

Comprehensive Technical Statement
 In support of
Talking Information Center, Incorporated
 Application for New Non-Commercial Educational FM Station
 88.5mHz, Channel 203A
 1.4kW-V @ 41m AAT
 Middleborough Center, MA

Introduction

Talking Information Center, Incorporated (TIC) provides a radio reading service for the blind and the visually impaired. The instant proposal would allow TIC to provide this important service directly to a significant population.

Vertical polarization is proposed to reduce Channel 6 interference to well below the requirements of 73.525.

The proposed tower is an existing structure to which no height will be added, and the RF exposure is well below the casual limit. The application therefore does not represent a major environmental impact.

Allocation Study

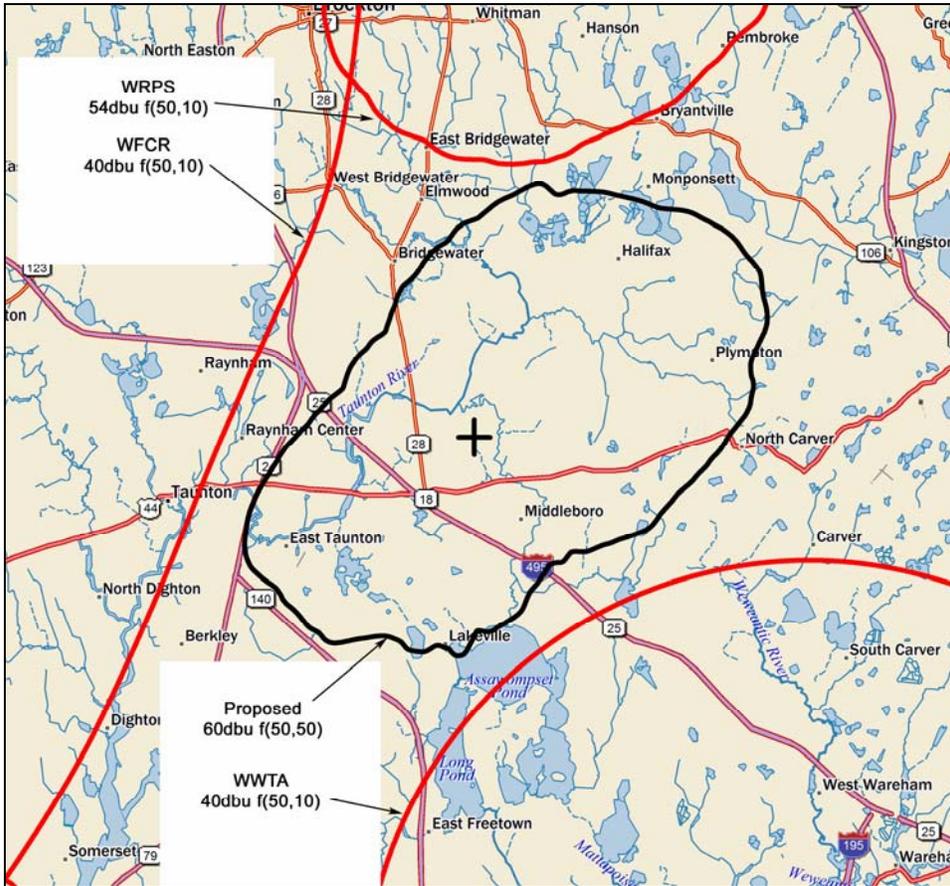
The following table lists all FM conflicts that do not exceed the 73.207 required spacings by at least 25km:

app_id	adj	chan	stts	call	st	city	brg	dist	erp	da	haat	reqd	delta	eval
193288	0	203A	LIC	WWTA	MA	MARION	150	27.72	0.1	N	16	115	-87.3	SHORT
94642	1	202A	LIC	WRPS	MA	ROCKLAND	4	22.79	0.11	N	42	72	-49.2	SHORT
1203470	1	204B1	APP	WJMF	RI	SMITHFIELD	270	49.96	8.5	Y	56	96	-46	SHORT
248181	0	203B	LIC	WFCR	MA	AMHERST	292	132.4	13	N	295	178	-45.7	SHORT
203385	1	202A	LIC	WQRI	RI	BRISTOL	221	40.71	0.8	N	23	72	-31.3	SHORT
205250	1	202A	LIC	WGAO	MA	FRANKLIN	295	42.36	0.18	N	58	72	-29.6	SHORT
30708	1	204A	LIC	WJMF	RI	SMITHFIELD	270	50.21	0.23	N	40	72	-21.8	SHORT
206628	1	202A	LIC	WIQH	MA	CONCORD	330	67.29	0.1	N	7	72	-4.71	SHORT
150068	2	205B1	LIC	WERS	MA	BOSTON	348	48.63	4	N	186	48	0.63	CRITICAL
667792	2	201A	LIC	WFHL	MA	NEW BEDFORD	171	32.24	0.3	N	41	31	1.24	CLOSE
205223	2	201A	LIC	WELH	RI	PROVIDENCE	257	32.57	0.15	N	30	31	1.57	CLOSE
291066	53	256B	LIC	WPLM-FM	MA	PLYMOUTH	76	20.01	50	N	131	15	5.01	CLEAR
675818	1	202A	LIC	WBMT	MA	BOXFORD	358	78.19	0.66	N	10	72	6.19	CLEAR
1203537	2	201A	APP	WELH	RI	PROVIDENCE	254	46.45	0.7	Y	80	31	15.45	CLEAR
211657	2	201A	LIC	WMBR	MA	CAMBRIDGE	346	50.16	0.72	Y	90	31	19.16	CLEAR

Detailed Interference Study

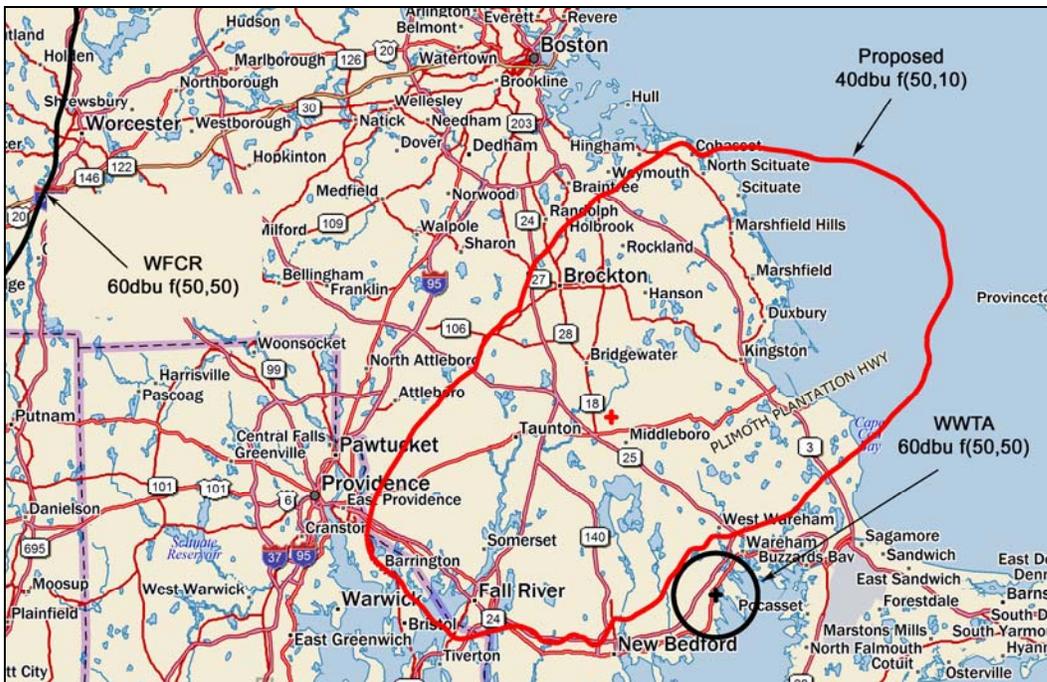
The following collection of maps and the narrative accompanying each show conclusively that no prohibited overlap will occur between the proposed facility and the working conflicts listed in the allocation study.

Map 1 – Inbound Interference



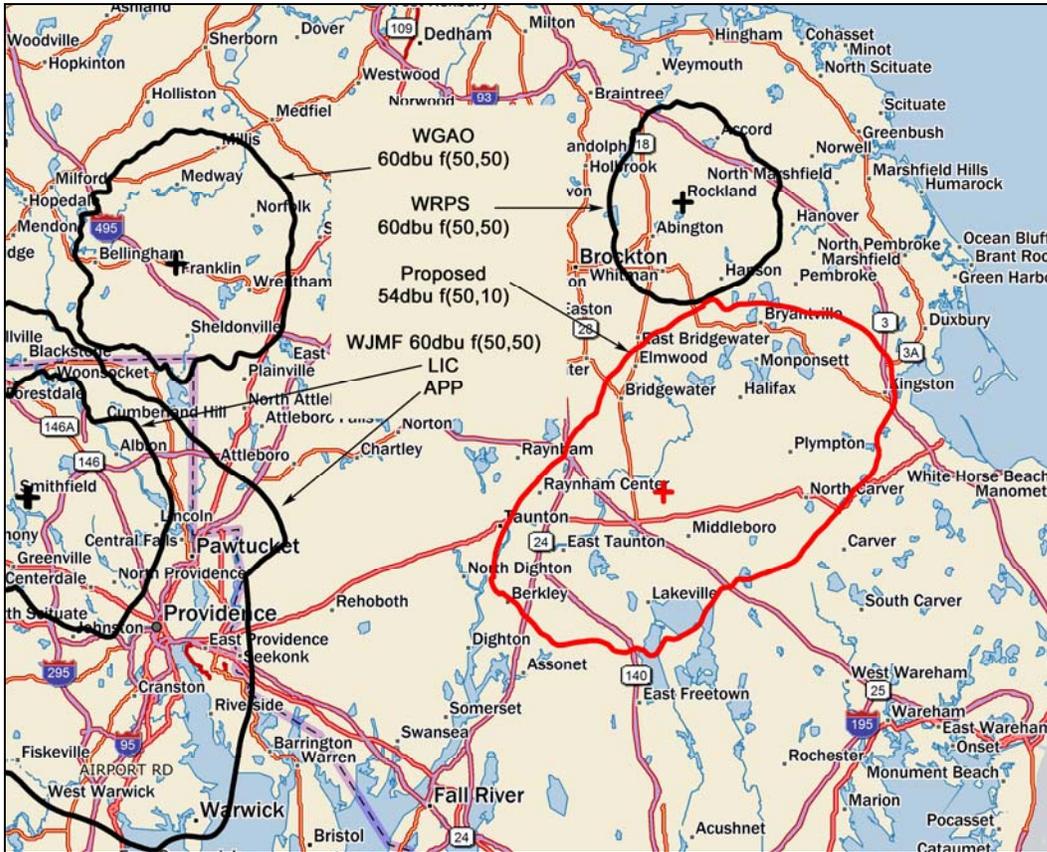
The above map shows that there will be no overlap with any nearby conflicts that could cause interference to the proposed facility.

Map 2 – Co-channel Outbound Interference

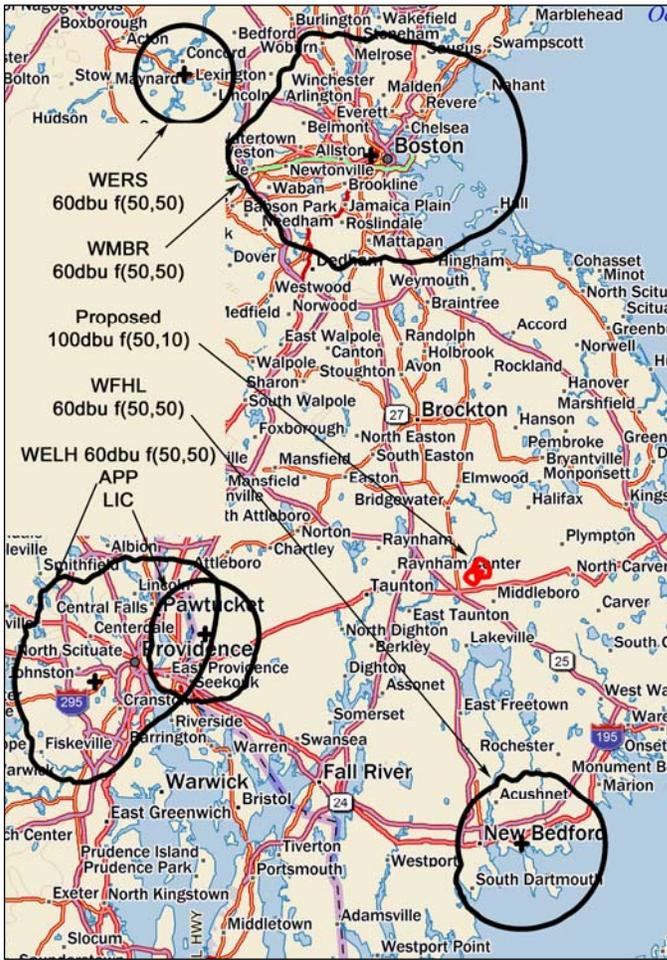


The above map shows that there will be no overlap from the proposed facility to any co-channel facility

Map 3 – First Adjacent Outbound Interference



The above map shows that there will be no overlap from the proposed facility to any first adjacent facility.



Map 4 – Second/Third Adjacent Outbound Interference Detail

The map to the left shows that there will be no overlap from the proposed facility to any second or third adjacent facility.

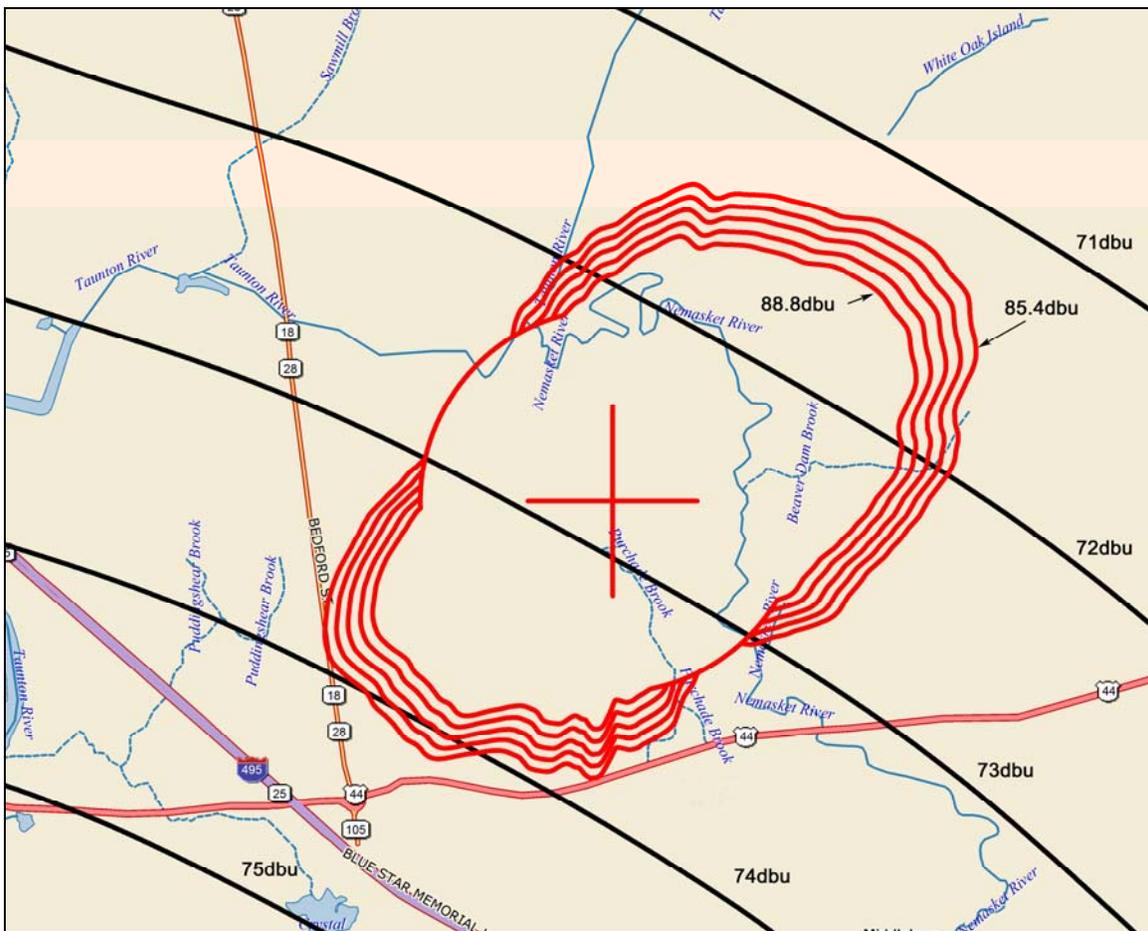
Channel 6 Interference

The proposed site is within the Grade A contour of WLNE-TV. Calculated in accordance with the curves per 73.525, the $f(50,50)$ signal of WLNE near the proposed transmitter location varies from 71 to 75dbu.

The following table shows the interfering signal level, with 16db added for the effect of vertical-only polarization:

TV6 Signal	+ D/U	= Int Sig	+ V only	=Final Int Sig
71.0	-1.6	69.4	16.0	85.4
72.0	-1.8	70.2	16.0	86.2
73.0	-2.0	71.0	16.0	87.0
74.0	-2.1	71.9	16.0	87.9
75.0	-2.2	72.8	16.0	88.8

The following plot shows that the 85.4dbu interfering contour does not reach the 71dbu protected contour, and encloses the other, higher signal strength contours.



It is therefore submitted that using the 85.4dbu $f(50,10)$ contour of the proposal would be an acceptable and conservative approach. The population contained within the proposed 85.4dbu $f(50,10)$ contour, based on the counting of individual centroids, is 972, substantially less than the allowed limit of 3,000 contained in 73.525. Because Vertical Polarization is proposed, no adjustment for directional receiving antennas was employed in generating this population count.

Directional Antenna

A directional antenna is proposed. The antenna has a null depth of 13db, which is less than the maximum limit of 15db allowed in the Rules. No ten degree increment has a change of greater than 2db.

az	fld	az	fld	az	fld
0	0.469	120	0.472	240	0.579
10	0.575	130	0.376	250	0.494
20	0.663	140	0.300	260	0.396
30	0.760	150	0.300	270	0.320
40	0.874	160	0.300	280	0.260
50	0.960	170	0.360	290	0.220
60	1.000	180	0.450	300	0.220
70	1.000	190	0.560	310	0.220
80	0.960	200	0.614	320	0.220
90	0.820	210	0.631	330	0.270
100	0.690	220	0.641	340	0.320
110	0.580	230	0.636	350	0.380

Transmitter Location

The proposed antenna will be side mounted on an 50m tower. The antenna will be centered at 48m AGL. The site elevation is 12m, and the HAMSL of the antenna will be 60m.

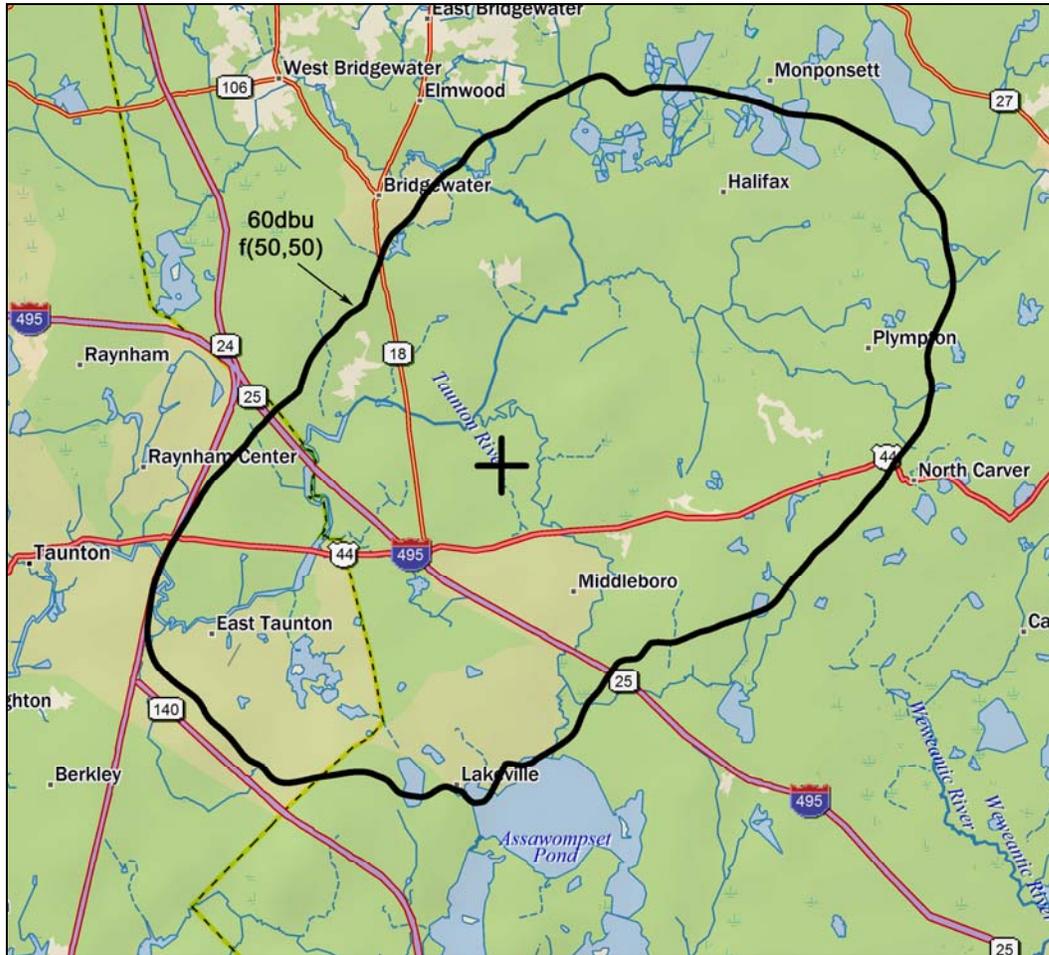
RF Exposure

The antenna will be mounted 48m AGL. Subtracting 2m for the height of a human leaves 46m. FMModel returns an exposure of less than $5\mu\text{W}/\text{cm}^2$ for the Shively vertical antenna. This is less than 2.5% of the limit for casual exposure.

The tower base is fenced off, and warning signs provide notification to authorized personnel of hazardous areas.

Applicant agrees to coordinate with other users of the site to reduce power or shut down in order to protect workers at the site.

Population and Area Covered



Area 273 km²
Population 47,502

Basis of population count and area:

The distance to the 60dbu f(50,50) signal was calculated for 3600 radials spaced evenly every 0.1 degree, and an intercept program was used to determine the coordinates from the distance and bearing. The 60dbu contour thus consists of a 3600-sided polygon. For each US Census Bureau population centroid in the area, a determination was made as to whether the centroid was located in the contour polygon. The population inside the contour is the sum of the populations of the centroids that fall within the contour.

The total area was calculated as $\pi/3600$ times the sum of the squares of the 3600 radial distances.

First NCE and Second NCE Service

NCE service population counts were computed as follows:

The distance to the 60dbu f(50,50) signal was calculated for 3600 radials spaced evenly every 0.1 degree, and an intercept program was used to determine the coordinates from the distance and bearing. The 60dbu contour thus consists of a 3600-sided polygon. For each US Census Bureau population centroid in the area, a determination was made as to whether the centroid was located in the contour polygon. The population inside the contour is the sum of the populations of the centroids that fall within the contour.

For each centroid, a count was made of the number of contours enclosing it, and the centroid was ranked accordingly. The centroid populations were then added together according to rank.

The following report summarizes the results:

SKYWAVES NCE/FM POPULATION COUNT REPORT

Population by current servers

0 people are currently served by 0 stations.
10,827 people are currently served by 1 stations.
21,160 people are currently served by 2 stations.
15,515 people are currently served by 3 stations.
0 people are currently served by four or more stations.

ERROR CHECK

47,502 counted by centroid
47,502 overall population
0 error count

SUMMARY

0 people would receive a FIRST NCE/FM service.
10,827 people would receive a SECOND NCE/FM service.
10,827 people would receive a FIRST OR SECOND NCE/FM service.

SERVERS

WBI M-FM 218 MA BRIDGEWATER
WBUR-FM 215 MA BOSTON
WGBH 209 MA BOSTON
WSMA 213 MA SCITUATE
WUMD 207 MA NORTH DARTMOUTH

The total population of the proposed service area is 47,502.

The population that would receive a first NCE service is 0. Applicant therefore answers NO to Section III, question 1.

The population that would receive a second NCE service is 10,827. or 23% of the total population, and greater than 2,000. Applicant therefore answers YES to Section III, question 2.

Conclusion

The instant application would provide a second NCE service to more than 10,000 people. It would cause no objectionable interference to any existing FM license or construction permit, and it would cause no objectionable interference to any channel 6 television station. The application can be granted without the issuance of any waivers. It is therefore respectfully submitted that a grant of the application would be in the public interest.