DIRECT TESTIMONY

OF

SALVATORE FALCONE

ON BEHALF OF

ITC GREAT PLAINS, LLC

AND

MID-KANSAS ELECTRIC, COMPANY, LLC

13-ITCE-677-MIS

MAY 3, 2013

I. INTRODUCTION

Q: Please state your name and business address.

A: Salvatore Falcone, and I work at 11401 Lamar in Overland Park, Kansas.

Q: By whom and in what capacity are you employed?

A: I work for Black & Veatch as a senior environmental engineer and permitting manager. I also perform routing studies for our transmission line clients.

Q: Please describe your educational background and professional experience.

A: I have a bachelor's degree in engineering science, majoring in mechanical engineering and a master's degree in business administration, majoring in finance. I am a registered professional engineer in Kansas and Missouri. I have worked as an environmental engineer for thirty-two years.

Q: Have you provided testimony in prior regulatory proceedings?

A: Yes, I have. I have testified before the Kansas Corporation Commission ("KCC" or "Commission") on behalf of ITC Great Plains, LLC ("ITC Great Plains," "ITC" or "Company"). Specifically, I testified on transmission routing in the siting dockets for KETA Phase I and II and the V-Plan project, Docket Nos. 09-ITCE-729-MIS, 10-ITCE-557-MIS and 11-ITCE-644-MIS, respectively.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of both ITC Great Plains and Mid-Kansas Electric Company, LLC ("Mid-Kansas")(collectively, the "Companies").

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to describe the process used to determine the proposed route for the transmission line from ITC Great Plains' existing Elm Creek Substation

located near Concordia, Kansas, south to an interconnection point with Westar Energy, Inc. ("Westar"), who will continue south with the line to its existing Summit Substation located near Salina, Kansas (the "Elm Creek-Summit Line").

II. ROUTE SELECTION PROCESS

Q: **Please describe the process used to select the preliminary routes for the transmission line.**

A: Black & Veatch Corporation was hired by both ITC Great Plains and Westar to develop routes for the Elm Creek-Summit Line and to assist ITC Great Plains with the siting process.[1] The Route Selection Study is attached to my testimony as **Exhibit 1**. The entire study area for the Elm Creek-Summit Line routing process is shown in Figure 1-1 of Exhibit 1. This area covers approximately 840 square miles and includes parts of Cloud and Ottawa Counties in Kansas.

After the study area was defined, the first step in the routing process was to gather and evaluate information concerning land uses, environmental features, historic and cultural resources, residences, farm buildings and other concerns that may be relevant to the construction of an overhead electric transmission line. We did a desktop review of public domain aerial photography, topographical maps, land use databases and agency environmental resource sites. Our goal was to provide at least three technically and environmentally feasible preliminary routes.

In developing the preliminary routes, we used the following objectives: (1) avoid proximity of the line to residences, businesses and public facilities; (2) avoid crossing over center pivot irrigation systems; (3) parallel existing utilities, roads or railroads when practical; (4) avoid wetlands, riparian areas and conservation lands; (5) avoid placing the

line directly over tanks and oil, gas, or water wells; and (6) maintain reasonable length using as few angles as possible to minimize costs. The overall goal of the routing process was to develop alternatives that would provide economical routes with minimal adverse social and environmental impacts. Following the identification of potential route alternatives, the next step was to drive the routes. I accompanied a routing specialist and senior biologist on the field reconnaissance trip and we drove approximately 520 miles in the Elm Creek-Summit Line study area. We evaluated the preliminary route locations, noted where residences, buildings and sensitive habitats were located, observed and noted the wildlife in the study area, and adjusted our routes accordingly.

Black & Veatch also sent letters with study area maps covering the Elm Creek-Summit Line to the Kansas Department of Health and Environment, Kansas Department of Wildlife, Parks and Tourism, Kansas Natural Heritage Inventory, Kansas State Historical Society, United States Army Corps of Engineers, United States Department of Agriculture's Natural Resources Conservation Service and the United States Department of the Interior - Fish and Wildlife Service. These letters asked for the agencies' inputs and comments on resources (such as threatened or endangered species) or other items of concern that would arise from the construction of an electric transmission line within the study area. A summary of the responses received is provided in Appendix D of Exhibit 1.

Q: Did you receive feedback from the state and federal agencies?

A: Yes, we did, and we used that feedback to inform our subsequent route selection work. For example, the response we received from the Kansas Department of Health and Environment provided us information on the location of an Atlas missile site in the study

[1] I also assisted Westar in its siting process, which is the subject of a separate siting docket.

area. We used that information to ensure that all of our preliminary routes avoided this area.

Q: What were the route alternatives that were offered to the public for comment?

A: Appendix A to Exhibit 1 is the updated version of the map of the route alternatives on which ITC Great Plains sought comment at public open houses in Miltonvale, Bennington and Salina, Kansas, on December 4, 5 and 6, 2012, respectively. It reflects the inputs we received from landowners during and after those three open houses. Although none of the preliminary routes were changed substantially, the comments resulted in many small changes and refinements to the routes.

Q: How were landowners informed of ITC Great Plains' intent to construct a new line?

A: Once the revised preliminary routes were determined, ITC Great Plains used property ownership data from each county to identify the landowners within 1,000 feet of the center line of each of the potential routes. ITC Great Plains sent a letter to each landowner to advise that ITC was proposing to construct a new high voltage line near his/her property and inviting each of them to attend any of three open houses. The dates, times and locations of the open houses were identified in the letter. ITC also issued news releases prior to the open houses. A copy of the form invitation letter is attached to my testimony as **Exhibit 2.**

Q: Did public input have any bearing on the siting process?

A: Yes. The information obtained from the landowners was very important and helped identify issues that had not been identified through the field reconnaissance, agency contacts and aerial mapping. Public input resulted in many more revisions to the routes.

For example, modifications to the preliminary routes were required to address:

- Homes in the study area that may not have been identified and located initially;
- Plans to build new homes near the proposed route alternatives;
- Possible location of cultural and historical artifacts;
- Locations of Conservation Reserve Program property;
- Preservation of cedar trees that provide habitat for deer, turkey, and other species; and
- Center pivot irrigation structures that did not show on aerial photos or were not observed initially during the field reconnaissance.

As a result of this input and our follow-up activities, Black & Veatch refined the routing options for the Elm Creek-Summit Line.

A quantitative analysis of land use data, public input and engineering criteria were employed in the final evaluation of the route alternatives. The evaluation resulted in the selection of ITC Great Plains' preferred route for the project. The route selection process is addressed in detail in Section 4.0 of the Route Selection Study.

Q: Please provide more detail regarding the selection of the preferred route.

A: ITC Great Plains and Black & Veatch had established and refined criteria for evaluating routing alternatives during the Phase I and Phase II process of siting the KETA line and for siting the V-Plan line. We used the same methodology for the Elm Creek-Summit Line. The specific alignment of potential routes was based in large part on avoiding occupied structures and sensitive resources that might be adversely affected by the construction, maintenance and operation of a transmission line. The primary routing

concerns were residences, businesses, wells (gas, oil or water), towers, center pivot irrigation systems, parks, cemeteries and protected species and their habitats.

In most of the study area, there were at least three routing alternatives available. Much of the study area is sparsely populated and it afforded many options for siting new transmission lines. The selection of specific routes was made to provide a manageable basis for the discussion of route characteristics and preferences. Black & Veatch developed a comparative resource inventory for the alternative routes developed for the Elm Creek-Summit Line. The comparative resource inventory contains inventories of features and characteristics identified within and along each of the routes.

The composite score values at the bottom of Table 4-4 in Exhibit 1 represent the result of efforts to quantify land use along each route using land data embedded in the state of Kansas GIS maps of the area and factoring in cost-related data by counting the number of angle structures and crossings. Low scores are better than higher scores in the Table, and the proposed route is usually the route which scores the lowest, or best. The length of each type of land use and the number of angle structures or crossings is multiplied by the assigned weight of each and the products are added to arrive at the composite scores for each route. For the Elm Creek Substation to the interconnection point with Westar, the preferred route was the best-scoring, technically viable route that also resulted in the best-scoring overall project route when combined with the Westar portion of the project.

The assignment of values in Table 4-5 is based on the desirability of types of land for construction of transmission lines. Therefore, areas which are the most barren and have the fewest obstacles are generally the best prospects for construction and have the

lowest scores. With respect to residences, the nearness of the routes to residences has been addressed in three ways in the Route Selection Study. The first way was accomplished through desktop work with online aerial photography and also through direct observations in the field in September 2012. These efforts confirmed that no residence would be closer than 500 feet[2] to any of the proposed lines. The second way, which is reflected in the scoring, is contained in the "developed" land use categories, which are defined as areas characterized by varying percents of constructed materials (*e.g.*, asphalt, concrete, buildings, etc.). The third way, also reflected in the scoring, is in the number of angles. On the routes contained in the Route Selection Study, many of the angles placed in the lines were done to avoid residences, as well as businesses, institutional buildings or environmentally sensitive areas.

Q: Which route was selected as the Proposed Route for which the Companies seek approval in this docket?

A: The Proposed Route identified for the ITC project, a map of which is attached to my testimony as **Exhibit 3,** is composed primarily of the westernmost of the three alternative routes with a crossover to the central route just north of the change of ownership point.. It is a combination of three individual route segments and resulted from the combination of route scoring, route reconnaissance and the input we received from landowners.

Q: Please describe the environment in which the line was sited.

A: A description of the soils, climate, hydrological resources, biological resources and land uses are included the Route Selection Study as Exhibit 1. At least 90% of each route is in either agricultural land or in grassland, most of which is suitable for pasture. Most of the

[2] 500 feet is the distance determined by Black & Veatch and ITC Great Plains as a reasonable and appropriate distance to maintain from residences. This is not a legal set-back requirement nor a statutory requirement in Kansas.

streams and rivers in the study area are small. In the northernmost five miles of the study area, flow is generally to the north or northeast. In the remainder of the study area, flow is generally to the south or southwest. Large stands of trees are rare, with most trees found near streams and rivers. The study area is home to many species of plants and animals and these are described in the report.

Q: Is there any other information you would like to provide?

A: Yes. I'd like to conclude by stating that ITC Great Plains, in addition to directing Black & Veatch to find routes with the least impact to residents and the environment, has made a concerted effort to communicate with environmental agencies, inform landowners in the study area, ask for their comments and concerns, and then respond to those concerns with route changes wherever they are technically and economically feasible. Because of these efforts, I believe that the Proposed Route adequately addresses the objectives of the project and minimizes overall impacts to landowners and the environment.

Q: Does this complete your testimony?

A: Yes, it does.

VERIFICATION

STATE OF KANSAS)
) ss.
COUNTY OF JOHNSON)

I, Salvatore Falcone, of lawful age, being duly sworn upon my oath state that I am a senior environmental engineer and permitting manager at Black & Veatch; that I was engaged by ITC Great Plains, LLC, to perform a routing study for its portion of the Elm Creek-Summit Transmission Line project; that I have read the above and foregoing Direct Testimony and, upon information and belief, state that the matters therein appearing are true and correct.

Salvatore Falcone

SUBSCRIBED AND SWORN to before me on this 22nd day of April, 2013.

Notary Public

My commission expires:

RENEE M. LINK
My Appt. Exp. 11-16-2014

RENEE M. LINK NOTARY PUBLIC STATE OF KANSAS

Route Selection Study

Elm Creek to Summit
345 kV Transmission Line Project
Cloud and Ottawa Counties

Prepared by:

Black & Veatch Corporation
Overland Park, Kansas

And

ITC Great Plains
Topeka, Kansas

April 2013

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1.0 Introduction

ITC Great Plains, LLC (ITC), a subsidiary of ITC Holdings Corporation, is proposing the construction of a new 345,000 volt (345 kV), single-circuit transmission line between ITC's Elm Creek Substation near Aurora, Kansas and a point in east-central Ottawa County near Wells, Kansas (change of ownership point). South of this point the continuation of the line will be owned by Westar Energy (Westar). The entire project, from ITC's Elm Creek Substation to Westar's Summit Substation near Salina, Kansas, is approximately 60 miles in length and is divided in half between ITC and Westar

The project is entirely within the state of Kansas and consists of the expansion of existing substations at Elm Creek (by ITC) and Summit (by Westar) and construction of a new 345 kV, single-circuit transmission line connecting the two substations. Figure 1-1 shows the Elm Creek to Summit routing study area and the locations of the two substations.

The proposed transmission line in the ITC portion of the project will be a single circuit line designed for a capacity of 1,800 MVA. The substation equipment ratings will be 3,000 amperes at a minimum. The line will be built primarily with self supporting, weathering, tubular steel monopoles with a vertical davit arm configuration (Figure 1-2). Other structure types may be utilized for special situations, such as long-span crossings or heavy angles. The transmission line conductors will be arranged in a two conductor bundle per phase. An overhead ground wire will be located at the top of the structures as well as two shield wires. The structures will utilize I-string insulator assemblies for tangent and small angle structures. Typical span lengths will be approximately 900 feet. Structure placement and span lengths will be adjusted in cultivated fields, if possible, to minimize interference with the operation of existing or proposed center pivot irrigation systems. A new 200-foot wide easement will be required for the Project.

ITC retained the services of Black & Veatch Corporation (Black & Veatch) as an independent consultant to provide the following services:

- Assist ITC in developing a preferred route and alternative routing options between its Elm Creek Substation and the change of ownership point.
- Conduct a general environmental and engineering review of the potential routing options.
- Identify permits and formal approvals required for the routes.

Black & Veatch performed the same services for Westar. Those are described in a separate routing study report.

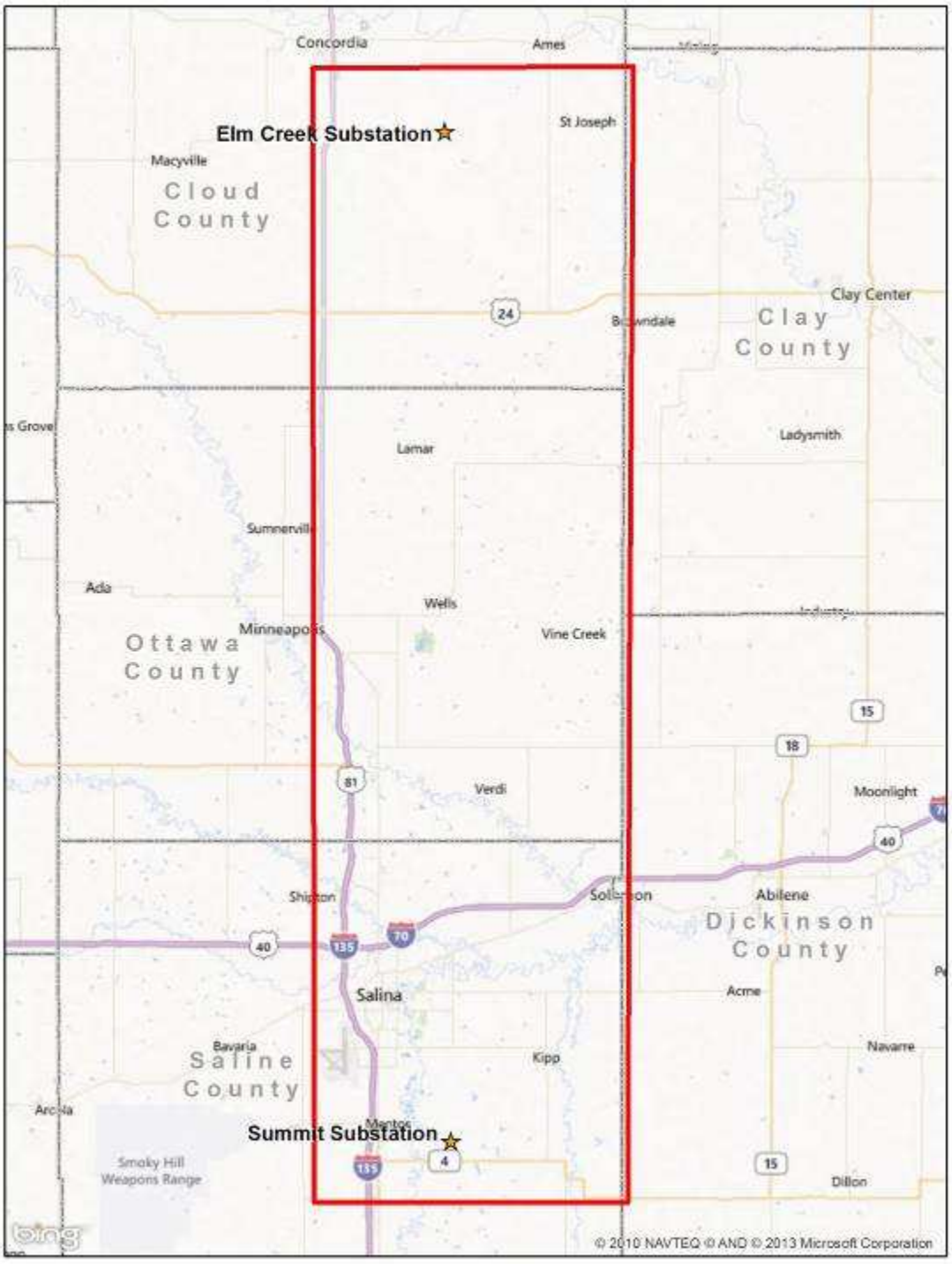


Figure 1-1
Elm Creek to Summit Study Area

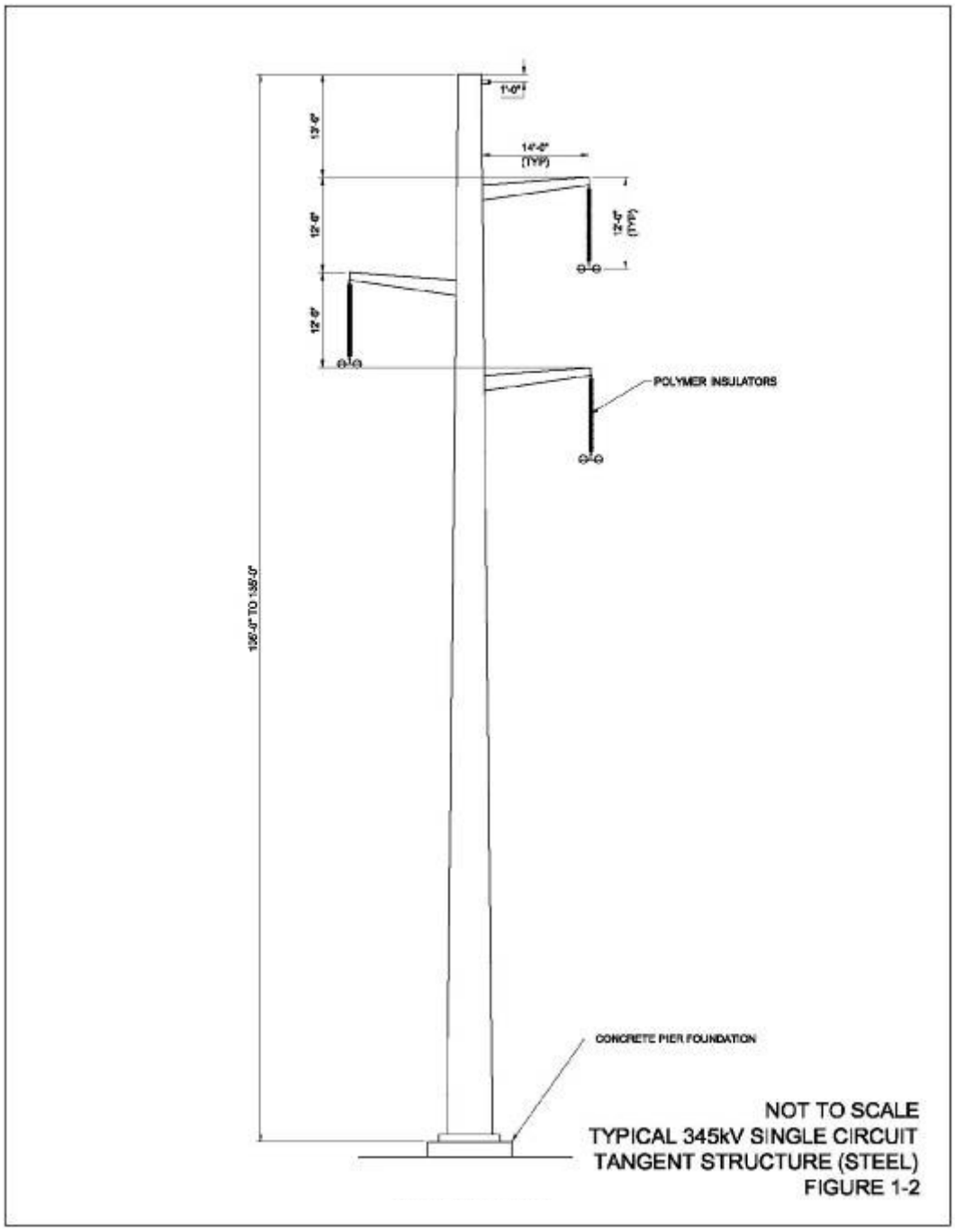


Figure 1-2
Typical 345 kV Single-Circuit Structure

2.0 Project Purpose and Need

In 2009, the SPP Board of Directors authorized implementation of the recommendations in a Synergistic Planning Project Team's (SPPT) report. The recommendations were for creating a reliable and cost-effective transmission system for the SPP region. In order to achieve this goal, the SPP created the Integrated Transmission Planning (ITP) process which is SPP's approach to planning transmission needed to maintain reliability, provide economic benefits and achieve public policy goals to the SPP region in both the near and long-term. The ITP process is a three-year iterative process that includes 20-Year, 10-Year and Near-Term Assessments. On January 31, 2012, the SPP Board of Directors approved the Elm Creek-Summit project to be constructed as part of the 2012 ITP 10-Year (ITP10) Assessment. The purpose of the Elm Creek-Summit Line is to address reliability issues related to the north-central Kansas area for the loss of the Elm Creek-Northwest Manhattan 230 kV line (including potential voltage collapse). This project will also support future Southwest Power Pool, Inc. ("SPP") energy markets, provide for wide-ranging dispatch savings, improve dynamic performance and grid stability during extreme events and provide additional societal economic benefits. Further, construction of the Elm Creek-Summit Line will provide for more efficient use of existing generation resources and reduce line losses.

3.0 Route Selection Process

The activities associated with the development of routing options for the project include the following:

- Preliminary desktop route mapping
- Agency contacts and data collection.
- Field examination of the proposed routes
- Revised desktop route mapping
- Environmental evaluation
- Initial local stakeholder and landowner contacts
- Public meetings and subsequent landowner contacts
- Route modifications based on public and landowner input

Using the information obtained from these activities, final route delineations were determined and are presented in this report.

3.1 Preliminary Desktop Route Mapping

At the outset of routing activities for this project, and before specifying routing alternatives on a map, the endpoints were identified and located. For this Project, the existing ITC Elm Creek Substation was fixed as the north terminus and the existing Westar Summit Substation was fixed as the southern terminus. The entire project included both the ITC and Westar portions so a change of ownership point needed to be identified as well.

Black & Veatch used the spatial analysis tool within the ESRI® ArcGIS suite of tools to identify potential routes after constraints and avoidance areas were identified. By varying the constraints from one GIS (Geographic Information Systems) analysis to another, multiple routes between the fixed points (substations) were obtained. Once obtained, these very preliminary routing options were imported into online aerial photography tools including, but not limited to, MapQuest®, Google™ Earth, and Bing™ Maps. For each portion of the study area, the site with the best photographic quality or the most recent image was used. Using online aerial photography, the desktop examination of routing options was done by centering approximately one square mile of area at a time on the computer screen, searching the photograph for the presence of houses, businesses, cemeteries, center pivot irrigation systems, and other items to avoid, and zooming in for more details when necessary. Wherever potential obstructions were observed, revisions to the GIS-generated routes were made on screen.

Once this on-line proofing process was completed for all of the route alternatives initially generated by the GIS analysis, paper maps were created. These were used for the route reconnaissance work to be described later. Maps of the entire Project area were also included in consultation request letters sent to environmental agencies.

3.2 Agency Contacts and Data Collection

Environmental data that could be pertinent to the location and environmental evaluation of the preliminary routing options were gathered for the following:

- Federal and state threatened and endangered (listed), candidate, and proposed plant and animal species and habitats, as well as Species In Need of Conservation (SINC).
- Wetlands and navigable waters of the United States.
- State park locations.
- Known and recorded historic and archaeological sites.

Black & Veatch contacted federal, state and local agencies as part of data collection and environmental consultation. The objective of making the contacts is the identification of issues of concern for the agencies after their review of the Project and the determination of the permits and approvals that will be required. The results of these contacts are summarized in Section 5.5 of this report. Copies of the letters received from the agencies are contained in Appendix D, Agency Responses to Requests for Consultation.

3.3 Field Investigations

Black & Veatch performed an initial environmental field review of the preliminary routing options on September 24-26, 2012. Three Black & Veatch professionals: a permitting manager, routing specialist, and ecologist, performed these field reviews. The team examined the preliminary routes for constructability potential, avoidance areas, obstructions, and for the presence of wetlands and protected species habitats. Observations were made primarily by vehicle and occasionally on foot at accessible road crossings, public access points, and from roads, railroads and pipelines that paralleled or crossed the route alternatives. No attempt was made to enter private property. In areas where public roads terminated before crossing preliminary routes, the survey team found the best accessible vantage point for observation.

Field observations were made to verify information previously observed on or interpreted from aerial photography, satellite imagery and composite topographic maps or to examine areas where new alignments might be needed, such as at creek crossings. The field observations also provided current information relative to new land use activity in recent months. Field observations also proved valuable in those areas where trees on aerial photographs blocked the view of the ground, potentially hiding residences, farm buildings, and other structures to avoid.

Handwritten notes for areas of possible concern or further study were placed on hard copies of the aerial photographs in the field and then transcribed for clarity before being presented to Black & Veatch GIS personnel for development of the route maps that accompany this report. ExpertGPS™ was also used in the field to pinpoint locations, record

driving routes, provide up-to-date maps, and record field data. ExpertGPS™ is mapping software that was used with a laptop computer in the survey vehicle.

3.4 Environmental Evaluations

Black & Veatch conducted an environmental evaluation of the project area and each of the preliminary routing options. Consideration was given to potential impacts from construction and operation of the proposed 345 kV transmission line to the observed existing environment. While a final determination of impacts rests with a detailed on-site evaluation, the initial reconnaissance aided in revealing routing alternatives that may be less desirable from constructability, operational, social or environmental aspects as well as additional possible alternate route segments.

The Project area surveyed covered roughly the southeast quarter of Cloud County in ITC's territory, the eastern half of Ottawa County, containing the change of ownership point, and the northeast quarter of Saline County, in Westar's territory (see Figure 1-1).

Using aerial photography and GIS-based environmental data coupled with field observations, Black & Veatch conducted an environmental evaluation of each of the preliminary routing alternatives. Areas of possible concern were noted on copies of the aerial photography to improve the alternative routes and aid in determining a preferred route. This initial evaluation focused on extant natural resources in the project area, primarily surface water crossings (e.g., streams, canals and ditches), wetlands, major plant communities, observed wildlife species, and possible listed species habitat. While not strictly under legal protections, species listed as candidate or proposed species at the federal level or SINC at the state level also were evaluated if observed in the project vicinity. Consideration for potential impacts from construction and operation of the proposed 345 kV transmission line to wetlands and listed species at state and federal levels was the primary concern, with a strong focus on routing alternatives that avoid direct impacts to these resources. This section of the report covers the portion of the project to be constructed by ITC, which includes the route from the Elm Creek Substation to the change of ownership point at Justice Road in east-central Ottawa County.

3.4.1 Physiographic Setting

The project area lies in the Smoky Hills ecoregion of the Central Great Plains (Chapman et al., 2001). The Smoky Hills ecoregion is an undulating to hilly dissected loess plain with sandstone hills. The region is transitional, with a variable temperate continental climate and potential natural vegetation ranging from tallgrass prairie in the east to mixed grass prairie in the western part. Some floodplain forests are present near larger streams, most narrowly confined to the streambanks and therefore trees in the region are relatively sparse. The dominant soil order is Mollisols, very dark colored, rich, mineral soils formed under grasses and savanna vegetation. The soils generally are silty and loamy, and formed

in loess (fine-grained wind-blown soils), with some areas of sandy soils formed from weathered sandstone. Much of this ecoregion has been converted to agricultural uses, either for growing crops in relatively level areas (winter wheat is the primary crop, but with more corn grown in irrigated areas), or rangeland and pasture in areas unsuitable for conventional tillage. Center pivot irrigation is used on level areas to a greater degree than in surrounding regions. Drainage in most of the area has been modified to favor agriculture, although larger streams were not extensively channelized and these meander naturally. The average annual precipitation ranges from 24 to 28 inches with a bimodal distribution, leaving the summer months relatively dry except for occasional cloudbursts.

Most of the project area is a broad mix of grassland (rangeland, pasture and fallow) and actively cultivated agricultural fields. Some fallow areas may also be Conservation Reserve Program (CRP) areas or set-asides for wildlife habitat. The agricultural crops present are primarily Corn (*Zea mays*), Wheat (*Triticum aestivum*), Sorghum (*Sorghum bicolor*) or Grain Sorghum and hay or straw (various grasses). Fallow fields generally are inhabited by a variety of old-field species, such as ragweed (*Ambrosia* spp.), pigweed (*Amaranthus* spp.), Canadian Horseweed (*Conyza canadensis*), Lamb's Quarters (*Chenopodium album*), Pinkweed (*Polygonum pensylvanicum*) and Yellow Foxtail (*Setaria pumila*). These and other old-field, weedy or ruderal species also are abundant along road edges, fencelines between fields, and other disturbed or neglected areas.

3.4.2 Wetlands

Wetlands in the project area were evaluated using a combination of aerial photography review and on-site observations. While this rapid assessment methodology can reveal many wetland areas, the level of resolution is low and additional fieldwork would be needed to fully evaluate wetland boundaries and the potential for a given wetland area to be regulated, as well as the potential for wetland impacts from the Project requiring a permit from the U.S. Army Corps of Engineers.

Wetlands in the project vicinity generally are associated with streams and often are in low-lying areas with poor drainage. Although not strictly speaking wetlands, stock ponds and streams (rivers, creeks, etc.) are included as potentially protected waterbodies. Most ponds in the Project area were excavated in low areas or were formed by obstructing surface flow to create an impoundment. These constructed ponds generally serve as a water source for cattle and some incidental wildlife species and most are relatively small in size (less than one acre).

Specific wetland types observed in the project area consist primarily of emergent wetlands (wetlands with rooted vegetation that stands above the water surface). Aquatic bed wetlands (wetlands dominated by submerged aquatic vegetation), forested wetlands (dominated by trees), and scrub-shrub wetlands (dominated by brushy woody vegetation other than trees) also are frequent. Transmission line construction requires avoidance of

sharp elevation changes over short distances, so most wetlands would be spanned without any direct impacts because they are in low-lying locations. However, location of construction access roads must consider wetlands because wetlands can be inadvertently disturbed by construction equipment when access is poorly sited. Based on this initial review, none of the wetlands observed will be impacted by construction access because better alternative construction access routes appear to be available. Additional detailed investigation during the design process will aid in developing access routes that avoid sensitive natural resources, such as wetlands.

A secondary concern with wetlands, ponds and streams is safe access for wildlife using these habitats, particularly migrating birds. Several such areas are close to or crossed overhead by each of the route alternatives, which may pose a collision risk for some bird species. However, in most cases the wetlands crossed are small and unlikely to harbor large concentrations of migratory birds, particularly during fall migration when many of the smaller wetlands are dry. Northward migration in spring typically is completed more quickly than the southern migration, meaning many layover locations potentially used in fall are passed over in spring. While some wetlands in the region might be used by small flocks of migrating birds, many of the wetlands in the project area were dry at the time of the September 2012 site reconnaissance, suggesting that they were less likely to be used during fall migrations. Small wetland areas are less desirable to migrating birds because of limitations associated with forage (quantity and quality) and predation risk. Therefore, the collision risk while being a concern, should not pose a major risk to migratory birds resulting in population level effects.

3.4.3 Wildlife and Wildlife Habitats

Woodlots are small stands of trees (i.e., less than 40 acres) that occur mainly in moist areas (e.g., riparian zones associated with streams), on soils considered poor for agriculture or slopes too steep for farm machinery. Few are dense enough to qualify as forest and none is large enough to represent habitat for wildlife species requiring a deep interior (generally roadless woodland of 500 acres or more with a minimum distance of 300 feet from any forest edges). In most cases the only migratory pathway is not along a corridor (i.e., woodlots generally are isolated from each other by farmland or rangeland), requiring wildlife to traverse fields or other open areas, which may represent an obstacle for some species.

Wildlife habitat associated with the project area principally consists of open grassland and agricultural land. Urbanized areas are far apart and most development is limited to farmsteads with a residence, barn or sheds and other outbuildings. Unimproved roads traverse portions of the project area, most often in a grid pattern with adjustments in locations where soils or other conditions prohibit roads. Portions of the project area are located adjacent to or intersect riparian areas associated with streams. Many streams

appear to be ephemeral or intermittent and were dry during the site reconnaissance. Streambeds in many of these dry streams were partially vegetated, further confirming the infrequent flows. Constructed ponds dot the landscape, mainly on rangeland, a few with associated wetland vegetation downstream of the pond outfall or where seepage through a dike may occur. Most of these ponds were constructed for livestock watering, but they are likely to be used by some wildlife species, such as deer.

Wildlife observed during the site reconnaissance (Table 3-1) were primarily generalist species; that is, those capable of exploiting grazed grassland or scattered woodlots and able to meet their needs in these areas. The dominant plant communities are mixed grass prairie (rangeland) and agricultural lands, which are heavily disturbed by cultivation. Table 3-1 and Table 3-2 below present wildlife and plant species observed during the routing study, respectively. Because wildlife encounters are dependent on time of day, weather conditions, available cover, season, availability and quality of forage, Table 3-1 should not be considered a comprehensive determination of the wildlife present. However, the table is representative of the common and dominant species present in the project area.

Table 3-1. Wildlife Species Observed in the ITC Portion of the Elm Creek to Summit Project

Common Name	Scientific Name	Federal Status	State Status
Birds			
American Crow	*Corvus brachyrhynchos*	--	--
American Kestrel	*Falco sparverius*	--	--
Barn Swallow	*Hirundo rustica*	--	--
Canada Goose	*Branta canadensis*	--	--
Eastern Meadowlark	*Sturnella magna*	--	--
European Starling	*Sturnus vulgaris*	--	--
Field Sparrow	*Spizella pusilla*	--	--
Great-tailed Grackle	*Quiscalus mexicanus*	--	--
Grey Catbird	*Dumetella carolinensis*	--	--
Horned Lark	*Eremophila alpestris*	--	--
Killdeer	*Charadrius vociferus*	--	--
Mourning Dove	*Zenaida macroura*	--	--
Northern Harrier	*Circus cyaneus*	--	--
Red-tailed Hawk	*Buteo jamaicensis*	--	--
Rough-legged Hawk	*Buteo lagopus*	--	--
Song Sparrow	*Melospiza melodia*	--	--
Turkey Vulture	*Cathartes aura*	--	--
White-faced Ibis	*Plegadis chihi*	--	--
Wild Turkey	*Meleagris gallopavo*	--	--
Mammals			
Domestic cattle	*Bos taurus*	--	--
Black-tailed Prairie Dog	*Cynomys ludovicianus*	--	--
Opossum	*Didelphis virginiana*	--	--
White-tailed Deer	*Odocoileus virginianus*	--	--
Fox Squirrel	*Sciurus niger*	--	--
Reptiles			
Black Rat Snake	*Pantherophis obsoletus*	--	--
Ornate Box Turtle	*Terrapene ornata*	--	--
Insects			
Cloudless Sulphur	*Phoebis sennae*	--	--

Table 3-2. Plant Species Observed in the ITC Portion of the Elm Creek to Summit Project

Common Name	Scientific Name	Federal Status	State Status
Plants			
Rough Amaranth	*Amaranthus retroflexus*	--	--
Common Ragweed	*Ambrosia artemisiifolia*	--	--
Western Ragweed	*Ambrosia psilostachya*	--	--
Giant Ragweed	*Ambrosia trifida*	--	--
Big Bluestem	*Andropogon gerardii*	--	--
Common Milkweed	*Asclepias syriaca*	--	--
Side-oats Grama	*Bouteloua curtipendula*	--	--
Blue Grama	*Bouteloua gracilis*	--	--
Smooth Brome	*Bromus inermis*	--	--
Nodding Thistle	*Carduus nutans*	--	--
Lamb's Quarters	*Chenopodium album*	--	--
Chicory	*Cichorium intybus*	--	--
Bull Thistle	*Cirsium vulgare*	--	--
Roughleaf Dogwood	*Cornus drummondii*	--	--
Bermudagrass	*Cynodon dactylon*	--	--
Purple Prairie Clover	*Dalea purpurea*	--	--
Jimson's Weed	*Datura strumonium*	--	--
Illinois Bundleflower	*Desmanthus illinoensis*	--	--
Horseweed	*Erigeron canadensis*	--	--
Snow-on-the-mountain	*Euphorbia marginata*	--	--
Grass-leaved Goldenrod	*Euthamia graminifolia*	--	--
Soy Bean	*Glycine max*	--	--
Annual Sunflower	*Helianthus annuus*	--	--
Sawtooth Sunflower	*Helianthus grosseserratus*	--	--
Stiff Sunflower	*Helianthus pauciflorus*	--	--
Bitternut Hickory	*Juglans cinerea*	--	--
Eastern Red Cedar	*Juniperus virginiana*	--	--
Osage Orange	*Maclura pomifera*	--	--
White Mulberry	*Morus alba*	--	--
Pokeweed	*Phytolacca americana*	--	--
Heartsease	*Polygonum lapathifolium*	--	--
Eastern Cottonwood	*Populus deltoides*	--	--
Smooth Sumac	*Rhus glabra*	--	--
Curly Dock	*Rumex crispus*	--	--
Black Willow	*Salix nigra*	--	--
Tall Fescue	*Schedonorus arundinaceus*	--	--
Giant Foxtail	*Setaria faberi*	--	--
Yellow Foxtail	*Setaria pumila* ssp. *pumila*	--	--
Rosinweed	*Silphium integrifolium*	--	--
Horse Nettle	*Solanum carolina*	--	--
Canada Goldenrod	*Solidago canadensis*	--	--

Table 3-2. Plant Species Observed in the ITC Portion of the Elm Creek to Summit Project			
Common Name	**Scientific Name**	**Federal Status**	**State Status**
Indian Grass	*Sorghastrum nutans*	--	--
Milo	*Sorghum bicolor*	--	--
Johnsongrass	*Sorghum halepense*	--	--
Prairie Cordgrass	*Spartina pectinata*	--	--
White Heath Aster	*Symphyotrichum ericoides*	--	--
Wheat	*Triticum aestivum*	--	--
American Elm	*Ulmus americanus*	--	--
Siberian Elm	*Ulmus pumila*	--	--
Common Mullein	*Verbascum thapsus*	--	--
Prairie Ironweed	*Vernonia fasciculata*	--	--
Corn	*Zea mays*	--	--

3.4.4 Endangered and Threatened Species

Table 3-3 lists the species listed as threatened or endangered at federal or state levels, federal candidate species or state SINC species. Some species have been affected by conversion of grassland to row crops (e.g., Henslow's Sparrow, Short-eared Owl, and Ferruginous Hawk). While grassland habitats are present in the project area, many are small in extent (e.g., less than 100 acres) or they are fragmented by roads or other infrastructure, which limits the population size and use of the habitat by species sensitive to disturbance and habitat fragmentation.

None of the listed species was observed in the project area during the site reconnaissance and no federally designated critical habitat is present in the project area. Based on the initial site reconnaissance, suitable habitat may be present in the project area for nine species; Golden Eagle (*Aquila chrysaetos*), Short-eared Owl (*Asio flammeus*), Ferruginous Hawk (*Buteo regalis*), Bobolink (*Dolichonyx oryzivorus*), Eastern Spotted Skunk (*Spilogale putorius*), Eastern Hognose Snake (*Heterodon platirhinos*), Western Hognose Snake (*Heterodon nasicus*), Plains Minnow (*Hybognathus placitus*), and Shoal Chub (*Macrhybopsis hyostoma*). In addition, the entire length of the project lies within the eastern fringe of the migration corridor used by the western population of Whooping Crane (*Grus americana*).

Although suitable migration habitat for Whooping Crane appears to be present in some locations (principally cropland close to large wetlands, shallow ponds, or wetland complexes), the project area generally is unlikely to be used by this species because few large wetland areas suitable for layovers are present in the Project area. Most of the wetlands present are dry during the fall migration, making them less likely to be used by cranes. In rare cases, weather can force migrating cranes eastward (two instances occurred east of the Project near Manhattan, KS about 11 years apart; both were related to strong

storms that displaced migrating cranes in the western population eastward as far as Illinois). However, this is not considered a significant factor placing Whooping crane at a high risk because of the infrequent use of the project area. It is possible that weather conditions could infrequently force migrating cranes in the eastern population far enough west to enter the Project area, but again the level of risk to cranes is considered low because of the limited habitat availability. Cranes displaced from normal migration routes aside, Whooping Crane collisions with the proposed Elm Creek to Summit transmission line are considered a low probability because of a very low occurrence in the Project vicinity.

Habitat suitable for Eastern Spotted Skunk (*Spilogale putorius*) in the project area is associated with open woods along streams. This habitat would primarily be affected where tree removal in the transmission line right-of-way (ROW) could prevent movement in riparian travel corridors used by the species. Eastern Spotted Skunk tends to avoid open or unvegetated areas. Revegetation of the ROW should restore the use of these areas by Eastern Spotted Skunk even if trees remain absent. Impacts to other habitats used by the skunk are not likely to move the species closer to extinction because much larger areas of the same habitats, including the prey species contained in them, would continue to be present.

Both snake species could be present, although the extensive habitat alteration for cultivation throughout the project area may reduce the suitability for Western Hognose Snake, while wetland drainage for agriculture may limit the distribution of Eastern Hognose Snake, if present. It is anticipated that the small-scale disturbances represented by the addition of power poles to the landscape will not adversely affect these species, if present.

Habitat for shorebird species (Least Tern, Snowy Plover and Piping Plover) is highly localized and generally marginal in the Project area. None are listed as being present in the Project area by the FWS, although the species' range includes the Project. Stock ponds during drawdown in late summer/early fall could provide resting habitat during migration, but most of the ponds are distant from the route alternates. The marginal nature of this habitat probably precludes breeding populations of these species in the Project area; therefore, it is considered unlikely that these species would be significantly affected by the Project. Similarly, marsh habitats in the project area are generally less than 13 acres, the smallest reported marsh size used by Black Tern. This species is not likely to be present, or if present would not be adversely affected by the project. Eskimo Curlew has not been observed in Kansas since 1902 and is considered extirpated (locally extinct). Although the possibility remains that migrant curlews could pass through Kansas, adverse effects are considered unlikely because it is not apparent that the Project would be in the migratory path. American Burying Beetle is reported from southeastern Kansas, but has not been reported in Saline County by the FWS. While the historic range of the beetle includes the Project, it is considered unlikely to be present and would not be affected.

As defined by Kansas Administrative Regulations, state-designated critical habitats include those areas documented as currently supporting self-sustaining population(s) of any threatened or endangered species of wildlife as well as those areas determined essential for the conservation of any threatened or endangered species of wildlife by the Kansas Department of Wildlife, Parks and Tourism (KDWPT). Although critical habitat has been designated for the Plains Minnow and Shoal Chub in the Republican River downstream of the Lovewell Reservoir, the mainstream channel is not crossed by the three routes under consideration in this routing study. Further consultation with the KDWPT may be necessary to evaluate the Republican River tributaries crossed by the route near the Elm Creek Substation. However, impacts to these and other streams in the Project would be limited to crossings, either for stringing the conductors after poles have been erected or for access during construction, and by tree removal within the ROW to prevent line hazards or outages per North American Reliability Corporation (NERC) vegetation requirements. Because the stream impacts would be subject to conventional erosion control and sedimentation controls, it is anticipated that any such impacts would be minimal and not a significant threat to either fish species. If streams or ponds can be spanned without entering the water and conventional best management practices (BMPs) are employed to prevent erosion and sedimentation, aquatic species would not be adversely affected by the project. If streams potentially containing protected aquatic species would be crossed, additional site-specific study and consultation with state or federal resource agencies is recommended. An Action Permit obtained from the KDWPT may be required for habitat impacts related to stream access in the Republican River tributaries if they are suitable for use by Plains Minnow or Shoal Chub. Further agency consultation, possibly including a detailed onsite investigation, is recommended after the preferred route is selected.

Habitat for the other protected species is not present, is not suitable (extent, quality, level of disturbance, fragmentation, etc.) or the species' known range does not include the project area. Avoidance of most wildlife habitat, mainly wetlands, ponds and streams or rivers, would be accomplished by spanning the area and through selective support structure placement. In addition to structure placement, consideration for construction access needs to be made, which cannot be accurately evaluated at this stage of the Project investigation. Based on this preliminary review, significant adverse impacts to listed species or their habitats are not anticipated, although as project details develop additional review and agency consultation are recommended.

Not included in the list of protected species are several species recently delisted but still considered imperiled because of low population numbers or poor distribution in available habitats. One of these is the Bald Eagle (*Haliaetus leucocephalus*), which could use large trees along larger streams or rivers as nesting habitat in the project area. If any nests are located in the project area, protections under the Bald and Golden Eagle Protection Act (BGEPA) or the Migratory Bird Treaty Act (MBTA) could be invoked by the FWS. Additional

analysis to evaluate the potential for impacts to Bald Eagles is recommended in areas adjacent to streams with wooded corridors before any tree clearing occurs. In particular, an on-site nest survey is recommended to determine if Bald Eagle nests are located within 0.5-mile of rivers, larger streams, lakes or large ponds and other large waterbodies near the route alternatives. Nests located at this distance may prompt a route re-location to avoid the nest site(s).

Table 3-3. Protected Species in the Elm Creek to Summit Project Area

Common Name	Scientific Name	State Status	Federal Status	County of Occurrence*
Birds				
Henslow's Sparrow	*Ammodramus henslowii*	SINC	--	CL
Golden Eagle	*Aquila chyrsaetos*	SINC	--	CL, OT, SA
Short-eared Owl	*Asio flammeus*	SINC	--	OT, SA
Ferruginous Hawk	*Buteo regalis*	SINC	--	SA
Snowy Plover	*Charadrius alexandrinus*	T	--	CL, OT, SA
Piping Plover	*Charadrius melodus*	T	LT	CL, OT, SA
Black Tern	*Childonias niger*	SINC	--	CL, OT, SA
Bobolink	*Dolichonyx oryzivorus*	SINC	--	CL, SA
Whooping Crane	*Grus americana*	E	LE	CL, OT, SA
Eskimo Curlew	*Numenius borealis*	E	LE	CL, OT, SA
Least Tern	*Sterna antillarum*	E	LE	CL, OT, SA
Mammals				
Eastern Spotted Skunk	*Spilogale putorius*	T	--	CL, OT, SA
Reptiles				
Western Hognose Snake	*Heterodon nasicus*	SINC	--	CL, OT, SA
Eastern Hognose Snake	*Heterodon platirhinos*	SINC	--	SA
Fish				
Plains Minnow	*Hybognathus placitus*	T	--	CL
Shoal Chub	*Macrhybopsis hyostoma*	T	--	CL
Topeka Shiner	*Notropis topeka*	T	LE	SA
Mussels				
Cylindrical Papershell Mussel	*Anodontoides ferussacianus*	SINC	--	CL, OT, SA
Insects				
American Burying Beetle	*Nicrophorus americanus*	E	LE	SA

* CL = Cloud; OT = Ottawa; SA = Saline; reported county occurrences per Kansas Department of Wildlife, Parks and Tourism (KDWPT).

Cultural resources in the project area were not reviewed before or during the site reconnaissance except to the extent of information obtained from online sources and USGS maps. Historic properties and archaeological sites will be reviewed in consultation with the

Kansas State Historic Society and State Historic Preservation Officer before the beginning of construction.

Evaluation of the human environment included consideration of existing and future land uses, proximity to residences, schools, churches, subdivisions and other population concentrations, industrial developments, other existing utilities and linear rights-of-way, visual impacts, and irrigated farmlands.

3.5 Local Stakeholders and Public Meetings

ITC has actively informed stakeholders about the Project and engaged them in the consultation process. The principal methods of engagement have consisted of public open house meetings or workshops, smaller meetings with community leaders and landowners.

Three public workshops were held, the first conducted at the Miltonvale City Building, Senior Center Room in Miltonvale on December 4, 2012, the second at the Bennington Bible Church in Bennington on December 5, and the third at the Bicentennial Center in Salina on December 6. These workshops were held to inform potentially affected landowners and to seek their comments. Landowners owning property within 1,000 feet of the center line of any of the proposed alternate routes were invited to attend the open houses, to visit with ITC and Westar employees, and to learn more about ITC, Westar, and the project. Notice of the public workshops was provided three ways: postcard invitations mailed directly to affected landowners, personal letters mailed to each landowner, and print advertisements which ran in local papers for two weeks before the event.

In addition to a registration table, the public workshops featured information stations that landowners could visit at their convenience: introduction to the Project; need for the project; maps and details of the route alternatives; GIS mapping of routes on landowner property; right-of-way information; and environmental considerations. There was also a final station where landowners were encouraged to provide feedback or ask additional questions. Feedback obtained at any of the information stations was entered into a landowner database and utilized by ITC and Westar to provide a qualitative context for the technical considerations involved in selecting a preferred route. In the center of each workshop room were two to three sets of route maps, four maps in each set.

The GIS mapping station provided landowners with the opportunity to see how the proposed routes specifically crossed their properties. By providing section, township, and range, landowners could zoom in using aerial photography to determine where a proposed route would be in relation to their homes or other structures on their properties. The environmental considerations station addressed the project's impacts not only on wildlife and humans, but on other considerations such as land use and agriculture.

All three public workshops were well attended, drawing nearly 300 visitors in total. Landowners provided contact information to facilitate future conversations, and provided written feedback on the proposed routes and any other message they wished to convey.

Every question posed by a landowner received an answer in the manner requested – most often e-mail.

Prior to the public workshops, ITC also organized Leadership Summits in both Cloud and Ottawa Counties. The informational meetings were held with a combination of key influencers, economic development personnel, local elected officials, and chamber members.

The Leadership Summits were held in Bennington and Concordia On September 18, 2012. ITC maintained contact with representatives that attended the Leadership Summits throughout the routing process to learn about planned business developments in the Project area and to get information regarding local reaction to the Project.

Community relations and stakeholder engagement has been an ITC Great Plains priority since it began operations in July 2006 and will always be one. ITC will continue to nurture relationships with affected landowners and communities based on transparency and open communication throughout the planning and construction process, and throughout its stewardship of transmission assets in Kansas.

3.6 Route Modifications

As a result of the field reconnaissance trip and comments received after the three public meetings, Black & Veatch made numerous modifications to the preliminary routing options. These modifications resulted in the identification of updated potential routes for the proposed transmission line. Modifications to the preliminary routes addressed the following avoidance areas not identified in the initial desktop work:

- Homes present in the study area.
- Parcels of land subdivided for future residential and commercial development.
- Center pivot irrigation structures.
- Oil, gas, and water wells.
- Technically challenging creek and stream crossing locations.
- Existing high-voltage transmission lines and lower voltage distribution lines.
- Wetlands.
- Communication towers.
- Other existing or planned construction near any of the potential routes.

After revisions were made to the routing options based on landowner comments, Black & Veatch developed route scores.

3.7 Proposed Routing Options

As a result of desktop research, field investigations, public meetings, and other inputs, Black & Veatch refined the routing options for the Elm Creek to Summit project and arrived at a preferred route. This process for determining the preferred route is described

in Section 4.0 of this report. The map provided in Appendix B to this report contains the preferred route alignment. All of the routes shown on the maps are technically feasible and environmentally viable options for the new transmission line.

4.0 Description of Routes and Segments

Between the Elm Creek and Summit Substations, Black & Veatch developed three primary routing options, designated on maps (see Figure 4-1) as the Yellow (western) Route 1, the Red (central) Route 2, and the Blue (eastern) Route 3. By adding five crossovers in locations where two of the primary routes are close to each other or where a crossover might shorten a route overall, additional feasible routes were developed. From Elm Creek Substation to the change of ownership point in Ottawa County, one crossover (Segment P) was added. This resulted in one additional feasible route for the ITC portion of the project. South of the change of ownership point, three crossovers (Segments Q, R, and S) were added. Additionally, in southeast Ottawa County, in Westar territory, there is a location where Routes 1 and 2 meet. This point was treated as a crossover from Route 1 to Route 2. The addition of these crossovers meant that ITC had four feasible routing options and Westar had 19 feasible routing options.

It is important at this point to provide an overview of the route and segment numbering system, particularly because of the change of ownership point in the middle of the project area. Routes 1, 2, and 3 run the entire distance from Elm Creek to Summit substations and traverse both the ITC and Westar territories. The crossovers added feasible alternative routes to the three primary routes. ITC's routes are numbered I1 through I4, and Westar's routes are numbered W1 through W19.

The addition of crossovers linking the primary routes required the identification of segments for route scoring purposes. The segments are identified by letters from A to S. Route 1 contains Segments A through D, Route 2 contains Segments E through K (the letter I was not used), and Route 3 contains Segments L through N. The crossovers were designated as Segments P through S (the letter O was not used). Finally, the point where Routes 1 and 2 meet in Ottawa County was treated as a crossover, but no crossover segment designation was needed.

Because the number of crossovers added routing alternatives to the three primary routes, analysis of each possible alternative route was done by its component segments (see Figure 4-1 for route segment locations). A segment is defined as that portion of a route between adjacent intersections with other routes or crossovers or between a substation and an intersection with another segment. For example, on Figure 4-1 Segment A on Route 1 starts at Elm Creek Substation and ends at its intersection with crossover Segment P. For this project, segments lengths ranged from 0.93 mile (Segment P) to 47.86 miles (Segment L). Each route in this project is composed of three to ten segments.

Because of the change of ownership in the middle of each primary route, there was the further need to split each segment that crossed the midpoint. This was necessary so that each route in each territory (ITC and Westar) could be scored independently for the purpose of selecting preferred routes. Segments B (Route 1), F (Route 2), and L (Route 3) cross the change of ownership point, so those segments were further divided into B1 and

B2, F1 and F2 and L1 and L2. Segments B1, F1, and L1 are in ITC territory and Segments B2, F2, and L2 are in Westar territory.

The reason for using segments to build routes is because the routing process involves many route adjustments. These adjustments are due to landowner and agency comments, new discoveries from route reconnaissance and review of aerial photography, and additional crossovers that may have become viable after the reroutes were made. By creating a spreadsheet containing data for each segment, entry of new data from a revision to one segment automatically updates the scores for all routes containing that segment. If the analysis were to be done on a whole route basis, each revision would require that every route containing the area of the revision would have to be updated individually.

For example, if a route revision had to be made to Segment G, every route containing Segment G would also have to be revised. As shown in Table 4-1, there are 12 routes containing that segment and a new GIS land use and construction factor analysis would have to be run for each of the 12 routes. By using segments, only one GIS analysis, for Segment G, is needed to update all 12 routes.

It can be noted that in most of the Project area, a greater number of additional routes might be feasible. Much of the Project area is sparsely populated, affording even more routing options than the 27 listed in Table 4-1. The selection of the three primary routes and the inclusion of several crossovers were made to provide a manageable basis for discussion of route characteristics and preferences. Identifying and analyzing many more routes would provide little or no net benefit from either an environmental or engineering standpoint.

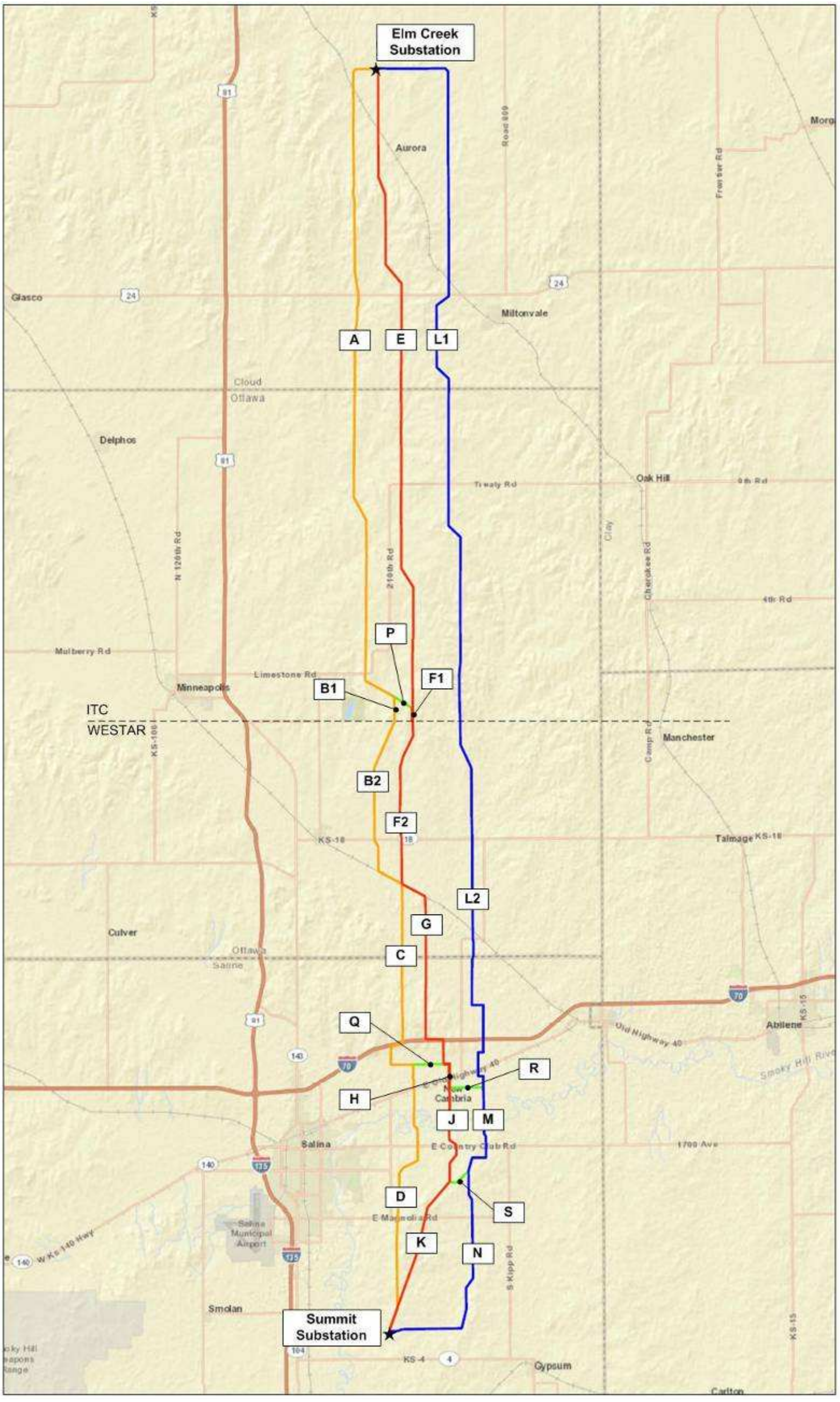


Figure 4-1: Elm Creek to Summit Route Segments

Table 4-1: Route Numbers and Segments	
Entire Route	
Route Number	Route Segments
1	A-B-C-D
2	E-F-G-H-J-K
3	L-M-N
4	A-P-F-G-H-J-K
5	A-P-F-C-D
6	A-P-F-C-Q-H-J-K
7	A-P-F-G-Q-D
8	A-B-G-H-J-K
9	A-B-C-Q-H-J-K
10	E-F-C-D
11	E-F-C-Q-H-J-K
12	A-B-G-Q-D
13	E-F-G-Q-D
14	E-F-G-H-R-M-N
15	E-F-G-H-R-M-S-K
16	L-R-J-K
17	L-M-S-K
18	A-B-G-H-R-M-N
19	A-B-G-H-R-M-S-K
20	A-P-F-G-H-R-M-N
21	A-P-F-G-H-R-M-S-K
22	A-P-F-C-Q-H-R-M-N
23	A-P-F-C-Q-H-R-M-S-K
24	E-F-C-Q-H-R-M-N
25	E-F-C-Q-H-R-M-S-K
26	A-B-C-Q-H-R-M-N
27	A-B-C-Q-H-R-M-S-K
ITC Portion of Route	
Route Number	Route Segments
I1	A-B1
I2	A-P-F1
I3	E-F1
I4	L1

4.1 Preferred Project Route

The preferred route for the entire project, including both ITC and Westar territories, is Route 4. It includes ITC's Route I2 and Westar's Route W9 and is composed of Segments A-P-F-G-H-J-K. Table 4-2 contains scoring data for ITC routes and those for the entire project. The figure in Appendix B shows the preferred ITC route.

Route 4 has the best overall score of 480.47, the second best ITC route score of 206.86 and the best Westar score of 273.61. The best ITC route score is for Route I1 at 206.67, just 0.19 or 0.09% better than I2. However, the use of ITC Route I1 results in a worse score for the entire project (486.17 or higher) and for the Westar portion of the project (279.50 or higher).

The preferred route exits the Elm Creek Substation in Cloud County to the west (Yellow Route 1) traveling 0.85 mile, turning to the southwest for 0.16 mile while crossing an existing high voltage transmission line, and then heading south for nearly 8.5 miles. At a point one mile north of US Highway 24, the route turns slightly to the southeast, crosses the highway, and turns slightly to the southwest to resume its due south orientation approximately 1.7 miles south of the highway. From this point, the route heads south for 6.9 miles, crossing into Ottawa County in the process, then heads southeast for one mile before turning south once again for 6.8 miles. At this point, the route turns to the southeast for 1.4 mile, leaves the primary Yellow Route 1 and continues on the Segment P crossover for 0.9 mile to Red Route 2. From there, it turns south and runs one-half mile to the change of ownership point at Justice Road. The total length of this route is 29.77 miles. South of Justice Road, the line continues under Westar's ownership.

Table 4-2: Elm Creek to Summit Route Scores				
Entire Route				
Route Number	Route Segments	Route Length (miles)	Route Score	Rank
1	A-B-C-D	57.89	516.78	11
2	E-F-G-H-J-K	56.53	497.20	5
3	L-M-N	61.86	518.40	13
4	A-P-F-G-H-J-K	58.14	480.47	1
5	A-P-F-C-D	57.61	501.08	7
6	A-P-F-C-Q-H-J-K	59.44	504.13	9
7	A-P-F-G-Q-D	58.87	497.54	6
8	A-B-G-H-J-K	58.42	486.17	2
9	A-B-C-Q-H-J-K	59.72	519.83	14
10	E-F-C-D	56.00	517.81	12
11	E-F-C-Q-H-J-K	57.83	520.86	15
12	A-B-G-Q-D	59.15	503.24	8
13	E-F-G-Q-D	57.26	514.27	10
14	E-F-G-H-R-M-N	60.83	563.65	22
15	E-F-G-H-R-M-S-K	58.87	541.13	18
16	L-R-J-K	60.44	493.43	3
17	L-M-S-K	59.90	495.88	4
18	A-B-G-H-R-M-N	62.72	552.62	21
19	A-B-G-H-R-M-S-K	60.76	530.10	17
20	A-P-F-G-H-R-M-N	62.44	546.92	19
21	A-P-F-G-H-R-M-S-K	60.48	524.40	16
22	A-P-F-C-Q-H-R-M-N	63.74	570.58	25
23	A-P-F-C-Q-H-R-M-S-K	61.78	548.06	20
24	E-F-C-Q-H-R-M-N	62.13	587.31	27
25	E-F-C-Q-H-R-M-S-K	60.17	564.79	24
26	A-B-C-Q-H-R-M-N	64.02	586.28	26
27	A-B-C-Q-H-R-M-S-K	62.06	563.76	23
ITC Portion of Route				
Route Number	Route Segments	Route Length (miles)	Route Score	Rank
I1	A-B1	29.38	206.67	1
I2	A-P-F1	29.77	206.86	2

Table 4-2: Elm Creek to Summit Route Scores				
I3	E-F1	28.16	223.59	4
I4	L1	31.28	210.71	3

4.2 Alternate Routes

As described in Section 4.0 above, the routing analysis yielded 4 distinct ITC routes from Elm Creek Substation to the change of ownership point at Justice Road in Ottawa County. In addition to the primary Routes 1, 2, and 3, a fourth route is created from the use of the Segment P crossover a mile north of the change of ownership point.

Table 4-3 provides a summary comparison of the preferred and three alternate routes.

Table 4-3
Comparison of ITC Route Alternatives

ITC Route #	Route Length (miles)	Route Score	Segment List	Distinctive Segments from Preferred Route
I1	29.38	206.67	A-B1	B1
I2	29.77	206.86	A-P-F1	Preferred Route
I3	28.16	223.59	E-F1	E
I4	31.28	210.71	L1	L1

Though Route I2, the preferred route, is neither the shortest nor the best scoring route, its 0.19 difference in score from I1, the best scoring route, is insignificant. Additionally, the only difference between I1 and I2 is that I2 uses the Segment P crossover north of Justice Road. This gives it an additional length of 0.39 mile but, significantly, makes it part of the overall project's best scoring Route 4, which includes the Westar portion of the project.

Route I3 is the primary Red Route 2. It is the shortest of the four routes but also the worst-scoring. This is due primarily to the presence of several floodplains along and across Route 3. Floodplain-related scores accounted for 43 additional construction score points compared to the preferred route.

Route I4 is the primary Blue Route 3. It is the longest of the four routes by 1.5 miles over the next longest, but scored relatively close to I1 and I2, the best scoring routes. The difference in score between Route I4 and the preferred route is accounted for primarily by land use, which is 8 points higher for I4 than for I2.

Based on the foregoing information, Route I2 is designated as the preferred route from Elm Creek Substation to the change of ownership point at Justice Road in Ottawa

County. The transmission line route will continue south into Westar territory using Segment F on Red Route 2.

4.3 Comparative Resource Inventory

Table 4-4 provides a comparative resource inventory for the preferred route and the alternate routes developed for the Project. It contains inventories of features and characteristics identified within and along each of the routes.

The composite score values at the bottom of the table represent, in part, the results of efforts to quantify land use along each route using land use data embedded in state of Kansas GIS maps of the area and factoring in cost considerations due to angle structures. Lower scores are better than higher scores. The length of each type of land use or other route feature is multiplied by its assigned value and the resulting products are added to arrive at a composite score for the route. The values used for land use, number of angle structures, crossings, and proximity to wind turbines are shown in Table 4-5. This table contains only those types of land use than were encountered for this project, though there are many more land uses in the state of Kansas.

With respect to land use, the assignment of values is based on the desirability of types of land for construction of transmission lines: the more barren the land, the fewer the obstructions, and the better its prospects for construction. With respect to residences, the nearness of the routes to residences has been addressed in three ways. The first way, not reflected directly in the scoring, was accomplished through direct observations in the field in September 2012, along with subsequent confirmation from aerial photographs. These efforts confirmed that no residence is nearer than 500 feet to any of the proposed lines, assuming the transmission line would be constructed in the center of its 200-foot right-of-way throughout the entire route. The second way, reflected in the scoring, is contained in the "Developed" land use categories, definitions of which can be found in Appendix C. The third way, also reflected in the scoring, is in the number of angles. On the routes contained in this project, many of the angles placed in the lines are for avoidance of residences, businesses, or institutional buildings.

Table 4-4: Comparative Resource Inventory				
Resource Categories	Route I1	Route I2	Route I3	Route I4
Total Length (miles)	29.38	29.77	28.16	31.28
Cultivated Crops (miles)	4.24	3.81	5.04	5.83
Deciduous Forest (miles)	0.44	0.44	0.80	0.82
Developed, Low Intensity (miles)	0.00	0.00	0.02	0.00
Developed, Open Space (miles)	0.85	1.22	2.93	1.70
Grassland/Herbaceous (miles)	23.73	24.18	19.27	22.80
Hay / Pasture (miles)	0.06	0.06	0.04	0.00
Mixed Forest	0.04	0.04	0.00	0.00
Open Water (miles)	0.02	0.02	0.06	0.13
Number of Flood Zones > 800 feet wide	1	1	9	3
Number of Flood Zones ≤ 800 feet	8	7	10	10
Number of Angle Structures ≥ 30 degrees	6	6	5	8
Number of Angle Structures < 30 degrees	9	9	6	2
Number of High-Voltage Transmission Line Crossings	2	2	1	1
Number of Federal or State Highway Crossings	1	1	1	1
Number of Railroad Crossings	1	1	1	1
Number of River Crossings	0	0	0	0
Number of Sited Wind Turbines within 500 feet	0	0	0	0
Composite Score	206.67	206.86	223.59	210.71

Table 4-5
Assigned Values for Types of Land Use and Technical Issues

Type of Land Use and Construction Factors*	Assigned Value**
Barren Land	1
Cultivated Crops	4
Deciduous Forest	6
Developed, High Intensity	9
Developed, Low Intensity	5
Developed, Medium Intensity	7
Developed, Open Space	3
Emergent Herbaceous Wetlands	7
Evergreen Forest	6
Grassland/Herbaceous	4
Hay/Pasture	3
Mixed Forest	6
Open Water	9
Shrub/Scrub	3
Woody Wetlands	7
Flood Zones greater than 800 feet wide	5
Flood Zones no greater than 800 feet wide	1
Angle Structure, at least 30 degrees	5
Angle Structure, greater than 5 and less than 30 degrees	3
High-Voltage Transmission Line Crossing	5
Federal or State Highway Crossing	4
Railroad Crossing	5
River Crossing	7
Sited Wind Turbines within 500 Feet	4

* Some of these land use and construction factors were not encountered in this routing study.
** The lower the value, the more favorable for siting a transmission line.

5.0 Permitting Requirements

A preliminary search of regulatory requirements identified those federal, state, and local permits or formal approvals that will or might be required for the construction, and in some cases operation, of the Elm Creek to Summit Project. These permits and approvals are described in Sections 5.1, 5.2, and 5.3. Formal consultations with several of the involved agencies were also conducted and these are addressed in Section 5.5.

The need for the following permits and approvals will not be conclusively determined until route approval is granted and engineering design work begins. Once details of design are known, this permitting assessment will be updated and the process of applying for and obtaining permits will begin.

5.1 Federal

The following reviews, permits and approvals may be required from federal regulatory agencies for the construction and operation of the proposed transmission line and substations:

- U. S. Department of Agriculture, Natural Resources Conservation Service (NRCS, formerly the U. S. Soil Conservation Service)
  - Review of the final preferred route for the presence of land designated as "Prime Farmland."
  - Review of the final preferred route for the presence of land designated as "Farmed Wetlands" (regulated by COE Section 404 permitting).
- U. S. Department of Defense, Army Corps of Engineers (COE)
  - Clean Water Act Section 404 Permit – required for work in "Waters of the United States," including wetlands. Such work includes the need for fill material and the installation of transmission line structures and permanent access roads (considered as fill). Required permit may be a Nationwide Permit or an Individual Permit.
- U. S. Department of the Interior, Fish and Wildlife Service (USFWS)
  - Endangered Species Act Section 7 Consultation – review of designated Threatened and Endangered (T&E) species (plant and animal and habitats) for any required federal and state permits.
  - Endangered Species Act Section 10 Survey and Permit – field survey of designated T&E species and incidental take permit if construction will harm the affected species or destroy its habitat. A habitat conservation plan may also be needed.
- U. S. Department of Transportation, Federal Aviation Administration (FAA)
  - Notice of Proposed Construction – for objects that have heights that could be considered obstructions to navigable airspace, project notification to the FAA will be required.

- U. S. Environmental Protection Agency (EPA)
  - Spill Prevention Control and Countermeasure (SPCC) Plan – only if the project will have petroleum products in storage during construction and/or operation in excess of 1,320 gallons. This would apply to transformers at the new or expanded substations and to fuel tanks for construction vehicles and equipment.

5.2 State

The following permits and approvals may be required from various state regulatory agencies for construction and operation of the proposed transmission line and substations:

- Kansas State Historical Society
  - National Historic Preservation Act Section 106 Review – a review of cultural resources (archaeological and historic resources) required as a general condition for authorization of COE Section 10 and Section 404 permits.
  - Review under the State Historic Preservation Statute (KSA 75-2715 to 75-2726) – review of a project requiring authorization from the state or any political subdivision of the state when the project is located within 500 feet of the boundaries of a historic property within the corporate limits of a city, or within 1,000 feet of the boundaries of a historic property located within the unincorporated portion of a county.
- Kansas Department of Health and Environment
  - NPDES General Storm Water Permit for Construction – required for land disturbances greater than or equal to one acre.
  - Construction Storm Water Pollution Prevention Plan – required to design, implement, manage, and maintain Best Management Practices to reduce the amount of pollutants in storm water discharges.
  - Above Ground Storage Tank System Permitting and Registration – required for storage of flammable and combustible liquids.
  - Temporary or Minor Source Construction Permit – required for the installation of generators
  - Water Quality Protection Plan – required with the submittal of a Clean Water Action Section 404 permit application, if the proposed project will traverse an exceptional state water.
  - Section 401 Water Quality Certification – approval is required as a general condition for authorization of the COE Section 10 and Section 404 permits.
- Kansas Department of Wildlife and Parks

  - Threatened and Endangered Species Evaluation – review of designated Threatened and Endangered (T&E) species (plant and animal and habitats) for any required federal and state permits.
- Kansas Department of Agriculture
  - Floodplain Fill Approval – required for the installation of structures within the 100-year flood plain.
- Kansas Department of Transportation
  - Highway Use Permit – required for the crossing of highway crossings, including US-24, K-18, and I-70.

5.3 Local

The following permits and approvals may be required from Cloud and Ottawa Counties for construction of the proposed transmission line and new substations. The need for each of these has not yet been confirmed, but each will be investigated with the appropriate permitting agency upon approval of construction of the Project and the development of more engineering design details.

- Flood Zone Determination and Compliance.
- Conditional Use and Development Plan Permit.
- Building Permit or Land Use Permit.
- Construction Permits.
- Entrance/Culvert Permits – Survey Permits-Excavation Permits

5.4 Other Permits

Because the routes cross railroads, permits or approvals from each railroad company will be needed. Railroads owned by the following companies may be crossed by the proposed transmission line: BNSF Railway, Union Pacific, and Kyle Railway System.

5.5 Agency Consultations

Black & Veatch contacted federal, state and local agencies as part of data collection and environmental consultation. The objective of making the contacts is the identification of issues of concern for the agencies after their review of the Project and the determination of the permits and approvals that will be required. The results of the phone and electronic mail contacts are summarized in this section and copies of the letters received from the agencies are contained in Appendix D, Agency Responses to Requests for Consultation.

5.5.1 Summary of Agency Responses

Letters requesting consultation were sent to the following agencies:

- Kansas Department of Health and Environment

- Kansas Historical Society
- Kansas Department of Wildlife, Parks and Tourism
- Kansas Natural Heritage Inventory
- U.S. Department of the Interior, Fish and Wildlife Service
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture, Natural Resources Conservation Service

Consultation with the Kansas Department of Transportation will take place following approval of the project by the Kansas Corporation Commission. The following is a summary of the responses from those agencies that did respond. They appear in the order received from the agency.

5.5.1.1 Kansas Department of Health and Environment. In a letter dated November 13, 2012, the respondent from the Bureau of Environmental Remediation stated there is one Formerly Used Defense Site in the study area, the Schilling Atlas Missile Site S-1. One of the alternative routes was within one mile of this facility.

In a letter dated November 20, 2012, another respondent from the Bureau of Environmental Remediation stated that there is one known contaminated Superfund facility, known as the Exline, Inc. site on East Country Club Road, within about 1.1 mile of one of the alternative routes of the proposed project.

In a letter dated November 27, 2012, the respondent from the Bureau of Water stated that she had no objection to the proposal but warned about the potential need for a National Pollutant Discharge Elimination System (NPDES) permit application for stormwater runoff resulting from construction activities.

In another letter dated November 27, 2012, the respondent from the Bureau of Water stated that clearance of the project should be granted.

5.5.1.2 Kansas Historical Society. In a letter dated November 13, 2012, the respondent stated that the agency lacks the resources for researching such a large study area but offered observations. The project crosses both the Smoky Hill and Saline River Valleys, along with small drainages to the north. Numerous recorded archeological sites are present in the valleys and the potential for unrecorded sites is high. The agency recommended that a professional archeologist conduct a file search of the study area and discuss the results of the search with the Kansas State Historic Preservation Office.

5.5.1.3 Kansas Department of Wildlife and Parks. In a letter dated December 12, 2012 the respondent stated that the selected route should reduce fragmentation and impacts to all native ecosystems including intact grasslands, wetlands, and clearing riparian areas. The respondent observed that Route 3 seems to impact larger intact grasslands than the other two routes. The agency's preference was for Route 1. The respondent further stated that agency does not anticipate any significant impacts to state threatened and endangered

species, but recommends coordinating with the U.S. Fish and Wildlife Service to reduce impacts to migratory birds. The respondent also listed ten general recommendations.

5.5.1.4 Kansas Natural Heritage Inventory. In a letter dated November 8, 2012, the respondent stated that its database does not contain any records of state or federal endangered or threatened plants or animals within three miles of the project corridor. However, because most of Kansas has not been surveyed for rare species and unique habitats, the absence of records should not be interpreted as an indication that these do not occur in the project area. Much of the project corridor falls within the range of the Greater prairie chicken, which has experienced significant range reductions throughout North American over the last century. The respondent recommended consultation with the Kansas Department of Wildlife, Parks and Tourism to obtain locations of prairie chicken leks. If playas occur in the project area, the respondent recommends consultation with the U.S. Fish and Wildlife Service for guidelines on ways to minimize impacts to migratory birds.

5.5.1.5 United States Department of the Interior, Fish and Wildlife Service. In a letter dated November 27, 2012, the respondent stated that the project would occur within the migratory corridor for the federally listed endangered whooping crane. The candidate species Sprague's pipit may also occur in the project area during spring and fall migration.

The respondent recommended incorporation of guidelines into the design and construction activities such as those found in the Avian Power Line Interaction Committee's publication, "Suggested Practices for Raptor Protection on Power Lines".

The respondent noted that under the Migratory Bird Treaty Act (MBTA) construction activities that could result in the taking of migratory birds, eggs, young, and/or active nests should be avoided. The provisions of the MBTA are applicable year-round and most migratory bird nesting activities in Kansas occurs April 1 to July 15.

The respondent also stated that invasive species have been identified as a major factor in the decline of native flora and fauna and impact aquatic resources. Proactive measures to prevent the inadvertent spread of exotic and invasive species were recommended.

Construction and operational activities should avoid wetlands, streams, and riparian woodlands to the maximum extent possible.

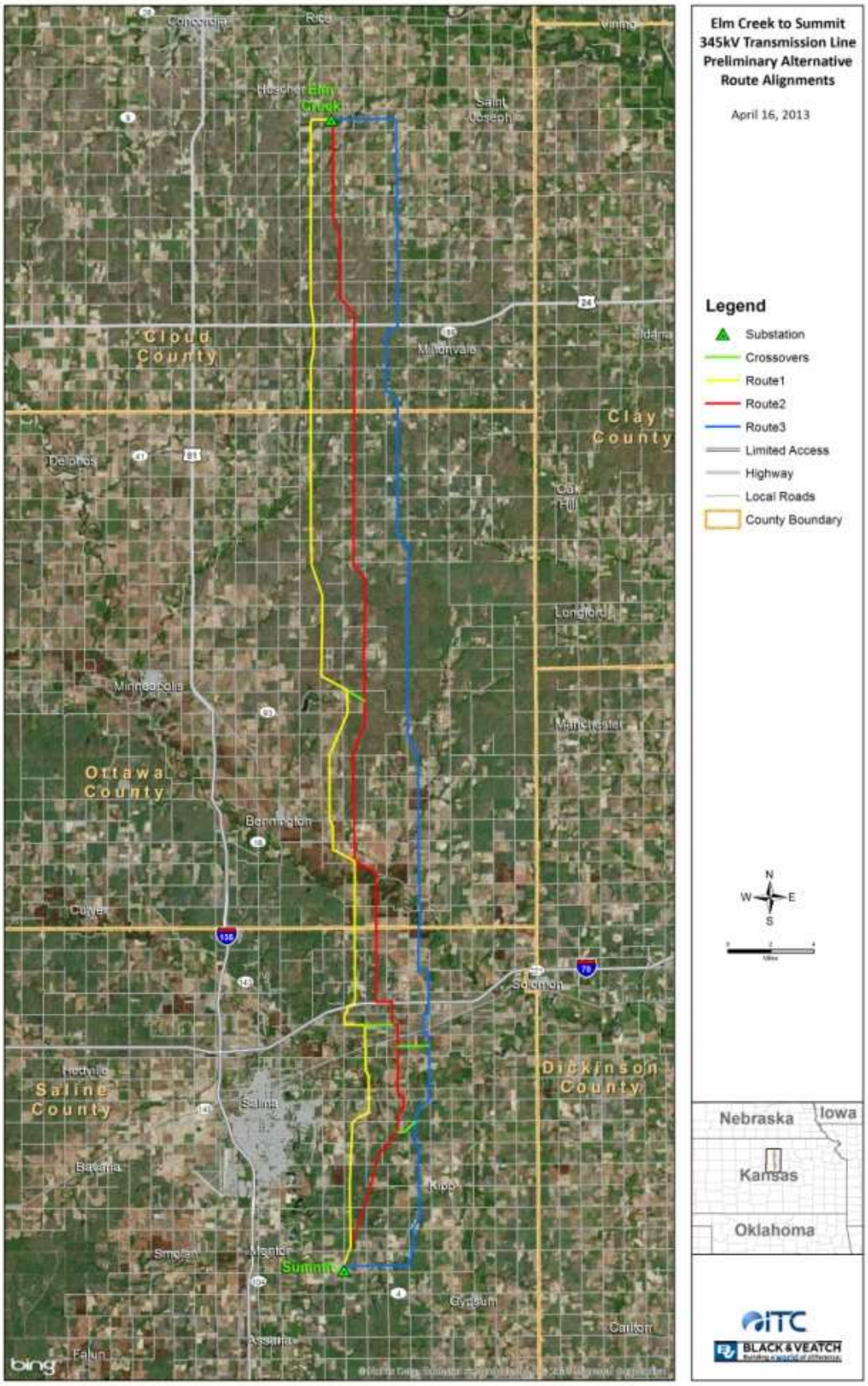
5.5.1.6 United States Army Corps of Engineers. In a letter dated November 13, 2012, the respondent stated that if streams and wetlands will be aerially spanned, agency permit authorization will not be required. However, construction impacts to streams and wetlands, including dry ephemeral or intermittent streams, could require a Corps of Engineers permit under Section 404 of the Clean Water Act (33 USC 1344).

5.5.1.7 United States Department of Agriculture, Natural Resources Conservation Service. In a letter dated November 29, 2012, the respondent stated that one of the proposed routes would cross the edge of one of the agency's Grassland Reserve Program easements located

in Section 3, Township 12, Range 2 and respectfully requested that an alternate route be chosen.

In another letter dated November 29, 2012, the respondent stated that our request for information needs to be accompanied by additional forms completed for the substation location only. Upon review of the forms, it became apparent that the respondent assumed federal funding was being sought. Because no federal funding is being used to construct this project, these forms do not need to be completed.

Appendix A
Map of Alternate Routes


Elm Creek to Summit
345kV Transmission Line
Preliminary Alternative
Route Alignments
April 16, 2013
Legend
Substation
Crossovers
Route1
Route2
Route3
Limited Access
Highway
Local Roads
County Boundary
N
W
E
S
Nebraska
Iowa
Kansas
Oklahoma
Concordia
Rice
Vining
Elm Creek
Saint Joseph
Cloud County
Miltonvale
Clay County
Delphos
Oak Hill
Longford
Minneapolis
Manchester
Ottawa County
Bennington
Culver
Solomon
Dickinson County
Salina
Saline County
Kipp
Smolan
Manor
Summit
Gypsum
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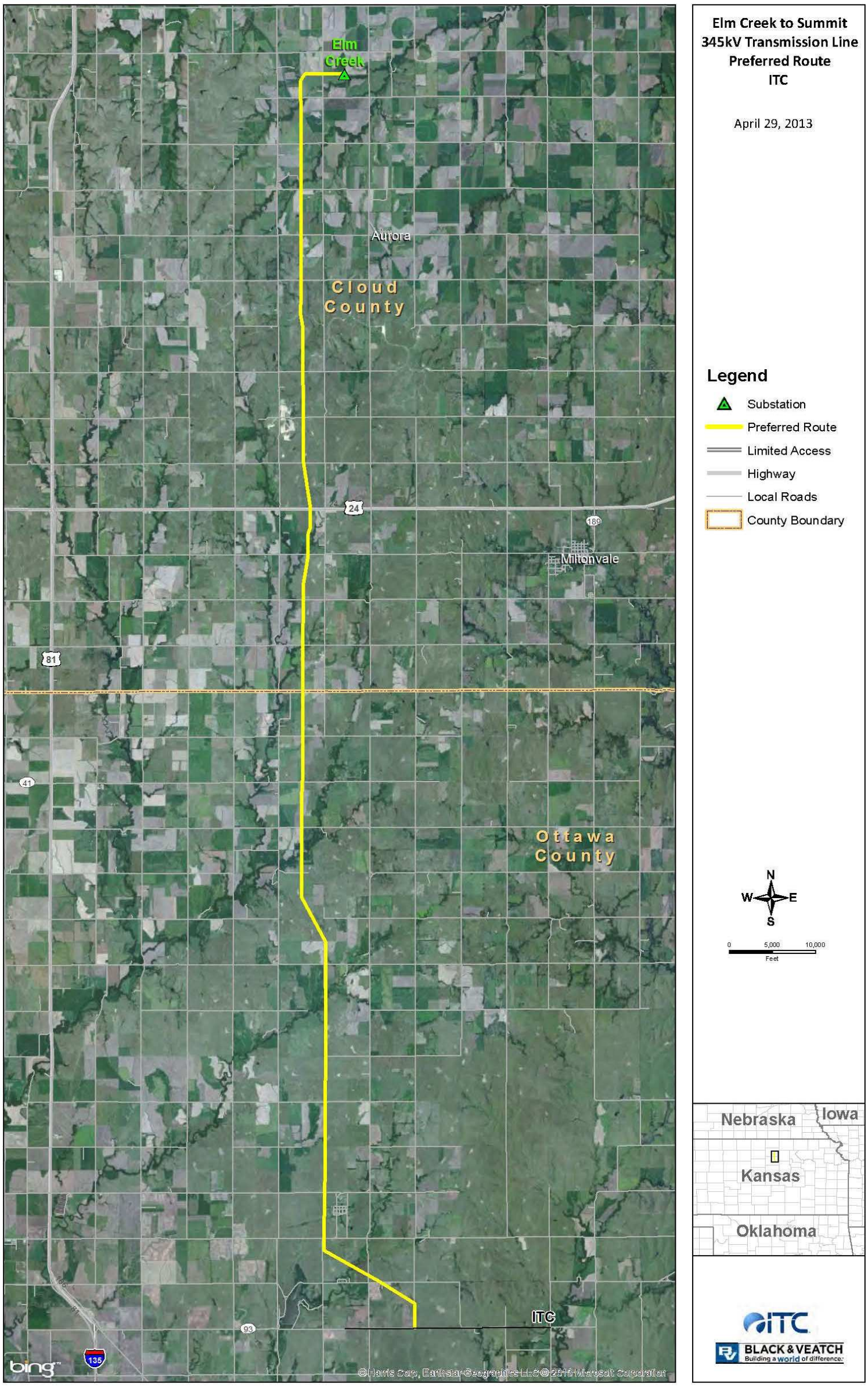
Appendix B
Map of Preferred Route


Elm Creek
Aurora
Cloud County
24
180
Miltonvale
81
41
Ottawa County
ITC
135
bing
© Harris Corp, Earthstar Geographics LLC © 2013 Microsoft Corporation
Elm Creek to Summit
345kV Transmission Line
Preferred Route
ITC
April 29, 2013
Legend
Substation
Preferred Route
Limited Access
Highway
Local Roads
County Boundary
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5,000
10,000
Feet
Nebraska
Iowa
Kansas
Oklahoma
ITC
BLACK & VEATCH
Building a world of difference.

Appendix C
Land Use Category Definitions

Multi-Resolution Land Characteristics Consortium (MRLC)

National Land Cover Data (NLCD) 2006 Land Cover Class Definitions

DEFINITIONS OF TERMS USED IN STUDY:

Barren Land (Rock/Sand/Clay)—Barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes,strip mines, gravel pits, and other accumulations of earthen material. Generally, vegetation accounts for less than 15 percent of total cover.

Cultivated Crops—Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.

Deciduous Forest—Areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change.

Developed, High Intensity—Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses, and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover.

Developed, Low Intensity—Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20–49 percent of total cover. These areas most commonly include single-family housing units.

Developed, Medium Intensity—Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50–79 percent of the total cover. These areas most commonly include single-family housing units.

Developed, Open Space—Includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.

> **Road Crossing** - Locations where routes cross or closely parallel roads of all kinds. Minimum width of crossing is 100 feet. This category is a subset of the Developed Open Space category and is not a standard land use type.

Emergent Herbaceous Wetlands—Areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

Grassland/Herbaceous—Areas dominated by grammanoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.

Open Water—All areas of open water, generally with less than 25 percent cover of vegetation or soil.

Woody Wetlands—Areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

BROAD CATEGORY DEFINITIONS:
Water - All areas of open water or permanent ice/snow cover.
Developed - Areas characterized by a high percentage (30 percent or greater) of constructed materials (e.g. asphalt, concrete, buildings, etc).
Barren - Areas characterized by bare rock, gravel, sand, silt, clay, or other earthen material, with little or no "green" vegetation present regardless of its inherent ability to support life. Vegetation, if present, is more widely spaced and scrubby than that in the "green" vegetated categories; lichen cover may be extensive.
Forested Upland - Areas characterized by tree cover (natural or semi-natural woody vegetation, generally greater than 6 meters tall); tree canopy accounts for 25-100 percent of the cover.
Herbaceous Upland - Upland areas characterized by natural or semi-natural herbaceous vegetation; herbaceous vegetation accounts for 75-100 percent of the cover.
Planted/Cultivated - Areas characterized by herbaceous vegetation that has been planted or is intensively managed for the production of food, feed, or fiber; or is maintained in developed settings for specific purposes. Herbaceous vegetation accounts for 75-100 percent of the cover.

Appendix D
Agency Responses to Requests for Consultation

The University of Kansas

Kansas Biological Survey

November 8, 2012

Ed Shadrick
Senior Ecologist
Black & Veatch Corporation
11401 Lamar Avenue
Overland Park, KS 66211

RE: Elm Creek to Summit Transmission Line Project
Saline, Ottawa, and Cloud Counties, Kansas

Dear Mr. Shadrick:

I have reviewed the Kansas Natural Heritage Inventory database for records of state and federal threatened, endangered, and special concern species at the referenced site. The database does not contain any records of state or federal endangered or threatened plants or animals within three miles of the project corridor. Most of Kansas has not been surveyed for rare species and unique habitats and absence of records should not be interpreted as an indication that rare species and unique habitats do not occur in any particular area. For a complete list of protected animal species known or likely to occur in the counties in which the project occurs please go to http://www.kdwp.state.ks.us/news/other_services/threatened_and_endangered_species/threatened_and_endangered_species/county_lists. No protected plant species occur in the project counties.

Much of the project corridor falls within the range of the Greater prairie chicken (*Tympanuchus cupido*). This species has experienced dramatic range reductions in North America over the past century and is a Kansas Species of Greatest Conservation Need. As birds of open grasslands, prairie chickens do not tolerate tall, vertical structures in their habitats and may not nest within 1+ miles of transmission line supports, and may avoid power lines and improved roads as well. Please consult with the Kansas Dept. of Wildlife, Parks and Tourism to obtain data on locations of prairie chicken leks and to discuss measures that can be taken to minimize impacts on this species.

If playas occur in the project area, please be aware that bird use in these habitats could be high at certain times of the year. Please contact the U.S. Fish and Wildlife Service for guidelines on ways to minimize impacts to migratory birds.

Higuchi Hall • 2101 Constant Ave., Room 108 • Lawrence, KS 66047-3759
(785) 864-1500 • Fax: (785) 864-1534 • www.kbs.ku.edu

The University of Kansas

Thank you for providing the Kansas Biological Survey with the opportunity to comment on this proposed project. Please give me a call at 785-864-1538 if I can be of further assistance.

Sincerely,

Jennifer M. Delisle
Information Manager
Kansas Natural Heritage Inventory

Higuchi Hall • 2101 Constant Ave., Room 108 • Lawrence, KS 66047-3759
(785) 864-1500 • Fax: (785) 864-1534 • www.kbs.ku.edu

KSR&C No. 12-11-064

6425 SW 6th Avenue
Topeka, KS 66615

Kansas

phone: 785-272-8681
fax: 785-272-8682
cultural_resources@kshs.org

Kansas Historical Society

Sam Brownback, Governor
Jennie Chinn, Executive Director

November 13, 2012

Salvatore Falcone
Permitting Project Manager
Black & Veatch
11401 Lamar
Overland Park, KS 66211

RE: Transmission Line Routing Study
Elm Creek to Summit Project
Ottawa and Saline Counties

Dear Mr. Falcone:

The Kansas State Historic Preservation Office has received your letter dated November 7, 2012 regarding the above-referenced project. Our small staff lacks the resources to research such a large study area and the variety of topographic features it encompasses. All we can offer at this point are a few general observations. We note that the proposed project crosses both the Smoky Hill and Saline River Valleys, along with smaller drainages to the north. Numerous recorded archeological sites are present in the Smoky Hill and Saline valleys, especially east of Salina along the Smoky Hill River. In those and other areas, potential for unrecorded sites is high. We therefore recommend that a professional archeologist conduct a file search at the Kansas State Historical Society of the study area. Upon completing the site file search, the archeologist should arrange a meeting with the Historic Preservation Office staff to discuss the results of the search and the areas determined to be of high and moderate potential for containing cultural resources. At that time, we can provide assistance regarding selection of a route for the proposed transmission line and with delineation of any potential survey areas.

Since this project will likely require only state and/or county level permits our agency has no legal authority to compel the project's developer to fund either background research or an archeological survey. However, given the potential impact to cultural resources (especially in the Smoky Hill and Saline Valleys) we strongly encourage that course of action If any federal funds are to be used or if any federal permits (such as a Section 404 permit from the Corps of Engineers) might ultimately be required, then Section 106 of the National Historic Preservation Act will apply.

Any archeologist meeting the Minimum Professional Qualifications of this office as outlined in *The State Historic Preservation Officer's Guide For Archeological Survey, Assessment, and Reports* (SHPO's Guide), is eligible to perform the requested work. A list of archeological contractors meeting these standards is available from our web site at: http://www.kshs.org/p/archeological-consultants/14593.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214) or Kim Gant at 785-272-8681 ext. 225. Please refer to the Kansas Review & Compliance number (KSR&C#) above on all future correspondence relating to this project.

Sincerely,

Jennie Chinn, Executive Director and
State Historic Preservation Officer

Timothy Weston for

Patrick Zollner
Deputy SHPO

Operations Office
512 SE 25th Ave.
Pratt, KS 67124-8174

Kansas
Department of Wildlife, Parks and Tourism

Phone: (620) 672-5911
Fax: 620-672-6020
www.kdwp.state.ks.us

Robin Jennison, Secretary

Sam Brownback, Governor

December 12, 2012

Ref: D5.0303
Cloud, Ottawa, Saline
Track: 20121407

Ed Shadrick
Black and Veatch Corporation
11401 Lamar Avenue
Overland Park, KS

Ref: Elm Creek to Summit 345 kV Transmission Line Project

Dear Mr. Shadrick:

We have reviewed the information for the proposed Elm Creek to Summit 345 kV Transmission Line Project. The project was reviewed for potential impacts on crucial wildlife habitats, current state-listed threatened and endangered species and species in need of conservation, and Kansas Department of Wildlife, Parks, and Tourism managed areas for which this agency has administrative authority.

We note that several routes are still being analyzed all of which will be connecting the Summit substation and the Elk Creek Substation. We have general recommendations to choose a route that reduces the fragmentation and impacts to all native ecosystems including intact grasslands, wetlands, and clearing riparian areas. Kansas grasslands are increasingly fragmented via infrastructure and conversion; therefore, we recommend avoiding those impacts by siting along existing road and transmission right of way and avoiding native grasslands. Route 3 seems to impact larger intact grasslands than do routes 1 and 2. Our preference would be Route 1, but to avoid KDWPT managed areas, such as Ottawa State Fishing Lake, and all native grasslands to the extent possible. We would be happy to continue to working with both ITC and Westar to microsite the line to reduce impacts to crucial habitats in Kansas.

We do not anticipate any significant impacts to state threatened or endangered species. However, we do recommend coordinating with USFWS to reduce impacts to migratory birds and implementing USFWS marking guidelines. We also make the following general recommendations:

- **Strictly follow existing road right-of-way and/or transmission right-of-way**
- **Avoid/Minimize impacts to existing wetlands, springs or areas that pond water (e.g. filling)**
- **Avoid instream and stream bank disturbances including stabilizing the banks with foreign materials (e.g. riprap)**
- **Avoid traversing intact grasslands**
- **Avoid encroachment or development in floodplains**
- **Restore all stream crossings to the original substrate configuration and composition**
- **Minimize removal of native upland and riparian vegetation**
- **Implement standard erosion control BMPs and temporary weed-free seeding/mulching to protect water quality during construction**
- **Minimize instream construction activities particularly during general spawning dates of May1 through July 31**
- **Use native grasses and forbs to permanently revegetated all areas disturbed by construction**

Results of our review indicate there will be no significant impacts to crucial wildlife habitats; therefore, no special mitigation measures are recommended. The project will not impact any public recreational areas, nor could we document any potential impacts to currently listed threatened or endangered species or species in need

of conservation. No Department of Wildlife and Parks permits or special authorizations will be needed if construction is started within one year, and no design changes are made in the project plans. Since the Department's recreational land obligations and the State's species listings periodically change, if construction has not started within one year of this date, or if design changes are made in the project plans, the project sponsor must contact this office to verify continued applicability of this assessment report. For our purposes, we consider construction started when advertisements for bids are distributed.

Thank you for the opportunity to provide these comments and recommendations.

Sincerely,

David Bender

David Bender, Ecologist

Pratt Operations Office
512 SE 25th Ave., Pratt, KS 67124-8174
Phone 620-672-5911 Fax 620-672-6020 www.ksoutdoors.com

RECD 11/29/12

Division of Environment
Curtis State Office Building
1000 SW Jackson St., Suite 400
Topeka, KS 66612-1367

Kansas
Department of Health & Environment

Phone: 785.296.1535
Fax: 785.296.8464
www.kdheks.gov

Robert Moser, MD, Secretary

Sam Brownback, Governor

Comments by: KDHE

Transmittal Date: November 27, 2012

This form provides notification and the opportunity for your agency to review and comments on this proposed project as required by Executive Order 12372. Review Agency, please complete Parts II and III as appropriate and return to contact person listed below. Your prompt response will be appreciated.

RETURN TO: Salvatore Falcone, Permitting Project Manager
Black & Veatch Corporation
11401 Lamar
Overland Park, KS 66211

PART I

REVIEW AGENCIES/COMMISSION

___Aging
___Agriculture
___Biological Survey
___Conservation Commission
___Corporation Commission
___Education
___Geological Survey, KS
_X_Health & Environment
___Historical Society
___Social & Rehabilitation
___State Forester
___Transportation
___Water Office, KS
___Wildlife & Parks
___Commerce

PART II **AGENCY REVIEW COMMENTS**

COMMENTS: (Attach additional sheet if necessary) Re: Proposed Transmission Line, Elm Creek to Summit Project for Cloud, Ottawa and Saline Counties, Kansas.
Please see the enclosed comments submitted by Scott Yankey and Travis Daneke, Bureau of Environmental Remediation Don Carlson, Bureau of Water comments are enclosed for this project.

PART III
RECOMMENDED ACTION COMMENTS:

_X_Clearance of the project should be granted.

__Clearance of the project should not be granted.

__Clearance of the project should be delayed until the issues or questions above have been clarified.

___Request a State Process Recommendation in concurrence with the above comments.

__ Clearance of the project should not be delayed but the Applicant should (in the final application) address and clarify the question or concerns indicated above.

___Request the opportunity to review final application prior to submission to the federal funding agency.

DIVISIONS/ AGENCY/ COMMISSION

John W. Mitchell

John W. Mitchell, Director
Division of Environment

JM/df

Bureau of Environmental Remediation
Curtis State Office Building
1000 SW Jackson St., Suite 410
Topeka, KS 66612-1367

Robert Moser, MD, Secretary

Kansas
Department of Health and Environment

phone: 785-296-8025
fax: 785-296-4823
syankey@kdheks.gov
www.kdheks.gov

Sam Brownback, Governor

MEMORANDUM

TO: Donna Fisher

FROM: Scott Yankey

DATE: November 20, 2012

RE: Intergovernmental Agency Review requested by Black & Veatch for a Proposed Transmission Line, Elm Creeek to Summit Project in Cloud, Ottawa, and Saline Counties, Kansas

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The Kansas Department of Health and Environment (KDHE), Bureau of Environmental Remediation (BER), Assessment and Restoration Section, Superfund and Drycleaner Remediation Unit have identified one known contaminated Superfund facility within about three (3) miles of the proposed project. The facilities is known as the Exline, Inc. site and is located on East Country Club Road, about 1.1 miles west of the proposed project. However, contamination from this site would not be anticipated to adversely affect the proposed project.

Staff member(s) from Black & Veatch are welcome to come and view the KDHE-BER files in accordance with the Kansas Open Records Act. If you have any questions, please contact me by telephone at (785) 296-8025 or by e-mail at syankey@kdheks.gov.

Bureau of Environmental Remediation
Curtis State Office Building
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www.kdheks.gov

Robert Moser, MD. Secretary

Department of Health & Environment

Sam Brownback, Governor

MEMORANDUM

TO: Donna Fisher

CC: Schilling Atlas Missile Site S-1 (C5-072-03054)

FROM: Travis Daneke

DATE: November 13, 2012

RE: Environmental Audit Requested by Salvadore Falcone from the Black and Veatch Corporation.

The Kansas Department of Health and Environment (KDHE), Bureau of Environmental Remediation (BER), Assessment and Restoration Section has located one (1) known Formerly Used Defense Site (FUDS) in the vicinity of the area in question.

- Schilling Atlas Missile Site S-1 (C5-072-03054)

The proposed project is located within one-mile of one known FUDS. Affiliates of the Black and Veatch are welcome to come view the KDHE/BER files in accordance with the Kansas Open Records Act. If you have any questions, please contact Travis Daneke at (785) 296-6378 or at tdaneke@kdheks.gov.

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Kansas

Phone: 785.296.1535
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Robert Moser, MD, Secretary | Department of Health & Environment | Sam Brownback, Governor

November 27, 2012

Salvatore Falcone
Permitting Project Manager
Black & Veatch Corporation
11401 Lamar
Overland Park, KS 66211

Re: Proposed Transmission Line, Elm Creek to Summit Project for Cloud, Ottawa and Saline Counties

Dear Mr. Falcone:

Please see the following comments submitted by Don Carlson, Bureau of Water.

I have no objection to the proposal but offer the following comment for review and consideration:

Any construction activity which disturbs one acre or more is required to file a National Pollutant Discharge Elimination System (NPDES) permit application for stormwater runoff resulting from construction activities. The project owner (party responsible for the project) must obtain authorization from KDHE to discharge stormwater runoff associated with construction activities prior to commencing construction.
The Kansas construction stormwater general permit, a Notice of Intent (application form), a frequently asked questions file and supplemental materials are on-line on the KDHE Stormwater Program webpage at www.kdhe.state.ks.us/stormwater. Answers to questions regarding or additional information concerning construction stormwater permitting requirements can be obtained by calling 785.296.5549.

Sincerely,

Donna Fisher
Director's Office

DC/df

REC'D 11/30/12

United States Department of Agriculture

NRCS
Natural Resources Conservation Service
760 South Broadway
Salina, Kansas 67401-4604

Phone: 785-823-4500
FAX: 785-823-4540
www.ks.nrcs.usda.gov

November 29, 2012

BLACK & VEATCH
ATTN: Salvatore Falcone
11401 Lamar
Overland Park, Kansas 66211

Dear Mr. Falcone:

Based on the information provided in your letter received on November 9, 2012, re: **Proposed Transmission Line, Elm Creek to Summit Project in North Central Kansas**, the Natural Resources Conservation Service (NRCS) submits the following request indicated below:

☐ The project is not subject to the Farmland Protection Policy Act as no farmland is being converted to nonagricultural use.

☒ Your request needs to be accompanied with Form AD-1006, Farmland Conversion Impact Rating (or Form NRCS-CPA-106, Farmland Conversion Impact Rating for Corridor Projects) with parts I and III filled out. Please provide information on the substation location only.

(Form AD-1006 is available at: www.nrcs.usda.gov/programs/fppa/pdf_files/AD1006.PDF and Form NRCS-CPA-106 at www.nrcs.usda.gov/Programs/fppa/pdf_files/CPA106.pdf.) Please submit the completed form(s) to me at the above address or by e-mail to susie.mcbride@ks.usda.gov.

Sincerely,

SUSIE M. McBRIDE
Soil Conservationist

REC'D 12/3/12

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
760 South Broadway
Salina, Kansas 67401-4604

Phone: 785-823-4500
FAX: 785-823-4540
www.ks.nrcs.usda.gov

November 29, 2012

BLACK & VEATCH
ATTN: Salvatore Falcone
11401 Lamar
Overland Park, Kansas 66211

Dear Mr. Falcone:

The Natural Resources Conservation Service (NRCS) received your request to conduct an environmental review for a proposed transmission line, noted as Elm Creek to Summit project in North Central Kansas. Also requested, we provide information regarding natural resources or potential constraints within the project area to assist in identification of a preferred route.

We found that a section of the proposed line will cross the edge of one of our Grassland Reserve Program (GRP) easements located in Section 3 Township 12 Range 2. We respectfully request that you find an alternate route for this section of the transmission.

We have attached an aerial photo delineating the convergence of our GRP easement and your proposed transmission line. If you have any questions or require additional information, please contact Susie M. McBride, Soil Conservationist, at 785-823-4551 or susie.mcbride@ks.usda.gov.

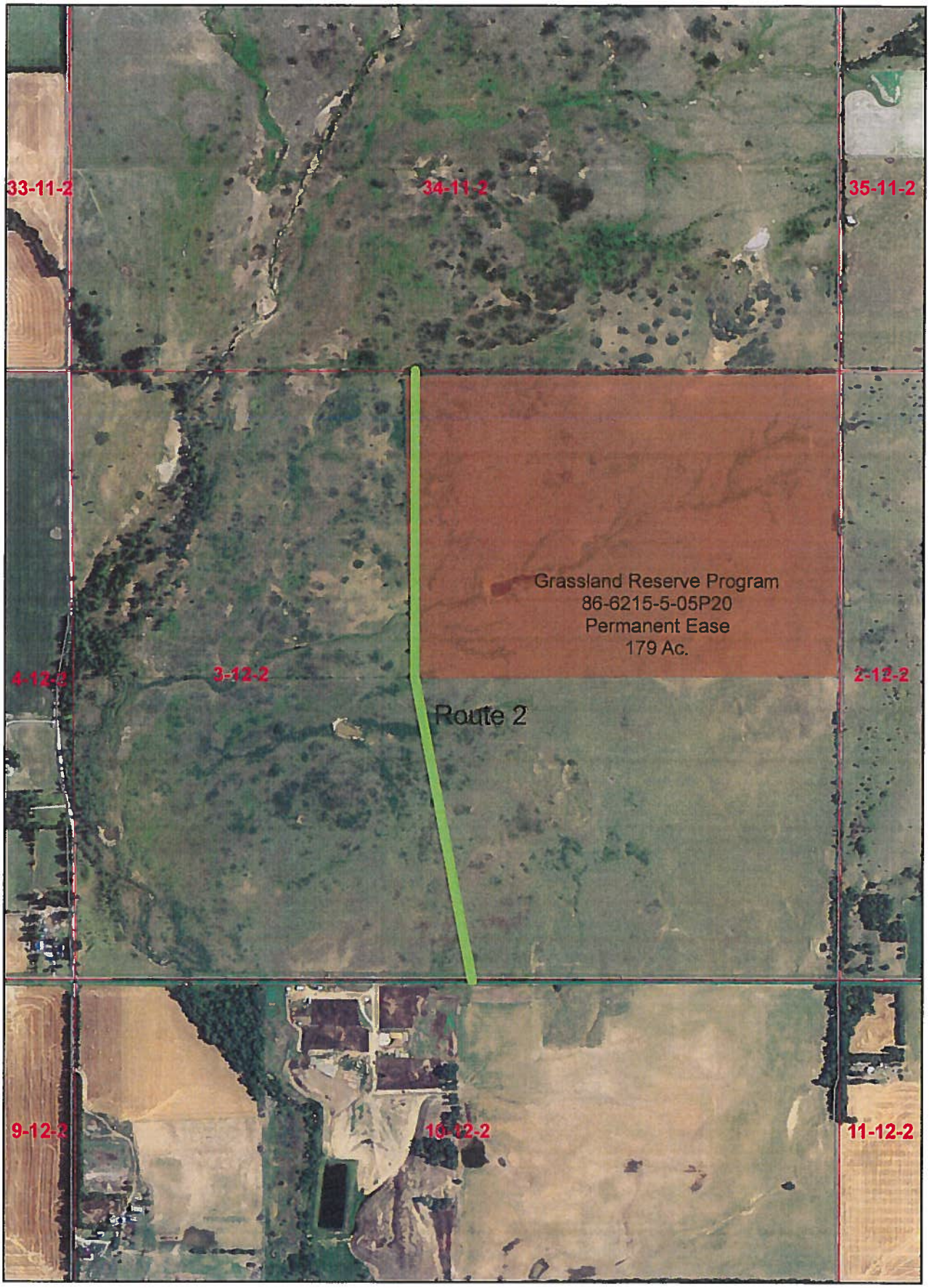
Sincerely,

James J. Krueger

ACTING FOR

ERIC B. BANKS
State Conservationist

Helping People Help the Land


33-11-2
34-11-2
35-11-2
Grassland Reserve Program
86-6215-5-05P20
Permanent Ease
179 Ac.
4-12-2
3-12-2
2-12-2
Route 2
9-12-2
10-12-2
11-12-2

DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
REGULATORY BRANCH – KANOPOLIS SATELLITE OFFICE
107 RIVERSIDE DRIVE
MARQUETTE, KANSAS 67464

REPLY TO
ATTENTION OF

November 13, 2012

Kanopolis Satellite Office
(NWK-2012-01555)

Black & Veatch
Salvatore Falcone
11401 Lamar
Overland Park, Kansas 66211

Dear Mr. Falcone:

This is in reply to your letter dated November 7, 2012, on behalf of ITC Great Plains and Westar Energy requesting comments concerning the new construction of 60 miles of single circuit345 kv transmission line as well as the upgrading of two substations. As shown on the provided map, the project is located in Saline and Ottawa and Cloud Counties.

The Corps of Engineers has jurisdiction over all waters of the United States. Discharges of dredged or fill material in waters of the United States, including wetlands, require prior authorization from the Corps under Section 404 of the Clean Water Act (Title 33 United States Code Section1344). The implementing regulation for this Act is found at Title 33 Code of Federal Regulations Parts 320-332.

If you choose to aerially span or use directional boring as your method of installation for crossing streams and wetlands, Department of the Army permit authorization would not be required. However, if you intend to trench or static plow through any streams or wetlands (including dry ephemeral or intermittent streams) which would involve a discharge of dredged or fill material in waters of the United States, Department of the Army permit authorization would be required and an application should be submitted. However, other Federal, state and/or local permits may be required and you should verify this yourself.

We are interested in your thoughts and opinions concerning your experience with the Kansas City District, Corps of Engineers Regulatory Program. We have placed an automated version of our Customer Service Survey form on our website at: http://www.nwk.usace.army.mil/regulatory/survey.pdf which can be filled in and submitted online. At your request, we will mail a paper copy that you may complete and return to us by mail or fax.

Mr. Steven Whetzel, Regulatory Specialist, reviewed the information furnished and made this determination. If you have any questions concerning this matter, please feel free to contact Mr. Whetzel at 785-546-2130 (FAX 785-546-2050). Please reference Permit No. NWK-2012-01555 in all comments and/or inquiries relating to this project.

Enclosures

Copies Furnished (electronically wo/enclosures):

Environmental Protection Agency,
Watershed Planning and Implementation Branch
U.S. Fish and Wildlife Service,
Manhattan, Kansas
Kansas Department of Wildlife, Parks and Tourism
Kansas Department of Health and Environment
Kansas Department of Agriculture

Copies Furnished (electronically w/enclosure)
Department of Defense Clearinghouse

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Ecological Services Field Office
2609 Anderson Avenue
Manhattan, Kansas 66502-2801

November 27, 2012

Ed Shadrick
Senior Ecologist
Black & Veatch Corporation
11401 Lamar Ave.
Overland Park, KS

RE: Elm Creek to Summit 345 kV Transmission Line 64411-2013-CPA-0019

Dear Mr. Shadrick:

This is in response to your letter of October 11, 2012, requesting Fish and Wildlife Service review and comment on proposed installation and improvement of electrical facilities in Cloud, Ottawa and Saline counties, Kansas. We have reviewed this proposal and offer the following comments for your consideration.

In accordance with section 7(c) of the Endangered Species Act, we have determined that the federally listed endangered whooping crane occurs in the project area during its spring and fall migration. I am enclosing the Service's recommended whooping crane policy regarding transmission line construction within the migration corridor.

The candidate species Sprague's pipit may also occur in the project area during spring and fall migration. This small songbird may utilize any areas of short grass, including tallgrass species that have been mowed or grazed short. Candidates are those species for which the Service has on file substantial information on biological vulnerability and threats to support proposals to list them as endangered or threatened species. Development and publication of proposed rules to list candidate species as threatened or endangered are anticipated at some point in the future. Candidate species have no legal protection under the Endangered Species Act; however, the Service is concerned for their conservation due to their uncertain status.

Construction and operational activities should avoid wetlands, streams, and riparian woodlands to the maximum extent possible. All powerline construction rights-of-way should be surveyed for the presence of marshes and other wetland habitat types. If impacts to these areas are unavoidable, a permit may be required from the U.S. Army Corps of Engineers. If a permit is required, the Service will be given the opportunity to review the application and provide recommendations. All disturbed riparian areas should be revegetated with native plants as soon as possible after the disturbance occurs. Species composition following revegetation should parallel that which existed prior to the disturbance.

Powerlines have been documented as constituting a significant collision hazard to a number of bird species, including waterfowl and some endangered species. The company should provide for enhanced visibility of the static lines on any overhead line segment within one mile of a stream or wetland. Marking of selected lines during construction should prove both easier and less expensive than application of remedial measures at a later date if it becomes necessary.

Electrical distribution lines also have been shown to pose the threat of electrocution to large birds of prey which use the poles, crossarms, and wires as perching sites. I recommend incorporation of guidelines into the design and construction activities such as those found in the Avian Power Line Interaction Committee's publication, "Suggested Practices for Raptor Protection on Power Lines". These guidelines, which are available at www.aplic.org/, should be applied on all above-ground line segments to help ensure that the proposed facilities will have little significant effect on resident and migrant raptors, such as hawks, eagles, and owls. Utilization of these guidelines is a matter of company discretion, but be advised the failure to use them could result in the electric cooperative being held liable for any raptor electrocutions which occur on these lines.

Under the Migratory Bird Treaty Act, construction activities that could result in the taking of migratory birds, eggs, young, and/or active nests should be avoided. Bird nests may be encountered in prairies, wetlands, stream and woodland habitats, as well as on bridges and other structures. While the provisions of MBTA are applicable year-round, most migratory bird nesting activity in Kansas occurs April 1 to July 15. Keep in mind that some migratory birds are known to nest outside these dates, so a field assessment may be necessary. If the project appears likely to impact habitat which may be used by nesting birds, I recommend a survey to determine the presence of active nests. Our office should be contacted immediately for further guidance if a survey identifies the existence of one or more active bird nests that you believe cannot be avoided temporally or spatially by the planned activities.

Invasive species have been identified as a major factor in the decline of native flora and fauna and impact aquatic resources. Information on aquatic invasive species in Kansas can be found on KDWP's website http://www.kdep.state.ks.us/news/fishing/aquatic_nuisance_species. I recommend the following proactive measures to prevent the inadvertent spread of exotic and invasive species:

All equipment brought on site will be thoroughly washed to remove dirt, seeds, and plant parts. Any equipment that has been in any body of water within the past 30 days will be thoroughly cleaned with hot water greater than 140° F (typically the temperature found at commercial car washes) and dried for a minimum of five days before being used at this project site. In addition, before transporting equipment from the project site all visible mud, plants and fish and animal parts will be removed, all water will be eliminated, and the equipment will be thoroughly cleaned. Anything that came in contact with water will be cleaned and dried following this procedure.

The recommendations provided in this letter are to assist you in minimizing adverse impacts resulting from this project. Thank you for this opportunity to provide comments.

Sincerely,

Daniel W. Mulhern
Acting Field Supervisor

cc: KDWPT, Pratt, KS (Ecological Services)

Region 6 Guidance for Minimizing Effects from Power Line Projects Within the Whooping Crane Migration Corridor

1) Project proponents should avoid construction of overhead power lines within 5.0 miles of designated critical habitat and documented high use areas (these locations can be obtained from the local ES field office).

2) To the greatest extent possible, project proponents should bury all new power lines, especially those within 1.0 mile of potentially suitable habitat[1].

3) If it is not economically or technically feasible to bury lines, then we recommend the following conservation measures be implemented:

   a) Within the 95-percent sighting corridor (see attached map)

      i) Project proponents should mark[2] new lines within 1.0 mile of potentially suitable habitat and an equal amount of existing line within 1.0 mile of potentially suitable habitat (preferably within the 75-percent corridor, but at a minimum within the 95-percent corridor) according to the U.S. Fish and Wildlife Service (USFWS) recommendations described in APLIC 1994 (or newer version as updated).

      ii) Project proponents should mark replacement or upgraded lines within 1.0 mile of potentially suitable habitat according to the USFWS recommendations described in APLIC 1994 (or newer version as updated).

   b) Outside the 95-percent sighting corridor within a State's borders

      Project proponents should mark new lines within 1.0 mile of potentially suitable habitat at the discretion of the local ES field office, based on the biological needs of the whooping crane.

   c) Develop compliance monitoring plans

      Field offices should request written confirmation from the project proponent that power lines have been or will be marked and maintained (i.e., did the lines recommended for marking actually get marked? Are the markers being maintained in working condition?)

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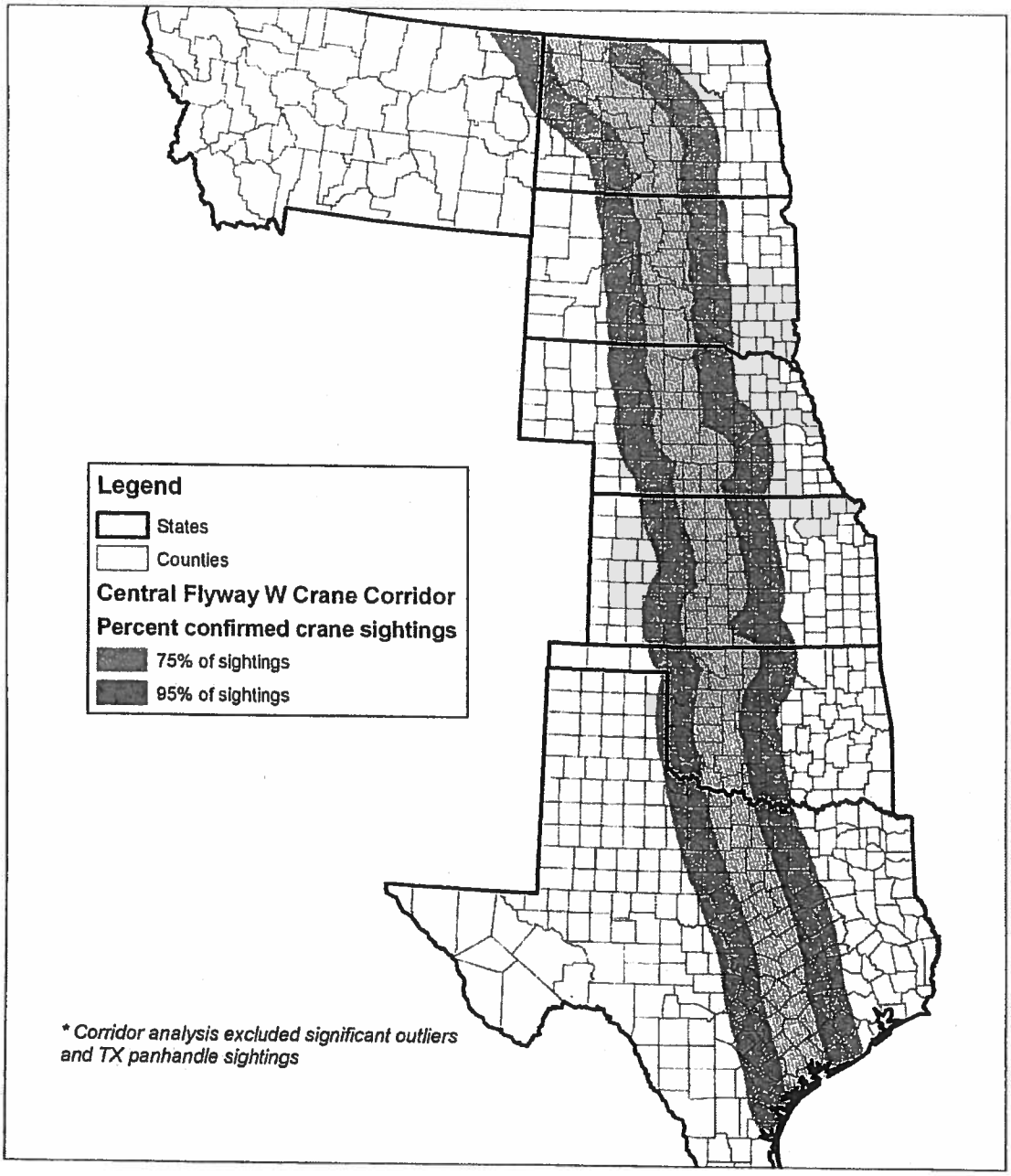
[1] Potentially suitable migratory stop over habitat for whooping cranes includes wetlands with areas of shallow water without visual obstructions (i.e., high or dense vegetation) (Austin & Richert 2001; Johns et al. 1997; Lingle et al. 1991; Howe 1987) and submerged sandbars in wide, unobstructed river channels that are isolated from human disturbance (Armbruster 1990). Roosting wetlands are often located within 1 mile of grain fields. As this is a broad definition, ES field office biologists should assist action agencies/applicants/companies in determining what constitutes potentially suitable habitat at the local level.

[2] Power lines are cited as the single greatest threat of mortality to fledged whooping cranes. Studies have shown that marking power lines reduces the risk of a line strike by 50 to 80 percent (Yee 2008; Brown & Drewien 1995; Morkill & Anderson 1991). Marking new lines and an equal length of existing line in the migration corridor maintains the baseline condition from this threat.

U.S. Fish & Wildlife Service

United States Central Flyway Whooping Crane Migration Corridor *



Produced for Ecological Services
Grand Island, NE
Current to: 2008
Basemap (Date): U.S. Counties
Meridian:
File:

0 70 140 280 420 560 Miles

N
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Literature Cited

Armbruster, M.J. 1990. Characterization of habitat used by whooping cranes during migration. U.S. Fish and Wildlife Service. Biological Report 90(4). 16 pp.

Austin, E.A., and A.L. Richert. 2001. A comprehensive review of observational and site evaluation data of migrant whooping cranes in the United States, 1943-99. U.S. Geological Survey. Northern Prairie Wildlife Research Center, Jamestown, North Dakota, and State Museum, University of Nebraska, Lincoln, Nebraska. 157 pp.

Avian Power Line Interaction Committee. 1994. Mitigating bird collisions with power lines: the state of the art in 1994. Edison Electric Institute. Washington, D.C. 99 pp.

Brown, W.M., and R.C. Drewien. 1995. Evaluation of two powerline markers to reduce crane and waterfowl collision mortality. Wildlife Society Bulletin 23(2):217-227.

Howe, M.A. 1987. Habitat use by migrating whooping cranes in the Aransas-Wood Buffalo corridor. Pp 303-311, in J.C. Lewis and J.W. Ziewitz, eds. Proc. 1985 Crane Workshop. Platte River Whooping Crane Habitat Maintenance Trust and U.S. Fish and Wildlife Service, Grand Island, Nebraska.

Johns, B.W., E.J. Woodsworth, and E.A. Driver. 1997. Habitat use by migrant whooping cranes in Saskatchewan. Proc. N. Am. Crane Workshop 7:123-131.

Lingle, G.R., G.A. Wingfield, and J.W. Ziewitz. 1991. The migration ecology of whooping cranes in Nebraska, U.S.A. Pp 395-401 in J. Harris, ed. Proc. 1987 International Crane Workshop, International Crane Foundation, Baraboo,Wisconsin.

Morkill, A.E., and S.H. Anderson. 1991. Effectiveness of marking powerlines to reduce sandhill crane collisions. Wildlife Society Bulletin 19:442-449.

Yee, M.L. 2008. Testing the effectiveness of an avian flight diverter for reducing avian collisions with distribution power lines in the Sacramento Valley, California. California Energy Commission; Publication CEC-500-2007-122.