

Engineering Report in Support of  
Request for Waiver of FM Translator  
Application Minor Change Requirement

Introduction

This Engineering Report has been prepared for Northeast Broadcasting Company, Inc. (“Northeast”), applicant in the Federal Communications Commission’s Auction 83 for a new FM translator on Channel 243D at Needham, Massachusetts, File Number BNPFT-20030317JQI. The Report is submitted in support of a request for waiver of the requirements of Section 74.1233(a)(1) of the Commission’s Rules, to permit an amendment to the frequency of the proposed translator to Channel 291D in the pending short form application. The argument in favor of such a waiver is contained in the attached Waiver Request.

The Commission’s use of the Arbitron market grid for the Boston market, to protect future Low Power FM station filing opportunities, prevents the applicant from continuing to specify Channel 243D. As a result of the applicable allocation considerations for the pertinent precluded frequencies, it is not feasible to amend to one of the adjacent channel frequencies or an intermediate frequency channel in the amendment filing window that extends from April 1 through April 19, 2013.

The requested waiver is sought in order to amend the application to request non-precluded Channel 291D as the translator output frequency. The grid for the Boston Arbitron market does not show any filing opportunities for a new LPFM station on Channel 291, nor on Channels 290 or 292.

This Report shows in detail that the projected operation of the proposed FM translator on Channel 291D would conform with all of the Commission’s allocation requirements for a new FM translator.

Furthermore, and most importantly, the Report shows in great detail that there is absolutely no possibility that the projected operation of the translator on Channel 291D would ever block a new LPFM station at the proposed site, or anywhere else. This determination takes into account all the different types of LPFM facilities, up to 250 watts effective radiated power, that the Commission has considered at various times.

Therefore, unless the waiver request is approved, this opportunity for the proposed Northeast FM translator to promptly commence needed fill-in service for FM station WXRV, Andover, Massachusetts, on Channel 291D will be lost without resulting in any additional filing opportunities for new LPFM stations.

The requested waiver is only for amending the frequency of the proposed FM translator to a non-precluded channel. The location of the proposed translator would remain the same, and the 60 dBu contour for operation of the translator on Channel 291D would overlap the 60 dBu contour for the proposed translator on Channel 243D.

### Request for Change to Non-Precluded Frequency

The Boston Arbitron market grid identifies filing opportunities for a new LPFM station on Channel 243 very close to the location specified in the pending Northeast FM translator application. A study of the possibility of moving on Channel 243D to another location reveals that it is not possible to move the proposed translator far enough from the Boston grid points while maintaining some overlap of 60 dBu contours with the operation specified in the pending application.

The following paragraphs provide complete information to establish that it would not be feasible for the proposed FM translator to operate on any of the frequencies (first, second or third adjacent channel or intermediate frequency channel) precluded by the proposed operation on Channel 243D. The geographical coordinates of the proposed translator site are as follows:

North latitude: 42° 18' 12"  
West longitude: 71° 13' 08".

The pertinent contours for the proposed translator and the FM stations of interest are depicted in Figure 1 of this Report. The transmitting facilities for the FM stations are listed in Table A of this Report.

For operation of the proposed FM translator on third-adjacent Channel 240D, and also on first-adjacent Channel 242D, there would be first-adjacent-channel contour overlap with the licensed operation of WSRS(FM) on Channel 241B. Additionally, as the proposed translator 60 dBu contour falls entirely within the WSRS(FM) 54 dBu F(50,50) protected contour, it would not be possible to move the translator to a different site in order to protect WSRS(FM) and still provide some overlap of 60 dBu contours with the pending application.

Operation on second-adjacent Channel 241D would result in co-channel contour overlap between the proposed FM translator and the licensed operation of WSRS(FM) on Channel 241B, and it would not be possible to move the translator to a different site to protect WSRS(FM) and still provide overlap of translator service areas.

For operation of the proposed FM translator on first-adjacent Channel 244D, and also on third-adjacent Channel 246D, there would be first-adjacent-channel contour overlap with the licensed operation of WBQT(FM) on Channel 245B, and it would not be possible to move the translator to a different site to protect WBQT(FM) while providing overlap of translator service areas.

Operation on second-adjacent Channel 245D would result in co-channel contour overlap between the proposed FM translator and the licensed operation of WBQT(FM) on Channel 245B, and it would not be possible to move the translator to a different site to protect WBQT(FM) while providing overlap of translator service areas.

On the intermediate frequency Channels 296D and 297D, there would be first-adjacent channel contour overlap, and co-channel contour overlap, respectively, between the proposed FM translator and the licensed operation of WAAF(FM) on Channel 297B. In both instances the proposed translator 60 dBu contour falls entirely within the WAAF(FM) 54 dBu F(50,50) protected contour, and it would not be possible to move the translator to a different site to protect WAAF(FM) and still provide some overlap of 60 dBu contours with the pending application.

Accordingly, none of the frequencies precluded by the proposed FM translator on Channel 243D is available for use. The applicant therefore proposes operation on Channel 291D.

#### Interference Considerations for Projected Operation of FM Translator on Channel 291D

This part of this Report contains complete data to show that the projected operation of the proposed Northeast FM translator on Channel 291D meets the Commission's allocation requirements for a new FM translator.

The operation of the proposed Northeast FM translator on Channel 291D would conform with the requirements of Section 74.1204 of the Commission's Rules for an FM translator with respect to overlap of predicted contours with the licensed operation of any FM station, LPFM station or FM translator, and the operation of such facilities specified in a construction permit or pending application, on the same channel and the first adjacent channels, on one of the second-adjacent channels, and on one of the third-adjacent channels, as shown in this Report. On the other second-adjacent channel and third-adjacent channel, the proposed translator site is located within the predicted protected

contours of two existing FM stations. This Report demonstrates that under Section 74.1204(d) of the Rules no objectionable interference will be caused to either station. The operation of the proposed FM translator on Channel 291D therefore would not result in objectionable interference to any station.

Figure 2 of this Report shows the pertinent predicted contours for the proposed FM translator and co-channel FM station WCOD-FM, Hyannis, Massachusetts, on Channel 291B.

The pertinent predicted contours for the proposed FM translator and first-adjacent-channel stations WWKX(FM), Woonsocket, Rhode Island, on Channel 292A; and WFNQ(FM), Nashua, New Hampshire, on Channel 292A, are shown in Figure 3 of this Report.

Figure 4A of this Report depicts the location of the proposed FM translator site with respect to the predicted protected contours of the nearby FM stations on the second- and third-adjacent channels. As shown in Figure 4A, the proposed translator is located within the 54 dBu contour for the licensed operations of WROR-FM, Framingham, Massachusetts, on Channel 289B; and WMJX(FM), Boston, Massachusetts, on Channel 294B.

The potential for interference from the proposed FM translator to the licensed operations of WROR-FM and WMJX(FM) was evaluated by determining the three-dimensional volume in which the ratio of undesired to desired signal between the proposed translator and each of these stations equals or exceeds 40 dB, using free space propagation calculations for the translator signal.

With respect to the licensed operation of WROR-FM, the predicted F(50,50) WROR-FM signal at the proposed FM translator site is 87.0 dBu, and interference would occur where the translator signal is 127.0 dBu (2240 mV/m) or greater. For the licensed operation of WMJX(FM) the predicted F(50,50) WMJX(FM) signal at the proposed translator site is 87.1 dBu, and interference would occur where the translator signal is 127.1 dBu (2260 mV/m) or greater.

Computations show that, for operation at 10 watts effective radiated power and assuming uniform radiation from the proposed FM translator antenna in all directions, interference to either WROR-FM or WMJX(FM) would not extend beyond a distance of 10 meters from the translator antenna in any direction.

The map of Figure 4B of this Report is the most recent edition of the USGS 7-1/2-minute topographic map that depicts the vicinity of the proposed FM translator site. The proposed site is located in an urban area, but the translator antenna would be at a considerable height (152 meters) above ground, and there are no nearby exceptionally tall buildings. The proposed operation of the FM translator on Channel 291D conforms with the requirements of Section 74.1204(d) of the Commission's Rules, as the three-dimensional space within which interference to WROR-FM and WMJX(FM) may be expected does not include any places that could be considered populated, or any streets and highways, and the proposed FM translator therefore would not result in objectionable interference to WROR-FM or WMJX(FM).

#### Analysis of LPFM Filing Opportunities For Operation of FM Translator on Channel 291D

This section of this Report provides complete information to establish that amending the frequency of the proposed Northeast FM translator from Channel 243D to Channel 291D, and operating at the proposed site with up to maximum facilities for a fill-in translator, could not block any future LPFM licensing opportunities at the proposed site or at any other location. An FM translator is the only type of new FM service that could be established on Channel 291 at the proposed site. The Commission's Boston grid shows that Channels 235 and 275 would both be available for a new LPFM station at the proposed translator site.

For operation of the proposed FM translator on Channel 291D, the frequencies that require evaluation are Channels 288 through 294. This analysis is based on the distance separation requirements of Section 73.807 of the Commission's Rules (as amended in the Commission's Sixth Report and Order in MM Docket No. 99-25, released December 4, 2012). For reference purposes, intermediate frequency Channels 237 and 238 also have been evaluated.

In Figures 5A through 5D of this Report, circles of a given radius from the proposed translator site show the greatest distance a new LPFM station would need to be located from the translator on a particular frequency. Figures 5A through 5D also depict arcs drawn from the transmitter sites of pertinent existing FM stations that define the distance a new LPFM station would need to be located from these FM stations. Data for the FM stations, including the applicable distance separation requirements, are provided in Tables B-1 through B-4 of this Report.

Figure 5A of this Report demonstrates that operation of the proposed FM translator on Channel 291D would not eliminate any co-channel LPFM filing opportunities on Channel 291 for a distance of at least 39 kilometers from the translator site (the greatest required co-channel spacing between an LPFM station and an FM translator). As shown, the minimum required spacings between an LPFM station and licensed FM stations WCOD-FM on Channel 291B; WFNQ(FM) on Channel 292A; and WWKX(FM) on Channel 292A already rule out a new LPFM station on Channel 291 within 39 kilometers of the proposed translator site.

As shown in Figure 5B of this Report, operation of the proposed FM translator on Channel 291D would not eliminate any first-adjacent-channel LPFM filing opportunities on Channels 290 and 292 for a distance of at least 28 kilometers from the translator site (the greatest required first-adjacent channel spacing between an LPFM station and an FM translator). The minimum required spacing between an LPFM station and licensed FM station WROR-FM on Channel 289B already rules out a new LPFM station on Channel 290 within 28 kilometers of the proposed translator site. Similarly, the minimum required spacings to licensed FM stations WCOD-FM on Channel 291B; WFNQ(FM) on Channel 292A; and WWKX(FM) on Channel 292A already rule out a new LPFM station on Channel 292.

Figure 5C of this Report demonstrates that operation of the proposed FM translator on Channel 291D would not eliminate any LPFM filing opportunities on second-adjacent Channels 289 and 293, for a distance of at least 21 kilometers from the translator site (the greatest required second-adjacent channel spacing between an LPFM station and an FM translator). The minimum required spacing between an LPFM station and licensed FM station WROR-FM on Channel 289B already rules out any possibility of a new LPFM station on Channel 289 within 21 kilometers of the proposed translator site; and the minimum required spacing to licensed FM station WMJX(FM) on Channel 294B already rules out a new LPFM station on Channel 293 within that distance.

Additionally, Figure 5C of this Report shows that operation of the proposed FM translator on Channel 291D would not eliminate any LPFM filing opportunities on third-adjacent Channels 288 and 294, for a distance of at least 21 kilometers from the translator site (also the greatest required third-adjacent channel spacing between an LPFM station and an FM translator). The minimum required spacing between an LPFM station and licensed FM station WROR-FM on Channel 289B already rules out any new LPFM station on Channel 288 within 21 kilometers of the proposed translator site; and the minimum required spacing to licensed FM station WMJX(FM) on Channel 294B already rules out a new LPFM station on Channel 294 within this distance.

With respect to the intermediate frequency Channels 237 and 238, Figure 5D of this Report shows that operation of the proposed FM translator on Channel 291D would not eliminate any LPFM filing opportunities for a distance of at least 5 kilometers from the translator site (the intermediate frequency spacing formerly required between an LPFM station and an FM translator). Licensed FM station WHRB(FM) on Channel 237A already rules out a new LPFM station on Channel 237 or 238.

It has therefore been firmly established in this Report that operation of the proposed FM translator on Channel 291D would in no way impede the Commission's objective of making channels available for new LPFM applicants. This statement is fully supported by the absence of LPFM filing opportunities identified for any of these channels on the Commission's grid for the Boston Arbitron market.

#### Methods Employed in Determining Contours

The predicted contours shown in this Report were determined in accordance with the requirements of Section 73.313 of the Commission's Rules, from computerized calculations based on the NGDC 30-second terrain database and Figures 1 and 1a of Section 73.333 of the Rules. Distances to the contours were calculated at azimuthal increments of one degree.

#### Conclusion

It has been shown in this Report that an amendment to the Northeast Broadcasting Company, Inc., FM translator application for Needham, Massachusetts, to change frequency from Channel 243D to Channel 291D would not obstruct in any way the Commission's plan for making filing opportunities available for new Low Power FM stations at the present time or in the future.

Fred W. Volken  
Engineering Consultant

March 2013

Sierra Madre, California

## Statement of Engineer

FRED W. VOLKEN, whose place of business is located at 348 W. Sierra Madre Blvd., Sierra Madre, California, hereby states that he is a graduate physicist holding the degree Bachelor of Arts from Occidental College, Los Angeles, California; that his qualifications as an engineering consultant are a matter of record with the Federal Communications Commission; that he has prepared the attached document as engineering consultant for Northeast Broadcasting Company, Inc., applicant for a new FM translator at Needham, Massachusetts; and that all of the information contained in this document is accurate and correct to the best of his knowledge and ability.

April 1, 2013

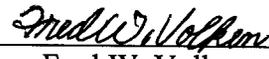
  
Fred W. Volken

FIGURE 1  
Interference Considerations  
For Precluded Frequencies

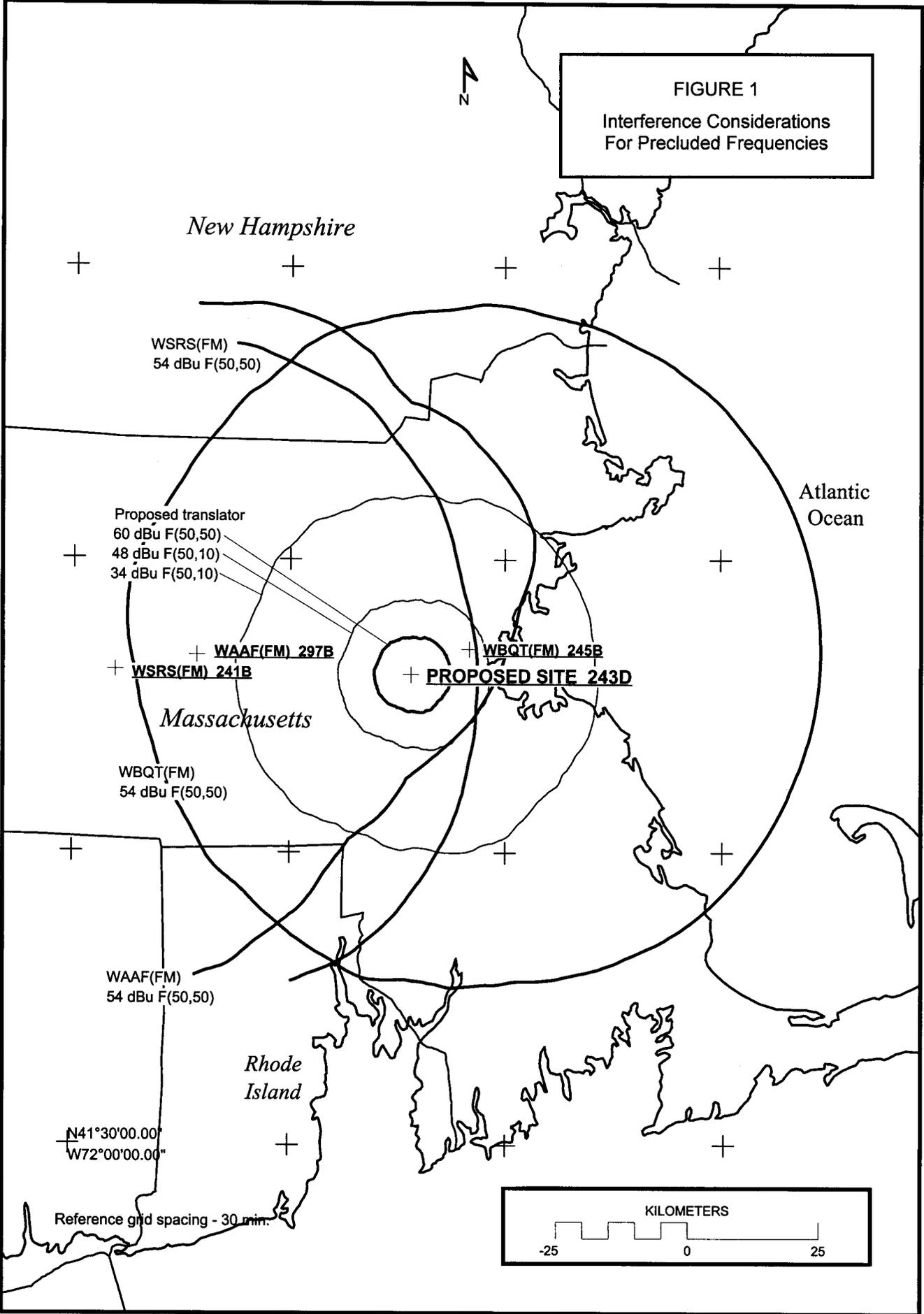
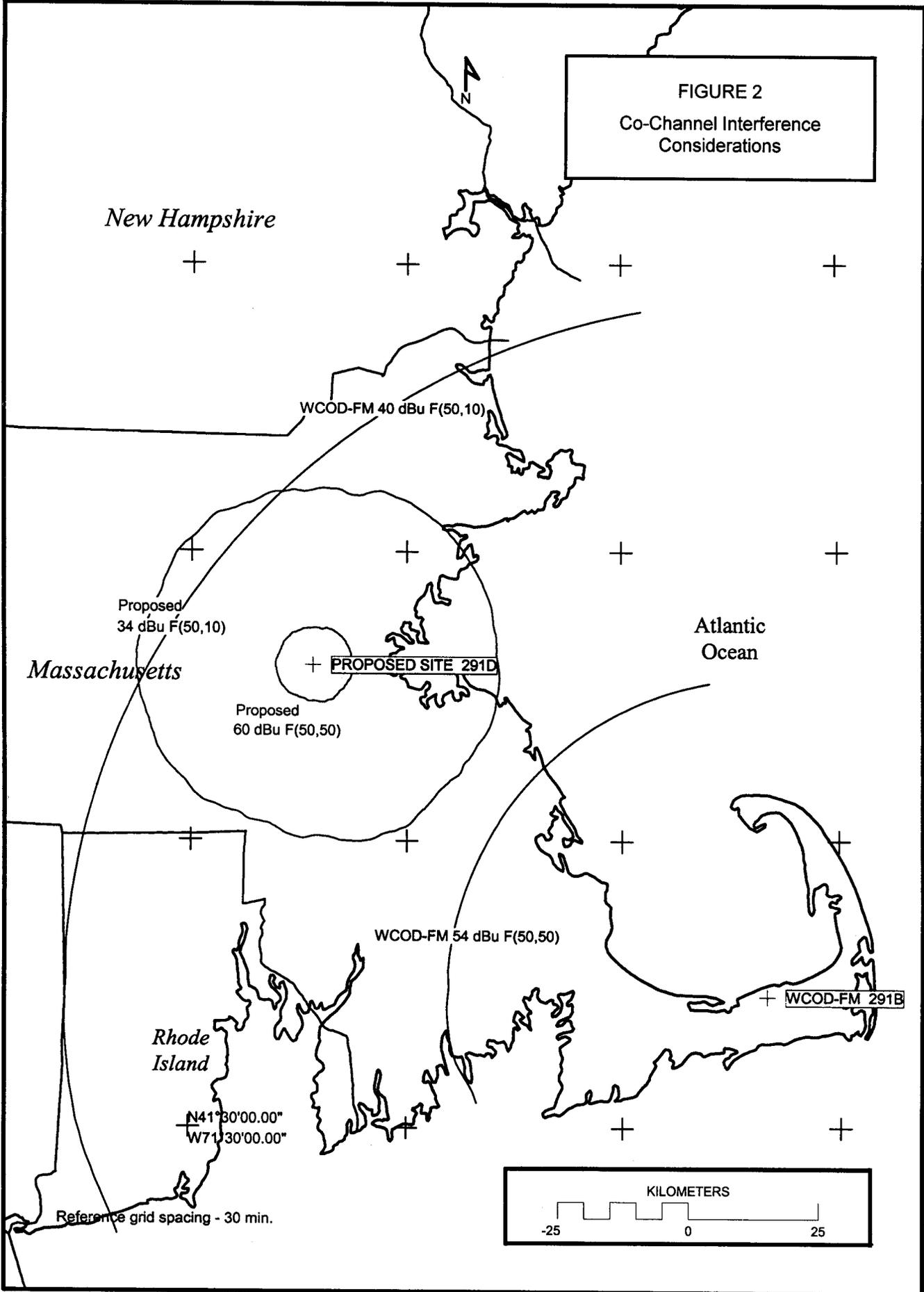


TABLE A  
 FM Station Facilities for  
 Study of Precluded Frequencies

Channel and Class	Station and Location, Status, File Number	Geographical Coordinates	Facilities	
			Effective Radiated Power and Antenna	Antenna Height Above Average Terrain
241B	WSRS(FM), Worcester, MA License BMLH-20051227AFL	N 42° 18' 34" W 71° 54' 13"	16.5 kW Nondirectional	263 meters
245B	WBQT(FM), Boston, MA License BLH-19960903KE	N 42° 20' 50" W 71° 04' 59"	22.5 kW Nondirectional	224 meters
297B	WAAF(FM), Westborough, MA License BLH-20051019ABP	N 42° 20' 09" W 71° 42' 57"	9.6 kW Directional	335 meters

FIGURE 2  
Co-Channel Interference  
Considerations



**FIGURE 3**  
First Adjacent Channel  
Interference Considerations

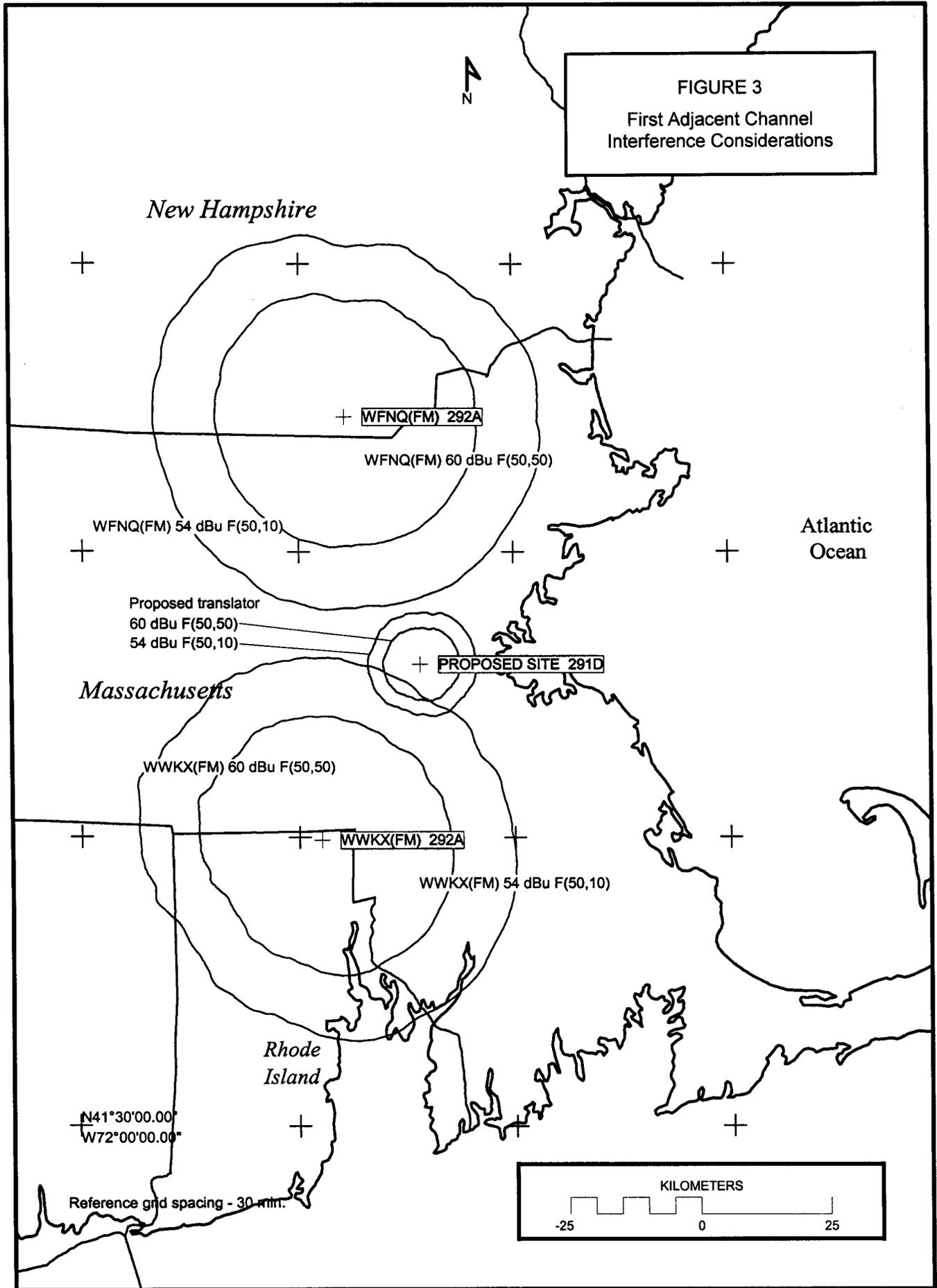
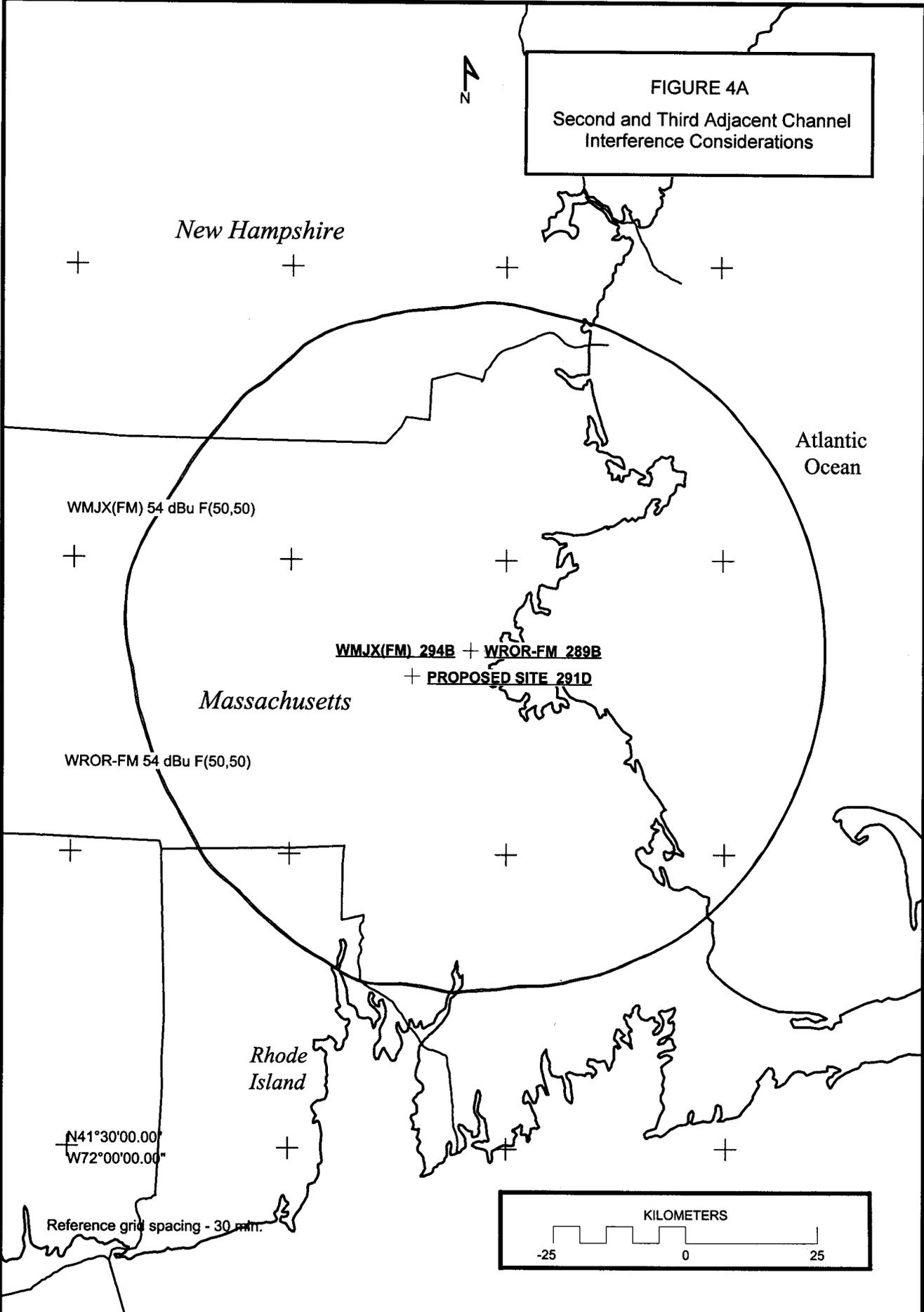


FIGURE 4A  
Second and Third Adjacent Channel  
Interference Considerations



**FIGURE 4B**  
Second and Third Adjacent Channel  
Interference Considerations

Map consists of portion of Newton, Mass.  
(1970), USGS 7-1/2 minute topographic  
quadrangle. Contour interval 10 feet

PROPOSED SITE 291D

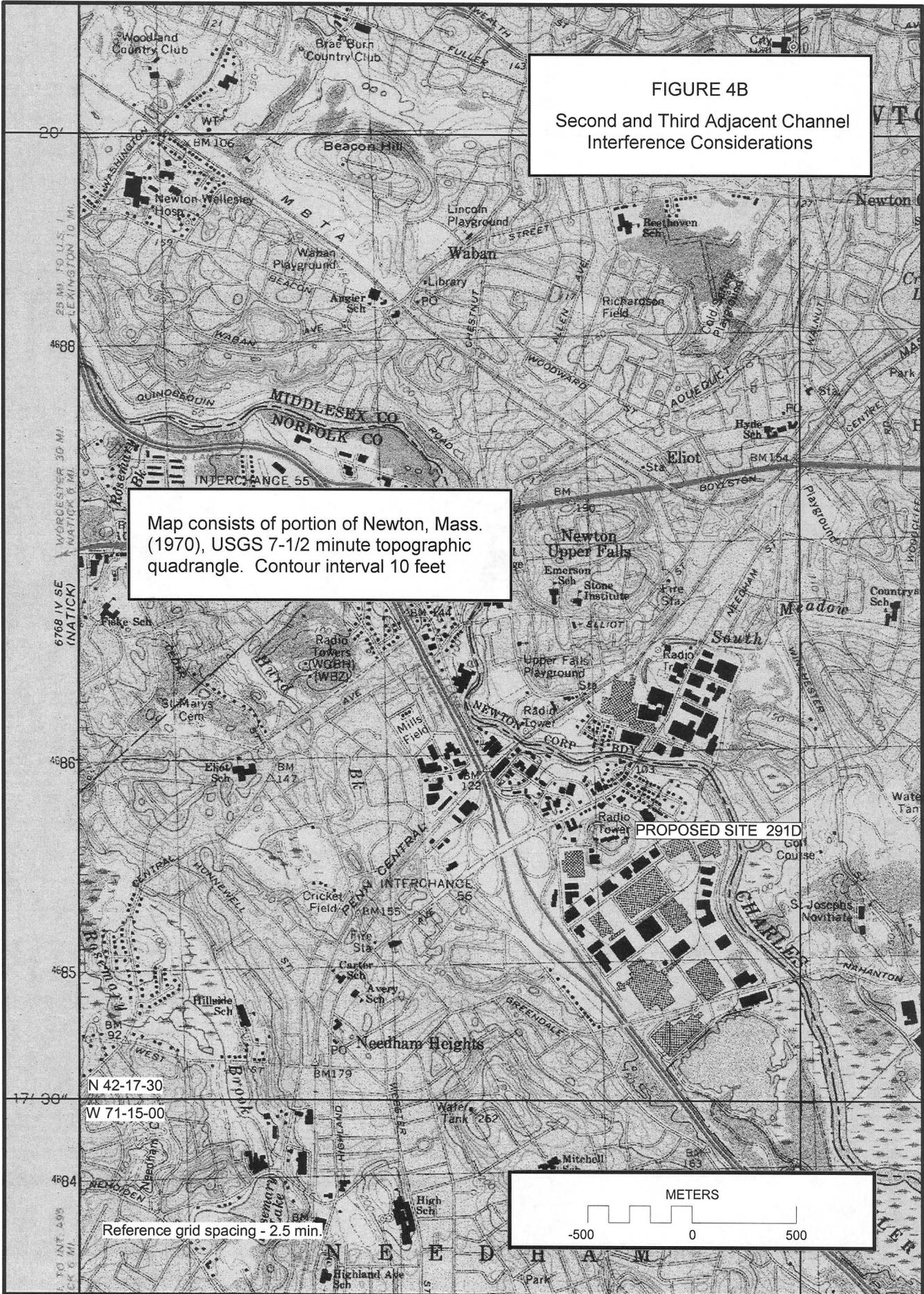


FIGURE 5A  
FM Stations That Block  
LPFM Station on Channel 291

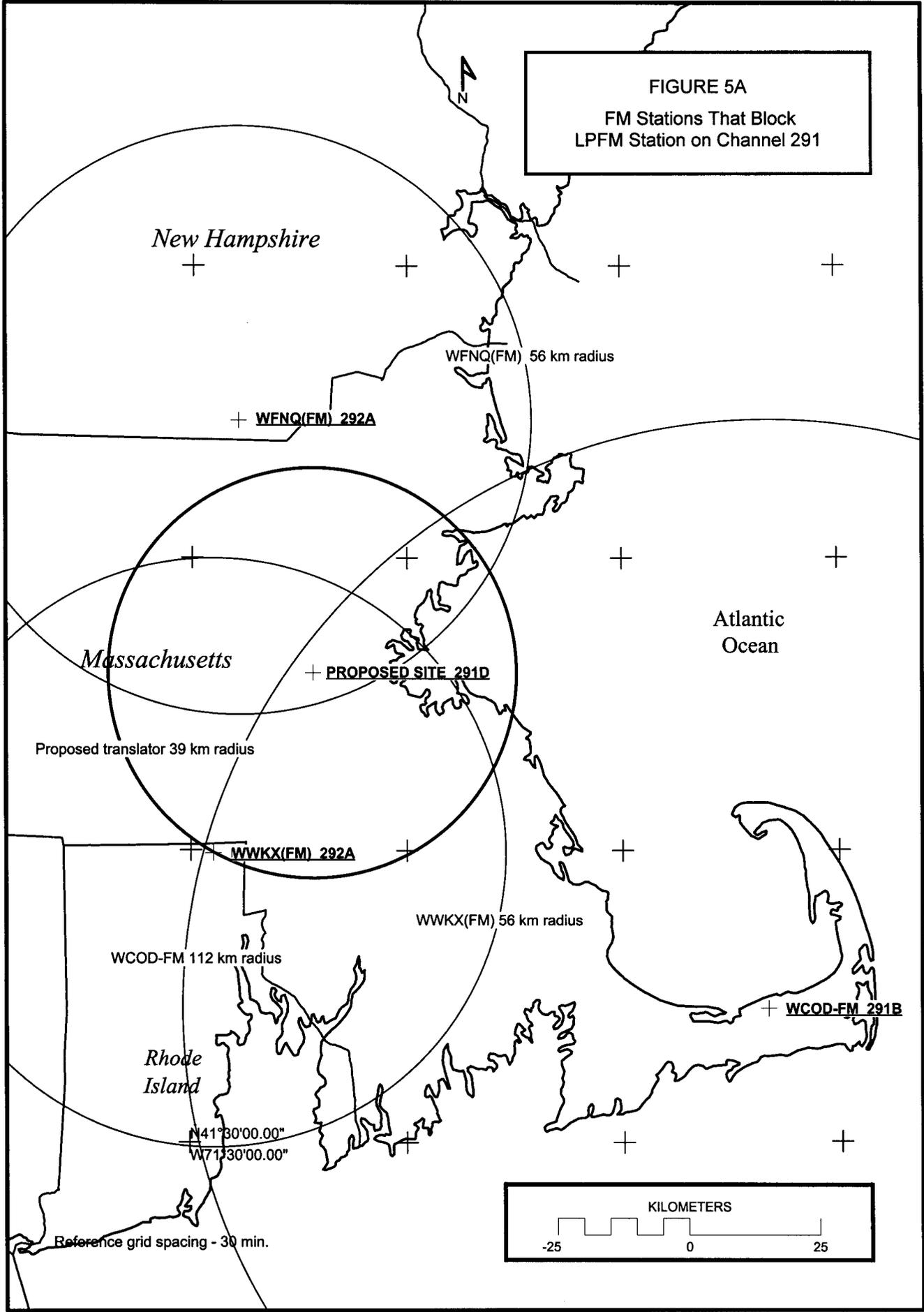
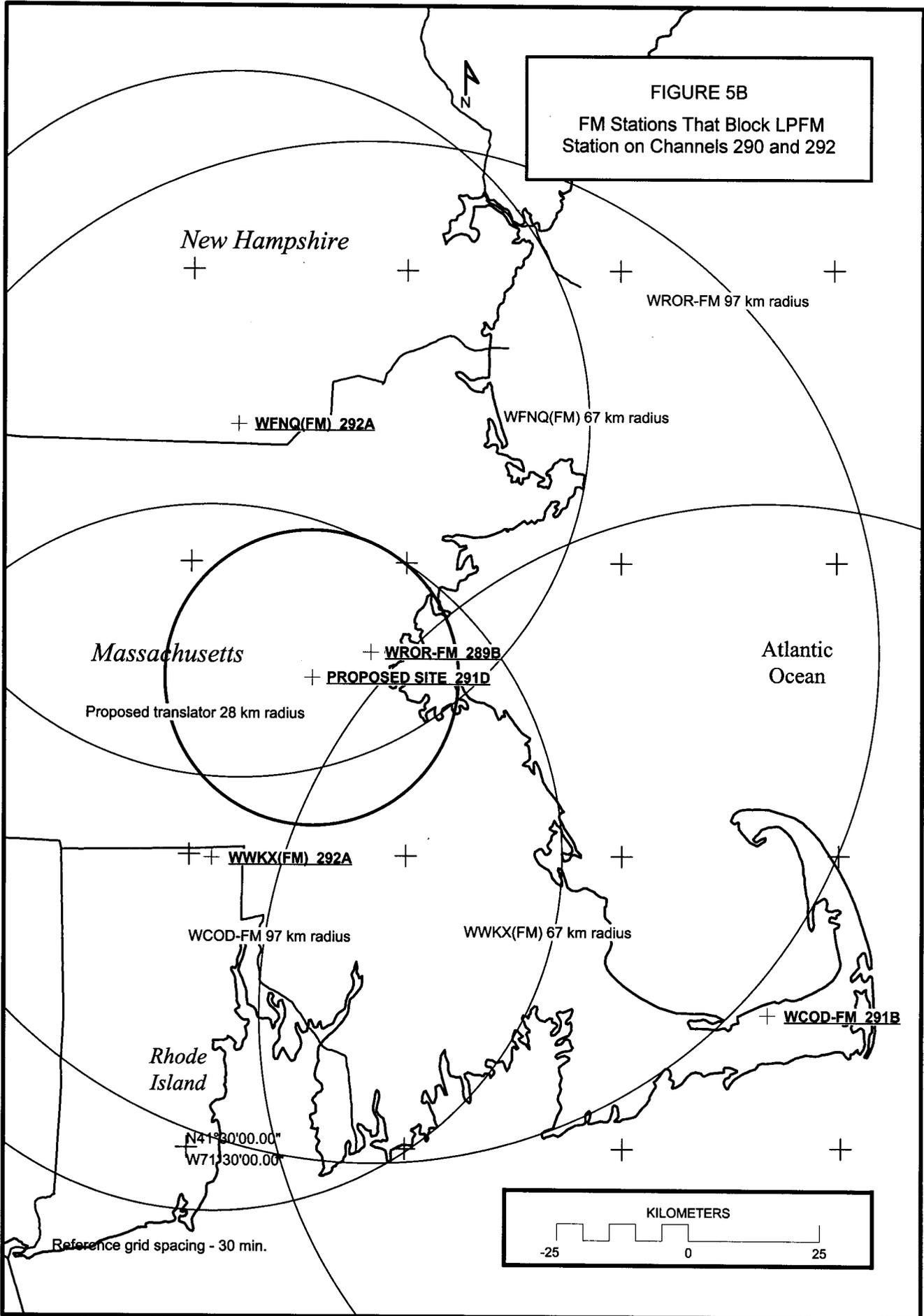


FIGURE 5B  
FM Stations That Block LPFM  
Station on Channels 290 and 292



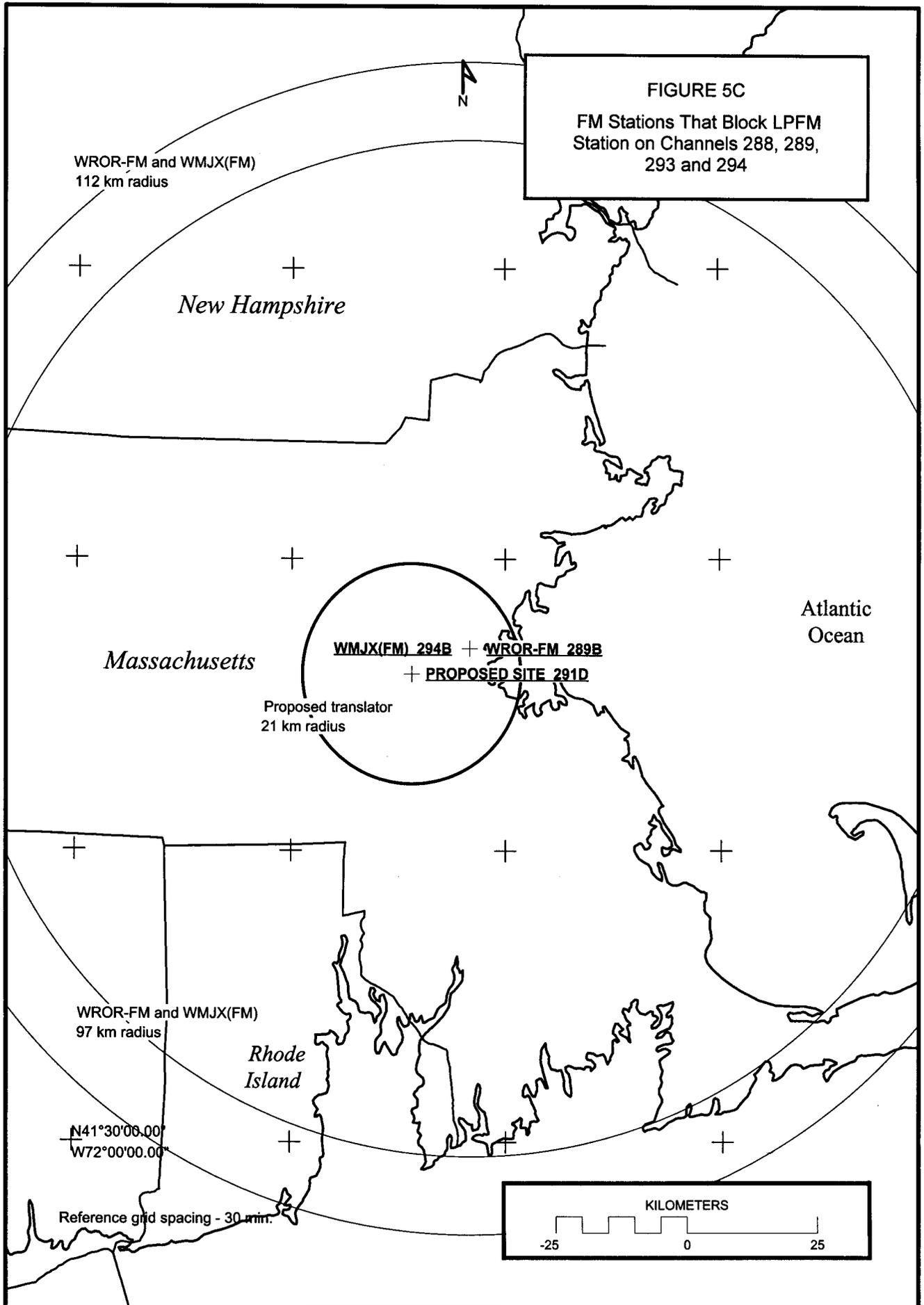


FIGURE 5D  
FM Stations That Block LPFM  
Station on Channels 237 and 238

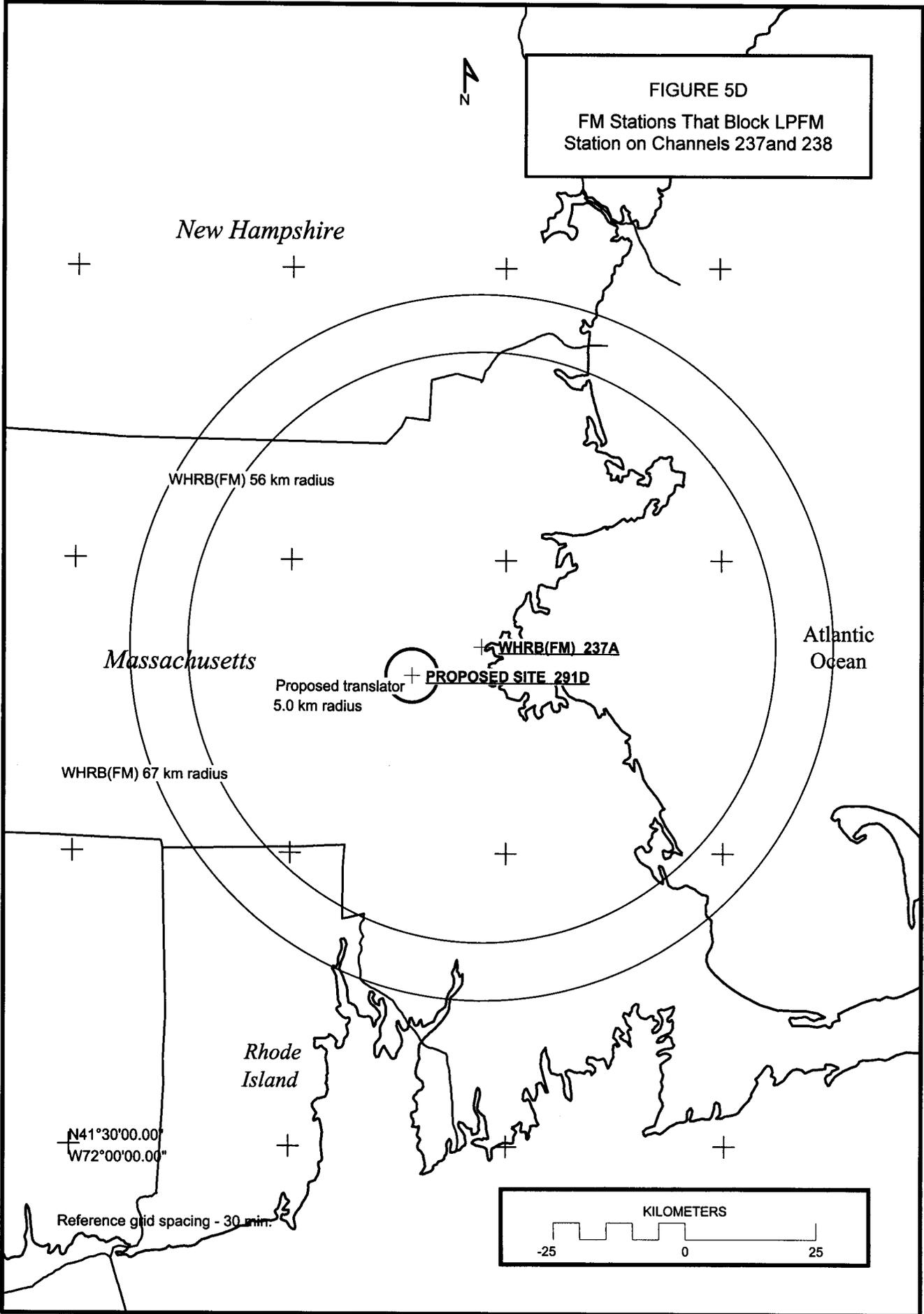


TABLE B-1

FM Stations That Block LPFM Station on  
Co-Channel 291 Within 39 km of Proposed Translator Site

FM Stations Ruling Out LPFM Station				
LPFM Channel	Channel and Class	Station and Location, Status, File Number	Geographical Coordinates	Required Separation for LPFM Station
291L100	291B	WCOD-FM, Hyannis, MA License BMLH-20080703AGY	N 41° 43' 44" W 70° 10' 02"	112 km
	292A	WFNQ(FM), Nashua, NH License BLH-19920527KA	N 42° 44' 07" W 71° 23' 37"	56 km
	292A	WWKX(FM), Woonsocket, RI License BLH-19921228KB	N 41° 59' 43" W 71° 26' 54"	56 km

TABLE B-2

FM Stations That Block LPFM Station on  
First-Adjacent Channels 290 and 292  
Within 28 km of Proposed Translator Site

FM Stations Ruling Out LPFM Station				
LPFM Channel	Channel and Class	Station and Location, Status, File Number	Geographical Coordinates	Required Separation for LPFM Station
290L100	289B	WROR-FM, Framingham, MA License BLH-20000223AAP	N 41° 20' 50" W 71° 04' 59"	97 km
292L100	291B	WCOD-FM, Hyannis, MA License BMLH-20080703AGY	N 41° 43' 44" W 70° 10' 02"	97 km
	292A	WFNQ(FM), Nashua, NH License BLH-19920527KA	N 42° 44' 07" W 71° 23' 37"	67 km
	292A	WWKX(FM), Woonsocket, RI License BLH-19921228KB	N 41° 59' 43" W 71° 26' 54"	67 km

TABLE B-3

FM Stations That Block LPFM Station on  
 Second-Adjacent Channels 290 and 293 and  
 Third-Adjacent Channels 288 and 294  
 Within 21 km of Proposed Translator Site

FM Stations Ruling Out LPFM Station				
LPFM Channel	Channel and Class	Station and Location, Status, File Number	Geographical Coordinates	Required Separation for LPFM Station
288L100	289B	WROR-FM, Framingham, MA License BLH-20000223AAP	N 41° 20' 50" W 71° 04' 59"	97 km
289L100	289B	WROR-FM, Framingham, MA License BLH-20000223AAP	N 41° 20' 50" W 71° 04' 59"	112 km
293L100	294B	WMJX(FM), Boston, MA License BLH-19911018KC	N 42° 20' 50" W 71° 04' 59"	97 km
294L100	294B	WMJX(FM), Boston, MA License BLH-19911018KC	N 42° 20' 50" W 71° 04' 59"	112 km

TABLE B-4

FM Stations That Block LPFM Station on  
 Intermediate Frequency Channels 237 and 238  
 Within 5 km of Proposed Translator Site

FM Stations Ruling Out LPFM Station				
LPFM Channel	Channel and Class	Station and Location, Status, File Number	Geographical Coordinates	Required Separation for LPFM Station
237L100	237A	WHRB(FM), Cambridge, MA License BLH-20111115ABD	N 42° 21' 08" W 71° 03' 25"	67 km
238L100	237A	WHRB(FM), Cambridge, MA License BLH-20111115ABD	N 42° 21' 08" W 71° 03' 25"	56 km