

64. Details regarding the maintenance procedures used in the transmission line ROWs, including mechanical, chemical, and biological control methods for vegetation management.

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D4
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- Clarify discussions regarding site boundaries, land ownership, and land use within Section 2.4 and Figure 2-3 of the ER (WCGS, 1980). Clarify the difference between "Site Boundary" and the "Plant Site" on the map, with respect to whether these are a land ownership distinction, a physical fencing distinction, or some other regulatory or access distinction. Please clarify whether or not the referenced agricultural production areas are within the "Site Boundary" as shown on Figure 2-3. Identify any areas fenced to restrict human access and any areas fenced that may restrict wildlife access.
- Additional data on the avian collision studies that were ceased in 1986. Section 2.4 of the ER (WCGS, 1980) states that sufficient data had been collected by 1986. Provide any documentation of regulatory involvement and concurrence in this determination of sufficiency.
- Details on the power transmission system, including information on the design of the towers, the number and configuration of the lines on the towers within each right-of-way (ROW).
- Details regarding the maintenance procedures used in the transmission line ROWs, including mechanical, chemical, and biological control methods for vegetation management.
- More detailed maps/aerial photos of the transmission line ROWs showing topographic features, major habitats/vegetation communities, land uses, wetlands, and floodplains, and the location of the Sharpe Generating Station.
- Please provide information on the locations of transmission line ROWs crossings with parks, wildlife refuges, or wildlife management areas, or any major lakes (in addition to CCL), ponds, or streams? If so, please provide information on these crossings and their locations.
- Any available studies or other information about the issues raised in the letter from the U.S. Fish and Wildlife Service (November 14, 2005) regarding terrestrial threatened and endangered species.
For example:
 - Any assessments of the transmission lines for conformity with "Suggested Practices for Raptor Protection on Power Lines" (Raptor Research Foundation 1996)? Please provide any such assessments and details of transmission line construction relevant to raptor protection. Also provide a copy of "Suggested Practices," if available.
 - Any special ROW maintenance procedures used to reduce the potential for impacts to Mead's milkweed or animals with federal or state listing status.
- Any available maps and aerial photographs of the WCGS plant site and the area within and adjoining the larger site boundary (which encompasses CCL) showing topographic features, major habitats/vegetation communities, land uses, wetlands, and floodplains.
- Any available information identifying natural communities and dominant species of plants and animals that utilize terrestrial habitats of the site and the transmission line ROWs, as well as semiaquatic species such as waterfowl that use Lime Sludge Pond and CCL.

WCNOC-082

Westar Energy, Inc.

Transmission Line Vegetation Management Program

D) Introduction:

This document describes the Westar Energy, Inc. and Kansas Gas and Electric Company ("Westar Energy") transmission line vegetation management program. This program applies to Westar Energy transmission lines of 69 KV through 345 KV and is designed to address vegetation management issues related both to newly designed transmission lines and to the management of vegetation along existing transmission line rights-of-way. This program is designed to allow each transmission line to operate at full rated capacity under the conditions for which it was designed without any outage caused by an energized line contacting vegetation.

II) Design of New Transmission Lines:

A) Development of New Line Routes – Transmission line routing decisions shall be made based in part on current and expected vegetation growth and encroachment. Where possible, new lines should be routed to avoid heavily wooded areas. When this is impossible due to other competing design considerations, the transmission line design engineer shall consider specifying a wider than normal right-of-way. This is particularly important in areas that contain trees that are tall enough so that toppling clearance by vegetation would be impossible to maintain using a right-of-way of standard width.

B) Right-of-Way and Easement Documents – Easements obtained for new transmission lines should incorporate language that clearly provides Westar Energy with the rights required to initially clear the full width of right-of-way from the ground to the sky. The easement documents should allow Westar Energy to maintain the right-of-way free of encroaching vegetation that may interfere with the line's operation at full capacity. Rights to selectively remove and/or prune tall trees located off the right-of-way that may present a hazard to the transmission line should also be included. The easement documents should also provide Westar Energy with the flexibility to use all commonly approved methods of vegetation management.

III) Ongoing Transmission Line Vegetation Management Operations:

A) Vegetation Management Program:

i) Transmission Line Vegetation Management Objectives - This program is designed to allow each transmission line to operate at its full rated capacity under the conditions for which it was designed without any outages caused by vegetation contact with an energized line.

ii) Transmission Line Vegetation Management Methods:

a) Cross-Country Transmission Line Rights-of-Way - The first step in managing the vegetation on these transmission line rights-of-way is to mechanically mow and prune to clear vegetation from the floor and sides of the right-of-way. One to two years later, herbicide should be applied to the full width of the right-of-way to control re-sprouting of the woody vegetation that was previously mowed. This step is critically important because repeated mowing of a transmission line right-of-way without the application of herbicides to control re-sprouting will result in much higher stem counts due to shattering of each stump caused by the mowing. By the same token, application of herbicides to woody vegetation that has been allowed to get more than about 5' high will require a very high volume of herbicide to provide effective control. This may not be cost effective and will result in dead vegetation standing on the right-of-way for a long time before it finally decays and falls over. Many property owners dislike the

appearance of standing dead vegetation and their ill feelings may make it difficult to maintain a good working relationship between Westar Energy and the property owner. A second application of herbicide may be required two to four years later to further control re-sprouting if stem counts were originally very high. When stem counts have been sufficiently reduced, herbicides can be more selectively applied at about five-year intervals to maintain the right-of-way free of woody vegetation of more than a few feet tall. Every ten to fifteen years typically, it may be necessary to mechanically prune trees located just outside of the right-of-way to prevent their canopies from encroaching into the right-of-way. Although the time intervals referenced herein are fairly typical of what is required in Westar Energy's service territory, the exact timing can vary somewhat due to available moisture and soil conditions across the area. Scheduling will be driven by the vegetation management inspections conducted periodically on Westar Energy's transmission system. The inspection process will be discussed in more detail in another part of this vegetation management program document.

b) Transmission Lines Located in Urban Areas – Due to the nature of managing vegetation located along city streets and alleys and in the landscaped yards of urban property owners, vegetation management techniques utilized to manage cross country transmission line rights-of-way cannot generally be employed. Vegetation management techniques generally used for distribution line rights-of-way (pruning trees and selective removal of trees using crews equipped with bucket trucks and manual climbing crews) are more often used rather than mechanical clearing of the entire right-of-way and extensive use of herbicides to control re-sprouting. Most transmission lines located along streets and alleys in urban areas are constructed using single-pole structures and relatively short span lengths. For this reason, much narrower rights-of-way are used and frequently lines are placed in public right-of-way along streets and alleys or in a public utility easement rather than located on a transmission line easement dedicated to Westar Energy. As a result, vegetation management rights are generally not as well defined. In many cases, we must be content with clearing to the ground the area within the wire zone (defined as outside phase to outside phase plus 10' on each side) and then pruning trees located outside this wire zone using natural pruning methods to limit re-growth toward the transmission line. In many cases, less clearance can be obtained so the time between pruning cycles is limited to four or five years. The time between pruning is determined by the periodic vegetation management inspections done on the Westar Energy transmission system. The inspection process will be discussed in more detail in another part of this vegetation management program document.

c) Understanding Work Load – Westar Energy maintains a record of the length of each transmission line in the system. Beginning in 2003, Westar Energy tracked the cost spent to systematically clear or do hot spot pruning on each line. Data gathered by the periodic vegetation management inspections is perhaps the most important element in understanding the scope of the work needed to complete each year. Using all these types of information validated by knowledge of the system, a transmission line vegetation management work plan should be developed each summer that identifies the lines to be cleared the following year. This plan should be used to establish the transmission line vegetation management budget for the following year.

B) Annual Transmission Line Vegetation Management Work Plan:

i) Transmission Line Vegetation Management Inspections – Westar Energy conducts two inspections of the complete transmission system each year that are intended primarily to assess the system's need for vegetation management. These inspections are generally conducted in May and September of each year. These inspection results shall be documented and any inspection results that indicate conditions that could cause an imminent outage should be cleared forthwith. These results should then be used to develop a plan for the following year's transmission line vegetation management work.

ii) Transmission Line Vegetation Management Schedules – Since the mid-1990's, Westar Energy has kept historical data of when each line section was mechanically cleared, when herbicide was applied and when any hot spot vegetation management work was completed. This historical data shall be combined with the results of the transmission line vegetation management inspection conducted in May of each year. This combination of data should then be used to create an annual plan that identifies when each transmission line segment should receive a complete mechanical clearing, the systematic application of herbicide or selectively targeted hot spot mechanical clearing or herbicide application. These schedules should be used to determine transmission line vegetation management budget requirements for the following year.

iii) Transmission Line Vegetation Management Funding – Creating the transmission line vegetation management schedules in early summer each year serves to identify the work to be funded in the following year's transmission line vegetation management budget. The transmission line vegetation management budget should be based on the scope of the vegetation management work plan for the year and should only be modified to reflect changes in actual conditions (higher or lower than anticipated labor bids, equipment cost, herbicide cost, etc).

iv) Transmission Line Vegetation Management Quality Assurance – Completion of each line section included in the annual transmission line vegetation management plan shall be documented. For each line section, a document shall be prepared and signed by the line inspector and the line clearance manager that supervised the work certifying that the work was completed in accordance with the applicable contractual specifications.

C) Transmission Line Clearance Standards for Vegetation:

i) Clearance Standards – The clearance standards noted in the table shown in Appendix A represent the minimum acceptable clearance immediately before the next time that vegetation management work is done on a given transmission line. More clearance than these minimum standards must be obtained when work is performed so that the minimum standards are maintained as the vegetation grows for a period of time before the next time that vegetation management work is performed. The amount of clearance obtained from the conductor for a particular type of vegetation when the work is performed will vary depending upon vegetation species, growth habit, availability of water, etc. The clearance standards for each transmission line voltage used by Westar Energy are shown in the attached Appendix A.

D) Personnel Qualifications and Training:

i) Personnel Qualifications – Westar Energy employees and employees of the contractors employed by Westar Energy to perform vegetation management work shall be qualified by education, experience and training to perform, supervise and manage the activities needed to implement the Westar Energy transmission line vegetation management program.

ii) Personnel Training - Contractor employees shall be trained and certified in accordance with all federal, state and local regulations as required by the work being performed. The contractor shall ensure that all contractor employees are thoroughly trained to understand the contractual requirements of the work being performed. The contractor shall further ensure that all contractor employees are properly trained in accordance with OSHA requirements and ANSI Z133.1-2000 and ANSI A300 for the type of work being undertaken. All training shall be properly documented and available for audit inspection if required.

E) Communications:

i) Transmission Line Outage Prevention – Westar Energy employees and vegetation management contractor employees shall immediately report to the Westar Energy transmission operator any vegetation conditions that present an imminent threat of a transmission line outage or a reduction in transmission line rating. The Westar Energy transmission operations group shall report these conditions as appropriate to the governing reliability authority.

VERIFICATION

I hereby verify that the responses in the forgoing report are accurate and representative of Westar Energy, Inc.'s activity related to transmission line vegetation management activities.

D J Henry
Signature

JUNE 14, 2004
Date

DOUGLAS J. HENRY
Name

VP- POWER DELIVERY
Title

Appendix A – Westar Energy Transmission Line Vegetation Management Clearance Standards

Subject	345 KV	230 KV	161 KV	138 KV	115 KV	69 KV
Range of ROW Width Maintained	150-200 feet Widths vary depending on site-related factors, such as right-of-way agreements with property owners, multiple lines in a corridor, terrain, construction type (single pole, steel lattice tower or H-frame structure, for example) and other reasons. Most 345 KV rights-of-way are 150 feet wide.	75-150 feet Widths vary depending on site-related factors, such as right-of-way agreements with property owners, multiple lines in a corridor, terrain, construction (single pole, steel lattice tower or H-frame structure, for example) and other reasons. Most 230 KV rights-of-way are 100 feet wide.	50-150 feet Widths vary depending on site-related factors,, such as right-of-way agreements with property owners, multiple lines in a corridor, terrain, construction type (single pole, steel lattice tower or H-frame structure, for example) and other reasons. Most 161 KV rights-of-way are 100 feet wide.	50-150 feet Widths vary depending on site-related factors, such as right-of-way agreements with property owners, multiple lines in a corridor, terrain, construction (single pole, steel lattice tower or H-frame structure, for example) and other reasons. Most 138 KV rights-of-way are 100 feet wide.	50-100 feet Widths vary depending on site-related factors, such as right-of-way agreements with property owners, multiple lines in a corridor, terrain, construction (single pole, steel lattice tower or H-frame structure, for example) and other reasons. Most 115 KV rights-of-way are 100 feet wide.	50-100 feet Widths vary depending on site-related factors, such as right-of-way agreements with property owners, multiple lines in a corridor, terrain, construction (single pole, steel lattice tower or H-frame structure, for example) and other reasons. Most 69 KV rights-of-way are 50 feet wide.
Minimum Clearance Standards	Horizontal: 20 feet Vertical: 25 feet	Horizontal: 15 feet Vertical: 20 feet	Horizontal: 10 feet Vertical: 10.5 feet	Horizontal: 9.5 feet Vertical: 10 feet	Horizontal: 9 feet Vertical: 9.5 feet	Horizontal: 8.25 feet Vertical: 8.75 feet
Standards Utilized for Clearances	1). Westar Energy transmission line vegetation management standards. 2). NESC Rule 218 ¹ . 3). ANSI Z133.1-2000 ² . 4). ANSI A300 (Part 1)-2001 ² .	1). Westar Energy transmission line vegetation management standards. 2). NESC Rule 218 ¹ . 3). ANSI Z133.1-2000 ² . 4). ANSI A300 (Part 1)-2001 ² .	1). Westar Energy transmission line vegetation management standards. 2). NESC Rule 218 ¹ . 3). ANSI Z133.1-2000 ² . 4). ANSI A300 (Part 1)-2001 ² .	1). Westar Energy transmission line vegetation management standards. 2). NESC Rule 218 ¹ . 3). ANSI Z133.1-2000 ² . 4). ANSI A300 (Part 1)-2001 ² .	1). Westar Energy transmission line vegetation management standards. 2). NESC Rule 218 ¹ . 3). ANSI Z133.1-2000 ² . 4). ANSI A300 (Part 1)-2001 ² .	1). Westar Energy transmission line vegetation management standards. 2). NESC Rule 218 ¹ . 3). ANSI Z133.1-2000 ² . 4). ANSI A300 (Part 1)-2001 ² .
Ground Inspection	None	One Line--Twice annually ³	Most Urban Lines--Twice annually	Most Urban Lines--Twice annually	Most Urban Lines--Twice annually	Most Urban Lines--Twice annually
Aerial Inspection	Twice annually	All Others--Twice annually ³	Cross-Country Lines--Twice annually	Cross-Country Lines--Twice annually	Cross-Country Lines--Twice annually	Cross-Country Lines--Twice annually

Appendix A – Westar Energy Transmission Line Vegetation Management Clearance Standards

Subject	345 KV	230 KV	161 KV	138 KV	115 KV	69 KV
Vegetation Management Strategy	1). Mow all woody vegetation whose trunk is within the ROW corridor. 2). Prune trees with trunks outside the ROW corridor at the edge of the ROW corridor to provide appropriate lateral clearance from the phase conductors. 3). Apply herbicide to cut stumps to prevent resprouting. Spray herbicide on brush and small trees on the full width of the ROW to prevent resprouting and reduce stem counts.	1). Mow all woody vegetation whose trunk is within the ROW corridor. 2). Prune trees with trunks outside the ROW corridor at the edge of the ROW corridor to provide appropriate lateral clearance from the phase conductors. 3). Apply herbicide to cut stumps to prevent resprouting. Spray herbicide on brush and small trees on the full width of the ROW to prevent resprouting and reduce stem counts.	1). Mow all woody vegetation whose trunk is within the ROW corridor. 2). Prune trees with trunks outside the ROW corridor at the edge of the ROW corridor to provide appropriate lateral clearance from the phase conductors. 3). Apply herbicide to cut stumps to prevent resprouting. Spray herbicide on brush and small trees on the full width of the ROW to prevent resprouting and reduce stem counts.	1). Mow all woody vegetation whose trunk is within the ROW corridor. 2). Prune trees with trunks outside the ROW corridor at the edge of the ROW corridor to provide appropriate lateral clearance from the phase conductors. 3). Apply herbicide to cut stumps to prevent resprouting. Spray herbicide on brush and small trees on the full width of the ROW to prevent resprouting and reduce stem counts.	1). Mow all woody vegetation whose trunk is within the ROW corridor. 2). Prune trees with trunks outside the ROW corridor at the edge of the ROW corridor to provide appropriate lateral clearance from the phase conductors. 3). Apply herbicide to cut stumps to prevent resprouting. Spray herbicide on brush and small trees on the full width of the ROW to prevent resprouting and reduce stem counts.	1). Mow all woody vegetation whose trunk is within the ROW corridor. 2). Prune trees with trunks outside the ROW corridor at the edge of the ROW corridor to provide appropriate lateral clearance from the phase conductors. 3). Apply herbicide to cut stumps to prevent resprouting. Spray herbicide on brush and small trees on the full width of the ROW to prevent resprouting and reduce stem counts.
Alternative Vegetation Management Strategy	Where restrictions due to easement limitations, legal prohibitions or other impediments do not allow tree removal, we prune trees enough to achieve at least 25' of vertical clearance or 20' of horizontal clearance by the time the tree is pruned the next time.	Where restrictions due to easement limitations, legal prohibitions or other impediments do not allow tree removal, we prune trees enough to achieve at least 20' of vertical clearance or 15' of horizontal clearance by the time the tree is pruned the next time.	Where restrictions due to easement limitations, legal prohibitions or other impediments do not allow tree removal, we prune trees enough to achieve at least 10.5' of vertical clearance or 10' of horizontal clearance by the time the tree is pruned the next time.	Where restrictions due to easement limitations, legal prohibitions or other impediments do not allow tree removal, we prune trees enough to achieve at least 10' of vertical clearance or 9.5' of horizontal clearance by the time the tree is pruned the next time.	Where restrictions due to easement limitations, legal prohibitions or other impediments do not allow tree removal, we prune trees enough to achieve at least 9.5' of vertical clearance or 9' of horizontal clearance by the time the tree is pruned the next time.	Where restrictions due to easement limitations, legal prohibitions or other impediments do not allow tree removal, we prune trees enough to achieve at least 8.75' of vertical clearance or 8.25' of horizontal clearance by the time the tree is pruned the next time.
IEEE. 1997. National Electrical Safety Code (ANSI C2). The Institute of Electrical and Electronic Engineers, Inc. New York, New York Page 63						
² American National Standards Institute, Inc New York, New York						
³ Lawrence EC to Lawrence Hill 230 KV line is ground inspected rather than aerial inspected. All other 230 KV lines are aerial inspected.						

FERC Vegetation Management Practices Reporting Template: 12 a).

Subject	765 kV	500 kV	345 kV	230 kV	Tie-line Interconnection facilities of other voltages
Range of ROW Width Maintained	Westar Energy has no 765 KV facilities.	Westar Energy has no 500 KV facilities.	150-200 feet Widths vary depending on site-related factors, such as right-of-way agreements with property owners, multiple lines in a corridor, terrain, construction type (single pole, steel lattice tower or H-frame structure, for example) and other reasons. Most 345 KV rights-of-way are 150 feet wide.	75-150 feet Widths vary depending on site-related factors, such as right-of-way agreements with property owners, multiple lines in a corridor, terrain, construction (single pole or H-frame structure, for example) and other reasons. Most 230 KV rights-of-way are 100 feet wide.	50-125 feet Widths vary depending on site-related factors, such as right-of-way agreements with property owners, voltage, multiple lines in a corridor, terrain, construction (single pole or H-frame structure, for example) and other reasons. Most 161KV, 138 KV and 115 KV rights-of-way are 100 feet wide.
Minimum Clearance Assumptions	N/A	N/A	Horizontal: 20 feet Vertical: 25 feet	Horizontal: 15 feet Vertical: 20 feet	Horizontal: See below ⁴ Vertical: See below ⁵
Standards Utilized for Clearances	N/A	N/A	1). Westar Energy transmission line vegetation management standards as attached & summarized below. 2). NESC Rule 218 ¹ . 3). ANSI Z133.1-2000 ² . 4). ANSI A300 (Part 1)-2001 ² .	1). Westar Energy transmission line vegetation management standards as attached & summarized below. 2). NESC Rule 218 ¹ . 3). ANSI Z133.1-2000 ² . 4). ANSI A300 (Part 1)-2001 ² .	1). Westar Energy transmission line vegetation management standards as attached & summarized below. 2). NESC Rule 218 ¹ . 3). ANSI Z133.1-2000 ² . 4). ANSI A300 (Part 1)-2001 ² .
Ground Inspection	N/A	N/A	None	None ³	None
Aerial Inspection	N/A	N/A	Twice annually	Twice annually	Twice annually

FERC Vegetation Management Practices Reporting Template: 12 a).

Subject	765 kV	500 kV	345 kV	230 kV	Tie-line Interconnection facilities of other voltages
Vegetation Management Strategy	N/A	N/A	<p>1). Mow all woody vegetation whose trunk is within the ROW corridor.</p> <p>2). Prune trees with trunks outside the ROW corridor at the edge of the ROW corridor to provide appropriate lateral clearance from the phase conductors.</p> <p>3). Apply herbicide to cut stumps to prevent resprouting. Spray herbicide on brush and small trees on the full width of the ROW to prevent resprouting and reduce stem counts.</p> <p>4). NOTE: All clearances are based on the Westar Energy transmission line vegetation management specifications attached hereto, which exceed other standards noted above.</p>	<p>1). Mow all woody vegetation whose trunk is within the ROW corridor.</p> <p>2). Prune trees with trunks outside the ROW corridor at the edge of the ROW corridor to provide appropriate lateral clearance from the phase conductors.</p> <p>3). Apply herbicide to cut stumps to prevent resprouting. Spray herbicide on brush and small trees on the full width of the ROW to prevent resprouting and reduce stem counts.</p> <p>4). NOTE: All clearances are based on the Westar Energy transmission line vegetation management specifications attached hereto, which exceed other standards noted above.</p>	<p>1). Mow all woody vegetation whose trunk is within the ROW corridor.</p> <p>2). Prune trees with trunks outside the ROW corridor at the edge of the ROW corridor to provide appropriate lateral clearance from the phase conductors.</p> <p>3). Apply herbicide to cut stumps to prevent resprouting. Spray herbicide on brush and small trees on the full width of the ROW to prevent resprouting and reduce stem counts.</p> <p>4). NOTE: All clearances are based on the Westar Energy transmission line vegetation management specifications attached hereto, which exceed other standards noted above.</p>

FERC Vegetation Management Practices Reporting Template: 12 a).

Subject	765 kV	500 kV	345 kV	230 kV	Tie-line Interconnection facilities of other voltages
Alternative Vegetation Management Strategy	N/A	N/A	Where restrictions due to easement limitations, legal prohibitions or other impediments do not allow tree removal, prune trees enough to achieve at least 25' of vertical clearance or 20' of horizontal clearance by the time the tree is pruned the next time.	Where restrictions due to easement limitations, legal prohibitions or other impediments do not allow tree removal, prune trees enough to achieve at least 20' of vertical clearance or 15' of horizontal clearance by the time the tree is pruned the next time.	Where restrictions due to easement limitations, legal prohibitions or other impediments do not allow tree removal, prune trees enough to achieve either the minimum horizontal clearance shown in note 4, below or the minimum vertical clearance shown in note 5, below by the time the tree is pruned the next time.

¹ IEEE. 1997. National Electrical Safety Code (ANSI C2). The Institute of Electrical and Electronic Engineers, Inc. New York, New York Page 63

² American National Standards Institute, Inc. New York, New York

³ Lawrence EC to Lawrence Hill 230 KV line is ground inspected rather than aerial inspected. All other 230 KV lines are aerial inspected.

⁴ Horizontal clearances: 161 KV--10 feet. 138 KV--9.5 feet. 115 KV--9 feet.

⁵ Vertical clearances: 161 KV--10.5 feet. 138 KV--10 feet. 115 KV--9.5 feet.