

# EXHIBIT AA – Application for Site Certificate

## ELECTRIC AND MAGNETIC FIELDS

OAR 345-021-0010(1)(aa)

### REVIEWER CHECKLIST

(aa) Exhibit AA. If the proposed energy facility is a transmission line or has, as a related or supporting facility, a transmission line of any size:

Rule Sections	Section	✓
<p>(A) Information about the expected electric and magnetic fields, including:</p> <ul style="list-style-type: none"><li>(i) The distance in feet from the proposed center line of each proposed transmission line to the edge of the right-of-way.</li><li>(ii) The type of each occupied structure, including but not limited to residences, commercial establishments, industrial facilities, schools, daycare centers and hospitals, within 200 feet on each side of the proposed center line of each proposed transmission line.</li><li>(iii) The approximate distance in feet from the proposed center line to each structure identified in (A).</li><li>(iv) At representative locations along each proposed transmission line, a graph of the predicted electric and magnetic fields levels from the proposed center line to 200 feet on each side of the proposed center line.</li><li>(v) Any measures the applicant proposes to reduce electric or magnetic field levels.</li><li>(vi) The assumptions and methods used in the electric and magnetic field analysis, including the current in amperes on each proposed transmission line.</li><li>(vii) The applicant’s proposed monitoring program, if any, for actual electric and magnetic field levels.</li></ul>	AA.2	
<p>(B) An evaluation of alternate methods and costs of reducing radio interference likely to be caused by the transmission line in the primary reception area near interstate, U.S. and state highways.</p>	NA	



**EXHIBIT AA – Application for Site Certificate**

**ELECTRIC AND MAGNETIC FIELDS**

OAR 345-021-0010(1)(aa)

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## AA.1 INTRODUCTION

Obsidian Solar Center, LLC (Applicant) proposes to construct the Obsidian Solar Center (Facility) in Lake County, Oregon, with an alternating current generating capacity of up to 400 megawatts. Refer to Exhibit B for Facility layout information and to Exhibit C for Facility location information.

Exhibit AA provides information about the electric and magnetic fields expected to be produced by the Facility's proposed 115-kilovolt (kV), approximately 2-mile-long overhead transmission line, as required by Oregon Administrative Rules (OAR) 345-021-0010(1)(aa): *If the proposed energy facility is a transmission line or has, as a related or supporting facility, a transmission line of any size.*

This exhibit describes two transmission line configurations: the first consisting of a double circuit configuration utilizing 70-foot-tall steel monopoles located in the easternmost 0.5 miles of the proposed transmission line corridor, just to the west of Area A. This section of the line will be installed in the middle of a 60-foot-wide transmission easement. The second configuration is a double circuit configuration utilizing 70-foot-tall steel monopoles connecting the remaining 1.5 miles of proposed transmission line to the proposed substation on Area D. This section of the line will be located within 5 feet of the northern edge of the County's 60-foot-wide right-of-way (ROW) on Connley Lane.

### Executive Summary

This exhibit provides evidence that Applicant will construct the transmission line associated with the Facility to meet the siting standards described in OAR 345-024-0090 - Siting Standards for Transmission Lines. For the double circuit configuration, calculated electric fields range from 0.248 to 0.982 kilovolts per meter (kV/m) at the ROW edges (depending on the line placement within the ROW), with a maximum of 0.985 kV/m within the ROW. These calculated field levels are well below the 9 kV/m standard set by the Oregon Energy Facility Siting Council in OAR 345-024-0090. In addition, Applicant has designed the transmission line so that induced currents will be as low as reasonably achievable, including the use of a relatively low line voltage of 115 kV, combined with the measures proposed to reduce electric and magnetic field levels (refer to Section 4.4 in Appendix AA-1).

Applicant does not propose any specific conditions of approval pertaining to electric and magnetic fields for the Site Certificate.

## AA.2 INFORMATION ABOUT ELECTRIC AND MAGNETIC FIELDS

*OAR 345-021-0010(1)(aa)(A) Information about the expected electric and magnetic fields, including:*

*(i) The distance in feet from the proposed center line of each proposed transmission line to the edge of the right-of-way.*

Response: The minimum distance from the proposed transmission line center to the ROW edge is 5 feet (in the westernmost 1.5 miles of the transmission line), and 30 feet (in the easternmost 0.5 miles of the transmission line), with an overall ROW width of 60 feet.

*(ii) The type of each occupied structure, including but not limited to residences, commercial establishments, industrial facilities, schools, daycare centers and hospitals, within 200 feet on each side of the proposed center line of each proposed transmission line.*

Response: There are no residences or other occupied structures within 200 feet on each side of the center line of the proposed transmission line.

*(iii) The approximate distance in feet from the proposed center line to each structure identified in (A).*

Response: There are no occupied structures identified in (A).

*(iv) At representative locations along each proposed transmission line, a graph of the predicted electric and magnetic fields levels from the proposed center line to 200 feet on each side of the proposed center line.*

Response: Graphs of the calculated electric and magnetic field levels from the proposed center line to 200 feet on each side of the proposed center line are provided in Appendix AA-1.

For the double circuit configuration centered in the transmission line easement on private land, calculated electric fields range from 0.248 to 0.251 kV/m at the ROW edges, with a maximum of 0.985 kV/m within the ROW. Calculated magnetic fields range from 44.1 to 45.0 milligauss (mG) at the ROW edges, with a maximum of 148.1 mG within the ROW.

For the double circuit configuration located within 5 feet of the county ROW on Connley Lane, calculated electric fields range from 0.031 to 0.982 kV/m at the ROW edges, with a maximum of 0.985 kV/m within the ROW. Calculated magnetic fields range from 13.0 to 140.9 mG at the ROW edges, with a maximum of 148.1 mG within the ROW.

Refer to Appendix AA-1 for additional discussion of predicted electric and magnetic fields levels for the proposed transmission line circuit configuration options.

*(v) Any measures the applicant proposes to reduce electric or magnetic field levels.*

Response: Electric or magnetic fields will be reduced by the use of a vertical configuration of the phase conductors, with the different circuits employing opposite phasing arrangements (phase A-B-C top-to-bottom for one circuit and C-B-A top-to-bottom for the other circuit) to increase magnetic field cancellation. In addition, Applicant has designed the transmission line so that induced currents will be as low as reasonably achievable, including the use of a relatively low line voltage of 115 kV. Refer to Appendix AA-1 for further discussion of measures to reduce electric and magnetic fields, and induced currents.

*(vi) The assumptions and methods used in the electric and magnetic field analysis, including the current in amperes on each proposed transmission line.*

Response: Industry-standard computer modeling software, developed by organizations such as the Electric Power Research Institute and Bonneville Power Administration, was used to perform the field calculations. This type of software was developed using equations derived from physics and engineering principles. Appendix AA-1, Section 3 provides a more detailed description of the software and the modeling inputs.

Electric and magnetic field calculations were conducted at 1 meter (3.28 feet) above ground level in accordance with American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE) Standards (IEEE 1994). Electric field calculations were performed assuming a worst case +5% overvoltage condition (i.e., 121 kV instead of the nominal 115 kV). Audible noise calculations were conducted assuming 5,000-foot elevation at the proposed project site and calculated at 5 feet above ground level using a minimum ground clearance plus 1/3 sag for conductor height in accordance with ANSI/IEEE Standards (IEEE 1992, EPRI 2005). Radio noise calculations were conducted at 6.6 feet above ground level in accordance with ANSI/IEEE Standards (IEEE 1986).

Appendix AA-1, Attachment A presents drawings of the transmission line configurations, as well as related line geometry information. A typical loading condition of 1500 amperes per phase was used.

Refer to Appendix AA-1 for additional details of the assumptions and methods used in the electric and magnetic field analysis software modeling.

*(vii) The applicant's proposed monitoring program, if any, for actual electric and magnetic field levels.*

Response: Applicant is not proposing to conduct a post-construction monitoring program for electric and magnetic fields. The calculated maximum electric field for the double circuit configuration is 0.985 kV/m. This calculated field level is well below the 9 kV/m standard for

alternating current electric fields set by the Oregon Energy Facility Siting Council in OAR 345-024-0090. The standard does not include a threshold of magnetic fields. In addition, the transmission line will be designed to reduce electric and magnetic fields, as described above.

### **AA.3 ALTERNATE METHODS AND COSTS OF REDUCING RADIO INTERFERENCE**

*OAR 345-021-0010(1)(aa)(B) An evaluation of alternate methods and costs of reducing radio interference likely to be caused by the transmission line in the primary reception area near interstate, U.S. and state highways.*

Response: Calculated radio noise levels for the proposed Fort Rock 115 kV transmission line in fair weather were 10.3 decibel-microvolts per meter for the double circuit configuration at 50 feet away from the outside conductor (at 1 megahertz). These calculated noise levels are below the 56 decibel-microvolts per meter threshold (at 1 megahertz) established by IEEE (IEEE 1971, 1986). Based on the analysis provided in Appendix AA-1, no alternative methods to reduce radio and television interference area necessary.

Refer to Appendix AA-1 for additional discussion of transmission line radio interference.

### **AA.4 REFERENCES**

EPRI (Electric Power Research Institute). 2005. *Transmission Line Reference Book – 200 kV and Above*, Third Edition, Final Report 1011974.

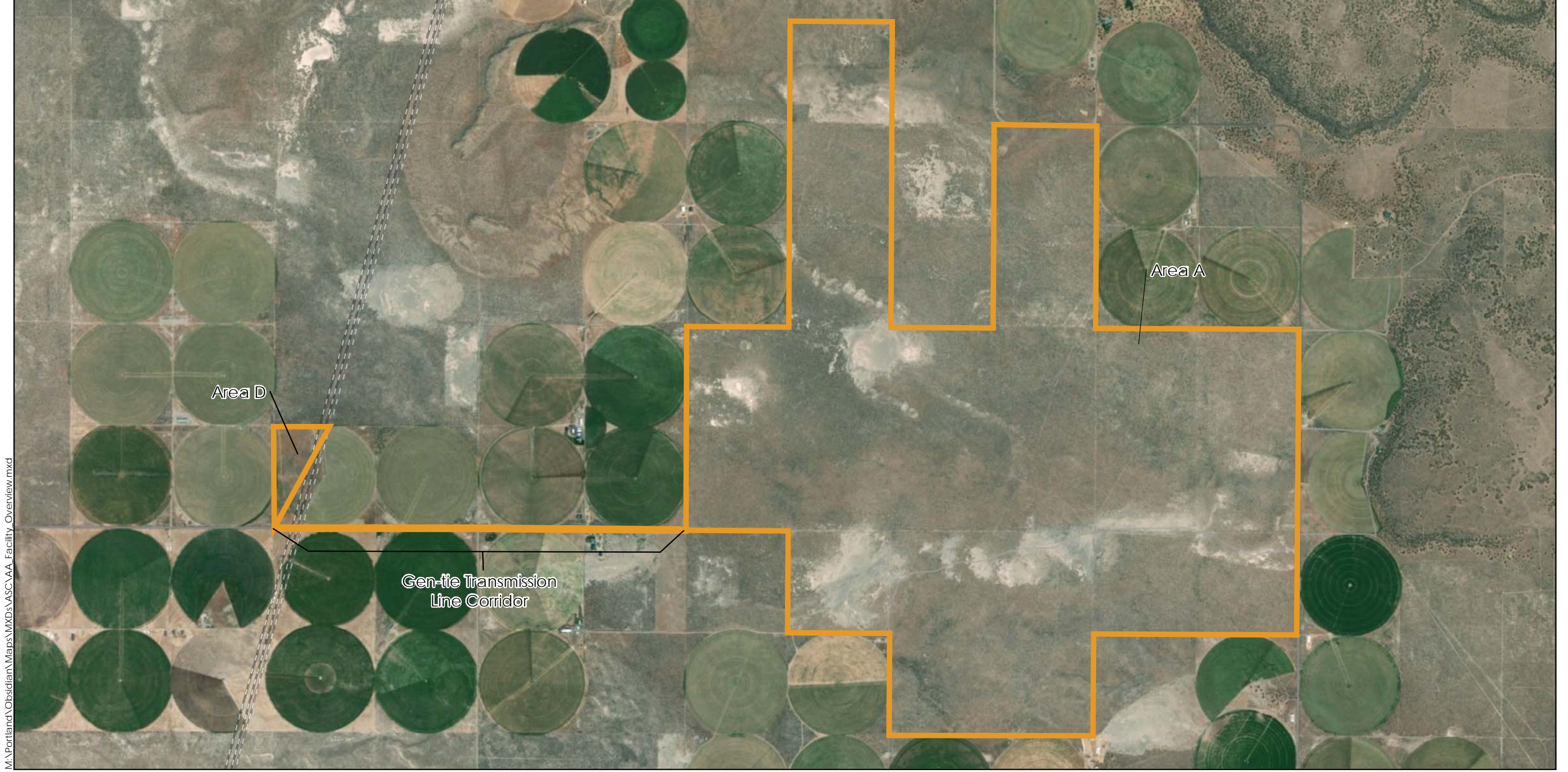
IEEE (Institute of Electrical and Electronics Engineers. 1971. *Radio Noise Design Guide for High Voltage Transmission Lines*. IEEE Committee Report, IEEE Transactions on Power Apparatus and Systems, PAS-90, No. 2, pp. 833–842, March/April.

\_\_\_\_\_. 1986. “IEEE Standard Procedures for the Measurement of Radio Noise from Overhead Power Lines and Substations.” ANSI/IEEE Standard 430-1986.

\_\_\_\_\_. 1992. “IEEE Standard Procedures for the Measurement of Audible Noise from Overhead Transmission Lines.” IEEE Standard 656-1992.




\_\_\_\_\_. 1994. “IEEE Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines.” IEEE Standard 644-1994.





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-  Site Boundary
-  Bonneville Power Administration Transmission Line (500kV)
-  PGE Transmission Line (500kV)

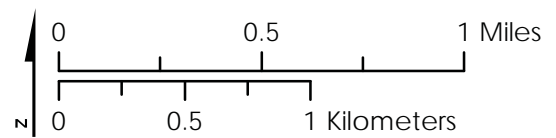


Figure AA-1  
Facility Overview

**Obsidian Solar Center**

October 2019

Obsidian Solar Center LLC

Sources: Esri 2019



**Appendix AA-1**  
**Electric and Magnetic Field Study for**  
**the Proposed Obsidian Solar Center**  
**115 kV Transmission Line**



**ELECTRIC AND MAGNETIC FIELD STUDY  
FOR THE PROPOSED  
OBSIDIAN SOLAR CENTER 115 kV TRANSMISSION LINE**

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## **NOTICE**

This report was prepared by the organization(s) named below as an account of work sponsored by Obsidian Solar Center LLC. Neither Obsidian Solar Center LLC, EMDEX LLC, nor any person acting on their behalf: (a) makes any warranty, express or implied, with respect to the use of any information, apparatus, method, or process disclosed in this report or that such use may not infringe privately owned rights; or (b) assumes any liabilities with respect to the use of or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

Prepared by  
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## **1.0 INTRODUCTION AND PURPOSE OF REPORT**

The Obsidian Solar Center is a proposed solar generation and storage project in south central Oregon, with a generating capacity of up to approximately 400 megawatts (MW). The proposed solar project would include a new 115 kilovolt (kV) transmission line to interconnect the power output of new solar facilities to the electrical grid. To comply with siting standards OAR 345-021-0010 and OAR 345-024-0090, computer-modeling of power-frequency electric and magnetic fields (EMF) and audible noise were performed. The results of this computer modeling evaluation for two potential transmission line configurations are presented in this report. This report is prepared to support Obsidian Solar Center LLC's (Applicant) application for site certificate to the Oregon Energy Facility Siting Council, meet the requirements in OAR 345-02-0010(aa), and support findings under OAR 345-024-0090.

## **2.0 PROPOSED TRANSMISSION LINE CONFIGURATIONS**

The proposed transmission lines would consist of approximately 2 miles of 115,000-volt (115 kV) overhead electric transmission line. The transmission line would interconnect new solar facilities to a proposed new substation. There are two transmission line configurations being considered for the project: approximately 1/2 mile of double circuit configuration where the transmission line would be centered within the right-of-way (ROW), and approximately 1 1/2 miles of double circuit configuration where the transmission line would be located near the northern ROW edge. This report analyzes both configurations.

### **2.1 Double Circuit Configuration**

The 115 kV double circuit transmission line would consist of single 1192.5-KCMIL (1.302-inch diameter) ACSR conductors ("Bunting") arranged in a vertical double circuit configuration, with a single 3/8" EHS shield wire at the top of 70-foot tall poles. A minimum ground clearance of 23-feet at midspan was used (12-foot sag from structure attachment height), with a vertical phase spacing of 9-feet between conductors and 9-feet spacing between the two circuits. A typical loading condition of 1500-amperes per phase was also used. Attachment A presents the double circuit configuration and related line geometry information as provided by Applicant.

### **2.2 Placement Within the Right-of-Way**

For approximately 1/2 miles at the eastern portion of the route, the double circuit transmission line would be centered within a 60-foot wide ROW. Attachment A, Figure A-3 presents a drawing of the centered ROW configuration for the proposed line as provided by Applicant.

For approximately 1 1/2 miles at the western portion of the route, the double circuit transmission line would be located about 5-feet away from the northern ROW edge. Attachment A, Figure A-4 presents a drawing of the offset ROW configuration for the proposed line as provided by Applicant.

### **3.0 DESCRIPTION OF COMPUTER MODELING SOFTWARE AND METHOD**

The computer program “EMF Workstation 2015” was used to model EMF and audible noise for the proposed transmission line. EMF Workstation 2015 is a software program that was developed for the Electric Power Research Institute (EPRI 2015). The software is designed to calculate the electric and magnetic fields from complex arrays of transmission lines, distribution lines, substation buswork, substation equipment, or user-defined current-carrying line segments. This modeling program contains several unique features, including two-dimensional and three-dimensional modeling capabilities, multiple calculation grids and profiles, calculations accounting for uneven terrain, and multiple loading conditions. The EMF Workstation 2015 software generated two-dimensional lateral profile plots (perpendicular to the proposed transmission line, calculated as field versus distance away from the transmission line) with tabular results. Calculated audible noise results were also produced in a similar manner for fair weather and for L5 and L50 rain conditions.

Electric and magnetic field calculations were conducted at 1 meter (3.28 feet) above ground level in accordance with American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE) Standards (IEEE 1994). Electric field calculations were performed assuming a worst case +5% overvoltage condition (i.e. 121 kV instead of the nominal 115 kV). Audible noise calculations were conducted assuming a 5,000-foot elevation at the proposed project site and calculated at 5-feet above ground level using a minimum ground clearance plus 1/3 sag for conductor height in accordance with ANSI/IEEE Standards (IEEE 1992, EPRI 2005).

For calculated audible noise Ldn values, the EPRI EMF Workstation Version 2.1 – ENVIRO software was used (EPRI 1997). This software is an older version of the present EMF Workstation 2015 software, and utilizes software modules to perform various types of calculations. A feature of the ENVIRO program that is not presently available in the EMF Workstation 2015 software is the calculation of audible noise Ldn values.

For radio noise calculations, the “Corona and Field Effects Program (Version 3.1)” was used (BPA 1977). This software was developed by the Bonneville Power Administration (BPA) and is based on the methods and equations presented in the EPRI Transmission Line Reference Book (EPRI 2005). Radio noise calculations were conducted at 6.6-feet above ground level in accordance with ANSI/IEEE Standards (IEEE 1986).

## **4.0 ELECTRIC AND MAGNETIC FIELDS**

### **4.1 Description of Electric and Magnetic Fields**

Electric and magnetic fields occur throughout nature and are one of the basic forces of nature. Any object with an electric charge on it has a voltage (potential) at its surface and can create an electric field. The change in voltage over distance is known as the electric field. When electrical

charges move together (known as “current”), they create forces. These forces are represented by magnetic fields. All currents create magnetic fields.

The strength of electric and magnetic fields are related to the voltage and current, respectively, and to the distance away from the source. The strength of the electric field depends on the voltage (higher voltages create higher electric fields) and distance (electric fields grow weaker as the distance from the source increases). The strength of the magnetic field depends on the current or load (higher currents or loads create higher magnetic fields) and distance (magnetic fields grow weaker as the distance from the source increases). For transmission line sources, the arrangement of the conductors (line geometry) and phasing arrangement also influence the strength of the electric and magnetic fields.

The electric power distribution system creates alternating current (AC) electric and magnetic fields. In the United States, the power system uses current that alternates 60 times each second (60 Hertz). For each electrical circuit, AC power is carried by each of the three phase conductors. The AC voltage and current in each phase conductor is out of sync with the other two phases by 120 degrees, or one-third of a 360-degree cycle.

Power-frequency electric fields can be encountered in everyday life. For example, almost all household appliances create an electric field. This is due to the voltage on the appliance. To create an electric field, the appliance need not be operating, but just plugged into the wall socket. Typical reported values measured one foot away from some common household appliances are shown in Table 1.

**Table 1. Typical Electric Field Values at 12” From Common Appliances**

Appliance	Electric Field - kV/m
Electric Blanket	0.250 *
Broiler	0.130
Stereo	0.090
Refrigerator	0.060
Iron	0.060
Hand Mixer	0.050
Phonograph	0.040
Toaster	0.040
Hair Dryer	0.040
Coffee Pot	0.030
Clock	0.015

Source: Sheppard & Eisenbud, 1977

\* - Electric fields can reach 1 – 10 kV/m next to the blanket wires.

Power-frequency magnetic fields are also common from household appliances. Since the magnetic field is caused by the flow of an electric current, a device must be operated for it to create a magnetic field. A survey of the magnetic field associated with a large number of typical household appliances was performed, and typical values for appliances are presented in Table 2. In addition, the earth has a natural static magnetic field of about 550 milliGauss (mG) in the central Oregon area (Merrill & McElhinney 1983).

**Table 2. Magnetic Fields Due To Typical Household Appliances**

Appliance	Magnetic Field (mG)	
	12" Away	Maximum
Electric Range	3 – 30	100 – 1,200
Electric Oven	2 – 5	10 – 50
Garbage Disposal	10 – 20	850 – 1,250
Refrigerator	0.3 – 3	4 – 15
Clothes Washer	2 – 30	10 – 400
Clothes Dryer	1 – 3	3 – 80
Coffee Maker	0.8 – 1	15 – 250
Toaster	0.6 – 8	70 – 150
Crock Pot	0.3 – 1	15 – 80
Iron	1 – 3	90 – 300
Can Opener	35 – 250	10,000 – 20,000
Mixer	6 – 100	500 – 7,000
Blender, Popper, Processor	6 – 20	250 – 1,050
Vacuum Cleaner	20 – 200	2,000 – 8,000
Portable Heater	1 – 40	100 – 1,100
Fans/Blowers	0.4 – 40	20 – 300
Hair Dryer	1 – 70	60 – 20,000
Electric Shaver	1 – 100	150 – 15,000
Color TV	9 – 20	150 – 500
Fluorescent Light	2 – 40	140 – 2,000
Fluorescent Desk Lamp	6 -20	400 – 3,500
Circular Saw	10 – 250	2,000 – 10,000
Electric Drill	25 - 35	4,000 – 8,000

Transmission lines also create power-frequency electric and magnetic fields. Since the voltage of a transmission line is held relatively constant (typically within +/-5%), the electric field from a transmission line remains steady and is not affected by daily and seasonal fluctuations in usage of electricity by customers. However, the current in a transmission line does fluctuate due to consumer usage and varies by time of day and also seasonally. Therefore, the magnetic field from a transmission line will also fluctuate (since magnetic field is related to the current or load on the line).

Electric fields are reported in units of volts per meter (V/m) or thousands of volts per meter (kV/m). Magnetic fields are reported in units of gauss (G), or more typically in units of milliGauss (mG), which are equal to one-thousandth of a gauss (i.e., 1 mG = 0.001 G). Some technical reports also use the unit Tesla (T) or microTesla ( $\mu\text{T}$ ; 1  $\mu\text{T}$  = 0.000001 T) for magnetic field. The conversion between these units is 1 mG = 0.1  $\mu\text{T}$  and 1  $\mu\text{T}$  = 10 mG.

#### 4.2 Electric and Magnetic Field Calculation Results

Table 3 presents a summary of the calculated electric and magnetic fields associated with the two configurations for the proposed transmission line. Attachment B presents graphs of the electric and magnetic field calculation results out to 200-feet from the transmission line center.

**Table 3. Summary of Electric and Magnetic Field Calculation Results**

Transmission Line Configuration and Type of Field		ROW Edge (Southern)	Maximum within ROW	ROW Edge (Northern)
Double Circuit Centered in ROW (-30'/+30')	Electric Field – kV/m	0.251	0.985	0.248
	Magnetic Field - mG	44.1	148.1	45.0
Double Circuit Offset in ROW (-55'/+5')	Electric Field – kV/m	0.031	0.985	0.982
	Magnetic Field - mG	13.0	148.1	140.9

As shown in Table 3, calculated electric fields are almost identical at the ROW edges when the transmission line is centered within the ROW (about 0.25 kV/m at the ROW edges, with a maximum of almost 1 kV/m within the ROW). When the transmission line is offset close to the northern ROW edge, then calculated electric fields are higher at the closer ROW edge (0.982 kV/m - almost equivalent to the maximum electric field of 0.985 kV/m within the ROW). However, calculated electric fields are lower at the opposite (southern) ROW edge due to the increased distance from the transmission line (about 0.03 kV/m).

For the calculated magnetic field, calculated field levels are fairly similar when the transmission line is centered within the ROW (about 44 – 45 mG at the ROW edges, with a maximum of almost 150 mG within the ROW). When the transmission line is offset close to the northern ROW edge, then calculated magnetic fields are higher at the closer ROW edge (about 141 mG - almost equivalent to the maximum magnetic field of 148 mG within the ROW). However, calculated magnetic fields are lower at the opposite (southern) ROW edge due to the increased distance from the transmission line (about 13 mG).

Attachment C contains the calculated tabular results from the EMF Workstation 2015 software.

### **4.3 Power-Frequency Electric and Magnetic Field Standards**

The state of Oregon has a limit of 9 kV/m electric field limit within the transmission line ROW, as stated in OAR 345-024-0090. The calculated maximum electric field within the ROW for the proposed 115 kV transmission line is less than 1 kV/m, which complies with this limit.

Presently, there are no magnetic field standards for the state of Oregon or federal health standards. Although there are no federal health standards in the United States specifically for 60 Hertz, some non-regulatory organizations have developed guidelines: the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and IEEE. Both of these guidelines are much higher than the calculated magnetic field levels for this Facility. For the general public, the ICNIRP guideline is 2,000 mG (ICNIRP 2010) while the IEEE guideline is 9,040 mG (IEEE 2002). The calculated maximum magnetic field within the ROW for the proposed 115 kV transmission line is 148.1 mG, which is well below these non-regulatory guidelines.

### **4.4 Reduction of EMF Levels**

As a double circuit configuration, fields will be reduced by the use of a vertical configuration of the phase conductors, with the phases arranged in an opposite phasing arrangement between circuits (phase A-B-C top-to-bottom for one circuit and C-B-A top-to-bottom for the other circuit). This arrangement locates the opposite phase conductors closer together between circuits and increases the magnetic field cancellation.

## **5.0 AUDIBLE NOISE**

### **5.1 Description of Audible Noise**

The natural phenomenon of corona can occur on a transmission line and can create audible noise. Corona is an electrical discharge of energy that occurs on an energized surface such as a transmission line conductor. The electrical voltage at a specific location on an energized surface increases wherever surface irregularities occur (such as nicks on the transmission line conductor,

water droplets, insects, or debris) to the point that the air surrounding that location becomes ionized and creates a tiny electrical discharge (EPRI 2006). Corona on high voltage transmission lines generates a small amount of sound or noise. The audible noise level can increase during foul weather conditions when the transmission line conductors are wet (during rain, snow, or fog) and at higher elevations. For example, water drops that collect on the surface of the conductors increase corona activity so that a crackling or humming sound may be heard near a transmission line. Audible noise decreases with distance from a transmission line.

Audible noise is measured in decibels (dB), a logarithmic (i.e., dimensionless) unit that is the ratio of a sound pressure referenced to the threshold of human hearing. The apparent loudness that is attributed to sound varies not only with the sound pressure but also with the frequency (or pitch) of the sound. Since the human ear is not equally sensitive to sound at all frequencies, a specific frequency-dependent rating scale was devised (A-weighted dB scale, or dBA) to approximate the sensitivity of the human ear. This dBA scale has been chosen by most authorities for purposes of environmental noise regulation. Typical sounds in a community may range from about 40 dBA (very quiet) to 100 dBA (very loud) or higher. Some typical noise levels are shown in Table 4, which range from the relative quiet of the library to loud trains.

**Table 4. Typical Sound Levels for Common Sources  
(in A-Weighted Decibels)**

<b>Source/Location</b>	<b>Sound Level (dBA)</b>
Threshold of Hearing	0
Motion Picture Studio–Ambient	20
Library	35
Chicago Suburbs—nighttime minimum	40
Wind in Deciduous Trees (2–14 mph)	3–61
Falling Rain (Variable Rainfall Rates)	41–63
Tomato Field on California Farm	44
Small Town/Quiet Suburb	47–53
Private Business Office	50
Light Traffic at 100 feet Away	50
Average Residence	50
Large Retail Store	60
Average Traffic on Street Corner	75
Inside Sports Car (50 mph)	80
Los Angeles–0.75 mile from Jet Landing	86
Inside New York Subway Train	95
Loud Automobile Horn (at 1 meter)	115

Source: EPA 1974, IEEE 1974, Miller 1978

It is important to remember that transmission line audible noise is variable and therefore is characterized using statistics that estimate the probability of a certain level of noise occurring. Statistical noise descriptors include what engineers call exceedance levels, for example, L10, L50, and L90. These descriptors indicate what percentage of time a certain noise level will be exceeded. For example, a L50 of 65 dBA indicates that 50 percent of the time, noise levels will be greater than 65 dBA at a certain location and, conversely, it could be less than 65 dBA for 50 percent of the time. Additional methods to characterize audible noise have been developed to evaluate the long-term characteristics of sound. The equivalent sound level, Leq, is the average level of a varying sound over a specified period of time (EPA 1974; Keast 1980). This value is a single-number equal to the level of an equivalent constant unchanging sound.

Some government agencies have adopted a level similar to Leq called the day-night averaged noise level (an equivalent day-night sound level, or Ldn). The Ldn represents a time-weighted 24-hour average noise level based on the A-weighted decibel for a variety of weather conditions. Time-weighted refers to the fact that noise occurring during certain sensitive time periods (nighttime, when other background sounds are relatively subdued) is adjusted for occurring at those times. Ldn includes an additional 10 dBA increase that is added to noise events occurring during the nighttime hours of 10 p.m. to 7 a.m. (because people are more sensitive to noise at night).

Regulatory organizations, such as the Environmental Protection Agency (EPA) have established an outdoor activity Ldn noise guideline of 55 dBA (EPA 1974). This value represents the sound energy averaged over a 24-hour period; it has a 10 dBA nighttime weighting (between 10:00 p.m. and 7:00 a.m.) (EPRI 2005). The noise level is applicable to outdoor residential areas and farms and other outdoor areas where people spend time.

## **5.2 Audible Noise Calculation Results**

Table 5 presents a summary of the calculated audible noise levels associated with the proposed transmission line. Attachment B presents graphs of the audible noise calculation results out to 200-feet from the transmission line center.

As shown in Table 5, calculated transmission line Ldn noise levels do not exceed the EPA Ldn noise guideline of 55 dBA, even within the ROW. In addition, these values comply with Oregon Department of Oregon Environmental Quality noise control standards (OAR 340-035-0035(1)(b)(A), which specify that no new noise source shall exceed the levels specified in Table 8 of OAR 340-035-0035. The lowest threshold in DEQ's Table 8 is a L<sub>50</sub> noise guideline of 50 dBA for nighttime noise (10 PM – 7 AM)(DEQ 2018).

Attachment C contains the calculated tabular results from the EMF Workstation 2015 software.



**Table 5. Summary of Audible Noise Calculation Results**

Transmission Line Configuration and Type of Noise Level		ROW Edge (Southern)	Maximum within ROW	ROW Edge (Northern)
Double Circuit Centered in ROW (-30’/+30’)	Fair Weather – dBA	0	0	0
	L5 Rain – dBA	31.5	33.2	31.5
	L50 Rain – dBA	9.1	10.8	9.1
	Ldn – dBA	17.3	18.8	17.3
Double Circuit Offset in ROW (-55’/+5’)	Fair Weather – dBA	0	0	0
	L5 Rain – dBA	29.6	33.2	33.1
	L50 Rain – dBA	7.3	10.8	10.8
	Ldn – dBA	15.5	18.8	18.8

## **6.0 DISCUSSION OF TRANSMISSION LINE RADIO NOISE**

Corona from a transmission line can create radio noise. Sporadic pulses of current, such as those produced by corona and gap discharges (tiny electrical gaps between mechanically connected parts) generate electromagnetic energy over a broad range of frequencies, including radio bands. Overhead transmission lines do not, as a general rule, interfere with radio reception, especially for transmission lines which are 230 kV and lower. Corona-generated radio frequency noise decreases with distance from a transmission line and also decreases with higher frequencies. (When it is a problem, it is usually for amplitude modulation [AM] radio and usually not higher frequencies.) The severity of interference depends on the strength and quality of the transmitted radio signal, the quality of the radio and antenna system, and the distance between the signal receiver (radio) and the transmission line. The units used for radio noise are decibels referenced to 1  $\mu\text{V}/\text{m}$  (or one-millionth of a volt per meter) and written as  $\text{dB}\mu\text{V}/\text{m}$ .

It is difficult to determine whether the radio frequency noise level produced by a transmission line will cause unacceptable interference, because the strength of the received signal, the sensitivity of the receiver, the orientation of the receiving antenna, and the ambient radio frequency noise are all important parameters in determining the degree to which noise from the transmission line may cause signal degradation. A common measure to evaluate possible interference levels is the signal-to-noise ratio (SNR): the ratio of average signal power to average noise power (for a given frequency bandwidth). Based upon listening tests, if the limit of tolerability is assessed as the point at which reception quality becomes less than satisfactory, then the radio interference level of a transmission line should be 22 dB or more below the average strength of the desired radio signal (EPRI 2005). Radio noise levels caused by the proposed transmission line can be computed, but without knowing broadcast signal strengths at various locations of interest along the line route, it is difficult to determine that a tolerable SNR criterion would be met.

The IEEE established the Radio Noise Design Guide of 56 dB $\mu$ V/m at a frequency of 1 million hertz (MHz) measured at 15 meters (50 feet) from the outside conductor in fair weather (IEEE 1971), which was modified by IEEE to a standard frequency of 0.5MHz by IEEE Standard 430-1986 (IEEE 1986) and corresponds to 61 dB $\mu$ V/m at 0.5MHz (Olsen 2014). However, this is a design guide rating for acceptable noise performance; actual performance is dependent upon many parameters that may influence signal reception (IEEE 1971), including the broadcast signal frequency, direction of the signal, alignment of the receiver antenna, quality of the radio station equipment, terrain variations and altitude, and, especially, weather conditions.

An important new issue is the radio conversion to digital broadcast system technology. Low levels of interference may not noticeably affect a digital receiver's performance but higher levels may break up or stop reception. In principle, the new digital signal should be less susceptible to interference than an old analog signal (Smith 2004). The quality of digital reception should be better in a given noise level and would stay good at SNRs beyond which the old analog reception is no longer viable. These results have been documented in previous studies, such as the FCC study (FCC 1999), which indicated that digital signals will provide superior coverage and immunity to impulse noise (such as noise interference from power lines) than analog signals. The International Electrotechnical Commission has endorsed the Digital Radio Mondiale on-air system, which is expected to be built to be immune to atmospheric electro-magnetic interference (EMI), and therefore are highly likely to be immune to power line EMI as well (EPRI 2005).

The calculated radio noise level for the proposed 115 kV transmission line in fair weather was 10.3 dB $\mu$ V/m for the double circuit configuration at 50-feet away from the outside conductor (at 1 MHz). This calculated noise level is below the 56 dB $\mu$ V/m threshold (at 1 MHz) established by IEEE.

## **7.0 DISCUSSION OF TRANSMISSION LINE INDUCED VOLTAGE/CURRENT**

Electric currents can be induced by electric and magnetic fields in conductive objects near transmission lines. In particular, the concern is for very long objects parallel and close to the line. The majority of concern is about the potential for small electric currents to be induced by electric fields in metallic objects close to transmission lines. Metallic roofs, vehicles, vineyard trellises, and fences are examples of objects that can develop a small electric charge in proximity to high-voltage transmission lines. Object characteristics, degree of grounding, and electric field strength affect the amount of induced charge. An electric current can flow when an object has an induced charge and a path to ground is presented. The amount of current flow is determined by the impedance of the object to ground and the voltage induced between the object and ground. The amount of induced current that can flow is important to evaluate because of the potential for nuisance shocks.

A common induced voltage hazard occurs on wire fences that parallel overhead transmission lines. If the fence is ungrounded, it possesses the voltage of the net electric field of the overhead conductors at the location of the fence. A person touching such a fence becomes a conducting

path for the current to flow to ground and will feel a momentary shock. The AC static voltage on the fence bleeds off quickly but can be annoying. This hazard is easily removed by bonding the fence wires along the length of the fence to grounding rods that are driven into the soil.

Induced currents from 115 kV transmission line magnetic fields are typically not a hazard because almost no voltage is involved. A current carrying conductor will induce a current to flow in another conductor that is parallel to it. Induced currents result from the net AC magnetic field. In the common case of grounded fences, electrical loops can be created in which induced currents can flow. The value of the induced current will depend on the magnetic field strength, the size, shape, and location of the conducting object, and the object-to-ground resistance.

The situation would be rare for the ideal conditions to occur (a large metallic object which is perfectly insulated from ground, located in the highest calculated electric field of almost 1 kV/m within the ROW, and touched by a perfectly grounded person) where the possibility of a perceived nuisance shock would occur. When the transmission line is centered within the ROW, the calculated electric field (0.25 kV/m) at both ROW edges and beyond would be sufficiently low enough that nuisance shocks should not occur. When the transmission line is offset towards the northern ROW edge, the calculated electric field at the northern ROW edge approaches 1 kV/m (0.982 kV/m). At the southern ROW edge, the calculated electric field (0.03 kV/m) would be sufficiently low enough that nuisance shocks should not occur. The calculated maximum magnetic field (148.1 mG within the ROW) is sufficiently low enough that induced current in a metallic object should not occur.

## **8.0 RESIDENCES NEAR THE LINE ROUTE**

The Applicant reported that there are no residences or other occupied structures within 200 feet of the double circuit configuration transmission line route.

## **9.0 SUMMARY**

This report was prepared to evaluate the proposed Facility 115 kV transmission line for compliance with the EFSC siting standard, OAR 345-024-0090. Computer modeling of power-frequency electric and magnetic fields and audible noise were performed.

The following summarizes the results of this evaluation:

- There are two different locations within the ROW where the double circuit transmission line would be located: centered within a 60-foot wide ROW (where the distance from the transmission line center to both ROW edges is 30-feet, and located at 5-feet from the northern ROW edge (i.e. 55-feet from the southern ROW edge).
- For the double circuit configuration centered within the ROW, calculated electric fields are about 0.25 kV/m at the ROW edges, with a maximum of 0.985 kV/m within the ROW. For the double circuit configuration offset within the ROW, calculated electric fields are about 0.982 kV/m at the northern ROW edge, and about 0.03 kV/m at the southern ROW edge.
- Calculated magnetic fields for the double circuit configuration centered within the ROW range from about 44.1 to 45.0 mG at the ROW edges, with a maximum of 148.1 mG within the ROW. Calculated magnetic fields are about 140.9 mG at the northern ROW edge, and about 13 mG at the southern ROW edge when the transmission line is located near the northern ROW edge.
- As a double circuit configuration, fields will be reduced by the use of a vertical configuration of the phase conductors, with the phases arranged in an opposite phasing arrangement between circuits (phase A-B-C top-to-bottom for one circuit and C-B-A top-to-bottom for the other circuit) to increase magnetic field cancellation.
- Applicant will design the transmission lines so that induced currents will be as low as reasonably achievable (the use of a low line voltage of 115 kV, combined with the measures proposed to reduce electric and magnetic field levels).
- Operation of the facility will comply with Oregon Department of Oregon Environmental Quality noise control standards (OAR 340-035-0035(1)(b)(A), which specify that no new noise source shall exceed the levels specified in Table 8 of OAR 340-035-0035.
- There are no residences or other occupied structures within 200 feet of the double circuit configuration transmission line.

## **10.0 REFERENCES**

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## **ATTACHMENT A**

### **TRANSMISSION LINE STRUCTURE DRAWINGS AND LINE GEOMETRY INFORMATION**

**TRANSMISSION LINE GEOMETRY INFORMATION**  
(To Be Completed for Each Transmission Line)

Circuit Name : FORT ROCK DOUBLE CIRCUIT

In-Service Date : \_\_\_\_\_ Voltage : 115kV

Number of Circuits : 2 AC or DC : AC

Conductor Name : 1192.5 KCMIL ACSR "BUNTING"

# of Subconductors : 1 Subconductor Diameter : 1.302"

Subconductor Spacing : N/A

Phasing Arrangement (include diagram) : VERTICAL (SEE SKETCH)

Vertical Phase Spacing : 9'

Horizontal Phase Spacing : 9' (BETWEEN CIRCUITS)

Attachment Height at Tower : 60', 51', 42'

Minimum Ground Clearance at Midspan : 23'

Shield Wire Diameter and Spacing : 3/8" EHS, 9' VERTICAL

Shield Wire Configuration : Grounded or Sectionalized & Insulated

Direction of Current Flow : WEST

Tower/Pole Height (Typical) : 70'

Span Length : 500' Ruling Span : 500'

Right-Of-Way Width : 50' MINIMUM

Placement Within ROW (include diagram) : CENTERED

Distance to Other Transmission Lines (include diagram) : 70' (MIN.) PARALLEL FROM  
C/C POLES, EXISTING HV LINES RUNNING PERPENDICULAR AT SUB.

Other/Special Information : \_\_\_\_\_

Future Plans : \_\_\_\_\_

Completed by : \_\_\_\_\_ Date : \_\_\_\_\_

Figure A-1. Double Circuit Transmission Line Geometry Sheet - 1



**TRANSMISSION LINE  
LOADING/CLEARANCE/OCCURRENCE CHART**

(To Be Completed for Each Transmission Line)

Parameter	Load Case Description				
	Emergency Minimum	Light	Medium (Typical)	Heavy	Emergency Maximum
Loading per Phase – (Amperes)			1500		
Minimum Conductor Ground Clearance – (Feet)			23'		
Duration – (Hours)			8		
Rate of Occurrence – (% of Year)			100%		

Direction of Current Flow : \_\_\_\_\_

Completed by : \_\_\_\_\_ Date : \_\_\_\_\_

Figure A-2. Double Circuit Transmission Line Geometry Sheet - 2



Subject: CONCEPTUAL GEN-TIE ELEVATION SKETCH  
DOUBLE CIRCUIT (200 MW/CIRCUIT @ 115 KV)

By: JMS

Date: 8/7/18

Chk. By:

Date:

Rev #: 1

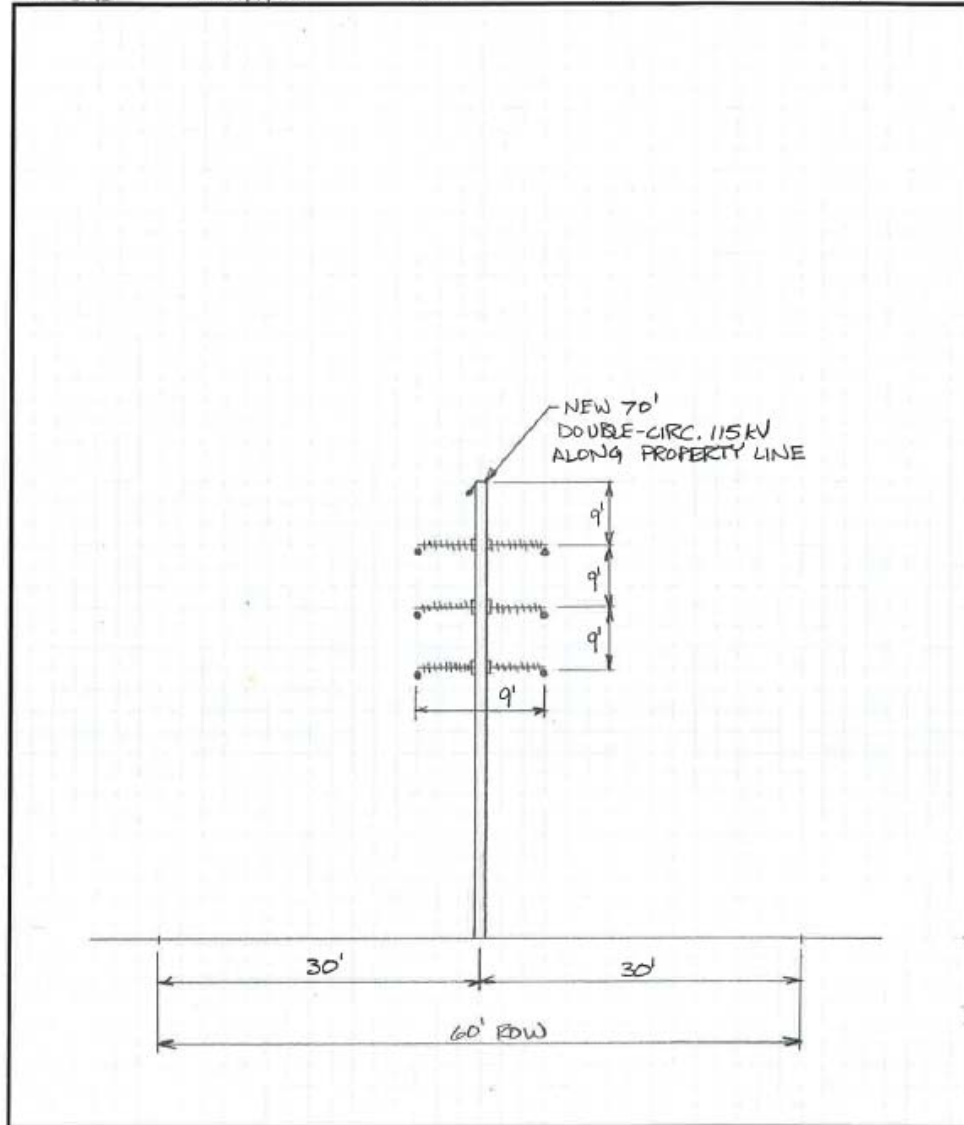


Figure A-3. Double Circuit Transmission Line Geometry Sheet – 3  
(Centered Within the Right-Of-Way)



Subject: CONCEPTUAL GEN-TIE ELEVATION SKETCH  
DOUBLE CIRCUIT (200 MW/CIRCUIT @ 115KV) ALONG ROADWAY  
By: JMS Date: 2/7/15 Chk. By: \_\_\_\_\_ Date: \_\_\_\_\_ Rev #: 1

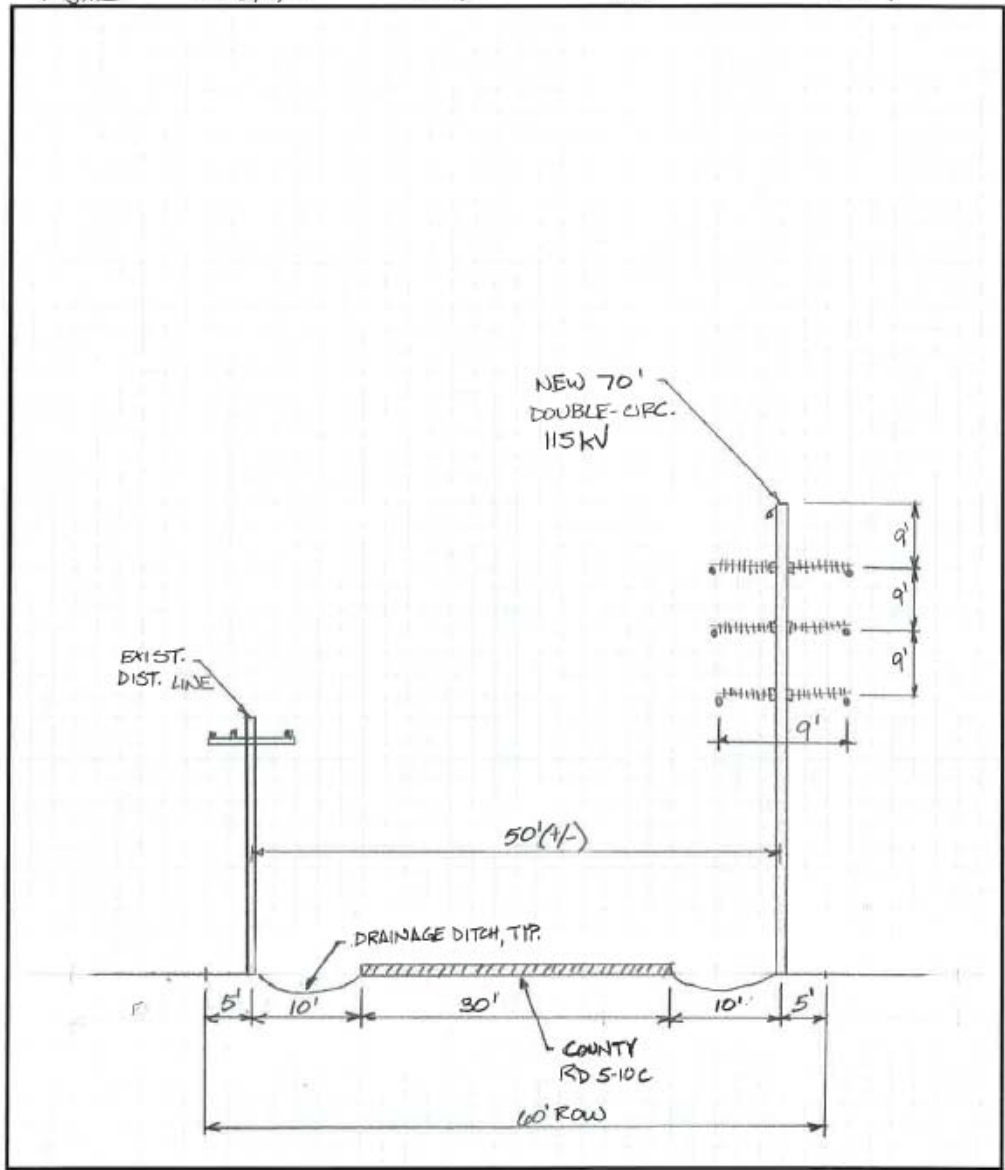


Figure A-4. Double Circuit Transmission Line Geometry Sheet – 4  
(Offset Within the Right-Of-Way)

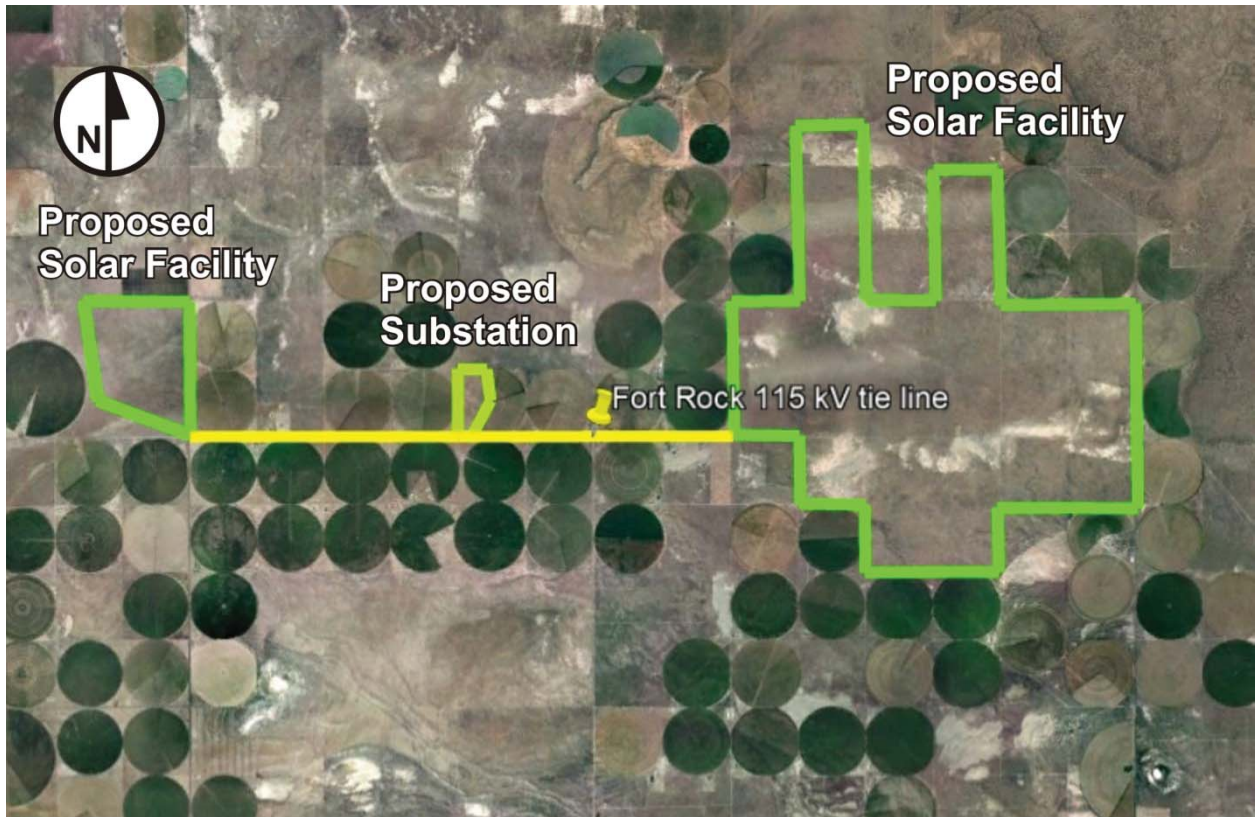


Figure A-5. General Site Map of Proposed 115 kV Transmission Line

## **ATTACHMENT B**

### **GRAPHS OF ELECTRIC FIELD, MAGNETIC FIELD, AND AUDIBLE NOISE CALCULATIONS**

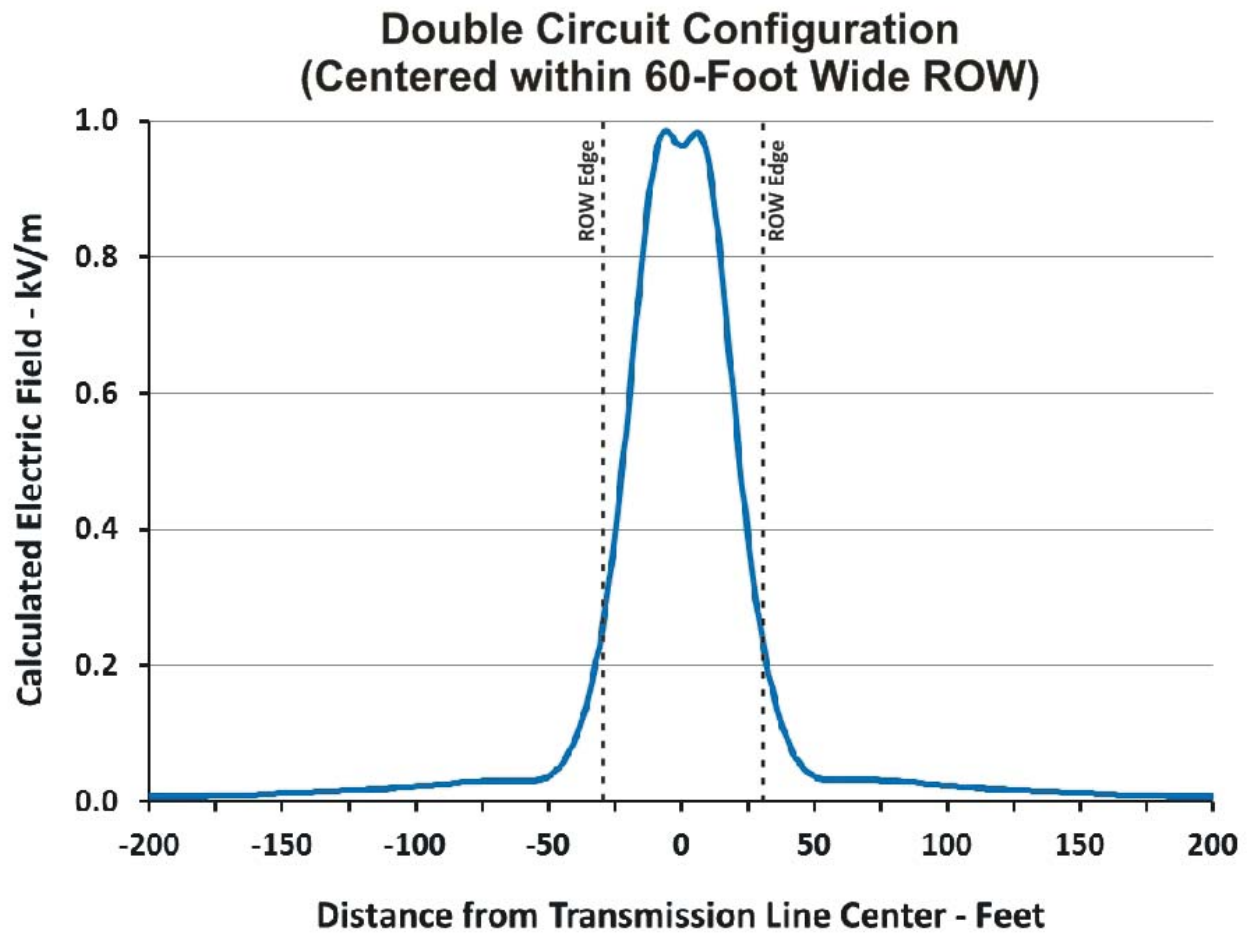


Figure B-1. Calculated Electric Field Graph for Double Circuit Configuration Centered Within the ROW

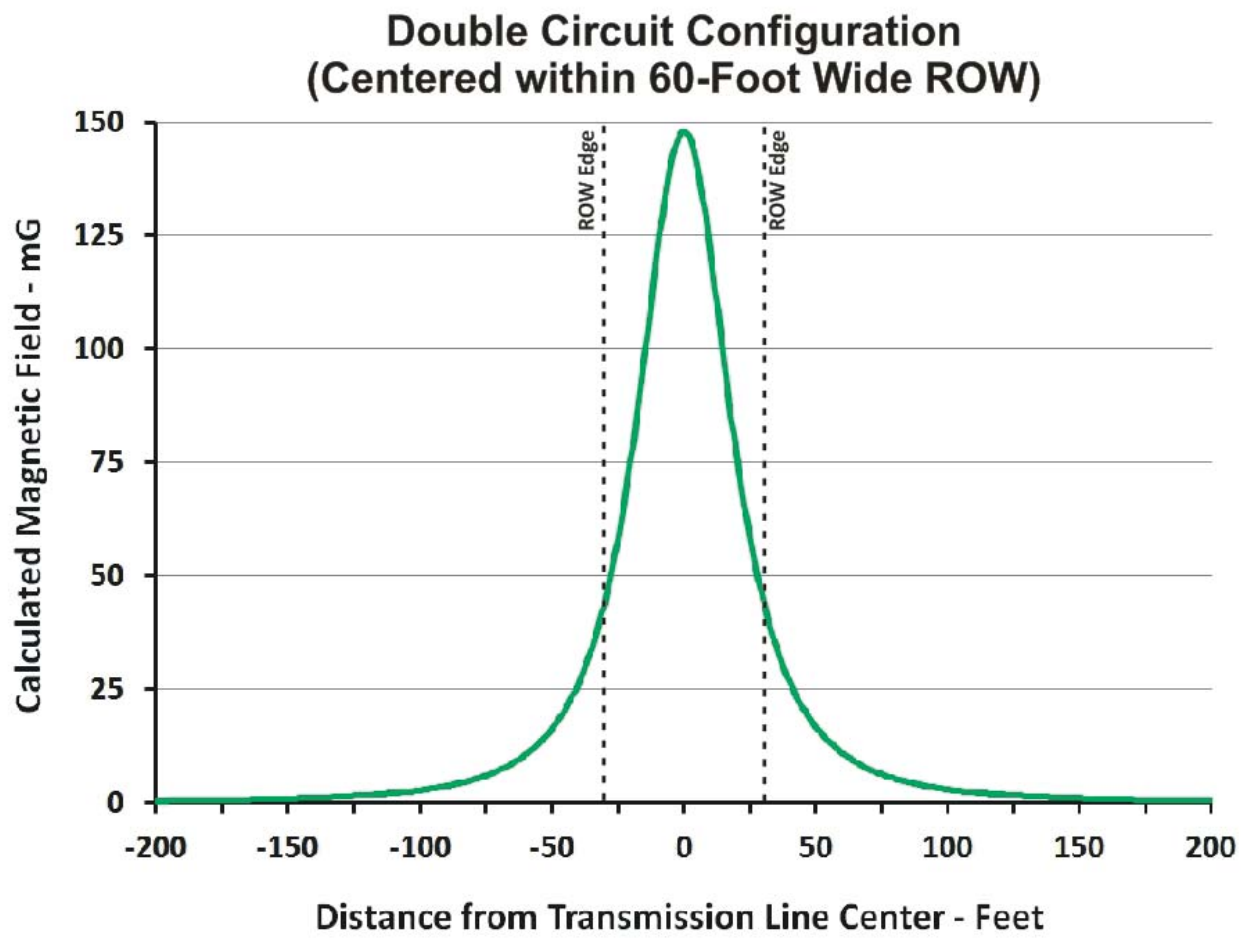


Figure B-2. Calculated Magnetic Field Graph for Double Circuit Configuration Centered Within the ROW

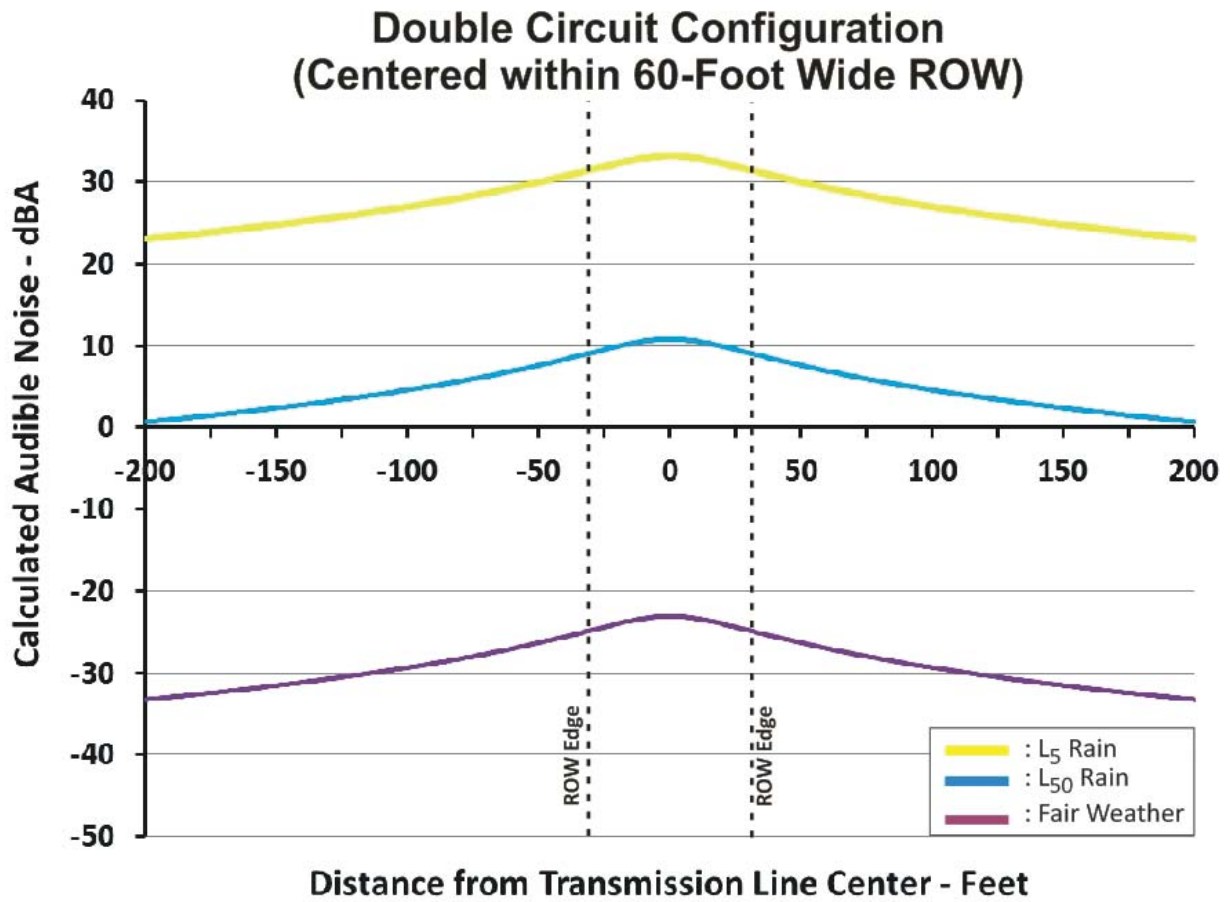


Figure B-3. Calculated Audible Noise Graph for Double Circuit Configuration Centered Within the ROW



### Double Circuit Configuration (Offset Towards Northern ROW Edge)

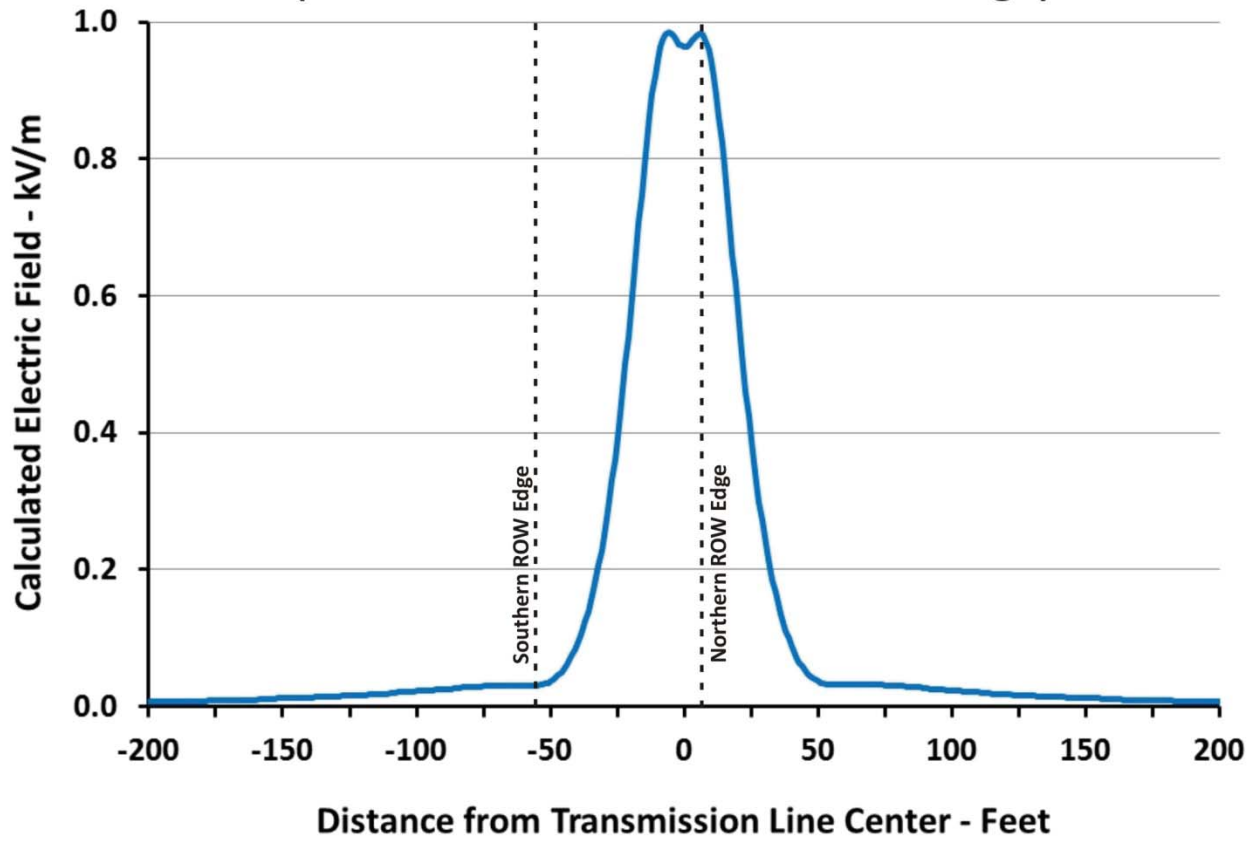


Figure B-4. Calculated Electric Field Graph for Double Circuit Configuration Offset Within the ROW

### Double Circuit Configuration (Offset Towards Northern ROW Edge)

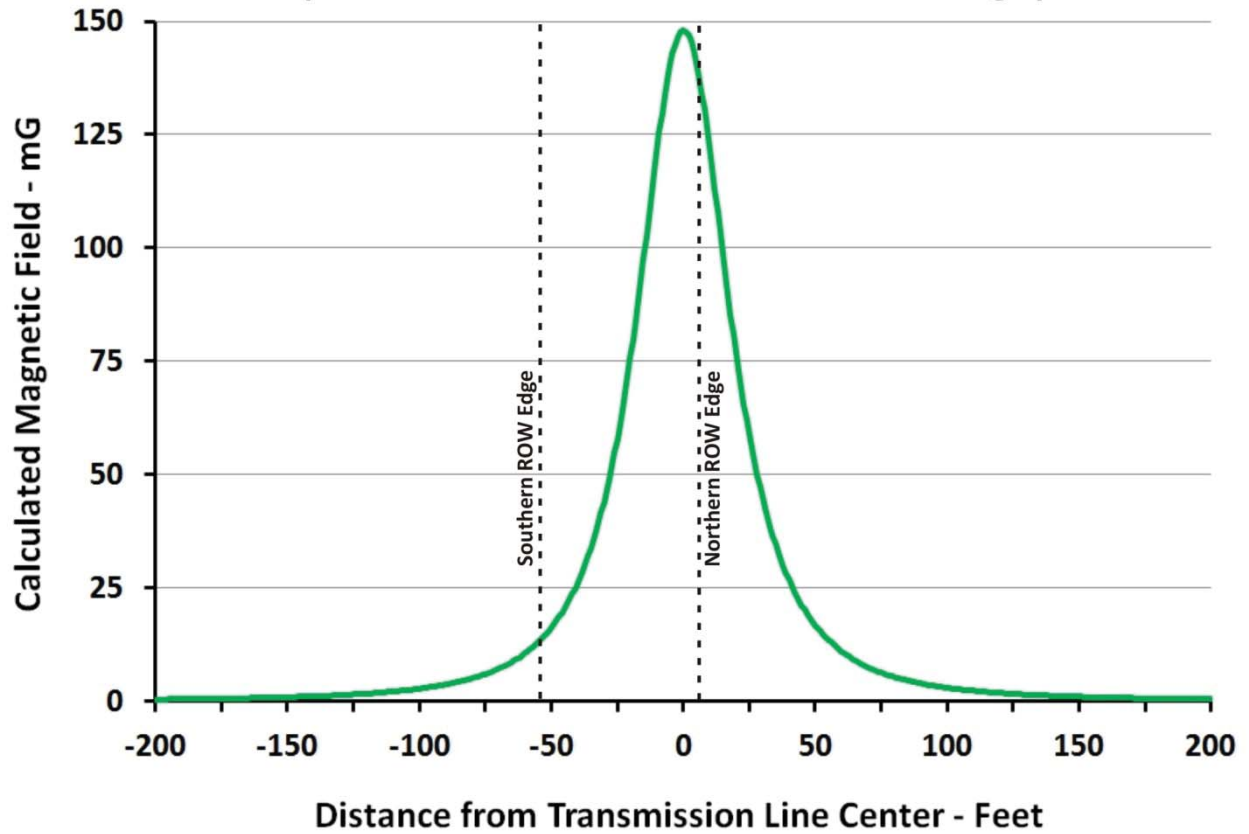


Figure B-5. Calculated Magnetic Field Graph for Double Circuit Configuration Offset Within the ROW

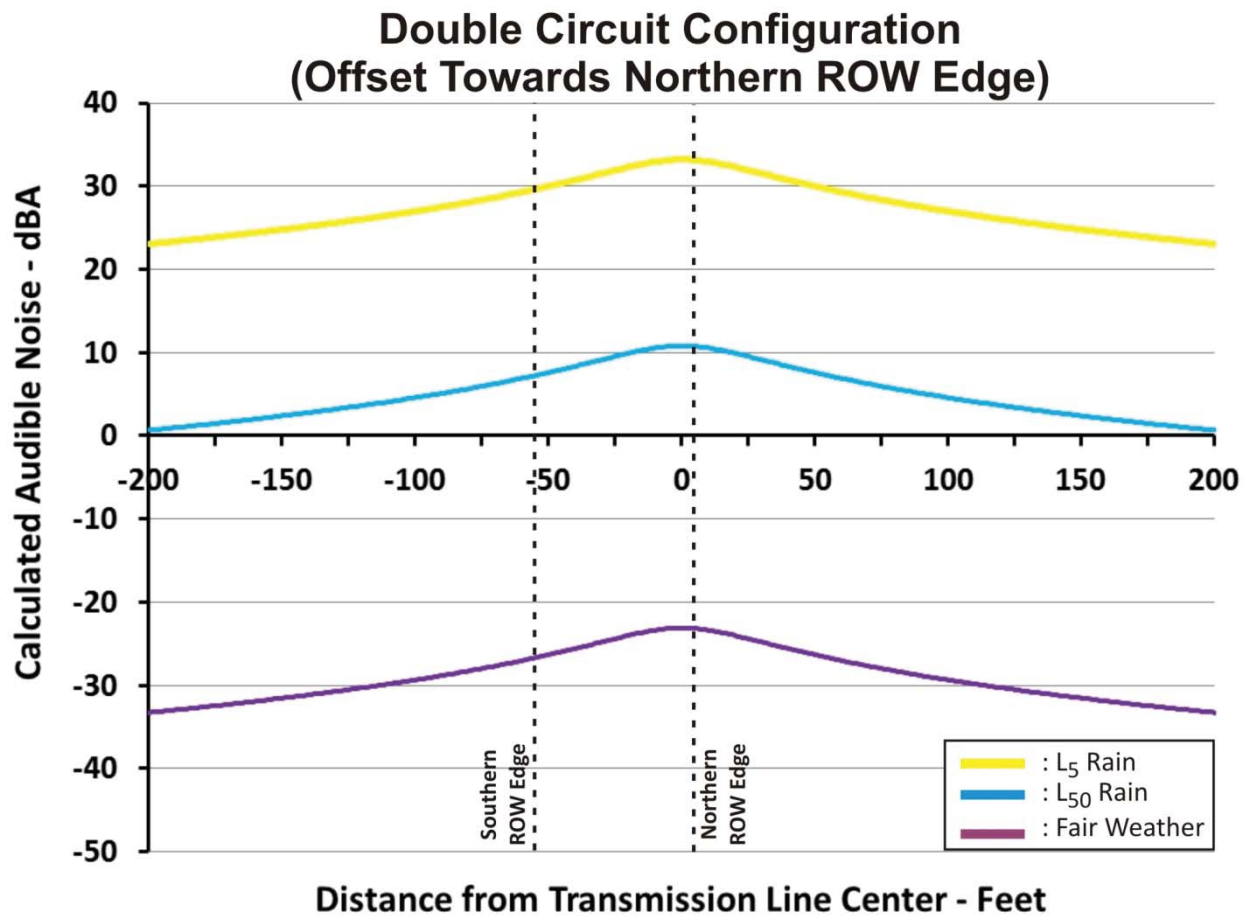


Figure B-6. Calculated Audible Noise Graph for Double Circuit Configuration Offset Within the ROW

**ATTACHMENT C**

**RESULTS OF EPRI EMF WORKSTATION 2015 SOFTWARE**

## Single Circuit Configuration – Electric Field Lateral Profile

File: C:\Users\hchooper\Desktop\New Projects\Obsidian - TLine in Oregon\Case 2 - EF.txt

E-Field HORIZONTAL Profile Chart: "Lateral Profile Electric Field - Model Load 1(EF)"

Field Components = Resultant

Distance units = (ft)

Electric field units = KV/m

Spacing = 1.00(ft)

Calculation Points = 401

Point	Distance (ft)	X (ft)	Y (ft)	Z (ft)	EF (KV/m)
0	0.00	300.00	-200.00	3.28	0.014
1	1.00	300.00	-199.00	3.28	0.015
2	2.00	300.00	-198.00	3.28	0.015
3	3.00	300.00	-197.00	3.28	0.015
4	4.00	300.00	-196.00	3.28	0.015
5	5.00	300.00	-195.00	3.28	0.015
6	6.00	300.00	-194.00	3.28	0.015
7	7.00	300.00	-193.00	3.28	0.016
8	8.00	300.00	-192.00	3.28	0.016
9	9.00	300.00	-191.00	3.28	0.016
10	10.00	300.00	-190.00	3.28	0.016
11	11.00	300.00	-189.00	3.28	0.016
12	12.00	300.00	-188.00	3.28	0.016
13	13.00	300.00	-187.00	3.28	0.017
14	14.00	300.00	-186.00	3.28	0.017
15	15.00	300.00	-185.00	3.28	0.017
16	16.00	300.00	-184.00	3.28	0.017
17	17.00	300.00	-183.00	3.28	0.017
18	18.00	300.00	-182.00	3.28	0.018
19	19.00	300.00	-181.00	3.28	0.018
20	20.00	300.00	-180.00	3.28	0.018
21	21.00	300.00	-179.00	3.28	0.018
22	22.00	300.00	-178.00	3.28	0.018
23	23.00	300.00	-177.00	3.28	0.019
24	24.00	300.00	-176.00	3.28	0.019
25	25.00	300.00	-175.00	3.28	0.019
26	26.00	300.00	-174.00	3.28	0.019
27	27.00	300.00	-173.00	3.28	0.019
28	28.00	300.00	-172.00	3.28	0.020
29	29.00	300.00	-171.00	3.28	0.020

30	30.00	300.00 -170.00	3.28	0.020
31	31.00	300.00 -169.00	3.28	0.020
32	32.00	300.00 -168.00	3.28	0.021
33	33.00	300.00 -167.00	3.28	0.021
34	34.00	300.00 -166.00	3.28	0.021
35	35.00	300.00 -165.00	3.28	0.021
36	36.00	300.00 -164.00	3.28	0.022
37	37.00	300.00 -163.00	3.28	0.022
38	38.00	300.00 -162.00	3.28	0.022
39	39.00	300.00 -161.00	3.28	0.022
40	40.00	300.00 -160.00	3.28	0.023
41	41.00	300.00 -159.00	3.28	0.023
42	42.00	300.00 -158.00	3.28	0.023
43	43.00	300.00 -157.00	3.28	0.024
44	44.00	300.00 -156.00	3.28	0.024
45	45.00	300.00 -155.00	3.28	0.024
46	46.00	300.00 -154.00	3.28	0.024
47	47.00	300.00 -153.00	3.28	0.025
48	48.00	300.00 -152.00	3.28	0.025
49	49.00	300.00 -151.00	3.28	0.025
50	50.00	300.00 -150.00	3.28	0.026
51	51.00	300.00 -149.00	3.28	0.026
52	52.00	300.00 -148.00	3.28	0.026
53	53.00	300.00 -147.00	3.28	0.027
54	54.00	300.00 -146.00	3.28	0.027
55	55.00	300.00 -145.00	3.28	0.028
56	56.00	300.00 -144.00	3.28	0.028
57	57.00	300.00 -143.00	3.28	0.028
58	58.00	300.00 -142.00	3.28	0.029
59	59.00	300.00 -141.00	3.28	0.029
60	60.00	300.00 -140.00	3.28	0.029
61	61.00	300.00 -139.00	3.28	0.030
62	62.00	300.00 -138.00	3.28	0.030
63	63.00	300.00 -137.00	3.28	0.031
64	64.00	300.00 -136.00	3.28	0.031
65	65.00	300.00 -135.00	3.28	0.032
66	66.00	300.00 -134.00	3.28	0.032
67	67.00	300.00 -133.00	3.28	0.032
68	68.00	300.00 -132.00	3.28	0.033
69	69.00	300.00 -131.00	3.28	0.033
70	70.00	300.00 -130.00	3.28	0.034
71	71.00	300.00 -129.00	3.28	0.034
72	72.00	300.00 -128.00	3.28	0.035
73	73.00	300.00 -127.00	3.28	0.035
74	74.00	300.00 -126.00	3.28	0.036

75	75.00	300.00 -125.00	3.28	0.037
76	76.00	300.00 -124.00	3.28	0.037
77	77.00	300.00 -123.00	3.28	0.038
78	78.00	300.00 -122.00	3.28	0.038
79	79.00	300.00 -121.00	3.28	0.039
80	80.00	300.00 -120.00	3.28	0.039
81	81.00	300.00 -119.00	3.28	0.040
82	82.00	300.00 -118.00	3.28	0.041
83	83.00	300.00 -117.00	3.28	0.041
84	84.00	300.00 -116.00	3.28	0.042
85	85.00	300.00 -115.00	3.28	0.043
86	86.00	300.00 -114.00	3.28	0.043
87	87.00	300.00 -113.00	3.28	0.044
88	88.00	300.00 -112.00	3.28	0.045
89	89.00	300.00 -111.00	3.28	0.046
90	90.00	300.00 -110.00	3.28	0.046
91	91.00	300.00 -109.00	3.28	0.047
92	92.00	300.00 -108.00	3.28	0.048
93	93.00	300.00 -107.00	3.28	0.049
94	94.00	300.00 -106.00	3.28	0.050
95	95.00	300.00 -105.00	3.28	0.050
96	96.00	300.00 -104.00	3.28	0.051
97	97.00	300.00 -103.00	3.28	0.052
98	98.00	300.00 -102.00	3.28	0.053
99	99.00	300.00 -101.00	3.28	0.054
100	100.00	300.00 -100.00	3.28	0.055
101	101.00	300.00 -99.00 3.28		0.056
102	102.00	300.00 -98.00 3.28		0.057
103	103.00	300.00 -97.00 3.28		0.058
104	104.00	300.00 -96.00 3.28		0.059
105	105.00	300.00 -95.00 3.28		0.060
106	106.00	300.00 -94.00 3.28		0.061
107	107.00	300.00 -93.00 3.28		0.062
108	108.00	300.00 -92.00 3.28		0.063
109	109.00	300.00 -91.00 3.28		0.065
110	110.00	300.00 -90.00 3.28		0.066
111	111.00	300.00 -89.00 3.28		0.067
112	112.00	300.00 -88.00 3.28		0.068
113	113.00	300.00 -87.00 3.28		0.070
114	114.00	300.00 -86.00 3.28		0.071
115	115.00	300.00 -85.00 3.28		0.072
116	116.00	300.00 -84.00 3.28		0.074
117	117.00	300.00 -83.00 3.28		0.075
118	118.00	300.00 -82.00 3.28		0.077
119	119.00	300.00 -81.00 3.28		0.078

120	120.00	300.00	-80.00	3.28	0.080
121	121.00	300.00	-79.00	3.28	0.081
122	122.00	300.00	-78.00	3.28	0.083
123	123.00	300.00	-77.00	3.28	0.085
124	124.00	300.00	-76.00	3.28	0.086
125	125.00	300.00	-75.00	3.28	0.088
126	126.00	300.00	-74.00	3.28	0.090
127	127.00	300.00	-73.00	3.28	0.092
128	128.00	300.00	-72.00	3.28	0.094
129	129.00	300.00	-71.00	3.28	0.096
130	130.00	300.00	-70.00	3.28	0.098
131	131.00	300.00	-69.00	3.28	0.100
132	132.00	300.00	-68.00	3.28	0.102
133	133.00	300.00	-67.00	3.28	0.104
134	134.00	300.00	-66.00	3.28	0.107
135	135.00	300.00	-65.00	3.28	0.109
136	136.00	300.00	-64.00	3.28	0.112
137	137.00	300.00	-63.00	3.28	0.114
138	138.00	300.00	-62.00	3.28	0.117
139	139.00	300.00	-61.00	3.28	0.120
140	140.00	300.00	-60.00	3.28	0.122
141	141.00	300.00	-59.00	3.28	0.125
142	142.00	300.00	-58.00	3.28	0.129
143	143.00	300.00	-57.00	3.28	0.132
144	144.00	300.00	-56.00	3.28	0.135
145	145.00	300.00	-55.00	3.28	0.139
146	146.00	300.00	-54.00	3.28	0.143
147	147.00	300.00	-53.00	3.28	0.147
148	148.00	300.00	-52.00	3.28	0.151
149	149.00	300.00	-51.00	3.28	0.155
150	150.00	300.00	-50.00	3.28	0.160
151	151.00	300.00	-49.00	3.28	0.165
152	152.00	300.00	-48.00	3.28	0.171
153	153.00	300.00	-47.00	3.28	0.176
154	154.00	300.00	-46.00	3.28	0.183
155	155.00	300.00	-45.00	3.28	0.190
156	156.00	300.00	-44.00	3.28	0.197
157	157.00	300.00	-43.00	3.28	0.205
158	158.00	300.00	-42.00	3.28	0.214
159	159.00	300.00	-41.00	3.28	0.224
160	160.00	300.00	-40.00	3.28	0.234
161	161.00	300.00	-39.00	3.28	0.246
162	162.00	300.00	-38.00	3.28	0.259
163	163.00	300.00	-37.00	3.28	0.273
164	164.00	300.00	-36.00	3.28	0.288



165	165.00	300.00	-35.00	3.28	0.305
166	166.00	300.00	-34.00	3.28	0.323
167	167.00	300.00	-33.00	3.28	0.344
168	168.00	300.00	-32.00	3.28	0.366
169	169.00	300.00	-31.00	3.28	0.390
170	170.00	300.00	-30.00	3.28	0.416
171	171.00	300.00	-29.00	3.28	0.445
172	172.00	300.00	-28.00	3.28	0.476
173	173.00	300.00	-27.00	3.28	0.510
174	174.00	300.00	-26.00	3.28	0.546
175	175.00	300.00	-25.00	3.28	0.585
176	176.00	300.00	-24.00	3.28	0.626
177	177.00	300.00	-23.00	3.28	0.670
178	178.00	300.00	-22.00	3.28	0.717
179	179.00	300.00	-21.00	3.28	0.766
180	180.00	300.00	-20.00	3.28	0.817
181	181.00	300.00	-19.00	3.28	0.870
182	182.00	300.00	-18.00	3.28	0.924
183	183.00	300.00	-17.00	3.28	0.979
184	184.00	300.00	-16.00	3.28	1.035
185	185.00	300.00	-15.00	3.28	1.090
186	186.00	300.00	-14.00	3.28	1.143
187	187.00	300.00	-13.00	3.28	1.194
188	188.00	300.00	-12.00	3.28	1.242
189	189.00	300.00	-11.00	3.28	1.286
190	190.00	300.00	-10.00	3.28	1.324
191	191.00	300.00	-9.00	3.28	1.356
192	192.00	300.00	-8.00	3.28	1.380
193	193.00	300.00	-7.00	3.28	1.396
194	194.00	300.00	-6.00	3.28	1.404
195	195.00	300.00	-5.00	3.28	1.403
196	196.00	300.00	-4.00	3.28	1.392
197	197.00	300.00	-3.00	3.28	1.373
198	198.00	300.00	-2.00	3.28	1.346
199	199.00	300.00	-1.00	3.28	1.312
200	200.00	300.00	0.00	3.28	1.272
201	201.00	300.00	1.00	3.28	1.226
202	202.00	300.00	2.00	3.28	1.177
203	203.00	300.00	3.00	3.28	1.125
204	204.00	300.00	4.00	3.28	1.072
205	205.00	300.00	5.00	3.28	1.019
206	206.00	300.00	6.00	3.28	0.968
207	207.00	300.00	7.00	3.28	0.918
208	208.00	300.00	8.00	3.28	0.871
209	209.00	300.00	9.00	3.28	0.827

210	210.00	300.00	10.00	3.28	0.787
211	211.00	300.00	11.00	3.28	0.750
212	212.00	300.00	12.00	3.28	0.716
213	213.00	300.00	13.00	3.28	0.686
214	214.00	300.00	14.00	3.28	0.658
215	215.00	300.00	15.00	3.28	0.633
216	216.00	300.00	16.00	3.28	0.610
217	217.00	300.00	17.00	3.28	0.589
218	218.00	300.00	18.00	3.28	0.569
219	219.00	300.00	19.00	3.28	0.550
220	220.00	300.00	20.00	3.28	0.532
221	221.00	300.00	21.00	3.28	0.516
222	222.00	300.00	22.00	3.28	0.499
223	223.00	300.00	23.00	3.28	0.483
224	224.00	300.00	24.00	3.28	0.468
225	225.00	300.00	25.00	3.28	0.453
226	226.00	300.00	26.00	3.28	0.438
227	227.00	300.00	27.00	3.28	0.424
228	228.00	300.00	28.00	3.28	0.409
229	229.00	300.00	29.00	3.28	0.396
230	230.00	300.00	30.00	3.28	0.382
231	231.00	300.00	31.00	3.28	0.369
232	232.00	300.00	32.00	3.28	0.356
233	233.00	300.00	33.00	3.28	0.344
234	234.00	300.00	34.00	3.28	0.332
235	235.00	300.00	35.00	3.28	0.320
236	236.00	300.00	36.00	3.28	0.308
237	237.00	300.00	37.00	3.28	0.297
238	238.00	300.00	38.00	3.28	0.287
239	239.00	300.00	39.00	3.28	0.276
240	240.00	300.00	40.00	3.28	0.267
241	241.00	300.00	41.00	3.28	0.257
242	242.00	300.00	42.00	3.28	0.248
243	243.00	300.00	43.00	3.28	0.239
244	244.00	300.00	44.00	3.28	0.231
245	245.00	300.00	45.00	3.28	0.222
246	246.00	300.00	46.00	3.28	0.215
247	247.00	300.00	47.00	3.28	0.207
248	248.00	300.00	48.00	3.28	0.200
249	249.00	300.00	49.00	3.28	0.193
250	250.00	300.00	50.00	3.28	0.187
251	251.00	300.00	51.00	3.28	0.180
252	252.00	300.00	52.00	3.28	0.174
253	253.00	300.00	53.00	3.28	0.168
254	254.00	300.00	54.00	3.28	0.163

255	255.00	300.00	55.00	3.28	0.158
256	256.00	300.00	56.00	3.28	0.153
257	257.00	300.00	57.00	3.28	0.148
258	258.00	300.00	58.00	3.28	0.143
259	259.00	300.00	59.00	3.28	0.139
260	260.00	300.00	60.00	3.28	0.134
261	261.00	300.00	61.00	3.28	0.130
262	262.00	300.00	62.00	3.28	0.126
263	263.00	300.00	63.00	3.28	0.122
264	264.00	300.00	64.00	3.28	0.119
265	265.00	300.00	65.00	3.28	0.115
266	266.00	300.00	66.00	3.28	0.112
267	267.00	300.00	67.00	3.28	0.109
268	268.00	300.00	68.00	3.28	0.106
269	269.00	300.00	69.00	3.28	0.103
270	270.00	300.00	70.00	3.28	0.100
271	271.00	300.00	71.00	3.28	0.097
272	272.00	300.00	72.00	3.28	0.095
273	273.00	300.00	73.00	3.28	0.092
274	274.00	300.00	74.00	3.28	0.090
275	275.00	300.00	75.00	3.28	0.087
276	276.00	300.00	76.00	3.28	0.085
277	277.00	300.00	77.00	3.28	0.083
278	278.00	300.00	78.00	3.28	0.081
279	279.00	300.00	79.00	3.28	0.079
280	280.00	300.00	80.00	3.28	0.077
281	281.00	300.00	81.00	3.28	0.075
282	282.00	300.00	82.00	3.28	0.073
283	283.00	300.00	83.00	3.28	0.072
284	284.00	300.00	84.00	3.28	0.070
285	285.00	300.00	85.00	3.28	0.068
286	286.00	300.00	86.00	3.28	0.067
287	287.00	300.00	87.00	3.28	0.065
288	288.00	300.00	88.00	3.28	0.064
289	289.00	300.00	89.00	3.28	0.062
290	290.00	300.00	90.00	3.28	0.061
291	291.00	300.00	91.00	3.28	0.060
292	292.00	300.00	92.00	3.28	0.058
293	293.00	300.00	93.00	3.28	0.057
294	294.00	300.00	94.00	3.28	0.056
295	295.00	300.00	95.00	3.28	0.055
296	296.00	300.00	96.00	3.28	0.054
297	297.00	300.00	97.00	3.28	0.053
298	298.00	300.00	98.00	3.28	0.052
299	299.00	300.00	99.00	3.28	0.051

300	300.00	300.00	100.00	3.28	0.050
301	301.00	300.00	101.00	3.28	0.049
302	302.00	300.00	102.00	3.28	0.048
303	303.00	300.00	103.00	3.28	0.047
304	304.00	300.00	104.00	3.28	0.046
305	305.00	300.00	105.00	3.28	0.045
306	306.00	300.00	106.00	3.28	0.044
307	307.00	300.00	107.00	3.28	0.043
308	308.00	300.00	108.00	3.28	0.043
309	309.00	300.00	109.00	3.28	0.042
310	310.00	300.00	110.00	3.28	0.041
311	311.00	300.00	111.00	3.28	0.040
312	312.00	300.00	112.00	3.28	0.040
313	313.00	300.00	113.00	3.28	0.039
314	314.00	300.00	114.00	3.28	0.038
315	315.00	300.00	115.00	3.28	0.038
316	316.00	300.00	116.00	3.28	0.037
317	317.00	300.00	117.00	3.28	0.036
318	318.00	300.00	118.00	3.28	0.036
319	319.00	300.00	119.00	3.28	0.035
320	320.00	300.00	120.00	3.28	0.035
321	321.00	300.00	121.00	3.28	0.034
322	322.00	300.00	122.00	3.28	0.033
323	323.00	300.00	123.00	3.28	0.033
324	324.00	300.00	124.00	3.28	0.032
325	325.00	300.00	125.00	3.28	0.032
326	326.00	300.00	126.00	3.28	0.031
327	327.00	300.00	127.00	3.28	0.031
328	328.00	300.00	128.00	3.28	0.030
329	329.00	300.00	129.00	3.28	0.030
330	330.00	300.00	130.00	3.28	0.030
331	331.00	300.00	131.00	3.28	0.029
332	332.00	300.00	132.00	3.28	0.029
333	333.00	300.00	133.00	3.28	0.028
334	334.00	300.00	134.00	3.28	0.028
335	335.00	300.00	135.00	3.28	0.027
336	336.00	300.00	136.00	3.28	0.027
337	337.00	300.00	137.00	3.28	0.027
338	338.00	300.00	138.00	3.28	0.026
339	339.00	300.00	139.00	3.28	0.026
340	340.00	300.00	140.00	3.28	0.026
341	341.00	300.00	141.00	3.28	0.025
342	342.00	300.00	142.00	3.28	0.025
343	343.00	300.00	143.00	3.28	0.025
344	344.00	300.00	144.00	3.28	0.024

345	345.00	300.00	145.00	3.28	0.024
346	346.00	300.00	146.00	3.28	0.024
347	347.00	300.00	147.00	3.28	0.023
348	348.00	300.00	148.00	3.28	0.023
349	349.00	300.00	149.00	3.28	0.023
350	350.00	300.00	150.00	3.28	0.022
351	351.00	300.00	151.00	3.28	0.022
352	352.00	300.00	152.00	3.28	0.022
353	353.00	300.00	153.00	3.28	0.021
354	354.00	300.00	154.00	3.28	0.021
355	355.00	300.00	155.00	3.28	0.021
356	356.00	300.00	156.00	3.28	0.021
357	357.00	300.00	157.00	3.28	0.020
358	358.00	300.00	158.00	3.28	0.020
359	359.00	300.00	159.00	3.28	0.020
360	360.00	300.00	160.00	3.28	0.020
361	361.00	300.00	161.00	3.28	0.019
362	362.00	300.00	162.00	3.28	0.019
363	363.00	300.00	163.00	3.28	0.019
364	364.00	300.00	164.00	3.28	0.019
365	365.00	300.00	165.00	3.28	0.019
366	366.00	300.00	166.00	3.28	0.018
367	367.00	300.00	167.00	3.28	0.018
368	368.00	300.00	168.00	3.28	0.018
369	369.00	300.00	169.00	3.28	0.018
370	370.00	300.00	170.00	3.28	0.017
371	371.00	300.00	171.00	3.28	0.017
372	372.00	300.00	172.00	3.28	0.017
373	373.00	300.00	173.00	3.28	0.017
374	374.00	300.00	174.00	3.28	0.017
375	375.00	300.00	175.00	3.28	0.016
376	376.00	300.00	176.00	3.28	0.016
377	377.00	300.00	177.00	3.28	0.016
378	378.00	300.00	178.00	3.28	0.016
379	379.00	300.00	179.00	3.28	0.016
380	380.00	300.00	180.00	3.28	0.016
381	381.00	300.00	181.00	3.28	0.015
382	382.00	300.00	182.00	3.28	0.015
383	383.00	300.00	183.00	3.28	0.015
384	384.00	300.00	184.00	3.28	0.015
385	385.00	300.00	185.00	3.28	0.015
386	386.00	300.00	186.00	3.28	0.015
387	387.00	300.00	187.00	3.28	0.014
388	388.00	300.00	188.00	3.28	0.014
389	389.00	300.00	189.00	3.28	0.014

390	390.00	300.00	190.00	3.28	0.014
391	391.00	300.00	191.00	3.28	0.014
392	392.00	300.00	192.00	3.28	0.014
393	393.00	300.00	193.00	3.28	0.014
394	394.00	300.00	194.00	3.28	0.013
395	395.00	300.00	195.00	3.28	0.013
396	396.00	300.00	196.00	3.28	0.013
397	397.00	300.00	197.00	3.28	0.013
398	398.00	300.00	198.00	3.28	0.013
399	399.00	300.00	199.00	3.28	0.013
400	400.00	300.00	200.00	3.28	0.013

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\* BUNDLE CONFIGURATION \*

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CIRCUIT	NODE	PHASE	VOLTAGE	LOAD	ANGLE	OF	X	Y
#	#	(kV)	(AMPS)	(DEG)	COND	(ft)	(ft)	

\*\*\*\*\*

1	1	A	121.000	400.00	0.00	1	0.00	0.00
1	1	B	121.000	400.00	240.00	1	0.00	0.00
1	1	C	121.000	400.00	120.00	1	0.00	0.00
1	2	A	121.000	0.00	0.00	1	0.00	0.00
1	2	B	121.000	0.00	0.00	1	0.00	0.00
1	2	C	121.000	0.00	0.00	1	0.00	0.00
2	1	SW	0.000	5.62	227.79	1	0.00	0.00
2	2	SW	0.000	0.00	0.00	1	0.00	0.00

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\* SUBCONDUCTOR INFORMATION \*

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CIRCUIT	NODE	DIAMETER	SPACING	AC RESIST.	AC REACT.
#	#	(in)	(in)	(ohms/mi)	(ohms/mi)

\*\*\*\*\*

1	1	0.500	0.000	-NA-	-NA-
1	1	0.500	0.000	-NA-	-NA-
1	1	0.500	0.000	-NA-	-NA-
1	2	0.500	0.000	-NA-	-NA-
1	2	0.500	0.000	-NA-	-NA-
1	2	0.500	0.000	-NA-	-NA-
2	1	0.360	0.000	6.600000	1.500000
2	2	0.360	0.000	6.600000	1.500000

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## Single Circuit Configuration – Magnetic Field Lateral Profile

File: C:\Users\hchooper\Desktop\New Projects\Obsidian - TLine in Oregon\Case 2 - MF.txt

B-Field HORIZONTAL Profile Chart: "Lateral Profile Magnetic Field - Model Load 1"

Field Components = Resultant

Distance units = (ft)

Magnetic field units = mG

Spacing = 1.00(ft)

Calculation Points = 401

Point	Distance (ft)	X (ft)	Y (ft)	Z (ft)	BF (mG)
0	0.00	300.00	-200.00		0.99
1	1.00	300.00	-199.00		1.00
2	2.00	300.00	-198.00		1.01
3	3.00	300.00	-197.00		1.03
4	4.00	300.00	-196.00		1.04
5	5.00	300.00	-195.00		1.05
6	6.00	300.00	-194.00		1.06
7	7.00	300.00	-193.00		1.07
8	8.00	300.00	-192.00		1.08
9	9.00	300.00	-191.00		1.09
10	10.00	300.00	-190.00		1.11
11	11.00	300.00	-189.00		1.12
12	12.00	300.00	-188.00		1.13
13	13.00	300.00	-187.00		1.14
14	14.00	300.00	-186.00		1.16
15	15.00	300.00	-185.00		1.17
16	16.00	300.00	-184.00		1.18
17	17.00	300.00	-183.00		1.20
18	18.00	300.00	-182.00		1.21
19	19.00	300.00	-181.00		1.22
20	20.00	300.00	-180.00		1.24
21	21.00	300.00	-179.00		1.25
22	22.00	300.00	-178.00		1.27
23	23.00	300.00	-177.00		1.28
24	24.00	300.00	-176.00		1.30
25	25.00	300.00	-175.00		1.31
26	26.00	300.00	-174.00		1.33
27	27.00	300.00	-173.00		1.34
28	28.00	300.00	-172.00		1.36
29	29.00	300.00	-171.00		1.38
30	30.00	300.00	-170.00		1.39

31	31.00	300.00 -169.00	3.28	1.41
32	32.00	300.00 -168.00	3.28	1.43
33	33.00	300.00 -167.00	3.28	1.44
34	34.00	300.00 -166.00	3.28	1.46
35	35.00	300.00 -165.00	3.28	1.48
36	36.00	300.00 -164.00	3.28	1.50
37	37.00	300.00 -163.00	3.28	1.52
38	38.00	300.00 -162.00	3.28	1.54
39	39.00	300.00 -161.00	3.28	1.56
40	40.00	300.00 -160.00	3.28	1.58
41	41.00	300.00 -159.00	3.28	1.60
42	42.00	300.00 -158.00	3.28	1.62
43	43.00	300.00 -157.00	3.28	1.64
44	44.00	300.00 -156.00	3.28	1.66
45	45.00	300.00 -155.00	3.28	1.68
46	46.00	300.00 -154.00	3.28	1.70
47	47.00	300.00 -153.00	3.28	1.73
48	48.00	300.00 -152.00	3.28	1.75
49	49.00	300.00 -151.00	3.28	1.77
50	50.00	300.00 -150.00	3.28	1.80
51	51.00	300.00 -149.00	3.28	1.82
52	52.00	300.00 -148.00	3.28	1.85
53	53.00	300.00 -147.00	3.28	1.87
54	54.00	300.00 -146.00	3.28	1.90
55	55.00	300.00 -145.00	3.28	1.93
56	56.00	300.00 -144.00	3.28	1.95
57	57.00	300.00 -143.00	3.28	1.98
58	58.00	300.00 -142.00	3.28	2.01
59	59.00	300.00 -141.00	3.28	2.04
60	60.00	300.00 -140.00	3.28	2.07
61	61.00	300.00 -139.00	3.28	2.10
62	62.00	300.00 -138.00	3.28	2.13
63	63.00	300.00 -137.00	3.28	2.16
64	64.00	300.00 -136.00	3.28	2.19
65	65.00	300.00 -135.00	3.28	2.23
66	66.00	300.00 -134.00	3.28	2.26
67	67.00	300.00 -133.00	3.28	2.29
68	68.00	300.00 -132.00	3.28	2.33
69	69.00	300.00 -131.00	3.28	2.37
70	70.00	300.00 -130.00	3.28	2.40
71	71.00	300.00 -129.00	3.28	2.44
72	72.00	300.00 -128.00	3.28	2.48
73	73.00	300.00 -127.00	3.28	2.52
74	74.00	300.00 -126.00	3.28	2.56
75	75.00	300.00 -125.00	3.28	2.60



76	76.00	300.00 -124.00	3.28	2.64
77	77.00	300.00 -123.00	3.28	2.68
78	78.00	300.00 -122.00	3.28	2.73
79	79.00	300.00 -121.00	3.28	2.77
80	80.00	300.00 -120.00	3.28	2.82
81	81.00	300.00 -119.00	3.28	2.87
82	82.00	300.00 -118.00	3.28	2.91
83	83.00	300.00 -117.00	3.28	2.96
84	84.00	300.00 -116.00	3.28	3.01
85	85.00	300.00 -115.00	3.28	3.07
86	86.00	300.00 -114.00	3.28	3.12
87	87.00	300.00 -113.00	3.28	3.17
88	88.00	300.00 -112.00	3.28	3.23
89	89.00	300.00 -111.00	3.28	3.29
90	90.00	300.00 -110.00	3.28	3.35
91	91.00	300.00 -109.00	3.28	3.41
92	92.00	300.00 -108.00	3.28	3.47
93	93.00	300.00 -107.00	3.28	3.53
94	94.00	300.00 -106.00	3.28	3.60
95	95.00	300.00 -105.00	3.28	3.67
96	96.00	300.00 -104.00	3.28	3.74
97	97.00	300.00 -103.00	3.28	3.81
98	98.00	300.00 -102.00	3.28	3.88
99	99.00	300.00 -101.00	3.28	3.96
100	100.00	300.00 -100.00	3.28	4.03
101	101.00	300.00 -99.00	3.28	4.11
102	102.00	300.00 -98.00	3.28	4.19
103	103.00	300.00 -97.00	3.28	4.28
104	104.00	300.00 -96.00	3.28	4.36
105	105.00	300.00 -95.00	3.28	4.45
106	106.00	300.00 -94.00	3.28	4.54
107	107.00	300.00 -93.00	3.28	4.64
108	108.00	300.00 -92.00	3.28	4.74
109	109.00	300.00 -91.00	3.28	4.84
110	110.00	300.00 -90.00	3.28	4.94
111	111.00	300.00 -89.00	3.28	5.04
112	112.00	300.00 -88.00	3.28	5.15
113	113.00	300.00 -87.00	3.28	5.27
114	114.00	300.00 -86.00	3.28	5.38
115	115.00	300.00 -85.00	3.28	5.50
116	116.00	300.00 -84.00	3.28	5.63
117	117.00	300.00 -83.00	3.28	5.76
118	118.00	300.00 -82.00	3.28	5.89
119	119.00	300.00 -81.00	3.28	6.02
120	120.00	300.00 -80.00	3.28	6.17

121	121.00	300.00	-79.00	3.28	6.31
122	122.00	300.00	-78.00	3.28	6.46
123	123.00	300.00	-77.00	3.28	6.62
124	124.00	300.00	-76.00	3.28	6.78
125	125.00	300.00	-75.00	3.28	6.95
126	126.00	300.00	-74.00	3.28	7.12
127	127.00	300.00	-73.00	3.28	7.30
128	128.00	300.00	-72.00	3.28	7.48
129	129.00	300.00	-71.00	3.28	7.68
130	130.00	300.00	-70.00	3.28	7.87
131	131.00	300.00	-69.00	3.28	8.08
132	132.00	300.00	-68.00	3.28	8.30
133	133.00	300.00	-67.00	3.28	8.52
134	134.00	300.00	-66.00	3.28	8.75
135	135.00	300.00	-65.00	3.28	8.99
136	136.00	300.00	-64.00	3.28	9.24
137	137.00	300.00	-63.00	3.28	9.50
138	138.00	300.00	-62.00	3.28	9.76
139	139.00	300.00	-61.00	3.28	10.04
140	140.00	300.00	-60.00	3.28	10.33
141	141.00	300.00	-59.00	3.28	10.64
142	142.00	300.00	-58.00	3.28	10.95
143	143.00	300.00	-57.00	3.28	11.28
144	144.00	300.00	-56.00	3.28	11.62
145	145.00	300.00	-55.00	3.28	11.97
146	146.00	300.00	-54.00	3.28	12.34
147	147.00	300.00	-53.00	3.28	12.73
148	148.00	300.00	-52.00	3.28	13.13
149	149.00	300.00	-51.00	3.28	13.55
150	150.00	300.00	-50.00	3.28	13.99
151	151.00	300.00	-49.00	3.28	14.45
152	152.00	300.00	-48.00	3.28	14.93
153	153.00	300.00	-47.00	3.28	15.43
154	154.00	300.00	-46.00	3.28	15.95
155	155.00	300.00	-45.00	3.28	16.49
156	156.00	300.00	-44.00	3.28	17.06
157	157.00	300.00	-43.00	3.28	17.66
158	158.00	300.00	-42.00	3.28	18.28
159	159.00	300.00	-41.00	3.28	18.93
160	160.00	300.00	-40.00	3.28	19.61
161	161.00	300.00	-39.00	3.28	20.33
162	162.00	300.00	-38.00	3.28	21.07
163	163.00	300.00	-37.00	3.28	21.85
164	164.00	300.00	-36.00	3.28	22.67
165	165.00	300.00	-35.00	3.28	23.52

166	166.00	300.00	-34.00	3.28	24.42
167	167.00	300.00	-33.00	3.28	25.35
168	168.00	300.00	-32.00	3.28	26.33
169	169.00	300.00	-31.00	3.28	27.35
170	170.00	300.00	-30.00	3.28	28.41
171	171.00	300.00	-29.00	3.28	29.52
172	172.00	300.00	-28.00	3.28	30.68
173	173.00	300.00	-27.00	3.28	31.89
174	174.00	300.00	-26.00	3.28	33.14
175	175.00	300.00	-25.00	3.28	34.44
176	176.00	300.00	-24.00	3.28	35.79
177	177.00	300.00	-23.00	3.28	37.18
178	178.00	300.00	-22.00	3.28	38.62
179	179.00	300.00	-21.00	3.28	40.10
180	180.00	300.00	-20.00	3.28	41.61
181	181.00	300.00	-19.00	3.28	43.15
182	182.00	300.00	-18.00	3.28	44.72
183	183.00	300.00	-17.00	3.28	46.30
184	184.00	300.00	-16.00	3.28	47.88
185	185.00	300.00	-15.00	3.28	49.45
186	186.00	300.00	-14.00	3.28	51.00
187	187.00	300.00	-13.00	3.28	52.51
188	188.00	300.00	-12.00	3.28	53.97
189	189.00	300.00	-11.00	3.28	55.35
190	190.00	300.00	-10.00	3.28	56.64
191	191.00	300.00	-9.00	3.28	57.81
192	192.00	300.00	-8.00	3.28	58.85
193	193.00	300.00	-7.00	3.28	59.74
194	194.00	300.00	-6.00	3.28	60.46
195	195.00	300.00	-5.00	3.28	61.01
196	196.00	300.00	-4.00	3.28	61.37
197	197.00	300.00	-3.00	3.28	61.53
198	198.00	300.00	-2.00	3.28	61.50
199	199.00	300.00	-1.00	3.28	61.28
200	200.00	300.00	0.00	3.28	60.88
201	201.00	300.00	1.00	3.28	60.30
202	202.00	300.00	2.00	3.28	59.56
203	203.00	300.00	3.00	3.28	58.68
204	204.00	300.00	4.00	3.28	57.67
205	205.00	300.00	5.00	3.28	56.54
206	206.00	300.00	6.00	3.28	55.32
207	207.00	300.00	7.00	3.28	54.02
208	208.00	300.00	8.00	3.28	52.66
209	209.00	300.00	9.00	3.28	51.25
210	210.00	300.00	10.00	3.28	49.81

211	211.00	300.00	11.00	3.28	48.34
212	212.00	300.00	12.00	3.28	46.86
213	213.00	300.00	13.00	3.28	45.38
214	214.00	300.00	14.00	3.28	43.91
215	215.00	300.00	15.00	3.28	42.46
216	216.00	300.00	16.00	3.28	41.02
217	217.00	300.00	17.00	3.28	39.62
218	218.00	300.00	18.00	3.28	38.24
219	219.00	300.00	19.00	3.28	36.89
220	220.00	300.00	20.00	3.28	35.59
221	221.00	300.00	21.00	3.28	34.32
222	222.00	300.00	22.00	3.28	33.09
223	223.00	300.00	23.00	3.28	31.90
224	224.00	300.00	24.00	3.28	30.76
225	225.00	300.00	25.00	3.28	29.65
226	226.00	300.00	26.00	3.28	28.59
227	227.00	300.00	27.00	3.28	27.57
228	228.00	300.00	28.00	3.28	26.58
229	229.00	300.00	29.00	3.28	25.64
230	230.00	300.00	30.00	3.28	24.73
231	231.00	300.00	31.00	3.28	23.87
232	232.00	300.00	32.00	3.28	23.03
233	233.00	300.00	33.00	3.28	22.24
234	234.00	300.00	34.00	3.28	21.47
235	235.00	300.00	35.00	3.28	20.74
236	236.00	300.00	36.00	3.28	20.04
237	237.00	300.00	37.00	3.28	19.37
238	238.00	300.00	38.00	3.28	18.72
239	239.00	300.00	39.00	3.28	18.11
240	240.00	300.00	40.00	3.28	17.52
241	241.00	300.00	41.00	3.28	16.95
242	242.00	300.00	42.00	3.28	16.41
243	243.00	300.00	43.00	3.28	15.89
244	244.00	300.00	44.00	3.28	15.40
245	245.00	300.00	45.00	3.28	14.92
246	246.00	300.00	46.00	3.28	14.46
247	247.00	300.00	47.00	3.28	14.02
248	248.00	300.00	48.00	3.28	13.60
249	249.00	300.00	49.00	3.28	13.20
250	250.00	300.00	50.00	3.28	12.81
251	251.00	300.00	51.00	3.28	12.44
252	252.00	300.00	52.00	3.28	12.09
253	253.00	300.00	53.00	3.28	11.74
254	254.00	300.00	54.00	3.28	11.41
255	255.00	300.00	55.00	3.28	11.10

256	256.00	300.00	56.00	3.28	10.79
257	257.00	300.00	57.00	3.28	10.50
258	258.00	300.00	58.00	3.28	10.22
259	259.00	300.00	59.00	3.28	9.95
260	260.00	300.00	60.00	3.28	9.69
261	261.00	300.00	61.00	3.28	9.43
262	262.00	300.00	62.00	3.28	9.19
263	263.00	300.00	63.00	3.28	8.96
264	264.00	300.00	64.00	3.28	8.73
265	265.00	300.00	65.00	3.28	8.52
266	266.00	300.00	66.00	3.28	8.31
267	267.00	300.00	67.00	3.28	8.10
268	268.00	300.00	68.00	3.28	7.91
269	269.00	300.00	69.00	3.28	7.72
270	270.00	300.00	70.00	3.28	7.54
271	271.00	300.00	71.00	3.28	7.36
272	272.00	300.00	72.00	3.28	7.19
273	273.00	300.00	73.00	3.28	7.03
274	274.00	300.00	74.00	3.28	6.87
275	275.00	300.00	75.00	3.28	6.72
276	276.00	300.00	76.00	3.28	6.57
277	277.00	300.00	77.00	3.28	6.42
278	278.00	300.00	78.00	3.28	6.28
279	279.00	300.00	79.00	3.28	6.15
280	280.00	300.00	80.00	3.28	6.02
281	281.00	300.00	81.00	3.28	5.89
282	282.00	300.00	82.00	3.28	5.77
283	283.00	300.00	83.00	3.28	5.65
284	284.00	300.00	84.00	3.28	5.53
285	285.00	300.00	85.00	3.28	5.42
286	286.00	300.00	86.00	3.28	5.31
287	287.00	300.00	87.00	3.28	5.20
288	288.00	300.00	88.00	3.28	5.10
289	289.00	300.00	89.00	3.28	5.00
290	290.00	300.00	90.00	3.28	4.91
291	291.00	300.00	91.00	3.28	4.81
292	292.00	300.00	92.00	3.28	4.72
293	293.00	300.00	93.00	3.28	4.63
294	294.00	300.00	94.00	3.28	4.54
295	295.00	300.00	95.00	3.28	4.46
296	296.00	300.00	96.00	3.28	4.38
297	297.00	300.00	97.00	3.28	4.30
298	298.00	300.00	98.00	3.28	4.22
299	299.00	300.00	99.00	3.28	4.15
300	300.00	300.00	100.00	3.28	4.07

301	301.00	300.00	101.00	3.28	4.00
302	302.00	300.00	102.00	3.28	3.93
303	303.00	300.00	103.00	3.28	3.86
304	304.00	300.00	104.00	3.28	3.80
305	305.00	300.00	105.00	3.28	3.73
306	306.00	300.00	106.00	3.28	3.67
307	307.00	300.00	107.00	3.28	3.61
308	308.00	300.00	108.00	3.28	3.55
309	309.00	300.00	109.00	3.28	3.49
310	310.00	300.00	110.00	3.28	3.43
311	311.00	300.00	111.00	3.28	3.38
312	312.00	300.00	112.00	3.28	3.32
313	313.00	300.00	113.00	3.28	3.27
314	314.00	300.00	114.00	3.28	3.22
315	315.00	300.00	115.00	3.28	3.17
316	316.00	300.00	116.00	3.28	3.12
317	317.00	300.00	117.00	3.28	3.07
318	318.00	300.00	118.00	3.28	3.02
319	319.00	300.00	119.00	3.28	2.98
320	320.00	300.00	120.00	3.28	2.93
321	321.00	300.00	121.00	3.28	2.89
322	322.00	300.00	122.00	3.28	2.85
323	323.00	300.00	123.00	3.28	2.80
324	324.00	300.00	124.00	3.28	2.76
325	325.00	300.00	125.00	3.28	2.72
326	326.00	300.00	126.00	3.28	2.68
327	327.00	300.00	127.00	3.28	2.64
328	328.00	300.00	128.00	3.28	2.61
329	329.00	300.00	129.00	3.28	2.57
330	330.00	300.00	130.00	3.28	2.53
331	331.00	300.00	131.00	3.28	2.50
332	332.00	300.00	132.00	3.28	2.46
333	333.00	300.00	133.00	3.28	2.43
334	334.00	300.00	134.00	3.28	2.40
335	335.00	300.00	135.00	3.28	2.36
336	336.00	300.00	136.00	3.28	2.33
337	337.00	300.00	137.00	3.28	2.30
338	338.00	300.00	138.00	3.28	2.27
339	339.00	300.00	139.00	3.28	2.24
340	340.00	300.00	140.00	3.28	2.21
341	341.00	300.00	141.00	3.28	2.18
342	342.00	300.00	142.00	3.28	2.15
343	343.00	300.00	143.00	3.28	2.13
344	344.00	300.00	144.00	3.28	2.10
345	345.00	300.00	145.00	3.28	2.07

346	346.00	300.00	146.00	3.28	2.05
347	347.00	300.00	147.00	3.28	2.02
348	348.00	300.00	148.00	3.28	2.00
349	349.00	300.00	149.00	3.28	1.97
350	350.00	300.00	150.00	3.28	1.95
351	351.00	300.00	151.00	3.28	1.92
352	352.00	300.00	152.00	3.28	1.90
353	353.00	300.00	153.00	3.28	1.88
354	354.00	300.00	154.00	3.28	1.86
355	355.00	300.00	155.00	3.28	1.83
356	356.00	300.00	156.00	3.28	1.81
357	357.00	300.00	157.00	3.28	1.79
358	358.00	300.00	158.00	3.28	1.77
359	359.00	300.00	159.00	3.28	1.75
360	360.00	300.00	160.00	3.28	1.73
361	361.00	300.00	161.00	3.28	1.71
362	362.00	300.00	162.00	3.28	1.69
363	363.00	300.00	163.00	3.28	1.67
364	364.00	300.00	164.00	3.28	1.65
365	365.00	300.00	165.00	3.28	1.63
366	366.00	300.00	166.00	3.28	1.61
367	367.00	300.00	167.00	3.28	1.60
368	368.00	300.00	168.00	3.28	1.58
369	369.00	300.00	169.00	3.28	1.56
370	370.00	300.00	170.00	3.28	1.54
371	371.00	300.00	171.00	3.28	1.53
372	372.00	300.00	172.00	3.28	1.51
373	373.00	300.00	173.00	3.28	1.50
374	374.00	300.00	174.00	3.28	1.48
375	375.00	300.00	175.00	3.28	1.46
376	376.00	300.00	176.00	3.28	1.45
377	377.00	300.00	177.00	3.28	1.43
378	378.00	300.00	178.00	3.28	1.42
379	379.00	300.00	179.00	3.28	1.40
380	380.00	300.00	180.00	3.28	1.39
381	381.00	300.00	181.00	3.28	1.37
382	382.00	300.00	182.00	3.28	1.36
383	383.00	300.00	183.00	3.28	1.35
384	384.00	300.00	184.00	3.28	1.33
385	385.00	300.00	185.00	3.28	1.32
386	386.00	300.00	186.00	3.28	1.31
387	387.00	300.00	187.00	3.28	1.29
388	388.00	300.00	188.00	3.28	1.28
389	389.00	300.00	189.00	3.28	1.27
390	390.00	300.00	190.00	3.28	1.26

391	391.00	300.00	191.00	3.28	1.24
392	392.00	300.00	192.00	3.28	1.23
393	393.00	300.00	193.00	3.28	1.22
394	394.00	300.00	194.00	3.28	1.21
395	395.00	300.00	195.00	3.28	1.20
396	396.00	300.00	196.00	3.28	1.19
397	397.00	300.00	197.00	3.28	1.17
398	398.00	300.00	198.00	3.28	1.16
399	399.00	300.00	199.00	3.28	1.15
400	400.00	300.00	200.00	3.28	1.14

```
*****
*                BUNDLE CONFIGURATION                *
*****
|  |  |  |  |  |  | CRNT/VLT | # | COORDINATES |
|CIRCUIT|NODE|PHASE| VOLTAGE | LOAD | ANGLE|OF| X | Y |
| # | # | | (kV) | (AMPS) | (DEG)|COND| (ft) | (ft) |
*****
| 1 | 1 | A | 121.000 | 400.00 | 0.00 | 1 | 0.00 | 0.00 |
| 1 | 1 | B | 121.000 | 400.00 | 240.00 | 1 | 0.00 | 0.00 |
| 1 | 1 | C | 121.000 | 400.00 | 120.00 | 1 | 0.00 | 0.00 |
| 1 | 2 | A | 121.000 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
| 1 | 2 | B | 121.000 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
| 1 | 2 | C | 121.000 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
| 2 | 1 | SW | 0.000 | 5.62 | 227.79 | 1 | 0.00 | 0.00 |
| 2 | 2 | SW | 0.000 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
*****
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*****
*                SUBCONDUCTOR INFORMATION                *
*****
|CIRCUIT|NODE| DIAMETER | SPACING | AC RESIST. | AC REACT. |
| # | # | (in) | (in) | (ohms/mi) | (ohms/mi) |
*****
| 1 | 1 | 0.500 | 0.000 | -NA- | -NA- |
| 1 | 1 | 0.500 | 0.000 | -NA- | -NA- |
| 1 | 1 | 0.500 | 0.000 | -NA- | -NA- |
| 1 | 2 | 0.500 | 0.000 | -NA- | -NA- |
| 1 | 2 | 0.500 | 0.000 | -NA- | -NA- |
| 1 | 2 | 0.500 | 0.000 | -NA- | -NA- |
| 2 | 1 | 0.360 | 0.000 | 6.600000 | 1.500000 |
| 2 | 2 | 0.360 | 0.000 | 6.600000 | 1.500000 |
*****
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## Single Circuit Configuration – Audible Noise Lateral Profile

File: C:\Users\hchooper\Desktop\New Projects\Obsidian - TLine in Oregon\Calcs\Case 2 - Audible Noise.txt

Aud-Noise HORIZONTAL Profile Chart: "Lateral Profile Audible Noise - Model Load 1(AN)"

Field Components = Resultant

Distance units = (ft)

Audible Noise units = dB(A)

Spacing = 1.00(ft)

Calculation Points = 401

Point	Distance (ft)	X (ft)	Y (ft)	Z (ft)	L5 dB(A)	L50 dB(A)	FW dB(A)
0	0.00	300.00	-200.00	5.00	37.31	26.51	15.31
1	1.00	300.00	-199.00	5.00	37.34	26.54	15.35
2	2.00	300.00	-198.00	5.00	37.38	26.57	15.38
3	3.00	300.00	-197.00	5.00	37.41	26.61	15.41
4	4.00	300.00	-196.00	5.00	37.44	26.64	15.44
5	5.00	300.00	-195.00	5.00	37.47	26.67	15.47
6	6.00	300.00	-194.00	5.00	37.51	26.70	15.51
7	7.00	300.00	-193.00	5.00	37.54	26.74	15.54
8	8.00	300.00	-192.00	5.00	37.57	26.77	15.57
9	9.00	300.00	-191.00	5.00	37.60	26.80	15.61
10	10.00	300.00	-190.00	5.00	37.64	26.84	15.64
11	11.00	300.00	-189.00	5.00	37.67	26.87	15.67
12	12.00	300.00	-188.00	5.00	37.70	26.90	15.71
13	13.00	300.00	-187.00	5.00	37.74	26.94	15.74
14	14.00	300.00	-186.00	5.00	37.77	26.97	15.77
15	15.00	300.00	-185.00	5.00	37.80	27.00	15.81
16	16.00	300.00	-184.00	5.00	37.84	27.04	15.84
17	17.00	300.00	-183.00	5.00	37.87	27.07	15.87
18	18.00	300.00	-182.00	5.00	37.91	27.10	15.91
19	19.00	300.00	-181.00	5.00	37.94	27.14	15.94
20	20.00	300.00	-180.00	5.00	37.97	27.17	15.98
21	21.00	300.00	-179.00	5.00	38.01	27.21	16.01
22	22.00	300.00	-178.00	5.00	38.04	27.24	16.04
23	23.00	300.00	-177.00	5.00	38.08	27.28	16.08
24	24.00	300.00	-176.00	5.00	38.11	27.31	16.11
25	25.00	300.00	-175.00	5.00	38.15	27.35	16.15
26	26.00	300.00	-174.00	5.00	38.18	27.38	16.18
27	27.00	300.00	-173.00	5.00	38.22	27.42	16.22
28	28.00	300.00	-172.00	5.00	38.25	27.45	16.25
29	29.00	300.00	-171.00	5.00	38.29	27.49	16.29

30	30.00	300.00 -170.00	5.00	38.33	27.52	16.33
31	31.00	300.00 -169.00	5.00	38.36	27.56	16.36
32	32.00	300.00 -168.00	5.00	38.40	27.59	16.40
33	33.00	300.00 -167.00	5.00	38.43	27.63	16.43
34	34.00	300.00 -166.00	5.00	38.47	27.67	16.47
35	35.00	300.00 -165.00	5.00	38.51	27.70	16.51
36	36.00	300.00 -164.00	5.00	38.54	27.74	16.54
37	37.00	300.00 -163.00	5.00	38.58	27.78	16.58
38	38.00	300.00 -162.00	5.00	38.62	27.81	16.62
39	39.00	300.00 -161.00	5.00	38.65	27.85	16.65
40	40.00	300.00 -160.00	5.00	38.69	27.89	16.69
41	41.00	300.00 -159.00	5.00	38.73	27.93	16.73
42	42.00	300.00 -158.00	5.00	38.77	27.96	16.76
43	43.00	300.00 -157.00	5.00	38.80	28.00	16.80
44	44.00	300.00 -156.00	5.00	38.84	28.04	16.84
45	45.00	300.00 -155.00	5.00	38.88	28.08	16.88
46	46.00	300.00 -154.00	5.00	38.92	28.11	16.92
47	47.00	300.00 -153.00	5.00	38.96	28.15	16.95
48	48.00	300.00 -152.00	5.00	38.99	28.19	16.99
49	49.00	300.00 -151.00	5.00	39.03	28.23	17.03
50	50.00	300.00 -150.00	5.00	39.07	28.27	17.07
51	51.00	300.00 -149.00	5.00	39.11	28.31	17.11
52	52.00	300.00 -148.00	5.00	39.15	28.35	17.15
53	53.00	300.00 -147.00	5.00	39.19	28.39	17.19
54	54.00	300.00 -146.00	5.00	39.23	28.43	17.23
55	55.00	300.00 -145.00	5.00	39.27	28.47	17.27
56	56.00	300.00 -144.00	5.00	39.31	28.51	17.31
57	57.00	300.00 -143.00	5.00	39.35	28.55	17.35
58	58.00	300.00 -142.00	5.00	39.39	28.59	17.39
59	59.00	300.00 -141.00	5.00	39.43	28.63	17.43
60	60.00	300.00 -140.00	5.00	39.47	28.67	17.47
61	61.00	300.00 -139.00	5.00	39.51	28.71	17.51
62	62.00	300.00 -138.00	5.00	39.55	28.75	17.55
63	63.00	300.00 -137.00	5.00	39.59	28.79	17.59
64	64.00	300.00 -136.00	5.00	39.64	28.83	17.63
65	65.00	300.00 -135.00	5.00	39.68	28.88	17.68
66	66.00	300.00 -134.00	5.00	39.72	28.92	17.72
67	67.00	300.00 -133.00	5.00	39.76	28.96	17.76
68	68.00	300.00 -132.00	5.00	39.81	29.00	17.80
69	69.00	300.00 -131.00	5.00	39.85	29.04	17.85
70	70.00	300.00 -130.00	5.00	39.89	29.09	17.89
71	71.00	300.00 -129.00	5.00	39.93	29.13	17.93
72	72.00	300.00 -128.00	5.00	39.98	29.17	17.97
73	73.00	300.00 -127.00	5.00	40.02	29.22	18.02
74	74.00	300.00 -126.00	5.00	40.07	29.26	18.06

75	75.00	300.00 -125.00	5.00	40.11	29.31	18.11
76	76.00	300.00 -124.00	5.00	40.15	29.35	18.15
77	77.00	300.00 -123.00	5.00	40.20	29.40	18.20
78	78.00	300.00 -122.00	5.00	40.24	29.44	18.24
79	79.00	300.00 -121.00	5.00	40.29	29.49	18.29
80	80.00	300.00 -120.00	5.00	40.33	29.53	18.33
81	81.00	300.00 -119.00	5.00	40.38	29.58	18.38
82	82.00	300.00 -118.00	5.00	40.43	29.62	18.42
83	83.00	300.00 -117.00	5.00	40.47	29.67	18.47
84	84.00	300.00 -116.00	5.00	40.52	29.71	18.52
85	85.00	300.00 -115.00	5.00	40.57	29.76	18.56
86	86.00	300.00 -114.00	5.00	40.61	29.81	18.61
87	87.00	300.00 -113.00	5.00	40.66	29.86	18.66
88	88.00	300.00 -112.00	5.00	40.71	29.90	18.70
89	89.00	300.00 -111.00	5.00	40.76	29.95	18.75
90	90.00	300.00 -110.00	5.00	40.80	30.00	18.80
91	91.00	300.00 -109.00	5.00	40.85	30.05	18.85
92	92.00	300.00 -108.00	5.00	40.90	30.10	18.90
93	93.00	300.00 -107.00	5.00	40.95	30.15	18.95
94	94.00	300.00 -106.00	5.00	41.00	30.20	19.00
95	95.00	300.00 -105.00	5.00	41.05	30.25	19.05
96	96.00	300.00 -104.00	5.00	41.10	30.30	19.10
97	97.00	300.00 -103.00	5.00	41.15	30.35	19.15
98	98.00	300.00 -102.00	5.00	41.20	30.40	19.20
99	99.00	300.00 -101.00	5.00	41.25	30.45	19.25
100	100.00	300.00 -100.00	5.00	41.30	30.50	19.30
101	101.00	300.00 -99.00	5.00	41.36	30.55	19.35
102	102.00	300.00 -98.00	5.00	41.41	30.60	19.40
103	103.00	300.00 -97.00	5.00	41.46	30.66	19.45
104	104.00	300.00 -96.00	5.00	41.51	30.71	19.51
105	105.00	300.00 -95.00	5.00	41.57	30.76	19.56
106	106.00	300.00 -94.00	5.00	41.62	30.82	19.61
107	107.00	300.00 -93.00	5.00	41.67	30.87	19.67
108	108.00	300.00 -92.00	5.00	41.73	30.92	19.72
109	109.00	300.00 -91.00	5.00	41.78	30.98	19.78
110	110.00	300.00 -90.00	5.00	41.84	31.03	19.83
111	111.00	300.00 -89.00	5.00	41.89	31.09	19.89
112	112.00	300.00 -88.00	5.00	41.95	31.15	19.94
113	113.00	300.00 -87.00	5.00	42.01	31.20	20.00
114	114.00	300.00 -86.00	5.00	42.06	31.26	20.06
115	115.00	300.00 -85.00	5.00	42.12	31.32	20.11
116	116.00	300.00 -84.00	5.00	42.18	31.37	20.17
117	117.00	300.00 -83.00	5.00	42.24	31.43	20.23
118	118.00	300.00 -82.00	5.00	42.30	31.49	20.29
119	119.00	300.00 -81.00	5.00	42.35	31.55	20.35

120	120.00	300.00	-80.00	5.00	42.41	31.61	20.41
121	121.00	300.00	-79.00	5.00	42.47	31.67	20.47
122	122.00	300.00	-78.00	5.00	42.53	31.73	20.53
123	123.00	300.00	-77.00	5.00	42.60	31.79	20.59
124	124.00	300.00	-76.00	5.00	42.66	31.85	20.65
125	125.00	300.00	-75.00	5.00	42.72	31.91	20.71
126	126.00	300.00	-74.00	5.00	42.78	31.98	20.77
127	127.00	300.00	-73.00	5.00	42.84	32.04	20.84
128	128.00	300.00	-72.00	5.00	42.91	32.10	20.90
129	129.00	300.00	-71.00	5.00	42.97	32.17	20.96
130	130.00	300.00	-70.00	5.00	43.04	32.23	21.03
131	131.00	300.00	-69.00	5.00	43.10	32.30	21.09
132	132.00	300.00	-68.00	5.00	43.17	32.36	21.16
133	133.00	300.00	-67.00	5.00	43.23	32.43	21.22
134	134.00	300.00	-66.00	5.00	43.30	32.49	21.29
135	135.00	300.00	-65.00	5.00	43.37	32.56	21.36
136	136.00	300.00	-64.00	5.00	43.44	32.63	21.43
137	137.00	300.00	-63.00	5.00	43.50	32.70	21.49
138	138.00	300.00	-62.00	5.00	43.57	32.77	21.56
139	139.00	300.00	-61.00	5.00	43.64	32.84	21.63
140	140.00	300.00	-60.00	5.00	43.71	32.91	21.70
141	141.00	300.00	-59.00	5.00	43.78	32.98	21.77
142	142.00	300.00	-58.00	5.00	43.86	33.05	21.84
143	143.00	300.00	-57.00	5.00	43.93	33.12	21.92
144	144.00	300.00	-56.00	5.00	44.00	33.19	21.99
145	145.00	300.00	-55.00	5.00	44.07	33.27	22.06
146	146.00	300.00	-54.00	5.00	44.15	33.34	22.14
147	147.00	300.00	-53.00	5.00	44.22	33.42	22.21
148	148.00	300.00	-52.00	5.00	44.30	33.49	22.29
149	149.00	300.00	-51.00	5.00	44.37	33.57	22.36
150	150.00	300.00	-50.00	5.00	44.45	33.64	22.44
151	151.00	300.00	-49.00	5.00	44.53	33.72	22.52
152	152.00	300.00	-48.00	5.00	44.61	33.80	22.59
153	153.00	300.00	-47.00	5.00	44.68	33.88	22.67
154	154.00	300.00	-46.00	5.00	44.76	33.96	22.75
155	155.00	300.00	-45.00	5.00	44.84	34.04	22.83
156	156.00	300.00	-44.00	5.00	44.92	34.12	22.91
157	157.00	300.00	-43.00	5.00	45.01	34.20	22.99
158	158.00	300.00	-42.00	5.00	45.09	34.28	23.07
159	159.00	300.00	-41.00	5.00	45.17	34.36	23.16
160	160.00	300.00	-40.00	5.00	45.25	34.44	23.24
161	161.00	300.00	-39.00	5.00	45.34	34.53	23.32
162	162.00	300.00	-38.00	5.00	45.42	34.61	23.41
163	163.00	300.00	-37.00	5.00	45.51	34.70	23.49
164	164.00	300.00	-36.00	5.00	45.59	34.78	23.57

165	165.00	300.00	-35.00	5.00	45.68	34.87	23.66
166	166.00	300.00	-34.00	5.00	45.76	34.95	23.75
167	167.00	300.00	-33.00	5.00	45.85	35.04	23.83
168	168.00	300.00	-32.00	5.00	45.93	35.13	23.92
169	169.00	300.00	-31.00	5.00	46.02	35.21	24.01
170	170.00	300.00	-30.00	5.00	46.11	35.30	24.09
171	171.00	300.00	-29.00	5.00	46.20	35.39	24.18
172	172.00	300.00	-28.00	5.00	46.28	35.48	24.27
173	173.00	300.00	-27.00	5.00	46.37	35.56	24.35
174	174.00	300.00	-26.00	5.00	46.46	35.65	24.44
175	175.00	300.00	-25.00	5.00	46.55	35.74	24.53
176	176.00	300.00	-24.00	5.00	46.63	35.82	24.61
177	177.00	300.00	-23.00	5.00	46.72	35.91	24.70
178	178.00	300.00	-22.00	5.00	46.80	35.99	24.79
179	179.00	300.00	-21.00	5.00	46.89	36.08	24.87
180	180.00	300.00	-20.00	5.00	46.97	36.16	24.95
181	181.00	300.00	-19.00	5.00	47.05	36.24	25.03
182	182.00	300.00	-18.00	5.00	47.13	36.32	25.11
183	183.00	300.00	-17.00	5.00	47.21	36.40	25.19
184	184.00	300.00	-16.00	5.00	47.28	36.47	25.27
185	185.00	300.00	-15.00	5.00	47.35	36.55	25.34
186	186.00	300.00	-14.00	5.00	47.42	36.62	25.41
187	187.00	300.00	-13.00	5.00	47.49	36.68	25.47
188	188.00	300.00	-12.00	5.00	47.55	36.74	25.53
189	189.00	300.00	-11.00	5.00	47.61	36.80	25.59
190	190.00	300.00	-10.00	5.00	47.66	36.85	25.64
191	191.00	300.00	-9.00	5.00	47.70	36.90	25.69
192	192.00	300.00	-8.00	5.00	47.74	36.94	25.73
193	193.00	300.00	-7.00	5.00	47.78	36.97	25.77
194	194.00	300.00	-6.00	5.00	47.81	37.00	25.80
195	195.00	300.00	-5.00	5.00	47.83	37.02	25.82
196	196.00	300.00	-4.00	5.00	47.84	37.04	25.84
197	197.00	300.00	-3.00	5.00	47.85	37.05	25.85
198	198.00	300.00	-2.00	5.00	47.85	37.05	25.85
199	199.00	300.00	-1.00	5.00	47.85	37.04	25.85
200	200.00	300.00	0.00	5.00	47.84	37.03	25.84
201	201.00	300.00	1.00	5.00	47.82	37.02	25.82
202	202.00	300.00	2.00	5.00	47.79	36.99	25.80
203	203.00	300.00	3.00	5.00	47.76	36.97	25.77
204	204.00	300.00	4.00	5.00	47.73	36.93	25.74
205	205.00	300.00	5.00	5.00	47.69	36.89	25.70
206	206.00	300.00	6.00	5.00	47.64	36.85	25.66
207	207.00	300.00	7.00	5.00	47.60	36.80	25.62
208	208.00	300.00	8.00	5.00	47.54	36.75	25.56
209	209.00	300.00	9.00	5.00	47.49	36.69	25.51

210	210.00	300.00	10.00	5.00	47.43	36.63	25.45
211	211.00	300.00	11.00	5.00	47.36	36.57	25.39
212	212.00	300.00	12.00	5.00	47.30	36.51	25.33
213	213.00	300.00	13.00	5.00	47.23	36.44	25.26
214	214.00	300.00	14.00	5.00	47.16	36.37	25.19
215	215.00	300.00	15.00	5.00	47.09	36.30	25.12
216	216.00	300.00	16.00	5.00	47.01	36.22	25.05
217	217.00	300.00	17.00	5.00	46.94	36.15	24.97
218	218.00	300.00	18.00	5.00	46.86	36.07	24.90
219	219.00	300.00	19.00	5.00	46.78	35.99	24.82
220	220.00	300.00	20.00	5.00	46.70	35.91	24.74
221	221.00	300.00	21.00	5.00	46.62	35.83	24.66
222	222.00	300.00	22.00	5.00	46.54	35.75	24.58
223	223.00	300.00	23.00	5.00	46.45	35.67	24.49
224	224.00	300.00	24.00	5.00	46.37	35.58	24.41
225	225.00	300.00	25.00	5.00	46.29	35.50	24.33
226	226.00	300.00	26.00	5.00	46.20	35.42	24.25
227	227.00	300.00	27.00	5.00	46.12	35.33	24.16
228	228.00	300.00	28.00	5.00	46.03	35.25	24.08
229	229.00	300.00	29.00	5.00	45.95	35.16	23.99
230	230.00	300.00	30.00	5.00	45.87	35.08	23.91
231	231.00	300.00	31.00	5.00	45.78	35.00	23.83
232	232.00	300.00	32.00	5.00	45.70	34.91	23.74
233	233.00	300.00	33.00	5.00	45.61	34.83	23.66
234	234.00	300.00	34.00	5.00	45.53	34.75	23.58
235	235.00	300.00	35.00	5.00	45.45	34.66	23.49
236	236.00	300.00	36.00	5.00	45.36	34.58	23.41
237	237.00	300.00	37.00	5.00	45.28	34.50	23.33
238	238.00	300.00	38.00	5.00	45.20	34.42	23.25
239	239.00	300.00	39.00	5.00	45.12	34.33	23.16
240	240.00	300.00	40.00	5.00	45.04	34.25	23.08
241	241.00	300.00	41.00	5.00	44.96	34.17	23.00
242	242.00	300.00	42.00	5.00	44.88	34.09	22.92
243	243.00	300.00	43.00	5.00	44.80	34.01	22.84
244	244.00	300.00	44.00	5.00	44.72	33.93	22.76
245	245.00	300.00	45.00	5.00	44.64	33.86	22.69
246	246.00	300.00	46.00	5.00	44.56	33.78	22.61
247	247.00	300.00	47.00	5.00	44.49	33.70	22.53
248	248.00	300.00	48.00	5.00	44.41	33.63	22.45
249	249.00	300.00	49.00	5.00	44.33	33.55	22.38
250	250.00	300.00	50.00	5.00	44.26	33.47	22.30
251	251.00	300.00	51.00	5.00	44.18	33.40	22.23
252	252.00	300.00	52.00	5.00	44.11	33.33	22.15
253	253.00	300.00	53.00	5.00	44.04	33.25	22.08
254	254.00	300.00	54.00	5.00	43.96	33.18	22.01

255	255.00	300.00	55.00	5.00	43.89	33.11	21.93
256	256.00	300.00	56.00	5.00	43.82	33.03	21.86
257	257.00	300.00	57.00	5.00	43.75	32.96	21.79
258	258.00	300.00	58.00	5.00	43.68	32.89	21.72
259	259.00	300.00	59.00	5.00	43.61	32.82	21.65
260	260.00	300.00	60.00	5.00	43.54	32.75	21.58
261	261.00	300.00	61.00	5.00	43.47	32.69	21.51
262	262.00	300.00	62.00	5.00	43.40	32.62	21.44
263	263.00	300.00	63.00	5.00	43.34	32.55	21.38
264	264.00	300.00	64.00	5.00	43.27	32.48	21.31
265	265.00	300.00	65.00	5.00	43.20	32.42	21.24
266	266.00	300.00	66.00	5.00	43.14	32.35	21.18
267	267.00	300.00	67.00	5.00	43.07	32.28	21.11
268	268.00	300.00	68.00	5.00	43.01	32.22	21.05
269	269.00	300.00	69.00	5.00	42.94	32.16	20.98
270	270.00	300.00	70.00	5.00	42.88	32.09	20.92
271	271.00	300.00	71.00	5.00	42.82	32.03	20.85
272	272.00	300.00	72.00	5.00	42.75	31.97	20.79
273	273.00	300.00	73.00	5.00	42.69	31.90	20.73
274	274.00	300.00	74.00	5.00	42.63	31.84	20.67
275	275.00	300.00	75.00	5.00	42.57	31.78	20.60
276	276.00	300.00	76.00	5.00	42.51	31.72	20.54
277	277.00	300.00	77.00	5.00	42.45	31.66	20.48
278	278.00	300.00	78.00	5.00	42.39	31.60	20.42
279	279.00	300.00	79.00	5.00	42.33	31.54	20.36
280	280.00	300.00	80.00	5.00	42.27	31.48	20.30
281	281.00	300.00	81.00	5.00	42.21	31.42	20.25
282	282.00	300.00	82.00	5.00	42.15	31.36	20.19
283	283.00	300.00	83.00	5.00	42.09	31.31	20.13
284	284.00	300.00	84.00	5.00	42.04	31.25	20.07
285	285.00	300.00	85.00	5.00	41.98	31.19	20.02
286	286.00	300.00	86.00	5.00	41.92	31.14	19.96
287	287.00	300.00	87.00	5.00	41.87	31.08	19.90
288	288.00	300.00	88.00	5.00	41.81	31.02	19.85
289	289.00	300.00	89.00	5.00	41.76	30.97	19.79
290	290.00	300.00	90.00	5.00	41.70	30.91	19.74
291	291.00	300.00	91.00	5.00	41.65	30.86	19.68
292	292.00	300.00	92.00	5.00	41.60	30.81	19.63
293	293.00	300.00	93.00	5.00	41.54	30.75	19.58
294	294.00	300.00	94.00	5.00	41.49	30.70	19.52
295	295.00	300.00	95.00	5.00	41.44	30.65	19.47
296	296.00	300.00	96.00	5.00	41.38	30.59	19.42
297	297.00	300.00	97.00	5.00	41.33	30.54	19.36
298	298.00	300.00	98.00	5.00	41.28	30.49	19.31
299	299.00	300.00	99.00	5.00	41.23	30.44	19.26

300	300.00	300.00	100.00	5.00	41.18	30.39	19.21
301	301.00	300.00	101.00	5.00	41.13	30.34	19.16
302	302.00	300.00	102.00	5.00	41.08	30.29	19.11
303	303.00	300.00	103.00	5.00	41.03	30.24	19.06
304	304.00	300.00	104.00	5.00	40.98	30.19	19.01
305	305.00	300.00	105.00	5.00	40.93	30.14	18.96
306	306.00	300.00	106.00	5.00	40.88	30.09	18.91
307	307.00	300.00	107.00	5.00	40.83	30.04	18.86
308	308.00	300.00	108.00	5.00	40.78	29.99	18.81
309	309.00	300.00	109.00	5.00	40.73	29.94	18.76
310	310.00	300.00	110.00	5.00	40.69	29.90	18.72
311	311.00	300.00	111.00	5.00	40.64	29.85	18.67
312	312.00	300.00	112.00	5.00	40.59	29.80	18.62
313	313.00	300.00	113.00	5.00	40.54	29.75	18.57
314	314.00	300.00	114.00	5.00	40.50	29.71	18.53
315	315.00	300.00	115.00	5.00	40.45	29.66	18.48
316	316.00	300.00	116.00	5.00	40.40	29.61	18.43
317	317.00	300.00	117.00	5.00	40.36	29.57	18.39
318	318.00	300.00	118.00	5.00	40.31	29.52	18.34
319	319.00	300.00	119.00	5.00	40.27	29.48	18.30
320	320.00	300.00	120.00	5.00	40.22	29.43	18.25
321	321.00	300.00	121.00	5.00	40.18	29.39	18.21
322	322.00	300.00	122.00	5.00	40.13	29.34	18.16
323	323.00	300.00	123.00	5.00	40.09	29.30	18.12
324	324.00	300.00	124.00	5.00	40.04	29.25	18.07
325	325.00	300.00	125.00	5.00	40.00	29.21	18.03
326	326.00	300.00	126.00	5.00	39.96	29.17	17.99
327	327.00	300.00	127.00	5.00	39.91	29.12	17.94
328	328.00	300.00	128.00	5.00	39.87	29.08	17.90
329	329.00	300.00	129.00	5.00	39.83	29.04	17.86
330	330.00	300.00	130.00	5.00	39.79	28.99	17.81
331	331.00	300.00	131.00	5.00	39.74	28.95	17.77
332	332.00	300.00	132.00	5.00	39.70	28.91	17.73
333	333.00	300.00	133.00	5.00	39.66	28.87	17.69
334	334.00	300.00	134.00	5.00	39.62	28.83	17.65
335	335.00	300.00	135.00	5.00	39.57	28.78	17.60
336	336.00	300.00	136.00	5.00	39.53	28.74	17.56
337	337.00	300.00	137.00	5.00	39.49	28.70	17.52
338	338.00	300.00	138.00	5.00	39.45	28.66	17.48
339	339.00	300.00	139.00	5.00	39.41	28.62	17.44
340	340.00	300.00	140.00	5.00	39.37	28.58	17.40
341	341.00	300.00	141.00	5.00	39.33	28.54	17.36
342	342.00	300.00	142.00	5.00	39.29	28.50	17.32
343	343.00	300.00	143.00	5.00	39.25	28.46	17.28
344	344.00	300.00	144.00	5.00	39.21	28.42	17.24



345	345.00	300.00	145.00	5.00	39.17	28.38	17.20
346	346.00	300.00	146.00	5.00	39.13	28.34	17.16
347	347.00	300.00	147.00	5.00	39.09	28.30	17.12
348	348.00	300.00	148.00	5.00	39.05	28.26	17.08
349	349.00	300.00	149.00	5.00	39.01	28.22	17.04
350	350.00	300.00	150.00	5.00	38.98	28.18	17.00
351	351.00	300.00	151.00	5.00	38.94	28.15	16.96
352	352.00	300.00	152.00	5.00	38.90	28.11	16.93
353	353.00	300.00	153.00	5.00	38.86	28.07	16.89
354	354.00	300.00	154.00	5.00	38.82	28.03	16.85
355	355.00	300.00	155.00	5.00	38.78	27.99	16.81
356	356.00	300.00	156.00	5.00	38.75	27.96	16.77
357	357.00	300.00	157.00	5.00	38.71	27.92	16.74
358	358.00	300.00	158.00	5.00	38.67	27.88	16.70
359	359.00	300.00	159.00	5.00	38.64	27.84	16.66
360	360.00	300.00	160.00	5.00	38.60	27.81	16.63
361	361.00	300.00	161.00	5.00	38.56	27.77	16.59
362	362.00	300.00	162.00	5.00	38.52	27.73	16.55
363	363.00	300.00	163.00	5.00	38.49	27.70	16.52
364	364.00	300.00	164.00	5.00	38.45	27.66	16.48
365	365.00	300.00	165.00	5.00	38.42	27.62	16.44
366	366.00	300.00	166.00	5.00	38.38	27.59	16.41
367	367.00	300.00	167.00	5.00	38.34	27.55	16.37
368	368.00	300.00	168.00	5.00	38.31	27.52	16.33
369	369.00	300.00	169.00	5.00	38.27	27.48	16.30
370	370.00	300.00	170.00	5.00	38.24	27.45	16.26
371	371.00	300.00	171.00	5.00	38.20	27.41	16.23
372	372.00	300.00	172.00	5.00	38.17	27.37	16.19
373	373.00	300.00	173.00	5.00	38.13	27.34	16.16
374	374.00	300.00	174.00	5.00	38.10	27.30	16.12
375	375.00	300.00	175.00	5.00	38.06	27.27	16.09
376	376.00	300.00	176.00	5.00	38.03	27.24	16.05
377	377.00	300.00	177.00	5.00	37.99	27.20	16.02
378	378.00	300.00	178.00	5.00	37.96	27.17	15.98
379	379.00	300.00	179.00	5.00	37.92	27.13	15.95
380	380.00	300.00	180.00	5.00	37.89	27.10	15.92
381	381.00	300.00	181.00	5.00	37.86	27.06	15.88
382	382.00	300.00	182.00	5.00	37.82	27.03	15.85
383	383.00	300.00	183.00	5.00	37.79	27.00	15.81
384	384.00	300.00	184.00	5.00	37.76	26.96	15.78
385	385.00	300.00	185.00	5.00	37.72	26.93	15.75
386	386.00	300.00	186.00	5.00	37.69	26.90	15.71
387	387.00	300.00	187.00	5.00	37.66	26.86	15.68
388	388.00	300.00	188.00	5.00	37.62	26.83	15.65
389	389.00	300.00	189.00	5.00	37.59	26.80	15.61

390	390.00	300.00	190.00	5.00	37.56	26.76	15.58
391	391.00	300.00	191.00	5.00	37.52	26.73	15.55
392	392.00	300.00	192.00	5.00	37.49	26.70	15.52
393	393.00	300.00	193.00	5.00	37.46	26.67	15.48
394	394.00	300.00	194.00	5.00	37.43	26.63	15.45
395	395.00	300.00	195.00	5.00	37.39	26.60	15.42
396	396.00	300.00	196.00	5.00	37.36	26.57	15.39
397	397.00	300.00	197.00	5.00	37.33	26.54	15.35
398	398.00	300.00	198.00	5.00	37.30	26.50	15.32
399	399.00	300.00	199.00	5.00	37.27	26.47	15.29
400	400.00	300.00	200.00	5.00	37.23	26.44	15.26

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\* BUNDLE CONFIGURATION \*

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CIRCUIT	NODE	PHASE	VOLTAGE	LOAD	ANGLE	OF	X	Y
#	#	(kV)	(AMPS)	(DEG)	COND	(ft)	(ft)	

\*\*\*\*\*

1	1	A	121.000	400.00	0.00	1	-4.50	43.00
1	1	B	121.000	400.00	240.00	1	4.50	35.00
1	1	C	121.000	400.00	120.00	1	-4.50	27.00
1	2	A	121.000	0.00	0.00	1	-4.50	43.00
1	2	B	121.000	0.00	0.00	1	4.50	35.00
1	2	C	121.000	0.00	0.00	1	-4.50	27.00
2	1	SW	0.000	5.62	227.79	1	-0.50	52.00
2	2	SW	0.000	0.00	0.00	1	-0.50	52.00

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\* SUBCONDUCTOR INFORMATION \*

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CIRCUIT	NODE	DIAMETER	SPACING	AC RESIST.	AC REACT.
#	#	(in)	(in)	(ohms/mi)	(ohms/mi)

\*\*\*\*\*

1	1	0.500	0.000	-NA-	-NA-
1	1	0.500	0.000	-NA-	-NA-
1	1	0.500	0.000	-NA-	-NA-
1	2	0.500	0.000	-NA-	-NA-
1	2	0.500	0.000	-NA-	-NA-
1	2	0.500	0.000	-NA-	-NA-
2	1	0.360	0.000	6.600000	1.500000
2	2	0.360	0.000	6.600000	1.500000

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## Double Circuit Configuration – Electric Field Lateral Profile

File: C:\Users\hchooper\Desktop\New Projects\Obsidian - TLine in Oregon\Case 1 - EF.txt

E-Field HORIZONTAL Profile Chart: "Lateral Profile Electric Field - Model Load 1(EF)"

Field Components = Resultant

Distance units = (ft)

Electric field units = KV/m

Spacing = 1.00(ft)

Calculation Points = 401

Point	Distance (ft)	X (ft)	Y (ft)	Z (ft)	EF (KV/m)
0	0.00	300.00	-200.00		3.28 0.007
1	1.00	300.00	-199.00		3.28 0.007
2	2.00	300.00	-198.00		3.28 0.007
3	3.00	300.00	-197.00		3.28 0.007
4	4.00	300.00	-196.00		3.28 0.007
5	5.00	300.00	-195.00		3.28 0.007
6	6.00	300.00	-194.00		3.28 0.007
7	7.00	300.00	-193.00		3.28 0.007
8	8.00	300.00	-192.00		3.28 0.007
9	9.00	300.00	-191.00		3.28 0.008
10	10.00	300.00	-190.00		3.28 0.008
11	11.00	300.00	-189.00		3.28 0.008
12	12.00	300.00	-188.00		3.28 0.008
13	13.00	300.00	-187.00		3.28 0.008
14	14.00	300.00	-186.00		3.28 0.008
15	15.00	300.00	-185.00		3.28 0.008
16	16.00	300.00	-184.00		3.28 0.008
17	17.00	300.00	-183.00		3.28 0.008
18	18.00	300.00	-182.00		3.28 0.008
19	19.00	300.00	-181.00		3.28 0.008
20	20.00	300.00	-180.00		3.28 0.008
21	21.00	300.00	-179.00		3.28 0.008
22	22.00	300.00	-178.00		3.28 0.009
23	23.00	300.00	-177.00		3.28 0.009
24	24.00	300.00	-176.00		3.28 0.009
25	25.00	300.00	-175.00		3.28 0.009
26	26.00	300.00	-174.00		3.28 0.009
27	27.00	300.00	-173.00		3.28 0.009
28	28.00	300.00	-172.00		3.28 0.009
29	29.00	300.00	-171.00		3.28 0.009
30	30.00	300.00	-170.00		3.28 0.009

31	31.00	300.00 -169.00	3.28	0.009
32	32.00	300.00 -168.00	3.28	0.010
33	33.00	300.00 -167.00	3.28	0.010
34	34.00	300.00 -166.00	3.28	0.010
35	35.00	300.00 -165.00	3.28	0.010
36	36.00	300.00 -164.00	3.28	0.010
37	37.00	300.00 -163.00	3.28	0.010
38	38.00	300.00 -162.00	3.28	0.010
39	39.00	300.00 -161.00	3.28	0.010
40	40.00	300.00 -160.00	3.28	0.010
41	41.00	300.00 -159.00	3.28	0.011
42	42.00	300.00 -158.00	3.28	0.011
43	43.00	300.00 -157.00	3.28	0.011
44	44.00	300.00 -156.00	3.28	0.011
45	45.00	300.00 -155.00	3.28	0.011
46	46.00	300.00 -154.00	3.28	0.011
47	47.00	300.00 -153.00	3.28	0.011
48	48.00	300.00 -152.00	3.28	0.012
49	49.00	300.00 -151.00	3.28	0.012
50	50.00	300.00 -150.00	3.28	0.012
51	51.00	300.00 -149.00	3.28	0.012
52	52.00	300.00 -148.00	3.28	0.012
53	53.00	300.00 -147.00	3.28	0.012
54	54.00	300.00 -146.00	3.28	0.012
55	55.00	300.00 -145.00	3.28	0.013
56	56.00	300.00 -144.00	3.28	0.013
57	57.00	300.00 -143.00	3.28	0.013
58	58.00	300.00 -142.00	3.28	0.013
59	59.00	300.00 -141.00	3.28	0.013
60	60.00	300.00 -140.00	3.28	0.013
61	61.00	300.00 -139.00	3.28	0.013
62	62.00	300.00 -138.00	3.28	0.014
63	63.00	300.00 -137.00	3.28	0.014
64	64.00	300.00 -136.00	3.28	0.014
65	65.00	300.00 -135.00	3.28	0.014
66	66.00	300.00 -134.00	3.28	0.014
67	67.00	300.00 -133.00	3.28	0.015
68	68.00	300.00 -132.00	3.28	0.015
69	69.00	300.00 -131.00	3.28	0.015
70	70.00	300.00 -130.00	3.28	0.015
71	71.00	300.00 -129.00	3.28	0.015
72	72.00	300.00 -128.00	3.28	0.016
73	73.00	300.00 -127.00	3.28	0.016
74	74.00	300.00 -126.00	3.28	0.016
75	75.00	300.00 -125.00	3.28	0.016

76	76.00	300.00 -124.00	3.28	0.016
77	77.00	300.00 -123.00	3.28	0.017
78	78.00	300.00 -122.00	3.28	0.017
79	79.00	300.00 -121.00	3.28	0.017
80	80.00	300.00 -120.00	3.28	0.017
81	81.00	300.00 -119.00	3.28	0.017
82	82.00	300.00 -118.00	3.28	0.018
83	83.00	300.00 -117.00	3.28	0.018
84	84.00	300.00 -116.00	3.28	0.018
85	85.00	300.00 -115.00	3.28	0.018
86	86.00	300.00 -114.00	3.28	0.019
87	87.00	300.00 -113.00	3.28	0.019
88	88.00	300.00 -112.00	3.28	0.019
89	89.00	300.00 -111.00	3.28	0.019
90	90.00	300.00 -110.00	3.28	0.020
91	91.00	300.00 -109.00	3.28	0.020
92	92.00	300.00 -108.00	3.28	0.020
93	93.00	300.00 -107.00	3.28	0.021
94	94.00	300.00 -106.00	3.28	0.021
95	95.00	300.00 -105.00	3.28	0.021
96	96.00	300.00 -104.00	3.28	0.021
97	97.00	300.00 -103.00	3.28	0.022
98	98.00	300.00 -102.00	3.28	0.022
99	99.00	300.00 -101.00	3.28	0.022
100	100.00	300.00 -100.00	3.28	0.023
101	101.00	300.00 -99.00	3.28	0.023
102	102.00	300.00 -98.00	3.28	0.023
103	103.00	300.00 -97.00	3.28	0.023
104	104.00	300.00 -96.00	3.28	0.024
105	105.00	300.00 -95.00	3.28	0.024
106	106.00	300.00 -94.00	3.28	0.024
107	107.00	300.00 -93.00	3.28	0.025
108	108.00	300.00 -92.00	3.28	0.025
109	109.00	300.00 -91.00	3.28	0.025
110	110.00	300.00 -90.00	3.28	0.026
111	111.00	300.00 -89.00	3.28	0.026
112	112.00	300.00 -88.00	3.28	0.026
113	113.00	300.00 -87.00	3.28	0.026
114	114.00	300.00 -86.00	3.28	0.027
115	115.00	300.00 -85.00	3.28	0.027
116	116.00	300.00 -84.00	3.28	0.027
117	117.00	300.00 -83.00	3.28	0.028
118	118.00	300.00 -82.00	3.28	0.028
119	119.00	300.00 -81.00	3.28	0.028
120	120.00	300.00 -80.00	3.28	0.028

121	121.00	300.00	-79.00	3.28	0.029
122	122.00	300.00	-78.00	3.28	0.029
123	123.00	300.00	-77.00	3.28	0.029
124	124.00	300.00	-76.00	3.28	0.029
125	125.00	300.00	-75.00	3.28	0.030
126	126.00	300.00	-74.00	3.28	0.030
127	127.00	300.00	-73.00	3.28	0.030
128	128.00	300.00	-72.00	3.28	0.030
129	129.00	300.00	-71.00	3.28	0.030
130	130.00	300.00	-70.00	3.28	0.030
131	131.00	300.00	-69.00	3.28	0.030
132	132.00	300.00	-68.00	3.28	0.030
133	133.00	300.00	-67.00	3.28	0.030
134	134.00	300.00	-66.00	3.28	0.030
135	135.00	300.00	-65.00	3.28	0.031
136	136.00	300.00	-64.00	3.28	0.030
137	137.00	300.00	-63.00	3.28	0.030
138	138.00	300.00	-62.00	3.28	0.030
139	139.00	300.00	-61.00	3.28	0.030
140	140.00	300.00	-60.00	3.28	0.030
141	141.00	300.00	-59.00	3.28	0.030
142	142.00	300.00	-58.00	3.28	0.030
143	143.00	300.00	-57.00	3.28	0.031
144	144.00	300.00	-56.00	3.28	0.031
145	145.00	300.00	-55.00	3.28	0.031
146	146.00	300.00	-54.00	3.28	0.032
147	147.00	300.00	-53.00	3.28	0.033
148	148.00	300.00	-52.00	3.28	0.034
149	149.00	300.00	-51.00	3.28	0.035
150	150.00	300.00	-50.00	3.28	0.037
151	151.00	300.00	-49.00	3.28	0.040
152	152.00	300.00	-48.00	3.28	0.043
153	153.00	300.00	-47.00	3.28	0.046
154	154.00	300.00	-46.00	3.28	0.050
155	155.00	300.00	-45.00	3.28	0.055
156	156.00	300.00	-44.00	3.28	0.061
157	157.00	300.00	-43.00	3.28	0.067
158	158.00	300.00	-42.00	3.28	0.075
159	159.00	300.00	-41.00	3.28	0.083
160	160.00	300.00	-40.00	3.28	0.092
161	161.00	300.00	-39.00	3.28	0.102
162	162.00	300.00	-38.00	3.28	0.113
163	163.00	300.00	-37.00	3.28	0.125
164	164.00	300.00	-36.00	3.28	0.139
165	165.00	300.00	-35.00	3.28	0.154

166	166.00	300.00	-34.00	3.28	0.170
167	167.00	300.00	-33.00	3.28	0.188
168	168.00	300.00	-32.00	3.28	0.207
169	169.00	300.00	-31.00	3.28	0.228
170	170.00	300.00	-30.00	3.28	0.251
171	171.00	300.00	-29.00	3.28	0.275
172	172.00	300.00	-28.00	3.28	0.302
173	173.00	300.00	-27.00	3.28	0.330
174	174.00	300.00	-26.00	3.28	0.360
175	175.00	300.00	-25.00	3.28	0.392
176	176.00	300.00	-24.00	3.28	0.427
177	177.00	300.00	-23.00	3.28	0.463
178	178.00	300.00	-22.00	3.28	0.500
179	179.00	300.00	-21.00	3.28	0.540
180	180.00	300.00	-20.00	3.28	0.580
181	181.00	300.00	-19.00	3.28	0.622
182	182.00	300.00	-18.00	3.28	0.664
183	183.00	300.00	-17.00	3.28	0.706
184	184.00	300.00	-16.00	3.28	0.748
185	185.00	300.00	-15.00	3.28	0.788
186	186.00	300.00	-14.00	3.28	0.826
187	187.00	300.00	-13.00	3.28	0.862
188	188.00	300.00	-12.00	3.28	0.894
189	189.00	300.00	-11.00	3.28	0.922
190	190.00	300.00	-10.00	3.28	0.945
191	191.00	300.00	-9.00	3.28	0.963
192	192.00	300.00	-8.00	3.28	0.975
193	193.00	300.00	-7.00	3.28	0.982
194	194.00	300.00	-6.00	3.28	0.985
195	195.00	300.00	-5.00	3.28	0.983
196	196.00	300.00	-4.00	3.28	0.979
197	197.00	300.00	-3.00	3.28	0.974
198	198.00	300.00	-2.00	3.28	0.968
199	199.00	300.00	-1.00	3.28	0.965
200	200.00	300.00	0.00	3.28	0.963
201	201.00	300.00	1.00	3.28	0.964
202	202.00	300.00	2.00	3.28	0.968
203	203.00	300.00	3.00	3.28	0.973
204	204.00	300.00	4.00	3.28	0.978
205	205.00	300.00	5.00	3.28	0.982
206	206.00	300.00	6.00	3.28	0.983
207	207.00	300.00	7.00	3.28	0.981
208	208.00	300.00	8.00	3.28	0.973
209	209.00	300.00	9.00	3.28	0.961
210	210.00	300.00	10.00	3.28	0.943

211	211.00	300.00	11.00	3.28	0.920
212	212.00	300.00	12.00	3.28	0.892
213	213.00	300.00	13.00	3.28	0.860
214	214.00	300.00	14.00	3.28	0.824
215	215.00	300.00	15.00	3.28	0.786
216	216.00	300.00	16.00	3.28	0.745
217	217.00	300.00	17.00	3.28	0.704
218	218.00	300.00	18.00	3.28	0.661
219	219.00	300.00	19.00	3.28	0.619
220	220.00	300.00	20.00	3.28	0.578
221	221.00	300.00	21.00	3.28	0.537
222	222.00	300.00	22.00	3.28	0.498
223	223.00	300.00	23.00	3.28	0.460
224	224.00	300.00	24.00	3.28	0.424
225	225.00	300.00	25.00	3.28	0.389
226	226.00	300.00	26.00	3.28	0.357
227	227.00	300.00	27.00	3.28	0.327
228	228.00	300.00	28.00	3.28	0.299
229	229.00	300.00	29.00	3.28	0.272
230	230.00	300.00	30.00	3.28	0.248
231	231.00	300.00	31.00	3.28	0.225
232	232.00	300.00	32.00	3.28	0.204
233	233.00	300.00	33.00	3.28	0.185
234	234.00	300.00	34.00	3.28	0.167
235	235.00	300.00	35.00	3.28	0.151
236	236.00	300.00	36.00	3.28	0.136
237	237.00	300.00	37.00	3.28	0.123
238	238.00	300.00	38.00	3.28	0.110
239	239.00	300.00	39.00	3.28	0.099
240	240.00	300.00	40.00	3.28	0.089
241	241.00	300.00	41.00	3.28	0.080
242	242.00	300.00	42.00	3.28	0.072
243	243.00	300.00	43.00	3.28	0.065
244	244.00	300.00	44.00	3.28	0.059
245	245.00	300.00	45.00	3.28	0.054
246	246.00	300.00	46.00	3.28	0.049
247	247.00	300.00	47.00	3.28	0.045
248	248.00	300.00	48.00	3.28	0.042
249	249.00	300.00	49.00	3.28	0.039
250	250.00	300.00	50.00	3.28	0.037
251	251.00	300.00	51.00	3.28	0.035
252	252.00	300.00	52.00	3.28	0.034
253	253.00	300.00	53.00	3.28	0.033
254	254.00	300.00	54.00	3.28	0.033
255	255.00	300.00	55.00	3.28	0.032



256	256.00	300.00	56.00	3.28	0.032
257	257.00	300.00	57.00	3.28	0.032
258	258.00	300.00	58.00	3.28	0.032
259	259.00	300.00	59.00	3.28	0.032
260	260.00	300.00	60.00	3.28	0.032
261	261.00	300.00	61.00	3.28	0.032
262	262.00	300.00	62.00	3.28	0.032
263	263.00	300.00	63.00	3.28	0.032
264	264.00	300.00	64.00	3.28	0.032
265	265.00	300.00	65.00	3.28	0.032
266	266.00	300.00	66.00	3.28	0.032
267	267.00	300.00	67.00	3.28	0.032
268	268.00	300.00	68.00	3.28	0.032
269	269.00	300.00	69.00	3.28	0.032
270	270.00	300.00	70.00	3.28	0.032
271	271.00	300.00	71.00	3.28	0.032
272	272.00	300.00	72.00	3.28	0.032
273	273.00	300.00	73.00	3.28	0.032
274	274.00	300.00	74.00	3.28	0.032
275	275.00	300.00	75.00	3.28	0.031
276	276.00	300.00	76.00	3.28	0.031
277	277.00	300.00	77.00	3.28	0.031
278	278.00	300.00	78.00	3.28	0.031
279	279.00	300.00	79.00	3.28	0.030
280	280.00	300.00	80.00	3.28	0.030
281	281.00	300.00	81.00	3.28	0.030
282	282.00	300.00	82.00	3.28	0.030
283	283.00	300.00	83.00	3.28	0.029
284	284.00	300.00	84.00	3.28	0.029
285	285.00	300.00	85.00	3.28	0.029
286	286.00	300.00	86.00	3.28	0.028
287	287.00	300.00	87.00	3.28	0.028
288	288.00	300.00	88.00	3.28	0.028
289	289.00	300.00	89.00	3.28	0.027
290	290.00	300.00	90.00	3.28	0.027
291	291.00	300.00	91.00	3.28	0.027
292	292.00	300.00	92.00	3.28	0.026
293	293.00	300.00	93.00	3.28	0.026
294	294.00	300.00	94.00	3.28	0.026
295	295.00	300.00	95.00	3.28	0.025
296	296.00	300.00	96.00	3.28	0.025
297	297.00	300.00	97.00	3.28	0.025
298	298.00	300.00	98.00	3.28	0.024
299	299.00	300.00	99.00	3.28	0.024
300	300.00	300.00	100.00	3.28	0.024

301	301.00	300.00	101.00	3.28	0.023
302	302.00	300.00	102.00	3.28	0.023
303	303.00	300.00	103.00	3.28	0.023
304	304.00	300.00	104.00	3.28	0.022
305	305.00	300.00	105.00	3.28	0.022
306	306.00	300.00	106.00	3.28	0.022
307	307.00	300.00	107.00	3.28	0.022
308	308.00	300.00	108.00	3.28	0.021
309	309.00	300.00	109.00	3.28	0.021
310	310.00	300.00	110.00	3.28	0.021
311	311.00	300.00	111.00	3.28	0.020
312	312.00	300.00	112.00	3.28	0.020
313	313.00	300.00	113.00	3.28	0.020
314	314.00	300.00	114.00	3.28	0.020
315	315.00	300.00	115.00	3.28	0.019
316	316.00	300.00	116.00	3.28	0.019
317	317.00	300.00	117.00	3.28	0.019
318	318.00	300.00	118.00	3.28	0.019
319	319.00	300.00	119.00	3.28	0.018
320	320.00	300.00	120.00	3.28	0.018
321	321.00	300.00	121.00	3.28	0.018
322	322.00	300.00	122.00	3.28	0.018
323	323.00	300.00	123.00	3.28	0.017
324	324.00	300.00	124.00	3.28	0.017
325	325.00	300.00	125.00	3.28	0.017
326	326.00	300.00	126.00	3.28	0.017
327	327.00	300.00	127.00	3.28	0.016
328	328.00	300.00	128.00	3.28	0.016
329	329.00	300.00	129.00	3.28	0.016
330	330.00	300.00	130.00	3.28	0.016
331	331.00	300.00	131.00	3.28	0.016
332	332.00	300.00	132.00	3.28	0.015
333	333.00	300.00	133.00	3.28	0.015
334	334.00	300.00	134.00	3.28	0.015
335	335.00	300.00	135.00	3.28	0.015
336	336.00	300.00	136.00	3.28	0.015
337	337.00	300.00	137.00	3.28	0.014
338	338.00	300.00	138.00	3.28	0.014
339	339.00	300.00	139.00	3.28	0.014
340	340.00	300.00	140.00	3.28	0.014
341	341.00	300.00	141.00	3.28	0.014
342	342.00	300.00	142.00	3.28	0.014
343	343.00	300.00	143.00	3.28	0.013
344	344.00	300.00	144.00	3.28	0.013
345	345.00	300.00	145.00	3.28	0.013

346	346.00	300.00	146.00	3.28	0.013
347	347.00	300.00	147.00	3.28	0.013
348	348.00	300.00	148.00	3.28	0.013
349	349.00	300.00	149.00	3.28	0.012
350	350.00	300.00	150.00	3.28	0.012
351	351.00	300.00	151.00	3.28	0.012
352	352.00	300.00	152.00	3.28	0.012
353	353.00	300.00	153.00	3.28	0.012
354	354.00	300.00	154.00	3.28	0.012
355	355.00	300.00	155.00	3.28	0.012
356	356.00	300.00	156.00	3.28	0.011
357	357.00	300.00	157.00	3.28	0.011
358	358.00	300.00	158.00	3.28	0.011
359	359.00	300.00	159.00	3.28	0.011
360	360.00	300.00	160.00	3.28	0.011
361	361.00	300.00	161.00	3.28	0.011
362	362.00	300.00	162.00	3.28	0.011
363	363.00	300.00	163.00	3.28	0.011
364	364.00	300.00	164.00	3.28	0.010
365	365.00	300.00	165.00	3.28	0.010
366	366.00	300.00	166.00	3.28	0.010
367	367.00	300.00	167.00	3.28	0.010
368	368.00	300.00	168.00	3.28	0.010
369	369.00	300.00	169.00	3.28	0.010
370	370.00	300.00	170.00	3.28	0.010
371	371.00	300.00	171.00	3.28	0.010
372	372.00	300.00	172.00	3.28	0.010
373	373.00	300.00	173.00	3.28	0.009
374	374.00	300.00	174.00	3.28	0.009
375	375.00	300.00	175.00	3.28	0.009
376	376.00	300.00	176.00	3.28	0.009
377	377.00	300.00	177.00	3.28	0.009
378	378.00	300.00	178.00	3.28	0.009
379	379.00	300.00	179.00	3.28	0.009
380	380.00	300.00	180.00	3.28	0.009
381	381.00	300.00	181.00	3.28	0.009
382	382.00	300.00	182.00	3.28	0.009
383	383.00	300.00	183.00	3.28	0.008
384	384.00	300.00	184.00	3.28	0.008
385	385.00	300.00	185.00	3.28	0.008
386	386.00	300.00	186.00	3.28	0.008
387	387.00	300.00	187.00	3.28	0.008
388	388.00	300.00	188.00	3.28	0.008
389	389.00	300.00	189.00	3.28	0.008
390	390.00	300.00	190.00	3.28	0.008

391	391.00	300.00	191.00	3.28	0.008
392	392.00	300.00	192.00	3.28	0.008
393	393.00	300.00	193.00	3.28	0.008
394	394.00	300.00	194.00	3.28	0.008
395	395.00	300.00	195.00	3.28	0.007
396	396.00	300.00	196.00	3.28	0.007
397	397.00	300.00	197.00	3.28	0.007
398	398.00	300.00	198.00	3.28	0.007
399	399.00	300.00	199.00	3.28	0.007
400	400.00	300.00	200.00	3.28	0.007

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\* BUNDLE CONFIGURATION \*

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CIRCUIT #	NODE #	PHASE	VOLTAGE (kV)	LOAD (AMPS)	ANGLE (DEG)	COND	CRNT/VLT	#	COORDINATES (ft)	OF (ft)	X	Y
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1	1	A	121.000	1500.00	0.00	1	-4.50	41.00				
1	1	B	121.000	1500.00	240.00	1	-4.50	32.00				
1	1	C	121.000	1500.00	120.00	1	-4.50	23.00				
1	2	A	121.000	0.00	0.00	1	-4.50	41.00				
1	2	B	121.000	0.00	0.00	1	-4.50	32.00				
1	2	C	121.000	0.00	0.00	1	-4.50	23.00				
2	1	A	121.000	1500.00	0.00	1	4.50	23.00				
2	1	B	121.000	1500.00	240.00	1	4.50	32.00				
2	1	C	121.000	1500.00	120.00	1	4.50	41.00				
2	2	A	121.000	0.00	0.00	1	4.50	23.00				
2	2	B	121.000	0.00	0.00	1	4.50	32.00				
2	2	C	121.000	0.00	0.00	1	4.50	41.00				
3	1	SW	0.000	5.75	301.28	1	-0.50	50.00				
3	2	SW	0.000	0.00	0.00	1	-0.50	50.00				

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\* SUBCONDUCTOR INFORMATION \*

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CIRCUIT #	NODE #	DIAMETER (in)	SPACING (in)	AC RESIST. (ohms/mi)	AC REACT. (ohms/mi)
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1	1	1.300	0.000	-NA-	-NA-
1	1	1.300	0.000	-NA-	-NA-
1	1	1.300	0.000	-NA-	-NA-
1	2	1.300	0.000	-NA-	-NA-

1	2	1.300	0.000	-NA-	-NA-
1	2	1.300	0.000	-NA-	-NA-
2	1	1.300	0.000	-NA-	-NA-
2	1	1.300	0.000	-NA-	-NA-
2	1	1.300	0.000	-NA-	-NA-
2	2	1.300	0.000	-NA-	-NA-
2	2	1.300	0.000	-NA-	-NA-
2	2	1.300	0.000	-NA-	-NA-
3	1	0.360	0.000	6.600000	1.500000
3	2	0.360	0.000	6.600000	1.500000

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## Double Circuit Configuration – Magnetic Field Lateral Profile

File: C:\Users\hchooper\Desktop\New Projects\Obsidian - TLine in Oregon\Case 1 - MF.txt

B-Field HORIZONTAL Profile Chart: "Lateral Profile Magnetic Field - Model Load 1"

Field Components = Resultant

Distance units = (ft)

Magnetic field units = mG

Spacing = 1.00(ft)

Calculation Points = 401

Point	Distance (ft)	X (ft)	Y (ft)	Z (ft)	BF (mG)
0	0.00	300.00	-200.00		0.44
1	1.00	300.00	-199.00		0.44
2	2.00	300.00	-198.00		0.45
3	3.00	300.00	-197.00		0.46
4	4.00	300.00	-196.00		0.46
5	5.00	300.00	-195.00		0.47
6	6.00	300.00	-194.00		0.47
7	7.00	300.00	-193.00		0.48
8	8.00	300.00	-192.00		0.49
9	9.00	300.00	-191.00		0.49
10	10.00	300.00	-190.00		0.50
11	11.00	300.00	-189.00		0.51
12	12.00	300.00	-188.00		0.51
13	13.00	300.00	-187.00		0.52
14	14.00	300.00	-186.00		0.53
15	15.00	300.00	-185.00		0.53
16	16.00	300.00	-184.00		0.54
17	17.00	300.00	-183.00		0.55
18	18.00	300.00	-182.00		0.56
19	19.00	300.00	-181.00		0.57
20	20.00	300.00	-180.00		0.57
21	21.00	300.00	-179.00		0.58
22	22.00	300.00	-178.00		0.59
23	23.00	300.00	-177.00		0.60
24	24.00	300.00	-176.00		0.61
25	25.00	300.00	-175.00		0.62
26	26.00	300.00	-174.00		0.63
27	27.00	300.00	-173.00		0.64
28	28.00	300.00	-172.00		0.65
29	29.00	300.00	-171.00		0.66
30	30.00	300.00	-170.00		0.67

31	31.00	300.00 -169.00	3.28	0.68
32	32.00	300.00 -168.00	3.28	0.69
33	33.00	300.00 -167.00	3.28	0.70
34	34.00	300.00 -166.00	3.28	0.71
35	35.00	300.00 -165.00	3.28	0.72
36	36.00	300.00 -164.00	3.28	0.73
37	37.00	300.00 -163.00	3.28	0.75
38	38.00	300.00 -162.00	3.28	0.76
39	39.00	300.00 -161.00	3.28	0.77
40	40.00	300.00 -160.00	3.28	0.78
41	41.00	300.00 -159.00	3.28	0.80
42	42.00	300.00 -158.00	3.28	0.81
43	43.00	300.00 -157.00	3.28	0.82
44	44.00	300.00 -156.00	3.28	0.84
45	45.00	300.00 -155.00	3.28	0.85
46	46.00	300.00 -154.00	3.28	0.87
47	47.00	300.00 -153.00	3.28	0.88
48	48.00	300.00 -152.00	3.28	0.90
49	49.00	300.00 -151.00	3.28	0.91
50	50.00	300.00 -150.00	3.28	0.93
51	51.00	300.00 -149.00	3.28	0.95
52	52.00	300.00 -148.00	3.28	0.97
53	53.00	300.00 -147.00	3.28	0.98
54	54.00	300.00 -146.00	3.28	1.00
55	55.00	300.00 -145.00	3.28	1.02
56	56.00	300.00 -144.00	3.28	1.04
57	57.00	300.00 -143.00	3.28	1.06
58	58.00	300.00 -142.00	3.28	1.08
59	59.00	300.00 -141.00	3.28	1.10
60	60.00	300.00 -140.00	3.28	1.12
61	61.00	300.00 -139.00	3.28	1.14
62	62.00	300.00 -138.00	3.28	1.17
63	63.00	300.00 -137.00	3.28	1.19
64	64.00	300.00 -136.00	3.28	1.21
65	65.00	300.00 -135.00	3.28	1.24
66	66.00	300.00 -134.00	3.28	1.26
67	67.00	300.00 -133.00	3.28	1.29
68	68.00	300.00 -132.00	3.28	1.32
69	69.00	300.00 -131.00	3.28	1.34
70	70.00	300.00 -130.00	3.28	1.37
71	71.00	300.00 -129.00	3.28	1.40
72	72.00	300.00 -128.00	3.28	1.43
73	73.00	300.00 -127.00	3.28	1.46
74	74.00	300.00 -126.00	3.28	1.50
75	75.00	300.00 -125.00	3.28	1.53

76	76.00	300.00 -124.00	3.28	1.56
77	77.00	300.00 -123.00	3.28	1.60
78	78.00	300.00 -122.00	3.28	1.63
79	79.00	300.00 -121.00	3.28	1.67
80	80.00	300.00 -120.00	3.28	1.71
81	81.00	300.00 -119.00	3.28	1.75
82	82.00	300.00 -118.00	3.28	1.79
83	83.00	300.00 -117.00	3.28	1.83
84	84.00	300.00 -116.00	3.28	1.88
85	85.00	300.00 -115.00	3.28	1.92
86	86.00	300.00 -114.00	3.28	1.97
87	87.00	300.00 -113.00	3.28	2.01
88	88.00	300.00 -112.00	3.28	2.06
89	89.00	300.00 -111.00	3.28	2.12
90	90.00	300.00 -110.00	3.28	2.17
91	91.00	300.00 -109.00	3.28	2.22
92	92.00	300.00 -108.00	3.28	2.28
93	93.00	300.00 -107.00	3.28	2.34
94	94.00	300.00 -106.00	3.28	2.40
95	95.00	300.00 -105.00	3.28	2.46
96	96.00	300.00 -104.00	3.28	2.53
97	97.00	300.00 -103.00	3.28	2.59
98	98.00	300.00 -102.00	3.28	2.66
99	99.00	300.00 -101.00	3.28	2.74
100	100.00	300.00 -100.00	3.28	2.81
101	101.00	300.00 -99.00	3.28	2.89
102	102.00	300.00 -98.00	3.28	2.97
103	103.00	300.00 -97.00	3.28	3.05
104	104.00	300.00 -96.00	3.28	3.14
105	105.00	300.00 -95.00	3.28	3.23
106	106.00	300.00 -94.00	3.28	3.32
107	107.00	300.00 -93.00	3.28	3.42
108	108.00	300.00 -92.00	3.28	3.52
109	109.00	300.00 -91.00	3.28	3.63
110	110.00	300.00 -90.00	3.28	3.73
111	111.00	300.00 -89.00	3.28	3.85
112	112.00	300.00 -88.00	3.28	3.97
113	113.00	300.00 -87.00	3.28	4.09
114	114.00	300.00 -86.00	3.28	4.22
115	115.00	300.00 -85.00	3.28	4.35
116	116.00	300.00 -84.00	3.28	4.49
117	117.00	300.00 -83.00	3.28	4.63
118	118.00	300.00 -82.00	3.28	4.78
119	119.00	300.00 -81.00	3.28	4.94
120	120.00	300.00 -80.00	3.28	5.11



121	121.00	300.00	-79.00	3.28	5.28
122	122.00	300.00	-78.00	3.28	5.46
123	123.00	300.00	-77.00	3.28	5.64
124	124.00	300.00	-76.00	3.28	5.84
125	125.00	300.00	-75.00	3.28	6.04
126	126.00	300.00	-74.00	3.28	6.26
127	127.00	300.00	-73.00	3.28	6.48
128	128.00	300.00	-72.00	3.28	6.71
129	129.00	300.00	-71.00	3.28	6.96
130	130.00	300.00	-70.00	3.28	7.21
131	131.00	300.00	-69.00	3.28	7.48
132	132.00	300.00	-68.00	3.28	7.76
133	133.00	300.00	-67.00	3.28	8.06
134	134.00	300.00	-66.00	3.28	8.37
135	135.00	300.00	-65.00	3.28	8.70
136	136.00	300.00	-64.00	3.28	9.04
137	137.00	300.00	-63.00	3.28	9.40
138	138.00	300.00	-62.00	3.28	9.77
139	139.00	300.00	-61.00	3.28	10.17
140	140.00	300.00	-60.00	3.28	10.59
141	141.00	300.00	-59.00	3.28	11.03
142	142.00	300.00	-58.00	3.28	11.49
143	143.00	300.00	-57.00	3.28	11.98
144	144.00	300.00	-56.00	3.28	12.50
145	145.00	300.00	-55.00	3.28	13.04
146	146.00	300.00	-54.00	3.28	13.61
147	147.00	300.00	-53.00	3.28	14.22
148	148.00	300.00	-52.00	3.28	14.86
149	149.00	300.00	-51.00	3.28	15.53
150	150.00	300.00	-50.00	3.28	16.25
151	151.00	300.00	-49.00	3.28	17.00
152	152.00	300.00	-48.00	3.28	17.80
153	153.00	300.00	-47.00	3.28	18.64
154	154.00	300.00	-46.00	3.28	19.54
155	155.00	300.00	-45.00	3.28	20.49
156	156.00	300.00	-44.00	3.28	21.49
157	157.00	300.00	-43.00	3.28	22.55
158	158.00	300.00	-42.00	3.28	23.68
159	159.00	300.00	-41.00	3.28	24.88
160	160.00	300.00	-40.00	3.28	26.15
161	161.00	300.00	-39.00	3.28	27.50
162	162.00	300.00	-38.00	3.28	28.93
163	163.00	300.00	-37.00	3.28	30.45
164	164.00	300.00	-36.00	3.28	32.07
165	165.00	300.00	-35.00	3.28	33.78

166	166.00	300.00	-34.00	3.28	35.60
167	167.00	300.00	-33.00	3.28	37.53
168	168.00	300.00	-32.00	3.28	39.58
169	169.00	300.00	-31.00	3.28	41.76
170	170.00	300.00	-30.00	3.28	44.07
171	171.00	300.00	-29.00	3.28	46.52
172	172.00	300.00	-28.00	3.28	49.11
173	173.00	300.00	-27.00	3.28	51.86
174	174.00	300.00	-26.00	3.28	54.77
175	175.00	300.00	-25.00	3.28	57.84
176	176.00	300.00	-24.00	3.28	61.08
177	177.00	300.00	-23.00	3.28	64.50
178	178.00	300.00	-22.00	3.28	68.09
179	179.00	300.00	-21.00	3.28	71.85
180	180.00	300.00	-20.00	3.28	75.79
181	181.00	300.00	-19.00	3.28	79.89
182	182.00	300.00	-18.00	3.28	84.15
183	183.00	300.00	-17.00	3.28	88.55
184	184.00	300.00	-16.00	3.28	93.08
185	185.00	300.00	-15.00	3.28	97.71
186	186.00	300.00	-14.00	3.28	102.41
187	187.00	300.00	-13.00	3.28	107.16
188	188.00	300.00	-12.00	3.28	111.90
189	189.00	300.00	-11.00	3.28	116.59
190	190.00	300.00	-10.00	3.28	121.17
191	191.00	300.00	-9.00	3.28	125.59
192	192.00	300.00	-8.00	3.28	129.78
193	193.00	300.00	-7.00	3.28	133.68
194	194.00	300.00	-6.00	3.28	137.23
195	195.00	300.00	-5.00	3.28	140.37
196	196.00	300.00	-4.00	3.28	143.03
197	197.00	300.00	-3.00	3.28	145.17
198	198.00	300.00	-2.00	3.28	146.75
199	199.00	300.00	-1.00	3.28	147.73
200	200.00	300.00	0.00	3.28	148.10
201	201.00	300.00	1.00	3.28	147.85
202	202.00	300.00	2.00	3.28	146.98
203	203.00	300.00	3.00	3.28	145.52
204	204.00	300.00	4.00	3.28	143.48
205	205.00	300.00	5.00	3.28	140.92
206	206.00	300.00	6.00	3.28	137.88
207	207.00	300.00	7.00	3.28	134.42
208	208.00	300.00	8.00	3.28	130.59
209	209.00	300.00	9.00	3.28	126.47
210	210.00	300.00	10.00	3.28	122.11

211	211.00	300.00	11.00	3.28	117.58
212	212.00	300.00	12.00	3.28	112.93
213	213.00	300.00	13.00	3.28	108.23
214	214.00	300.00	14.00	3.28	103.51
215	215.00	300.00	15.00	3.28	98.83
216	216.00	300.00	16.00	3.28	94.21
217	217.00	300.00	17.00	3.28	89.69
218	218.00	300.00	18.00	3.28	85.29
219	219.00	300.00	19.00	3.28	81.02
220	220.00	300.00	20.00	3.28	76.92
221	221.00	300.00	21.00	3.28	72.97
222	222.00	300.00	22.00	3.28	69.20
223	223.00	300.00	23.00	3.28	65.60
224	224.00	300.00	24.00	3.28	62.17
225	225.00	300.00	25.00	3.28	58.91
226	226.00	300.00	26.00	3.28	55.82
227	227.00	300.00	27.00	3.28	52.89
228	228.00	300.00	28.00	3.28	50.12
229	229.00	300.00	29.00	3.28	47.50
230	230.00	300.00	30.00	3.28	45.03
231	231.00	300.00	31.00	3.28	42.70
232	232.00	300.00	32.00	3.28	40.50
233	233.00	300.00	33.00	3.28	38.43
234	234.00	300.00	34.00	3.28	36.47
235	235.00	300.00	35.00	3.28	34.63
236	236.00	300.00	36.00	3.28	32.90
237	237.00	300.00	37.00	3.28	31.26
238	238.00	300.00	38.00	3.28	29.72
239	239.00	300.00	39.00	3.28	28.27
240	240.00	300.00	40.00	3.28	26.90
241	241.00	300.00	41.00	3.28	25.61
242	242.00	300.00	42.00	3.28	24.40
243	243.00	300.00	43.00	3.28	23.25
244	244.00	300.00	44.00	3.28	22.17
245	245.00	300.00	45.00	3.28	21.14
246	246.00	300.00	46.00	3.28	20.18
247	247.00	300.00	47.00	3.28	19.27
248	248.00	300.00	48.00	3.28	18.41
249	249.00	300.00	49.00	3.28	17.59
250	250.00	300.00	50.00	3.28	16.82
251	251.00	300.00	51.00	3.28	16.10
252	252.00	300.00	52.00	3.28	15.41
253	253.00	300.00	53.00	3.28	14.75
254	254.00	300.00	54.00	3.28	14.13
255	255.00	300.00	55.00	3.28	13.55

256	256.00	300.00	56.00	3.28	12.99
257	257.00	300.00	57.00	3.28	12.47
258	258.00	300.00	58.00	3.28	11.97
259	259.00	300.00	59.00	3.28	11.49
260	260.00	300.00	60.00	3.28	11.04
261	261.00	300.00	61.00	3.28	10.61
262	262.00	300.00	62.00	3.28	10.20
263	263.00	300.00	63.00	3.28	9.81
264	264.00	300.00	64.00	3.28	9.44
265	265.00	300.00	65.00	3.28	9.09
266	266.00	300.00	66.00	3.28	8.76
267	267.00	300.00	67.00	3.28	8.44
268	268.00	300.00	68.00	3.28	8.13
269	269.00	300.00	69.00	3.28	7.84
270	270.00	300.00	70.00	3.28	7.57
271	271.00	300.00	71.00	3.28	7.30
272	272.00	300.00	72.00	3.28	7.05
273	273.00	300.00	73.00	3.28	6.81
274	274.00	300.00	74.00	3.28	6.58
275	275.00	300.00	75.00	3.28	6.36
276	276.00	300.00	76.00	3.28	6.15
277	277.00	300.00	77.00	3.28	5.94
278	278.00	300.00	78.00	3.28	5.75
279	279.00	300.00	79.00	3.28	5.57
280	280.00	300.00	80.00	3.28	5.39
281	281.00	300.00	81.00	3.28	5.22
282	282.00	300.00	82.00	3.28	5.06
283	283.00	300.00	83.00	3.28	4.90
284	284.00	300.00	84.00	3.28	4.75
285	285.00	300.00	85.00	3.28	4.61
286	286.00	300.00	86.00	3.28	4.47
287	287.00	300.00	87.00	3.28	4.33
288	288.00	300.00	88.00	3.28	4.21
289	289.00	300.00	89.00	3.28	4.08
290	290.00	300.00	90.00	3.28	3.97
291	291.00	300.00	91.00	3.28	3.85
292	292.00	300.00	92.00	3.28	3.74
293	293.00	300.00	93.00	3.28	3.64
294	294.00	300.00	94.00	3.28	3.54
295	295.00	300.00	95.00	3.28	3.44
296	296.00	300.00	96.00	3.28	3.34
297	297.00	300.00	97.00	3.28	3.25
298	298.00	300.00	98.00	3.28	3.17
299	299.00	300.00	99.00	3.28	3.08
300	300.00	300.00	100.00	3.28	3.00

301	301.00	300.00	101.00	3.28	2.92
302	302.00	300.00	102.00	3.28	2.85
303	303.00	300.00	103.00	3.28	2.77
304	304.00	300.00	104.00	3.28	2.70
305	305.00	300.00	105.00	3.28	2.64
306	306.00	300.00	106.00	3.28	2.57
307	307.00	300.00	107.00	3.28	2.51
308	308.00	300.00	108.00	3.28	2.44
309	309.00	300.00	109.00	3.28	2.39
310	310.00	300.00	110.00	3.28	2.33
311	311.00	300.00	111.00	3.28	2.27
312	312.00	300.00	112.00	3.28	2.22
313	313.00	300.00	113.00	3.28	2.17
314	314.00	300.00	114.00	3.28	2.12
315	315.00	300.00	115.00	3.28	2.07
316	316.00	300.00	116.00	3.28	2.02
317	317.00	300.00	117.00	3.28	1.97
318	318.00	300.00	118.00	3.28	1.93
319	319.00	300.00	119.00	3.28	1.89
320	320.00	300.00	120.00	3.28	1.84
321	321.00	300.00	121.00	3.28	1.80
322	322.00	300.00	122.00	3.28	1.76
323	323.00	300.00	123.00	3.28	1.73
324	324.00	300.00	124.00	3.28	1.69
325	325.00	300.00	125.00	3.28	1.65
326	326.00	300.00	126.00	3.28	1.62
327	327.00	300.00	127.00	3.28	1.58
328	328.00	300.00	128.00	3.28	1.55
329	329.00	300.00	129.00	3.28	1.52
330	330.00	300.00	130.00	3.28	1.49
331	331.00	300.00	131.00	3.28	1.46
332	332.00	300.00	132.00	3.28	1.43
333	333.00	300.00	133.00	3.28	1.40
334	334.00	300.00	134.00	3.28	1.37
335	335.00	300.00	135.00	3.28	1.34
336	336.00	300.00	136.00	3.28	1.32
337	337.00	300.00	137.00	3.28	1.29
338	338.00	300.00	138.00	3.28	1.27
339	339.00	300.00	139.00	3.28	1.24
340	340.00	300.00	140.00	3.28	1.22
341	341.00	300.00	141.00	3.28	1.20
342	342.00	300.00	142.00	3.28	1.17
343	343.00	300.00	143.00	3.28	1.15
344	344.00	300.00	144.00	3.28	1.13
345	345.00	300.00	145.00	3.28	1.11

346	346.00	300.00	146.00	3.28	1.09
347	347.00	300.00	147.00	3.28	1.07
348	348.00	300.00	148.00	3.28	1.05
349	349.00	300.00	149.00	3.28	1.03
350	350.00	300.00	150.00	3.28	1.02
351	351.00	300.00	151.00	3.28	1.00
352	352.00	300.00	152.00	3.28	0.98
353	353.00	300.00	153.00	3.28	0.96
354	354.00	300.00	154.00	3.28	0.95
355	355.00	300.00	155.00	3.28	0.93
356	356.00	300.00	156.00	3.28	0.92
357	357.00	300.00	157.00	3.28	0.90
358	358.00	300.00	158.00	3.28	0.89
359	359.00	300.00	159.00	3.28	0.87
360	360.00	300.00	160.00	3.28	0.86
361	361.00	300.00	161.00	3.28	0.84
362	362.00	300.00	162.00	3.28	0.83
363	363.00	300.00	163.00	3.28	0.82
364	364.00	300.00	164.00	3.28	0.80
365	365.00	300.00	165.00	3.28	0.79
366	366.00	300.00	166.00	3.28	0.78
367	367.00	300.00	167.00	3.28	0.77
368	368.00	300.00	168.00	3.28	0.75
369	369.00	300.00	169.00	3.28	0.74
370	370.00	300.00	170.00	3.28	0.73
371	371.00	300.00	171.00	3.28	0.72
372	372.00	300.00	172.00	3.28	0.71
373	373.00	300.00	173.00	3.28	0.70
374	374.00	300.00	174.00	3.28	0.69
375	375.00	300.00	175.00	3.28	0.68
376	376.00	300.00	176.00	3.28	0.67
377	377.00	300.00	177.00	3.28	0.66
378	378.00	300.00	178.00	3.28	0.65
379	379.00	300.00	179.00	3.28	0.64
380	380.00	300.00	180.00	3.28	0.63
381	381.00	300.00	181.00	3.28	0.62
382	382.00	300.00	182.00	3.28	0.61
383	383.00	300.00	183.00	3.28	0.60
384	384.00	300.00	184.00	3.28	0.60
385	385.00	300.00	185.00	3.28	0.59
386	386.00	300.00	186.00	3.28	0.58
387	387.00	300.00	187.00	3.28	0.57
388	388.00	300.00	188.00	3.28	0.56
389	389.00	300.00	189.00	3.28	0.56
390	390.00	300.00	190.00	3.28	0.55

391	391.00	300.00	191.00	3.28	0.54
392	392.00	300.00	192.00	3.28	0.53
393	393.00	300.00	193.00	3.28	0.53
394	394.00	300.00	194.00	3.28	0.52
395	395.00	300.00	195.00	3.28	0.51
396	396.00	300.00	196.00	3.28	0.51
397	397.00	300.00	197.00	3.28	0.50
398	398.00	300.00	198.00	3.28	0.49
399	399.00	300.00	199.00	3.28	0.49
400	400.00	300.00	200.00	3.28	0.48

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*                               *
*          BUNDLE CONFIGURATION          *
*                               *
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CIRCUIT #	NODE #	PHASE	VOLTAGE (kV)	LOAD (AMPS)	ANGLE (DEG)	COND	CRNT/VLT	#	COORDINATES (ft)	X	Y
1	1	A	121.000	1500.00	0.00	1	-4.50	41.00			
1	1	B	121.000	1500.00	240.00	1	-4.50	32.00			
1	1	C	121.000	1500.00	120.00	1	-4.50	23.00			
1	2	A	121.000	0.00	0.00	1	-4.50	41.00			
1	2	B	121.000	0.00	0.00	1	-4.50	32.00			
1	2	C	121.000	0.00	0.00	1	-4.50	23.00			
2	1	A	121.000	1500.00	0.00	1	4.50	23.00			
2	1	B	121.000	1500.00	240.00	1	4.50	32.00			
2	1	C	121.000	1500.00	120.00	1	4.50	41.00			
2	2	A	121.000	0.00	0.00	1	4.50	23.00			
2	2	B	121.000	0.00	0.00	1	4.50	32.00			
2	2	C	121.000	0.00	0.00	1	4.50	41.00			
3	1	SW	0.000	5.75	301.28	1	-0.50	50.00			
3	2	SW	0.000	0.00	0.00	1	-0.50	50.00			

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*                               *
*          SUBCONDUCTOR INFORMATION          *
*                               *
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CIRCUIT #	NODE #	DIAMETER (in)	SPACING (in)	AC RESIST. (ohms/mi)	AC REACT. (ohms/mi)
1	1	1.300	0.000	-NA-	-NA-
1	1	1.300	0.000	-NA-	-NA-
1	1	1.300	0.000	-NA-	-NA-
1	2	1.300	0.000	-NA-	-NA-

1	2	1.300	0.000	-NA-	-NA-
1	2	1.300	0.000	-NA-	-NA-
2	1	1.300	0.000	-NA-	-NA-
2	1	1.300	0.000	-NA-	-NA-
2	1	1.300	0.000	-NA-	-NA-
2	2	1.300	0.000	-NA-	-NA-
2	2	1.300	0.000	-NA-	-NA-
2	2	1.300	0.000	-NA-	-NA-
3	1	0.360	0.000	6.600000	1.500000
3	2	0.360	0.000	6.600000	1.500000

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## Double Circuit Configuration – Audible Noise Lateral Profile

File: C:\Users\hchooper\Desktop\New Projects\Obsidian - TLine in Oregon\Calcs\Case 1 - Audible Noise.txt

Aud-Noise HORIZONTAL Profile Chart: "Lateral Profile Audible Noise - Model Load 1(AN)"

Field Components = Resultant

Distance units = (ft)

Audible Noise units = dB(A)

Spacing = 1.00(ft)

Calculation Points = 401

Point	Distance (ft)	X (ft)	Y (ft)	Z (ft)	L5 dB(A)	L50 dB(A)	FW dB(A)
0	0.00	300.00	-200.00	5.00	23.05	0.66	-33.26
1	1.00	300.00	-199.00	5.00	23.08	0.69	-33.23
2	2.00	300.00	-198.00	5.00	23.11	0.72	-33.20
3	3.00	300.00	-197.00	5.00	23.15	0.75	-33.17
4	4.00	300.00	-196.00	5.00	23.18	0.79	-33.14
5	5.00	300.00	-195.00	5.00	23.21	0.82	-33.10
6	6.00	300.00	-194.00	5.00	23.24	0.85	-33.07
7	7.00	300.00	-193.00	5.00	23.27	0.88	-33.04
8	8.00	300.00	-192.00	5.00	23.31	0.91	-33.01
9	9.00	300.00	-191.00	5.00	23.34	0.95	-32.98
10	10.00	300.00	-190.00	5.00	23.37	0.98	-32.94
11	11.00	300.00	-189.00	5.00	23.40	1.01	-32.91
12	12.00	300.00	-188.00	5.00	23.44	1.05	-32.88
13	13.00	300.00	-187.00	5.00	23.47	1.08	-32.84
14	14.00	300.00	-186.00	5.00	23.50	1.11	-32.81
15	15.00	300.00	-185.00	5.00	23.54	1.15	-32.78
16	16.00	300.00	-184.00	5.00	23.57	1.18	-32.74
17	17.00	300.00	-183.00	5.00	23.60	1.21	-32.71
18	18.00	300.00	-182.00	5.00	23.64	1.25	-32.68
19	19.00	300.00	-181.00	5.00	23.67	1.28	-32.64
20	20.00	300.00	-180.00	5.00	23.71	1.31	-32.61
21	21.00	300.00	-179.00	5.00	23.74	1.35	-32.57
22	22.00	300.00	-178.00	5.00	23.77	1.38	-32.54
23	23.00	300.00	-177.00	5.00	23.81	1.42	-32.51
24	24.00	300.00	-176.00	5.00	23.84	1.45	-32.47
25	25.00	300.00	-175.00	5.00	23.88	1.48	-32.44
26	26.00	300.00	-174.00	5.00	23.91	1.52	-32.40
27	27.00	300.00	-173.00	5.00	23.95	1.55	-32.37
28	28.00	300.00	-172.00	5.00	23.98	1.59	-32.33
29	29.00	300.00	-171.00	5.00	24.02	1.62	-32.30

30	30.00	300.00 -170.00	5.00	24.05	1.66	-32.26
31	31.00	300.00 -169.00	5.00	24.09	1.70	-32.23
32	32.00	300.00 -168.00	5.00	24.12	1.73	-32.19
33	33.00	300.00 -167.00	5.00	24.16	1.77	-32.16
34	34.00	300.00 -166.00	5.00	24.19	1.80	-32.12
35	35.00	300.00 -165.00	5.00	24.23	1.84	-32.08
36	36.00	300.00 -164.00	5.00	24.27	1.87	-32.05
37	37.00	300.00 -163.00	5.00	24.30	1.91	-32.01
38	38.00	300.00 -162.00	5.00	24.34	1.95	-31.98
39	39.00	300.00 -161.00	5.00	24.38	1.98	-31.94
40	40.00	300.00 -160.00	5.00	24.41	2.02	-31.90
41	41.00	300.00 -159.00	5.00	24.45	2.06	-31.86
42	42.00	300.00 -158.00	5.00	24.49	2.09	-31.83
43	43.00	300.00 -157.00	5.00	24.52	2.13	-31.79
44	44.00	300.00 -156.00	5.00	24.56	2.17	-31.75
45	45.00	300.00 -155.00	5.00	24.60	2.21	-31.72
46	46.00	300.00 -154.00	5.00	24.64	2.24	-31.68
47	47.00	300.00 -153.00	5.00	24.67	2.28	-31.64
48	48.00	300.00 -152.00	5.00	24.71	2.32	-31.60
49	49.00	300.00 -151.00	5.00	24.75	2.36	-31.56
50	50.00	300.00 -150.00	5.00	24.79	2.40	-31.53
51	51.00	300.00 -149.00	5.00	24.83	2.43	-31.49
52	52.00	300.00 -148.00	5.00	24.87	2.47	-31.45
53	53.00	300.00 -147.00	5.00	24.90	2.51	-31.41
54	54.00	300.00 -146.00	5.00	24.94	2.55	-31.37
55	55.00	300.00 -145.00	5.00	24.98	2.59	-31.33
56	56.00	300.00 -144.00	5.00	25.02	2.63	-31.29
57	57.00	300.00 -143.00	5.00	25.06	2.67	-31.25
58	58.00	300.00 -142.00	5.00	25.10	2.71	-31.21
59	59.00	300.00 -141.00	5.00	25.14	2.75	-31.17
60	60.00	300.00 -140.00	5.00	25.18	2.79	-31.13
61	61.00	300.00 -139.00	5.00	25.22	2.83	-31.09
62	62.00	300.00 -138.00	5.00	25.26	2.87	-31.05
63	63.00	300.00 -137.00	5.00	25.30	2.91	-31.01
64	64.00	300.00 -136.00	5.00	25.35	2.95	-30.97
65	65.00	300.00 -135.00	5.00	25.39	2.99	-30.93
66	66.00	300.00 -134.00	5.00	25.43	3.04	-30.89
67	67.00	300.00 -133.00	5.00	25.47	3.08	-30.85
68	68.00	300.00 -132.00	5.00	25.51	3.12	-30.80
69	69.00	300.00 -131.00	5.00	25.55	3.16	-30.76
70	70.00	300.00 -130.00	5.00	25.60	3.20	-30.72
71	71.00	300.00 -129.00	5.00	25.64	3.25	-30.68
72	72.00	300.00 -128.00	5.00	25.68	3.29	-30.63
73	73.00	300.00 -127.00	5.00	25.72	3.33	-30.59
74	74.00	300.00 -126.00	5.00	25.77	3.37	-30.55

75	75.00	300.00	-125.00	5.00	25.81	3.42	-30.50
76	76.00	300.00	-124.00	5.00	25.85	3.46	-30.46
77	77.00	300.00	-123.00	5.00	25.90	3.50	-30.42
78	78.00	300.00	-122.00	5.00	25.94	3.55	-30.37
79	79.00	300.00	-121.00	5.00	25.99	3.59	-30.33
80	80.00	300.00	-120.00	5.00	26.03	3.64	-30.28
81	81.00	300.00	-119.00	5.00	26.08	3.68	-30.24
82	82.00	300.00	-118.00	5.00	26.12	3.73	-30.19
83	83.00	300.00	-117.00	5.00	26.17	3.77	-30.15
84	84.00	300.00	-116.00	5.00	26.21	3.82	-30.10
85	85.00	300.00	-115.00	5.00	26.26	3.86	-30.06
86	86.00	300.00	-114.00	5.00	26.30	3.91	-30.01
87	87.00	300.00	-113.00	5.00	26.35	3.96	-29.97
88	88.00	300.00	-112.00	5.00	26.40	4.00	-29.92
89	89.00	300.00	-111.00	5.00	26.44	4.05	-29.87
90	90.00	300.00	-110.00	5.00	26.49	4.10	-29.83
91	91.00	300.00	-109.00	5.00	26.54	4.14	-29.78
92	92.00	300.00	-108.00	5.00	26.59	4.19	-29.73
93	93.00	300.00	-107.00	5.00	26.63	4.24	-29.68
94	94.00	300.00	-106.00	5.00	26.68	4.29	-29.63
95	95.00	300.00	-105.00	5.00	26.73	4.34	-29.58
96	96.00	300.00	-104.00	5.00	26.78	4.39	-29.54
97	97.00	300.00	-103.00	5.00	26.83	4.44	-29.49
98	98.00	300.00	-102.00	5.00	26.88	4.49	-29.44
99	99.00	300.00	-101.00	5.00	26.93	4.54	-29.39
100	100.00	300.00	-100.00	5.00	26.98	4.59	-29.34
101	101.00	300.00	-99.00	5.00	27.03	4.64	-29.29
102	102.00	300.00	-98.00	5.00	27.08	4.69	-29.24
103	103.00	300.00	-97.00	5.00	27.13	4.74	-29.18
104	104.00	300.00	-96.00	5.00	27.18	4.79	-29.13
105	105.00	300.00	-95.00	5.00	27.23	4.84	-29.08
106	106.00	300.00	-94.00	5.00	27.29	4.89	-29.03
107	107.00	300.00	-93.00	5.00	27.34	4.95	-28.98
108	108.00	300.00	-92.00	5.00	27.39	5.00	-28.92
109	109.00	300.00	-91.00	5.00	27.44	5.05	-28.87
110	110.00	300.00	-90.00	5.00	27.50	5.11	-28.82
111	111.00	300.00	-89.00	5.00	27.55	5.16	-28.76
112	112.00	300.00	-88.00	5.00	27.61	5.21	-28.71
113	113.00	300.00	-87.00	5.00	27.66	5.27	-28.65
114	114.00	300.00	-86.00	5.00	27.72	5.32	-28.60
115	115.00	300.00	-85.00	5.00	27.77	5.38	-28.54
116	116.00	300.00	-84.00	5.00	27.83	5.43	-28.49
117	117.00	300.00	-83.00	5.00	27.88	5.49	-28.43
118	118.00	300.00	-82.00	5.00	27.94	5.55	-28.38
119	119.00	300.00	-81.00	5.00	28.00	5.60	-28.32

120	120.00	300.00	-80.00	5.00	28.06	5.66	-28.26
121	121.00	300.00	-79.00	5.00	28.11	5.72	-28.20
122	122.00	300.00	-78.00	5.00	28.17	5.78	-28.14
123	123.00	300.00	-77.00	5.00	28.23	5.84	-28.09
124	124.00	300.00	-76.00	5.00	28.29	5.90	-28.03
125	125.00	300.00	-75.00	5.00	28.35	5.96	-27.97
126	126.00	300.00	-74.00	5.00	28.41	6.02	-27.91
127	127.00	300.00	-73.00	5.00	28.47	6.08	-27.85
128	128.00	300.00	-72.00	5.00	28.53	6.14	-27.79
129	129.00	300.00	-71.00	5.00	28.59	6.20	-27.72
130	130.00	300.00	-70.00	5.00	28.65	6.26	-27.66
131	131.00	300.00	-69.00	5.00	28.72	6.32	-27.60
132	132.00	300.00	-68.00	5.00	28.78	6.39	-27.54
133	133.00	300.00	-67.00	5.00	28.84	6.45	-27.47
134	134.00	300.00	-66.00	5.00	28.91	6.51	-27.41
135	135.00	300.00	-65.00	5.00	28.97	6.58	-27.35
136	136.00	300.00	-64.00	5.00	29.04	6.64	-27.28
137	137.00	300.00	-63.00	5.00	29.10	6.71	-27.22
138	138.00	300.00	-62.00	5.00	29.17	6.77	-27.15
139	139.00	300.00	-61.00	5.00	29.23	6.84	-27.08
140	140.00	300.00	-60.00	5.00	29.30	6.91	-27.02
141	141.00	300.00	-59.00	5.00	29.37	6.97	-26.95
142	142.00	300.00	-58.00	5.00	29.43	7.04	-26.88
143	143.00	300.00	-57.00	5.00	29.50	7.11	-26.81
144	144.00	300.00	-56.00	5.00	29.57	7.18	-26.74
145	145.00	300.00	-55.00	5.00	29.64	7.25	-26.67
146	146.00	300.00	-54.00	5.00	29.71	7.32	-26.60
147	147.00	300.00	-53.00	5.00	29.78	7.39	-26.53
148	148.00	300.00	-52.00	5.00	29.85	7.46	-26.46
149	149.00	300.00	-51.00	5.00	29.92	7.53	-26.39
150	150.00	300.00	-50.00	5.00	30.00	7.60	-26.32
151	151.00	300.00	-49.00	5.00	30.07	7.68	-26.25
152	152.00	300.00	-48.00	5.00	30.14	7.75	-26.17
153	153.00	300.00	-47.00	5.00	30.22	7.82	-26.10
154	154.00	300.00	-46.00	5.00	30.29	7.90	-26.03
155	155.00	300.00	-45.00	5.00	30.36	7.97	-25.95
156	156.00	300.00	-44.00	5.00	30.44	8.05	-25.88
157	157.00	300.00	-43.00	5.00	30.51	8.12	-25.80
158	158.00	300.00	-42.00	5.00	30.59	8.20	-25.72
159	159.00	300.00	-41.00	5.00	30.67	8.27	-25.65
160	160.00	300.00	-40.00	5.00	30.74	8.35	-25.57
161	161.00	300.00	-39.00	5.00	30.82	8.43	-25.49
162	162.00	300.00	-38.00	5.00	30.90	8.51	-25.42
163	163.00	300.00	-37.00	5.00	30.98	8.58	-25.34
164	164.00	300.00	-36.00	5.00	31.05	8.66	-25.26

165	165.00	300.00	-35.00	5.00	31.13	8.74	-25.18
166	166.00	300.00	-34.00	5.00	31.21	8.82	-25.10
167	167.00	300.00	-33.00	5.00	31.29	8.90	-25.02
168	168.00	300.00	-32.00	5.00	31.37	8.98	-24.94
169	169.00	300.00	-31.00	5.00	31.45	9.06	-24.86
170	170.00	300.00	-30.00	5.00	31.53	9.14	-24.78
171	171.00	300.00	-29.00	5.00	31.61	9.22	-24.70
172	172.00	300.00	-28.00	5.00	31.69	9.30	-24.62
173	173.00	300.00	-27.00	5.00	31.77	9.38	-24.54
174	174.00	300.00	-26.00	5.00	31.84	9.46	-24.46
175	175.00	300.00	-25.00	5.00	31.92	9.53	-24.38
176	176.00	300.00	-24.00	5.00	32.00	9.61	-24.31
177	177.00	300.00	-23.00	5.00	32.08	9.69	-24.23
178	178.00	300.00	-22.00	5.00	32.15	9.77	-24.15
179	179.00	300.00	-21.00	5.00	32.23	9.84	-24.07
180	180.00	300.00	-20.00	5.00	32.30	9.92	-24.00
181	181.00	300.00	-19.00	5.00	32.38	9.99	-23.92
182	182.00	300.00	-18.00	5.00	32.45	10.06	-23.85
183	183.00	300.00	-17.00	5.00	32.52	10.13	-23.78
184	184.00	300.00	-16.00	5.00	32.58	10.20	-23.71
185	185.00	300.00	-15.00	5.00	32.65	10.27	-23.65
186	186.00	300.00	-14.00	5.00	32.71	10.33	-23.58
187	187.00	300.00	-13.00	5.00	32.77	10.39	-23.52
188	188.00	300.00	-12.00	5.00	32.83	10.45	-23.46
189	189.00	300.00	-11.00	5.00	32.88	10.50	-23.41
190	190.00	300.00	-10.00	5.00	32.93	10.55	-23.35
191	191.00	300.00	-9.00	5.00	32.98	10.60	-23.31
192	192.00	300.00	-8.00	5.00	33.02	10.64	-23.26
193	193.00	300.00	-7.00	5.00	33.06	10.68	-23.22
194	194.00	300.00	-6.00	5.00	33.10	10.72	-23.19
195	195.00	300.00	-5.00	5.00	33.12	10.75	-23.16
196	196.00	300.00	-4.00	5.00	33.15	10.77	-23.14
197	197.00	300.00	-3.00	5.00	33.17	10.79	-23.12
198	198.00	300.00	-2.00	5.00	33.18	10.80	-23.10
199	199.00	300.00	-1.00	5.00	33.19	10.81	-23.09
200	200.00	300.00	0.00	5.00	33.19	10.81	-23.09
201	201.00	300.00	1.00	5.00	33.19	10.81	-23.09
202	202.00	300.00	2.00	5.00	33.18	10.80	-23.10
203	203.00	300.00	3.00	5.00	33.17	10.79	-23.12
204	204.00	300.00	4.00	5.00	33.15	10.77	-23.14
205	205.00	300.00	5.00	5.00	33.12	10.75	-23.16
206	206.00	300.00	6.00	5.00	33.09	10.72	-23.19
207	207.00	300.00	7.00	5.00	33.06	10.68	-23.22
208	208.00	300.00	8.00	5.00	33.02	10.64	-23.26
209	209.00	300.00	9.00	5.00	32.98	10.60	-23.31

210	210.00	300.00	10.00	5.00	32.93	10.55	-23.35
211	211.00	300.00	11.00	5.00	32.88	10.50	-23.41
212	212.00	300.00	12.00	5.00	32.83	10.45	-23.46
213	213.00	300.00	13.00	5.00	32.77	10.39	-23.52
214	214.00	300.00	14.00	5.00	32.71	10.33	-23.58
215	215.00	300.00	15.00	5.00	32.65	10.27	-23.65
216	216.00	300.00	16.00	5.00	32.58	10.20	-23.71
217	217.00	300.00	17.00	5.00	32.52	10.13	-23.78
218	218.00	300.00	18.00	5.00	32.45	10.06	-23.85
219	219.00	300.00	19.00	5.00	32.37	9.99	-23.93
220	220.00	300.00	20.00	5.00	32.30	9.92	-24.00
221	221.00	300.00	21.00	5.00	32.23	9.84	-24.08
222	222.00	300.00	22.00	5.00	32.15	9.76	-24.15
223	223.00	300.00	23.00	5.00	32.08	9.69	-24.23
224	224.00	300.00	24.00	5.00	32.00	9.61	-24.31
225	225.00	300.00	25.00	5.00	31.92	9.53	-24.39
226	226.00	300.00	26.00	5.00	31.84	9.45	-24.47
227	227.00	300.00	27.00	5.00	31.76	9.37	-24.55
228	228.00	300.00	28.00	5.00	31.69	9.30	-24.63
229	229.00	300.00	29.00	5.00	31.61	9.22	-24.71
230	230.00	300.00	30.00	5.00	31.53	9.14	-24.79
231	231.00	300.00	31.00	5.00	31.45	9.06	-24.87
232	232.00	300.00	32.00	5.00	31.37	8.98	-24.95
233	233.00	300.00	33.00	5.00	31.29	8.90	-25.03
234	234.00	300.00	34.00	5.00	31.21	8.82	-25.11
235	235.00	300.00	35.00	5.00	31.13	8.74	-25.18
236	236.00	300.00	36.00	5.00	31.05	8.66	-25.26
237	237.00	300.00	37.00	5.00	30.97	8.58	-25.34
238	238.00	300.00	38.00	5.00	30.90	8.50	-25.42
239	239.00	300.00	39.00	5.00	30.82	8.43	-25.50
240	240.00	300.00	40.00	5.00	30.74	8.35	-25.58
241	241.00	300.00	41.00	5.00	30.66	8.27	-25.65
242	242.00	300.00	42.00	5.00	30.59	8.20	-25.73
243	243.00	300.00	43.00	5.00	30.51	8.12	-25.81
244	244.00	300.00	44.00	5.00	30.44	8.04	-25.88
245	245.00	300.00	45.00	5.00	30.36	7.97	-25.96
246	246.00	300.00	46.00	5.00	30.29	7.89	-26.03
247	247.00	300.00	47.00	5.00	30.21	7.82	-26.11
248	248.00	300.00	48.00	5.00	30.14	7.75	-26.18
249	249.00	300.00	49.00	5.00	30.07	7.67	-26.25
250	250.00	300.00	50.00	5.00	29.99	7.60	-26.33
251	251.00	300.00	51.00	5.00	29.92	7.53	-26.40
252	252.00	300.00	52.00	5.00	29.85	7.46	-26.47
253	253.00	300.00	53.00	5.00	29.78	7.39	-26.54
254	254.00	300.00	54.00	5.00	29.71	7.32	-26.61

255	255.00	300.00	55.00	5.00	29.64	7.25	-26.68
256	256.00	300.00	56.00	5.00	29.57	7.18	-26.75
257	257.00	300.00	57.00	5.00	29.50	7.11	-26.82
258	258.00	300.00	58.00	5.00	29.43	7.04	-26.89
259	259.00	300.00	59.00	5.00	29.36	6.97	-26.96
260	260.00	300.00	60.00	5.00	29.30	6.90	-27.02
261	261.00	300.00	61.00	5.00	29.23	6.84	-27.09
262	262.00	300.00	62.00	5.00	29.16	6.77	-27.16
263	263.00	300.00	63.00	5.00	29.10	6.70	-27.22
264	264.00	300.00	64.00	5.00	29.03	6.64	-27.29
265	265.00	300.00	65.00	5.00	28.97	6.57	-27.35
266	266.00	300.00	66.00	5.00	28.90	6.51	-27.42
267	267.00	300.00	67.00	5.00	28.84	6.45	-27.48
268	268.00	300.00	68.00	5.00	28.78	6.38	-27.54
269	269.00	300.00	69.00	5.00	28.71	6.32	-27.61
270	270.00	300.00	70.00	5.00	28.65	6.26	-27.67
271	271.00	300.00	71.00	5.00	28.59	6.20	-27.73
272	272.00	300.00	72.00	5.00	28.53	6.13	-27.79
273	273.00	300.00	73.00	5.00	28.47	6.07	-27.85
274	274.00	300.00	74.00	5.00	28.41	6.01	-27.91
275	275.00	300.00	75.00	5.00	28.35	5.95	-27.97
276	276.00	300.00	76.00	5.00	28.29	5.89	-28.03
277	277.00	300.00	77.00	5.00	28.23	5.83	-28.09
278	278.00	300.00	78.00	5.00	28.17	5.78	-28.15
279	279.00	300.00	79.00	5.00	28.11	5.72	-28.21
280	280.00	300.00	80.00	5.00	28.05	5.66	-28.27
281	281.00	300.00	81.00	5.00	28.00	5.60	-28.32
282	282.00	300.00	82.00	5.00	27.94	5.54	-28.38
283	283.00	300.00	83.00	5.00	27.88	5.49	-28.44
284	284.00	300.00	84.00	5.00	27.83	5.43	-28.49
285	285.00	300.00	85.00	5.00	27.77	5.38	-28.55
286	286.00	300.00	86.00	5.00	27.71	5.32	-28.60
287	287.00	300.00	87.00	5.00	27.66	5.27	-28.66
288	288.00	300.00	88.00	5.00	27.60	5.21	-28.71
289	289.00	300.00	89.00	5.00	27.55	5.16	-28.77
290	290.00	300.00	90.00	5.00	27.50	5.10	-28.82
291	291.00	300.00	91.00	5.00	27.44	5.05	-28.88
292	292.00	300.00	92.00	5.00	27.39	5.00	-28.93
293	293.00	300.00	93.00	5.00	27.34	4.94	-28.98
294	294.00	300.00	94.00	5.00	27.28	4.89	-29.03
295	295.00	300.00	95.00	5.00	27.23	4.84	-29.09
296	296.00	300.00	96.00	5.00	27.18	4.79	-29.14
297	297.00	300.00	97.00	5.00	27.13	4.74	-29.19
298	298.00	300.00	98.00	5.00	27.08	4.68	-29.24
299	299.00	300.00	99.00	5.00	27.03	4.63	-29.29

300	300.00	300.00	100.00	5.00	26.98	4.58	-29.34
301	301.00	300.00	101.00	5.00	26.93	4.53	-29.39
302	302.00	300.00	102.00	5.00	26.88	4.48	-29.44
303	303.00	300.00	103.00	5.00	26.83	4.43	-29.49
304	304.00	300.00	104.00	5.00	26.78	4.38	-29.54
305	305.00	300.00	105.00	5.00	26.73	4.33	-29.59
306	306.00	300.00	106.00	5.00	26.68	4.29	-29.64
307	307.00	300.00	107.00	5.00	26.63	4.24	-29.69
308	308.00	300.00	108.00	5.00	26.58	4.19	-29.73
309	309.00	300.00	109.00	5.00	26.54	4.14	-29.78
310	310.00	300.00	110.00	5.00	26.49	4.09	-29.83
311	311.00	300.00	111.00	5.00	26.44	4.05	-29.88
312	312.00	300.00	112.00	5.00	26.39	4.00	-29.92
313	313.00	300.00	113.00	5.00	26.35	3.95	-29.97
314	314.00	300.00	114.00	5.00	26.30	3.91	-30.02
315	315.00	300.00	115.00	5.00	26.26	3.86	-30.06
316	316.00	300.00	116.00	5.00	26.21	3.82	-30.11
317	317.00	300.00	117.00	5.00	26.16	3.77	-30.15
318	318.00	300.00	118.00	5.00	26.12	3.73	-30.20
319	319.00	300.00	119.00	5.00	26.07	3.68	-30.24
320	320.00	300.00	120.00	5.00	26.03	3.64	-30.29
321	321.00	300.00	121.00	5.00	25.98	3.59	-30.33
322	322.00	300.00	122.00	5.00	25.94	3.55	-30.38
323	323.00	300.00	123.00	5.00	25.90	3.50	-30.42
324	324.00	300.00	124.00	5.00	25.85	3.46	-30.47
325	325.00	300.00	125.00	5.00	25.81	3.41	-30.51
326	326.00	300.00	126.00	5.00	25.76	3.37	-30.55
327	327.00	300.00	127.00	5.00	25.72	3.33	-30.60
328	328.00	300.00	128.00	5.00	25.68	3.29	-30.64
329	329.00	300.00	129.00	5.00	25.64	3.24	-30.68
330	330.00	300.00	130.00	5.00	25.59	3.20	-30.72
331	331.00	300.00	131.00	5.00	25.55	3.16	-30.77
332	332.00	300.00	132.00	5.00	25.51	3.12	-30.81
333	333.00	300.00	133.00	5.00	25.47	3.07	-30.85
334	334.00	300.00	134.00	5.00	25.43	3.03	-30.89
335	335.00	300.00	135.00	5.00	25.38	2.99	-30.93
336	336.00	300.00	136.00	5.00	25.34	2.95	-30.97
337	337.00	300.00	137.00	5.00	25.30	2.91	-31.02
338	338.00	300.00	138.00	5.00	25.26	2.87	-31.06
339	339.00	300.00	139.00	5.00	25.22	2.83	-31.10
340	340.00	300.00	140.00	5.00	25.18	2.79	-31.14
341	341.00	300.00	141.00	5.00	25.14	2.75	-31.18
342	342.00	300.00	142.00	5.00	25.10	2.71	-31.22
343	343.00	300.00	143.00	5.00	25.06	2.67	-31.26
344	344.00	300.00	144.00	5.00	25.02	2.63	-31.30



345	345.00	300.00	145.00	5.00	24.98	2.59	-31.34
346	346.00	300.00	146.00	5.00	24.94	2.55	-31.37
347	347.00	300.00	147.00	5.00	24.90	2.51	-31.41
348	348.00	300.00	148.00	5.00	24.86	2.47	-31.45
349	349.00	300.00	149.00	5.00	24.83	2.43	-31.49
350	350.00	300.00	150.00	5.00	24.79	2.39	-31.53
351	351.00	300.00	151.00	5.00	24.75	2.36	-31.57
352	352.00	300.00	152.00	5.00	24.71	2.32	-31.61
353	353.00	300.00	153.00	5.00	24.67	2.28	-31.64
354	354.00	300.00	154.00	5.00	24.63	2.24	-31.68
355	355.00	300.00	155.00	5.00	24.60	2.20	-31.72
356	356.00	300.00	156.00	5.00	24.56	2.17	-31.76
357	357.00	300.00	157.00	5.00	24.52	2.13	-31.79
358	358.00	300.00	158.00	5.00	24.49	2.09	-31.83
359	359.00	300.00	159.00	5.00	24.45	2.06	-31.87
360	360.00	300.00	160.00	5.00	24.41	2.02	-31.91
361	361.00	300.00	161.00	5.00	24.37	1.98	-31.94
362	362.00	300.00	162.00	5.00	24.34	1.94	-31.98
363	363.00	300.00	163.00	5.00	24.30	1.91	-32.02
364	364.00	300.00	164.00	5.00	24.27	1.87	-32.05
365	365.00	300.00	165.00	5.00	24.23	1.84	-32.09
366	366.00	300.00	166.00	5.00	24.19	1.80	-32.12
367	367.00	300.00	167.00	5.00	24.16	1.76	-32.16
368	368.00	300.00	168.00	5.00	24.12	1.73	-32.20
369	369.00	300.00	169.00	5.00	24.09	1.69	-32.23
370	370.00	300.00	170.00	5.00	24.05	1.66	-32.27
371	371.00	300.00	171.00	5.00	24.02	1.62	-32.30
372	372.00	300.00	172.00	5.00	23.98	1.59	-32.34
373	373.00	300.00	173.00	5.00	23.95	1.55	-32.37
374	374.00	300.00	174.00	5.00	23.91	1.52	-32.41
375	375.00	300.00	175.00	5.00	23.88	1.48	-32.44
376	376.00	300.00	176.00	5.00	23.84	1.45	-32.48
377	377.00	300.00	177.00	5.00	23.81	1.41	-32.51
378	378.00	300.00	178.00	5.00	23.77	1.38	-32.54
379	379.00	300.00	179.00	5.00	23.74	1.35	-32.58
380	380.00	300.00	180.00	5.00	23.70	1.31	-32.61
381	381.00	300.00	181.00	5.00	23.67	1.28	-32.65
382	382.00	300.00	182.00	5.00	23.64	1.24	-32.68
383	383.00	300.00	183.00	5.00	23.60	1.21	-32.71
384	384.00	300.00	184.00	5.00	23.57	1.18	-32.75
385	385.00	300.00	185.00	5.00	23.54	1.14	-32.78
386	386.00	300.00	186.00	5.00	23.50	1.11	-32.81
387	387.00	300.00	187.00	5.00	23.47	1.08	-32.85
388	388.00	300.00	188.00	5.00	23.44	1.04	-32.88
389	389.00	300.00	189.00	5.00	23.40	1.01	-32.91

390	390.00	300.00	190.00	5.00	23.37	0.98	-32.95
391	391.00	300.00	191.00	5.00	23.34	0.94	-32.98
392	392.00	300.00	192.00	5.00	23.31	0.91	-33.01
393	393.00	300.00	193.00	5.00	23.27	0.88	-33.04
394	394.00	300.00	194.00	5.00	23.24	0.85	-33.08
395	395.00	300.00	195.00	5.00	23.21	0.82	-33.11
396	396.00	300.00	196.00	5.00	23.18	0.78	-33.14
397	397.00	300.00	197.00	5.00	23.14	0.75	-33.17
398	398.00	300.00	198.00	5.00	23.11	0.72	-33.20
399	399.00	300.00	199.00	5.00	23.08	0.69	-33.24
400	400.00	300.00	200.00	5.00	23.05	0.66	-33.27

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\* BUNDLE CONFIGURATION \*

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CIRCUIT	NODE	PHASE	VOLTAGE	LOAD	ANGLE	OF	X	Y
#	#	(kV)	(AMPS)	(DEG)	COND	(ft)	(ft)	

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1	1	A	121.000	1500.00	0.00	1	-4.50	47.30
1	1	B	121.000	1500.00	240.00	1	-4.50	38.30
1	1	C	121.000	1500.00	120.00	1	-4.50	29.30
1	2	A	121.000	0.00	0.00	1	-4.50	47.30
1	2	B	121.000	0.00	0.00	1	-4.50	38.30
1	2	C	121.000	0.00	0.00	1	-4.50	29.30
2	1	A	121.000	1500.00	0.00	1	4.50	29.30
2	1	B	121.000	1500.00	240.00	1	4.50	38.30
2	1	C	121.000	1500.00	120.00	1	4.50	47.30
2	2	A	121.000	0.00	0.00	1	4.50	29.30
2	2	B	121.000	0.00	0.00	1	4.50	38.30
2	2	C	121.000	0.00	0.00	1	4.50	47.30
3	1	SW	0.000	5.75	301.28	1	-0.50	56.30
3	2	SW	0.000	0.00	0.00	1	-0.50	56.30

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\* SUBCONDUCTOR INFORMATION \*

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CIRCUIT	NODE	DIAMETER	SPACING	AC RESIST.	AC REACT.
#	#	(in)	(in)	(ohms/mi)	(ohms/mi)

\*\*\*\*\*

1	1	1.300	0.000	-NA-	-NA-
1	1	1.300	0.000	-NA-	-NA-
1	1	1.300	0.000	-NA-	-NA-

1	2	1.300	0.000	-NA-	-NA-
1	2	1.300	0.000	-NA-	-NA-
1	2	1.300	0.000	-NA-	-NA-
2	1	1.300	0.000	-NA-	-NA-
2	1	1.300	0.000	-NA-	-NA-
2	1	1.300	0.000	-NA-	-NA-
2	2	1.300	0.000	-NA-	-NA-
2	2	1.300	0.000	-NA-	-NA-
2	2	1.300	0.000	-NA-	-NA-
3	1	0.360	0.000	6.600000	1.500000
3	2	0.360	0.000	6.600000	1.500000

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