

# **TECHNICAL EXHIBIT**

**APPLICATION FOR CONSTRUCTION PERMIT  
MINOR MODIFICATION OF FACILITIES  
Bernard, Ohio, LLC.**

**RADIO STATION WVKO  
COLUMBUS, OHIO**

August 5, 2012

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1580 KHZ 5KW-D

# TABLE OF CONTENTS

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Table of Contents  
Technical Narrative

## **Exhibit 11 - Broadcast Facility**

Exhibit 11.1 – Present Daytime Service Contours  
Exhibit 11.2 – Proposed Daytime Service Contours  
Exhibit 11.3 – Present Blanketing Contour  
Exhibit 11.4 – Proposed Blanketing Contour  
Exhibit 11.5 – Community of License Coverage

**Exhibit 12 – Community Coverage** (See Technical Narrative below)

**Exhibit 13 – Main Studio Location** (See Technical Narrative below)

**Exhibit 14 – Main Interference Section** (See Technical Narrative below)

## **Exhibit 15 – Groundwave Protections**

Exhibit 15.1 – Maps of Proposed M-3 Allocation  
Exhibit 15.2 – Tabulation of Proposed Allocation  
Exhibit 15.3 – Plot of Proposed Daytime Standard Pattern  
Exhibit 15.4 – Tabulation of Proposed Daytime Standard Pattern  
Exhibit 15.5 – Day Radiation Limit Report  
Exhibit 15.6 – Tabulation of Ground Conductivity  
Exhibit 15.7 – Distance to Contour Report

**Exhibit 17 – Critical Hours Study** (See Discussion)

## **Exhibit 18 – RF Radiation Study**

Exhibit 18.1 – RF Radiation Study

RADIO STATION WVKO  
COLUMBUS, OHIO

1580KHZ 5KW-D

## **TECHNICAL NARRATIVE**

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This engineering report has been prepared in support of a minor modification for AM broadcast station WVKO, 1580 kHz, Columbus, OH.

WVKO proposes to relocate, co-locate with existing station WVSG and modify its license to operate as a daytime-only, class D station with 5kW during daytime hours utilizing four of the six WVSG towers.

The data and exhibit numbering contained herein is responsive to Section III-A of FCC Form 301.

**Exhibit 11- Broadcast Facility.** The broadcast facility remains in compliance with all applicable rules contained in *C.F.R. Chapter 47, Part 73, Subpart A*. Because the towers being utilized are existing towers in use for the WVSG night site, an aerial photograph and site plat are not included.

- A map depicting the present 0.5 mV/m, 2.0 mV/m, and 5.0 mV/m daytime service contours and City of License coverage for WVKO has been included as **Exhibit 11.1**.
- A map depicting the proposed daytime service contours and City of License coverage has been included as **Exhibit 11.2**.
- It is proposed to discontinue nighttime operation and reclassify WVSG from class B to Daytime-only, class D status.
- The present and proposed 1.0 V/m daytime "Blanket" Contours have been included in **Exhibit 11.3 and 11.4**

**Proposed Transmitter Location.** The center of the proposed WVKO facility will operate at NAD27 coordinates:

39-54-35 North

83-03-20 West

An aerial (satellite) photograph, a proposed transmitter location and an antenna site plat are not included as the proposal is from an existing facility.

**Directional Antenna System.** WVKO will utilize the existing three southern towers and the Northeast tower of the WVSG nighttime array for the WVKO daytime operation (WVSG towers 3,4,5,and 6). The radiating elements are each 91.4 meters (300ft) in height with an overall height of 94.7m (311ft) above ground level.

**Exhibit 12 - Community of License Coverage.** Presently the WVKO 5mV/m daytime signal covers 98.4% of Columbus, OH. As shown in **Figure 11.5**, daytime City of License coverage will increase from 98.4% to 99.98%.

**73.24(g) Compliance.** The proposed calculated 1000mV/m contours are depicted in Figure 11.9. It has been determined that the population according to the U.S. Census within the 1000mV/m day contour (1,600) is less than 1% (0.36%) of the population within the 25mV/m contour (444,645).

**Exhibit 13 - Main Studio Location.** The main studio location remains in compliance with the requirements of §73.1125. Studios for WVKO will remain unchanged from the present facilities inside the community of license, Columbus, OH.

**Exhibit 14 - Interference.** The proposed facility complies with all applicable rule sections. Please see **Exhibit 15** for details of those studies.

**Daytime Allocation Study.** The proposed allocation remains in compliance with the requirements of §73.37. **Exhibits 15.1 to 15.7** contain relevant allocation studies for

the proposed operation. This study was made using FCC M-3 conductivities. The distances to all groundwave contours were calculated using the equivalent distance method. Contours were calculated at five degree intervals using ground conductivity values shown on the M-3 soil map for U.S. contours. No daytime contour overlap will take place with any other existing or proposed AM facility.

**Exhibit 17 - Critical Hours.** The proposed allocation is in compliance with the requirements of 73.187. No critical hours are required for this allocation.

**Blanketing Interference.** In response to all complaints of blanketing interference, the applicant will undertake steps to mitigate the blanketing effects in accordance with the requirements of Section 73.88 of the FCC Rules. There are two AM stations other than the proposed WVKO operation within 3.2km of the proposed site. The first, WVSG is proposed to be co-located with WVKO. All appropriate filtering and duplexing equipment will be installed at the WVSG/WVKO site to allow compliant operation of the two stations on the same tower array. WMNI, 920kHz, 1kW day, 500w night is located 2.1km from the proposed tower site. FM stations within 5km include WCOL-FM (222B, 50kW), WHKC (218B, 15kW), and WUFM (204B, 5kW). TV stations operating within 5km of the proposed site include WSYX (CH48, 1,000kW), WTTE-DT (CH36 1,000kW), and WWHO (CH46 APP, 1,000kW). It is expected that no detrimental interaction will occur with any stations. A Method of Moments proof of performance will be conducted.

**Exhibit 18 - Environmental Considerations.** This instant application has been evaluated for potential of human exposure to non-ionizing radiofrequency radiation. The guidelines set forth in OET Bulletin No. 65 (Edition 97-01) and the companion Supplement A (Edition 97-01) were used as the standard for this evaluation.

The proposed 1580 kHz, WVKO facility will operate with a daytime power of 5 kW into a four tower array. WVKO will be using the WVSG unused nighttime towers 3,4,5, and 6. To maximize the degree of protection afforded to the public, the total

daytime power of 5kW has been assumed to be present in each tower. The four WVSG towers that will be used by WVKO are 172 degrees at 1580 (0.48 wavelength).

Table 2 of Supplement A specifies for 0.41- 0.5 wavelength AM towers operating on 1580 kHz with a total input power of 5.0 kW or less, the non-ionizing radiation will fall to safe levels at distances of 2 meters (6.6 feet) or more from the base of each tower. Since WVSG will not be using these towers at the same time WVKO will be using them, it is not necessary to consider the additional RFR of WVSG at these towers.

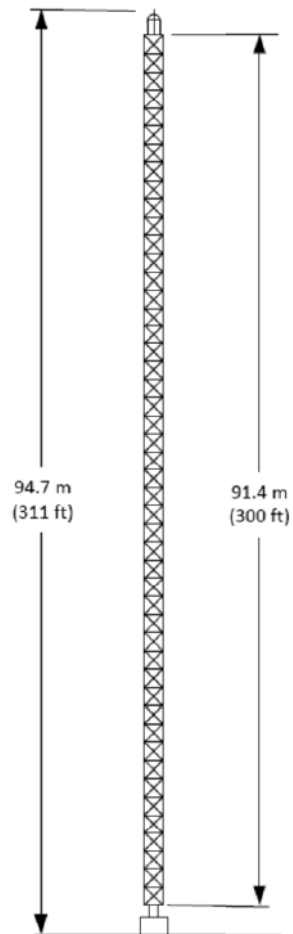
Access to areas within the fences will be limited by means of locked gates. In addition to these measures, signs will also be posted warning of the potential for exposure to excessive levels of non-ionizing radiofrequency radiation.

In the event maintenance personnel are required to work within the restricted areas, they will be advised to limit their work in the high RF field areas to specified periods of time appropriate for compliance with the FCC guidelines set forth in OET Bulletin No. 65(Edition 97-01). If their work cannot be completed within the specified period of time, it is proposed to reduce power appropriately or shut down the operation of the station to permit completion of the assignment. There are no additional sources of radiofrequency radiation subject to the guidelines of OET Bulletin No. 65 (Edition 97-01) at this location.

A handwritten signature in dark ink, appearing to read "Bert Goldman", with a stylized, flowing script.

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## WV KO- Sketch of Antenna Element



Typical, towers 3,4,5,6 WVSG

ASR's 1028403, 1028404, 1028405, 1028406

### Center of Array Coordinates

39°-54'-35" North

83°-03'-20" West

Not to Scale

# EXHIBIT 11

## DESCRIPTION OF PROPOSED DAYTIME ANTENNA SYSTEM

### ANTENNA SYSTEM

1. The antenna system will consist of four (4) vertical, insulated, guyed, uniform cross-section steel towers. These towers correspond to towers numbered 3,4,5 and 6 of the WVSG nighttime antenna array. The towers stand 172.0° or 91.4 meters above a 2.0 meter base pier and insulator for a height of 48.3 meters Above Ground Level (AGL). No obstruction lighting is required. Given the site elevation of 320.3 meters AMSL. The towers all have ASR existing numbers. There will be no change in the existing towers. ASR numbers are 1028403, 1028404, 1028405, 1028406.
2. The geographical coordinates for the center of the proposed antenna array is 39 degrees, 54 minutes, 35 seconds North Latitude, 83 degrees, 03 minutes, 20 seconds West Longitude, referenced to the 1927 North American Datum (NAD27)
3. WVKO will utilize the existing ground system for WVSG, 820kHz.
4. Proposed antenna system theoretical parameters:

PROPOSED DAYTIME THEORETICAL PARAMETERS					
TOWER	WVSG #	FIELD	PHASE	SPACING	ORIENTATION
1 (SC)	5	1.000	0.0°	0.0°	0.0°
2 (SW)	4	1.172	78.0°	172.0°	244.5°
3 (SE)	6	0.457	-113.8°	172.0°	64.5°
4(NE)	3	0.426	-123.4°	188.6°	14.3°

**All towers are 172 degrees at 1580kHz.**

5. The theoretical RMS for the proposed daytime array will be 791.86 mV/m at one kilometer. The standard pattern RMS will be 831.78 mV/m at one kilometer.
6. The sampling system for the proposed array will conform to §73.68 of the Commission's Rules regarding approved sampling systems.



EXHIBIT 11.1 WKCO Licensed 5mV/m, 2mV/m, and 0.5mV/m Service Contours

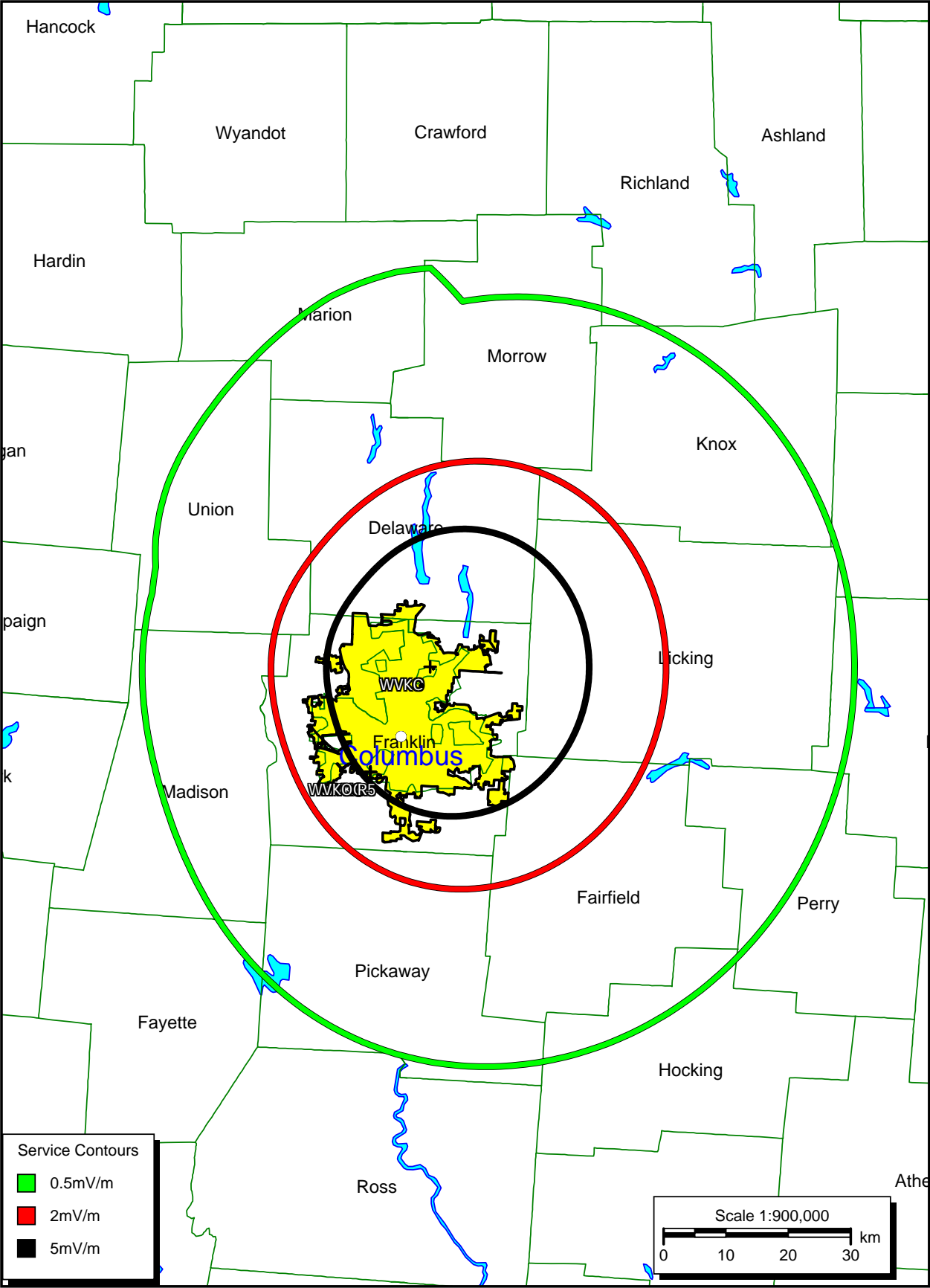


EXHIBIT 11.2 WVCO Proposed 5mV/m, 2mV/m, and 0.5mV/m Service Contours

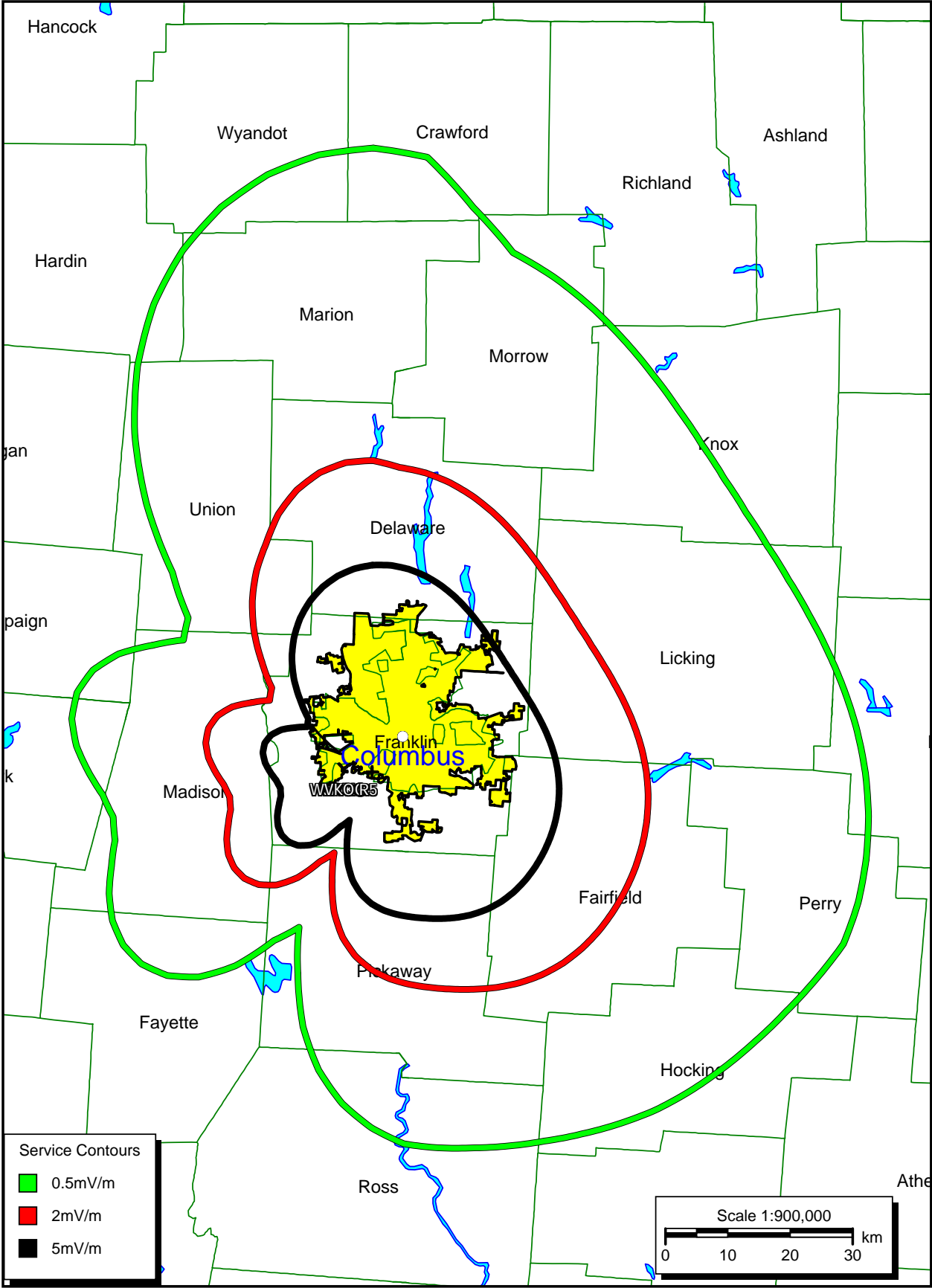
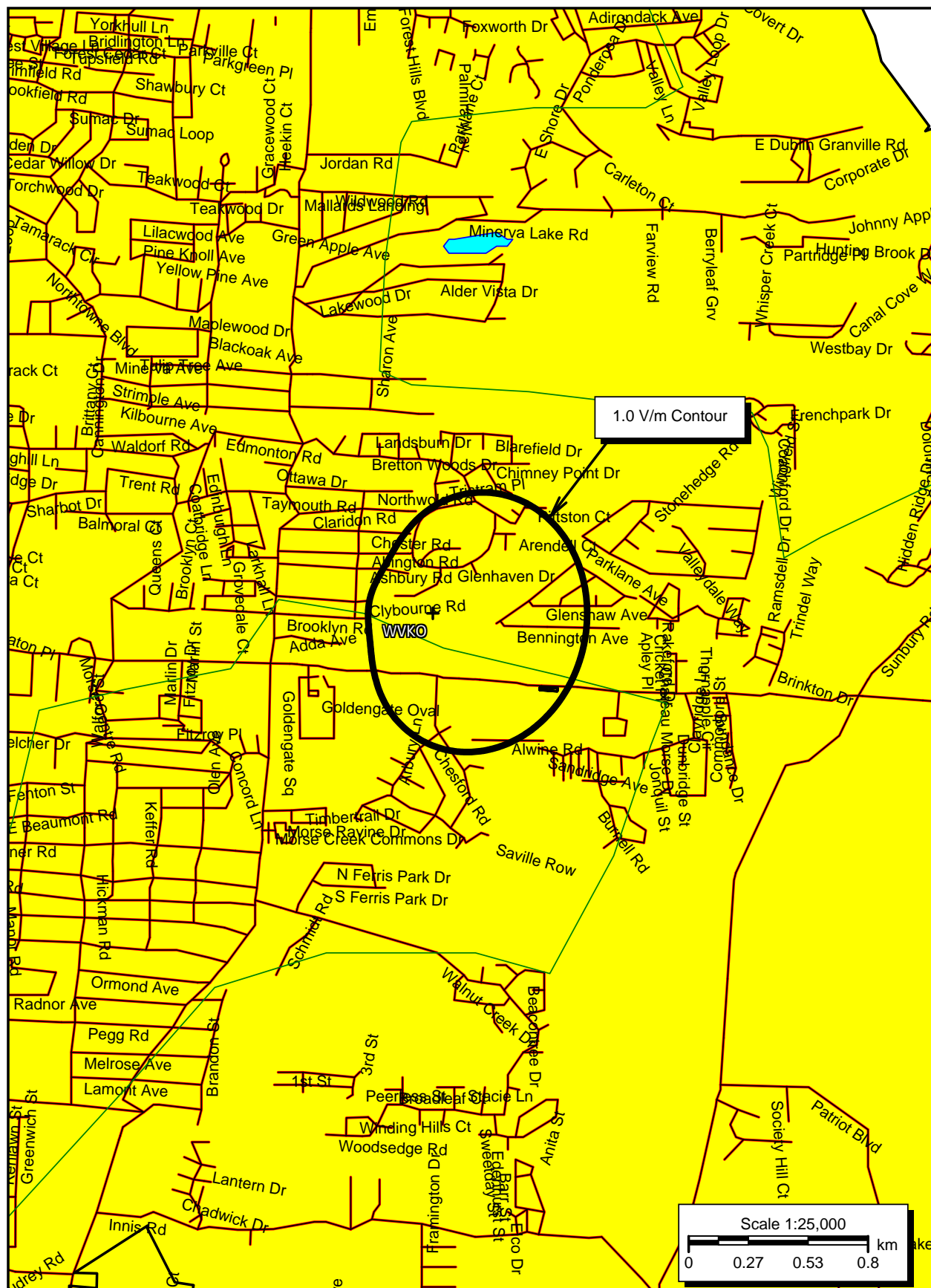
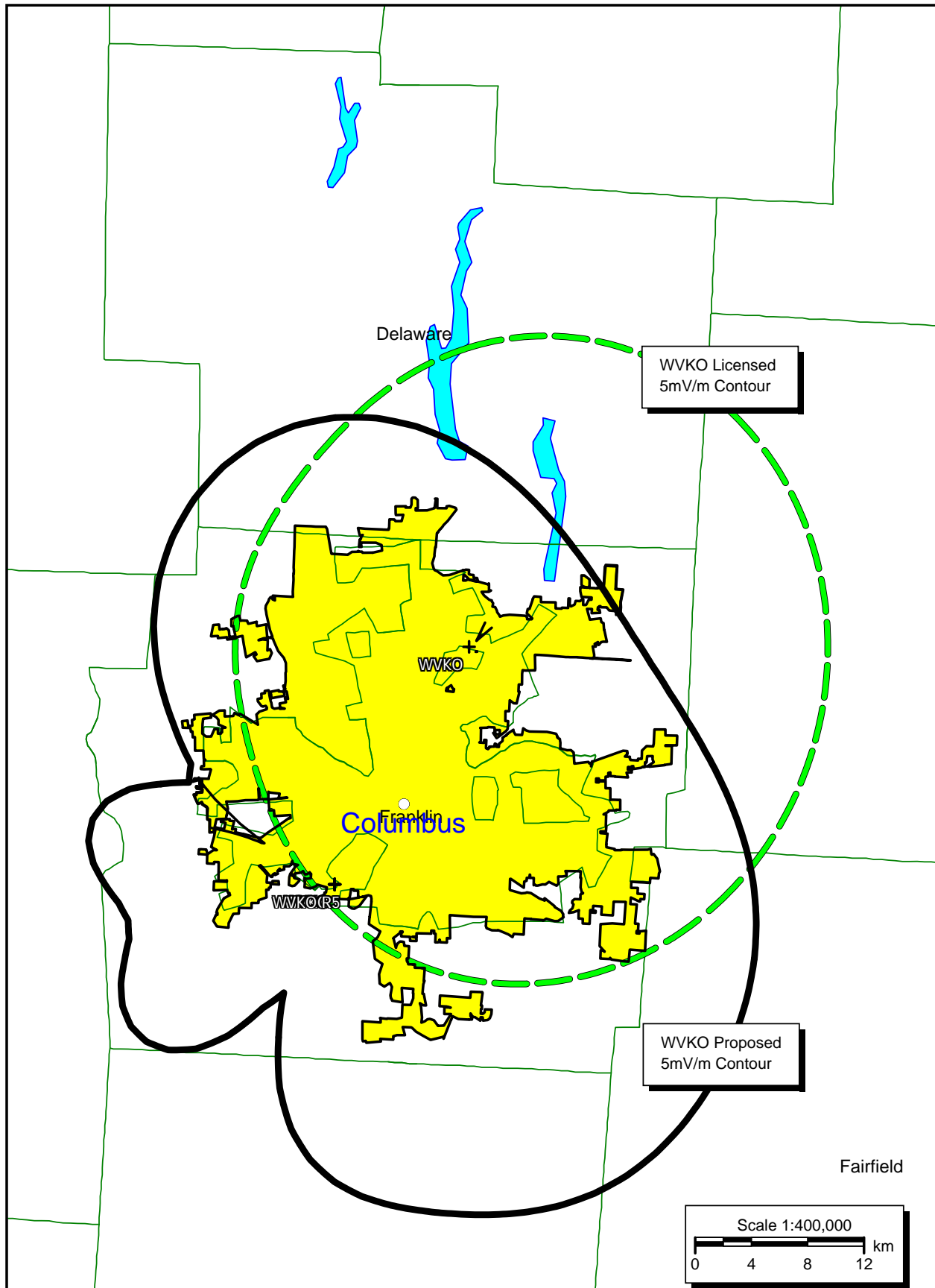


EXHIBIT 11.3 WVCO Licensed 1.0V/m Daytime "Blanket" Contour



The map displays a residential area with numerous streets. A thick black line represents the 1.0 V/m contour, which is irregular and roughly oval-shaped, centered around the WWKOR5 station. The station is marked with a black cross and labeled 'WWKOR5'. A white box with a black border contains the text '1.0 V/m Contour' with an arrow pointing to the black line. The map includes a scale bar at the bottom right indicating a scale of 1:25,000, with distances marked in kilometers (0, 0.27, 0.53, 0.8 km). The background is yellow, and the streets are shown in red lines. A green line represents a creek or river flowing through the area.

# EXHIBIT 11.5 WVKO Licensed vs. Proposed Community of License Coverage



## Exhibit 15.1 WVKO Proposed Daytime Contours

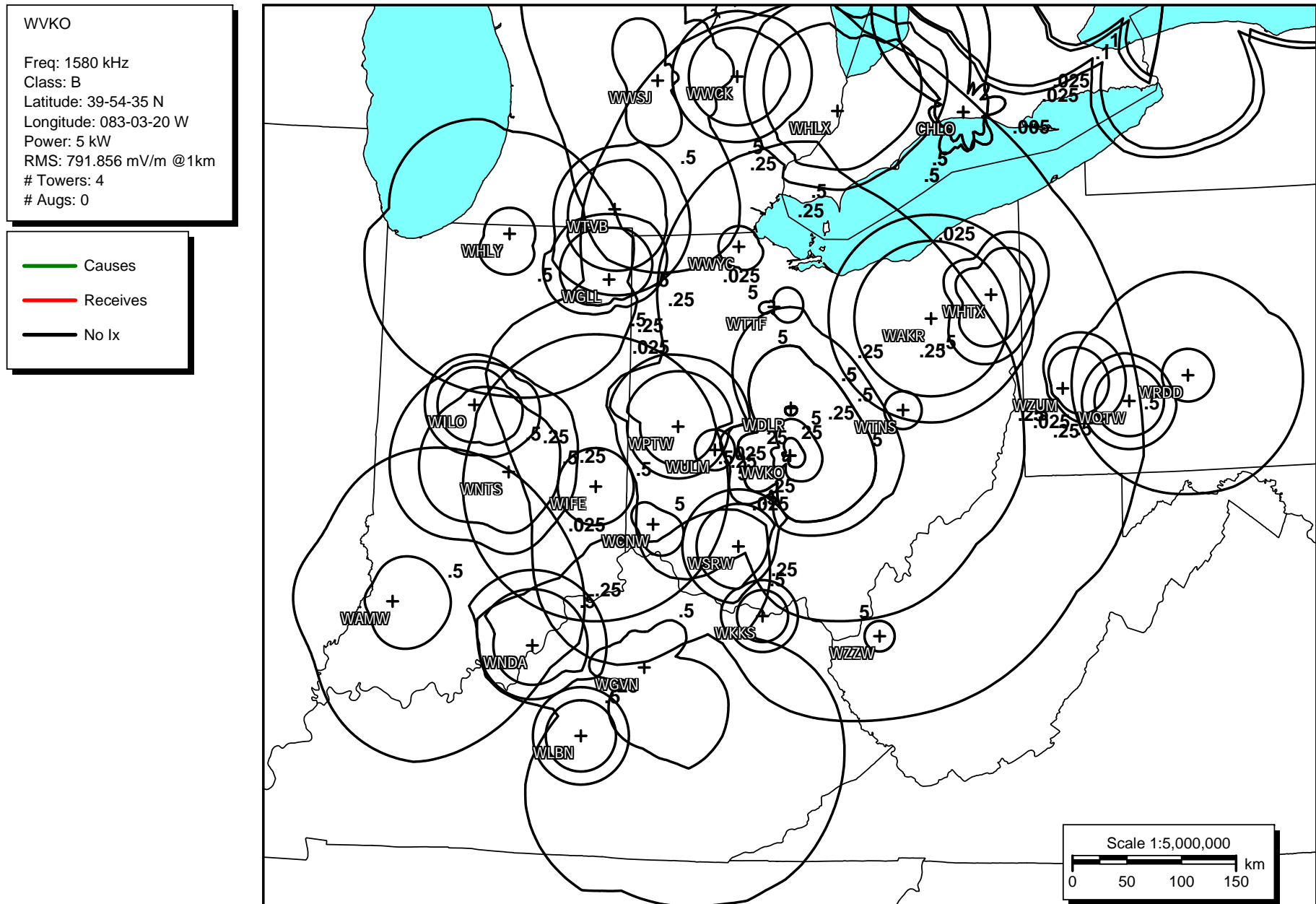


Exhibit 15.2 WVKO Proposed Daytime Contours (Close-in)

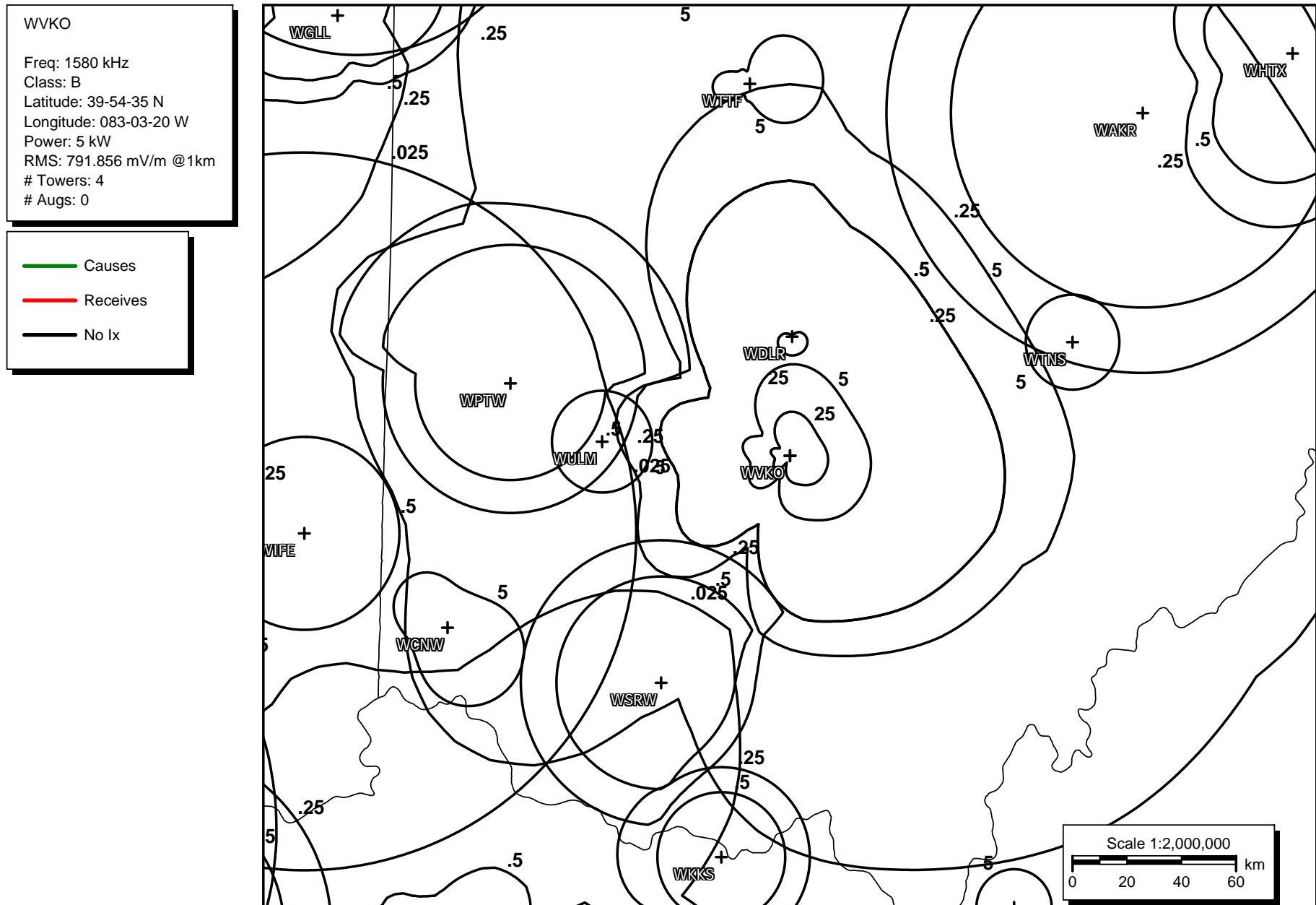




Exhibit 15.3 WVKO Proposed Co-Channel Daytime Allocation

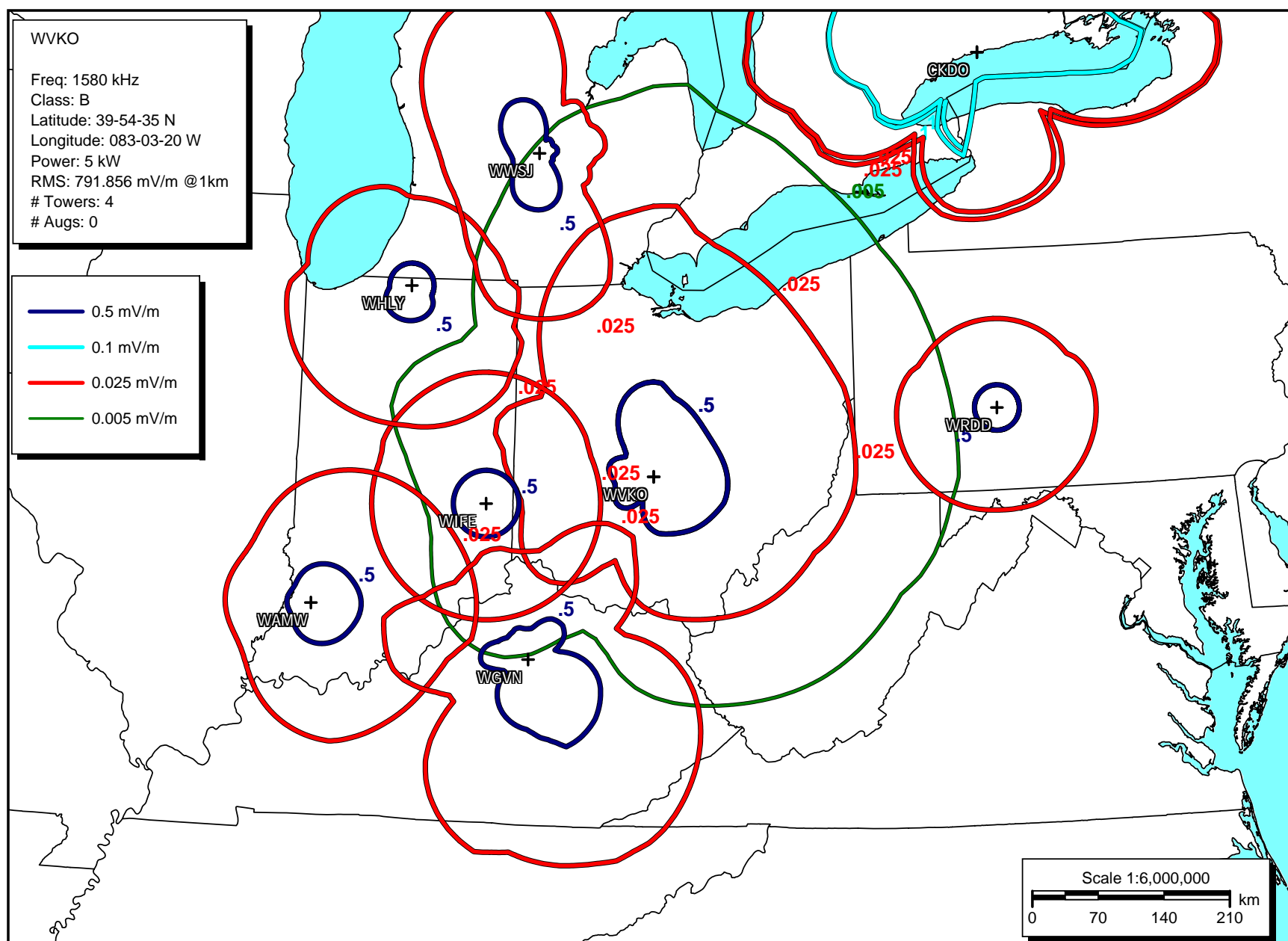




Exhibit 15.4 WVKO Proposed 1st Adjacent-Channel Daytime Allocation

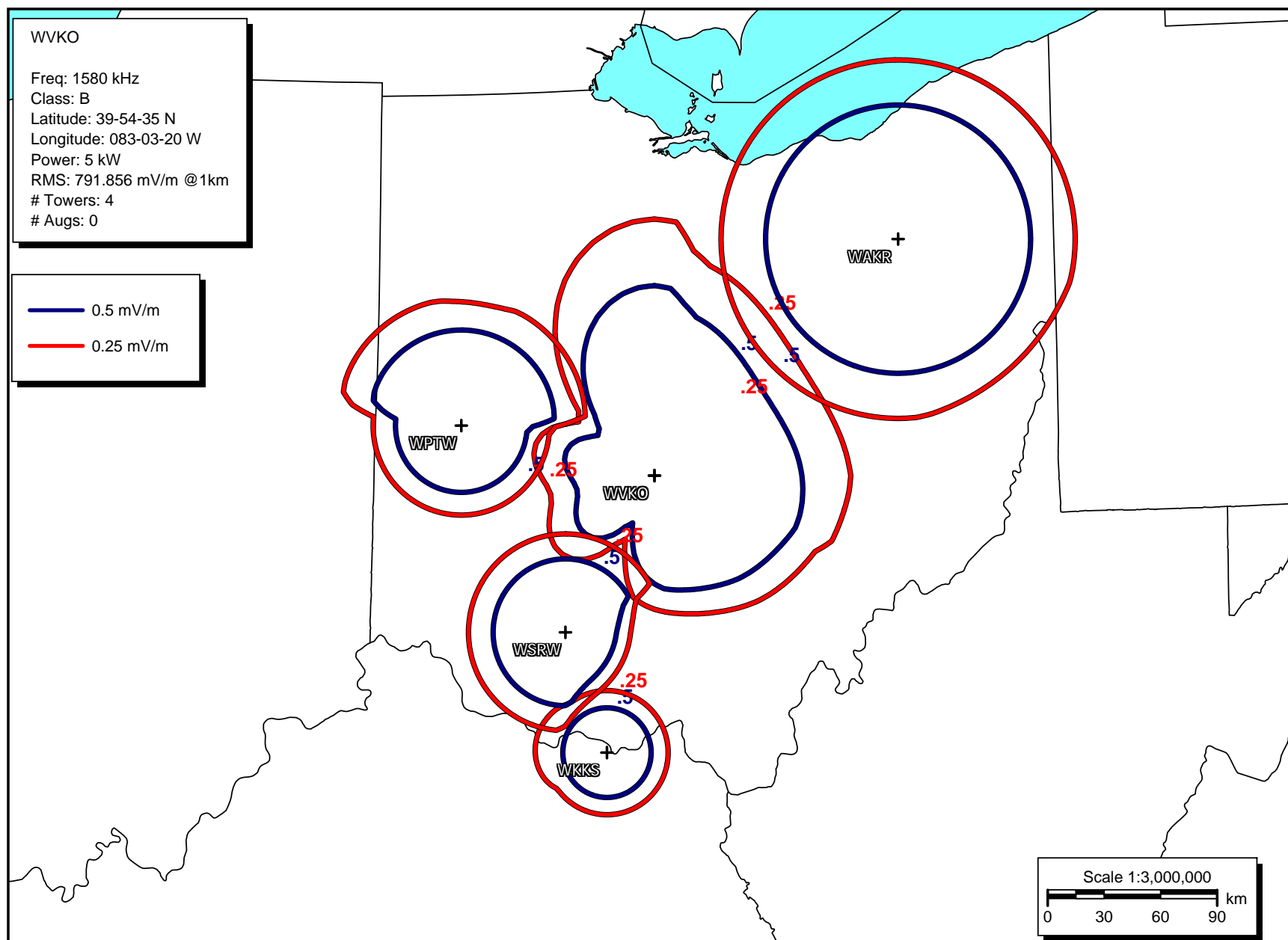
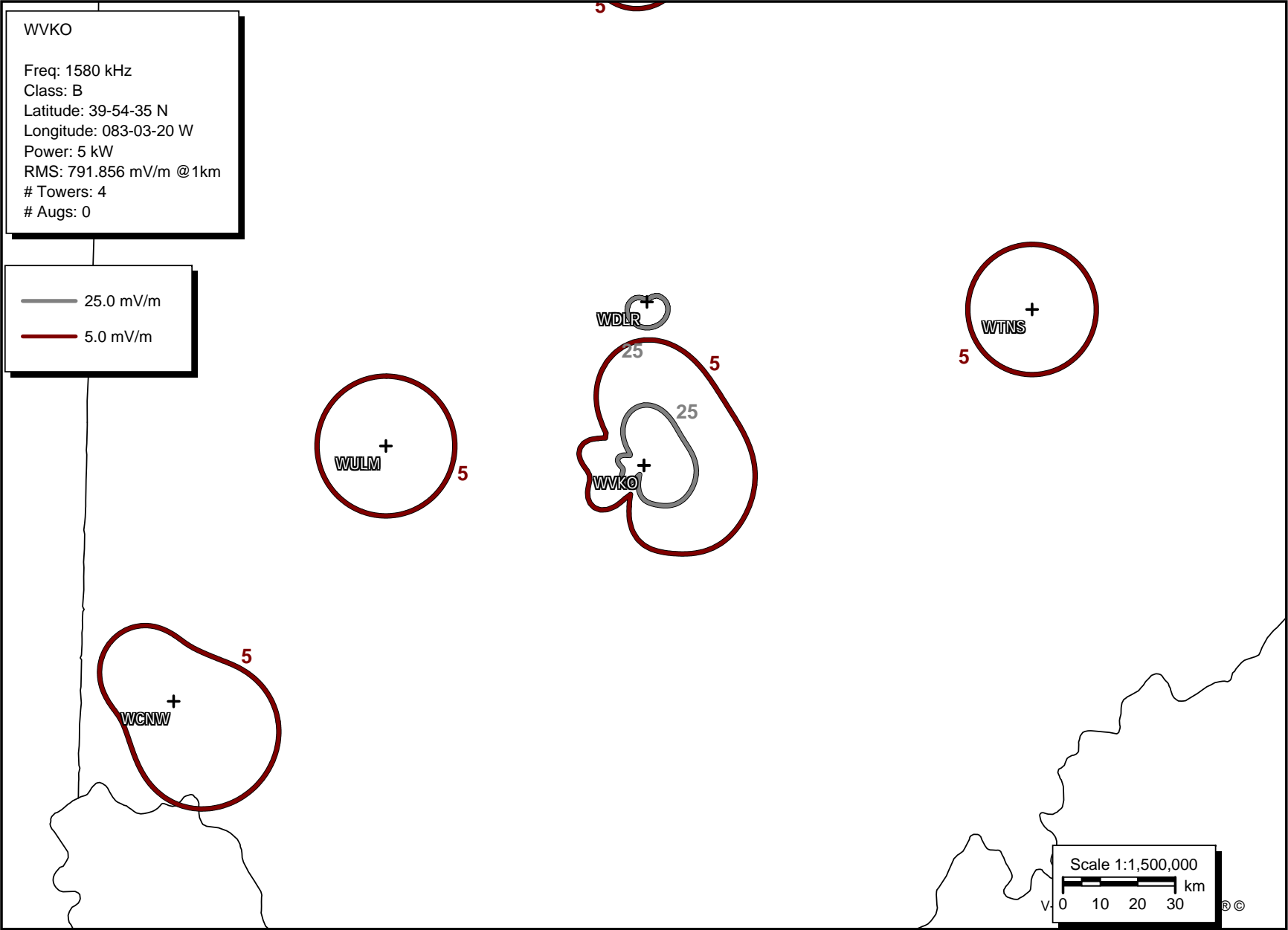


Exhibit 15.5 WVKO Proposed 2nd-3rd Adjacent-Channel Daytime Allocation



# AM Daytime Study

## Reference Station:

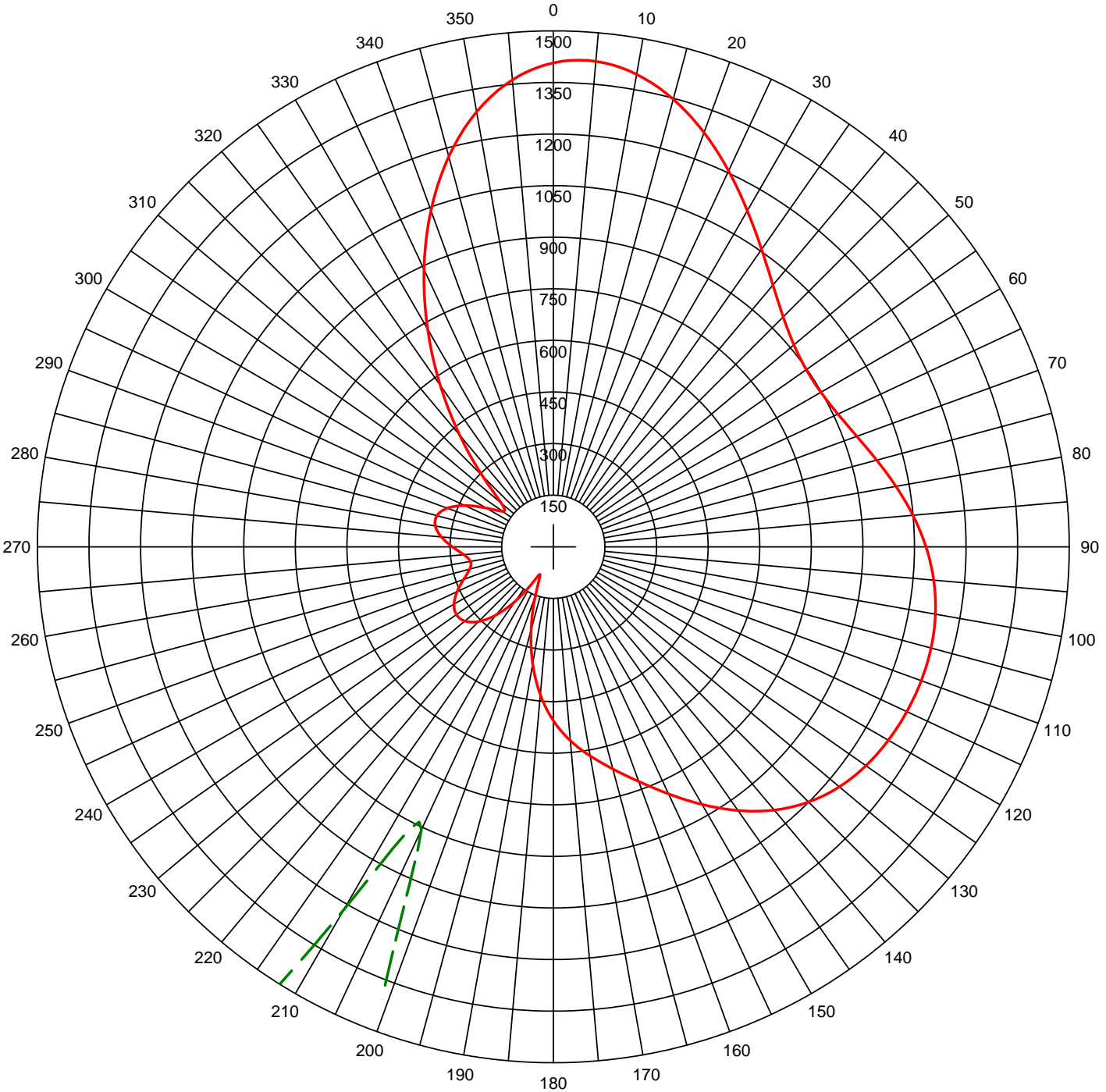
Call: WVKO Freq: 1580 kHz COLUMBUS, OH, US  
 Lat: 39-54-35 N Power: 5.0 kW  
 Lng: 083-03-20 W Theo RMS: 791.86 mV/m @ 1km

#	Field Ratio	Phase (deg)	Spacing (deg)	Orient (deg)	Height (deg)	Ref Swtch	TL Swtch	A (deg)	B (deg)	C (deg)	D (deg)
1	1.000	0.0	0.0	0.0	172.0	0	0	0.0	0.0	0.0	0.0
2	1.172	78.0	172.0	244.5	172.0	0	0	0.0	0.0	0.0	0.0
3	0.457	-113.8	172.0	64.5	172.0	0	0	0.0	0.0	0.0	0.0
4	0.426	-123.4	188.6	14.3	172.0	0	0	0.0	0.0	0.0	0.0

Call	Freq	City	ST	Dist	Azi	In	Out
WIFE	1580	CONNERSVILLE	IN	181.8	259.8	16.70	1.63
WPTW	1570	PIQUA	OH	106.7	283.5	10.51	5.81
WAKR	1590	AKRON	OH	180.3	47.3	11.56	10.55
WSRW	1590	HILLSBORO	OH	95.2	209.7	12.29	14.79
WDLR	1550	DELAWARE	OH	43.2	1.1	20.49	20.49
WULM	1600	SPRINGFIELD	OH	69.7	273.7	33.95	33.95
WGVN	1580	GEORGETOWN	KY	234.8	214.1	27.77	52.69
WWSJ	1580	ST. JOHNS	MI	362.1	339.3	104.94	52.85
WKKS	1570	VANCEBURG	KY	147.9	189.7	66.72	59.27
WTNS	1560	COSHOCTON	OH	112.4	69.2	67.08	67.08
WTF	1600	TIFFIN	OH	135.8	353.6	96.15	96.15
WHTX	1570	WARREN	OH	236.4	53.2	113.17	101.34
WCNW	1560	FAIRFIELD	OH	141.2	242.9	104.30	104.30
WTVB	1590	COLDWATER	MI	276.2	322.9	133.69	130.19
WRDD	1580	EBENSBURG	PA	375.2	81.5	189.64	132.11
CKDO	1580	OSHAWA	ON	565.9	40.4	360.97	136.65
WHLX	1590	MARINE CITY	MI	316.2	8.3	150.28	137.43
WWYC	1560	TOLEDO	OH	195.5	345.7	142.66	142.66
WZZW	1600	MILTON	WV	183.7	153.8	143.68	143.68
WGLL	1570	AUBURN	IN	231.4	312.4	155.74	144.99
WZUM	1590	CARNEGIE	PA	259.4	78.2	168.66	147.50
WHLY	1580	SOUTH BEND	IN	328.2	305.9	150.93	149.35
CKDO	1580	OSHAWA	ON	565.9	40.4	377.61	150.25
WNTS	1590	BEECH GROVE	IN	260.6	264.9	153.10	154.13
WWCK	1570	FLINT	MI	348.0	351.6	190.54	171.38
WNDA	1570	NEW ALBANY	IN	294.0	232.5	176.80	177.73
WQTW	1570	LATROBE	PA	317.6	83.3	196.29	182.51
WILO	1570	FRANKFORT	IN	295.3	276.8	185.02	184.65
WAMW	1580	WASHINGTON	IN	390.5	247.6	174.72	187.92
CHLO	1570	ST. THOMAS	ON	350.9	28.4	227.40	227.40
WLBN	1590	LEBANON	KY	319.5	215.9	235.10	233.31
CHLO	1570	ST. THOMAS	ON	350.9	28.4	244.52	244.52

Negative values in the "In" and "Out" columns reflect km<sup>2</sup> areas of Incoming and Outgoing overlap respectively. Positive values reflect linear distance of clearance to the offending contour on the direct line of bearing only. In response to FCC attempts to streamline the application process, tabulations of distances to contours and Map M-3 Conductivities for each station have been omitted. Tabulations will be supplied upon request.

WVKO Daytime Proposed



Theo RMS: 791.856 mV/m@1km  
Std RMS: 831.78 mV/m@1km  
Q: 22.361 mV/m@1km

Standard Horizontal Plane Pattern

— Pattern (mV/m @ 1km)  
- - - Pattern X10

#	Field Ratio	Phase (deg)	Spacing (deg)	Orient (deg)	Height (deg)	Ref Switch	TL Switch	A (deg)	B (deg)	C (deg)	D (deg)
1	1.000	0.0	0.0	0.0	172.0	0	0	0.0	0.0	0.0	0.0
2	1.172	78.0	172.0	244.5	172.0	0	0	0.0	0.0	0.0	0.0
3	0.457	-113.8	172.0	64.5	172.0	0	0	0.0	0.0	0.0	0.0
4	0.426	-123.4	188.6	14.3	172.0	0	0	0.0	0.0	0.0	0.0

Call: WVKO  
Freq: 1580 kHz  
COLUMBUS, OH, US  
Hours: D  
Lat: 39-54-35 N  
Lng: 083-03-20 W  
Power: 5.0 kW  
Theo RMS: 791.86 mV/m@1km  
@ 5.0 kW

## WVKO Stations Report

Reference Station: WVKO, 1580 kHz  
 Location: 39-54-35 N, 083-03-20 W

\*\*\* 1550 kHz (-3) \*\*\*  
 43.2 km WDLR L 40-17-56 N 083-02-46 W 0.5 kW DA2 - 202.8 mV/m@1km  
 26.9 mi Azi: 1.1 Class: D Sched: U File #: BL  
 Location: DELAWARE, OH, US

\*\*\* 1560 kHz (-2) \*\*\*  
 112.4 km WTNS L 40-16-30 N 081-49-37 W 1.0 kW NDD - 329.9 mV/m@1km  
 69.8 mi Azi: 69.2 Class: D Sched: D File #: BL  
 Location: COSHOCTON, OH, US  
 141.2 km WCNW L 39-20-20 N 084-31-30 W 5.0 kW DA2 - 651.8 mV/m@1km  
 87.7 mi Azi: 242.9 Class: D Sched: D File #: BL  
 Location: FAIRFIELD, OH, US  
 195.5 km WWYC L 41-37-00 N 083-37-17 W 1.5 kW ND3 - 322.0 mV/m@1km  
 121.5 mi Azi: 345.7 Class: D Sched: U File #: BL20100412AFI  
 Location: TOLEDO, OH, US

\*\*\* 1570 kHz (-1) \*\*\*  
 106.7 km WPTW L 40-08-25 N 084-16-07 W 0.25 kW ND1 - 321.9 mV/m@1km  
 66.3 mi Azi: 283.5 Class: B Sched: U File #: BP19930112DA  
 Location: PIQUA, OH, US  
 147.9 km WKKS L 38-35-50 N 083-20-50 W 1.0 kW NDD - 302.6 mV/m@1km  
 91.9 mi Azi: 189.7 Class: D Sched: D File #: BL19880204AE  
 Location: VANCEBURG, KY, US  
 231.4 km WGLL L 41-20-01 N 085-03-08 W 0.5 kW DA2 - 224.0 mV/m@1km  
 143.8 mi Azi: 312.4 Class: D Sched: U File #: BL  
 Location: AUBURN, IN, US  
 236.4 km WHTX L 41-12-22 N 080-50-29 W 0.5 kW DA2 - 204.7 mV/m@1km  
 146.9 mi Azi: 53.2 Class: D Sched: U File #: BL  
 Location: WARREN, OH, US  
 294.0 km WNDA L 38-19-40 N 085-46-56 W 1.5 kW ND1 - 317.9 mV/m@1km  
 182.7 mi Azi: 232.5 Class: B Sched: U File #: BL19890606AH  
 Location: NEW ALBANY, IN, US  
 295.3 km WILO L 40-16-40 N 086-29-07 W 0.25 kW ND1 - 301.0 mV/m@1km  
 183.5 mi Azi: 276.8 Class: B Sched: U File #: BL  
 Location: FRANKFORT, IN, US  
 317.6 km WQTW L 40-18-07 N 079-21-56 W 1.0 kW NDD - 304.2 mV/m@1km  
 197.3 mi Azi: 83.3 Class: D Sched: D File #: BL5942  
 Location: LATROBE, PA, US  
 348.0 km WWCK L 43-00-39 N 083-39-03 W 1.0 kW ND1 - 282.0 mV/m@1km  
 216.2 mi Azi: 351.6 Class: D Sched: U File #: BL19970124AE  
 Location: FLINT, MI, US  
 350.9 km CHLO 42-42-22 N 081-06-20 W 10.0 kW DA2 - 957.6 mV/m@1km  
 218.0 mi Azi: 28.4 Class: B Sched: U File #:  
 Location: ST. THOMAS, ON, CA  
 350.9 km CHLO 42-42-22 N 081-06-20 W 10.0 kW DA2 - 967.2 mV/m@1km  
 218.0 mi Azi: 28.4 Class: B Sched: U File #:  
 Location: ST. THOMAS, ON, CA

\*\*\* 1580 kHz (CO) \*\*\*  
 181.8 km WIFE L 39-38-18 N 085-08-54 W 0.25 kW ND1 - 320.3 mV/m@1km  
 113.0 mi Azi: 259.8 Class: D Sched: U File #: BL19790618AF  
 Location: CONNERSVILLE, IN, US  
 234.8 km WGVN L 38-10-05 N 084-35-37 W 10.0 kW DA2 - 914.1 mV/m@1km  
 145.9 mi Azi: 214.1 Class: D Sched: U File #:

Location: GEORGETOWN, KY, US  
 328.2 km WHLY L 41-41-09 N 086-09-53 W 1.0 kW DAN - 305.8 mV/m@1km  
 203.9 mi Azi: 305.9 Class: B Sched: U File #: BL19880812AB  
 Location: SOUTH BEND, IN, US  
 362.1 km WWSJ L 42-58-14 N 084-32-59 W 1.0 kW DA2 - 283.2 mV/m@1km  
 225.0 mi Azi: 339.3 Class: D Sched: U File #: BL  
 Location: ST. JOHNS, MI, US  
 375.2 km WRDD L 40-29-33 N 078-42-54 W 1.0 kW ND1 - 312.2 mV/m@1km  
 233.1 mi Azi: 81.5 Class: D Sched: U File #: BL  
 Location: EBENSBURG, PA, US  
 390.5 km WAMW L 38-38-47 N 087-16-48 W 0.5 kW DAD - 240.7 mV/m@1km  
 242.7 mi Azi: 247.6 Class: D Sched: U File #: BL19911220AB  
 Location: WASHINGTON, IN, US  
 565.9 km CKDO 43-52-19 N 078-45-54 W 10.0 kW DA2 - 1007.0 mV/m@1km  
 351.7 mi Azi: 40.4 Class: A Sched: U File #:  
 Location: OSHAWA, ON, CA  
 565.9 km CKDO 43-52-19 N 078-45-54 W 10.0 kW DA2 - 1007.0 mV/m@1km  
 351.7 mi Azi: 40.4 Class: A Sched: U File #:  
 Location: OSHAWA, ON, CA

\*\*\* 1590 kHz (+1) \*\*\*  
 95.2 km WSRW L 39-09-58 N 083-36-25 W 0.5 kW ND2 - 284.9 mV/m@1km  
 59.2 mi Azi: 209.7 Class: D Sched: U File #: BL19850913AA  
 Location: HILLSBORO, OH, US  
 180.3 km WAKR L 41-01-14 N 081-30-20 W 5.0 kW DAN - 375.0 mV/m@1km  
 112.0 mi Azi: 47.3 Class: B Sched: U File #: BL  
 Location: AKRON, OH, US  
 259.4 km WZUM L 40-25-28 N 080-05-05 W 1.0 kW DA2 - 317.9 mV/m@1km  
 161.2 mi Azi: 78.2 Class: D Sched: U File #: BL20060111ADG  
 Location: CARNEGIE, PA, US  
 260.6 km WNTS L 39-44-21 N 086-05-29 W 5.0 kW DA2 - 700.1 mV/m@1km  
 161.9 mi Azi: 264.9 Class: B Sched: U File #: BL19791113AG  
 Location: BEECH GROVE, IN, US  
 276.2 km WTVB L 41-54-34 N 085-00-21 W 5.0 kW DAN - 317.0 mV/m@1km  
 171.6 mi Azi: 322.9 Class: B Sched: U File #: BL  
 Location: COLDWATER, MI, US  
 316.2 km WHLX L 42-43-42 N 082-31-15 W 1.0 kW DA2 - 338.0 mV/m@1km  
 196.5 mi Azi: 8.3 Class: D Sched: U File #: BL  
 Location: MARINE CITY, MI, US  
 319.5 km WLBN L 37-35-55 N 085-14-47 W 1.0 kW ND1 - 312.2 mV/m@1km  
 198.5 mi Azi: 215.9 Class: D Sched: U File #: BL  
 Location: LEBANON, KY, US

\*\*\* 1600 kHz (+2) \*\*\*  
 69.7 km WULM L 39-57-11 N 083-52-07 W 1.0 kW ND1 - 381.4 mV/m@1km  
 43.3 mi Azi: 273.7 Class: D Sched: U File #: BL19871230AG  
 Location: SPRINGFIELD, OH, US  
 135.8 km WTTF L 41-07-32 N 083-13-55 W 0.5 kW DA2 - 201.2 mV/m@1km  
 84.4 mi Azi: 353.6 Class: D Sched: U File #: BL  
 Location: TIFFIN, OH, US  
 183.7 km WZZW L 38-25-46 N 082-06-21 W 5.0 kW ND1 - 437.4 mV/m@1km  
 114.1 mi Azi: 153.8 Class: D Sched: U File #: BL19880502AE  
 Location: MILTON, WV, US

# WVCO Radiation Limit Report

Radiation Limit Report for WVCO

Frequency: 1580 kHz

Latitude: 39-54-35 N Longitude: 083-03-20 W

\* indicates contour of proposed station

Azi (deg)	Rad Limit (mV/m@1km)	Call Letters	Contour Overlap	Azi (deg)	Rad Limit (mV/m@1km)	Call Letters	Contour Overlap
0	8768.5	WDLR	[25.000 25.000*]	180	6639.9	WKKS	[0.500* 0.250]
5	9085.6	WDLR	[25.000 25.000*]	185	438.7	WSRW	[0.500* 0.250]
10	9999.9	No Limit		190	356.8	WSRW	[0.500* 0.250]
15	4738.4	WAKR	[0.500* 0.250]	195	310.3	WSRW	[0.500 0.250*]
20	2512.0	WAKR	[0.500* 0.250]	200	272.1	WSRW	[0.500 0.250*]
25	1923.7	WAKR	[0.500* 0.250]	205	253.5	WSRW	[0.500 0.250*]
30	1627.0	WAKR	[0.500* 0.250]	210	247.8	WSRW	[0.500 0.250*]
35	1382.1	WAKR	[0.500 0.250*]	215	253.3	WSRW	[0.500 0.250*]
40	1258.2	WAKR	[0.500 0.250*]	220	271.7	WSRW	[0.500 0.250*]
45	1211.2	WAKR	[0.500 0.250*]	225	309.5	WSRW	[0.500 0.250*]
50	1225.3	WAKR	[0.500 0.250*]	230	355.9	WSRW	[0.500* 0.250]
55	1305.0	WAKR	[0.500 0.250*]	235	436.9	WSRW	[0.500* 0.250]
60	1481.4	WAKR	[0.500 0.250*]	240	613.5	WSRW	[0.500* 0.250]
65	1745.5	WAKR	[0.500* 0.250]	245	642.3	WIFE	[0.500* 0.025]
70	2145.2	WAKR	[0.500* 0.250]	250	594.8	WIFE	[0.500* 0.025]
75	3057.2	WAKR	[0.500* 0.250]	255	282.2	WIFE	[0.500 0.025*]
80	7191.6	WRDD	[0.500 0.025*]	260	259.0	WIFE	[0.500 0.025*]
85	9999.9	No Limit		265	267.1	WIFE	[0.500 0.025*]
90	9999.9	No Limit		270	319.8	WIFE	[0.500 0.025*]
95	9999.9	No Limit		275	476.7	WPTW	[0.500 0.250*]
100	9999.9	No Limit		280	440.0	WPTW	[0.500 0.250*]
105	9999.9	No Limit		285	431.4	WPTW	[0.500 0.250*]
110	9999.9	No Limit		290	423.8	WPTW	[0.500 0.250*]
115	9999.9	No Limit		295	344.9	WPTW	[0.500 0.250*]
120	9999.9	No Limit		300	294.3	WPTW	[0.500 0.250*]
125	9999.9	No Limit		305	320.7	WPTW	[0.500 0.250*]
130	9999.9	No Limit		310	343.4	WPTW	[0.500* 0.250]
135	9999.9	No Limit		315	393.6	WPTW	[0.500* 0.250]
140	9999.9	No Limit		320	518.8	WPTW	[0.500* 0.250]
145	9999.9	No Limit		325	6890.1	WTVB	[0.500 0.250*]
150	9999.9	No Limit		330	7884.1	WTVB	[0.500 0.250*]
155	9999.9	No Limit		335	2586.4	WWSJ	[0.500 0.025*]
160	9999.9	No Limit		340	2263.9	WWSJ	[0.500 0.025*]
165	9999.9	No Limit		345	8777.0	WWSJ	[0.500* 0.025]
170	9999.9	No Limit		350	9999.9	No Limit	
175	9999.9	No Limit		355	9878.7	WDLR	[25.000 25.000*]

# WVKO Conductivity Report

Latitude: 39-54-35 N  
Longitude: 083-03-20 W

Conductivity Database Used: M3 (USA)

Ground Conductivity Data:										
Region conductivity in mS/m followed by distance in km										
Azimuth	to the end of region. E - map data; M - measurement data.									
0.0	8.0E	46.0	15.0E	186.4	8.0E	217.6	10.0E	236.7	20.0E	267.4
	8.0E	306.6	15.0E	456.5	8.0E	629.1	10.0E	659.5	4.0E	671.4
	10.0E	696.2	2.0E	1000.0						
5.0	8.0E	50.0	15.0E	170.8	8.0E	175.7	15.0E	181.8	8.0E	206.9
	10.0E	232.8	20.0E	307.5	15.0E	421.5	8.0E	573.3	10.0E	643.9
	4.0E	678.1	10.0E	694.9	2.0E	998.6	6.0E	1000.0		
10.0	8.0E	58.1	15.0E	77.1	8.0E	173.1	15.0E	173.9	8.0E	199.7
	10.0E	235.5	20.0E	352.4	10.0E	393.7	8.0E	421.7	10.0E	682.8
	2.0E	687.6	10.0E	688.9	2.0E	982.9	6.0E	1000.0		
15.0	8.0E	202.7	10.0E	262.1	20.0E	382.5	6.0E	389.4	10.0E	421.3
	6.0E	520.6	4.0E	536.1	10.0E	546.0	4.0E	582.6	10.0E	693.1
	2.0E	993.9	6.0E	1000.0						
20.0	8.0E	222.3	10.0E	278.1	20.0E	390.4	6.0E	511.9	4.0E	563.9
	10.0E	647.4	1.0E	658.8	2.0E	1000.0				
25.0	8.0E	251.1	10.0E	337.5	20.0E	385.0	4.0E	407.6	6.0E	484.9
	4.0E	570.7	10.0E	574.3	4.0E	600.6	10.0E	609.8	1.0E	747.5
	2.0E	1000.0								
30.0	8.0E	286.3	10.0E	354.8	4.0E	563.7	6.0E	626.5	1.0E	820.5
	2.0E	1000.0								
35.0	8.0E	319.1	10.0E	364.9	4.0E	371.8	10.0E	374.3	4.0E	400.6
	20.0E	463.6	15.0E	512.1	6.0E	659.8	1.0E	784.8	4.0E	850.2
	2.0E	1000.0								
40.0	8.0E	290.0	4.0E	291.5	8.0E	357.9	10.0E	432.3	20.0E	495.5
	15.0E	500.3	8.0E	539.4	15.0E	600.1	6.0E	638.7	4.0E	742.0
	1.0E	765.9	4.0E	880.6	2.0E	1000.0				
45.0	8.0E	306.9	4.0E	376.4	8.0E	469.6	10.0E	474.7	8.0E	596.7
	15.0E	656.7	4.0E	669.9	15.0E	677.1	10.0E	940.1	4.0E	963.0
	2.0E	1000.0								
50.0	8.0E	330.0	4.0E	515.1	8.0E	581.7	4.0E	608.2	8.0E	709.9
	4.0E	940.0	10.0E	1000.0						
55.0	8.0E	328.2	2.0E	377.3	4.0E	917.1	2.0E	1000.0		
60.0	8.0E	297.7	2.0E	404.6	4.0E	814.7	2.0E	972.7	1.0E	1000.0
65.0	8.0E	246.8	4.0E	301.4	2.0E	446.9	4.0E	906.9	1.0E	1000.0
70.0	8.0E	192.0	4.0E	314.0	2.0E	511.0	4.0E	861.8	1.0E	952.1
	2.0E	978.8	1.0E	987.0	2.0E	1000.0				
75.0	8.0E	159.5	4.0E	328.5	2.0E	592.3	4.0E	681.1	2.0E	752.7
	4.0E	801.2	1.0E	863.0	2.0E	996.8	5000.0E	1000.0		
80.0	8.0E	137.7	4.0E	346.6	2.0E	397.1	4.0E	460.0	2.0E	621.3
	4.0E	776.2	5000.0E	778.8	4.0E	784.0	5000.0E	785.1	4.0E	800.9
	0.5E	898.3	5000.0E	1000.0						
85.0	8.0E	120.5	4.0E	446.1	2.0E	523.3	4.0E	769.0	5000.0E	1000.0
90.0	8.0E	107.7	4.0E	428.0	2.0E	496.1	4.0E	640.2	5000.0E	644.2
	4.0E	747.8	5000.0E	1000.0						
95.0	8.0E	98.0	4.0E	200.4	2.0E	264.8	4.0E	406.0	2.0E	551.0
	4.0E	568.9	40.0E	570.7	4.0E	573.1	40.0E	588.1	4.0E	660.6
	5000.0E	704.6	4.0E	716.6	5000.0E	1000.0				
100.0	8.0E	90.1	4.0E	168.8	2.0E	249.5	4.0E	380.6	2.0E	529.6
	4.0E	575.1	40.0E	592.7	4.0E	598.0	40.0E	599.0	4.0E	669.2
	2.0E	705.9	5000.0E	1000.0						
105.0	8.0E	84.0	4.0E	139.8	2.0E	237.6	4.0E	340.6	2.0E	516.3



	4.0E	520.8	5000.0E	524.3	4.0E	588.9	5000.0E	596.5	4.0E	597.9
	5000.0E	644.0	2.0E	656.9	5000.0E	657.3	2.0E	696.3	5000.0E	1000.0
110.0	8.0E	79.2	4.0E	111.5	2.0E	234.3	4.0E	280.7	2.0E	568.2
	4.0E	571.9	5000.0E	578.1	4.0E	631.0	5000.0E	671.2	2.0E	692.8
	5000.0E	1000.0								
115.0	8.0E	75.1	2.0E	620.1	5000.0E	627.2	2.0E	645.7	5000.0E	1000.0
120.0	8.0E	71.1	2.0E	650.8	4.0E	729.5	5000.0E	733.7	4.0E	736.0
	5000.0E	1000.0								
125.0	8.0E	68.0	2.0E	686.1	4.0E	687.6	5000.0E	692.1	4.0E	718.7
	5000.0E	726.6	4.0E	772.7	5000.0E	777.7	4.0E	790.6	5000.0E	1000.0
130.0	8.0E	65.6	2.0E	704.6	4.0E	742.5	5000.0E	760.2	4.0E	777.0
	5000.0E	1000.0								
135.0	8.0E	63.8	2.0E	445.7	4.0E	547.3	2.0E	699.3	4.0E	790.6
	5000.0E	1000.0								
140.0	8.0E	62.5	2.0E	448.4	4.0E	780.6	5000.0E	1000.0		
145.0	8.0E	61.1	2.0E	499.9	4.0E	587.8	2.0E	699.9	4.0E	802.4
	5000.0E	1000.0								
150.0	8.0E	60.2	2.0E	507.7	4.0E	591.4	2.0E	695.9	4.0E	783.9
	5000.0E	1000.0								
155.0	8.0E	59.7	2.0E	529.2	4.0E	604.4	2.0E	694.3	4.0E	827.1
	5000.0E	1000.0								
160.0	8.0E	59.8	2.0E	325.7	4.0E	379.5	2.0E	558.9	4.0E	626.9
	2.0E	694.2	4.0E	853.9	5000.0E	1000.0				
165.0	8.0E	59.6	2.0E	327.3	4.0E	388.7	2.0E	582.9	4.0E	652.4
	2.0E	705.8	4.0E	849.0	8.0E	868.0	5000.0E	1000.0		
170.0	8.0E	59.8	2.0E	331.3	4.0E	401.7	2.0E	589.3	4.0E	687.8
	2.0E	758.3	4.0E	921.9	8.0E	929.4	5000.0E	930.9	8.0E	945.2
	5000.0E	1000.0								
175.0	8.0E	60.4	2.0E	337.0	4.0E	418.5	2.0E	590.6	4.0E	740.5
	2.0E	791.2	4.0E	1000.0						
180.0	8.0E	61.5	2.0E	345.1	4.0E	411.4	2.0E	609.4	4.0E	954.2
	2.0E	1000.0								
185.0	8.0E	63.1	2.0E	653.5	4.0E	992.6	2.0E	1000.0		
190.0	8.0E	65.3	2.0E	696.3	1.0E	750.1	4.0E	1000.0		
195.0	8.0E	70.8	2.0E	217.3	8.0E	276.5	2.0E	542.2	4.0E	632.8
	2.0E	815.7	4.0E	1000.0						
200.0	8.0E	82.9	2.0E	143.6	8.0E	309.9	2.0E	569.1	4.0E	710.5
	2.0E	811.4	4.0E	884.5	8.0E	1000.0				
205.0	8.0E	323.6	2.0E	402.1	4.0E	512.0	2.0E	744.2	4.0E	923.4
	8.0E	1000.0								
210.0	8.0E	249.4	4.0E	654.7	2.0E	750.5	4.0E	806.8	2.0E	1000.0
215.0	8.0E	244.1	4.0E	779.0	2.0E	989.1	4.0E	1000.0		
220.0	8.0E	260.1	4.0E	794.7	2.0E	932.8	8.0E	1000.0		
225.0	8.0E	276.6	4.0E	773.1	8.0E	1000.0				
230.0	8.0E	287.0	4.0E	735.6	8.0E	1000.0				
235.0	8.0E	296.1	4.0E	382.4	8.0E	582.4	4.0E	684.6	8.0E	953.9
	4.0E	1000.0								
240.0	8.0E	583.6	4.0E	621.1	8.0E	982.5	4.0E	1000.0		
245.0	8.0E	1000.0								
250.0	8.0E	1000.0								
255.0	8.0E	592.5	15.0E	667.3	8.0E	1000.0				
260.0	8.0E	526.0	15.0E	685.8	8.0E	942.6	15.0E	1000.0		
265.0	8.0E	488.6	15.0E	654.0	8.0E	804.9	15.0E	1000.0		
270.0	8.0E	468.2	15.0E	619.0	8.0E	747.7	15.0E	1000.0		
275.0	8.0E	245.6	15.0E	286.0	8.0E	456.0	15.0E	588.1	8.0E	660.6
	15.0E	1000.0								
280.0	8.0E	173.4	15.0E	278.6	8.0E	446.2	15.0E	546.0	8.0E	684.7
	15.0E	1000.0								
285.0	8.0E	103.0	15.0E	261.4	8.0E	437.3	15.0E	509.4	8.0E	771.6
	15.0E	1000.0								
290.0	8.0E	75.8	15.0E	248.0	8.0E	432.3	15.0E	485.4	8.0E	780.2
	15.0E	1000.0								
295.0	8.0E	63.6	15.0E	236.5	8.0E	430.7	15.0E	469.9	8.0E	855.5

	15.0E	982.0	30.0E	1000.0				
300.0	8.0E	56.6	15.0E	227.3	8.0E	681.4	4.0E	802.1
	15.0E	1000.0					8.0E	889.8
305.0	8.0E	51.3	15.0E	209.1	8.0E	354.1	2.0E	375.3
	15.0E	509.7	8.0E	679.5	4.0E	841.0	8.0E	948.7
	15.0E	1000.0					4.0E	949.0
310.0	8.0E	47.5	15.0E	135.4	8.0E	290.0	2.0E	374.0
	15.0E	536.3	8.0E	679.8	4.0E	1000.0		
315.0	8.0E	45.1	15.0E	119.1	8.0E	287.5	2.0E	381.7
	15.0E	590.8	8.0E	690.0	4.0E	1000.0		
320.0	8.0E	43.3	15.0E	113.2	8.0E	263.7	4.0E	293.8
	8.0E	581.0	15.0E	652.4	8.0E	710.4	4.0E	990.0
325.0	8.0E	42.0	15.0E	111.9	8.0E	252.3	4.0E	300.5
	8.0E	723.3	4.0E	940.9	8.0E	1000.0		
330.0	8.0E	41.0	15.0E	115.5	8.0E	247.6	4.0E	306.2
	8.0E	440.5	2.0E	542.5	8.0E	741.8	4.0E	925.9
335.0	8.0E	40.3	15.0E	124.8	8.0E	252.9	4.0E	307.8
	2.0E	592.6	8.0E	775.2	4.0E	868.1	8.0E	910.9
	8.0E	1000.0					4.0E	933.6
340.0	8.0E	40.6	15.0E	146.4	8.0E	268.4	4.0E	297.2
	2.0E	568.1	8.0E	1000.0				
345.0	8.0E	41.4	15.0E	179.2	8.0E	1000.0		
350.0	8.0E	42.5	15.0E	192.2	8.0E	908.0	2.0E	1000.0
355.0	8.0E	44.0	15.0E	195.0	8.0E	690.9	2.0E	706.5
	2.0E	1000.0					10.0E	715.1

# WV KO Distance to Contour Report

COLUMBUS ,OH

Call: WV KO

Coordinates: N 39 54 35 W 83 3 20

Frequency: 1580 kHz Number of contours: 7

Azimuth	Radiation (mV/m at one km)	Distances to Contours in Kilometers :						
		Contour levels in mV/m.						
		.025	.500	.005	.500	.250	5.000	25.000
0.0	1407.04	285.33	100.02	412.02	100.02	135.07	33.19	15.94
5.0	1416.66	286.49	98.93	415.48	98.93	134.06	33.28	15.99
10.0	1394.78	262.32	91.79	392.18	91.79	120.25	33.06	15.87
15.0	1347.19	252.69	86.27	383.75	86.27	114.40	32.58	15.60
20.0	1281.46	248.38	84.49	377.63	84.49	112.14	31.89	15.20
25.0	1205.82	243.22	82.37	367.25	82.37	109.46	31.07	14.74
30.0	1128.24	238.66	80.11	358.88	80.11	106.58	30.19	14.24
35.0	1055.65	234.06	77.90	353.31	77.90	103.75	29.34	13.75
40.0	993.46	229.87	75.93	347.78	75.93	101.23	28.58	13.32
45.0	945.36	226.50	74.36	341.83	74.36	99.21	27.97	12.96
50.0	913.36	224.19	73.29	340.68	73.29	97.82	27.55	12.73
55.0	897.96	223.06	72.76	338.74	72.76	97.14	27.35	12.61
60.0	898.45	223.09	72.78	334.98	72.78	97.16	27.36	12.61
65.0	913.05	224.17	73.28	332.27	73.28	97.81	27.55	12.72
70.0	939.14	221.93	74.16	329.18	74.16	98.94	27.89	12.92
75.0	973.30	219.19	75.28	327.89	75.28	100.40	28.32	13.17
80.0	1011.53	217.76	76.51	326.97	76.51	101.97	28.80	13.44
85.0	1049.60	216.76	77.71	326.47	77.71	103.51	29.27	13.71
90.0	1083.52	216.13	78.76	326.20	78.76	104.85	29.67	13.94
95.0	1110.21	213.89	79.57	319.24	79.57	104.19	29.98	14.12
100.0	1128.02	209.18	80.10	315.49	80.10	102.98	30.19	14.24
105.0	1136.97	204.03	80.37	311.04	80.37	101.86	30.29	14.29
110.0	1138.42	198.17	80.12	303.78	80.12	100.80	30.31	14.30
115.0	1134.12	189.84	78.23	292.08	78.23	94.63	30.26	14.28
120.0	1124.89	187.75	76.43	289.90	76.43	92.78	30.15	14.21
125.0	1109.70	185.71	74.88	287.66	74.88	91.13	29.98	14.11
130.0	1085.69	183.51	73.47	285.12	73.47	89.57	29.70	13.95
135.0	1049.52	180.92	72.07	282.00	72.07	87.94	29.27	13.71
140.0	999.28	177.71	70.59	278.04	70.59	86.13	28.65	13.36
145.0	936.14	173.64	68.76	272.97	68.76	83.88	27.85	12.90
150.0	864.87	169.04	66.93	267.25	66.93	81.54	26.90	12.36
155.0	792.65	164.33	65.21	261.14	65.21	79.27	25.89	11.78
160.0	726.27	159.91	63.73	255.27	63.73	77.27	24.90	11.21
165.0	668.77	155.73	62.33	249.78	62.33	75.37	24.01	10.70
170.0	617.52	151.91	61.13	244.53	61.13	73.73	23.16	10.22
175.0	565.58	147.96	59.82	239.07	59.82	72.16	22.26	9.71
180.0	505.41	143.20	57.03	232.28	57.03	70.39	21.13	9.08
185.0	432.21	136.88	53.37	223.11	53.37	68.14	19.64	8.25
190.0	345.49	128.33	48.54	210.26	48.54	65.12	17.64	7.15
195.0	249.28	117.92	42.28	193.35	42.28	56.70	14.99	5.75
200.0	153.71	106.51	34.46	181.72	34.46	46.20	11.58	4.07
205.0	90.74	97.56	27.47	179.14	27.47	36.98	8.50	2.70
210.0	121.76	109.89	31.20	197.45	31.20	41.87	10.14	3.41
215.0	193.30	131.65	37.98	227.99	37.98	50.90	13.12	4.81
220.0	258.80	146.86	42.96	248.16	42.96	57.61	15.28	5.90
225.0	307.47	156.37	46.20	260.44	46.20	61.98	16.66	6.63
230.0	335.97	161.38	47.97	266.76	47.97	64.35	17.40	7.03
235.0	343.94	162.73	48.44	268.45	48.44	65.00	17.61	7.13
240.0	333.30	160.92	47.81	266.19	47.81	64.14	17.34	6.99
245.0	308.55	156.57	46.27	260.69	46.27	62.07	16.69	6.64
250.0	277.48	150.64	44.24	253.13	44.24	59.34	15.83	6.19
255.0	251.85	145.40	42.47	246.24	42.47	56.94	15.07	5.79
260.0	244.77	143.88	41.96	244.25	41.96	56.26	14.85	5.68
265.0	261.49	147.41	43.15	248.89	43.15	57.86	15.36	5.94
270.0	293.62	153.79	45.31	257.22	45.31	60.78	16.28	6.43

275.0	326.70	159.78	47.40	266.28	47.40	63.59	17.17	6.90
280.0	348.26	163.45	48.70	279.23	48.70	65.34	17.71	7.19
285.0	350.02	175.07	48.80	290.20	48.80	65.48	17.76	7.22
290.0	328.14	177.52	47.49	290.40	47.49	63.71	17.20	6.92
295.0	283.72	171.44	44.66	282.00	44.66	59.90	16.01	6.28
300.0	225.42	159.09	40.52	266.84	40.52	54.33	14.23	5.37
305.0	179.65	147.18	36.82	250.83	36.82	49.35	12.61	4.56
310.0	198.29	151.24	38.39	248.02	38.39	52.80	13.30	4.90
315.0	291.28	169.42	45.16	272.73	45.16	65.62	16.22	6.39
320.0	423.09	190.44	56.20	295.86	56.20	79.67	19.45	8.14
325.0	573.11	209.33	66.26	314.90	66.26	92.46	22.39	9.78
330.0	731.25	226.04	75.12	331.65	75.12	103.65	24.98	11.26
335.0	889.69	241.04	82.75	352.79	82.75	113.22	27.24	12.55
340.0	1040.29	255.28	88.91	370.80	88.91	120.93	29.15	13.64
345.0	1174.46	268.39	93.72	387.86	93.72	126.99	30.72	14.54
350.0	1284.08	276.00	97.19	396.34	97.19	131.32	31.92	15.22
355.0	1362.79	280.06	99.30	400.75	99.30	134.02	32.74	15.69