

ENGINEERING EXHIBIT

Displacement Application for Modification of Digital Television Translator Station

prepared for

Mountain Lake Public Telecommunications Council

W46ED-D Willsboro, NY

Facility ID 44028

Ch. 34 (digital) 0.394 kW

Mountain Lake Public Telecommunications Council (“*MLPTC*”) is the licensee of digital television translator station W46ED-D, Channel 46, Willsboro NY, Facility ID 44028. W46ED-D has received a 120 day notice from a 600 MHz licensee that the wireless licensee intends to commence operations and W46ED-D is predicted to cause interference to the wireless operations. Pursuant to the procedures described in DA 17-584,¹ *MLPTC* herein seeks a displacement channel for W46ED-D.

The 120 day notice, attached separately, states that wireless operations will commence on October 31, 2017, in advance of the Special Displacement Window. Therefore, *BLLP* requests a waiver of the Displacement Freeze.² A request for Special Temporary Authority is being submitted contemporaneously to operate on the proposed displacement channel pending the final outcome of the Special Displacement Window.

As proposed herein, W46ED-D will operate at its existing antenna location and height on Channel 34 in lieu of the licensed Channel 46. A coordinate correction of 6 seconds latitude and 8 seconds longitude is specified to correspond to the actual antenna location (0.26 km from the licensed coordinates).

¹“*Incentive Auction Task Force and Media Bureau Set Forth Tools Available to LPTV/Translator Stations Displaced Prior to the Special Displacement Window*,” Public Notice, DA 17-584, released June 13, 2017.

²“*Freeze on the Filing of Applications for Digital Replacement Translator Stations and Displacement Applications*,” Public Notice, DA 14-808, released June 11, 2014.

The existing antenna supporting structure is not registered as the overall structure height is less than 61 meters above ground and passes the FCC's TOWAIR program for the tower location. The proposed W46ED-D facility will employ a replacement antenna system and no change to the overall structure height is proposed.

The existing W46ED-D facility is licensed to operate at 0.182 kW effective radiated power ("ERP") with a directional antenna. As proposed herein, the Channel 34 W46ED-D facility will operate at 0.394 kW ERP. Changes also include a different directional antenna pattern and a "full service" out of channel emission mask. A plot of the directional antenna's azimuthal pattern is supplied in Figure 1. Figure 2 depicts the 51 dB μ coverage contour of the licensed and proposed facilities, demonstrating compliance with §73.3572 for a minor change.

Interference study per OET Bulletin 69³ shows that the proposal complies with the FCC's interference protection requirements toward all digital television, television translator, LPTV, and Class A stations (existing and post-auction). The results, summarized in Table 1, show that any new interference does not exceed the FCC's interference limits (0.5 percent to full power and Class A stations, and 2.0 percent to secondary stations) to any facility.

The site is located 67 km from the U.S. – Canadian border. For Canada referral purposes, the 25.6 dB μ F(50,10) contour is relevant for digital LPTV operations on Channel 34. The 25.6 dB μ F(50,10) contour is depicted in Figure 3 and does not reach Canada. Thus, international coordination is not required.

The nearest FCC monitoring station is 346 km distant at Belfast, ME. This exceeds by a large margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The site is not located within the areas requiring

³FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69"). This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 1 km cell size, and 1 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC's implementation of TVStudy show excellent correlation.

coordination with “quiet” zones specified in §73.1030(a) and (b). There are no authorized AM stations within 3 kilometers of the site.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed W46ED-D operation was evaluated for human exposure to Radiofrequency (“RF”) energy using the procedures outlined in the FCC’s OET Bulletin Number 65. Based on OET-65 equation (10), and considering the antenna relative field in downward elevations, the graph in Figure 4 depicts calculated power density levels attributable to the proposed W45ED-D at locations near the site at a height of two meters above ground level. The maximum calculated RF electromagnetic field attributable to the proposed W46ED-D facility is 27.6 percent of the general population / uncontrolled MPE limit at any location two meters above ground level, which occurs within 20 meters of the W46ED-D tower location. Along azimuths where the proposed directional antenna is at maximum radiation, the actual terrain drops sharply, thus reducing the signal density at ground level locations from the values depicts on Figure 4.

Two FM radio transmitting stations are co-located with W46ED-D. WXZO(FM) (Ch. 244A, Facility ID 36422, Willsboro NY, BLH-19990405KE) and WCPV(FM) (Ch. 267A, Facility ID 36269, Essex, NY, BMLH-19990405KD) utilize a shared antenna system side-mounted near the top of the tower structure. According to a measurement report filed with their license renewal applications (BRH-20060131AWA and BRH-20060131AVU), the highest measured RF electromagnetic field at publicly accessible areas near the tower was found to be 5.5 percent of the general population / uncontrolled MPE limit.

Summing the measured results for the existing facilities (5.5 percent) and the highest calculated RF attributable to the proposed W46ED-D (27.6 percent), the total maximum calculated RF density at two meters above ground level near the site will be 33.1 percent of the FCC’s uncontrolled / general population maximum permissible exposure limit. No other authorized broadcast facilities are near enough to the site to contribute significant RF levels.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines. This exhibit is limited to the evaluation of exposure to RF electromagnetic field. No increase in structure height is proposed.

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Figure 3	Interfering Contour Towards Canada
Figure 4	Calculated RF Electromagnetic Field
Table 1	OET Bulletin 69 Interference Study
Form 2100	Saved Version of Engineering Sections from FCC Form at Time of Upload

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	September 6, 2017	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

**Azimuth Pattern - Relative Field
(True North)**

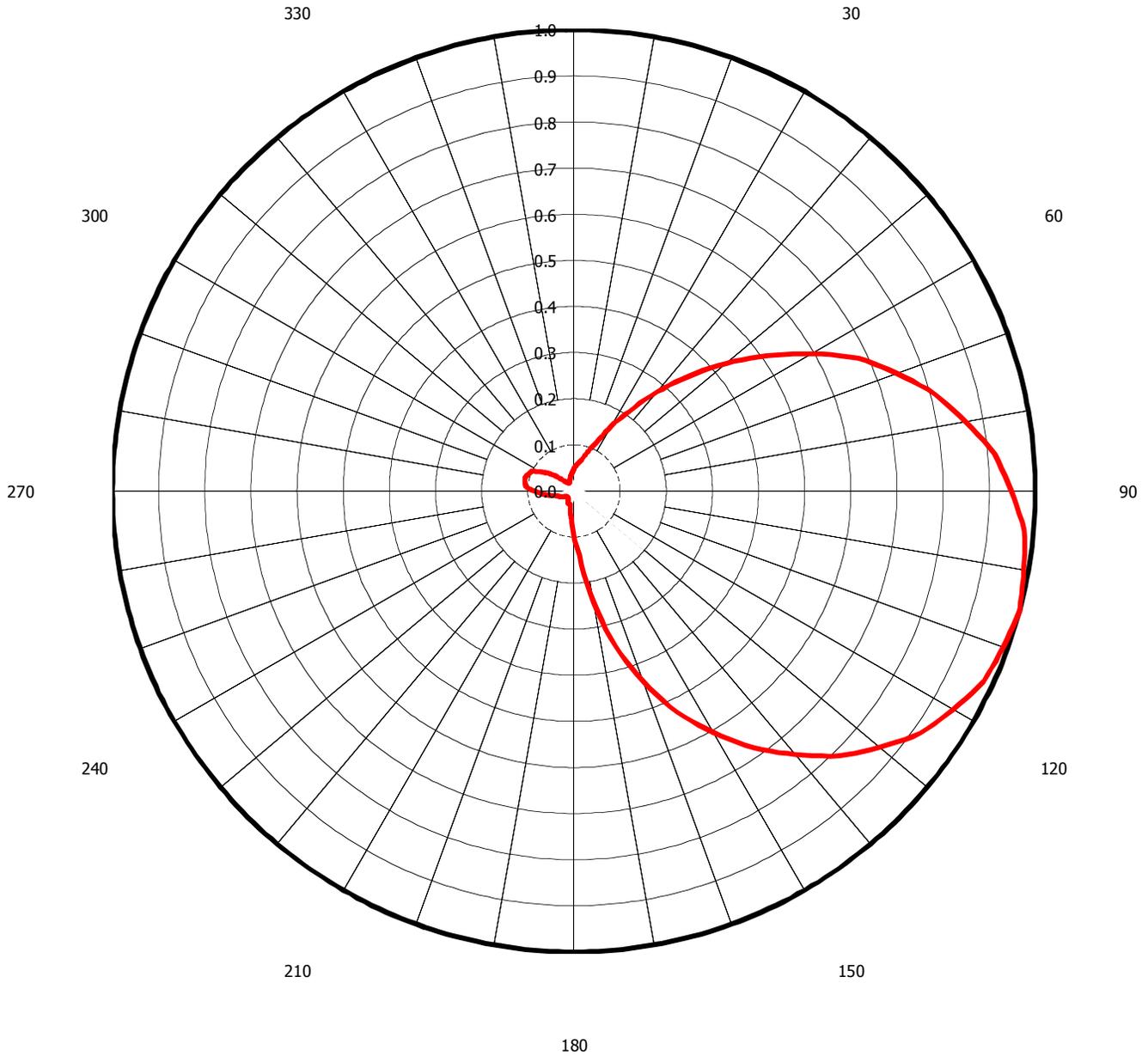
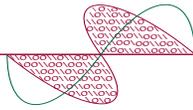


Figure 1
Antenna Azimuthal Pattern
W46ED-D Willsboro, NY
Facility ID 44028
Ch. 34 (digital) 0.394 kW

prepared for
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September, 2017

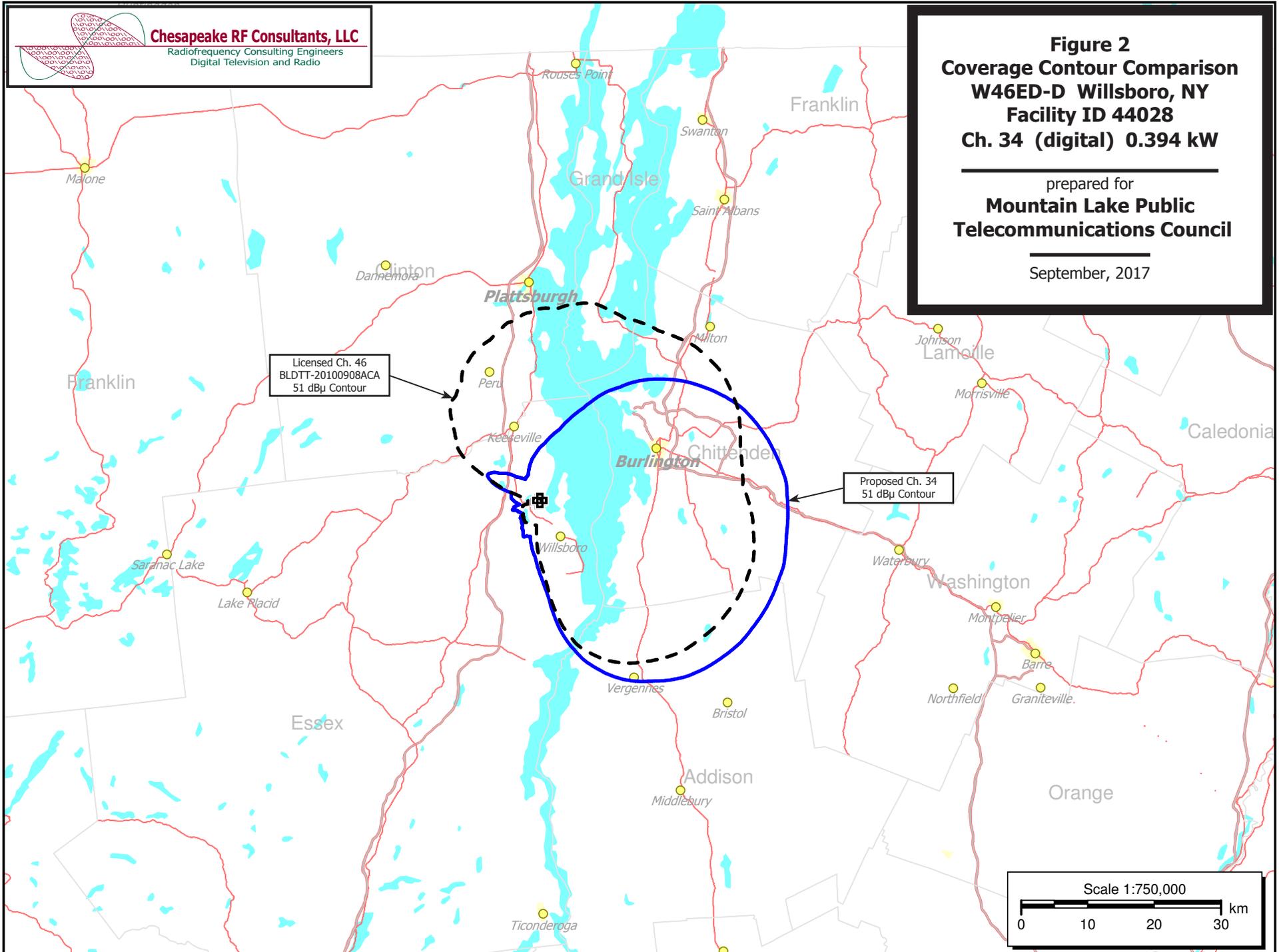


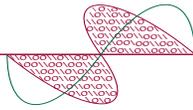
Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 2
Coverage Contour Comparison
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Figure 3
Interfering Contour Towards Canada
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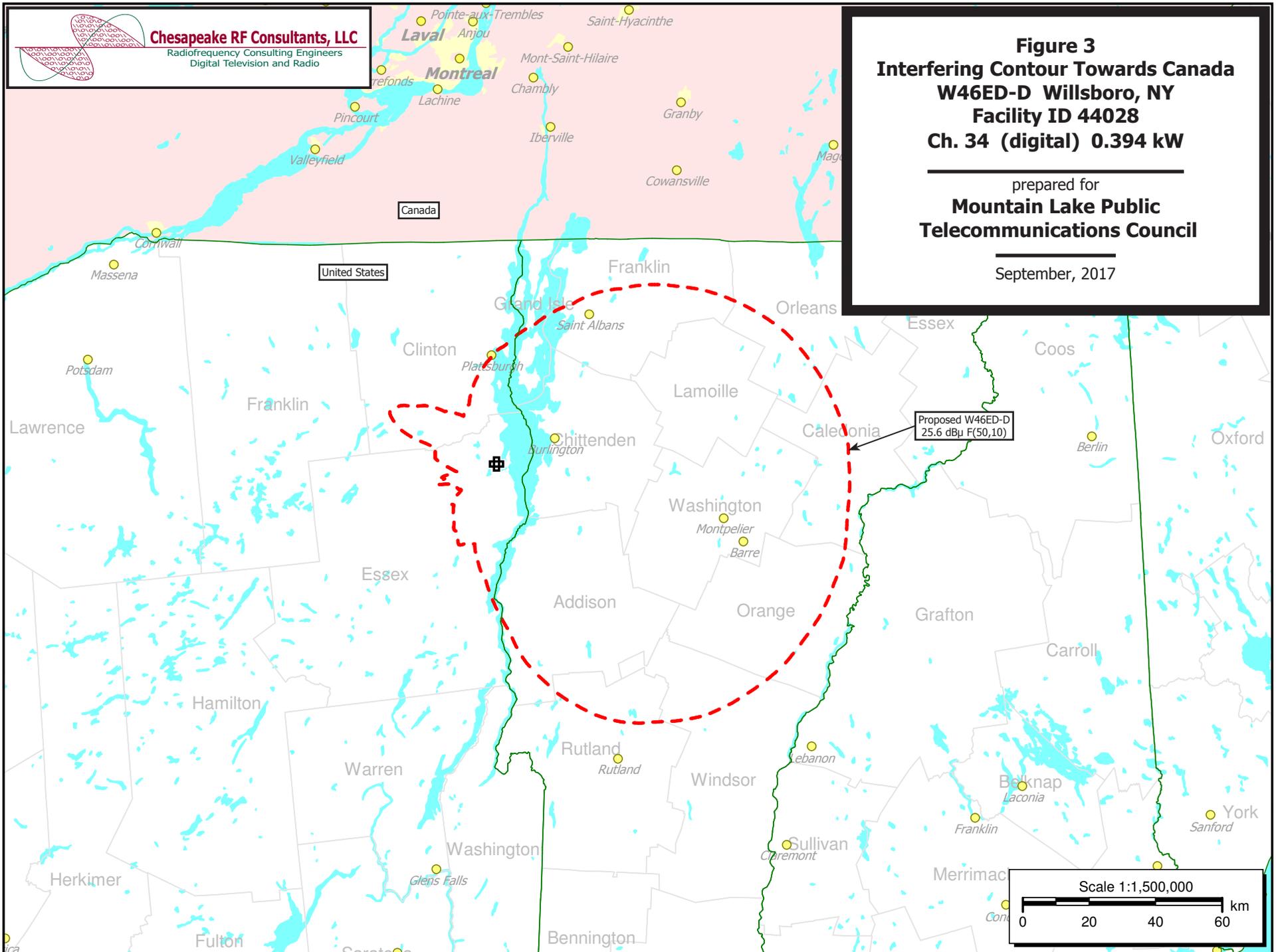


Figure 4
Calculated RF Electromagnetic Field
W46ED-D Willsboro, NY
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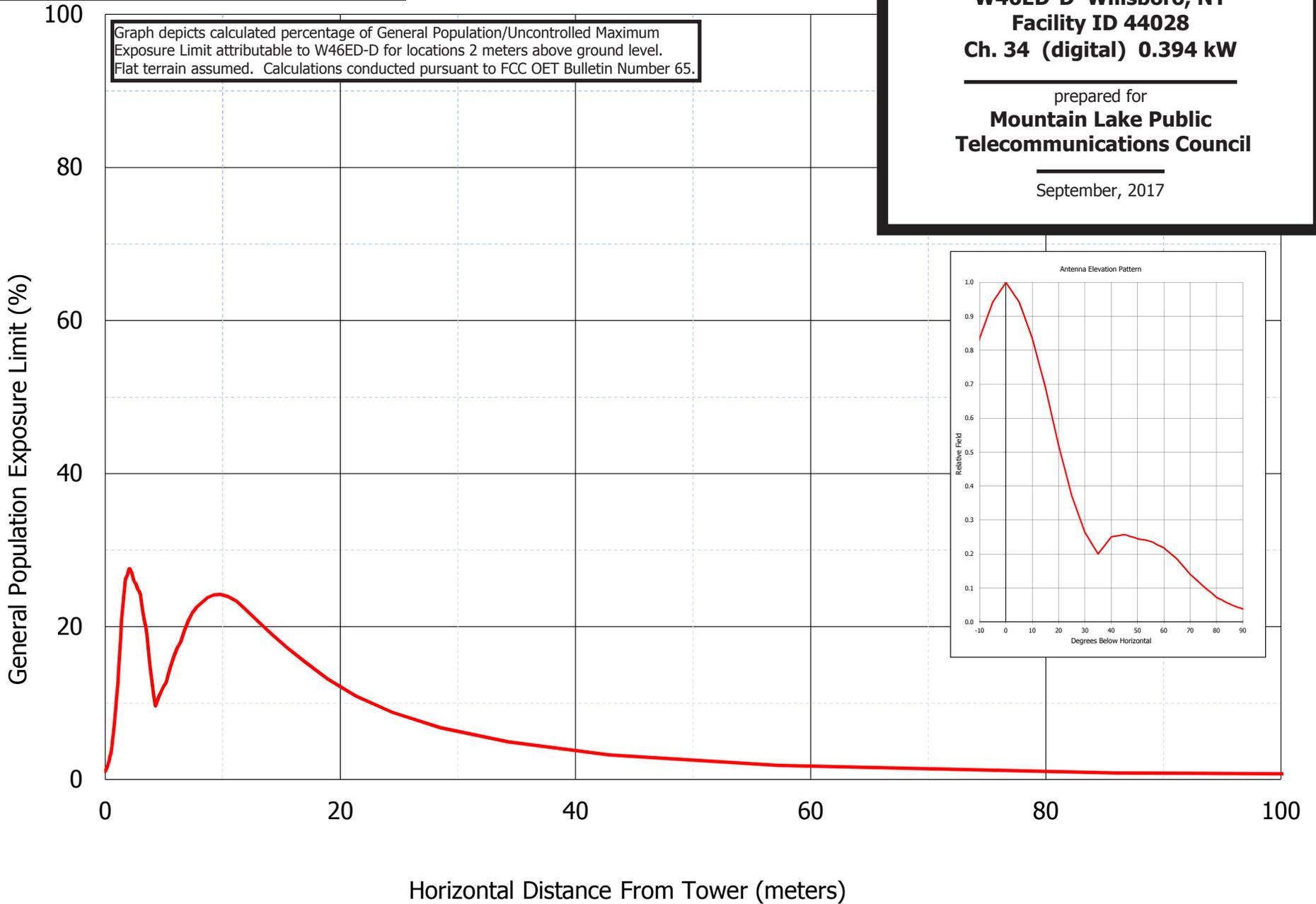


Table 1 W46ED-D OET Bulletin 69 Interference Study
 (page 1 of 2)



tvstudy v2.2.3 (DAezul)
 Database: localhost, Study: W46ED-D Ch-34 4DR-4S 0.394kW, Model: Longley-Rice
 Start: 2017.09.06 07:52:25

Study created: 2017.09.06 07:51:37

Study build station data: LMS TV 2017-09-06 LMSTV

Proposal: W46ED-D D34 LD APP WILLSBORO, NY
 File number: W46ED-D Ch-34 4DR-4S 0.394kW
 Facility ID: 44028
 Station data: User record
 Record ID: 1039
 Country: U.S.
 Zone: I

Build options:
 Protect records not on baseline channel
 Protect baseline records from LPTV

Stations affected by proposal:

Call	Chan	Svc	Status	City, State	File Number	Distance
WMHT	D34	DT	LIC	SCHENECTADY, NY	BLEDT20040108ALV	203.3 km

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D34
 Mask: Full Service
 Latitude: 44 24 19.30 N (NAD83)
 Longitude: 73 25 53.30 W
 Height AMSL: 392.1 m
 HAAT: 0.0 m
 Peak ERP: 0.394 kW
 Antenna: SCA-4DR-4S (ID 20748) 105.0 deg
 Elev Pattnr: Generic

50.7 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.000 kW	231.3 m	8.0 km
45.0	0.048	362.5	26.5
90.0	0.354	356.8	37.5
135.0	0.260	354.4	35.6
180.0	0.004	207.9	11.1
225.0	0.000	149.6	4.1
270.0	0.003	-18.2	4.1
315.0	0.000	153.4	5.2

Database HAAT does not agree with computed HAAT
 Database HAAT: 0 m Computed HAAT: 225 m

Distance to Canadian border: 67.1 km

Distance to Mexican border: 2937.8 km

Conditions at FCC monitoring station: Belfast ME
 Bearing: 87.7 degrees Distance: 345.2 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
 Bearing: 270.9 degrees Distance: 2639.8 km

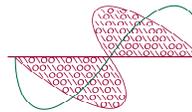
Study cell size: 1.00 km
 Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%
 Maximum new IX to LPTV: 2.00%

 Interference to BLEDT20040108ALV LIC, scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WMHT	D34	DT	LIC	SCHENECTADY, NY	BLEDT20040108ALV	
Undesireds:	W46ED-D	D34	LD	APP	WILLSBORO, NY	W46ED-D Ch-34 4DR-4S 0	203.3 km
	WFSB	D33	DT	LIC	HARTFORD, CT	BLCDT20041029AIL	137.0
	WCCT-TV	D33	DT	CP	WATERBURY, CT	BLANK0000025071	141.1

Table 1 W46ED-D OET Bulletin 69 Interference Study
 (page 2 of 2)



WTIC-TV	D34	DT	CP	HARTFORD, CT	BLANK0000025068	141.1			
WPPX-TV	D34	DT	CP	WILMINGTON, DE	BLANK0000027012	304.8			
WFXT	D34	DT	CP	BOSTON, MA	BLANK0000027179	231.7			
WPXT	D34	DT	CP	PORTLAND, ME	BLANK0000026107	327.9			
WNEU	D34	DT	LIC	MERRIMACK, NH	BLCDT20021028AAH	201.5			
WIVT	D34	DT	LIC	BINGHAMTON, NY	BLCDT20090819AGR	170.7			
WKBW-TV	D34	DT	CP	BUFFALO, NY	BLANK0000026789	376.9			
WFXN-TV	D34	DT	CP	NEW YORK, NY	BLANK0000027363	212.6			
WONO-CD	D34	DC	LIC	SYRACUSE, ETC., NY	BLANK0000001647	182.2			
WFXV	D34	DT	CP	UTICA, NY	BLANK0000028407	111.1			
WCAU	D34	DT	LIC	PHILADELPHIA, PA	BLCDT20090914AAH	304.8			
WSWB	D34	DT	CP	SCRANTON, PA	BLANK0000027930	193.9			
WVIT	D35	DT	LIC	NEW BRITAIN, CT	BLCDT20041203AEF	141.4			
Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
30325.4	1,622,653	25308.5	1,478,087	22233.2	1,408,184	22233.2	1,408,184	0.00	0.00
Undesired									
W46ED-D D34 LD APP		1.0	Total IX		Unique IX, before		Unique IX, after		
WFSB D33 DT LIC		121.9	1,654	4.0	63	4.0	63		
WCCT-TV D33 DT CP		102.9	1,564	0.0	0	0.0	0		
WTIC-TV D34 DT CP		1553.9	44,245	668.9	26,448	668.9	26,448		
WPPX-TV D34 DT CP		18.0	245	0.0	0	0.0	0		
WFXT D34 DT CP		238.9	2,592	8.0	94	8.0	94		
WPXT D34 DT CP		25.1	252	1.0	0	1.0	0		
WNEU D34 DT LIC		193.2	2,222	7.0	54	7.0	54		
WIVT D34 DT LIC		494.1	7,731	81.6	1,047	81.6	1,047		
WKBW-TV D34 DT CP		9.1	113	0.0	0	0.0	0		
WFXN-TV D34 DT CP		217.2	6,148	20.0	751	20.0	751		
WONO-CD D34 DC LIC		3.0	0	0.0	0	0.0	0		
WFXV D34 DT CP		2052.9	35,557	1066.0	18,298	1066.0	18,298		
WCAU D34 DT LIC		94.0	2,272	7.0	1,042	7.0	1,042		
WSWB D34 DT CP		167.8	2,576	16.0	52	16.0	52		
WVIT D35 DT LIC		123.9	1,623	1.0	22	1.0	22		

 Interference to proposal, scenario 1

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: W46ED-D	D34	LD	APP	WILLSBORO, NY	W46ED-D Ch-34 4DR-4S 0	

Service area	Terrain-limited	IX-free	Percent IX
1460.6	141,745	1349.1	138,121
		1349.1	138,121
		0.00	0.00

Channel and Facility Information

Section	Question	Response
Proposed Community of License	Facility ID	44028
	State	New York
	City	WILLSBORO
	LPT Channel	34

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	No
	ASR Number	
Coordinates (NAD83)	Latitude	44° 24' 19.3" N+
	Longitude	073° 25' 53.3" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	15.3 meters
	Support Structure Height	15.3 meters
	Ground Elevation (AMSL)	381 meters
Antenna Data	Height of Radiation Center Above Ground Level	5 meters
	Height of Radiation Center Above Mean Sea Level	386 meters
	Effective Radiated Power	0.394 kW

**Antenna
Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Off the Shelf
	Do you have an Antenna ID?	Yes
	Antenna ID	20748
Antenna Manufacturer and Model	Manufacturer:	SCA
	Model	4DR-4S
	Rotation	105 degrees
	Electrical Beam Tilt	Not Applicable
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Horizontal
Elevation Radiation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
	Uploaded file for elevation antenna (or radiation) pattern data	
	Out-of-Channel Emission Mask:	Full Service

Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	V _A (Authorized Value)						
0	1	90	0.03	180	0.11	270	0.07
10	0.98	100	0.03	190	0.1	280	0.115
20	0.917	110	0.02	200	0.065	290	0.21
30	0.813	120	0.02	210	0.03	300	0.35
40	0.68	130	0.02	220	0.02	310	0.51
50	0.53	140	0.03	230	0.02	320	0.68
60	0.35	150	0.04	240	0.03	330	0.81
70	0.14	160	0.07	250	0.04	340	0.915
80	0.06	170	0.105	260	0.055	350	0.98

Additional Azimuths

Degree	V _A
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