

Technical Report Supporting a Form 349 Application for a New FM Translator Station

Pursuant to 47 C.F.R. Section 74:

for

*CH231D.P - Keene, NH
CH231D (94.1 MHz)*

"New FM Translator Operation"

as a

*Commercial, Fill-In Translator
for Class B AM Station
WKBK(AM) - Keene, NH*

Table of Contents

Table of Contents

Explanation of Technical Report

Exhibit 1 - Service Contour Study: Present vs Proposed Operations

Exhibit 2 - Service Contour Study: Proposed vs Primary Operations

Exhibit 3 - Copy of Existing Antenna Structure Registration

Exhibit 4 - Vertical Plan of Antenna System

Exhibit 5 - HAAT Calculation & Miscellaneous Coordinate Information

Exhibit 6 - Tabulation of Proposed Allocation

Exhibit 7(a-c) - Contour Protection Studies Toward Select Allocation Concern(s)

Exhibit 8 - §74.1204(d) Second / Third Adjacent Given Interference Waiver Request

Exhibit 9 - Manufacturer's Antenna Documentation

Supplemental Appendix(s):

RF Appendix 1 - Radio Frequency Radiation Compliance Showing

Explanation of Technical Report

1

EXPLANATION OF PROPOSAL: This Form 349 Filing and accompanying technical report supports an Original Construction Permit Application for a new FM Translator facility for CH231D.P - Keene, NH. This FCC Form 349 Filing requests a new CH231D (94.1 MHz) operation with a power of 0.250 kW ERP (circular polarization). The FM Translator will operate from a COR of 193 meters AMSL. This Form 349 Filing will specify rebroadcast of Class B, AM Primary Station WKBK(AM) - Keene, NH (1290 kHz); Facility ID No. 36833. The Translator will be licensed to the community of Keene, NH.

The applicant would like to note WKBK(AM) is presently rebroadcast on co-owned AM Fill-In Translator W298BT.L - Keene, NH (Facility ID: 140893) and will serve substantially the same area as this CH231D.P AM Fill-In Translator proposal. Concurrent with, or prior to the commencement of operations of the future CH231D.P Translator, W298BT.L will be reassigned to an alternate Primary Station.

FACILITY COMPLIANCE SHOWINGS: A map of the proposed 60 dB μ service contour has been included in **Exhibit 1**. The proposed 60 dB μ contour of the Translator lies wholly inside the larger of the AM primary daytime 2.0 mV/m contour or a 25 mile radius around the AM site. The primary station service contour relationship has been plotted in **Exhibit 2**.

The proposed facility will be located on the tower bearing Antenna Structure Registration Number 1244740. In support of this filing, a copy of the existing ASRN has been included in **Exhibit 3**. A depiction of the tower and antenna configuration has been included in **Exhibit 4**. Further notification to the FAA or ASR governing authorities is not required as this proposal will not increase the overall tower height.

The applicant would like to note use of the FCC 30 second terrain database for all allocation, contour and HAAT showings contained herein. A copy of the proposed HAAT calculation has been included in **Exhibit 5**.

ALLOCATION COMPLIANCE SHOWINGS: The proposed Translator remains in compliance with 47 C.F.R. Section 74.1204 toward all allocation protection concerns with the exception of WEEY(FM) - Swanzey, NH (CH228A). A general allocation study for this proposal is found in **Exhibit 6**.

The applicant would like to note the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WEEY(FM) - Swanzey, NH (CH228A) as noted in **Exhibit 8**. Protection of the calculated 136.4 dBμ F(50:10) Interference Contour, corresponding to the 96.4 dBμ F(50:50) Protected Contour, has been demonstrated through a downward radiation study. Full protection will be afforded the concern as the interference area will not reach the ground nor a seven-meter artificial plane representing a standard two story home when taking into account the downward radiation characteristics of a worst case, one bay, isotropic antenna regardless of the three bay antenna to be employed. Additional antenna manufacturer's data has been included in **Exhibit 9**.

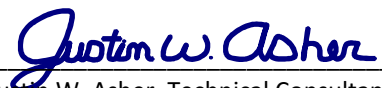
There are three additional facilities, existing or proposed, close enough to merit further study. Therefore, a supplemental contour protection study has been provided toward each facility as included in **Exhibit(s) 7(a-c)**. It is believed sufficient clearance exists, precluding the need for additional contour protection showings.

Regarding protection of international concerns, the facility is and will remain within 320 km from the common border between the United States and Canada. However full protection will be afforded all Canadian concerns as noted in **Exhibit 6**.

ENVIRONMENTAL COMPLIANCE SHOWINGS: The proposed facility complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments as set forth under §1.1310 and/or §1.1307(b)(3) of the Commission's rules and the guidelines for RF radiation protection guidelines as set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01). Compliance has been demonstrated in the attached **RF Appendix 1** of this filing. The facility is, or will be, properly marked with signs. Entry is, or will be, restricted by means of fencing with locked doors or gates. In addition, coordination with other users of the site will be secured to reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Regarding compliance with the NEPA, Nationwide Programmatic Agreement and NHPA Section 106 for tower co-location, compliance with the Agreement is not required where no new tower construction is being proposed and the tower is not being substantially altered. Specifically, compliance is not necessary where only an existing antenna and feed-line are being reused (combined), as here. However, should the Commission determine compliance is necessary, upon notification to the applicant, the applicant will file FCC Form 621.

CERTIFICATION OF TECHNICAL CONSULTANT: *I declare, under penalty of perjury, that the contents of this report are true and accurate to the best of my knowledge and belief. I further certify I have over eighteen years of experience as a broadcast technical consultant before the Federal Communications Commission ("the FCC"); and am familiar with the Code of Federal Regulations Title 47 ("the Rules") as pertaining to this report and its contents herein. The underlying data utilized in this report was taken directly from FCC databases or indirectly through third party software vendors securing data directly from FCC databases. This firm cannot be held liable for errors or omissions resulting from the underlying data. The information contained herein is believed accurate to the date reported below.*



Justin W. Asher, Technical Consultant

March 21, 2018

Exhibit 1
Service Contour Study:
Present vs Proposed Operations

Proposed 60 dBμ F(50:50) Contour

CH231D.P
Keene, NH
Proposed Operation
Facility ID: NEW
Latitude: 42-55-50 N
Longitude: 072-18-00 W
ERP: 0.25 kW
Channel: 231D (94.1 MHz)
AMSL Height: 193.0 m
Horiz. Pattern: Omni

60 dBμ F(50:50) Contour
Total Population: 27,173
Total Area: 158.1 sq. km

FCC 30 SEC Terrain Database
US Census 2010 PL Database

Terrain
106 960 m

Scale 1:100,000
0 2 4 6 km

Asher Broadcast Consulting LLC
justinasher@consultant.com
1 (202) 875-2986

Exhibit 2
Service Contour Study:
Proposed vs Primary Operations

25 mile Radius from AM Site

Primary 2 mV/m Daytime Contour

Licensed 60 dBu F(50:50) Contour
Proposed 60 dBu F(50:50) Contour

WKBK(AM)
+
Cheshire
CH231D.P
W298BT.L

WKBK 1290 kHz
Keene, New Hampshire
Station Class: B
Region 2 Class: B
Facility ID: 36833
File Number: BL-20000810ABY
42-56-46.0 N 72-18-33.0 W (NAD 27)
42-56-46.3 N 72-18-31.3 W (NAD 83)
Power: 5 kW, Directional
Hours: Daytime
Pattern Type: Augmented
Towers: 2 Augmentations: 14
RMS Theoretical: 675.92 mV/meter
RMS Standard: 753.24 mV/meter
RMS Augmented: mV/meter

CH231D.P
Keene, NH
Proposed Operation
Facility ID: NEW
Latitude: 42-55-50 N
Longitude: 072-18-00 W
ERP: 0.25 kW
Channel: 231D (94.1 MHz)
AMSL Height: 193.0 m
Horiz. Pattern: Omni

The applicant would like to note WKBK(AM) is presently rebroadcast on co-owned AM Fill-In Translator W298BT.L - Keene, NH (Facility ID: 140893) and will serve substantially the same area as this CH231D.P AM Fill-In Translator proposal. Concurrent with, or prior to the commencement of operations of the future CH231D.P Translator, W298BT.L will be reassigned to an alternate Primary Station.

FCC 30 SEC Terrain Database
US Census 2010 PL Database

Terrain
0 1202 m

Scale 1:475,000
0 8 16 24 km

W298BT.L
Keene, NH
BLFT20140416AAH
Facility ID: 140893
Latitude: 42-55-50 N
Longitude: 072-18-00 W
ERP: 0.25 kW
Channel: 298D (107.5 MHz)
AMSL Height: 193.0 m
Horiz. Pattern: Directional

Asher Broadcast Consulting LLC
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V-Soft Communications LLC ©

Exhibit 3

Copy of Existing Antenna Structure Registration

(public record copy)

Registration Detail

Reg Number	1244740	Status	Constructed
File Number	A0462096	Constructed	08/10/2004
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

Location (in NAD83 Coordinates)

Lat/Long	42-55-49.9 N 072-17-58.2 W	Address	0.23 mi s-sw of intersection West Street and SR 9
City, State	Keene , NH		
Zip	03431	County	CHESHIRE
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
143.3	54.5
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
197.8	53.5

Painting and Lighting Specifications

None

FAA Notification

FAA Study	2004-ANE-673-OE	FAA Issue Date	07/30/2004
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Owner & Contact Information

FRN	0009269861	Owner Entity Type	
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Owner

Saga Communications of New Hampshire, LLC
Attention To: Gregory Urbiel
73 Kercheval Avenue, Suite 201
Grosse Pointe Farms , MI 48236

P: (313)886-7070
F:
E: gurbiel@sagacom.com

Contact

Smithwick , Gary S Esq
5028 Wisconsin Avenue NW, Suite 301
Washington , DC 20016

P: (202)363-4560
F:
E: gsmithwick@fccworld.com

Last Action Status

Status	Constructed	Received	08/24/2005
Purpose	Notification	Entered	08/24/2005
Mode	Interactive		

Related Applications

08/24/2005	A0462096 - Notification (NT)
08/11/2004	A0390355 - Modification (MD)
08/10/2004	A0390273 - New (NE)

Related applications (4)

Comments

Comments

None

History

Date

08/24/2005

08/15/2005

08/12/2004

All History (7)

Event

Construction Notification Received

Construction Reminder Letter Sent

Registration Printed

Automated Letters

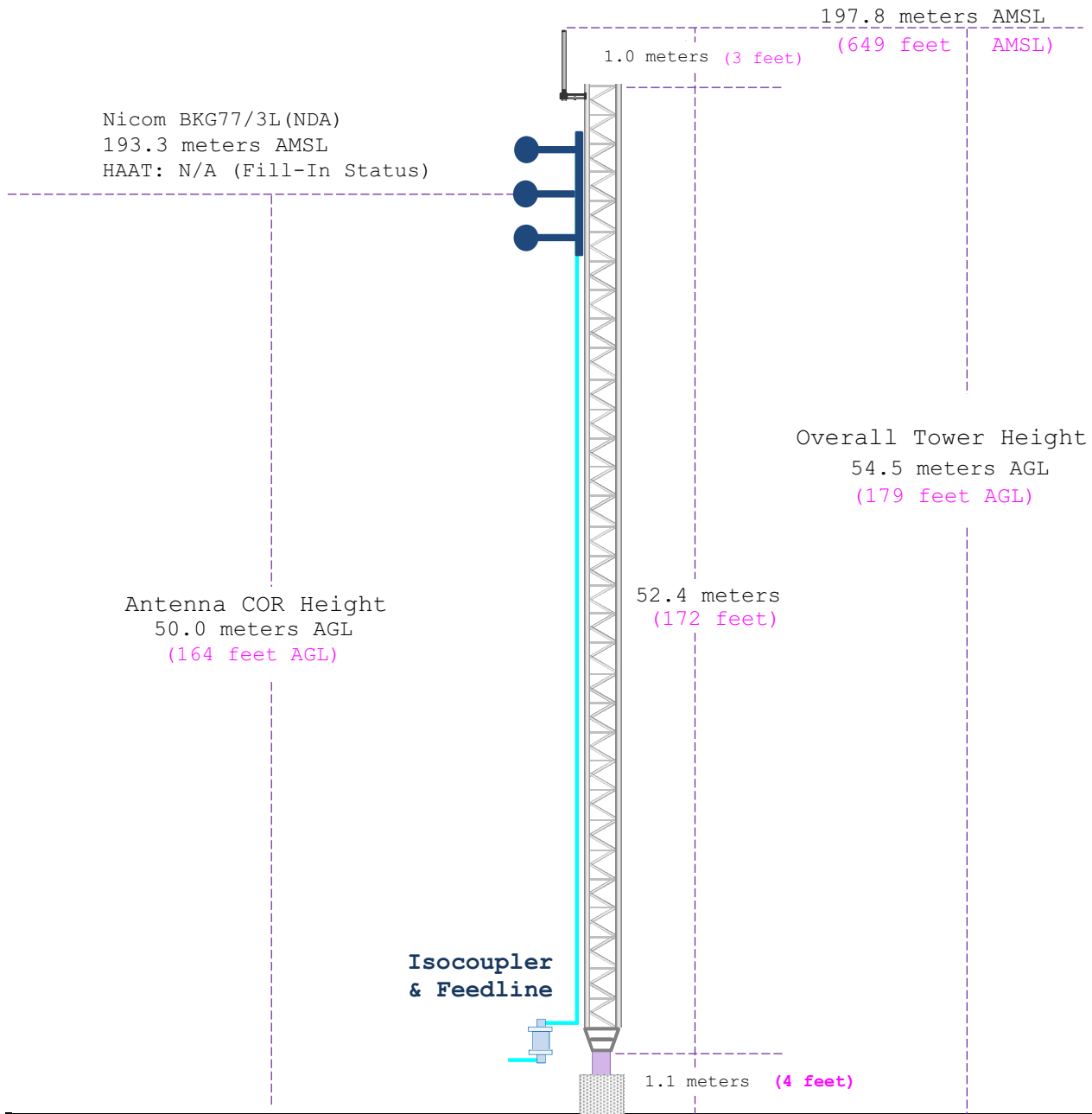
08/15/2005 Construction Reminder, Reference 442794

08/12/2004 Authorization, Reference 349600

08/11/2004 Authorization, Reference 349544

Exhibit 4

Vertical Plan of Antenna System



Ground Elevation: 143.3 meters AMSL (470 feet AMSL)		
Address: 0.23 miles south-southwest of the intersection of West Street and State Route 9.		
City: Keene	Latitude (D M S) Longitude (D M S)	
County: Cheshire	NAD 27 datum values: 42 55 49.60838 72 17 59.89151	
State: New Hampshire	NAD 83 datum values: 42 55 49.90000 72 17 58.20000	
Antenna Structure Registration 1244740	Drawing Is Not To Scale	Asher Broadcast Consulting, LLC justinasher@consultant.com 1(202)875-2986

Exhibit 5

HAAT and Miscellaneous Coordinate Information

HAAT Calculation (1927):

N. Lat. = 425550.0 W. Lng. = 721800.0
 HAAT and Distance to Contour,
 FCC, FM 2-10 Mi, 51 pts Method - FCC 30 SEC

Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	270.3	-77.3	0.2500	-6.02	1.000	7.09
030	357.0	-164.0	0.2500	-6.02	1.000	7.09
060	351.8	-158.8	0.2500	-6.02	1.000	7.09
090	343.3	-150.3	0.2500	-6.02	1.000	7.09
120	318.6	-125.6	0.2500	-6.02	1.000	7.09
150	276.8	-83.8	0.2500	-6.02	1.000	7.09
180	213.8	-20.8	0.2500	-6.02	1.000	7.09
210	210.5	-17.5	0.2500	-6.02	1.000	7.09
240	306.6	-113.6	0.2500	-6.02	1.000	7.09
270	249.7	-56.7	0.2500	-6.02	1.000	7.09
300	220.8	-27.8	0.2500	-6.02	1.000	7.09
330	310.2	-117.2	0.2500	-6.02	1.000	7.09

Ave El= 285.79 M HAAT= -92.79 M AMSL= 193 M

NAD 1983 to NAD 1927 Conversion:

	<u>Latitude</u>	<u>Longitude</u>
NAD 27 datum values:	42 55 49.60838	72 17 59.89151
NAD 83 datum values:	42 55 49.90000	72 17 58.20000

Various Coordinate Conversion Calculations (NAD 1983):

Position Type	Lat Lon
Degrees Lat Long	42.9305278°, -072.2995000°
Degrees Minutes	42°55.83167', -072°17.97000'
Degrees Minutes Seconds	42°55'49.9000", -072°17'58.2000"
UTM	18T 720367mE 4756638mN
UTM centimeter	18T 720367.14mE 4756638.61mN
MGRS	18TYN2036756638
Grid North	1.8°
GARS	216MB13
Maidenhead	FN32UW43BH48
GEOREF	HJCN42035583

Exhibit 6

Tabulation of Proposed Allocation

Blue Text indicates contour protection studies toward select stations as included in *Exhibit(s) 7(a-c)*.

Yellow Text denotes the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request as included in *Exhibit 8*.

REFERENCE		CH# 231D - 94.1 MHz, Pwr= 0.25 kW, HAAT= -92.6 M, COR= 193 M								DISPLAY DATES	
42 55 50.0 N.		Average Protected F(50-50)= 7.09 km								DATA 01-04-18	
72 18 00.0 W.		Omni-directional								SEARCH 01-04-18	
CH	CALL	TYPE	ANT	AZI	DIST	LAT	PWR (kW)	INT (km)	PRO (km)	*IN*	*OUT*
CITY	STATE			<--	FILE #	LNG	HAAT (M)	COR (M)	LICENSEE	(Overlap in km)	
228A	WEEY	LIC	CX	237.1	3.01	42 54 57.0	2.000	2.3	26.9	-6.4*<	-25.0*<
Swansey	NH			57.1	BLH20080912AAG	72 19 52.0	175	425	Great Eastern Radio, Llc		
231A	WFTN-FM	LIC	ZCX	42.7	82.46	43 28 23.8	6.000	81.8	27.2	-6.4<	31.5
Franklin	NH			223.2	BMLH20150812AAY	71 36 22.9	100	298	Northeast Communications C		
230A	WRSI	LIC	CN	208.5	50.19	42 32 01.0	2.500	45.7	30.4	-2.6<	9.7
Turners Falls	MA			28.3	BLH19951018KB	72 35 34.0	109	284	Saga Communications Of Ne		
228D	W228AU	LIC	DHN	144.2	9.13	42 51 50.0	0.005	0.1	7.5	1.9	0.5
North Bennington, E VT				324.3	BLFT19890301TA	72 14 04.0	390	696	Diponti Communications, Ll		
TRANSLATOR FOR WGLYFM, WATERBURY, VT.											
231B	WHJY	LIC	C	147.7	144.48	41 49 40.0	50.000	133.8	60.9	3.6	48.0
Providence	RI			328.4	BLH20000915ALB	71 22 09.0	139	170	Capstar Tx, Llc		
232D	W232CG	LIC	C	245.1	26.76	42 49 44.0	0.190	13.9	10.0	5.7	6.6
Brattleboro	VT			64.9	BLFT20121113ABM	72 35 52.0	31	307	Vermont Public Radio		
285A	WYRY	LIC	DC	216.3	21.33	42 46 33.0	4.100	13.0	8.5	9.5R	11.8M
Hinsdale	NH			36.2	BLH20010402AAV	72 27 17.0	122	344	Tri-valley Broadcasting Co		
230A	WWOD	LIC	ZEX	356.3	79.81	43 38 49.0	3.100	50.3	33.6	22.5	36.1
Woodstock	VT			176.3	BLH20101115DQH	72 21 49.0	139	399	Great Eastern Radio, Llc		
231A	WNYV	LIC	CN	303.5	111.17	43 28 37.0	3.000	76.6	24.7	27.5	62.7
Whitehall	NY			122.7	BLH19900726KA	73 26 56.0	100	271	Pine Tree Broadcasting Com		
232D	1771048	APP	C	0.5	51.73	43 23 45.0	0.015	15.3	10.8	29.3	30.8
Claremont	NH			180.5	BNPFT20171201APT	72 17 40.0		620	Great Eastern Radio, Llc		
232D	1763666	APP	C	0.5	51.73	43 23 45.0	0.015	15.3	10.8	29.3	30.8
Claremont	NH			180.5	BNPFT20170801AJM	72 17 40.0		620	Great Eastern Radio, Llc		
234D	W234BN	CP	DC	359.7	51.39	43 23 34.3	0.220	1.0	15.6	43.3	34.7
Claremont	NH			179.7	BPFT20170717ABK	72 18 13.8		467	Sugar River Media, Llc		
234D	W234BN	LIC	C	359.7	51.39	43 23 34.3	0.050	0.5	10.8	43.8	39.5
Claremont	NH			179.7	BLFT20091019ADA	72 18 13.8	155	467	Sugar River Media, Llc		
231D	W231BR	LIC	DC	84.1	68.33	42 59 25.0	0.250	15.9	4.9	45.4	39.6
Manchester	NH			264.7	BLFT20140718ABQ	71 27 51.0		142	Saga Communications Of New		

Terrain database is FCC NGDC 30 Sec , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
 Contour distances are on direct line to and from reference station. Reference zone= East Zone, Co to 3rd adjacent.
 All separation margins (if shown) include rounding.
 Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
 "*"affixed to 'IN' or 'OUT' values = site inside restricted contour.
 < = Contour Overlap
 Reference station has protected zone issue: AM tower

Exhibit 7a
Contour Protection Studies Toward Select Allocation Concern(s)

FMCommander Single Allocation Study - 01-04-2018 - FCC NGDC 30 Sec
CH231D.P's Overlaps (In= -2.63 km, Out= 9.66 km)

CH231D.P CH 231 D
Lat= 42 55 50.0, Lng= 72 18 00.0
0.25 kW -92.6 m HAAT, 193 m COR
Prot.= 60 dBu, Intef.= 54 dBu

WRSI CH 230 A BLH19951018KB
Lat= 42 32 01.0, Lng= 72 35 34.0
2.5 kW 109 m HAAT, 284 m COR
Prot.= 60 dBu, Intef.= 54 dBu

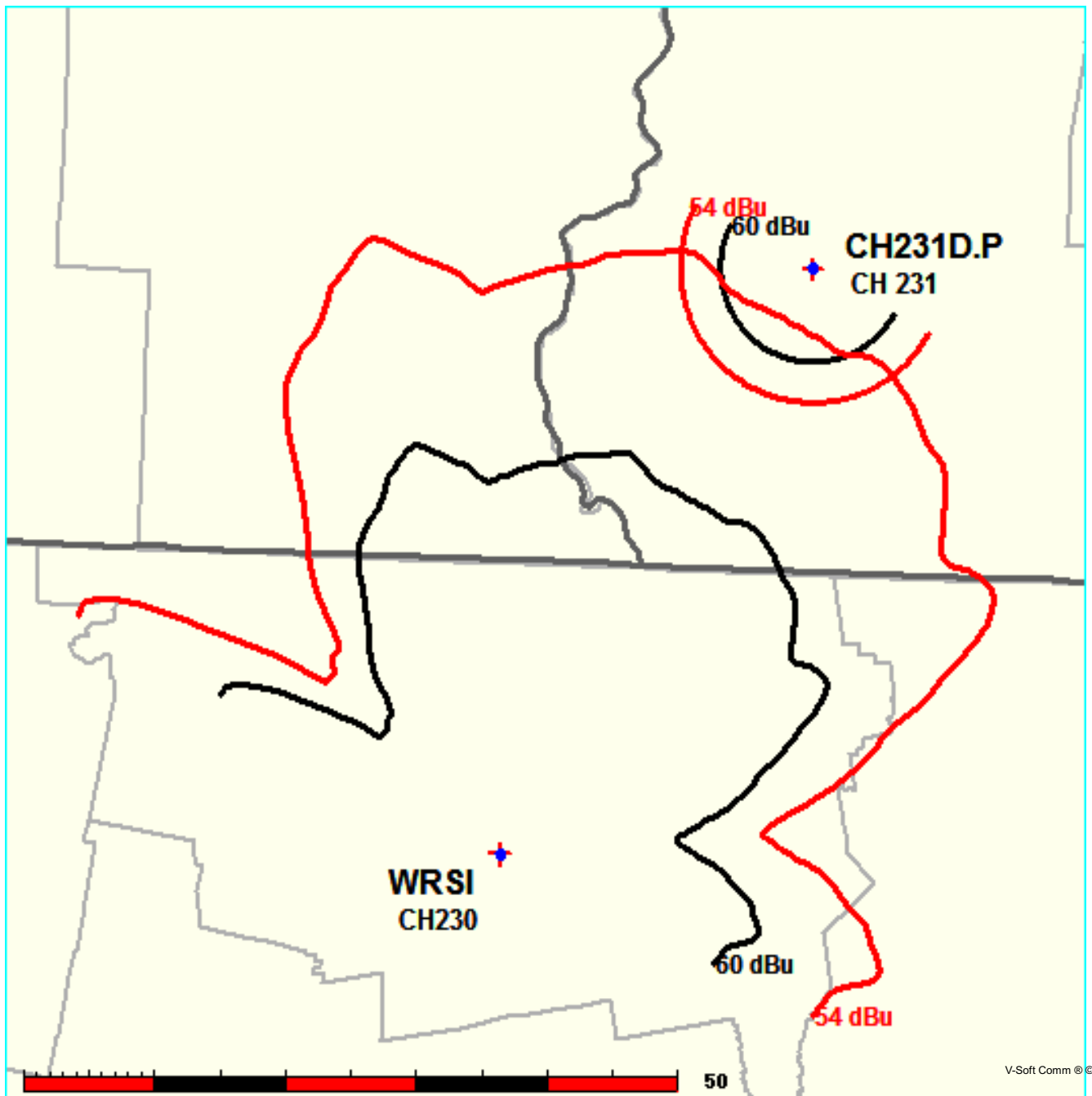


Exhibit 7a

Contour Protection Studies Toward Select Allocation Concern(s)

01-04-2018

Terrain Data: FCC NGDC 30 Sec

FMOver Analysis

CH231D.P

WRSI BLH19951018KB

Channel = 231D

Max ERP = 0.25 kW

RCAMSL = 193 m

N. Lat. 42 55 50.0

W. Lng. 72 18 00.0

Protected

60 dBu

Channel = 230A

Max ERP = 2.5 kW

RCAMSL = 284 m

N. Lat. 42 32 01.0

W. Lng. 72 35 34.0

Interfering

54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
167.0	000.2500	0021.0	007.1	034.3	002.5000	0182.8	045.1	54.25*	0.59
168.0	000.2500	0022.7	007.1	034.2	002.5000	0182.6	045.0	54.28*	0.66
169.0	000.2500	0023.2	007.1	034.1	002.5000	0182.4	045.0	54.31*	0.73
170.0	000.2500	0023.1	007.1	034.0	002.5000	0182.3	044.9	54.34*	0.81
171.0	000.2500	0020.7	007.1	033.9	002.5000	0182.2	044.8	54.37*	0.88
172.0	000.2500	0014.9	007.1	033.8	002.5000	0182.2	044.7	54.40*	0.96
173.0	000.2500	0002.8	007.1	033.6	002.5000	0182.2	044.6	54.44*	1.04
174.0	000.2500	-0011.2	007.1	033.5	002.5000	0182.2	044.5	54.47*	1.13
175.0	000.2500	-0024.8	007.1	033.4	002.5000	0182.3	044.5	54.51*	1.21
176.0	000.2500	-0036.5	007.1	033.3	002.5000	0182.3	044.4	54.55*	1.29
177.0	000.2500	-0044.2	007.1	033.2	002.5000	0182.4	044.3	54.58*	1.37
178.0	000.2500	-0038.9	007.1	033.0	002.5000	0182.5	044.2	54.61*	1.45
179.0	000.2500	-0029.9	007.1	032.9	002.5000	0182.5	044.2	54.65*	1.53
180.0	000.2500	-0020.8	007.1	032.8	002.5000	0182.6	044.1	54.68*	1.61
181.0	000.2500	-0018.5	007.1	032.6	002.5000	0182.7	044.0	54.71*	1.69
182.0	000.2500	-0016.1	007.1	032.5	002.5000	0182.8	044.0	54.75*	1.76
183.0	000.2500	-0014.1	007.1	032.3	002.5000	0182.9	043.9	54.78*	1.83
184.0	000.2500	-0014.5	007.1	032.2	002.5000	0183.0	043.8	54.81*	1.90
185.0	000.2500	-0014.0	007.1	032.1	002.5000	0183.0	043.8	54.83*	1.97
186.0	000.2500	-0014.2	007.1	031.9	002.5000	0183.1	043.7	54.86*	2.03
187.0	000.2500	-0016.1	007.1	031.8	002.5000	0183.2	043.7	54.89*	2.09
188.0	000.2500	-0019.6	007.1	031.6	002.5000	0183.2	043.6	54.91*	2.15
189.0	000.2500	-0021.4	007.1	031.5	002.5000	0183.3	043.6	54.94*	2.20
190.0	000.2500	-0021.0	007.1	031.3	002.5000	0183.3	043.5	54.96*	2.25
191.0	000.2500	-0018.4	007.1	031.2	002.5000	0183.3	043.5	54.98*	2.30
192.0	000.2500	-0016.7	007.1	031.0	002.5000	0183.3	043.4	55.00*	2.34
193.0	000.2500	-0014.3	007.1	030.9	002.5000	0183.4	043.4	55.02*	2.38
194.0	000.2500	-0010.7	007.1	030.7	002.5000	0183.4	043.4	55.03*	2.42
195.0	000.2500	-0009.2	007.1	030.5	002.5000	0183.3	043.3	55.05*	2.45
196.0	000.2500	-0009.5	007.1	030.4	002.5000	0183.4	043.3	55.06*	2.49
197.0	000.2500	-0009.7	007.1	030.2	002.5000	0183.4	043.3	55.07*	2.52
198.0	000.2500	-0007.2	007.1	030.1	002.5000	0183.4	043.2	55.09*	2.55
199.0	000.2500	-0002.7	007.1	029.9	002.5000	0183.4	043.2	55.10*	2.57

Exhibit 7a

Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
200.0	000.2500	0003.4	007.1	029.7	002.5000	0183.4	043.2	55.11* 2.59
201.0	000.2500	0010.9	007.1	029.6	002.5000	0183.4	043.2	55.12* 2.61
202.0	000.2500	0017.8	007.1	029.4	002.5000	0183.3	043.2	55.12* 2.63
203.0	000.2500	0022.5	007.1	029.3	002.5000	0183.3	043.1	55.13* 2.64
204.0	000.2500	0024.3	007.1	029.1	002.5000	0183.3	043.1	55.13* 2.65
205.0	000.2500	0021.8	007.1	028.9	002.5000	0183.2	043.1	55.13* 2.65
206.0	000.2500	0015.2	007.1	028.8	002.5000	0183.1	043.1	55.13* 2.65
207.0	000.2500	0007.1	007.1	028.6	002.5000	0183.0	043.1	55.13* 2.65
208.0	000.2500	-0000.8	007.1	028.4	002.5000	0183.0	043.1	55.13* 2.64
209.0	000.2500	-0008.8	007.1	028.3	002.5000	0182.9	043.1	55.13* 2.63
210.0	000.2500	-0017.5	007.1	028.1	002.5000	0182.8	043.1	55.12* 2.62
211.0	000.2500	-0026.4	007.1	027.9	002.5000	0182.7	043.1	55.11* 2.60
212.0	000.2500	-0034.4	007.1	027.8	002.5000	0182.6	043.1	55.11* 2.58
213.0	000.2500	-0042.6	007.1	027.6	002.5000	0182.5	043.1	55.10* 2.56
214.0	000.2500	-0050.6	007.1	027.5	002.5000	0182.4	043.1	55.09* 2.54
215.0	000.2500	-0056.3	007.1	027.3	002.5000	0182.4	043.2	55.08* 2.53
216.0	000.2500	-0058.6	007.1	027.1	002.5000	0182.4	043.2	55.07* 2.51
217.0	000.2500	-0059.0	007.1	027.0	002.5000	0182.4	043.2	55.06* 2.48
218.0	000.2500	-0060.1	007.1	026.8	002.5000	0182.4	043.2	55.05* 2.46
219.0	000.2500	-0062.3	007.1	026.6	002.5000	0182.4	043.2	55.04* 2.44
220.0	000.2500	-0065.8	007.1	026.5	002.5000	0182.4	043.3	55.03* 2.42
221.0	000.2500	-0070.5	007.1	026.3	002.5000	0182.5	043.3	55.02* 2.39
222.0	000.2500	-0075.6	007.1	026.2	002.5000	0182.5	043.3	55.01* 2.36
223.0	000.2500	-0080.6	007.1	026.0	002.5000	0182.6	043.4	55.00* 2.33
224.0	000.2500	-0085.4	007.1	025.9	002.5000	0182.6	043.4	54.98* 2.30
225.0	000.2500	-0089.9	007.1	025.7	002.5000	0182.6	043.4	54.97* 2.27
226.0	000.2500	-0094.0	007.1	025.5	002.5000	0182.7	043.5	54.95* 2.23
227.0	000.2500	-0096.1	007.1	025.4	002.5000	0182.7	043.5	54.93* 2.19
228.0	000.2500	-0095.8	007.1	025.2	002.5000	0182.7	043.6	54.91* 2.14
229.0	000.2500	-0094.6	007.1	025.1	002.5000	0182.6	043.6	54.89* 2.09
230.0	000.2500	-0094.0	007.1	024.9	002.5000	0182.6	043.7	54.86* 2.03
231.0	000.2500	-0094.8	007.1	024.8	002.5000	0182.6	043.7	54.84* 1.98
232.0	000.2500	-0096.2	007.1	024.7	002.5000	0182.5	043.8	54.81* 1.91
233.0	000.2500	-0098.3	007.1	024.5	002.5000	0182.5	043.8	54.79* 1.85
234.0	000.2500	-0101.3	007.1	024.4	002.5000	0182.4	043.9	54.76* 1.78
235.0	000.2500	-0104.3	007.1	024.2	002.5000	0182.4	044.0	54.73* 1.72
236.0	000.2500	-0107.1	007.1	024.1	002.5000	0182.3	044.0	54.70* 1.65
237.0	000.2500	-0109.7	007.1	024.0	002.5000	0182.3	044.1	54.67* 1.58
238.0	000.2500	-0112.0	007.1	023.8	002.5000	0182.3	044.2	54.64* 1.51
239.0	000.2500	-0113.4	007.1	023.7	002.5000	0182.3	044.2	54.61* 1.44
240.0	000.2500	-0113.6	007.1	023.6	002.5000	0182.3	044.3	54.58* 1.37
241.0	000.2500	-0113.0	007.1	023.4	002.5000	0182.4	044.4	54.55* 1.30
242.0	000.2500	-0112.2	007.1	023.3	002.5000	0182.5	044.5	54.52* 1.24
243.0	000.2500	-0111.7	007.1	023.2	002.5000	0182.6	044.5	54.49* 1.17
244.0	000.2500	-0111.6	007.1	023.1	002.5000	0182.7	044.6	54.46* 1.11

Exhibit 7a

Contour Protection Studies Toward Select Allocation Concern(s)

01-04-2018 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

WRSI BLH19951018KB

CH231D.P

Channel = 230A

Max ERP = 2.5 kW

RCAMSL = 284 m

N. Lat. 42 32 01.0

W. Lng. 72 35 34.0

Protected

60 dBu

Channel = 231D

Max ERP = 0.25 kW

RCAMSL = 193 m

N. Lat. 42 55 50.0

W. Lng. 72 18 00.0

Interfering

54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
343.0	002.5000	0171.5	029.5	244.0	000.2500	-0111.6	036.2	33.79	
344.0	002.5000	0177.6	030.0	244.6	000.2500	-0111.8	035.6	34.00	
345.0	002.5000	0183.0	030.4	245.1	000.2500	-0112.1	035.0	34.22	
346.0	002.5000	0189.0	030.9	245.7	000.2500	-0112.1	034.4	34.44	
347.0	002.5000	0195.0	031.3	246.4	000.2500	-0111.6	033.8	34.67	
348.0	002.5000	0196.5	031.5	246.4	000.2500	-0111.6	033.2	34.88	
349.0	002.5000	0193.7	031.2	245.8	000.2500	-0112.1	032.7	35.07	
350.0	002.5000	0188.5	030.8	244.9	000.2500	-0112.0	032.3	35.23	
351.0	002.5000	0184.2	030.5	244.0	000.2500	-0111.6	031.9	35.39	
352.0	002.5000	0180.2	030.2	243.2	000.2500	-0111.7	031.5	35.56	
353.0	002.5000	0175.6	029.8	242.2	000.2500	-0112.1	031.1	35.72	
354.0	002.5000	0172.5	029.6	241.5	000.2500	-0112.6	030.7	35.89	
355.0	002.5000	0169.0	029.3	240.6	000.2500	-0113.3	030.4	36.06	
356.0	002.5000	0163.7	028.9	239.4	000.2500	-0113.7	030.1	36.19	
357.0	002.5000	0157.5	028.3	238.1	000.2500	-0112.2	029.9	36.29	
358.0	002.5000	0153.1	028.0	237.0	000.2500	-0109.8	029.6	36.41	
359.0	002.5000	0155.6	028.2	236.9	000.2500	-0109.4	029.1	36.68	
000.0	002.5000	0158.1	028.4	236.7	000.2500	-0108.9	028.6	36.96	
001.0	002.5000	0159.5	028.5	236.3	000.2500	-0107.9	028.1	37.22	
002.0	002.5000	0161.8	028.7	236.0	000.2500	-0107.2	027.6	37.52	
003.0	002.5000	0164.1	028.9	235.7	000.2500	-0106.4	027.1	37.82	
004.0	002.5000	0166.9	029.1	235.4	000.2500	-0105.6	026.5	38.15	
005.0	002.5000	0169.8	029.4	235.1	000.2500	-0104.7	026.0	38.49	
006.0	002.5000	0171.8	029.5	234.7	000.2500	-0103.3	025.5	38.81	
007.0	002.5000	0172.8	029.6	234.0	000.2500	-0101.3	025.1	39.10	
008.0	002.5000	0174.2	029.7	233.4	000.2500	-0099.3	024.6	39.40	
009.0	002.5000	0178.8	030.1	233.1	000.2500	-0098.5	024.0	39.84	
010.0	002.5000	0183.0	030.4	232.7	000.2500	-0097.5	023.4	40.26	
011.0	002.5000	0185.6	030.6	232.0	000.2500	-0096.3	022.9	40.62	

Exhibit 7a
Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)		Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
012.0	002.5000	0187.4	030.7		231.2	000.2500	-0095.1	022.4	40.96
013.0	002.5000	0189.5	030.9		230.4	000.2500	-0094.1	022.0	41.30
014.0	002.5000	0190.9	031.0		229.4	000.2500	-0094.2	021.6	41.61
015.0	002.5000	0192.7	031.2		228.4	000.2500	-0095.3	021.1	41.94
016.0	002.5000	0195.7	031.4		227.5	000.2500	-0096.2	020.6	42.32
017.0	002.5000	0198.4	031.6		226.5	000.2500	-0095.2	020.2	42.69
018.0	002.5000	0199.4	031.7		225.2	000.2500	-0090.9	019.8	42.95
019.0	002.5000	0197.9	031.6		223.6	000.2500	-0083.6	019.7	43.05
020.0	002.5000	0194.2	031.3		221.8	000.2500	-0074.7	019.8	43.01
021.0	002.5000	0189.6	030.9		220.0	000.2500	-0065.7	019.9	42.88
022.0	002.5000	0185.2	030.6		218.2	000.2500	-0060.5	020.1	42.75
023.0	002.5000	0182.8	030.4		216.6	000.2500	-0059.0	020.2	42.71
024.0	002.5000	0182.3	030.3		215.1	000.2500	-0056.8	020.1	42.77
025.0	002.5000	0182.6	030.4		213.6	000.2500	-0047.9	020.0	42.86
026.0	002.5000	0182.6	030.4		212.1	000.2500	-0035.5	019.9	42.91
027.0	002.5000	0182.4	030.3		210.6	000.2500	-0023.0	019.9	42.93
028.0	002.5000	0182.7	030.4		209.1	000.2500	-0009.5	019.8	42.97
029.0	002.5000	0183.2	030.4		207.5	000.2500	0002.8	019.8	43.00
030.0	002.5000	0183.4	030.4		206.0	000.2500	0015.1	019.8	42.99
031.0	002.5000	0183.3	030.4		204.5	000.2500	0023.6	019.9	42.94
032.0	002.5000	0183.1	030.4		203.0	000.2500	0022.4	020.0	42.87
033.0	002.5000	0182.5	030.4		201.5	000.2500	0014.7	020.1	42.76
034.0	002.5000	0182.3	030.3		200.1	000.2500	0003.8	020.2	42.65
035.0	002.5000	0184.8	030.5		198.5	000.2500	-0005.3	020.2	42.68
036.0	002.5000	0189.1	030.9		196.7	000.2500	-0010.0	020.0	42.80
037.0	002.5000	0192.7	031.2		195.0	000.2500	-0009.2	020.0	42.87
038.0	002.5000	0193.7	031.2		193.4	000.2500	-0012.9	020.1	42.76
039.0	002.5000	0193.0	031.2		192.1	000.2500	-0016.4	020.4	42.53
040.0	002.5000	0191.8	031.1		190.9	000.2500	-0018.6	020.7	42.26
041.0	002.5000	0190.1	030.9		189.8	000.2500	-0021.3	021.1	41.95
042.0	002.5000	0188.2	030.8		188.8	000.2500	-0021.3	021.5	41.64
043.0	002.5000	0185.8	030.6		187.9	000.2500	-0019.4	022.0	41.29
044.0	002.5000	0182.9	030.4		187.2	000.2500	-0016.6	022.5	40.92
045.0	002.5000	0179.7	030.1		186.5	000.2500	-0014.9	023.0	40.54
046.0	002.5000	0176.8	029.9		185.9	000.2500	-0014.0	023.5	40.18
047.0	002.5000	0175.3	029.8		185.1	000.2500	-0014.0	023.9	39.87
048.0	002.5000	0174.8	029.8		184.3	000.2500	-0014.5	024.3	39.60
049.0	002.5000	0173.4	029.6		183.6	000.2500	-0014.4	024.8	39.30
050.0	002.5000	0169.5	029.3		183.3	000.2500	-0014.2	025.4	38.91
051.0	002.5000	0164.2	028.9		183.2	000.2500	-0014.2	026.0	38.47
052.0	002.5000	0158.8	028.5		183.2	000.2500	-0014.2	026.7	38.05
053.0	002.5000	0153.2	028.0		183.3	000.2500	-0014.3	027.4	37.65
054.0	002.5000	0147.3	027.5		183.4	000.2500	-0014.3	028.1	37.25
055.0	002.5000	0141.8	027.0		183.6	000.2500	-0014.4	028.7	36.89
056.0	002.5000	0138.2	026.7		183.5	000.2500	-0014.3	029.3	36.60

Exhibit 7b
Contour Protection Studies Toward Select Allocation Concern(s)

FMCommander Single Allocation Study - 01-04-2018 - FCC NGDC 30 Sec
CH231D.P's Overlaps (In= 1.95 km, Out= 0.51 km)

CH231D.P CH 231 D
Lat= 42 55 50.0, Lng= 72 18 00.0
0.25 kW -92.6 m HAAT, 193 m COR
Prot.= 60 dBu, Intef.= 100 dBu

W228AU CH 228 D DA BLFT19890301TA
Lat= 42 51 50.0, Lng= 72 14 04.0
0.005 kW 390 m HAAT, 696 m COR
Prot.= 60 dBu, Intef.= 100 dBu

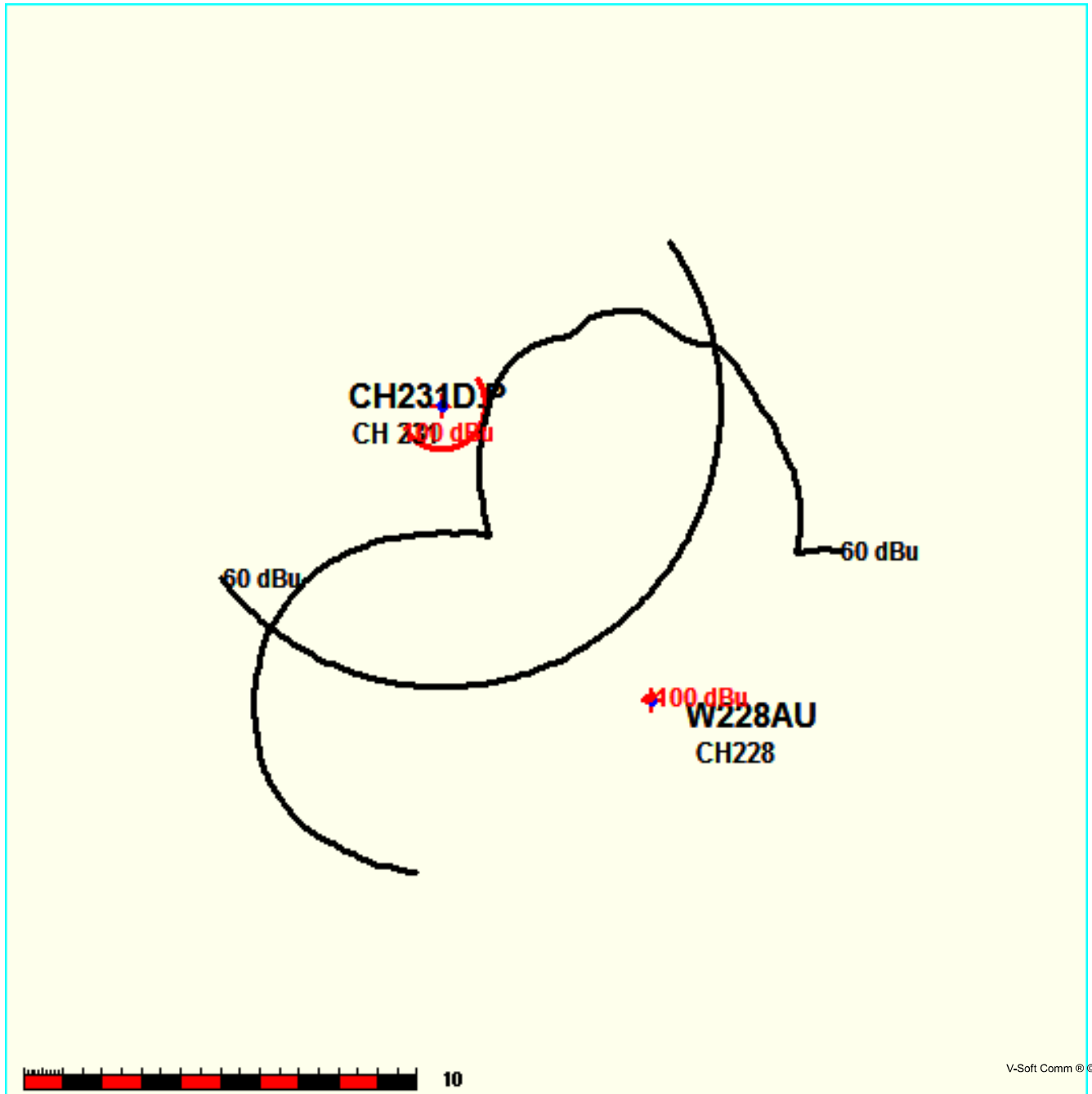


Exhibit 7b

Contour Protection Studies Toward Select Allocation Concern(s)

01-04-2018

Terrain Data: FCC NGDC 30 Sec

FMOVer Analysis

CH231D.P

W228AU BLFT19890301TA

Channel = 231D

Max ERP = 0.25 kW

RCAMSL = 193 m

N. Lat. 42 55 50.0

W. Lng. 72 18 00.0

Protected

60 dBu

Channel = 228D

Max ERP = 0.005 kW

RCAMSL = 696 m

N. Lat. 42 51 50.0

W. Lng. 72 14 04.0

Interfering

100 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
102.0	000.2500	-0128.9	007.1	015.1	000.0003	0351.8	006.1	52.22	
103.0	000.2500	-0126.4	007.1	015.1	000.0003	0351.4	006.0	52.47	
104.0	000.2500	-0124.0	007.1	015.1	000.0003	0351.1	005.9	52.73	
105.0	000.2500	-0121.5	007.1	015.2	000.0003	0351.0	005.8	52.99	
106.0	000.2500	-0120.2	007.1	015.1	000.0003	0351.1	005.7	53.26	
107.0	000.2500	-0120.2	007.1	015.1	000.0003	0351.3	005.5	53.54	
108.0	000.2500	-0120.8	007.1	015.1	000.0003	0351.8	005.4	53.82	
109.0	000.2500	-0121.1	007.1	015.0	000.0003	0352.4	005.3	54.10	
110.0	000.2500	-0122.5	007.1	014.9	000.0003	0353.3	005.2	54.39	
111.0	000.2500	-0124.5	007.1	014.7	000.0003	0354.4	005.0	54.69	
112.0	000.2500	-0126.9	007.1	014.6	000.0003	0355.8	004.9	54.99	
113.0	000.2500	-0129.2	007.1	014.4	000.0003	0357.4	004.8	55.29	
114.0	000.2500	-0131.2	007.1	014.1	000.0003	0359.4	004.7	55.60	
115.0	000.2500	-0132.5	007.1	013.8	000.0003	0361.6	004.5	55.92	
116.0	000.2500	-0133.2	007.1	013.5	000.0003	0364.1	004.4	56.25	
117.0	000.2500	-0132.6	007.1	013.1	000.0003	0366.8	004.3	56.59	
118.0	000.2500	-0131.1	007.1	012.7	000.0003	0369.4	004.2	56.93	
119.0	000.2500	-0128.7	007.1	012.2	000.0003	0371.2	004.1	57.27	
120.0	000.2500	-0125.6	007.1	011.7	000.0003	0372.4	003.9	57.60	
121.0	000.2500	-0121.9	007.1	011.1	000.0003	0372.9	003.8	57.94	
122.0	000.2500	-0119.1	007.1	010.4	000.0003	0373.1	003.7	58.27	
123.0	000.2500	-0117.5	007.1	009.7	000.0003	0372.6	003.6	58.60	
124.0	000.2500	-0116.4	007.1	008.9	000.0003	0370.2	003.5	58.92	
125.0	000.2500	-0115.3	007.1	008.0	000.0003	0367.4	003.4	59.24	
126.0	000.2500	-0113.6	007.1	007.0	000.0003	0367.1	003.3	59.57	
127.0	000.2500	-0110.5	007.1	005.8	000.0003	0368.3	003.2	59.92	
128.0	000.2500	-0105.7	007.1	004.6	000.0003	0372.5	003.1	60.30	
129.0	000.2500	-0098.5	007.1	003.3	000.0003	0382.9	003.0	60.71	
130.0	000.2500	-0089.5	007.1	001.8	000.0003	0395.4	002.9	61.12	
131.0	000.2500	-0079.6	007.1	000.2	000.0003	0408.9	002.8	61.52	
132.0	000.2500	-0070.7	007.1	358.5	000.0003	0426.0	002.7	61.89	
133.0	000.2500	-0063.7	007.1	356.5	000.0003	0437.2	002.6	62.24	
134.0	000.2500	-0059.0	007.1	354.5	000.0003	0439.6	002.5	62.57	

Exhibit 7b
Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
135.0	000.2500	-0057.3	007.1	352.2	000.0003	0445.6	002.4	62.88
136.0	000.2500	-0057.9	007.1	349.8	000.0003	0432.8	002.3	63.15
137.0	000.2500	-0060.7	007.1	347.2	000.0003	0425.9	002.3	63.41
138.0	000.2500	-0064.5	007.1	344.4	000.0003	0448.2	002.2	63.69
139.0	000.2500	-0069.0	007.1	341.5	000.0003	0477.7	002.2	63.95
140.0	000.2500	-0073.7	007.1	338.4	000.0003	0511.0	002.1	64.11
141.0	000.2500	-0077.1	007.1	335.2	000.0003	0535.6	002.1	64.17
142.0	000.2500	-0079.2	007.1	331.8	000.0002	0533.1	002.1	64.15
143.0	000.2500	-0080.7	007.1	328.4	000.0002	0526.5	002.1	64.14
144.0	000.2500	-0082.7	007.1	325.0	000.0002	0529.0	002.0	64.17
145.0	000.2500	-0084.7	007.1	321.5	000.0002	0514.4	002.0	64.14
146.0	000.2500	-0086.5	007.1	318.1	000.0002	0502.5	002.1	64.07
147.0	000.2500	-0087.5	007.1	314.7	000.0002	0497.3	002.1	63.97
148.0	000.2500	-0087.7	007.1	311.4	000.0002	0467.4	002.1	63.80
149.0	000.2500	-0086.5	007.1	308.3	000.0003	0453.6	002.2	63.81
150.0	000.2500	-0083.8	007.1	305.3	000.0003	0443.3	002.2	63.93
151.0	000.2500	-0079.9	007.1	302.5	000.0003	0444.0	002.3	64.01
152.0	000.2500	-0075.7	007.1	299.8	000.0003	0446.2	002.3	64.04
153.0	000.2500	-0071.8	007.1	297.3	000.0003	0448.3	002.4	64.10
154.0	000.2500	-0067.1	007.1	295.0	000.0004	0455.8	002.5	64.12
155.0	000.2500	-0061.4	007.1	292.8	000.0004	0459.8	002.5	64.08
156.0	000.2500	-0055.5	007.1	290.8	000.0004	0459.8	002.6	64.00
157.0	000.2500	-0050.3	007.1	289.0	000.0004	0463.5	002.7	63.97
158.0	000.2500	-0044.3	007.1	287.3	000.0005	0467.0	002.8	63.98
159.0	000.2500	-0036.6	007.1	285.8	000.0005	0468.5	002.9	63.94
160.0	000.2500	-0027.7	007.1	284.4	000.0005	0471.0	003.0	63.88
161.0	000.2500	-0017.6	007.1	283.2	000.0006	0472.5	003.1	63.79
162.0	000.2500	-0007.9	007.1	282.0	000.0006	0472.7	003.2	63.68
163.0	000.2500	0001.2	007.1	281.0	000.0006	0473.3	003.3	63.56
164.0	000.2500	0008.3	007.1	280.0	000.0006	0475.6	003.4	63.42
165.0	000.2500	0013.4	007.1	279.2	000.0007	0477.6	003.6	63.28
166.0	000.2500	0017.7	007.1	278.4	000.0007	0478.5	003.7	63.12
167.0	000.2500	0021.0	007.1	277.7	000.0007	0478.3	003.8	62.94
168.0	000.2500	0022.7	007.1	277.1	000.0007	0477.9	003.9	62.75
169.0	000.2500	0023.2	007.1	276.5	000.0008	0477.5	004.0	62.55
170.0	000.2500	0023.1	007.1	276.0	000.0008	0477.2	004.1	62.34
171.0	000.2500	0020.7	007.1	275.6	000.0008	0477.1	004.3	62.13
172.0	000.2500	0014.9	007.1	275.2	000.0008	0476.8	004.4	61.91
173.0	000.2500	0002.8	007.1	274.8	000.0008	0476.6	004.5	61.68
174.0	000.2500	-0011.2	007.1	274.5	000.0008	0476.5	004.6	61.45
175.0	000.2500	-0024.8	007.1	274.3	000.0008	0476.4	004.7	61.21
176.0	000.2500	-0036.5	007.1	274.0	000.0008	0476.3	004.9	60.98
177.0	000.2500	-0044.2	007.1	273.8	000.0008	0476.2	005.0	60.73
178.0	000.2500	-0038.9	007.1	273.7	000.0008	0476.1	005.1	60.48

Exhibit 7b

Contour Protection Studies Toward Select Allocation Concern(s)

01-04-2018 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

W228AU BLFT19890301TA

CH231D.P

Channel = 228D
Max ERP = 0.005 kW
RCAMSL = 696 m
N. Lat. 42 51 50.0
W. Lng. 72 14 04.0
Protected
60 dBu

Channel = 231D
Max ERP = 0.25 kW
RCAMSL = 193 m
N. Lat. 42 55 50.0
W. Lng. 72 18 00.0
Interfering
100 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
279.0	000.0047	0477.9	009.9	217.3	000.2500	-0059.3	007.4	59.32	
280.0	000.0046	0475.7	009.9	217.7	000.2500	-0059.6	007.2	59.72	
281.0	000.0045	0473.3	009.8	217.8	000.2500	-0059.7	007.0	60.18	
282.0	000.0045	0472.7	009.8	217.9	000.2500	-0060.0	006.8	60.63	
283.0	000.0044	0472.6	009.7	218.1	000.2500	-0060.3	006.7	61.10	
284.0	000.0043	0471.5	009.6	218.2	000.2500	-0060.4	006.5	61.57	
285.0	000.0042	0470.0	009.6	218.2	000.2500	-0060.4	006.3	62.06	
286.0	000.0041	0468.3	009.5	218.2	000.2500	-0060.4	006.1	62.56	
287.0	000.0040	0467.3	009.4	218.1	000.2500	-0060.3	005.9	63.08	
288.0	000.0039	0465.9	009.3	218.0	000.2500	-0060.2	005.8	63.62	
289.0	000.0039	0463.6	009.3	217.8	000.2500	-0059.9	005.6	64.17	
290.0	000.0038	0461.3	009.2	217.6	000.2500	-0059.5	005.4	64.72	
291.0	000.0037	0459.6	009.1	216.9	000.2500	-0059.0	005.2	65.31	
292.0	000.0035	0459.7	009.0	216.3	000.2500	-0058.8	005.0	65.89	
293.0	000.0034	0459.7	008.9	215.5	000.2500	-0058.0	004.9	66.46	
294.0	000.0033	0458.3	008.8	214.5	000.2500	-0054.2	004.7	67.04	
295.0	000.0032	0455.6	008.6	213.3	000.2500	-0045.4	004.5	67.66	
296.0	000.0031	0452.1	008.5	211.9	000.2500	-0033.6	004.3	68.29	
297.0	000.0030	0448.9	008.4	210.3	000.2500	-0020.3	004.2	68.93	
298.0	000.0029	0447.1	008.2	208.6	000.2500	-0005.7	004.0	69.57	
299.0	000.0027	0446.5	008.1	206.9	000.2500	0008.0	003.9	70.20	
300.0	000.0026	0446.1	008.0	204.9	000.2500	0022.1	003.8	70.81	
301.0	000.0025	0445.2	007.8	202.4	000.2500	0019.8	003.6	71.38	
302.0	000.0024	0444.4	007.7	199.5	000.2500	0000.3	003.5	71.89	
303.0	000.0023	0443.6	007.5	196.5	000.2500	-0009.9	003.5	72.34	
304.0	000.0022	0442.7	007.4	193.3	000.2500	-0013.3	003.4	72.72	
305.0	000.0020	0442.9	007.2	190.1	000.2500	-0020.8	003.3	73.02	
306.0	000.0019	0445.2	007.1	186.8	000.2500	-0015.7	003.3	73.26	
307.0	000.0018	0449.3	006.9	183.7	000.2500	-0014.5	003.2	73.44	
308.0	000.0017	0452.9	006.8	180.5	000.2500	-0019.5	003.2	73.55	
309.0	000.0016	0454.7	006.7	177.2	000.2500	-0044.5	003.2	73.53	
310.0	000.0015	0456.8	006.5	173.9	000.2500	-0009.3	003.2	73.42	
311.0	000.0014	0463.0	006.4	170.8	000.2500	0021.2	003.3	73.30	

Exhibit 7b

Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
312.0	000.0013	0474.0	006.3	168.1	000.2500	0022.7	003.3	73.18
313.0	000.0012	0485.9	006.1	165.3	000.2500	0014.9	003.3	72.97
314.0	000.0011	0494.4	006.0	162.5	000.2500	-0002.8	003.4	72.62
315.0	000.0011	0498.0	005.8	159.8	000.2500	-0029.3	003.5	72.15
316.0	000.0011	0499.2	006.0	159.4	000.2500	-0032.8	003.3	73.17
317.0	000.0012	0500.4	006.2	158.9	000.2500	-0037.1	003.1	74.31
318.0	000.0013	0502.3	006.4	158.2	000.2500	-0042.8	002.9	75.58
319.0	000.0014	0504.1	006.6	157.2	000.2500	-0049.0	002.7	76.99
320.0	000.0015	0506.6	006.8	156.0	000.2500	-0055.7	002.5	78.57
321.0	000.0016	0511.1	006.9	154.3	000.2500	-0065.6	002.3	80.20
322.0	000.0017	0517.5	007.1	152.1	000.2500	-0075.3	002.0	81.98
323.0	000.0018	0523.2	007.3	149.2	000.2500	-0086.2	001.8	83.75
324.0	000.0019	0527.2	007.5	145.4	000.2500	-0085.3	001.7	85.38
325.0	000.0020	0529.0	007.6	140.4	000.2500	-0075.3	001.5	97.38
326.0	000.0022	0528.7	007.8	134.2	000.2500	-0058.3	001.4	98.18
327.0	000.0023	0527.5	007.9	126.7	000.2500	-0111.5	001.3	98.86
328.0	000.0024	0526.6	008.1	117.9	000.2500	-0131.3	001.2	99.38
329.0	000.0025	0526.8	008.2	107.9	000.2500	-0120.7	001.2	99.68
330.0	000.0026	0528.4	008.4	097.4	000.2500	-0140.2	001.2	99.67
331.0	000.0027	0530.9	008.5	088.2	000.2500	-0150.9	001.2	99.26
332.0	000.0029	0533.5	008.7	080.0	000.2500	-0184.4	001.3	98.65
333.0	000.0030	0535.6	008.8	073.2	000.2500	-0197.3	001.4	97.90
334.0	000.0031	0536.6	008.9	067.9	000.2500	-0200.4	001.6	86.40
335.0	000.0032	0536.0	009.0	063.9	000.2500	-0182.8	001.7	84.98
336.0	000.0033	0532.7	009.1	061.0	000.2500	-0165.9	001.9	83.50
337.0	000.0034	0526.0	009.2	059.2	000.2500	-0152.9	002.0	82.03
338.0	000.0036	0515.9	009.2	058.2	000.2500	-0145.6	002.2	80.60
339.0	000.0037	0503.6	009.3	057.7	000.2500	-0142.0	002.4	79.23
340.0	000.0038	0492.1	009.4	057.3	000.2500	-0139.3	002.5	77.92
341.0	000.0039	0482.3	009.4	057.6	000.2500	-0141.3	002.7	76.73
342.0	000.0040	0472.9	009.4	057.9	000.2500	-0143.6	002.9	75.62
343.0	000.0041	0463.3	009.4	058.4	000.2500	-0147.1	003.0	74.60
344.0	000.0041	0452.8	009.4	059.1	000.2500	-0152.3	003.2	73.69
345.0	000.0042	0442.0	009.4	060.1	000.2500	-0159.5	003.3	72.88
346.0	000.0043	0432.8	009.4	061.0	000.2500	-0165.6	003.5	72.09
347.0	000.0044	0426.6	009.4	061.5	000.2500	-0169.1	003.7	71.30
348.0	000.0045	0424.8	009.4	061.6	000.2500	-0169.3	003.8	70.50
349.0	000.0046	0428.0	009.5	061.1	000.2500	-0166.1	004.0	69.67
350.0	000.0047	0434.4	009.6	060.3	000.2500	-0160.8	004.2	68.83
351.0	000.0047	0441.6	009.7	060.1	000.2500	-0159.2	004.4	68.08
352.0	000.0047	0445.4	009.8	060.3	000.2500	-0160.7	004.6	67.42
353.0	000.0048	0444.2	009.8	060.9	000.2500	-0165.3	004.7	66.85
354.0	000.0048	0440.5	009.8	061.8	000.2500	-0170.6	004.9	66.34
355.0	000.0048	0439.3	009.8	062.4	000.2500	-0174.3	005.1	65.81
356.0	000.0049	0438.6	009.8	063.0	000.2500	-0177.7	005.2	65.29

Exhibit 7c
Contour Protection Studies Toward Select Allocation Concern(s)

FMCommander Single Allocation Study - 01-04-2018 - FCC NGDC 30 Sec
CH231D.P's Overlaps (In= 5.73 km, Out= 6.59 km)

CH231D.P CH 231 D
Lat= 42 55 50.0, Lng= 72 18 00.0
0.25 kW -92.6 m HAAT, 193 m COR
Prot.= 60 dBu, Intef.= 54 dBu

W232CG CH 232 D BLFT20121113ABM
Lat= 42 49 44.0, Lng= 72 35 52.0
0.19 kW 31.2 m HAAT, 307 m COR
Prot.= 60 dBu, Intef.= 54 dBu

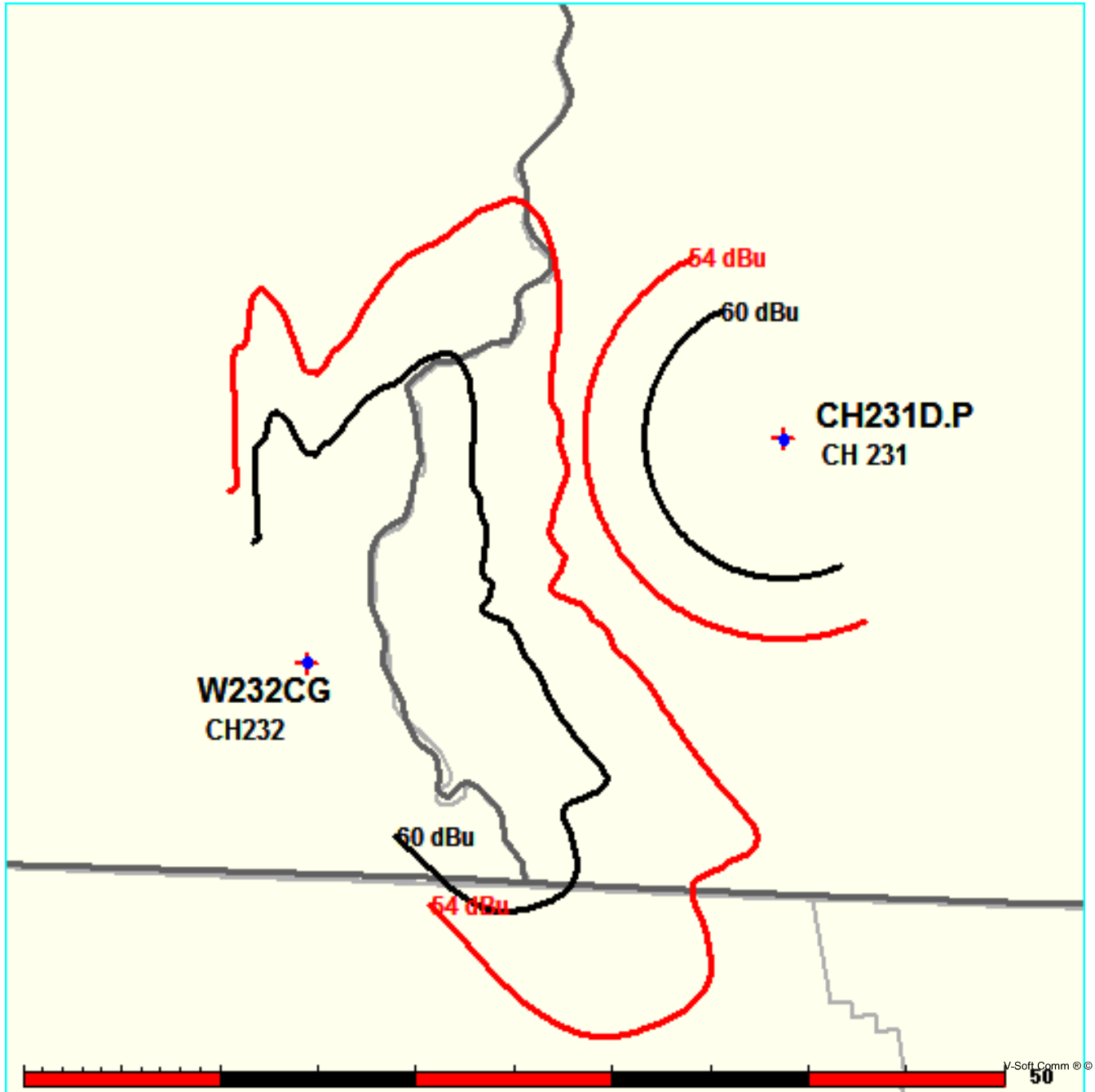


Exhibit 7c

Contour Protection Studies Toward Select Allocation Concern(s)

01-04-2018

Terrain Data: FCC NGDC 30 Sec

FMOver Analysis

CH231D.P

W232CG BLFT20121113ABM

Channel = 231D

Max ERP = 0.25 kW

RCAMSL = 193 m

N. Lat. 42 55 50.0

W. Lng. 72 18 00.0

Protected

60 dBu

Channel = 232D

Max ERP = 0.19 kW

RCAMSL = 307 m

N. Lat. 42 49 44.0

W. Lng. 72 35 52.0

Interfering

54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
204.0	000.2500	0024.3	007.1	077.2	000.0220	0066.6	021.9	37.65	
205.0	000.2500	0021.8	007.1	077.0	000.0218	0065.7	021.8	37.58	
206.0	000.2500	0015.2	007.1	076.8	000.0217	0064.8	021.7	37.50	
207.0	000.2500	0007.1	007.1	076.6	000.0215	0063.8	021.6	37.42	
208.0	000.2500	-0000.8	007.1	076.4	000.0213	0062.9	021.5	37.35	
209.0	000.2500	-0008.8	007.1	076.2	000.0211	0062.1	021.4	37.28	
210.0	000.2500	-0017.5	007.1	075.9	000.0209	0061.3	021.4	37.21	
211.0	000.2500	-0026.4	007.1	075.7	000.0207	0060.7	021.3	37.15	
212.0	000.2500	-0034.4	007.1	075.5	000.0205	0060.0	021.2	37.09	
213.0	000.2500	-0042.6	007.1	075.2	000.0202	0059.4	021.1	37.04	
214.0	000.2500	-0050.6	007.1	075.0	000.0200	0058.8	021.0	36.97	
215.0	000.2500	-0056.3	007.1	074.7	000.0198	0058.2	020.9	36.91	
216.0	000.2500	-0058.6	007.1	074.4	000.0196	0057.7	020.9	36.84	
217.0	000.2500	-0059.0	007.1	074.2	000.0194	0057.2	020.8	36.78	
218.0	000.2500	-0060.1	007.1	073.9	000.0191	0056.9	020.7	36.74	
219.0	000.2500	-0062.3	007.1	073.6	000.0189	0056.7	020.6	36.72	
220.0	000.2500	-0065.8	007.1	073.3	000.0187	0056.7	020.6	36.72	
221.0	000.2500	-0070.5	007.1	073.0	000.0184	0056.9	020.5	36.76	
222.0	000.2500	-0075.6	007.1	072.7	000.0182	0057.4	020.4	36.83	
223.0	000.2500	-0080.6	007.1	072.4	000.0179	0058.1	020.4	36.91	
224.0	000.2500	-0085.4	007.1	072.1	000.0177	0058.8	020.3	37.00	
225.0	000.2500	-0089.9	007.1	071.8	000.0174	0059.8	020.3	37.12	
226.0	000.2500	-0094.0	007.1	071.5	000.0172	0060.8	020.2	37.23	
227.0	000.2500	-0096.1	007.1	071.2	000.0169	0061.8	020.1	37.34	
228.0	000.2500	-0095.8	007.1	070.9	000.0167	0062.9	020.1	37.45	
229.0	000.2500	-0094.6	007.1	070.5	000.0164	0063.9	020.1	37.54	
230.0	000.2500	-0094.0	007.1	070.2	000.0161	0064.7	020.0	37.61	
231.0	000.2500	-0094.8	007.1	069.9	000.0159	0065.4	020.0	37.68	
232.0	000.2500	-0096.2	007.1	069.5	000.0158	0066.2	019.9	37.76	
233.0	000.2500	-0098.3	007.1	069.2	000.0156	0066.9	019.9	37.84	
234.0	000.2500	-0101.3	007.1	068.9	000.0155	0067.6	019.9	37.91	
235.0	000.2500	-0104.3	007.1	068.5	000.0153	0068.3	019.8	37.97	

Exhibit 7c

Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
236.0	000.2500	-0107.1	007.1	068.2	000.0152	0068.9	019.8	38.03
237.0	000.2500	-0109.7	007.1	067.8	000.0150	0069.3	019.8	38.05
238.0	000.2500	-0112.0	007.1	067.5	000.0149	0069.5	019.7	38.05
239.0	000.2500	-0113.4	007.1	067.1	000.0147	0069.5	019.7	38.03
240.0	000.2500	-0113.6	007.1	066.8	000.0146	0069.4	019.7	37.98
241.0	000.2500	-0113.0	007.1	066.4	000.0144	0069.2	019.7	37.93
242.0	000.2500	-0112.2	007.1	066.0	000.0143	0068.9	019.7	37.85
243.0	000.2500	-0111.7	007.1	065.7	000.0141	0068.6	019.7	37.77
244.0	000.2500	-0111.6	007.1	065.3	000.0140	0068.1	019.7	37.67
245.0	000.2500	-0112.0	007.1	065.0	000.0138	0067.6	019.7	37.57
246.0	000.2500	-0112.0	007.1	064.6	000.0137	0067.2	019.7	37.47
247.0	000.2500	-0110.8	007.1	064.2	000.0135	0066.8	019.7	37.37
248.0	000.2500	-0108.3	007.1	063.9	000.0134	0066.6	019.7	37.29
249.0	000.2500	-0103.8	007.1	063.5	000.0133	0066.5	019.7	37.23
250.0	000.2500	-0097.7	007.1	063.2	000.0131	0066.6	019.7	37.18
251.0	000.2500	-0090.0	007.1	062.8	000.0130	0066.8	019.7	37.15
252.0	000.2500	-0081.6	007.1	062.5	000.0128	0067.1	019.7	37.12
253.0	000.2500	-0073.3	007.1	062.1	000.0127	0067.6	019.8	37.11
254.0	000.2500	-0065.7	007.1	061.7	000.0125	0068.2	019.8	37.12
255.0	000.2500	-0060.1	007.1	061.4	000.0124	0068.8	019.8	37.12
256.0	000.2500	-0055.7	007.1	061.0	000.0123	0069.6	019.8	37.15
257.0	000.2500	-0053.0	007.1	060.7	000.0121	0070.4	019.9	37.17
258.0	000.2500	-0051.9	007.1	060.4	000.0120	0071.1	019.9	37.18
259.0	000.2500	-0051.5	007.1	060.0	000.0119	0072.0	020.0	37.20
260.0	000.2500	-0052.1	007.1	059.7	000.0118	0072.8	020.0	37.23
261.0	000.2500	-0053.5	007.1	059.4	000.0117	0073.6	020.0	37.25
262.0	000.2500	-0055.2	007.1	059.0	000.0116	0074.4	020.1	37.27
263.0	000.2500	-0056.9	007.1	058.7	000.0115	0075.1	020.1	37.28
264.0	000.2500	-0058.9	007.1	058.4	000.0114	0075.9	020.2	37.30
265.0	000.2500	-0061.0	007.1	058.1	000.0113	0076.6	020.2	37.29
266.0	000.2500	-0062.7	007.1	057.8	000.0112	0077.3	020.3	37.30
267.0	000.2500	-0063.7	007.1	057.5	000.0112	0078.0	020.4	37.30
268.0	000.2500	-0062.6	007.1	057.2	000.0111	0078.7	020.4	37.30
269.0	000.2500	-0059.7	007.1	056.9	000.0110	0079.5	020.5	37.29
270.0	000.2500	-0056.7	007.1	056.6	000.0109	0080.2	020.6	37.30
271.0	000.2500	-0053.8	007.1	056.3	000.0108	0081.0	020.6	37.29
272.0	000.2500	-0051.1	007.1	056.0	000.0108	0081.7	020.7	37.28
273.0	000.2500	-0049.6	007.1	055.7	000.0107	0082.4	020.8	37.27
274.0	000.2500	-0047.5	007.1	055.5	000.0106	0083.2	020.8	37.27
275.0	000.2500	-0044.6	007.1	055.2	000.0105	0084.0	020.9	37.27
276.0	000.2500	-0039.2	007.1	054.9	000.0105	0084.8	021.0	37.26
277.0	000.2500	-0034.4	007.1	054.7	000.0104	0085.6	021.1	37.25
278.0	000.2500	-0030.3	007.1	054.4	000.0103	0086.2	021.2	37.22
279.0	000.2500	-0027.2	007.1	054.2	000.0103	0086.8	021.2	37.19
280.0	000.2500	-0026.2	007.1	054.0	000.0102	0087.2	021.3	37.14

Exhibit 7c

Contour Protection Studies Toward Select Allocation Concern(s)

01-04-2018

Terrain Data: FCC NGDC 30 Sec

FMOver Analysis

W232CG BLFT20121113ABM

CH231D.P

Channel = 232D

Max ERP = 0.19 kW

RCAMSL = 307 m

N. Lat. 42 49 44.0

W. Lng. 72 35 52.0

Protected

60 dBu

Channel = 231D

Max ERP = 0.25 kW

RCAMSL = 193 m

N. Lat. 42 55 50.0

W. Lng. 72 18 00.0

Interfering

54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
020.0	000.1900	0168.2	015.8	280.6	000.2500	-0025.9	019.2	43.50	
021.0	000.1900	0175.5	016.1	281.6	000.2500	-0026.4	018.8	43.78	
022.0	000.1900	0182.6	016.5	282.5	000.2500	-0026.7	018.5	44.05	
023.0	000.1900	0189.4	016.8	283.3	000.2500	-0025.6	018.2	44.33	
024.0	000.1900	0194.8	017.0	283.9	000.2500	-0024.4	017.8	44.60	
025.0	000.1900	0197.6	017.1	284.1	000.2500	-0023.9	017.5	44.87	
026.0	000.1900	0197.3	017.1	283.8	000.2500	-0024.4	017.2	45.11	
027.0	000.1900	0194.6	017.0	283.2	000.2500	-0025.7	016.9	45.33	
028.0	000.1900	0190.8	016.8	282.4	000.2500	-0026.8	016.7	45.54	
029.0	000.1900	0186.0	016.6	281.4	000.2500	-0026.1	016.5	45.72	
030.0	000.1900	0180.7	016.4	280.3	000.2500	-0026.1	016.3	45.89	
031.0	000.1900	0174.6	016.1	279.0	000.2500	-0027.3	016.1	46.02	
032.0	000.1900	0168.0	015.8	277.5	000.2500	-0032.5	016.0	46.12	
033.0	000.1900	0162.0	015.4	276.0	000.2500	-0039.5	015.9	46.21	
034.0	000.1900	0156.5	015.1	274.5	000.2500	-0046.6	015.8	46.28	
035.0	000.1900	0150.8	014.8	273.0	000.2500	-0049.5	015.8	46.33	
036.0	000.1900	0144.7	014.5	271.5	000.2500	-0052.5	015.7	46.35	
037.0	000.1900	0137.4	014.0	269.7	000.2500	-0057.5	015.8	46.32	
038.0	000.1900	0129.6	013.6	268.0	000.2500	-0062.6	015.9	46.25	
039.0	000.1900	0122.2	013.2	266.4	000.2500	-0063.1	015.9	46.19	
040.0	000.1900	0116.1	012.9	265.0	000.2500	-0061.1	016.0	46.14	
041.0	000.1900	0111.1	012.7	263.8	000.2500	-0058.4	016.0	46.10	
042.0	000.1900	0106.7	012.4	262.6	000.2500	-0056.2	016.1	46.07	
043.0	000.1900	0103.6	012.2	261.6	000.2500	-0054.7	016.1	46.08	
044.0	000.1900	0102.0	012.2	260.8	000.2500	-0053.2	016.0	46.13	
045.0	000.1900	0101.7	012.1	260.2	000.2500	-0052.3	015.9	46.22	
046.0	000.1900	0100.9	012.1	259.5	000.2500	-0051.7	015.8	46.29	
047.0	000.1900	0098.9	012.0	258.6	000.2500	-0051.5	015.8	46.30	
048.0	000.1900	0096.3	011.8	257.7	000.2500	-0052.2	015.8	46.28	
049.0	000.1900	0093.4	011.7	256.7	000.2500	-0053.6	015.9	46.24	
050.0	000.1900	0091.5	011.5	255.9	000.2500	-0056.1	015.9	46.23	
051.0	000.1900	0090.6	011.5	255.1	000.2500	-0059.3	015.9	46.26	
052.0	000.1900	0090.1	011.5	254.4	000.2500	-0063.1	015.8	46.30	

Exhibit 7c

Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
053.0	000.1900	0089.0	011.4	253.7	000.2500	-0067.9	015.8	46.31
054.0	000.1900	0087.2	011.3	252.9	000.2500	-0074.3	015.8	46.28
055.0	000.1900	0084.7	011.1	252.0	000.2500	-0081.3	015.9	46.21
056.0	000.1900	0081.7	010.9	251.2	000.2500	-0088.4	016.0	46.10
057.0	000.1900	0079.1	010.8	250.4	000.2500	-0094.8	016.2	46.01
058.0	000.1900	0076.7	010.6	249.6	000.2500	-0100.1	016.3	45.91
059.0	000.1900	0074.4	010.5	248.9	000.2500	-0104.4	016.4	45.82
060.0	000.1900	0072.0	010.3	248.2	000.2500	-0107.6	016.5	45.71
061.0	000.1900	0069.7	010.2	247.5	000.2500	-0109.7	016.6	45.60
062.0	000.1900	0067.7	010.0	246.9	000.2500	-0111.0	016.7	45.50
063.0	000.1900	0066.7	010.0	246.3	000.2500	-0111.8	016.8	45.45
064.0	000.1900	0066.6	010.0	245.7	000.2500	-0112.2	016.8	45.45
065.0	000.1900	0067.7	010.0	245.1	000.2500	-0112.1	016.7	45.52
066.0	000.1900	0068.9	010.1	244.5	000.2500	-0111.8	016.7	45.58
067.0	000.1900	0069.5	010.2	243.8	000.2500	-0111.6	016.6	45.61
068.0	000.1900	0069.1	010.1	243.2	000.2500	-0111.7	016.7	45.58
069.0	000.1900	0067.3	010.0	242.7	000.2500	-0111.9	016.8	45.46
070.0	000.1900	0065.2	009.9	242.2	000.2500	-0112.1	017.0	45.32
071.0	000.1900	0062.5	009.7	241.7	000.2500	-0112.4	017.2	45.14
072.0	000.1900	0059.2	009.4	241.3	000.2500	-0112.8	017.4	44.92
073.0	000.1900	0057.0	009.3	240.9	000.2500	-0113.1	017.6	44.75
074.0	000.1900	0057.0	009.3	240.4	000.2500	-0113.4	017.7	44.72
075.0	000.1900	0058.9	009.4	239.7	000.2500	-0113.6	017.6	44.81
076.0	000.1900	0061.6	009.6	239.0	000.2500	-0113.4	017.4	44.93
077.0	000.1900	0065.7	009.9	238.2	000.2500	-0112.3	017.2	45.11
078.0	000.1900	0070.0	010.2	237.3	000.2500	-0110.5	017.0	45.29
079.0	000.1900	0073.0	010.4	236.5	000.2500	-0108.4	016.9	45.39
080.0	000.1900	0074.1	010.5	235.8	000.2500	-0106.7	016.9	45.39
081.0	000.1900	0074.3	010.5	235.3	000.2500	-0105.1	017.0	45.33
082.0	000.1900	0076.4	010.6	234.5	000.2500	-0102.8	016.9	45.36
083.0	000.1900	0077.9	010.7	233.8	000.2500	-0100.7	016.9	45.36
084.0	000.1900	0079.4	010.8	233.1	000.2500	-0098.5	016.9	45.35
085.0	000.1900	0080.7	010.9	232.4	000.2500	-0096.9	017.0	45.32
086.0	000.1900	0081.4	010.9	231.8	000.2500	-0095.8	017.0	45.26
087.0	000.1900	0081.7	010.9	231.2	000.2500	-0095.1	017.1	45.19
088.0	000.1900	0083.2	011.0	230.5	000.2500	-0094.2	017.2	45.15
089.0	000.1900	0085.8	011.2	229.7	000.2500	-0094.0	017.2	45.15
090.0	000.1900	0088.3	011.4	228.8	000.2500	-0094.7	017.2	45.15
091.0	000.1900	0090.9	011.5	228.0	000.2500	-0095.8	017.2	45.13
092.0	000.1900	0093.5	011.7	227.2	000.2500	-0096.3	017.2	45.10
093.0	000.1900	0095.7	011.8	226.4	000.2500	-0094.9	017.3	45.06
094.0	000.1900	0097.8	011.9	225.6	000.2500	-0092.5	017.4	44.99
095.0	000.1900	0099.9	012.0	224.9	000.2500	-0089.4	017.4	44.93
096.0	000.1900	0102.1	012.2	224.1	000.2500	-0086.0	017.5	44.86

Exhibit 8

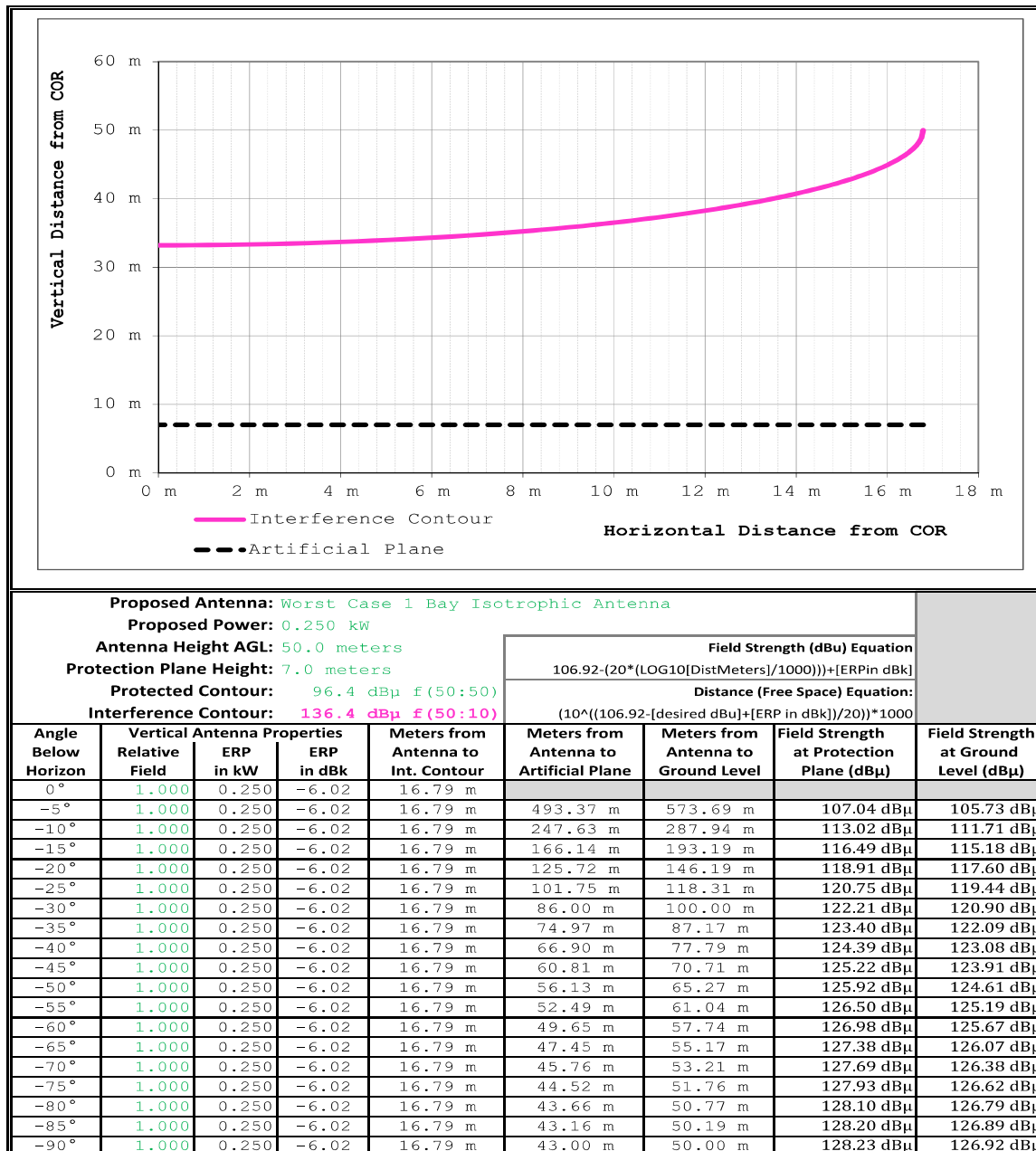
47 C.F.R. Section 74.1204(d) Second / Third Adjacent Given Interference Waiver Request

Yellow Highlighted Text denotes the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WEYY(FM) - Swanzey, NH (CH228A) as noted in **Exhibit 8**. Protection of the calculated 136.4 dBμ F(50:10) Interference Contour, corresponding to the 96.4 dBμ F(50:50) Protected Contour, has been demonstrated through a downward radiation study. Full protection will be afforded the concern as the interference area will not reach the ground nor a seven-meter artificial plane representing a standard two story home when taking into account the downward radiation characteristics of a worst case, one bay, isotropic antenna regardless of the three bay antenna to be employed. Additional antenna manufacturer's data has been included in **Exhibit 9**.

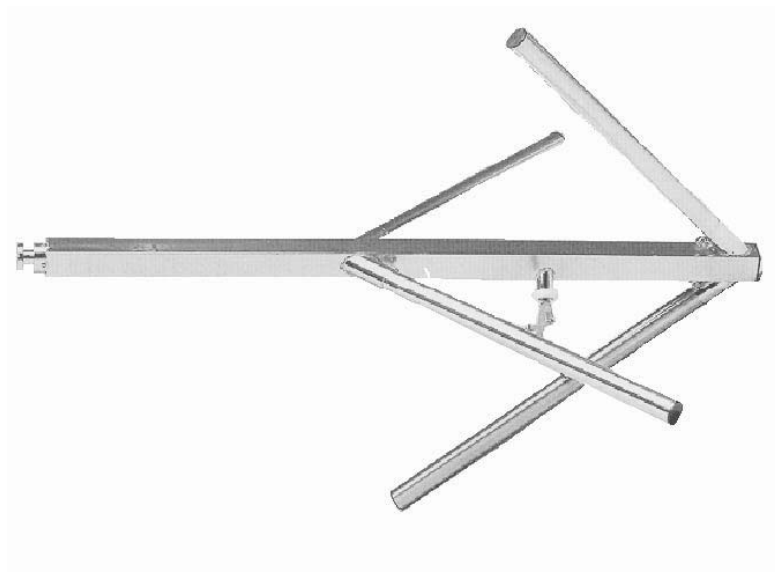
Signal Report ✕

WEYY Signal value at Reference site = 96.4 dBu. Distance to CH231D.P
interference signal contour = 16.7 m

OK



***Exhibit 9 - Copy of Manufacturer's
Vertical Radiation Pattern Documentation
(public record copy)***



NICOM
BKG77

Low Power

**Broadband
FM Circular
Polarization
Antenna
*Antena de
FM Banda Ancha
Polarizacion Circular***

This antenna, constructed completely of stainless steel, offers circular polarization for better coverage especially in urban areas. In order to facilitate and decrease shipping costs, this model is simple to break down and reassemble when ready to be installed. It is insulated with Teflon, and with the appropriate connector has a maximum input of 0.5 kw.

Esta antena, fabricada completamente de acero inoxidable, le ofrece polarización circular para mejor alcance, especialmente en zonas urbanas. Para facilitar y disminuir los costos de transportación, este modelo es fácil de desarmar y volver a montar tan pronto que la quiera instalar. Está aislada con Teflon, y con el conector apropiado tiene una entrada máxima de 0.5 kw.



TECHNICAL SPECIFICATIONS (per bay)

Antenna type	circular polarization dipole	Front-to-back ratio	3 dB
Frequency range	87.5 - 108 MHz	Lightening protection	all parts grounded
Bandwidth	500 kHz max	Max wind velocity	119 mph (190 km/h)
Impedance	50 ohms	Wind load	8 Lbs (3.6 kg)
Connectors	N type (0.5 kw)	Wind surface	0.3 ft ² (0.04 m ²)
Power rating	500 Watts max	Materials (external)	stainless steel
VSWR	< 1.1:1	Mounting	from 2" to 4"
Polarization	vertical and horizontal	Weight	7.7 Lbs (3.5 kg)
Gain	- 3 dBd (referred to half-wave dipole)	Dimensions	58"×32"×32" (1450×800×800mm)
H plane	omnidirectional ±1.5 dB (with a 4" mast)	Packing	72"×6"×6" (1500×152×152mm)
V plane	omnidirectional ±3 dB (with a 4" mast)		

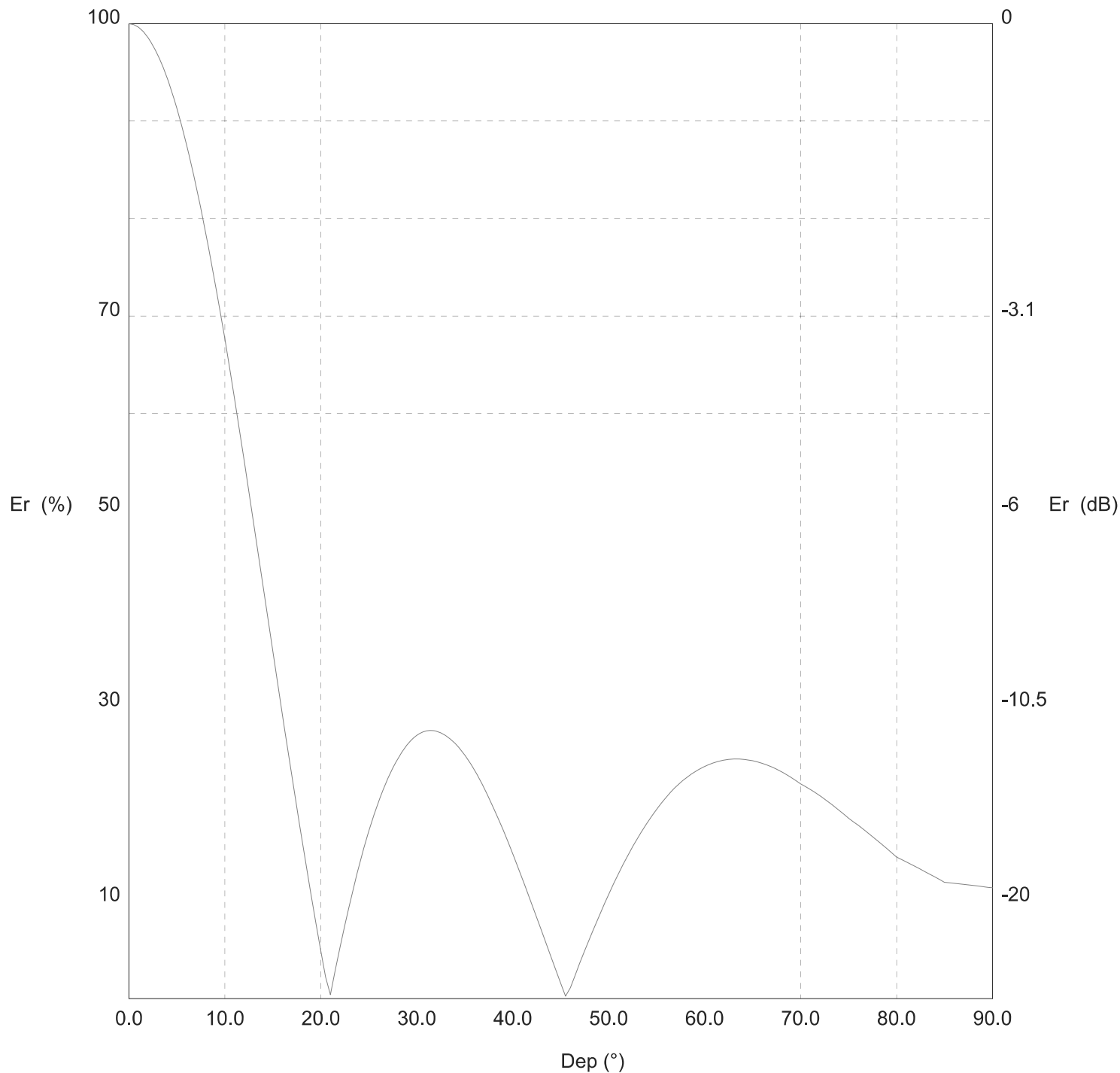
***Exhibit 9 - Copy of Manufacturer's
Vertical Radiation Pattern Documentation
(public record copy)***

TX station: BKG77-3

Site name:

Frequency: 100.00 MHz

Vertical diagram



— 0.0° Az. (Total antenna)

NicomUsa, Inc

Exhibit 9 - Copy of Manufacturer's Vertical Radiation Pattern Documentation (public record copy)

TX station: BKG77-3

Site name:

Frequency: 100.00 MHz

Vertical diagram at an azimuth of 0° degrees

Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)
0.0	100.0	1.37	30.0	27.0	0.10	60.0	23.8	0.08
0.5	99.9	1.37	30.5	27.3	0.10	60.5	24.0	0.08
1.0	99.6	1.36	31.0	27.4	0.10	61.0	24.2	0.08
1.5	99.2	1.35	31.5	27.5	0.10	61.5	24.3	0.08
2.0	98.5	1.33	32.0	27.4	0.10	62.0	24.5	0.08
2.5	97.8	1.31	32.5	27.3	0.10	62.5	24.5	0.08
3.0	96.8	1.28	33.0	27.0	0.10	63.0	24.6	0.08
3.5	95.7	1.26	33.5	26.6	0.10	63.5	24.6	0.08
4.0	94.4	1.22	34.0	26.2	0.09	64.0	24.5	0.08
4.5	92.9	1.18	34.5	25.6	0.09	64.5	24.5	0.08
5.0	91.3	1.14	35.0	25.0	0.09	65.0	24.4	0.08
5.5	89.5	1.10	35.5	24.2	0.08	65.5	24.3	0.08
6.0	87.6	1.05	36.0	23.4	0.08	66.0	24.1	0.08
6.5	85.5	1.00	36.5	22.5	0.07	66.5	23.9	0.08
7.0	83.3	0.95	37.0	21.6	0.06	67.0	23.7	0.08
7.5	81.0	0.90	37.5	20.6	0.06	67.5	23.5	0.08
8.0	78.6	0.85	38.0	19.5	0.05	68.0	23.3	0.07
8.5	76.0	0.79	38.5	18.4	0.05	68.5	23.0	0.07
9.0	73.4	0.74	39.0	17.3	0.04	69.0	22.7	0.07
9.5	70.6	0.68	39.5	16.1	0.04	69.5	22.4	0.07
10.0	67.8	0.63	40.0	14.8	0.03	70.0	22.0	0.07
10.5	64.7	0.57	40.5	13.6	0.03	70.5	21.7	0.06
11.0	61.6	0.52	41.0	12.3	0.02	71.0	21.4	0.06
11.5	58.5	0.47	41.5	11.0	0.02	71.5	21.1	0.06
12.0	55.3	0.42	42.0	9.6	0.01	72.0	20.8	0.06
12.5	52.1	0.37	42.5	8.3	0.01	72.5	20.4	0.06
13.0	48.8	0.33	43.0	6.9	0.01	73.0	20.1	0.06
13.5	45.5	0.28	43.5	5.6	0.00	73.5	19.7	0.05
14.0	42.2	0.24	44.0	4.2	0.00	74.0	19.3	0.05
14.5	38.9	0.21	44.5	2.9	0.00	74.5	18.9	0.05
15.0	35.7	0.17	45.0	1.5	0.00	75.0	18.5	0.05
15.5	32.4	0.14	45.5	0.2	0.00	75.5	18.1	0.05
16.0	29.1	0.12	46.0	1.1	0.00	76.0	17.8	0.04
16.5	25.9	0.09	46.5	2.4	0.00	76.5	17.4	0.04
17.0	22.7	0.07	47.0	3.6	0.00	77.0	17.0	0.04
17.5	19.6	0.05	47.5	4.9	0.00	77.5	16.6	0.04
18.0	16.5	0.04	48.0	6.1	0.01	78.0	16.2	0.04
18.5	13.5	0.02	48.5	7.3	0.01	78.5	15.8	0.03
19.0	10.5	0.02	49.0	8.5	0.01	79.0	15.4	0.03
19.5	7.7	0.01	49.5	9.6	0.01	79.5	14.9	0.03
20.0	4.9	0.00	50.0	10.7	0.02	80.0	14.5	0.03
20.5	2.2	0.00	50.5	11.7	0.02	80.5	14.3	0.03
21.0	0.4	0.00	51.0	12.7	0.02	81.0	14.0	0.03
21.5	2.9	0.00	51.5	13.7	0.03	81.5	13.8	0.03
22.0	5.3	0.00	52.0	14.7	0.03	82.0	13.5	0.03
22.5	7.5	0.01	52.5	15.6	0.03	82.5	13.3	0.02
23.0	9.7	0.01	53.0	16.4	0.04	83.0	13.0	0.02
23.5	11.7	0.02	53.5	17.2	0.04	83.5	12.7	0.02
24.0	13.7	0.03	54.0	18.0	0.04	84.0	12.5	0.02
24.5	15.5	0.03	54.5	18.7	0.05	84.5	12.2	0.02
25.0	17.1	0.04	55.0	19.4	0.05	85.0	11.9	0.02
25.5	18.7	0.05	55.5	20.1	0.06	85.5	11.9	0.02
26.0	20.1	0.06	56.0	20.7	0.06	86.0	11.8	0.02
26.5	21.4	0.06	56.5	21.2	0.06	86.5	11.8	0.02
27.0	22.6	0.07	57.0	21.7	0.06	87.0	11.7	0.02
27.5	23.6	0.08	57.5	22.2	0.07	87.5	11.6	0.02
28.0	24.5	0.08	58.0	22.6	0.07	88.0	11.6	0.02
28.5	25.3	0.09	58.5	22.9	0.07	88.5	11.5	0.02
29.0	26.0	0.09	59.0	23.3	0.07	89.0	11.5	0.02
29.5	26.6	0.10	59.5	23.5	0.08	89.5	11.4	0.02