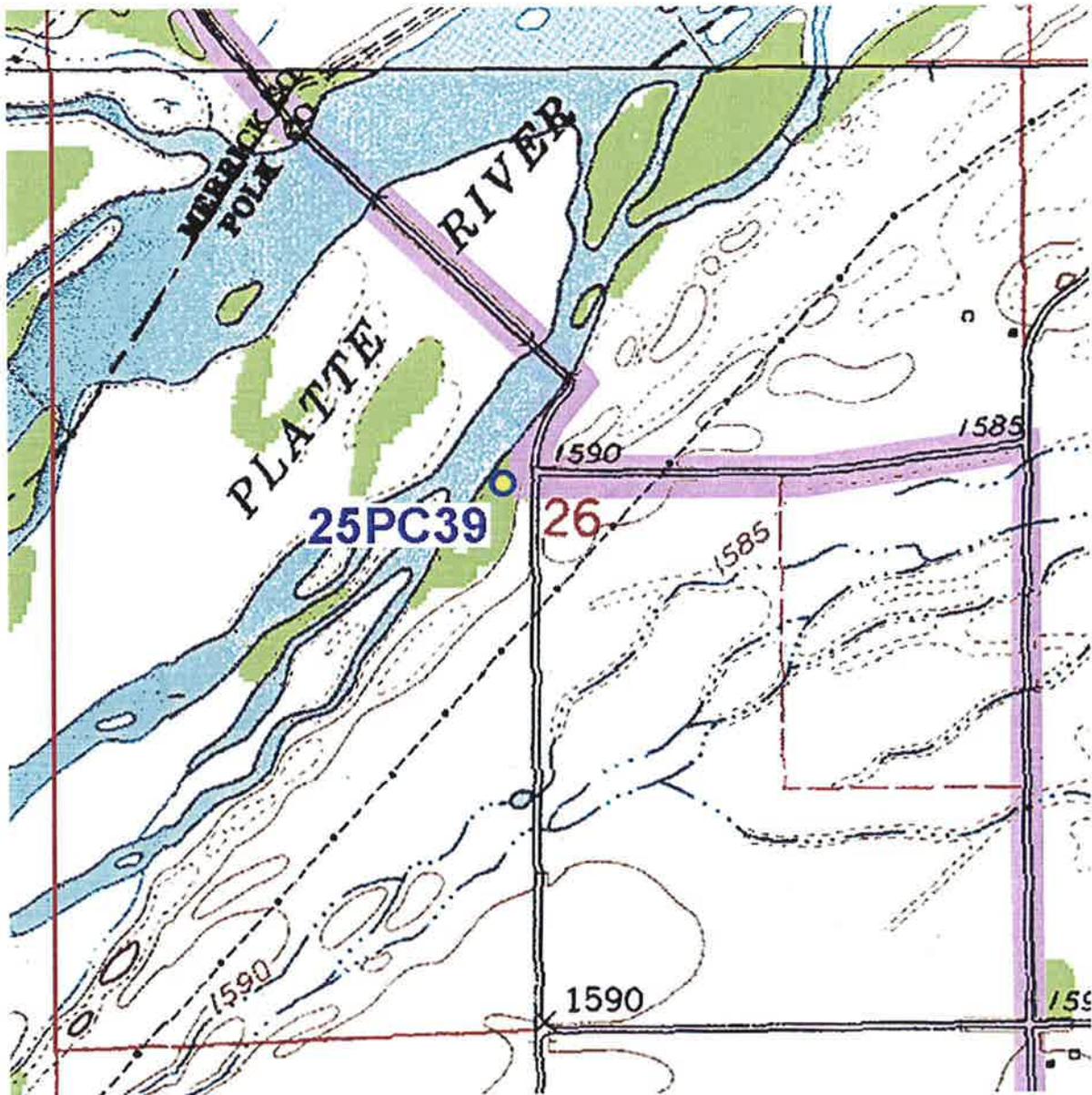
**Figure 8:** Topographic map of the central portion of the PCRPPD Power Transmission Upgrade area (Compare with Figure 3). Note landscape from the Loess Plains Region to the south, dropping in elevation in the rugged Bluffs and Escarpments Region onto the Platte Valley floor.



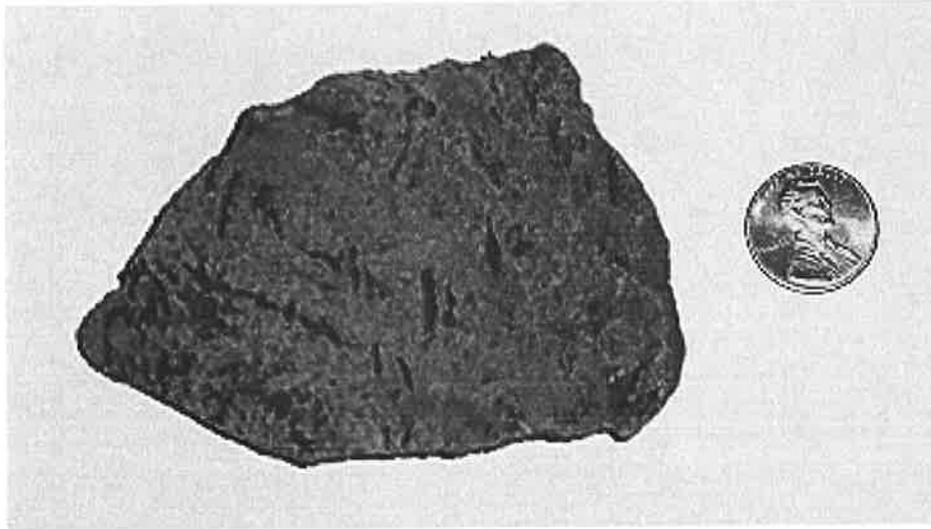
**Figure 9:** Topographic map of the northern portion of the PCRPPD Power Transmission Upgrade area (Compare with Figure 4). Note Platte Valley bottomland with terraces along the southern edge of the valley. Corridor crosses the Platte River into Merrick County.



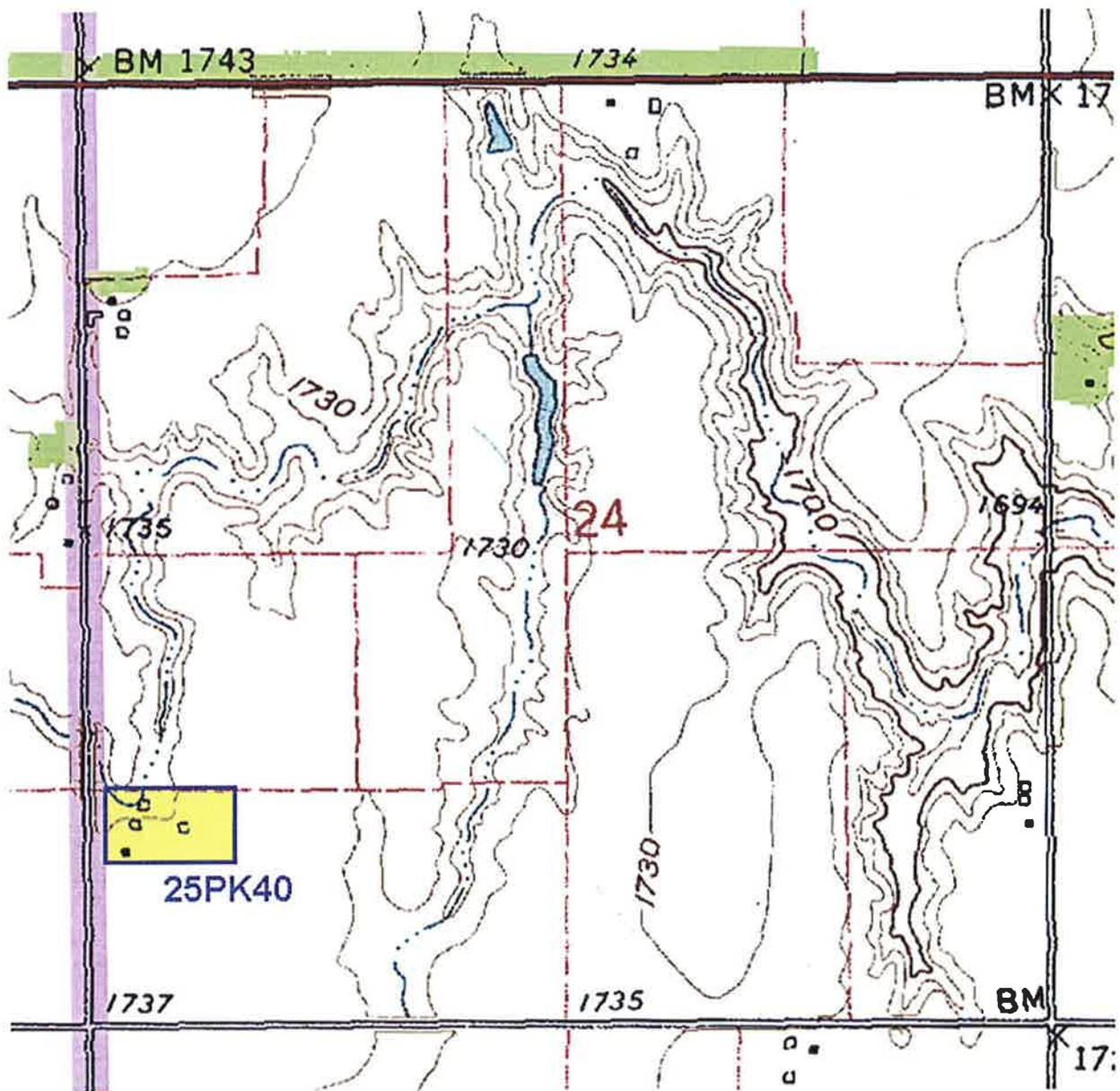
**Figure 10:** Topographic map showing the location of Site 25PK38, a sparse lithic scatter encountered in the Northeast 1/4 of the Northeast 1/4 of the Northeast 1/4 of the Southeast 1/4 of Section 2, Township 14 North, Range 4 West. The site is located at an elevation of 1,630-feet, near end of a sloped terrace remnant at the foot of the escarpments area.



**Figure 11:** Topographic map showing the location of Site 25PK39, an isolate find of prehistoric pottery observed from an eroded sidewall adjacent to the southern side of the Platte River, and west of Havens Road. The sherd was located in the Northeast 1/4 of the Southeast 1/4 of the Southwest 1/4 of the of the Northwest 1/4 of Section 26, Township 15 North, Range 4 West, roughly 15-meters (45-feet) west of the earthen berm on which Havens Road is located. Road location has been altered since creation of this 1962 topographic map (See Figure 4).



**Figure 12:** Photograph of the pottery sherd found at 25PK39. Sherd measures 8-centimeters by 5-1/2-centimeters, and 6-millimeters in thickness (3-1/4-inches by 2-1/8-inches by 1/4-inch). The curvature of the sherd suggests a globular vessel roughly 12-inches in diameter. The sherd exterior is brownish-yellow (10YR6/6 dry) with a dark-grayish-brown (10YR3/2) dry interior. The exterior appears to have been marked with a paddle, then smoothed to leave a mostly smooth exterior.



**Figure 13:** Topographic map showing the location of 25PK40. This is the archeological remnant of a historic farmstead located in the South 1/2 of the Northwest 1/4 and North 1/2 of the Southwest 1/4 of the Southwest 1/4 of Section 24, Township 14 North, Range 4 West.



11 January 2012

Sheila M. Hascall  
Emergency Management Agency  
1300 Military Road  
Lincoln, NE 68508-1090

Re: 69 kV and 12.47 kV Lines  
1770-0001  
Polk Co. , NE  
H.P. #1007-012-01

Dear Ms. Hascall:

The cultural resources survey report (Parks2011) on the above referenced project has been reviewed by this office. We concur that archaeological sites 25PK38, 25PK39, and 25PK40 are not eligible for the National Register of Historic Places. Therefore, with the findings of the report that no archaeological, architectural, or historic context property resources will be affected the proposed project will have no effect on historic resources. This review does not constitute the opinions of any Native American Tribes that may have an interest in Traditional Cultural Properties potentially affected by this project.

Sincerely,

A handwritten signature in black ink, appearing to read "Terry Steinacher".

Terry Steinacher  
H.P. Archaeologist

Concurrence:

A handwritten signature in black ink, appearing to read "L. Robert Puschendorf for RP".

L. Robert Puschendorf  
Deputy NeSHPO

cc: Herchenbach