

Exhibit 13.1 - Copy of Existing Antenna Structure Registration



Registration Detail

Reg Number	1294693	Status	Constructed
File Number	A0974358	Constructed	06/28/2015
EMI	No	Dismantled	
NEPA			

Antenna Structure

Structure Type	LTOWER - Lattice Tower		
Location (in NAD83 Coordinates)			
Lat/Long	43-23-41.7 N 085-34-35.1 W	Address	9182 88th Street
City, State	Howard City , MI		
Zip	49329	County	NEWAYGO
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
277.1	96.0
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
373.1	91.4

Painting and Lighting Specifications

FAA Chapters 4, 8, 12
Paint and Light in Accordance with FAA Circular Number 70/7460-1K

FAA Notification

FAA Study	2014-AGL-13932-OE	FAA Issue Date	01/22/2015
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Owner & Contact Information

FRN	0015011810	Owner Entity Type	Corporation
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Owner

Crystal Automation Systems, Inc. (DBA Casair, Inc.)	P: (989)831-8800
Attention To: Steven R. Meinhardt	F:
617 E. Lake St.	E: steve@casair.net
Stanton , MI 48888	

Contact

Meinhardt , Steven R	P: (989)831-8800
Attention To: Steven R. Meinhardt	F:
617 E. Lake St.	E: mike.grundel@casair.net
Stanton , MI 48888	

Last Action Status

Status	Constructed	Received	06/30/2015
Purpose	Notification	Entered	06/30/2015
Mode	Interactive		

Related Applications

06/30/2015	A0974358 - Notification (NT)
01/29/2015	A0927349 - Amendment (AM)

Comments

Comments

None

History

Date	Event
06/30/2015	Construction Notification Received
01/30/2015	Registration Printed

Automated Letters

01/30/2015	Authorization, Reference
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Exhibit 13.2

Vertical Plant of Antenna System

The site is located at 9182 88th Street;
the city of Howard City; Newaygo County; Michigan.

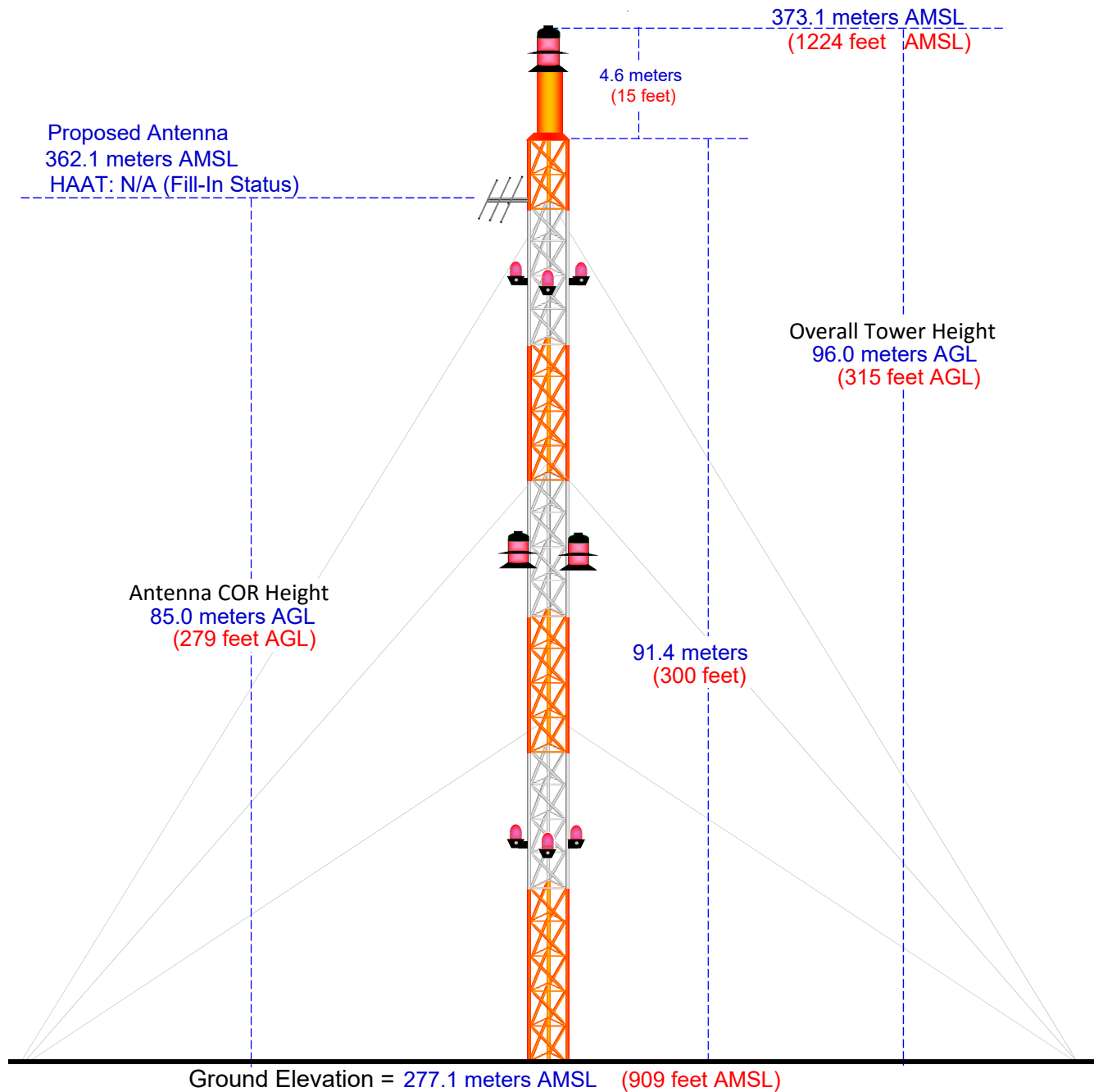
Antenna Structure Registration No.

1294693

Latitude (D M S) Longitude (D M S)

NAD 27 datum values: 43 23 41.60817 85 34 34.95077

NAD 83 datum values: 43 23 41.70000 85 34 35.10000



Drawing is not to Scale

Munn-Reese, Inc.

Broadcast Engineering Consultants
Coldwater, MI 49036

Terrain
194 335 m

USGS 03 SEC Terrain Database
U.S. Census 2010 PL Database

Exhibit 13.3 Present vs Proposed Service Contour Study

Proposed 60 dBu F(50:50) Contour

Present 60 dBu F(50:50) Contour

W242CH.P
Howard City, MI
Proposed Operation
Facility ID: 144400
Latitude: 43-23-42 N
Longitude: 085-34-35 W
ERP: 0.046 kW
Channel: 242D (96.3 MHz)
AMSL Height: 362.0 m
Horiz. Pattern: Directional

60 dBu F(50:50) Contour
Total Population: 7,216
Coverage Area: 182 sq. km

W242CH.C

W242CH.P

W242CH.C
Big Rapids, MI
BNPFT20130829AIF
Facility ID: 144400
Latitude: 43-25-23 N
Longitude: 085-29-20 W
ERP: 0.01 kW
Channel: 242D (96.3 MHz)
AMSL Height: 361.0 m
Horiz. Pattern: Omni

60 dBu F(50:50) Contour
Total Population: 5,984
Coverage Area: 94 sq. km

Scale 1:115,000

0 2 4 6 km

Exhibit 13.4

Proposed vs. Primary Service Contour Study

Primary 60 dBμ F(50:50) Contour

WYBR(FM)



Big Rapids

Proposed 60 dBμ F(50:50) Contour

W242CH.P



Howard City

W242CH.P

Howard City, MI

Proposed Operation

Facility ID: 144400

Latitude: 43-23-42 N

Longitude: 085-34-35 W

ERP: 0.046 kW

Channel: 242D (96.3 MHz)

AMSL Height: 362.0 m

Horiz. Pattern: Directional

WYBR(FM)

Big Rapids, MI

BLH19921112KE

Facility ID: 71629

Latitude: 43-41-01 N

Longitude: 085-34-56 W

ERP: 10.50 kW

Channel: 272C3 (102.3 MHz)

AMSL Height: 443.0 m

Horiz. Pattern: Omni

Terrain

170

519 m

Scale 1:400,000

0

5

10

15 km

Exhibit 13.5

Tabulation of Proposed Allocation

Mentor Partners, Inc.											
REFERENCE		CH#	242D	-	96.3 MHz, Pwr= 0.046 kW DA, HAAT= 94.3 M, COR= 362 M	Average Protected F(50-50)= 8.24 km		DISPLAY DATES			
43 23 42.0 N.								DATA 10-12-15			
85 34 35.0 W.								SEARCH 10-16-15			
Standard Directional											
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)
242D	W242CH	CP	_C_	66.2	7.72	43 25 23.0	0.010	18.2	5.6	-18.8*	-25.7*
Big Rapids		MI		246.2	BNPFT20130829AIF	85 29 20.0	90	361	Mentor Partners, Inc.		
245B	WLAV-FM	LIC	_CN	173.6	40.43	43 02 01.0	50.000	5.7	63.5	30.3	-23.3*<
Grand Rapids		MI		353.6	BLH19940822KC	85 31 15.0	149	386	Radio License Holding Cbc,		
239B	WLHT-FM	LIC	_CN	193.6	41.45	43 01 57.0	40.000	5.8	64.1	31.6	-23.0*<
Grand Rapids		MI		13.5	BLH19840120AE	85 41 47.0	168	397	Townsquare Media Of Grand		
242A	AL5657	RSV-A	___	310.2	82.14	43 52 10.0	6.000	83.0	25.4	-9.7*<	27.2
Pentwater		MI		129.7	RM11418	86 21 32.0	100	304			
242A	WMOM	CP	_CX	310.2	82.14	43 52 10.0	6.000	82.7	25.1	-9.4*<	27.5
Pentwater		MI		129.7	BPH20121001AON	86 21 32.0	100	302	Bay View Broadcasting, Inc		
241B	WMAX-FM	LIC	DEN	200.5	68.26	42 49 10.0	50.000	70.2	59.7	-6.2*<	0.3
Holland		MI		20.3	BLH19850403KR	85 52 09.0	150	357	Cc Licenses, Llc		
242A	AL6328	RSV-A	___	309.8	89.66	43 54 30.0	6.000	78.2	21.9	2.7	38.2
Ludington		MI		129.2	RM11704	86 26 10.0	100	293			
242A	WNOM	RSV-A	___	316.7	97.75	44 01 53.0	6.000	84.7	26.7	4.3	41.5
Ludington		MI		136.1		86 24 57.0	100	293	Wghn, Inc.		
243D	W243BA	LIC	_C_	14.3	30.82	43 39 49.0	0.019	10.2	7.3	12.5	12.1
Big Rapids		MI		194.4	BLFT20070517AIT	85 28 54.0	78	385	Mentor Partners, Inc.		
242A	WNOM	APP	NCX	310.3	90.30	43 55 01.0	3.400	68.9	19.4	12.6	41.4
Ludington		MI		129.7	BMPH20151005AFF	86 26 12.0	93	298	Wghn, Inc.		
242C1	WLXT	LIC	_CX	14.3	221.29	45 19 17.0	100.000	174.8	74.2	38.4	120.1
Petoskey		MI		194.8	BMLH20110406AAV	84 52 33.0	299	542	Macdonald Garber Broadcast		
243A	WQHH	LIC	_CX	129.1	95.47	42 50 58.0	6.000	45.6	29.6	41.9	54.7
Dewitt		MI		309.8	BLH20030331ALN	84 40 04.0	98	343	The Macdonald Broadcasting		
241C0	WHNN	LIC	DCN	82.8	153.20	43 33 10.0	100.000	102.1	70.3	42.8	71.3
Bay City		MI		264.1	BLH19920211KB	83 41 24.0	311	493	Radio License Holding Cbc,		

Terrain database is USGS 03 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. Call signs with strikeout need not be protected.
 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

Green Text denotes the facility to be modified by this Form 349 Filing. This facility need not be protected.

Yellow Highlighted Text denotes §74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Requests toward WLAV-FM - Grand Rapids, MI (CH245B) and WLHT-FM - Grand Rapids, MI (CH239B) as noted in **Exhibit(s) 13.7(a-b)**. The portion of the §74.1204(d) WLAV-FM - Grand Rapids, MI (CH245B) and WLHT-FM - Grand Rapids, MI (CH239B) protection from 235 meters to the extent of the worst case calculated 104.9 dBu F(50:10) Interference Contour, corresponding to the worst case WLHT-FM 64.9 dBu F(50:50) Protected Contour, has been demonstrated through a downward radiation study as included in **Exhibit 13.7a**. Full protection will be afforded each facility from 235 meters to the extent of the calculated 104.9 dBu F(50:10) interference contour as this area will not reach the ground nor a five meter artificial plane representing a standard one and a half story home when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the antenna manufacturer specifications has been included in **Exhibit 13.8**. The portion of the §74.1204(d) WLAV-FM - Grand Rapids, MI (CH245B) and WLHT-FM - Grand Rapids, MI (CH239B) protection within 235 meters of the site is currently void of population, buildings (with the exception of the dedicated transmitter building) or major roads as noted in **Exhibit 13.7b**.

Blue Highlighted Text denotes supplemental contour protection studies toward select stations as included in **Exhibit 13.6**.

Exhibit 13.6

Contour Protection Studies Toward WMAX-FM - Holland, MI

Mentor Partners, Inc.

FMCommander Single Allocation Study - 10-16-2015 - USGS 03 SEC
W242CH.P's Overlaps (In= -6.15 km, Out= 0.26 km)

W242CH.P CH 242 D DA
Lat= 43 23 42.0, Lng= 85 34 35.0
0.046 kW 94.3 M HAAT, 362 M COR
Prot.= 60 dBu, Intef.= 48 dBu

WMAX-FM CH 241 B DA BLH19850403KR
Lat= 42 49 10.0, Lng= 85 52 09.0
50.0 kW 150 M HAAT, 357 M COR
Prot.= 54 dBu, Intef.= 54 dBu

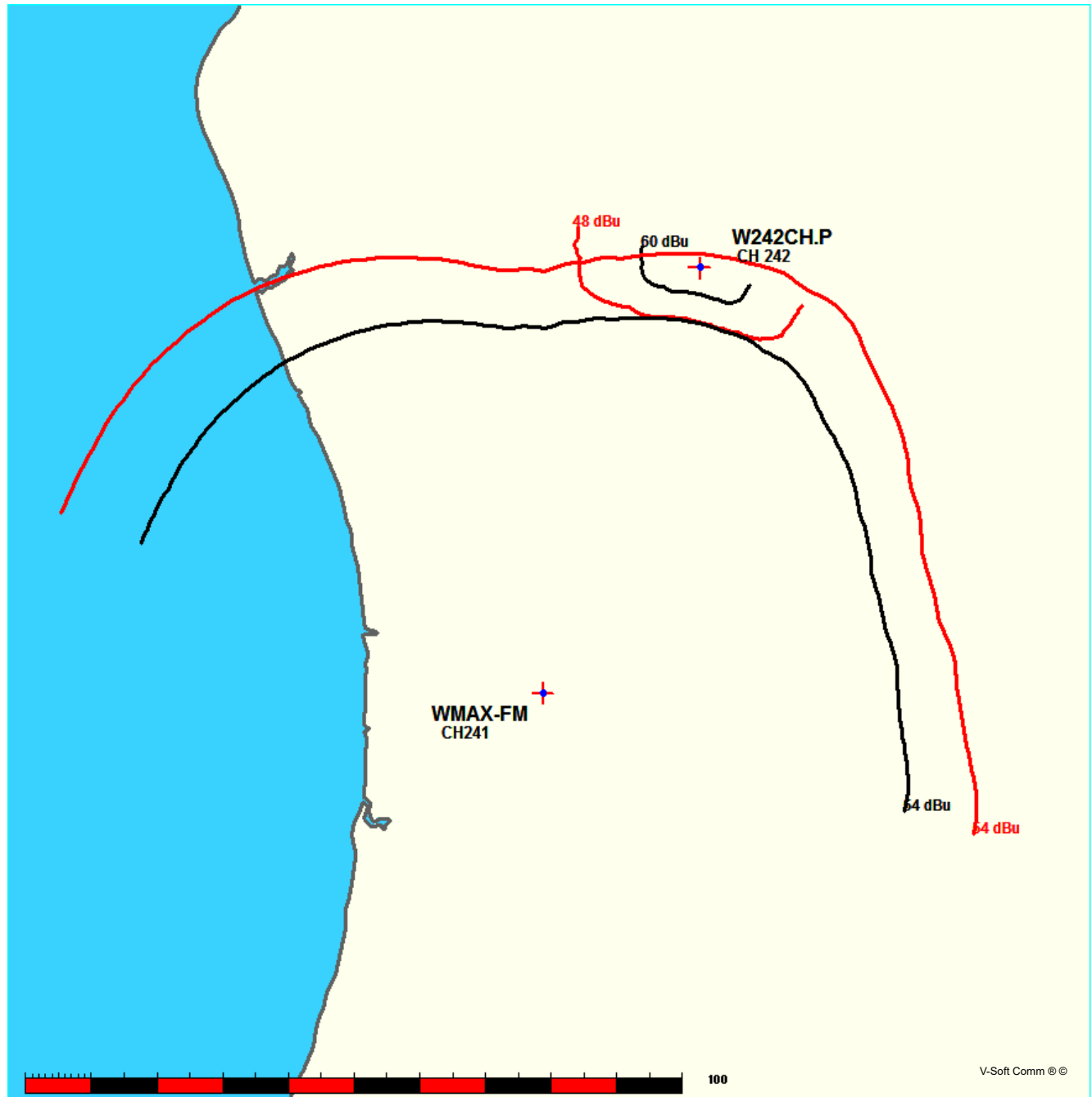


Exhibit 13.6

Contour Protection Studies Toward WMAX-FM - Holland, MI

10-16-2015

Terrain Data: USGS 03 SEC

FMOver Analysis

W242CH.P

WMAX-FM BLH19850403KR

Channel = 242D

Max ERP = 0.046 kW

RCAMSL = 362 M

N. Lat. 43 23 42.0

W. Lng. 85 34 35.0

Protected

60 dBu

Channel = 241B

Max ERP = 50 kW

RCAMSL = 357 M

N. Lat. 42 49 10.0

W. Lng. 85 52 09.0

Interfering

54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
158.0	000.0084	0084.9	005.1	023.4	050.0000	0156.5	064.6	58.68*	14.50
159.0	000.0079	0084.6	005.0	023.2	050.0000	0156.5	064.6	58.67*	14.49
160.0	000.0074	0085.3	005.0	023.1	050.0000	0156.4	064.6	58.68*	14.49
161.0	000.0071	0086.0	004.9	023.1	050.0000	0156.4	064.5	58.69*	14.53
162.0	000.0068	0086.4	004.9	023.0	050.0000	0156.3	064.5	58.69*	14.55
163.0	000.0065	0086.3	004.8	022.9	050.0000	0156.2	064.5	58.69*	14.54
164.0	000.0062	0086.2	004.8	022.8	050.0000	0156.1	064.5	58.69*	14.53
165.0	000.0060	0085.9	004.7	022.7	050.0000	0155.9	064.5	58.68*	14.51
166.0	000.0057	0085.8	004.7	022.6	050.0000	0155.8	064.5	58.67*	14.50
167.0	000.0054	0085.8	004.6	022.5	050.0000	0155.7	064.5	58.67*	14.49
168.0	000.0052	0085.7	004.5	022.4	050.0000	0155.7	064.5	58.67*	14.47
169.0	000.0049	0085.3	004.5	022.4	050.0000	0155.6	064.5	58.66*	14.46
170.0	000.0047	0084.8	004.4	022.3	050.0000	0155.6	064.5	58.65*	14.44
171.0	000.0047	0084.1	004.4	022.2	050.0000	0155.6	064.5	58.66*	14.46
172.0	000.0047	0083.6	004.4	022.1	050.0000	0155.6	064.4	58.67*	14.48
173.0	000.0047	0083.1	004.4	022.1	050.0000	0155.6	064.4	58.68*	14.51
174.0	000.0047	0082.3	004.3	022.0	050.0000	0155.6	064.4	58.68*	14.53
175.0	000.0047	0081.3	004.3	021.9	050.0000	0155.6	064.4	58.69*	14.54
176.0	000.0047	0080.3	004.3	021.9	050.0000	0155.6	064.4	58.69*	14.55
177.0	000.0047	0079.5	004.3	021.8	050.0000	0155.7	064.4	58.70*	14.58
178.0	000.0047	0078.7	004.2	021.7	050.0000	0155.8	064.4	58.71*	14.60
179.0	000.0047	0077.1	004.2	021.6	050.0000	0155.8	064.4	58.71*	14.60
180.0	000.0047	0075.7	004.2	021.6	050.0000	0155.9	064.4	58.71*	14.60
181.0	000.0048	0074.9	004.2	021.5	050.0000	0156.0	064.3	58.72*	14.64
182.0	000.0049	0074.6	004.2	021.5	050.0000	0156.0	064.3	58.74*	14.68
183.0	000.0050	0074.3	004.2	021.4	050.0000	0156.1	064.3	58.75*	14.72
184.0	000.0051	0072.9	004.2	021.3	050.0000	0156.1	064.3	58.75*	14.73
185.0	000.0052	0071.6	004.2	021.3	050.0000	0156.1	064.3	58.75*	14.73
186.0	000.0053	0070.5	004.1	021.2	050.0000	0156.0	064.3	58.75*	14.74
187.0	000.0053	0070.0	004.1	021.1	050.0000	0156.0	064.2	58.76*	14.75
188.0	000.0054	0069.2	004.1	021.1	050.0000	0156.0	064.2	58.76*	14.76
189.0	000.0055	0068.5	004.1	021.0	050.0000	0156.0	064.2	58.77*	14.77
190.0	000.0056	0066.9	004.1	020.9	050.0000	0155.9	064.2	58.76*	14.75

MUNN-REESE, INC.

Broadcast Engineering Consultants

COLDWATER, MI 49036

Exhibit 13.6

Contour Protection Studies Toward WMAX-FM - Holland, MI

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
191.0	000.0056	0066.4	004.1	020.9	050.0000	0155.9	064.2	58.76*
192.0	000.0056	0066.5	004.1	020.8	050.0000	0155.8	064.2	58.76*
193.0	000.0056	0065.7	004.1	020.7	050.0000	0155.8	064.2	58.75*
194.0	000.0056	0065.0	004.1	020.7	050.0000	0155.7	064.2	58.75*
195.0	000.0056	0065.3	004.1	020.6	050.0000	0155.6	064.2	58.75*
196.0	000.0056	0065.7	004.1	020.6	050.0000	0155.6	064.2	58.75*
197.0	000.0056	0066.9	004.1	020.5	050.0000	0155.6	064.2	58.77*
198.0	000.0056	0068.1	004.1	020.4	050.0000	0155.6	064.1	58.78*
199.0	000.0056	0068.6	004.2	020.4	050.0000	0155.6	064.1	58.79*
200.0	000.0056	0069.0	004.2	020.3	050.0000	0155.6	064.1	58.79*
201.0	000.0057	0069.9	004.2	020.2	050.0000	0155.7	064.1	58.80*
202.0	000.0058	0069.8	004.2	020.2	050.0000	0155.7	064.0	58.81*
203.0	000.0058	0069.9	004.2	020.1	050.0000	0155.7	064.0	58.81*
204.0	000.0059	0070.2	004.3	020.0	050.0000	0155.7	064.0	58.82*
205.0	000.0060	0070.1	004.3	020.0	049.9932	0155.7	064.0	58.82*
206.0	000.0060	0070.7	004.3	019.9	049.9760	0155.7	064.0	58.82*
207.0	000.0061	0070.7	004.3	019.8	049.9589	0155.7	064.0	58.83*
208.0	000.0062	0069.8	004.3	019.8	049.9427	0155.7	064.0	58.82*
209.0	000.0062	0070.8	004.3	019.7	049.9247	0155.7	064.0	58.82*
210.0	000.0063	0072.9	004.4	019.6	049.9052	0155.7	063.9	58.84*
211.0	000.0063	0073.9	004.4	019.5	049.8870	0155.7	063.9	58.85*
212.0	000.0063	0074.4	004.4	019.5	049.8693	0155.7	063.9	58.84*
213.0	000.0063	0076.4	004.5	019.4	049.8494	0155.7	063.9	58.86*
214.0	000.0063	0078.7	004.6	019.3	049.8283	0155.7	063.8	58.87*
215.0	000.0063	0081.3	004.7	019.2	049.8062	0155.7	063.8	58.89*
216.0	000.0063	0083.2	004.7	019.1	049.7849	0155.6	063.7	58.89*
217.0	000.0063	0084.9	004.8	019.1	049.7639	0155.6	063.7	58.90*
218.0	000.0063	0086.3	004.8	019.0	049.7431	0155.6	063.7	58.90*
219.0	000.0063	0088.3	004.9	018.9	049.7208	0155.5	063.7	58.90*
220.0	000.0063	0090.0	004.9	018.8	049.6989	0155.5	063.6	58.91*
221.0	000.0066	0091.1	005.0	018.7	049.6739	0155.5	063.6	58.92*
222.0	000.0069	0092.1	005.1	018.6	049.6481	0155.5	063.6	58.93*
223.0	000.0071	0093.2	005.2	018.5	049.6215	0155.5	063.5	58.95*
224.0	000.0074	0094.6	005.3	018.4	049.5941	0155.5	063.5	58.96*
225.0	000.0077	0095.5	005.4	018.3	049.5673	0155.4	063.4	58.97*
226.0	000.0080	0096.8	005.4	018.2	049.5393	0155.4	063.4	58.98*
227.0	000.0083	0097.8	005.5	018.0	049.5115	0155.4	063.4	58.98*
228.0	000.0087	0098.6	005.6	017.9	049.4841	0155.3	063.3	58.98*
229.0	000.0090	0099.3	005.7	017.8	049.4568	0155.3	063.3	58.98*
230.0	000.0093	0099.5	005.7	017.7	049.4309	0155.2	063.3	58.97*
231.0	000.0095	0100.0	005.8	017.6	049.4061	0155.1	063.3	58.96*
232.0	000.0097	0101.1	005.8	017.5	049.3792	0155.1	063.4	58.96*
233.0	000.0099	0102.0	005.9	017.4	049.3528	0155.1	063.4	58.95*
234.0	000.0102	0102.5	005.9	017.3	049.3282	0155.1	063.4	58.94*
235.0	000.0104	0102.8	006.0	017.2	049.3042	0155.2	063.4	58.93*
236.0	000.0106	0103.2	006.0	017.1	049.2797	0155.2	063.5	58.92*

Exhibit 13.6

Contour Protection Studies Toward WMAX-FM - Holland, MI

10-16-2015

Terrain Data: USGS 03 SEC

FMOVer Analysis

WMAX-FM BLH19850403KR

W242CH.P

Channel = 241B

Max ERP = 50 kW

RCAMSL = 357 M

N. Lat. 42 49 10.0

W. Lng. 85 52 09.0

Protected

54 dBu

Channel = 242D

Max ERP = 0.046 kW

RCAMSL = 362 M

N. Lat. 43 23 42.0

W. Lng. 85 34 35.0

Interfering

48 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
335.0	028.8800	0155.0	060.4	259.5	000.0449	0104.5	050.1	30.64	
336.0	028.1250	0154.9	060.2	259.5	000.0449	0104.4	049.0	31.06	
337.0	027.3800	0154.9	059.9	259.5	000.0448	0104.4	047.9	31.46	
338.0	026.6450	0154.9	059.6	259.4	000.0447	0104.4	046.8	31.86	
339.0	025.9200	0154.8	059.4	259.4	000.0446	0104.4	045.7	32.25	
340.0	025.2050	0154.7	059.1	259.3	000.0443	0104.4	044.7	32.65	
341.0	024.5700	0154.6	058.9	259.1	000.0440	0104.4	043.6	33.04	
342.0	023.9432	0154.2	058.6	258.9	000.0436	0104.4	042.6	33.43	
343.0	023.3244	0153.7	058.3	258.7	000.0430	0104.4	041.5	33.80	
344.0	022.7138	0153.1	057.9	258.3	000.0422	0104.4	040.5	34.17	
345.0	022.1112	0152.7	057.7	258.0	000.0415	0104.4	039.5	34.53	
346.0	021.5168	0152.4	057.4	257.6	000.0407	0104.5	038.5	34.89	
347.0	020.9305	0152.1	057.1	257.2	000.0398	0104.6	037.5	35.25	
348.0	020.3522	0151.6	056.8	256.7	000.0387	0104.7	036.5	35.58	
349.0	019.7821	0151.1	056.4	256.1	000.0375	0104.9	035.5	35.90	
350.0	019.2200	0150.3	056.1	255.4	000.0360	0105.5	034.5	36.22	
351.0	018.9420	0149.3	055.8	254.8	000.0348	0105.6	033.6	36.53	
352.0	018.6661	0148.3	055.5	254.1	000.0335	0105.8	032.7	36.82	
353.0	018.3921	0147.3	055.3	253.4	000.0321	0106.2	031.7	37.12	
354.0	018.1202	0146.8	055.1	252.7	000.0307	0106.7	030.8	37.44	
355.0	017.8503	0146.7	054.9	252.0	000.0295	0107.0	029.9	37.79	
356.0	017.5824	0147.7	054.9	251.6	000.0287	0107.2	029.0	38.23	
357.0	017.3166	0149.8	055.1	251.4	000.0283	0107.4	028.0	38.76	
358.0	017.0528	0150.3	055.0	250.6	000.0270	0107.7	027.1	39.15	
359.0	016.7910	0150.4	054.9	249.7	000.0254	0107.8	026.3	39.48	
000.0	016.5312	0149.9	054.6	248.6	000.0235	0108.3	025.4	39.73	
001.0	016.8200	0151.1	055.0	248.4	000.0232	0108.4	024.4	40.40	
002.0	017.1112	0152.8	055.3	248.3	000.0230	0108.4	023.4	41.12	
003.0	017.4050	0153.8	055.6	247.9	000.0224	0108.5	022.4	41.75	

MUNN-REESE, INC.

Broadcast Engineering Consultants

COLDWATER, MI 49036

Exhibit 13.6

Contour Protection Studies Toward WMAX-FM - Holland, MI

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
004.0	017.7012	0153.8	055.8	247.2	000.0212	0108.7	021.5	42.24
005.0	018.0000	0153.4	055.9	246.2	000.0197	0108.6	020.6	42.62
006.0	018.3013	0154.5	056.2	245.5	000.0187	0108.4	019.6	43.17
007.0	018.6050	0156.1	056.5	244.9	000.0178	0108.3	018.6	43.76
008.0	018.9113	0156.9	056.8	243.8	000.0162	0107.8	017.6	44.12
009.0	019.2200	0156.8	056.9	242.2	000.0142	0107.1	016.7	44.21
010.0	019.5313	0155.7	056.9	240.1	000.0116	0105.7	015.9	43.86
011.0	020.1612	0155.1	057.1	238.2	000.0111	0104.6	015.0	44.33
012.0	020.8012	0155.1	057.4	236.2	000.0107	0103.4	014.1	44.94
013.0	021.4513	0155.1	057.7	233.9	000.0102	0102.5	013.2	45.78
014.0	022.1113	0155.2	058.0	231.2	000.0096	0100.2	012.4	46.52
015.0	022.7813	0155.1	058.2	228.0	000.0087	0098.6	011.6	47.15
016.0	023.4613	0155.5	058.6	224.3	000.0075	0094.9	010.8	47.50
017.0	024.1512	0155.2	058.8	219.8	000.0063	0089.8	010.2	47.35
018.0	024.8513	0155.4	059.1	214.7	000.0063	0080.5	009.5	47.51
019.0	025.5613	0155.6	059.3	208.9	000.0062	0070.6	009.0	47.30
020.0	026.2813	0155.7	059.6	202.4	000.0058	0069.8	008.6	47.58
021.0	026.8278	0156.0	059.8	195.3	000.0056	0065.4	008.5	47.29
022.0	027.3800	0155.6	060.0	188.2	000.0055	0069.1	008.5	47.52
023.0	027.9378	0156.4	060.3	180.9	000.0048	0074.9	008.6	47.53
024.0	028.5012	0156.7	060.5	174.0	000.0047	0082.3	008.8	47.77
025.0	029.0703	0155.9	060.6	168.1	000.0052	0085.6	009.3	47.55
026.0	029.6450	0155.4	060.7	162.9	000.0065	0086.3	009.9	47.59
027.0	030.2253	0155.4	060.9	158.0	000.0084	0084.8	010.6	47.42
028.0	030.8113	0155.4	061.1	153.8	000.0109	0087.1	011.3	47.57
029.0	031.4028	0155.6	061.3	150.1	000.0133	0086.1	012.1	47.13
030.0	032.0000	0156.1	061.5	146.8	000.0188	0085.7	012.9	47.36
031.0	032.0000	0155.7	061.5	145.0	000.0222	0086.0	013.9	46.80
032.0	032.0000	0154.4	061.3	144.0	000.0243	0086.1	014.9	45.96
033.0	032.0000	0153.9	061.2	142.8	000.0268	0086.2	016.0	45.65
034.0	032.0000	0154.7	061.3	141.3	000.0302	0085.8	016.9	45.29
035.0	032.0000	0156.3	061.5	139.7	000.0336	0085.8	017.9	44.94
036.0	032.0000	0158.0	061.7	138.3	000.0353	0086.7	018.9	44.42
037.0	032.0000	0158.3	061.8	137.5	000.0362	0087.2	020.0	43.72
038.0	032.0000	0157.2	061.7	137.4	000.0364	0087.3	021.1	42.88
039.0	032.0000	0156.1	061.5	137.4	000.0364	0087.3	022.1	42.05
040.0	032.0000	0155.2	061.4	137.3	000.0365	0087.3	023.2	41.25
041.0	031.3632	0153.9	061.0	137.8	000.0359	0087.0	024.3	40.33
042.0	030.7328	0152.4	060.7	138.4	000.0351	0086.6	025.4	39.41
043.0	030.1088	0150.5	060.2	139.2	000.0342	0086.0	026.5	38.50
044.0	029.4912	0148.7	059.8	139.8	000.0334	0085.8	027.6	37.67
045.0	028.8800	0147.4	059.4	140.4	000.0323	0085.4	028.7	36.82
046.0	028.2752	0146.6	059.1	140.8	000.0313	0085.5	029.7	36.09
047.0	027.6768	0146.5	058.9	141.1	000.0307	0085.6	030.8	35.45
048.0	027.0848	0146.3	058.7	141.4	000.0300	0085.8	031.8	34.85
049.0	026.4992	0146.1	058.4	141.7	000.0293	0086.0	032.8	34.27

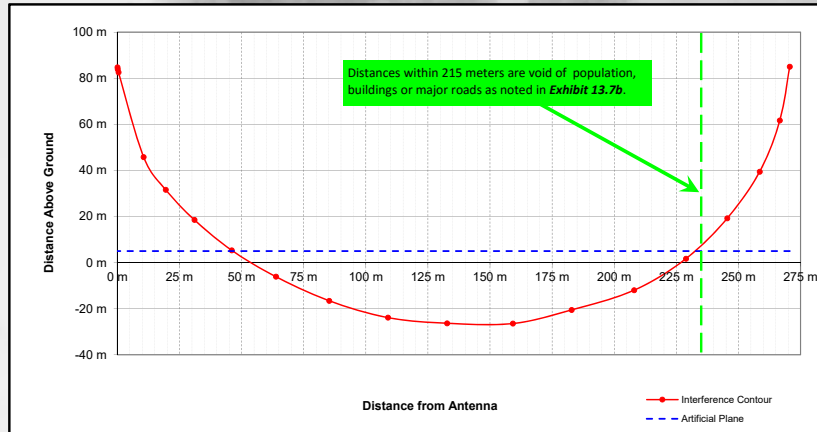
WLHT-FM - 64.9 F(50:50)dBμ Contour

W242CH.P

WLAV-FM - 65.1 F(50:50)dBμ Contour

Exhibit 13.7a

**§74.1204(d) 2nd/3rd Adjacent Channel
Given Interference Waiver Request
WLAV-FM - Grand Rapids, MI (CH245B)
WLHT-FM - Grand Rapids, MI (CH239B)**



W242CH.P

Howard City, MI
Proposed Operation
Facility ID: 144400
Latitude: 43-23-42 N
Longitude: 085-34-35 W
ERP: 0.046 kW
Channel: 242D (96.3 MHz)
AMSL Height: 362.0 m
Horiz. Pattern: Directional

WLAV-FM.L

Grand Rapids, MI
BLH19940822KC
Facility ID: 41680
Latitude: 43-02-01 N
Longitude: 085-31-15 W
ERP: 50.00 kW
Channel: 245B (96.9 MHz)
AMSL Height: 386.0 m
Horiz. Pattern: Omni

WLHT-FM.L

Grand Rapids, MI
BLH19840120AE
Facility ID: 37457
Latitude: 43-01-57 N
Longitude: 085-41-47 W
ERP: 40.00 kW
Channel: 239B (95.7 MHz)
AMSL Height: 397.0 m
Horiz. Pattern: Omni

Proposed Antenna: 1 Bay Nicom BKY3/P One Bay Fully Spaced									
Proposed Power: 0.046 kW									
Antenna Height AGL: 85 meters									
Interference Contour: 104.9 dBu (50:10)									
Artificial Ground Plane Height: 5 meters									
Distance (Free Space) Equation: $= (10^{((106.92 - \{desired\ dBu\} + \{ERP\ in\ dBu\}) / 20)}) * 1000$									
Field Strength (dBu) Equation $= 106.92 - (20 * (\text{LOG10}(\text{DistMeters} / 1000))) + \{ERP\ in\ dBu\}$									
Depression					Distance				
Angle	Antenna				from Ant.	Distance	Field Strength	Distance	Field Strength
Below	Relative	ERP	ERP	to Interference	from Ant. to	in dBu @	from Ant.	in dBu @	
Horizon	Field	in kW	in dBk	Contour	Artificial Plane	Artificial Plane	to Ground Level	Ground Level	
0°	1.000	0.046	-13.37	270.63 m	infinite	---	---	---	
-5°	0.989	0.045	-13.47	267.65 m	917.90 m	94.20 dBu	975.27 m	93.67 dBu	
-10°	0.970	0.043	-13.64	262.51 m	460.70 m	100.01 dBu	489.50 m	99.49 dBu	
-15°	0.939	0.041	-13.92	254.12 m	309.10 m	103.20 dBu	328.41 m	102.67 dBu	
-20°	0.900	0.037	-14.29	243.57 m	233.90 m	105.25 dBu	248.52 m	104.73 dBu	
-25°	0.848	0.033	-14.80	229.50 m	189.30 m	106.57 dBu	201.13 m	106.05 dBu	
-30°	0.780	0.028	-15.53	211.09 m	160.00 m	107.31 dBu	170.00 m	106.78 dBu	
-35°	0.718	0.024	-16.25	194.31 m	139.48 m	107.78 dBu	148.19 m	107.25 dBu	
-40°	0.640	0.019	-17.25	173.20 m	124.46 m	107.77 dBu	132.24 m	107.24 dBu	
-45°	0.569	0.015	-18.27	153.99 m	113.14 m	107.58 dBu	120.21 m	107.05 dBu	
-50°	0.490	0.011	-19.57	132.61 m	104.43 m	106.97 dBu	110.96 m	106.45 dBu	
-55°	0.411	0.008	-21.10	111.23 m	97.66 m	106.03 dBu	103.77 m	105.50 dBu	
-60°	0.340	0.005	-22.74	92.01 m	92.38 m	104.87 dBu	98.15 m	104.34 dBu	
-65°	0.271	0.003	-24.71	73.34 m	86.27 m	103.29 dBu	93.79 m	102.76 dBu	
-70°	0.210	0.002	-26.93	56.83 m	85.13 m	101.39 dBu	90.46 m	100.86 dBu	
-75°	0.150	0.001	-29.85	40.59 m	82.82 m	98.71 dBu	88.00 m	98.18 dBu	
-80°	0.009	0.000	-54.29	2.44 m	81.23 m	74.44 dBu	86.31 m	73.91 dBu	
-85°	0.004	0.000	-61.33	1.08 m	80.31 m	67.49 dBu	85.32 m	66.97 dBu	
-90°	0.001	0.000	-73.37	0.27 m	80.00 m	55.49 dBu	85.00 m	54.96 dBu	

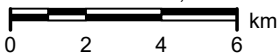
+ WLHT-FM.L

WLAV-FM.L +



USGS 03 SEC Terrain Database
U.S. Census 2010 PL Database

Scale 1:200,000



Terrain

177 335 m

The portion of the §74.1204(d) WLAV-FM - Grand Rapids, MI (CH245B) and WLHT-FM - Grand Rapids, MI (CH239B) protection from 235 meters to the extent of the worst case calculated 104.9 dBμ F(50:10) Interference Contour, corresponding to the worst case WLHT-FM 64.9 dBμ F(50:50) Protected Contour, has been demonstrated through a downward radiation study as included in **Exhibit 13.7a**. Full protection will be afforded each facility from 235 meters to the extent of the calculated 104.9 dBμ F(50:10) interference contour as this area will not reach the ground nor a five meter artificial plane representing a standard one and a half story home when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the antenna manufacturer specifications has been included in **Exhibit 13.8**.

The portion of the §74.1204(d) WLAV-FM - Grand Rapids, MI (CH245B) and WLHT-FM - Grand Rapids, MI (CH239B) protection within 235 meters of the site is currently void of population, buildings (with the exception of the dedicated transmitter building) or major roads as noted in **Exhibit 13.7b**.

The portion of the §74.1204(d) WLAV-FM - Grand Rapids, MI (CH245B) and WLHT-FM - Grand Rapids, MI (CH239B) protection from 235 meters to the extent of the worst case calculated 104.9 dBμ F(50:10) Interference Contour, corresponding to the worst case WLHT-FM 64.9 dBμ F(50:50) Protected Contour, has been demonstrated through a downward radiation study as included in **Exhibit 13.7a**. Full protection will be afforded each facility from 235 meters to the extent of the calculated 104.9 dBμ F(50:10) interference contour as this area will not reach the ground nor a five meter artificial plane representing a standard one and a half story home when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the antenna manufacturer specifications has been included in **Exhibit 13.8**.

The portion of the §74.1204(d) WLAV-FM - Grand Rapids, MI (CH245B) and WLHT-FM - Grand Rapids, MI (CH239B) protection within 235 meters of the site is currently void of population, buildings (with the exception of the dedicated transmitter building) or major roads as noted in **Exhibit 13.7b**.


Exhibit 13.7b

§74.1204(d) 2nd/3rd Adjacent Channel Given Interference Waiver Request WLAV-FM - Grand Rapids, MI (CH245B) WLHT-FM - Grand Rapids, MI (CH239B)

Proposed Site

	Latitude (D M S)	Longitude (D M S)
NAD 27 datum values:	43 23 41.60817	85 34 34.95077
NAD 83 datum values:	43 23 41.70000	85 34 35.10000

235 meter radius

 **909 ft / 277 m**

The applicant would like to note that the June 6, 2015 construction of ASR #1294693 actual occurred after the most recent USGS Aerial Photograph date of Sept. 25, 2014. Therefore the physical tower as constructed does not appear of the Aerial Photograph.



0 300 600ft

USGS
The National Map

Exhibit 13.8

Manufacturer's Directional Antenna Pattern Documentation

Azimuth ° True	FCC Pattern	Composite Pattern
0°	1.000	0.730
10°	1.000	0.810
20°	1.000	0.880
30°	1.000	0.930
40°	1.000	0.970
50°	1.000	0.990
60°	1.000	1.000
70°	1.000	0.990
80°	1.000	0.970
90°	1.000	0.930
100°	1.000	0.880
110°	1.000	0.810
120°	1.000	0.730
130°	1.000	0.630
140°	0.850	0.530
150°	0.540	0.440
160°	0.400	0.360
170°	0.320	0.290
180°	0.320	0.250
190°	0.350	0.220
200°	0.350	0.220
210°	0.370	0.220
220°	0.370	0.230
230°	0.450	0.230
240°	0.500	0.230
250°	0.750	0.230
260°	1.000	0.230
270°	1.000	0.220
280°	1.000	0.220
290°	1.000	0.220
300°	1.000	0.250
310°	1.000	0.290
320°	1.000	0.360
330°	1.000	0.440
340°	1.000	0.530
350°	1.000	0.630

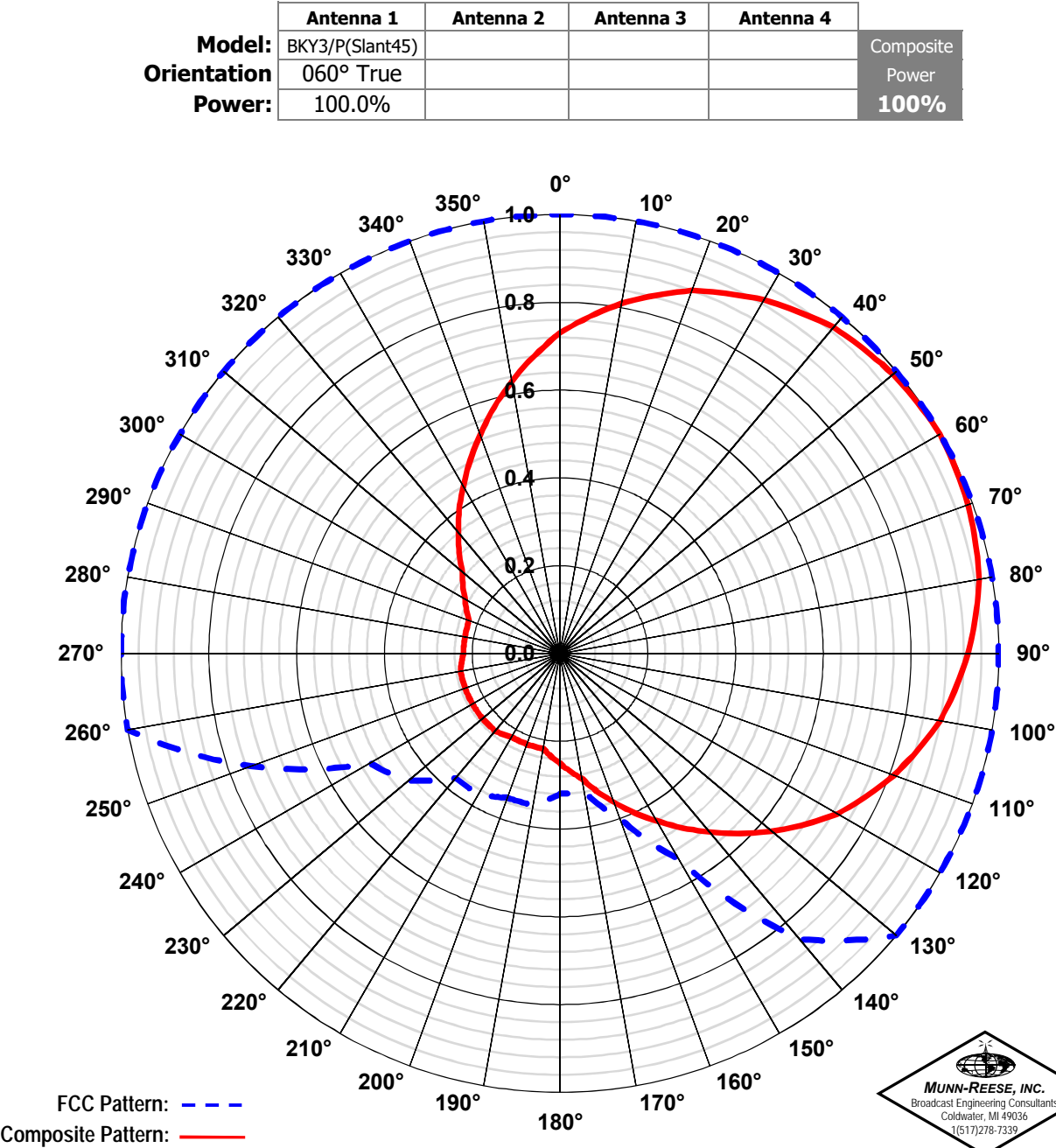
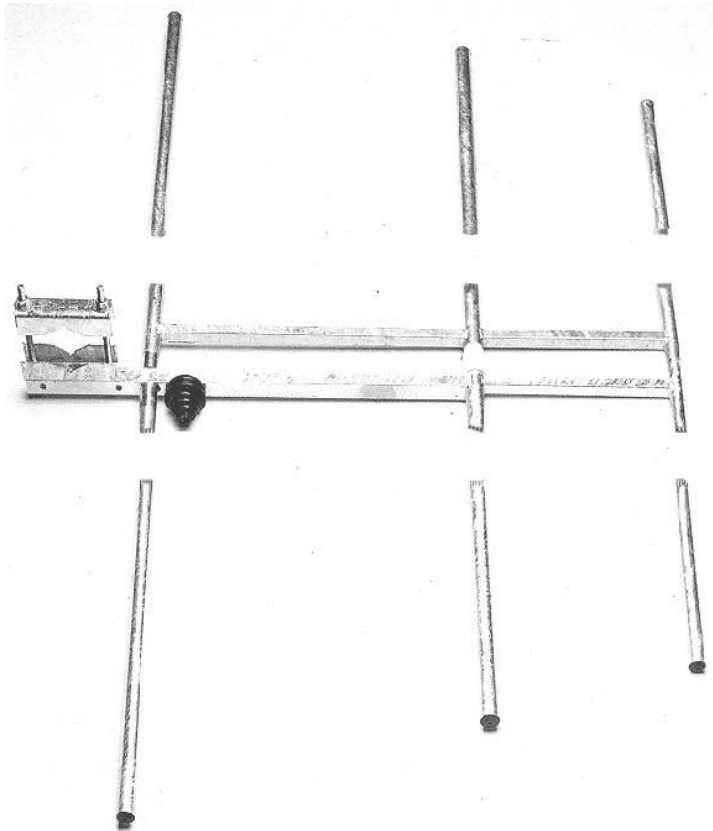


Exhibit 13.8 - Manufacturer's Directional Antenna Pattern Documentation (Actual Pattern Rotated to 060°T)



NICOM **BKY3/P** **Medium Power** **Portable** **Broadband FM** **Directional Antenna** **Antena Portátil** **Direccional** **de FM Banda Ancha**

This broadband dipole antenna constructed of stainless steel is designed to last a long time in any weather condition. Because of its sturdy construction it can support up to 2 kw of input power with the appropriate connector. Since it has a wide angle of radiation it is strongly recommended for omnidirectional arrays. Due to the fact that it is easily disassembled and reassembled, it can be placed in a compact container making it very portable and

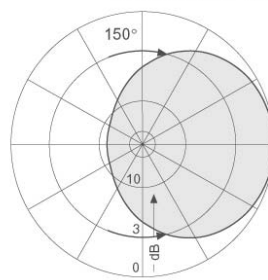
inexpensive to ship.

Esta antena dipolo de banda ancha, fabricada de acero inoxidable fue concebida para ser duradera en cualquier condición de clima. Debido a su robusta construcción puede soportar hasta 2 kw de potencia de entrada con el conector apropiado. Esta antena es recomendada para formaciones omnidireccionales ya que tiene un gran ángulo de irradiación. Dado al hecho que es fácil de armar y desarmar esta antena puede ser enviada en un contenedor muy compacto rendiéndola portátil y económica para envíos.

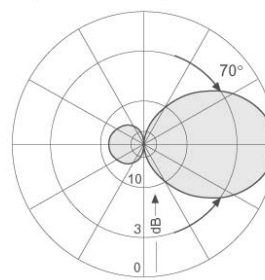
TECHNICAL SPECIFICATIONS

Antenna type	3 element directional antenna	Front-to-back ratio	18 dB
Frequency range	87.5 - 108 MHz	Lightning protection	all parts grounded
Bandwidth	20 MHz	Max wind velocity	130 mph (208 km/h)
Impedance	50 Ohms	Wind load	48.4 Lbs (22 kg)
Connectors	N type (1 kw) - EIA 7/8 (2 kw)	Wind surface	2.0 ft ² (0.19 m ²)
Power rating	2000 Watts max.	Materials (external)	stainless steel
VSWR	< 1.2 max.	Mounting	from 2" to 4"
Polarization	vertical or horizontal	Weight	20 Lbs (9 kg)
Gain	4.5 dB (referred to half-wave dipole)	Dimensions	50"×72"×3" (1250×1800×60mm)
H plane	150 degrees	Packing	53"×19"×4" (1300×480×100mm)
V plane	70 degrees		

Radiation Patterns (at mid-band)



in H-plane
Horizontal Radiation Pattern



in E-plane
Vertical Radiation Pattern

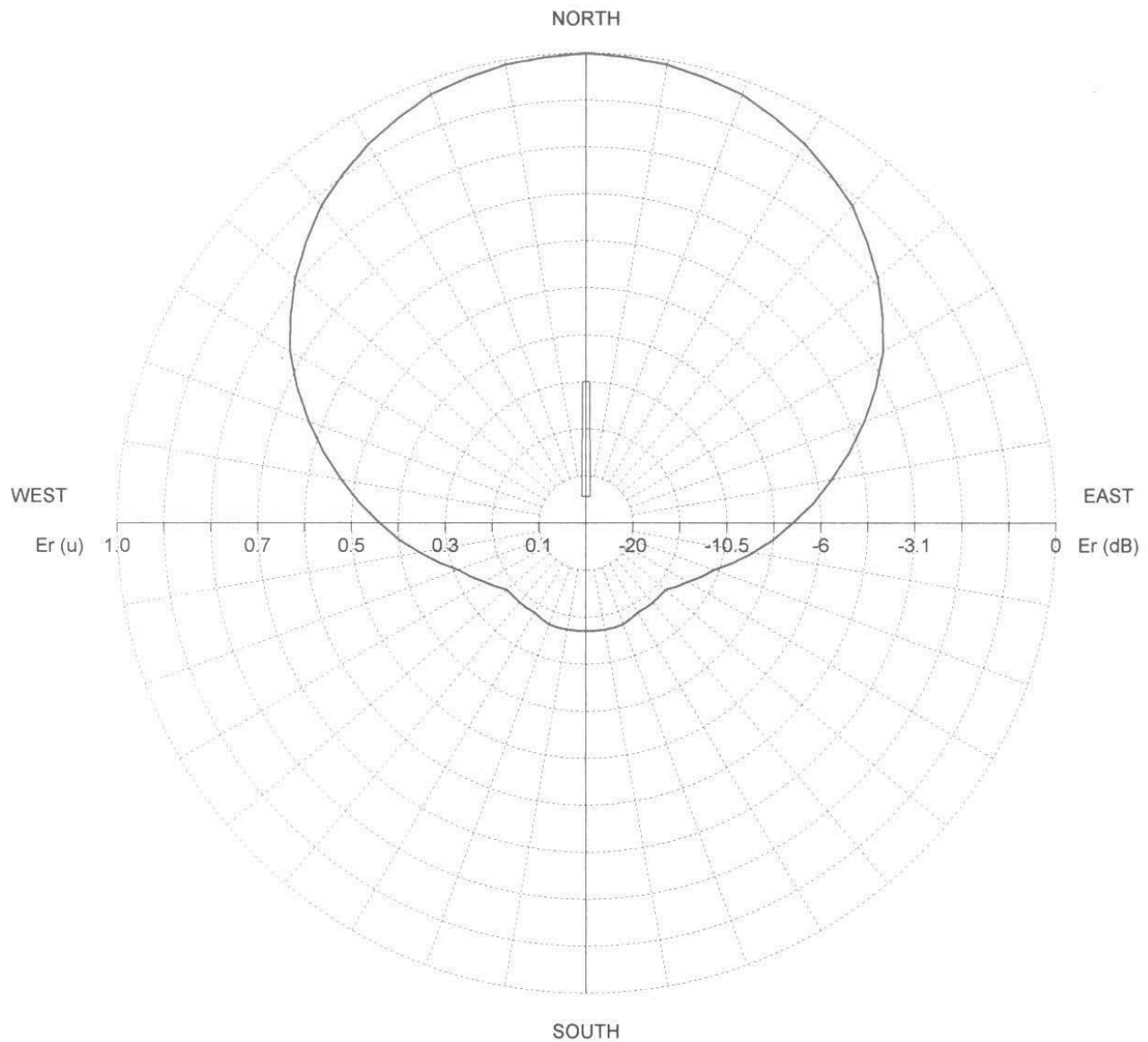
Exhibit 13.8 - Manufacturer's Directional Antenna Pattern Documentation (Actual Pattern Rotated to 060°T)



TX station: BKY/3
Frequency: 98.00 MHz

Site name:

Horizontal diagram



—— 0.0° depres. (Total antenna), Gain (dBd): 3.6 ERP T.max (KW): 2.291 ERP E.max (KW): 1.778

Exhibit 13.8 - Manufacturer's Directional Antenna Pattern Documentation (Actual Pattern Rotated to 060°T)



TX station: BKY/3

Site name:

Frequency: 98.00 MHz

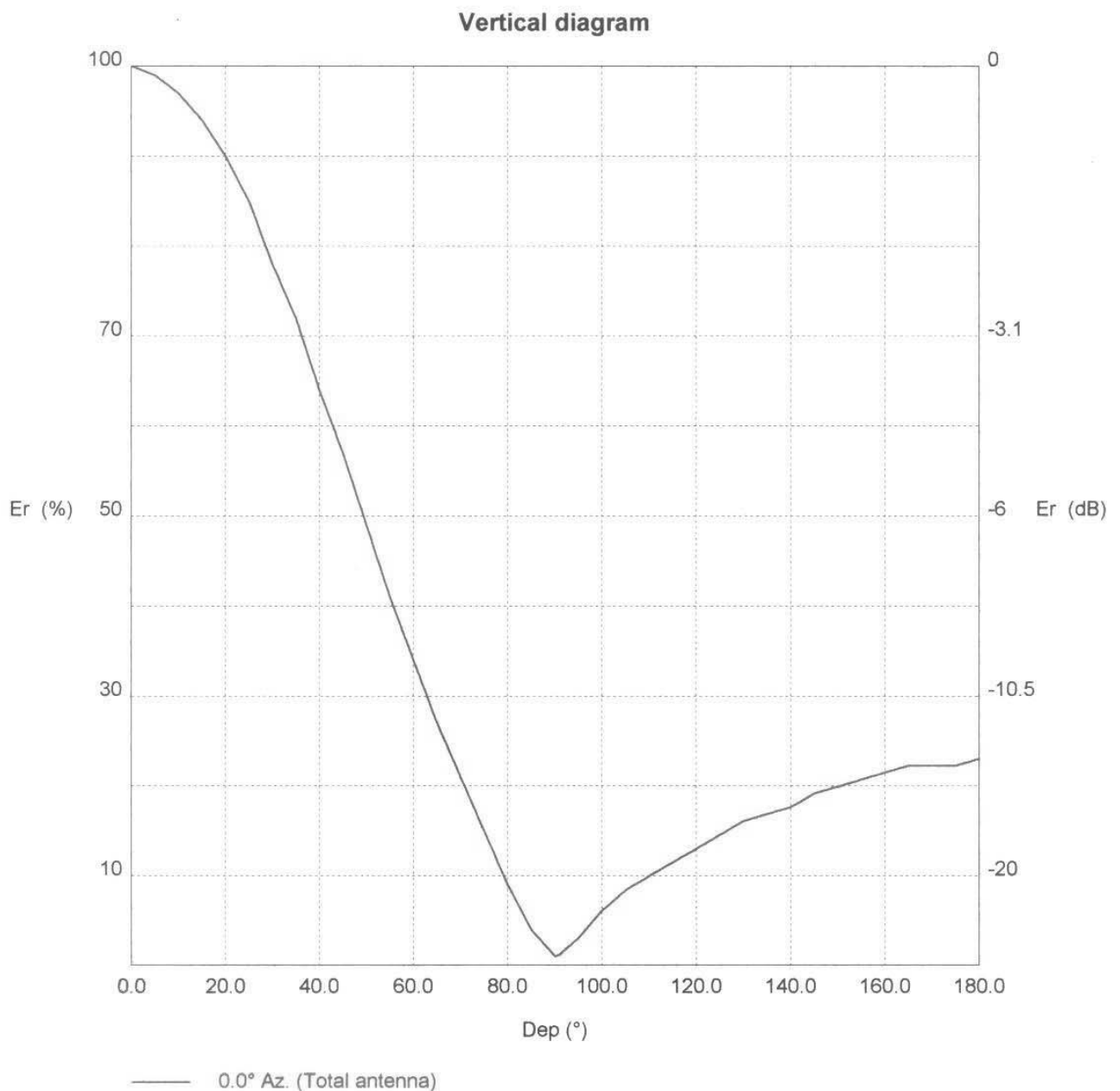


Exhibit 13.8 - Manufacturer's Directional Antenna Pattern Documentation (Actual Pattern Rotated to 060°T)



TX station: BKY/3

Site name:

Frequency: 98.00 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	1.78	60.0	34.0	0.21	120.0	13.0	0.03
2.0	99.6	1.76	62.0	31.2	0.17	122.0	13.6	0.03
4.0	99.2	1.75	64.0	28.4	0.14	124.0	14.3	0.04
6.0	98.6	1.73	66.0	25.8	0.12	126.0	14.9	0.04
8.0	97.8	1.70	68.0	23.4	0.10	128.0	15.5	0.04
10.0	97.0	1.67	70.0	21.0	0.08	130.0	16.1	0.05
12.0	95.8	1.63	72.0	18.6	0.06	132.0	16.4	0.05
14.0	94.6	1.59	74.0	16.2	0.05	134.0	16.7	0.05
16.0	93.2	1.54	76.0	13.8	0.03	136.0	17.0	0.05
18.0	91.6	1.49	78.0	11.4	0.02	138.0	17.3	0.05
20.0	90.0	1.44	80.0	9.0	0.01	140.0	17.6	0.06
22.0	88.0	1.38	82.0	7.0	0.01	142.0	18.2	0.06
24.0	86.0	1.32	84.0	5.0	0.00	144.0	18.9	0.06
26.0	83.6	1.24	86.0	3.4	0.00	146.0	19.3	0.07
28.0	80.8	1.16	88.0	2.2	0.00	148.0	19.6	0.07
30.0	78.0	1.08	90.0	1.0	0.00	150.0	19.9	0.07
32.0	75.6	1.02	92.0	1.7	0.00	152.0	20.2	0.07
34.0	73.2	0.95	94.0	2.6	0.00	154.0	20.5	0.08
36.0	70.4	0.88	96.0	3.7	0.00	156.0	20.9	0.08
38.0	67.2	0.80	98.0	4.9	0.00	158.0	21.2	0.08
40.0	64.0	0.73	100.0	6.1	0.01	160.0	21.5	0.08
42.0	61.2	0.67	102.0	7.1	0.01	162.0	21.8	0.08
44.0	58.4	0.61	104.0	8.0	0.01	164.0	22.1	0.09
46.0	55.4	0.55	106.0	8.7	0.01	166.0	22.2	0.09
48.0	52.2	0.48	108.0	9.4	0.02	168.0	22.2	0.09
50.0	49.0	0.43	110.0	10.0	0.02	170.0	22.2	0.09
52.0	45.8	0.37	112.0	10.6	0.02	172.0	22.2	0.09
54.0	42.6	0.32	114.0	11.2	0.02	174.0	22.2	0.09
56.0	39.6	0.28	116.0	11.8	0.02	176.0	22.4	0.09
58.0	36.8	0.24	118.0	12.4	0.03	178.0	22.7	0.09

TX station: BKY/3

Site name:

Frequency: 98.00 MHz

Horizontal diagram at 0.0° depres. (Total antenna)

Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)
0.0	100.0	1.78	120.0	25.0	0.11	240.0	25.0	0.11
10.0	99.0	1.74	130.0	22.0	0.09	250.0	29.0	0.15
20.0	97.0	1.67	140.0	22.0	0.09	260.0	36.0	0.23
30.0	93.0	1.54	150.0	22.0	0.09	270.0	44.0	0.34
40.0	88.0	1.38	160.0	23.0	0.09	280.0	53.0	0.50
50.0	81.0	1.17	170.0	23.0	0.09	290.0	63.0	0.71
60.0	73.0	0.95	180.0	23.0	0.09	300.0	73.0	0.95
70.0	63.0	0.71	190.0	23.0	0.09	310.0	81.0	1.17
80.0	53.0	0.50	200.0	23.0	0.09	320.0	88.0	1.38
90.0	44.0	0.34	210.0	22.0	0.09	330.0	93.0	1.54
100.0	36.0	0.23	220.0	22.0	0.09	340.0	97.0	1.67
110.0	29.0	0.15	230.0	22.0	0.09	350.0	99.0	1.74