**CONFIDENTIAL**

# Evergy Missouri Metro
# 2019 Annual Missouri Vegetation Management Report
# Pursuant to 20 CSR 4240-23.030

# Evergy Missouri West
# 2019 Annual Missouri Vegetation Management Report
# Pursuant to 20 CSR 4240-23.030

## TRANSMISSION and DISTRIBUTION RIGHT-OF-WAY VEGETATION MANAGEMENT PROGRAM

**April 30, 2020**

This program document applies to vegetation maintenance of Evergy Missouri Metro and Evergy Missouri West transmission and distribution power lines. It meets the requirements of the Missouri Public Service Commission Rule 20 CSR 4240-23.030 *Electrical Corporation Vegetation Management Standards and Reporting Requirements*. Evergy Missouri Metro, by operating agreement, provides vegetation management services to Evergy Missouri West.

2019 Annual Vegetation Management Report

Table of Contents

# 2019 Annual Vegetation Management Report

Confidential Information and Data

This report contains information that falls under the definitions of Confidential Information, Critical Energy Infrastructure Information, and/or Critical Infrastructure under the *Rules of Procedure of the North American Electric Reliability Corporation,* Section 1500. In light of the requirements to maintain the confidentiality of information and data that falls under Section 1500, portions of this report are marked as Confidential.

## 1.0 Introduction

Evergy Missouri Metro and Evergy Missouri West Transmission and Distribution Vegetation Management Program ("Program") report presents the strategy, key processes, and guidelines for orderly, uniform, safe, and efficient management of Missouri Metro and Missouri West's overhead delivery systems. The report reflects vegetation management performed in 2019 and planned for 2020; also, the report describes removal, trimming and spraying methods. The Program is dynamic in nature and, at times, requires adjustment to conform to performance as measured by tree-related service reliability; to take advantage of opportunities to gain efficiency; to incorporate customer feedback; to address changes in regulatory initiatives; and to address other program drivers.

## 2.0 Safety and Reliability

Missouri Metro and Missouri West Transmission and Distribution vegetation management program promotes safe and reliable electric service. Beyond compliance and requirements of a robust vegetation maintenance program under 20 CSR 4240-23.030 and the National Electric Safety Code Vegetation Management Section 218 (2007), regular vegetation management mitigates service interruptions and reduces potentially dangerous conditions, like downed power lines.

Crews performing vegetation management working on or near Missouri Metro and Missouri West facilities, rights-of-way ("ROW"), or easements are required to follow approved safety guidelines and procedures. Contractors performing vegetation management work are contractually required to comply with government safety and health regulations and Evergy's own safety and health standards.

Contractors must, prior to work commencing and at all times during the course of their work, have processes and procedures in place to maintain awareness of the nature and characteristics of Missouri Metro and Missouri West electric facilities. Foundational to safety is the contractors' understanding that Missouri Metro and Missouri West electric facilities are energized during the performance of their work unless, prior to the work commencing, arrangements are made with an authorized Evergy representative to de-energize the facilities.

Missouri Metro and Missouri West are pleased to report that in 2019 no incidents occurred resulting in death or life-threatening or serious injury to persons assigned to perform vegetation management activities or to the public.

## 3.0 Vegetation Manager

Evergy employs a vegetation manager to oversee Missouri Metro and Missouri West vegetation management program, ensuring regulatory compliance and implementation of the program described in this report.

## 4.0 Distribution Vegetation Management Program Strategy

### 4.1. Program Objectives

The Program's distribution system objectives are: to promote and maintain safe operation of the distribution system; to support system reliability; to ensure optimum use of resources; and to ensure compliance with regulatory requirements. The Program seeks to achieve these objectives, and reduce outage risk, by managing vegetation; trees, and other vegetation, left unmanaged, impact the number of service interruptions and service restoration efficiency. The Program strategy focuses on maintenance activities that reduce outage risks associated with trees growing into distribution lines and risks associated with trees breaking and then falling onto distribution lines.

### 4.2. Maintenance Scheduling Strategy

The Program's maintenance scheduling strategy considers: time-based maintenance intervals; voltage; historical reliability; potential vegetation interference of energized lines; and a comparison from year-to-year of the impact on safety and service reliability. Maintenance cycles of distribution lines are based on customer density—urban versus rural[1]. Mid-cycle line inspections of primary distribution lines are scheduled to identify conditions requiring maintenance in advance of the regular primary cycle.

Table 1: Missouri Cycle Lengths in Years

| Circuit Description | Primary Cycle Length (Years) | Mid-cycle Inspection/selective Tree Maintenance (Years) |
|---|---|---|
| Urban Circuits | 4 | 2 |
| Rural Circuits | 6 | 3 |

[1] Urban circuits are defined as those with customer density equal to or greater than 35 customers per line mile. Rural circuits are defined as those with customer density less than 35 customers per line mile. 20 CSR 4240-23.030 (1)(G) and (J).

Primary maintenance cycles result in maintenance of 25-percent of total urban distribution miles on an annual basis and 25-percent of rural distribution miles on an 18-month cycle.

### 4.3. Tree Selection Criteria

Evergy uses a strong prescriptive maintenance approach to tree selection. Professional utility arborists are assigned to create work plans designating specific vegetation for pruning, removal, or treatment by contract crews. Trees are selected based on risk factors, avoiding indiscriminate and wholesale maintenance decisions simply based on a fixed-distance-from-conductors criterion. Trees selected for pruning or removal are characterized as exhibiting observable and predictable threats that pose significant threats to service reliability. Also, trees exhibiting only some of the risk factors may be pruned or removed in anticipation of impacting service reliability.

General selection criteria for tree maintenance include:

- Potential to cause service interruption by growth into or across energized conductors prior to the next scheduled inspection or trim cycle;
- Obvious defects that predispose the tree to failure and damage to electrical facilities; and/or,
- Dead or broken branches hanging over electrical facilities.

Selection factors considered include:

- The natural growth rate of the tree;
- The expected re-growth rate following pruning of the tree;
- The relative wood strength of the tree species and potential for breakage;
- Voltage, construction type, conductor spacing, and conductor covering;
- Legal right to access the area;
- Extent of defects (decay, splits, weak branch attachments, etc.), customers served by the line, and potential for tree limbs or trunks to strike primary conductors in the event they break or fall; and/or,
- Sag of conductors at elevated temperatures and under wind and ice loading and combined displacement of vegetation, supporting structures, and conductors under adverse weather or routine wind conditions.

Trees affecting secondary service lines are the property owner's responsibility and not normally maintained. However, as part of the primary scheduled maintenance cycle, trees growing into service lines may be maintained to avoid deflection of secondary voltage conductors by tree limbs.

4.3.1 Tree Removal (trees larger than 4 inches diameter)

Tree removal, together with stump treatment to prevent re-sprouting, provides permanent clearance, eliminates the potential for removed trees to break and cause damage, and reduces future maintenance costs. However, neither is it practical, environmentally desirable, or welcomed by property owners to remove all trees that effect power lines. Consequently, designation of trees selected for removal is based on cost effectiveness, failure risk, and signed permission of the property owner.

Trees may be designated for removal if:

- Pruning will result in a significant adverse impact on the health of the tree;
- The tree is a hazard tree that poses an unacceptable risk to overhead lines; and/or,
- It is economically advantageous to remove rather than periodically prune the tree.

4.3.2 Hazard Trees

Structurally unsound trees, on or off the easement or ROW, that can fall into electrical conductors are evaluated for possible removal. Hazard tree conditions can include, but not limited to, the following symptoms:

- Dead or dying
- Severe lean
- Weak branches
- Root failure
- Cankers
- Conks (fungal fruiting bodies)
- Internal decay

4.3.3 Brush and Vines (trees smaller than 4 inches diameter)

Removal and/or treatment of small-size brush with herbicides is a cost effective method of reducing future maintenance costs before the brush grows large enough to affect power lines. Brush growing below conductors is designated for removal and stump treatment, mowing, foliar treatment, or individual stem treatment prior to growing to wire height and when it can be cost effectively treated. Vines observed growing on poles and guy wires are selected for cutting and treatment with approved herbicides. Pruning brush should be avoided.

4.3.4 Integrated Vegetation Management (IVM)

Evergy utilizes principles of Integrated Vegetation Management ("IVM") to control brush on distribution ROW. IVM is an approach that considers the use of mechanical mowing, hand cutting, and herbicide

applications, together with the benefits of biological control to manage undesirable woody vegetation on a ROW. The responsible, targeted use of herbicides is an important component of this approach.

Foliar application of herbicides for control of ROW brush on ROW, as well as basal and cut stump methods, will be used when appropriate. Cut stumps should be treated with an effective herbicide mixture to prevent re-sprouting. Small diameter brush stumps should be treated unless a follow-up foliar application is definitely scheduled.

In rural locations, herbicide application may be scheduled to occur 1 to 2 years in advance of tree maintenance. Brush stems missed during herbicide application can be retreated or cut during the tree maintenance cycle. If brush is too tall to control with herbicides and requires hand cutting or mowing, herbicide application should be scheduled approximately one growing season following cutting.

## 4.4 Contracting Strategy

Evergy contracts with several utility tree maintenance contractors as opposed to performing vegetation maintenance exclusively with its own personnel. Contracts are written to combine time and equipment with performance-based components.

## 4.5 Customer Relations

### 4.5.1 Customer Inquiries

Customer inquiries generated through Evergy's Customer Care Center, or other channels, are responded to by the appropriate vegetation management individual by personal meeting, telephone, or letter. Requests for tree trimming, removal assistance, or other requests are evaluated by inspection prior to assignment of work to a maintenance crew. Service provided to customers who request assistance with tree removal for the customer's convenience, normally includes removal of overhanging branches and all limbs within ten feet of energized conductors. Any debris is left at the worksite.

### 4.5.2 Property Owner Notification

Evergy notifies affected property owners or occupants of pending tree maintenance. Notification is by a combination of personal contact, door hangers, or mailings at least seven days, but not more than, ninety days prior to performing scheduled maintenance.

### 4.5.3 County and Municipal Notification

Evergy notifies appropriate county and municipal officials in writing at least two months in advance of planned vegetation management work in their respective jurisdictions. The notice includes planned dates and locations of scheduled vegetation maintenance and other information relevant to the particular municipality or county. The primary contact for each municipality or county is selected by mutual agreement between Evergy and the highest elected official in the jurisdiction or highest appointed official if there is no elected official.

### 4.5.4 Public Outreach

Evergy provides information to the public through its Website, publications, and community events, regarding its vegetation management program and appropriate trees to plant near overhead lines. Also, Evergy annually mails information to Missouri Metro and Missouri West customers regarding vegetation management.

## 4.6 Vegetation Management Practices

### 4.6.1 Industry Standards

Vegetation management contractors are required to comply with federal, state and local laws and regulations, including those of the U.S. Occupational Safety and Health Administration. Also, vegetation management contractors are required to follow industry safety standards such as, the *American National Standards Institute (ANSI) Z133.1 – 2006, Pruning, Trimming, Repairing, Maintaining, and Removing Trees and Cutting Brush – Safety Requirements, 2006*. *ANSI A-300 (Part 1) - 2001 Tree, Shrub and Other Woody Plant Maintenance – Standard Practice*s—a requirement as it applies to utility tree pruning. Furthermore, contractors are required to implement the pruning concepts presented in the booklet, *Pruning Trees Near Electric Utility Lines*, by Dr. Alex L. Shigo.

### 4.6.2 Evergy Vegetation Management Guidelines and Clearance Standards

Evergy Vegetation Management Guidelines, Appendix A, provide guidance to the performance of work by the vegetation management contractors. Included as part of the guidelines are standards for clearance at the time vegetation is maintained. For conductors energized at 600 to 50,000 volts, the minimum required clearance is ten-feet or clearance to the edge of the ROW, whichever is less. Mature trees, whose trunks or limbs have sufficient strength and rigidity to prevent the trunk or limbs from damaging the conductor under reasonably foreseeable wind and weather conditions, may be retained within ten-feet of conductors.

#### 4.6.3 Post-Work Inspection and Acceptance

Evergy, as part of its contract management process, inspects work following completion by vegetation maintenance contractors and prior to final acceptance. This inspection/audit process ensures the work performed is of acceptable quality, completeness, and consistent with work plans and specifications.

## 4.7 Reports and Record Keeping

#### 4.7.1 Operational Reporting

Complete records and reporting are important to effective management of vegetation management programs. Records are maintained to identify key aspects of the vegetation management program, to document program performance, and provide information necessary for ongoing program management, including:

Completed work data (substation and circuit designation, date worked, crew size, supervisor and type of work performed);

Cost metrics (cost per mile, cost per circuit, scheduled work, reactive work, etc.);

Contractor performance (man-hours per unit, miles completed, schedule attainment, etc.);

Schedule of future work by substation and circuit; and,

Safety hazards encountered by contractors and OSHA reportable events or accidents.

#### 4.7.2 Regulatory Reporting

Missouri Metro and Missouri West submit quarterly and annual reports to the Missouri Public Service Commission ("MPSC"). The quarterly report is submitted approximately six weeks after the quarter ends. It is required under the terms of Missouri Metro and Missouri West *Non-Unanimous Stipulation and Agreement* (Case Nos. ER-2008-0089, ER-2009-0090, respectively.), and provides data regarding Program expenditure, miles planned, and miles completed on the distribution and transmission systems.

The annual report—the instant report—is filed with the MPSC on or before April 1st of each year pursuant to 20 CSR 4240-23.030. It summarizes the vegetation management program success for the previous year, a plan for the current year, and an affidavit, verified by an officer with knowledge of the matters stated therein. Similarly, to the quarterly reports, the annual report includes:

- vegetation management expenditures for the preceding year;
- vegetation management budget for the current year;
- circuits, completion dates, and miles trimmed in the preceding year;

- circuits, completion dates, and miles scheduled for the current year; and,
- total distribution miles for the system and corresponding classification between rural and urban.

The Companies understand material changes contemplated in vegetation management scope, guidelines, or standards are to be filed with the MPSC no later than thirty (30) days prior to implementing the change, and verified by affidavit of an officer with knowledge of the matters stated therein. Additionally, the Companies will report to the MPSC a failure to meet requirements under the *Electrical Corporation Vegetation Management Standards and Reporting Requirements* (20 CSR 4240-23.030) within 30 days of discovery and include a mitigation plan for the irregular operation.

## APPENDIX A – Missouri Metro and Missouri West DISTRIBUTION LINE CLEARANCE GUIDELINES

About This Guideline

*Missouri Metro and Missouri West Distribution Line Clearance Guidelines* ("Guidelines") are intended as a contractor's guide to implement Missouri Metro and Missouri West Distribution Vegetation Management Program. The Guidelines' underlying principle is that each tree, and tree species, has its own unique growth pattern, condition, proximity to conductors, structures and other obstacles, and will require the exercise of professional judgment in implementing the guidelines.

The Guidelines apply to vegetation management of Missouri Metro and Missouri West distribution system, including voltages from 600 to 35,000 Volts.

Note: *The Guidelines are not intended as personal safety guidelines*[1].

### (1) Introduction

A copy of the Guidelines and the book, *Pruning Trees Near Electric Utility Lines*, by Dr. Alex L. Shigo shall be kept on each crew truck and available at every work location.

The Distribution Vegetation Management Program (hereinafter called the "Program") objective is to help maintain safe, reliable, and least cost electric service, while complying with all regulatory requirements. The Program helps achieve this overall objective by efficiently managing vegetation to reduce outage risk. Left unmanaged, trees and other vegetation can become a leading source of power interruptions during non-storm events and can delay outage restoration associated with major and regular weather events. The Program's strategy focuses on maintenance activities that help reduce tree-caused outage risks associated with trees that grow into lines and risks associated with trees breaking and falling onto lines.

The objectives of the Program are to be achieved within the framework of positive customer relations and using sound environmental practices. The Program also provides incentives to the Contractor to exceed specific production and quality criteria. On the other hand, the Program penalizes Contractors for failing to maintain specific production and quality criteria. Evergy, and/or its designated representative, is exclusively responsible for program oversight.

### (2) Line Clearance Guidelines

[1] While the Guidelines may comment on safety issues, Contractors and their crews performing vegetation management work on or near Missouri Metro and Missouri West facilities, rights-of-way, or easements are contractually required to follow government safety and health regulations and Evergy's own safety and health provisions.

(A) Pruning and Removal Guidelines

All tree pruning shall be governed by approved principles of modern arboriculture and shall adhere to industry standards, including, ANSI A-300 and Z-133 standards and the natural pruning method. Evergy representatives, in certain cases, can grant exceptions to these pruning standards where mechanical trimming equipment is used. Pruning shall be done in a manner that protects current tree health and with regard for future growth and development.

(B) Voltages

Vegetation management for voltages of (35,000) volts and higher are considered to be Transmission voltages and are deferred to the Transmission Program.
Vegetation management for distribution lines energized at 35 kV and below are maintained by the Program. Primary voltages range from 600 to 34,500 Volts, and are further defined as follows: Backbone consists of (3) energized conductors, and Lateral consists of (1) or (2) energized conductors. Conductors with voltages of less than 600 Volts are considered Secondary voltage. The neutral wire has the potential to carry primary voltage, which CONTRACTOR shall take into consideration when clearing primary lines.

(C) Clearance for Primary voltages

For primary conductors, radial clearance to be achieved at the time of maintenance is 10 feet.
Sub-transmission lines and Backbone lines shall be trimmed vertically to remove overhanging limbs to the widths prescribed in paragraphs (2)(C)1.
Any tree affecting or potentially affecting a primary distribution line shall be trimmed to help maintain reliable service. The following factors are considered during the clearance process: The natural growth rate per species; The re-growth rate of the tree species (how fast the branches grow back after pruning), see Section 9 “Tree Re-growth Rates”; The wood strength of the tree species (what is the chance of the branch breaking under the load of strong wind, snow, ice); the voltage conducted by the line (the risk presented by the branch contacting the line; the higher the voltage, the greater the risk); branches rubbing insulated wires and broken or hanging tree branches.
The radial clearances in subsection (2)(C) are minimum clearances that should be established between the vegetation and the energized conductors and associated live parts where practicable. Vegetation management practices may make it advantageous to obtain greater clearances than those listed. In the event that the specific trimming conflicts with any other materials within this section, the strictest rules shall apply.
Notwithstanding any provision to the contrary in this section (2), mature trees whose trunks or limbs have sufficient strength and rigidity to prevent the trunk or limbs from damaging the conductor under reasonably foreseeable wind and weather conditions are exempt from the minimum clearance requirements in this section (2).
Minimum clearances may be subject to limitations of right-of-way width or legal access.
All dead wood shall be removed when it is a risk to conductors or when the Evergy directs the CONTRACTOR to do so.

(D) Clearance considerations for Secondary Conductors, (600) volts or less

Open Wire secondary shall be cleared to the same standards as lateral primary conductors.
Triplex, street light and service lines shall be cleared only to remove **hard contact**, or deflection of the line's intended path.
All dead wood shall be removed when it is a risk to conductors or when Evergy directs the CONTRACTOR to do so.

(E) Clearance considerations for other electrical equipment

The neutral wire has the potential to carry primary voltage, which CONTRACTOR shall take into consideration when clearing primary lines.
Guy Wires and poles shall be cleared on a case by case basis as determined necessary during field inspection, to free them from weight, strain, or displacement caused by contact with trees.
All dead wood shall be removed when it is a risk to conductors or when Evergy directs the CONTRACTOR to do so.

(F) Removal Considerations for trees greater than 4" DBH

If the amount of tree crown to be removed in order to obtain adequate clearance will have an adverse impact on the overall long term health of the tree, the tree will be considered for removal.
Tall-growing trees within the width of the right-of-way shall be considered for removal.
Hazard trees that pose a risk to the utilities overhead facilities shall be considered for removal. Hazard tree conditions could include, but are not limited to the following symptoms: Dead or dying, severe lean, weak branches, root failures, cankers, conks or internal decay.
All removed trees should be cut as close to the ground as practical and chemically treated to prevent resprouting.
Trees where the cost of removing is equal to or less than the cost of trimming shall be considered for removal.

(G) Brush considerations

Brush is defined as any tall growing tree that is less than 4" DBH. Brush also includes vines growing on or around Missouri Metro and Missouri West overhead facilities.
Brush that has been planned to be removed shall be basal treated or cut as close to ground level as practical and chemically treated to prevent resprouting.
Vines shall be cut off approximately one foot above ground level. All vines shall be treated with herbicides below the cut.
Brush (as defined in (2)(G)1) that has been selected for removal and is located within the width of the right-of-way shall be removed and treated.
Second growth from stumps cut on previous pruning cycles shall be removed if it has been planned.

(H) Debris disposal

Unless specified otherwise, CONTRACTOR shall dispose of all debris resulting from scheduled maintenance work. Wood too large to be chipped shall be cut into fireplace lengths (approximately 18" lengths) and stacked on-site unless the homeowner requests the wood to be removed.

CONTRACTOR shall remove all debris produced from scheduled maintenance within 5 business days, unless property owner gives consent to leave debris.
Disposal of chips, wood and brush is the responsibility of the contractor.
Any debris resulting from outages and/or storms will be left on site.

(I) Herbicide treatment

The CONTRACTOR shall provide all necessary herbicide products and comply with applicable Laws regarding the application, storage and handling.
The CONTRACTOR shall use the most effective herbicide available for any given situation to prevent regeneration of vegetation and subject to approval by Evergy. The applicable MSDS shall be submitted as part of the approval process. Herbicides shall be applied according to manufacturer instructions. Consideration must be given to the surrounding vegetation and soil conditions to prevent damage to other growth or surface water or ground water.
CONTRACTOR shall warranty herbicide treatment for one (1) year after application and remedy any new growth identified.

## (3) Maintenance Cycle

(A) Missouri Maintenance Cycle

Urban circuits are defined as circuits with a customer density equal to or greater than 35 customers per line mile.
Rural circuits are defined as circuits with customer density less than 35 customers per line mile.
Urban circuits, both backbone and lateral, shall be maintained on a four (4) year cycle.
Rural circuits, both backbone and lateral, shall be maintained on a five (5) or six (6) year cycle.
Urban circuits shall be inspected every two (2) years. Where needed, vegetation maintenance will occur in a timely manner.
Rural circuits shall be inspected at least every three (3) years. Where needed, vegetation maintenance will occur in a timely manner.

## (4) Outage/Storm Response

(A) On-Call/Call Out

In the event of an emergency and when specifically requested by Evergy, contractors shall provide crews to perform work after hours and on week-ends and holidays, as necessitated by the emergency. Work that is unrelated to the restoration of reliable electric service shall not be performed. On such emergencies, only essential work (i.e. no chipping of brush) shall be done per tree as required to restore electric service rapidly.
If necessary, a Vegetation Management Supervisor will report to dispatch headquarters to aid in the dispatching of tree crews.
Improper pruning during outage/storm response work may occur due to unsafe conditions.

Fallen trees, broken limbs and all trimmings and cut vegetation associated with service restoration are left on site. Crews shall not inform customers that Evergy will return at a later day to clean up the trimmings and cut vegetation.

## (5) Customer Request Process

(A) Customer requests

Customer requests generated from Evergy's call center, online requests made at evergy.com or other designated source are managed by the vegetation management staff. Customer requests can include but are not limited to: Trim for Line Clearance; Customer Assisted Removal; Check for Drop Service; Pick Up Brush.
Customer requests will be inspected and the customer will be notified with the specific action that will be taken.
Under some circumstances, a customer request may be answered by a standard letter.
Response time to customer requests will vary depending on the number of requests in the system and the type of work required.
When necessary and with customer consent, brush will be left on-site.
For customer requested assistance for tree removal, any tree(s) to be removed by customer will have all overhang removed and ten feet (10') of clearance from all energized conductors will be provided.

## (6) Notification Process

(A) Landowner Notification

For regularly schedule maintenance, customers will be notified in person or by door card with appropriate contact number, by an Evergy representative. Questions regarding the scheduled work will be answered at this time. Notice to affected property owners or occupants will occur at least seven (7) days, but not more than ninety (90) days, prior to performing planned vegetation maintenance. Alternative notification methods may include direct mail, postcard or bill insert. Evergy shall maintain a record of the dates, content, and addresses to which all notices provided were given until the subsequent scheduled vegetation management cycle has occurred for each affected property owner or occupant.
Evergy and or its representative must secure signed permission to remove any tree equal to or greater than 4" DBH.
If vegetation management is necessary and the landowner refuses permission, the concern will be addressed by Evergy and or its representative.

(B) Public notification

Evergy shall provide written notice of any pending vegetation management activities to a primary contact for each county and municipality affected. The primary contact shall be selected by mutual agreement between Evergy and the highest elected official, or if no elected official, then the highest appointed official, of the county and municipality.

Notice shall be made in writing to the primary contact designated under subsection above (6)(B)1, at least two (2) months in advance of the planned vegetation management. This notice shall include the planned dates and locations of the vegetation management and the vegetation manager's name and contact information.

**(7) Contractor Guidelines**

(A) Appearance and Conduct

All contract line clearance workers shall maintain professional appearance and conduct and shall adhere to the following guidelines. The following guidelines are neither intended to be nor should they be considered to be inclusive. The contractor:

shall be courteous to customers at all times;
shall not engage in "horseplay" while on the job;
shall not use language that is profane, boisterous, derogatory, racial, or of an ethnic nature;
shall not display sexually suggestive objects or pictures, such as t-shirts, magazines, calendars or posters;
shall not use customers' property (i.e. patios, picnic tables, etc.) for breaks;
shall not leave refuse from lunches, etc. on private or public property;
shall not enter the customer's house;
shall refrain from climbing over or standing on any fence, garage, tool shed, etc. unless absolutely necessary to access work and only when it can be done safely and without damaging customers' property;
shall not solicit private work, including tree work, while performing work pursuant to this Contract;
shall not obligate Evergy to make any payments to another party, nor make any promises or representations of any nature to another party for or on behalf of Missouri Metro/Missouri West;
shall maintain neat appearance at all times and;
shall wear clothing and hard hat displaying CONTRACTOR's color and/or emblem.

(B) Supervision

The CONTRACTOR shall ensure that it has adequate supervisory personnel on the property to ensure that all of the CONTRACTOR's crews on the property are properly supervised. CONTRACTOR's personnel shall provide the interaction and communication with Evergy as required by this Contract. Such supervisory personnel shall be called "General Foremen" in these guidelines.
All contract supervisors and General Foreman will be Certified Arborists through the International Society of Arboriculture (ISA). Employees currently in these positions will have six months to obtain the certification; newly assigned supervisors and general foreman shall obtain their certification within twelve months.

(C) Identification

All General Foreman and Crew Forman shall possess identification stating employee name, employer, as well as documentation stating the contractor is providing vegetation management services for Evergy.

(D) Employment expectations

CONTRACTOR shall conduct pre-employment and random drug and alcohol screening to detect the presence of amphetamines, cocaine, marijuana, opiates, and phencyclidine, at no additional cost to Evergy.
CONTRACTOR shall conduct pre-employment background check for felony criminal convictions and motor vehicle violations for all states of residency within the past five (5) years, at no additional cost to Evergy.

(E) Vehicles

All vehicles and equipment shall be in good working condition, kept clean and organized at all times, maintaining a professional appearance. All trucks shall clearly display CONTRACTOR markings and vehicle numbers. Truck numbering should be visible from both side and the back. Also, the numbering should be large enough to be legible from a distance commonly encountered in traffic, i.e., several car lengths or across a four-lane intersection.
Each General Foreman and Crew shall be equipped with a two-way communication device at no additional cost to Evergy. If radios are supplied by Evergy, the contractor will replace all lost or stolen radios.
Cones will be placed at a highly visible area (street intersections, driveways, alleys, etc.) when a crew's work location is not readily detectable, as recommended by Missouri Department of Transportation.

(F) Time Fulfillment

All work shall be performed Monday through Friday, except under special circumstances as agreed by Evergy. The CONTRACTOR and Evergy shall mutually agree to the working hours in accordance to IBEW local 53. Any approved overtime shall be paid at the rates set forth in contract, depending on the circumstances, by Evergy for any work performed in excess of 40 hours per week.
While on stand-by, crew(s) shall be dumping chips, fueling trucks, maintaining chainsaws, and engaging in other productive duties. *Crews sitting for the 2-hour show up time shall not charge time towards their perspective equipment*.
Holidays - CONTRACTOR may, upon receipt of permission from Evergy, work at straight time on any Evergy-observed holiday.

(G) Certification and permits

The CONTRACTOR shall acquire all certifications and permits required by local, county, municipality, state, tribal and federal agencies in which the CONTRACTOR's crews will be performing work pursuant to this Contract.

(H) Refusal/Access

In the event that the CONTRACTOR encounters conditions prohibiting performance of Work, the crew foreman will make, and document on Work Log, all reasonable efforts to secure access. CONTRACTOR shall notify Evergy after all reasonable efforts to secure access have failed. A locked gate shall not, in and of itself, constitute "No Access". CONTRACTOR shall not be entitled to additional compensation for No Access.

In the event that a property owner refuses access to the work scheduled, the crew foreman will notify Evergy and move on to the next job site. Work will not be performed until Evergy has notified the CONTRACTOR that access has been granted.

(I) Reporting

The CONTRACTOR shall collect and report key aspects of the vegetation management program to document program performance and provide information necessary for ongoing program management including:

CONTRACTOR Weekly Work Log
Weekly TRES timesheets
Daily Crew Locations
A record of any safety hazards encountered
Any unexpected occurrence or accident resulting in death, life-threatening or serious injury to a person assigned to perform vegetation management activities or the public.
Additional documentation as requested by Evergy

(J) Contact information

Evergy and the CONTRACTOR shall provide each other as needed, a list of all Vegetation Management personnel, and the phone numbers where each can be contacted, including pagers/beepers/cell phones.

(K) Communication

During the progress of the work, CONTRACTOR shall provide crew locations to Evergy staff as requested. In the event the CONTRACTOR plans to deviate from the normal work schedule, e.g. leaving the job site or starting location due to inclement weather or other cause, the foreman shall notify the appropriate personnel immediately.

(L) System Awareness

The CONTRACTOR shall at all times be aware of the nature and characteristics of the electric facilities, including circuit voltage. It is understood that all circuits shall remain energized during the performance of work. Any exceptions must be authorized and scheduled by Evergy. If in the judgment of the Contractor's general foreman/supervisor, it is hazardous to prune or remove trees with the circuits energized, the Contractor must contact an authorized Evergy representative. If appropriate, Evergy will provide the necessary protective materials or de-energize circuits to ensure the safe pruning or removal of the tree(s).
Should the Contractor knock down or come into contact with conductors (power lines), the Contractor shall immediately notify Evergy and take the necessary protective measures. All Contractor-caused electric service interruptions are subject to repair at the Contractor's expense. This includes any damage to customers' property, including any electrical damage.
In the event a Contractor becomes aware of any broken, damaged, loose or faulty line facilities in the normal course of its line clearance performance, the Contractor shall promptly notify Evergy as to the exact location(s) and nature of the condition found.

The CONTRACTOR's Representative (i.e. Regional Manager or designated representative) and General Foreman shall attend meetings as scheduled by Evergy to discuss work practices and issues.

(M) Expectations

CONTRACTOR shall insure that crews are being productive at all times.
CONTRACTOR shall perform Work as identified by Evergy. The CONTRACTOR shall only accept work assignments from Evergy's designated representative. The CONTRACTOR shall make an attempt to contact the homeowner at each property they have planned work.

## (8) Definitions

**basal treatment** - Herbicide application covering the entire stem to approximately 18 inches above the soil

**brush** - a woody plant that is less than 4 inches DBH, that is not part of an existing tree, and that may reach the conductor at maturity.

**brush work** – trimming, clearing brush and applying a herbicide to the cut stems, or only applying herbicide to brush.

**clearance** - the distance between vegetation and the conductors.

**coniferous** - any of the cone-bearing trees or shrubs, mostly evergreens.

**DBH** - "diameter at breast height" – the diameter of individual tree trunks or individual stems of brush measured at a point 4.5 feet above the ground.

**deciduous** - any perennial plant that sheds its leaves annually at the end of a growing season.

**demand tree trimming** - trimming or removing trees on a customer requested or emergency basis. Also, may include tree work associated with line construction projects. This is typically required when trees have grown into the conductors, or are close to the conductors, and have created a potentially dangerous situation. This may also include special trimming or chipping work when requested by the Utility. Customer requested only Utility authorized representatives may assign demand tree work.

**directional pruning** - a form of natural pruning used to encourage tree regrowth away from the conductor. It is accomplished by removing limbs growing toward the conductors entirely at the branch collar near the trunk of the tree, or by pruning to lateral branches that are at least one-third the diameter of the limb being cut and are growing away from the conductor.

**drop-crotching** - is a crown reduction technique in which a tree trimmer makes proper pruning cuts at crotches, removing the larger limb and favoring the smaller. For electric line clearance, the trimmer would remove limbs growing toward the conductors and favor those growing away from the conductors. This usually results in a "V" shaped appearance of the tree crown and is frequently referred to as "V-trimming". See definition of "natural pruning" for further description.

**evergreen** - any plant that retains its leaves/needles year-round.

**foliar herbicide application** - the application of a herbicide to the leaves or needles of a target plant.

**hazard trees** - trees that are located off the right of way, have a high probability for failure and are of sufficient height to contact the conductors and/or structures and guy wires if they were to fall in that direction, and should be cleared. Conditions could include but are not limited to the following: Dead, dying or diseased, leaning trees, weak branches, shallow root system, root failure, internal decay, canker or canker root.

**herbicide** - a chemical pesticide used to control, suppress, or kill plants.

**natural pruning** - a method by which branches are cut to the branch collar at a suitable parent limb, the trunk of the tree, or an appropriately sized lateral branch. This method of pruning is sometimes called "drop-crotching", “proper pruning”, the “Shigo method” or "lateral trimming."

**preventative maintenance** - trimming or removing vegetation on a systematic basis typically by, but not limited to, circuit or grid, and in a manner intended to achieve system reliability.

**pruning** - the removal of dead, dying, diseased, interfering, objectionable, and/or weak branches of trees or shrubs using proper arboricultural techniques.

**removal** - completely removing an entire tree as close as practical to ground level and applying herbicide to the cut stump when appropriate.

**right-of-way** - a transmission or distribution right-of-way, an easement, a utility easement, or any other corridor of land paralleling, on both sides, an overhead transmission or distribution line, and in respect of which the Utility has certain rights.

**rounding over** - the making of many small cuts so that a tree underneath the conductors is rounded over in a uniform curve. This creates an unhealthy tree condition and results in rapid regrowth directly back toward the electrical conductors. This is not an acceptable practice.

**safety zone work** – removing all overhang and cutting back limbs to a minimum clearance of 10 feet from the energized conductor.

**selective herbicide** - a herbicide that, when applied to a mixed population of plants, will control specific species without injury to others.

**shearing** - the making of many small cuts so that a tree adjacent to the conductors is sheared in a uniform line. This is not a generally acceptable practice.

**show-up site** – site where CONTRACTOR crews receive work assignments.

**side pruning** - using natural pruning methods to cut back or removing side branches that are threatening the conductors; required where trees are growing adjacent to conductors.

**stump treatment** - applying an approved herbicide to the outer ring (cambium) portion of the stump to reduce or eliminate re-growth.

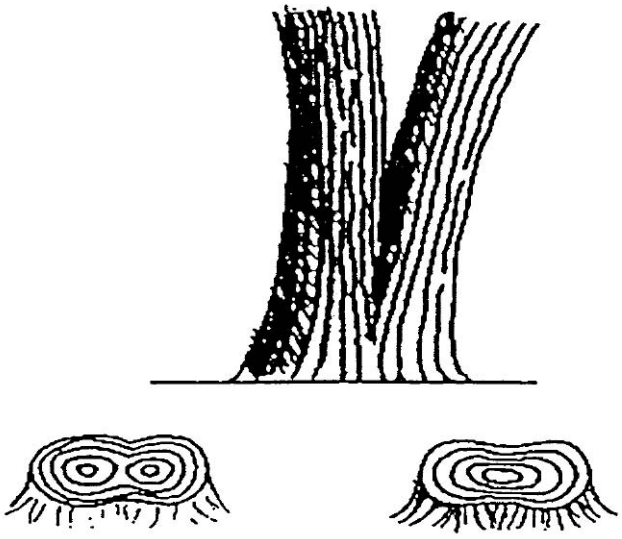
**sucker growth** - the re-growth within the tree that originates near the cuts made during the previous trimming.

**the property** - any work site associated with this contract.

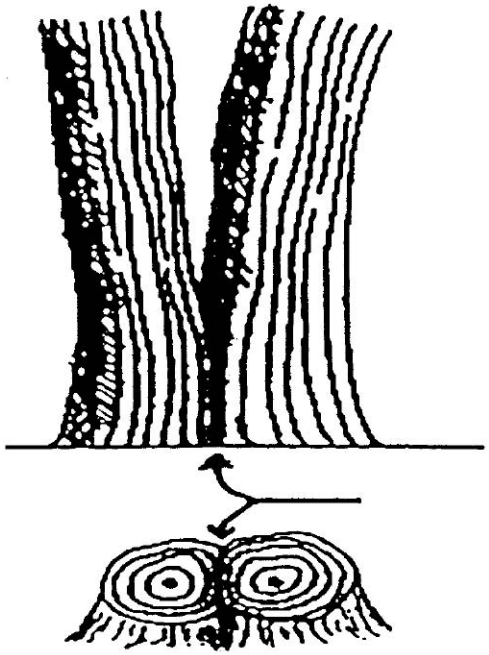
**topping** - cutting back the upper crown of a tree to a uniform horizontal line, leaving multiple stubs. This is an improper and unacceptable trimming technique.

**tree** - a perennial plant with a woody trunk measuring at least four (4) inches DBH, and having one set of annual rings at ground level or more than one set of annual rings not separated by included bark. Trees that grow adjacent to one another and share an apparent common base completely separated by "included bark" are considered to be distinct trees. "Included bark" is bark that is included within the wood of a tree, or between the woody stems of separate trees, creating a physical separation between the trees.

**single tree-** a tree that splits above the ground line and has no visible included bark seam down to the ground line.



**multiple trees-** Any tree that splits at the ground line or any tree that splits above the ground line but has a visible included bark seam down to the ground line.



**tree size classifications** - tree diameter as measured at breast height (DBH): 4” to 8”, 8” to 12”, 12” to 24”, 24” and greater

**tree crown** - the upper portion of the tree; the branches or leaf area.

**trimming** - cutting back tree branches or shrubs to shape or reduce the size of the tree or shrub.

**V-trim** - using natural pruning methods to cut back large portions of the upper crown of a tree. This is required when trees are located directly beneath a conductor. This is also known as crown reduction pruning or drop-crotching.

**vegetation** - all the plant (flora) life in a particular region. A plant community, assemblage, or aggregation with distinguishable characteristics

**(9) Tree Re-growth Rates**

**Average Annual Re-growth Rates for Individual Species on the Missouri Metro and Distribution Systems.**

| Species | Pruning Type | Inches of Re-growth by Age of Sprout | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 Yr. | 2 Yr. | 3 Yr. | 4 Yr. | 5 Yr. | 6 Yr. |
| | | | | | | | |
| Silver Maple | Side | 55 | 67 | 84 | 101 | 118 | 135 |
| | Top | 71 | 92 | 113 | 134 | 155 | 18 |
| | | | | | | | |
| Hackberry | Side | 36 | 56 | 78 | 87 | 100 | 104 |
| | Top | 53 | 81 | 104 | 120 | 140 | 161 |
| | | | | | | | |
| Ash | Side | 33 | 63 | 84 | 98 | 115 | 132 |
| | Top | 26 | 61 | 88 | 118 | 134 | 161 |
| | | | | | | | |
| Honey locust | Side | 36 | 68 | 91 | 115 | 135 | 162 |
| | Top | 48 | 81 | 115 | 128 | 147 | 173 |
| | | | | | | | |
| Black Walnut | Side | 43 | 71 | 87 | 103 | 119 | 130 |
| | Top | 69 | 103 | 144 | 166 | 183 | 212 |
| | | | | | | | |
| Eastern Redcedar | Side | 7 | 11 | 17 | 22 | 27 | 34 |
| | Top | 17 | 29 | 41 | 53 | 65 | 79 |
| | | | | | | | |
| Osage-Orange | Side | 67 | 89 | 111 | 133 | 155 | 177 |
| | Top | 81 | 105 | 129 | 153 | 177 | 201 |
| | | | | | | | |
| Mulberry | Side | 28 | 50 | 75 | 86 | 126 | 141 |
| | Top | 52 | 96 | 129 | 163 | 202 | 241 |
| | | | | | | | |
| Scotch Pine | Side | 12 | 22 | 29 | 37 | 46 | 54 |
| | Top | 13 | 25 | 35 | 44 | 53 | 59 |
| | | | | | | | |
| Sycamore | Side | 71 | 112 | 137 | 158 | 176 | 194 |
| | Top | 26 | 96 | 132 | 176 | 225 | 275 |
| | | | | | | | |
| Eastern Cottonwood | Side | 48 | 80 | 101 | 128 | 160 | 192 |
| | Top | 67 | 105 | 147 | 176 | 196 | 209 |
| | | | | | | | |
| Shingle Oak | Side | 43 | 57 | 71 | 87 | 94 | 103 |
| | Top | 17 | 36 | 54 | 66 | 77 | 88 |
| | | | | | | | |

| Species | Pruning Type | Inches of Re-growth by Age of Sprout | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 Yr. | 2 Yr. | 3 Yr. | 4 Yr. | 5 Yr. | 6 Yr. |
| Pin Oak | Side | 27 | 45 | 57 | 68 | 82 | 91 |
| | Top | 30 | 59 | 80 | 94 | 106 | 126 |
| | | | | | | | |
| Elm | Side | 50 | 83 | 111 | 133 | 152 | 203 |
| | Top | 53 | 93 | 124 | 158 | 193 | 226 |

## APPENDIX B – 2019 DISTRIBUTION VEGETATION MANAGEMENT EXPENSE AND PERFORMANCE

### Summary

Evergy manages vegetation for Missouri Metro and Missouri West through an Integrated Vegetation Management ("IVM") program. The IVM includes, but is not limited to: manual techniques, mechanical techniques, biological, chemical, and cultural control. Standard crew sizes are three workers on a manual crew and two workers on a bucket crew. Safety hazards may be encountered daily thereby requiring the contractor's certified line clearance trimmer to assess and take proactive measure(s) to safely clear limbs from power lines.

### Expenditures – 2019

2019 distribution vegetation management expenditures for Missouri service areas:

| | |
|---|---|
| Missouri Metro | $ 13,014,914 |
| Missouri West | $ 8,572,925 |
| Total | $ 21,587,838 |

### Vegetation Management Activities – 2019

Table 2 summarizes vegetation management activities completed in 2019 on distribution circuits in Missouri Metro and Missouri West service territories.

Table 2: 2019 MO Distribution System Vegetation Management Activities

| Company | Circuit Name | Classification | Total Miles | Completion Date |
|---|---|---|---|---|
| Missouri West | 37614 | R | 0.90 | 1/4/19 |
| Missouri West | 42720 | R | 0.05 | 1/4/19 |
| Missouri West | 31512 | R | 19.59 | 2/5/19 |
| Missouri Metro | 6131 | U | 16.56 | 2/11/19 |
| Missouri Metro | 7514 | U | 0.36 | 2/11/19 |
| Missouri Metro | 7541 | U | 0.50 | 2/11/19 |
| Missouri West | 42721 | U | 18.94 | 2/16/19 |
| Missouri West | 21212 | U | 0.31 | 2/21/19 |
| Missouri West | 20811 | U | 3.93 | 2/26/19 |
| Missouri West | 39411 | U | 4.22 | 2/26/19 |
| Missouri Metro | 647 | U | 2.25 | 2/26/19 |
| Missouri Metro | 83101 | 34 | 14.79 | 2/26/19 |
| Missouri Metro | 83301 | 34 | 0.20 | 2/26/19 |
| Missouri Metro | 83204 | 34 | 0.83 | 2/28/19 |
| Missouri Metro | 2711 | R | 0.41 | 3/1/19 |
| Missouri Metro | 7143 | R | 0.58 | 3/1/19 |
| Missouri Metro | 83103 | 34 | 7.13 | 3/1/19 |
| Missouri Metro | 5338 | U | 4.53 | 3/2/19 |

| | | | | |
|---|---|---|---|---|
| Missouri West | 26412 | R | 2.80 | 3/4/19 |
| Missouri West | 49812 | R | 2.73 | 3/4/19 |
| Missouri Metro | 5372 | U | 7.64 | 3/9/19 |
| Missouri West | 36111 | U | 5.68 | 3/16/19 |
| Missouri West | 21412 | U | 3.71 | 3/18/19 |
| Missouri West | 39410 | R | 0.03 | 3/18/19 |
| Missouri West | 39420 | R | 0.02 | 3/18/19 |
| Missouri West | 39430 | R | 0.02 | 3/18/19 |
| Missouri West | 39440 | R | 0.03 | 3/18/19 |
| Missouri West | 29012 | U | 11.28 | 3/21/19 |
| Missouri West | 40761 | U | 6.98 | 3/22/19 |
| Missouri Metro | 2422 | U | 3.43 | 3/23/19 |
| Missouri West | 24815 | U | 4.64 | 3/23/19 |
| Missouri West | 43612 | U | 9.55 | 3/23/19 |
| Missouri Metro | 2722 | U | 11.62 | 3/25/19 |
| Missouri Metro | 7484 | U | 0.01 | 3/25/19 |
| Missouri Metro | 9842 | U | 5.07 | 3/25/19 |
| Missouri Metro | 2374 | U | 8.44 | 3/27/19 |
| Missouri Metro | 3111 | U | 4.71 | 3/27/19 |
| Missouri West | 30711 | R | 69.49 | 3/28/19 |
| Missouri Metro | 2713 | U | 5.94 | 4/1/19 |
| Missouri Metro | 2822 | U | 1.46 | 4/1/19 |
| Missouri Metro | 3131 | U | 4.03 | 4/1/19 |
| Missouri Metro | 6333 | U | 3.68 | 4/1/19 |
| Missouri Metro | 127203 | 34 | 35.58 | 4/3/19 |
| Missouri West | 37622 | R | 14.08 | 4/4/19 |
| Missouri Metro | 2611 | R | 16.65 | 4/5/19 |
| Missouri West | 29113 | U | 3.49 | 4/5/19 |
| Missouri Metro | 2444 | U | 3.92 | 4/6/19 |
| Missouri West | 32111 | U | 24.00 | 4/6/19 |
| Missouri Metro | 2612 | R | 12.00 | 4/8/19 |
| Missouri West | 29123 | U | 3.68 | 4/8/19 |
| Missouri West | 37613 | U | 11.66 | 4/8/19 |
| Missouri West | 37632 | U | 2.01 | 4/11/19 |
| Missouri Metro | 7581 | U | 6.61 | 4/11/19 |
| Missouri Metro | 3413 | R | 12.52 | 4/15/19 |
| Missouri Metro | 4414 | U | 4.27 | 4/15/19 |
| Missouri West | 24211 | U | 8.14 | 4/20/19 |
| Missouri Metro | 11012 | R | 8.24 | 4/24/19 |
| Missouri West | 27011 | U | 0.26 | 4/24/19 |
| Missouri West | 223332 | 34 | 14.97 | 4/27/19 |
| Missouri West | 24212 | R | 12.35 | 4/27/19 |
| Missouri Metro | 1562 | U | 4.14 | 5/2/19 |
| Missouri Metro | 7421 | U | 0.69 | 5/2/19 |
| Missouri West | 40782 | U | 15.32 | 5/3/19 |

| | | | | |
|---|---|---|---|---|
| Missouri Metro | 5381 | U | 10.72 | 5/3/19 |
| Missouri Metro | 9614 | U | 3.51 | 5/3/19 |
| Missouri West | 40211 | U | 7.79 | 5/4/19 |
| Missouri Metro | 4812 | U | 2.37 | 5/4/19 |
| Missouri Metro | 2412 | U | 4.47 | 5/6/19 |
| Missouri West | 39161 | U | 15.48 | 5/8/19 |
| Missouri West | 401220 | 34 | 0.03 | 5/9/19 |
| Missouri Metro | 4853 | U | 5.74 | 5/13/19 |
| Missouri Metro | 6614 | U | 5.05 | 5/13/19 |
| Missouri West | 39153 | U | 4.72 | 5/14/19 |
| Missouri Metro | 3211 | R | 24.57 | 5/15/19 |
| Missouri West | 42211 | R | 0.36 | 5/16/19 |
| Missouri Metro | 6631 | U | 2.41 | 5/16/19 |
| Missouri Metro | 9813 | U | 13.35 | 5/17/19 |
| Missouri Metro | 3134 | U | 12.40 | 5/24/19 |
| Missouri West | 21423 | U | 7.68 | 5/25/19 |
| Missouri Metro | 7482 | U | 2.90 | 5/29/19 |
| Missouri West | 37623 | U | 13.35 | 5/30/19 |
| Missouri Metro | 5663 | U | 17.74 | 6/1/19 |
| Missouri Metro | 2742 | U | 2.85 | 6/3/19 |
| Missouri Metro | 2762 | U | 8.12 | 6/3/19 |
| Missouri Metro | 5644 | U | 14.20 | 6/4/19 |
| Missouri Metro | 7562 | U | 1.68 | 6/6/19 |
| Missouri West | 38312 | U | 12.84 | 6/10/19 |
| Missouri Metro | 7423 | U | 5.53 | 6/10/19 |
| Missouri Metro | 7532 | U | 1.12 | 6/10/19 |
| Missouri West | 21211 | U | 1.01 | 6/14/19 |
| Missouri West | 404006 | 34 | 0.26 | 6/17/19 |
| Missouri West | 38511 | U | 1.91 | 6/19/19 |
| Missouri Metro | 3143 | U | 7.88 | 6/20/19 |
| Missouri West | 40212 | U | 8.04 | 6/20/19 |
| Missouri West | 24712 | U | 12.09 | 6/24/19 |
| Missouri Metro | 2733 | U | 8.46 | 6/28/19 |
| Missouri Metro | 2734 | U | 3.26 | 6/28/19 |
| Missouri West | 28231 | R | 39.76 | 7/3/19 |
| Missouri West | 24813 | U | 5.24 | 7/6/19 |
| Missouri West | 31611 | U | 17.04 | 7/6/19 |
| Missouri Metro | 4311 | R | 34.48 | 7/11/19 |
| Missouri West | 11822 | U | 4.02 | 7/12/19 |
| Missouri West | 11823 | U | 7.28 | 7/12/19 |
| Missouri West | 21312 | U | 14.66 | 7/12/19 |
| Missouri West | 32132 | U | 40.73 | 7/12/19 |
| Missouri Metro | 3913 | U | 2.36 | 7/12/19 |
| Missouri Metro | 7041 | U | 5.35 | 7/12/19 |
| Missouri West | 24722 | U | 6.38 | 7/20/19 |

| | | | | |
|---|---|---|---|---|
| Missouri West | 24811 | U | 3.14 | 7/20/19 |
| Missouri Metro | 479 | U | 2.66 | 7/22/19 |
| Missouri Metro | 578 | U | 3.48 | 7/22/19 |
| Missouri Metro | 579 | U | 3.43 | 7/22/19 |
| Missouri West | 27021 | U | 0.79 | 7/23/19 |
| Missouri Metro | 7821 | U | 0.88 | 7/23/19 |
| Missouri Metro | 7822 | U | 8.01 | 7/23/19 |
| Missouri Metro | 568 | U | 4.84 | 7/25/19 |
| Missouri Metro | 10912 | R | 2.42 | 7/26/19 |
| Missouri Metro | 7412 | U | 5.11 | 7/29/19 |
| Missouri Metro | 7411 | U | 6.54 | 7/30/19 |
| Missouri Metro | 7551 | U | 7.76 | 8/1/19 |
| Missouri Metro | 7563 | U | 3.21 | 8/1/19 |
| Missouri West | 37642 | U | 10.94 | 8/5/19 |
| Missouri West | 401222 | 34 | 19.72 | 8/5/19 |
| Missouri Metro | 7553 | U | 3.49 | 8/8/19 |
| Missouri Metro | 10913 | R | 18.92 | 8/16/19 |
| Missouri West | 42212 | R | 11.62 | 8/26/19 |
| Missouri Metro | 6342 | U | 9.44 | 8/27/19 |
| Missouri Metro | 7853 | U | 4.54 | 8/27/19 |
| Missouri Metro | 5624 | U | 7.55 | 8/31/19 |
| Missouri Metro | 2332 | U | 7.78 | 9/4/19 |
| Missouri West | 41411 | R | 70.97 | 9/6/19 |
| Missouri Metro | 1521 | U | 0.16 | 9/16/19 |
| Missouri West | 40414 | 34 | 26.48 | 9/17/19 |
| Missouri West | 20913 | U | 3.33 | 9/21/19 |
| Missouri West | 24611 | U | 22.84 | 9/21/19 |
| Missouri West | 32812 | U | 10.38 | 9/21/19 |
| Missouri West | 35912 | U | 24.97 | 9/25/19 |
| Missouri West | 35921 | U | 0.44 | 9/25/19 |
| Missouri West | 365113 | 34 | 0.02 | 9/25/19 |
| Missouri West | 34412 | U | 0.24 | 10/3/19 |
| Missouri West | 32131 | U | 8.14 | 10/8/19 |
| Missouri Metro | 6331 | U | 18.32 | 10/11/19 |
| Missouri Metro | 9412 | U | 2.87 | 10/11/19 |
| Missouri Metro | 9422 | U | 3.05 | 10/11/19 |
| Missouri West | 31011 | R | 16.13 | 10/23/19 |
| Missouri Metro | 3723 | U | 1.99 | 10/23/19 |
| Missouri Metro | 3721 | U | 3.49 | 10/28/19 |
| Missouri Metro | 3722 | U | 4.74 | 10/28/19 |
| Missouri West | 37013 | R | 53.95 | 10/29/19 |
| Missouri West | 38712 | R | 43.21 | 10/30/19 |
| Missouri Metro | 2303 | U | 5.54 | 11/7/19 |
| Missouri Metro | 2352 | U | 8.39 | 11/7/19 |
| Missouri Metro | 2441 | U | 3.83 | 11/8/19 |

| | | | | |
|---|---|---|---|---|
| Missouri Metro | 2461 | U | 1.87 | 11/8/19 |
| Missouri Metro | 3733 | U | 2.05 | 11/8/19 |
| Missouri West | 27212 | R | 0.38 | 11/12/19 |
| Missouri West | 27213 | U | 0.28 | 11/12/19 |
| Missouri West | 32521 | U | 52.44 | 11/12/19 |
| Missouri West | 37341 | U | 13.53 | 11/12/19 |
| Missouri Metro | 4913 | U | 9.52 | 11/12/19 |
| Missouri Metro | 7142 | U | 2.74 | 11/12/19 |
| Missouri Metro | 9421 | U | 3.71 | 11/12/19 |
| Missouri West | 30612 | U | 22.55 | 11/15/19 |
| Missouri West | 204111 | 34 | 17.94 | 11/20/19 |
| Missouri West | 36522 | R | 23.63 | 11/20/19 |
| Missouri Metro | 2301 | U | 8.79 | 11/21/19 |
| Missouri West | 386221 | 34 | 8.47 | 11/21/19 |
| Missouri West | 386222 | 34 | 9.82 | 11/21/19 |
| Missouri Metro | 1144 | U | 1.89 | 11/25/19 |
| Missouri West | 33411 | U | 3.30 | 11/25/19 |
| Missouri West | 38311 | R | 78.49 | 11/25/19 |
| Missouri Metro | 3941 | U | 4.14 | 11/25/19 |
| Missouri Metro | 4941 | U | 5.29 | 11/25/19 |
| Missouri Metro | 4942 | U | 7.90 | 11/25/19 |
| Missouri West | 25612 | R | 3.17 | 11/26/19 |
| Missouri West | 27211 | R | 22.04 | 11/26/19 |
| Missouri West | 38111 | U | 23.23 | 11/27/19 |
| Missouri Metro | 3613 | R | 5.11 | 12/2/19 |
| Missouri West | 43411 | R | 20.29 | 12/5/19 |
| Missouri Metro | 1112 | U | 2.78 | 12/9/19 |
| Missouri Metro | 6011 | R | 89.93 | 12/10/19 |
| Missouri West | 37221 | U | 6.57 | 12/12/19 |
| Missouri West | 22511 | U | 7.80 | 12/17/19 |
| Missouri West | 226111 | 34 | 19.15 | 12/17/19 |
| Missouri West | 226112 | 34 | 3.91 | 12/17/19 |
| Missouri West | 34812 | U | 3.96 | 12/17/19 |
| Missouri Metro | 7931 | R | 82.05 | 12/17/19 |
| Missouri Metro | 12012 | R | 22.06 | 12/18/19 |
| Missouri West | 247511 | R | 38.47 | 12/18/19 |
| Missouri West | 11831 | U | 3.07 | 12/19/19 |
| Missouri West | 24513 | U | 8.30 | 12/19/19 |
| Missouri West | 31121 | U | 10.71 | 12/19/19 |
| Missouri Metro | 3611 | U | 15.17 | 12/19/19 |
| Missouri West | 247111 | R | 27.53 | 12/20/19 |
| Missouri West | 38321 | U | 16.35 | 12/20/19 |
| Missouri West | 35512 | R | 19.30 | 12/23/19 |
| Missouri West | 29211 | U | 7.08 | 12/24/19 |
| Missouri West | 38112 | R | 48.57 | 12/24/19 |

| | | | | |
|---|---|---|---|---|
| Missouri West | 23813 | U | 10.18 | 12/26/19 |
| Missouri Metro | 5251 | U | 9.28 | 12/26/19 |
| Missouri Metro | 5262 | U | 6.21 | 12/26/19 |
| Missouri West | 37612 | U | 5.25 | 12/27/19 |
| Missouri West | 28412 | R | 27.65 | 12/30/19 |
| Missouri West | 37342 | U | 48.50 | 12/30/19 |
| Missouri Metro | 2511 | R | 53.47 | 12/31/19 |
| Missouri West | 31111 | U | 32.92 | 12/31/19 |
| Missouri West | 34132 | U | 24.84 | 12/31/19 |
| Missouri Metro | 2391 | U | 13.29 | 12/31/19 |
| Missouri West | 32522 | U | 8.68 | 12/31/19 |
| Missouri Metro | 5374 | U | 14.22 | 12/31/19 |
| Missouri Metro | 2393 | U | 8.09 | 12/31/19 |
| Missouri West | 24011 | U | 26.51 | 12/31/19 |

Table 3: 2019 MO Completion Summary Of Distribution System Vegetation Management Circuits Scheduled for Maintenance

| **Territory** | **Urban Miles** | **Rural Miles** | **Total 12 kV (Urban + Rural)** | **34 kV** | **Total 12 kV + 34 kV** |
|---|---|---|---|---|---|
| Missouri Metro | 496 | 383 | 879 | 59 | 938 |
| Missouri West | 739 | 668 | 1,407 | 121 | 1,528 |
| Total | 1,235 | 1,051 | 2,286 | 180 | 2,466 |

Table 4: 2019 MO Distribution System Mileage Inventory

| Territory | Urban Miles | Rural Miles | Total 12 kV (Urban + Rural) | 34 kV | 12 kV + 34 kV |
|---|---|---|---|---|---|
| Missouri Metro | 1,955 | 1,818 | 3,773 | 176 | 3,949 |
| Missouri West | 2,948 | 4,463 | 7,411 | 494 | 7,905 |
| Total | 4,903 | 6,281 | 11,184 | 670 | 11,854 |

Note: Minor differences in distribution system miles occur between annual and quarterly reports. The minor differences reflect regular monitoring of the distribution system that identifies retired or new facilities.

## APPENDIX C – 2020 DISTRIBUTION VEGETATION MANAGEMENT BUDGET AND SCHEDULED PERFORMANCE

The listed vegetation management work is planned for completion in 2019. The Program is dynamic in nature and, at times, requires adjustment to conform to performance as measured by tree-related service reliability; to take advantage of opportunities to gain efficiency; to incorporate customer feedback; to address changes in regulatory initiatives; and to address other program drivers. In light of the many variables affecting vegetation management activities, including weather, specific schedule dates were excluded from this appendix.

### Budget – 2020

2020 distribution vegetation management budget for Missouri service areas:

Missouri Metro $ 8,312,219
Missouri West $11,302,130
Total $19,614,219

Table 5: 2020 MO Distribution System Vegetation Management Circuits Scheduled for Maintenance

| Company | Circuit | Classification | Miles |
|---|---|---|---|
| Missouri Metro | 104202 | 34 | 6.69 |
| Missouri Metro | 42106 | 34 | 17.04 |
| Missouri Metro | 42105 | 34 | 28.1 |
| Missouri West | 204112 | 34 | 11.87 |
| Missouri West | 407441 | 34 | 33.84 |
| Missouri West | 39142 | 34 | 7.46 |
| Missouri West | 39921 | 34 | 4.43 |
| Missouri West | 40413 | 34 | 3.26 |
| Missouri West | 40422 | 34 | 2.13 |
| Missouri West | 365111 | 34 | 13.18 |
| Missouri West | 322112 | 34 | 28.37 |
| Missouri West | 22821 | 34 | 10.19 |
| Missouri Metro | 9613 | R | 1.93 |
| Missouri Metro | 9622 | R | 3.22 |
| Missouri Metro | 9624 | R | 1.15 |
| Missouri West | 35112 | R | 66.69 |
| Missouri West | 42213 | R | 20.04 |
| Missouri West | 36011 | R | 30.44 |
| Missouri West | 21911 | R | 48.45 |
| Missouri West | 20311 | R | 22.13 |
| Missouri Metro | 2613 | R | 22.32 |
| Missouri Metro | 13611 | R | 0.07 |
| Missouri Metro | 14002 | R | 0.01 |

| Company | Circuit | Classification | Miles |
|---|---|---|---|
| Missouri Metro | 4221 | R | 137.8 |
| Missouri West | 23511 | R | 30.63 |
| Missouri West | 20422 | R | 28.61 |
| Missouri West | 33322 | R | 105.3 |
| Missouri West | 33312 | R | 4.61 |
| Missouri West | 29131 | R | 14.62 |
| Missouri West | 39311 | R | 77.33 |
| Missouri West | 41911 | R | 33.2 |
| Missouri West | 247512 | R | 0.07 |
| Missouri West | 101501 | R | 6.93 |
| Missouri West | 28721 | R | 28.66 |
| Missouri Metro | 2761 | R | 0.47 |
| Missouri Metro | 9414 | R | 1.07 |
| Missouri West | 42731 | R | 23.69 |
| Missouri West | 42612 | R | 31.42 |
| Missouri West | 30111 | R | 8.42 |
| Missouri West | 36521 | R | 13.43 |
| Missouri West | 31113 | R | 2.05 |
| Missouri West | 25411 | R | 39.49 |
| Missouri West | 38832 | R | 65.04 |
| Missouri West | 39511 | R | 33.83 |
| Missouri West | 20312 | R | 16.43 |
| Missouri West | 20611 | R | 10.03 |
| Missouri West | 41910 | R | 0.04 |
| Missouri West | 42730 | R | 0.03 |
| Missouri West | 29911 | R | 68.5 |
| Missouri West | 29912 | R | 61.06 |
| Missouri West | 24711 | U | 5.96 |
| Missouri West | 24621 | U | 12.66 |
| Missouri West | 20914 | U | 7 |
| Missouri West | 24622 | U | 16.41 |
| Missouri West | 24612 | U | 9.53 |
| Missouri West | 20925 | U | 9.01 |
| Missouri West | 20921 | U | 18.22 |
| Missouri West | 20922 | U | 8.38 |
| Missouri West | 36612 | U | 4.96 |
| Missouri West | 20813 | U | 1.37 |
| Missouri West | 20941 | U | 6.79 |
| Missouri West | 36622 | U | 2.65 |
| Missouri West | 20321 | U | 14.35 |
| Missouri Metro | 2522 | U | 9.8 |
| Missouri Metro | 11011 | U | 0.14 |
| Missouri Metro | 14001 | U | 0.01 |
| Missouri West | 22113 | U | 25.23 |
| Missouri West | 22312 | U | 16.96 |

| Company | Circuit | Classification | Miles |
|---|---|---|---|
| Missouri Metro | 6153 | U | 8.82 |
| Missouri Metro | 6111 | U | 17.53 |
| Missouri Metro | 6164 | U | 14.66 |
| Missouri Metro | 6123 | U | 15.72 |
| Missouri Metro | 6122 | U | 10.86 |
| Missouri Metro | 4822 | U | 1.84 |
| Missouri Metro | 3122 | U | 9.62 |
| Missouri Metro | 3152 | U | 9.07 |
| Missouri Metro | 3532 | U | 15.45 |
| Missouri Metro | 3151 | U | 9.15 |
| Missouri Metro | 2394 | U | 11.34 |
| Missouri Metro | 3123 | U | 1.09 |
| Missouri Metro | 3552 | U | 16.31 |
| Missouri Metro | 2355 | U | 9.8 |
| Missouri Metro | 3542 | U | 15.03 |
| Missouri Metro | 7522 | U | 0.03 |
| Missouri Metro | 2392 | U | 1.87 |
| Missouri Metro | 3153 | U | 6.39 |
| Missouri Metro | 5614 | U | 7.57 |
| Missouri Metro | 2342 | U | 6.89 |
| Missouri Metro | 7512 | U | 0.09 |
| Missouri Metro | 7584 | U | 1 |
| Missouri Metro | 7494 | U | 5.13 |
| Missouri Metro | 7493 | U | 9.97 |
| Missouri Metro | 7414 | U | 11.9 |
| Missouri Metro | 5383 | U | 11.64 |
| Missouri Metro | 5712 | U | 12.68 |
| Missouri Metro | 3712 | U | 0.04 |
| Missouri Metro | 2473 | U | 0.09 |
| Missouri Metro | 7401 | U | 6.16 |
| Missouri Metro | 7413 | U | 1.79 |
| Missouri Metro | 4413 | U | 1.9 |
| Missouri Metro | 2442 | U | 2.09 |
| Missouri Metro | 7433 | U | 2.9 |
| Missouri West | 35111 | U | 16.07 |
| Missouri West | 21511 | U | 4.75 |
| Missouri West | 21411 | U | 3.39 |
| Missouri West | 21512 | U | 4.23 |
| Missouri West | 24511 | U | 4.61 |
| Missouri West | 33023 | U | 15.51 |
| Missouri West | 28122 | U | 5.12 |
| Missouri West | 33021 | U | 15.53 |
| Missouri West | 32911 | U | 3.33 |
| Missouri West | 28111 | U | 7.28 |
| Missouri West | 28224 | U | 6.72 |

| Company | Circuit | Classification | Miles |
|---|---|---|---|
| Missouri West | 36113 | U | 8.33 |
| Missouri West | 28322 | U | 8.06 |
| Missouri West | 33013 | U | 16.94 |
| Missouri West | 28323 | U | 8.3 |
| Missouri West | 33012 | U | 12.85 |
| Missouri West | 33011 | U | 15.2 |
| Missouri West | 28112 | U | 13.96 |
| Missouri West | 27721 | U | 4.26 |
| Missouri West | 27113 | U | 8.06 |
| Missouri West | 28321 | U | 9.44 |
| Missouri West | 27111 | U | 3.25 |
| Missouri West | 27121 | U | 5.81 |
| Missouri West | 28121 | U | 7.45 |
| Missouri West | 28214 | U | 2.05 |
| Missouri West | 37644 | U | 0.79 |
| Missouri West | 29022 | U | 14.44 |
| Missouri West | 29221 | U | 17.32 |
| Missouri West | 29021 | U | 5.52 |
| Missouri West | 35922 | U | 7.93 |
| Missouri West | 29212 | U | 6.37 |
| Missouri West | 29121 | U | 1.65 |
| Missouri West | 25312 | U | 12.75 |
| Missouri West | 30611 | U | 10.48 |
| Missouri Metro | 7832 | U | 10.01 |
| Missouri Metro | 5252 | U | 8.36 |
| Missouri Metro | 4961 | U | 3.78 |
| Missouri Metro | 7851 | U | 9.72 |
| Missouri Metro | 7831 | U | 13.73 |
| Missouri Metro | 4953 | U | 8.31 |
| Missouri Metro | 7823 | U | 14.53 |
| Missouri Metro | 7863 | U | 11.94 |
| Missouri Metro | 4943 | U | 25.65 |
| Missouri Metro | 1142 | U | 6.73 |
| Missouri Metro | 2752 | U | 11.38 |
| Missouri Metro | 1111 | U | 3.95 |
| Missouri Metro | 7042 | U | 13.62 |
| Missouri Metro | 7811 | U | 10.56 |
| Missouri Metro | 2741 | U | 15.18 |
| Missouri Metro | 5261 | U | 14.54 |
| Missouri Metro | 2771 | U | 7.75 |
| Missouri Metro | 7051 | U | 4.73 |
| Missouri Metro | 9812 | U | 2.31 |
| Missouri West | 43811 | U | 14.89 |
| Missouri West | 43812 | U | 11.67 |
| Missouri West | 35511 | U | 8.44 |

| Company | Circuit | Classification | Miles |
|---|---|---|---|
| Missouri West | 35522 | U | 9.37 |
| Missouri West | 23822 | U | 14.25 |
| Missouri West | 23823 | U | 0.75 |
| Missouri West | 23811 | U | 5.66 |
| Missouri West | 34311 | U | 1.08 |
| Missouri West | 34312 | U | 0.89 |
| Missouri West | 34711 | U | 24.96 |
| Missouri West | 34211 | U | 6.33 |
| Missouri West | 34811 | U | 2.57 |
| Missouri West | 34212 | U | 32.12 |
| Missouri West | 38821 | U | 15.4 |
| Missouri West | 40911 | U | 10.57 |
| Missouri West | 43324 | U | 3.32 |
| Missouri West | 39033 | U | 9.65 |
| Missouri West | 40941 | U | 10.26 |
| Missouri West | 40931 | U | 7.54 |
| Missouri West | 40921 | U | 7.73 |
| Missouri West | 39042 | U | 7.56 |
| Missouri West | 38822 | U | 12.05 |
| Missouri West | 39152 | U | 3.74 |
| Missouri West | 42711 | U | 55.61 |
| Missouri West | 38541 | U | 1.78 |
| Missouri West | 37322 | U | 5.29 |
| Missouri West | 37222 | U | 6.64 |

Table 6: 2020 Summary MO Distribution System Vegetation Management Circuits Scheduled for Maintenance

| Territory | Urban Miles | Rural Miles | Total 12 kV (Urban + Rural) | 34 kV | 12 kV + 34 kV |
|---|---|---|---|---|---|
| Missouri Metro | 489 | 168 | 658 | 52 | 710 |
| Missouri West | 711 | 891 | 1,602 | 115 | 1,717 |
| Total | 1,201 | 1,059 | 2,260 | 167 | 2,426 |

Table 7: 2020 MO Distribution System Mileage Inventory

| Territory | Urban Miles | Rural Miles | Total 12 kV (Urban + Rural) | 34 kV | 12 kV + 34 kV |
|---|---|---|---|---|---|
| Missouri Metro | 1,957 | 1,818 | 3,775 | 176 | 3,951 |
| Missouri West | 2,917 | 4,500 | 7,417 | 494 | 7,910 |
| Total | 4,873 | 6,319 | 11,191 | 670 | 11,861 |

**APPENDICES D THROUGH G**
**CONFIDENTIAL**

**These appendices contain information that falls under the definitions of Confidential Information, Critical Energy Infrastructure Information, and/or Critical Infrastructure under *the Rules of Procedure of the North American Electric Reliability Corporation,* Section 1500. In light of the requirements to maintain the confidentiality of information and data that falls under Section 1500, the appendices are marked as Confidential.**