ATTACHMENT: Broadcast Station Facilities
and Allocation Considerations

I. Broadcast Station Facilities

Modification of WNCS(FM) Facilities

This application is for modification of the facilities of WNCS(FM), Montpelier, Vermont, from operation with a directional antenna to nondirectional operation. The station will remain on Channel 284C2. The proposed modifications require a reduction in effective radiated power, and also involve a small change in the location of the station's transmitter site.

WNCS(FM) presently operates on Channel 284C2 with 1.9 kW effective radiated power, employing a directional antenna. Data for the directional antenna is provided in Figure 1 of this Attachment. The NAD83 geographical coordinates for the station's present transmitter site are as follows:

North Latitude: 44° 25' 14.1"
West Longitude: 72° 49' 40.4".

The ground elevation for the present facilities is 1030 meters above mean sea level, and the antenna radiation center height is 31 meters above ground. Antenna height above average terrain is 634 meters.

For the proposed operation of WNCS(FM), the station will continue to operate on Channel 284C2, with effective power reduced to 1.65 kW, utilizing a nondirectional antenna. The proposed transmitter site is near the present site, at the following NAD83 geographical coordinates:

North Latitude: 44° 25' 12.6"
West Longitude: 72° 49' 40.0".

At the proposed site the ground elevation is 1010 meters above mean sea level. The proposed height of the antenna radiation center above ground is 52 meters, and the antenna height above average terrain would be 636 meters.

ATTACHMENT: Broadcast Station Facilities and
Allocation Considerations (continued)

Service to Principal Community

The proposed modified operation of WNCS(FM) would provide a 70 dBu F(50,50) signal to the entire community of Montpelier, and service to the principal community conforms with the requirements of Section 73.315(a) of the Commission's Rules. This is illustrated in Figure 2 of this Attachment.

The boundary for Montpelier was derived from maps contained in the 2010 U.S. Census.

Compliance with Environmental Rules

The proposed operation of WNCS(FM) will utilize an existing tower as the supporting structure for the station's antenna system. No new tower construction is proposed in this application. There presently are wireless Internet and cellular telephone facilities installed on the tower.

About 55 meters in a northerly direction from this structure is another tower, that is presently utilized by WNCS(FM), and also is used for wireless Internet and FAA facilities. No other broadcast stations are located at the Ricker Mountain site.

The Ricker Mountain site is reached over a lengthy (around 1.3 kilometers), rugged trail that starts at the upper end of a ski lift at the Bolton Valley ski area. Access to the trail is therefore controlled, and signs in the vicinity of the towers prohibit trespassing. Except for a few dedicated hikers, the site is inaccessible by the general public. In the past, tower construction at the mountaintop site has required the use of helicopter aircraft. As shown in subsequent paragraphs, radiofrequency radiation levels near the ground at the site resulting from the proposed operation of WNCS(FM) will fall well below the maximum safe exposure level for the general public.

The antenna system for the proposed operation of WNCS(FM) is a Shively Labs Model 6813-2-SS FM Antenna, which is comprised of two circularly polarized omni-directional radiating elements mounted in a vertical line and spaced one-half wavelength between elements. The antenna supporting structure extends to an overall height of 56.4 meters above ground, and the antenna system will be side-mounted on this structure, with the radiation center located 51.8 meters above ground.

A study made using the Commission's "FM Model" program for evaluating radiofrequency radiation levels for the proposed WNCS(FM) antenna system shows that for operation at 1.65 kW effective radiated power, the calculated power density levels would not exceed 0.006 mW/cm^2, or 3.0% of the maximum permissible exposure value of 0.20 mW/cm^2 for uncontrolled exposure situations at 104.7 MHz, at any point at a height of 2 meters or less above ground in the vicinity of the base of the antenna supporting structure. One or more RF hazard warning signs will be posted near the base of the antenna tower.

The applicant will operate the proposed transmitting facilities at reduced power, or temporarily cease operation, as may be required to protect all workers at the mountaintop site from exposure to hazardous levels of radiofrequency radiation.

II. Allocation Considerations

Distance Separations to Stations in the United States

The location of the proposed WNCS(FM) transmitter site conforms with the distance separation requirements of Section 73.207(b)(1) of the Commission's Rules for a Class C2 station with respect to existing stations, construction permits, pending applications, channel allotments and rulemaking petitions in the United States on the pertinent channels.

Table A shows the distance and required separation from the proposed WNCS(FM) site to each existing station, construction permit, pending application, allotment and rule-making petition in the United States within 300 kilometers for Channel 284 and the first adjacent channels; within 150 kilometers for the second and third adjacent channels; and within 50 kilometers for the frequencies removed by 53 and 54 channels from Channel 284.

Protection of Stations in Canada

The transmitting facilities for both the present and proposed operations of WNCS(FM) are located in the U.S.-Canada border zone, and the proposed operation needs to conform with the requirements of the "Canada-U.S. FM Agreement (1991, amended 1997)."

Both the present and the proposed operations of WNCS(FM) are short-spaced to one FM station and four FM allotments in Canada under the distance separation requirements for a United States Class B station as set forth in Paragraph 2.4 of the "Canada-U.S. FM Agreement" (using the methodology of Paragraph 2.6).

At present, the Canadian station and three of the Canadian allotments receive contour overlap from WNCS(FM). For two of the allotments this received overlap would be reduced by the proposed operation of WNCS(FM). The proposed operation of WNCS(FM) would rearrange, and reduce, the contour overlap received by the FM station and the other allotment, under Paragraph 3.5.3 of the "Canada-U.S. FM Agreement." Data for the short-spaced FM station and the four FM allotments is provided in Tables B and C of this Attachment. For this application, data for the Canadian stations was obtained informally from the Commission's staff.

Figure 3 of this Attachment shows that the allotment at Gatineau, Quebec, for Channel 284C1 (limited) would not receive contour overlap from either the present or the proposed operation of WNCS(FM).

In the case of the Montreal, Quebec, allotment on Channel 284A1, Figure 3 shows that the existing contour overlap received from the present operation of WNCS(FM) would decrease.

With respect to the first-adjacent-channel FM facilities, Figure 4 of this Attachment shows that for the St. Remi, Quebec, allotment on Channel 285A1, the existing contour overlap received from WNCS(FM) would decrease.

Also shown in Figure 4 is the existing contour overlap between the present and the proposed operations of WNCS(FM) and CFXM, Granby, Quebec, on Channel 285B (limited), and the Sherbrooke, Quebec, allotment on Channel 283C1 (limited).

Detailed depictions of the proposed rearrangement of the existing contour overlap received from WNCS(FM) by CFXM and the Sherbrooke allotment are shown in Figure 5 of this Attachment for the present operation of WNCS(FM), and in Figure 6 for the proposed operation.

In the case of CFXM, the total area of contour overlap received from the proposed operation of WNCS(FM) would be decreased by 42 square kilometers, from 230 square kilometers to two parts totaling 188 square kilometers; and the area of predicted interference (determined using the applicable desired-to-undesired signal ratio) would be decreased by 19 square kilometers, from 103 square kilometers to two parts totaling 84 square kilometers.

For the proposed operation of WNCS(FM), the area of contour overlap (in Canada) received by the Sherbrooke allotment would be decreased by 25 square kilometers, from 237 square kilometers to 212 square kilometers; and the area of predicted interference (using the signal ratio) would be decreased by 9 square kilometers, from 78 square kilometers to 69 square kilometers.

It is believed that the information and data provided in this Attachment establishes that the proposed operation of WNCS(FM) conforms with the Commission's Rules and with the provisions of the "Canada-U.S. FM Agreement."

Methods Employed in Determining Contours and Areas

The contours for the licensed and proposed operation of WNCS(FM) shown in this Attachment were determined from computerized calculations based on the NGDC 30-second terrain database, and Figures 1 and 1a of Section 73.333 of the Commission's Rules. Distances to the contours were calculated at azimuthal increments of one degree.

For the pertinent Canadian FM facilities, distances to contours were determined in accordance with the "Canada-U.S. FM Agreement." Where there is no limitation toward WNCS(FM), contours were based on maximum parameters for the station class; and for the facilities where there is a limitation toward WNCS(FM), by applying this limit over an appropriate circular arc toward WNCS(FM).

Areas of contour overlap and predicted interference were determined from measurements made with a compensating polar planimeter, and computation.

Fred W. Volken
Engineering Consultant

May 2020 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, or supervised the preparation of, the accompanying document as engineering consultant for Montpelier Broadcasting, Inc., licensee of FM Broadcast Station WNCS, Montpelier, Vermont; and that all of the information contained in this document is accurate and correct to the best of his knowledge and ability.

I state under penalty of perjury that the foregoing is true and correct. Executed on May 22, 2020.

Fred W. Volken

Fred W. Volken

ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)

FIGURE 1

Data for Present WNCS(FM) Directional Antenna System

5/13/2020 Relative Field Values

FCC Federal Communications Commission

FCC Home | MB

Relative Field Values

FCC> Media Bureau > MB-CDBS > CDBS Public Access > Antenna Search Help site map

Antenna Make	Model	Service	Antenna Id
ODD	ODD980715IC	FM	15633

Antenna relative field values:

0°	0.89	10°	0.707	20°	0.707	30°	0.89	40°	1	50°	1
60°	1	70°	1	80°	1	90°	1	100°	1	110°	1
120°	1	130°	1	140°	1	150°	1	160°	1	170°	1
180°	1	190°	1	200°	1	210°	1	220°	1	230°	1
240°	1	250°	1	260°	1	270°	1	280°	1	290°	1
300°	1	310°	1	320°	1	330°	1	340°	1	350°	1

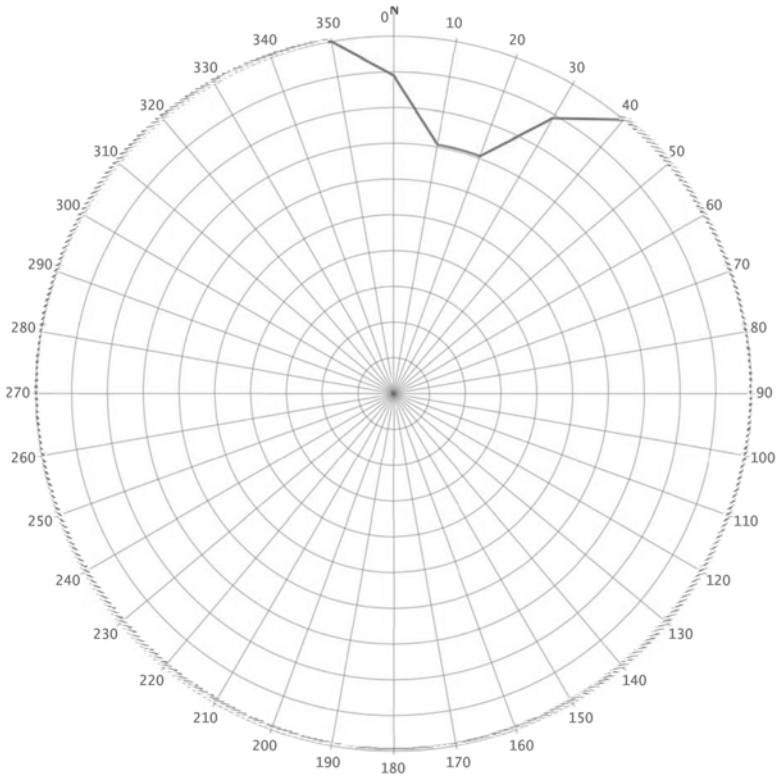
Additional Azimuths:

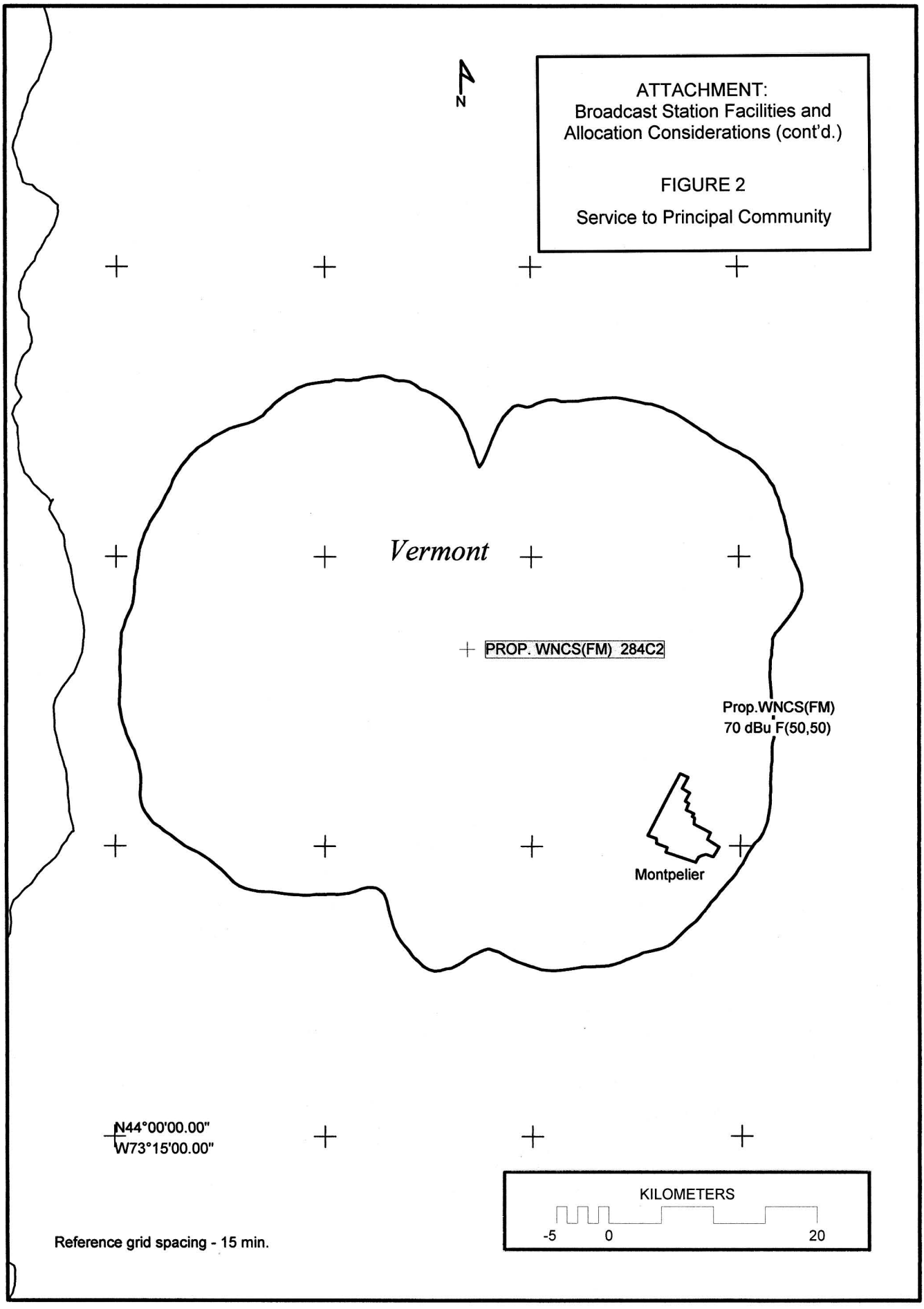
Relative Field Polar Plot

5/13/2020 Plot FM or TV Directional Antenna Relative Field Pattern Media Bureau (FCC) USA

Any directional antenna rotation has already been applied to the plotted pattern and relative field values.

Close Window

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ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)
FIGURE 2
Service to Principal Community
Vermont
PROP. WNCS(FM) 284C2
Prop.WNCS(FM)
70 dBu F(50,50)
Montpelier
N44°00'00.00"
W73°15'00.00"
KILOMETERS
-5
0
20
Reference grid spacing - 15 min.

ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)

TABLE A

Distance Separations from
WNCS(FM) Proposed Site to
FM Stations in the United States

Geographical coordinates of WNCS(FM) proposed transmitter site:

North Latitude 44º 25' 12.6"
West Longitude 72º 49' 40.0"

Channel and Class	Station and Location, Status, File Number	Geographical Coordinates	Distance from Reference (kilometers)	Required Separation (kilometers)
230A	WLVB(FM), Morrisville, VT License BLH-19930907KB	N 44º 34' 42.1" W 72º 38' 07.4"	23	15
281A	WMNV(FM), Rupert, VT License BLH-20041015ABS	N 43º 16' 01.2" W 73º 15' 19.3"	133	55
282C3	WJKS(FM), Keeseville, NY License BLH-20141031AAO	N 44º 31' 31.8" W 73º 31' 07.3"	56	56
283A	WVMJ(FM), Conway, NH License BLH-20100301ABY	N 43º 56' 48.2" W 71º 08' 22.2"	145	106
283A	WTMM-FM, Mechanicville, NY License BLH-19930107KA	N 42º 52' 44.3" W 73º 51' 45.4"	191	106
283B	WXLO(FM), Fitchburg, MA License BMLH-19910920KB	N 42º 30' 27.3" W 71º 49' 35.2"	227	169
284LP1	WKGT-LP, North Adams, MA License BLL-20150723ACD	N 42º 41' 53.3" W 73º 07' 45.4"	193	-----
284A	WHTP-FM, Kennebunkport, ME License BLH-19950607KB	N 43º 24' 16.3" W 70º 26' 13.1"	223	166
285LP1	WBLN-LP, Glens Falls, NY License BLL-20050502ABV	N 43º 18' 34.3" W 73º 38' 39.4"	140	-----
285A	WLKZ(FM), Wolfeboro, NH License BLH-20190531AAC	N 43º 32' 45.6" W 71º 22' 41.1"	152	106
285A	WYRY(FM), Hinsdale, NH License BLH-20010402AAV	N 42º 46' 33.3" W 72º 27' 15.3"	185	106

ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)

TABLE A (cont'd.)

Distance Separations from
WNCS(FM) Proposed Site to
FM Stations in the United States

Channel and Class	Station and Location, Status, File Number	Geographical Coordinates	Distance from Reference (kilometers)	Required Separation (kilometers)
285A	WINU(FM), Altamont, NY License BLH-20020625AAM	N 42º 38' 11.3" W 74º 00' 00.5"	220	106
285LP1	WREA-LP, Holyoke, MA License BLL-20051207ADP	N 42º 11' 15.3" W 72º 38' 28.3"	248	-----
285A	WBOQ(FM), Gloucester, MA License BLH-20130130ACE	N 42º 38' 22.3" W 70º 56' 20.2"	250	106
285D	WRBB(FM), Boston, MA License BLED-19831213AB	N 42º 20' 19.3" W 71º 05' 26.1"	271	-----
286C3	WKOL(FM), Plattsburgh, NY License BLH-19940919KB	N 44º 31' 31.1" W 73º 31' 05.4"	56	56
287C2	WJEN(FM), Killington, VT License BLH-19940829KC	N 43º 38' 22.2" W 72º 50' 10.3"	87	58

ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)

TABLE B

WNCS(FM) Facilities
and Canadian FM Facilities

	Channel and Class	Station and Location, Status	Geographical Coordinates	Facilities		Limitations
				Effective Radiated Power and Antenna	Antenna Height Above Average Terrain (meters)	
U.S. Station	284C2 *	Proposed WNCS(FM), Montpelier, VT	N 44° 25' 12.6" W 72° 49' 40.0"	1.65 kW Nondirectional	636	
	284C2 *	WNCS(FM), Montpelier, VT License BLH-19991001AAD	N 44° 25' 14.1" W 72° 49' 40.4"	1.9 kW Directional	634	
Canadian FM Facilities	283C1	Sherbrooke, QC Allotment	N 45° 22' 25.0" W 71° 54' 54.0"	-----	----	Limited to 3.2 kW ERP and 176.5 m HAAT toward WNCS(FM)
	284C1	Gatineau, QC Allotment	N 45° 30' 57.1" W 75° 39' 27.9"	-----	----	Limited to 52.7 kW ERP and 300 m HAAT toward WNCS(FM)
	284A1	Montreal, QC Allotment	N 45° 27' 49.0" W 73° 37' 48.0"	-----	----	Specially negotiated short-spaced allotment; not limited
	285B	CFXM, Granby, QC Operating	N 45° 28' 19.0" W 72° 51' 36.0"	-----	----	Limited to 1.1 kW ERP and 314.1 m HAAT toward WNCS(FM)
	285A1	St. Remi, QC Allotment	N 45° 15' 28.0" W 73° 37' 28.0"	-----	----	Specially negotiated short-spaced allotment; not limited

* Considered Class B under Canada-U.S. allocation standards.

ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)

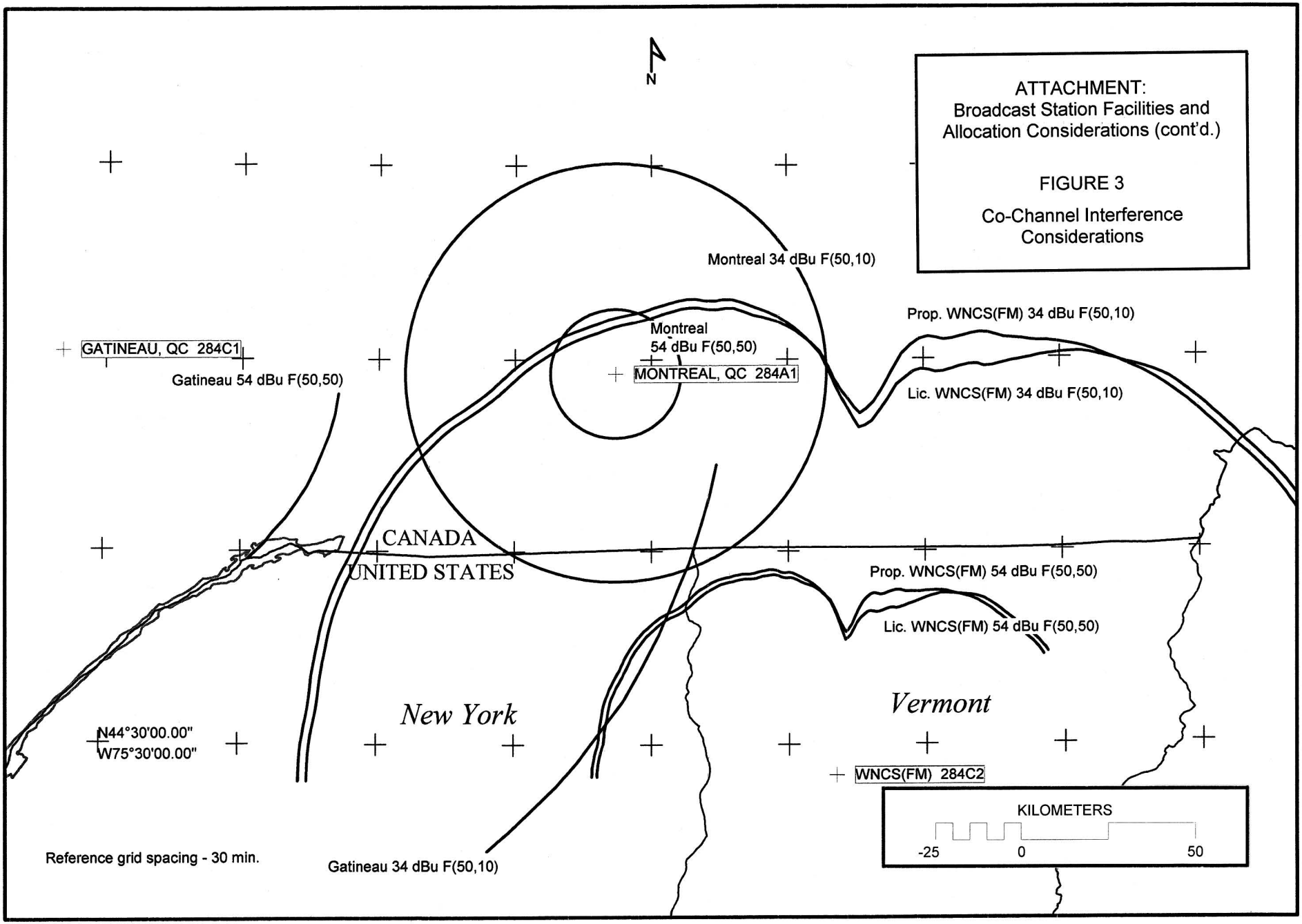
TABLE C

Distance Separations from WNCS(FM)
Reference Point to Short-Spaced
Canadian FM Stations and Allotments

Geographical coordinates of proposed WNCS(FM) reference point:

North Latitude 44º 25' 12.6"
West Longitude 72º 49' 40.0"

Channel and Class	Station and Location, Status, File Number	Geographical Coordinates	Distance from Reference (kilometers)	Required Separation (kilometers)
283C1	Sherbrooke, QC Allotment	N 45º 22' 25.0" W 71º 54' 54.0"	128	195
284C1	Gatineau, QC Allotment	N 45º 30' 57.1" W 75º 39'27.9 "	254	271
284A1	Montreal, QC Allotment	N 45º 27' 49.0" W 73º 37' 48.0"	132	190
285B	CFXM, Granby, QC Operating	N 45º 28' 19.0" W 72º 51' 36.0"	117	164
285A1	St. Remi, QC Allotment	N 45º 15' 28.0" W 73º 37' 28.0"	112	117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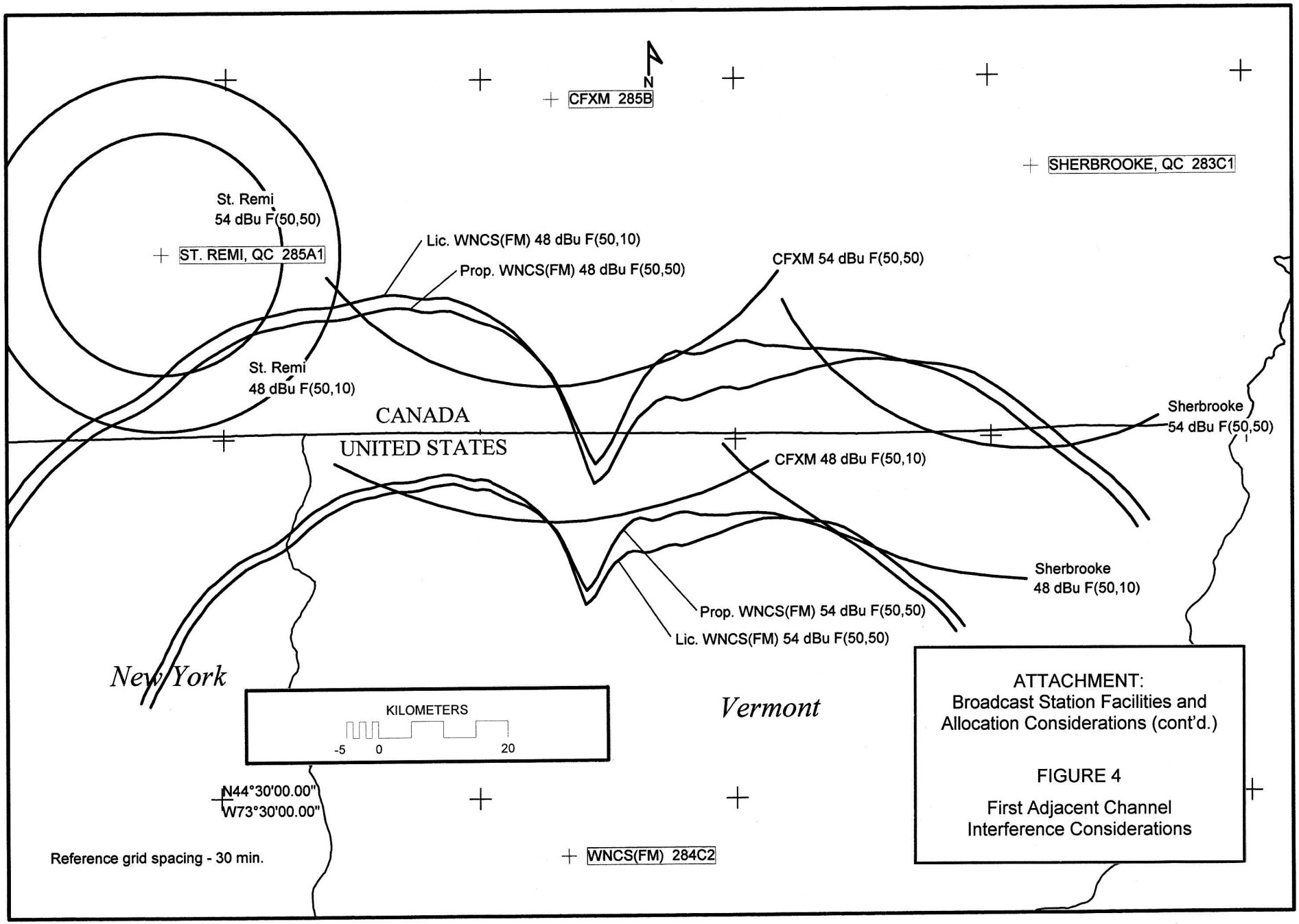
ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)
FIGURE 3
Co-Channel Interference
Considerations
Montreal 34 dBu F(50,10)
Prop. WNCS(FM) 34 dBu F(50,10)
Montreal
54 dBu F(50,50)
GATINEAU, QC 284C1
MONTREAL, QC 284A1
Gatineau 54 dBu F(50,50)
Lic. WNCS(FM) 34 dBu F(50,10)
CANADA
UNITED STATES
Prop. WNCS(FM) 54 dBu F(50,50)
Lic. WNCS(FM) 54 dBu F(50,50)
New York
Vermont
N44°30'00.00"
W75°30'00.00"
WNCS(FM) 284C2
KILOMETERS
-25
0
50
Reference grid spacing - 30 min.
Gatineau 34 dBu F(50,10)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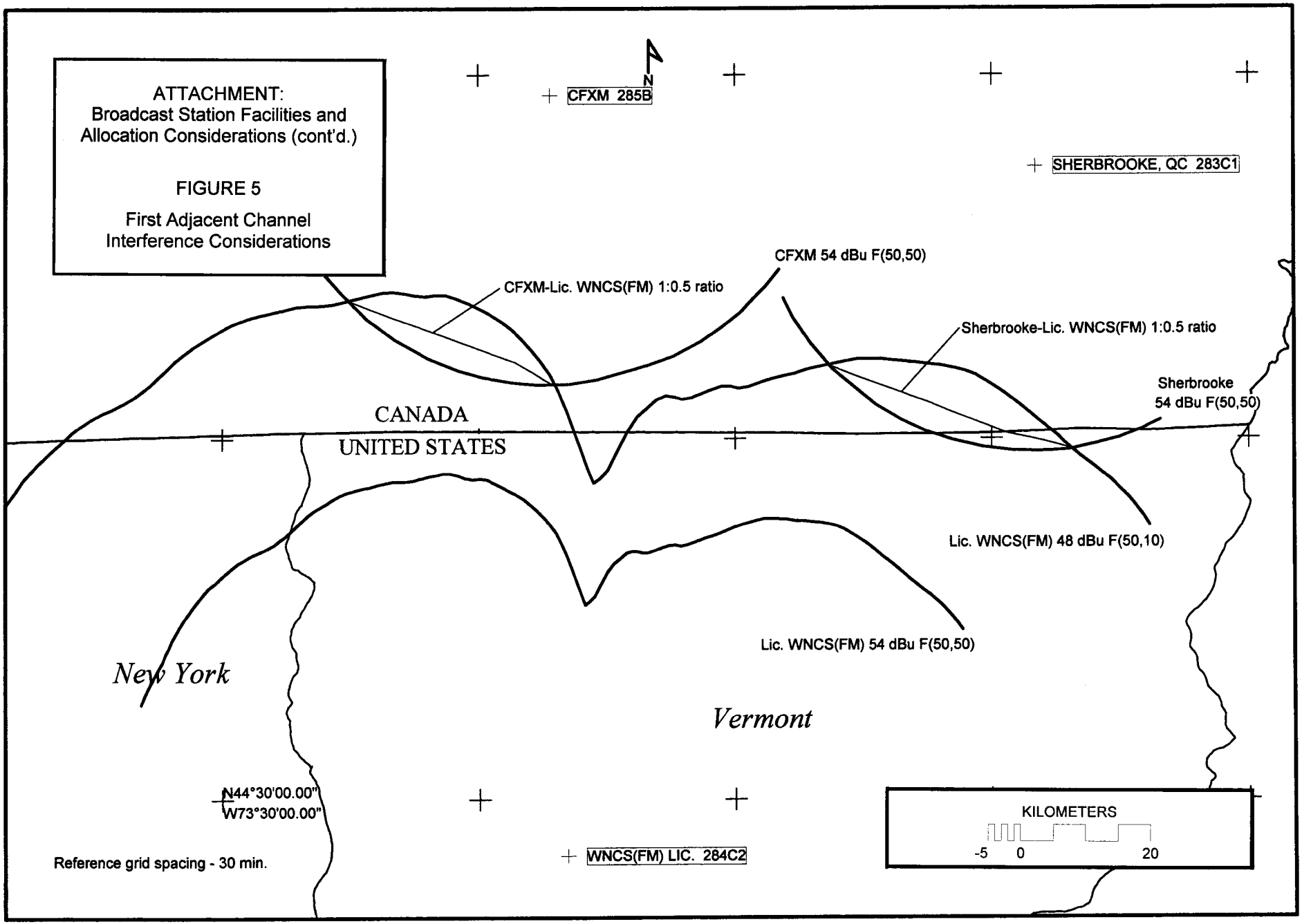
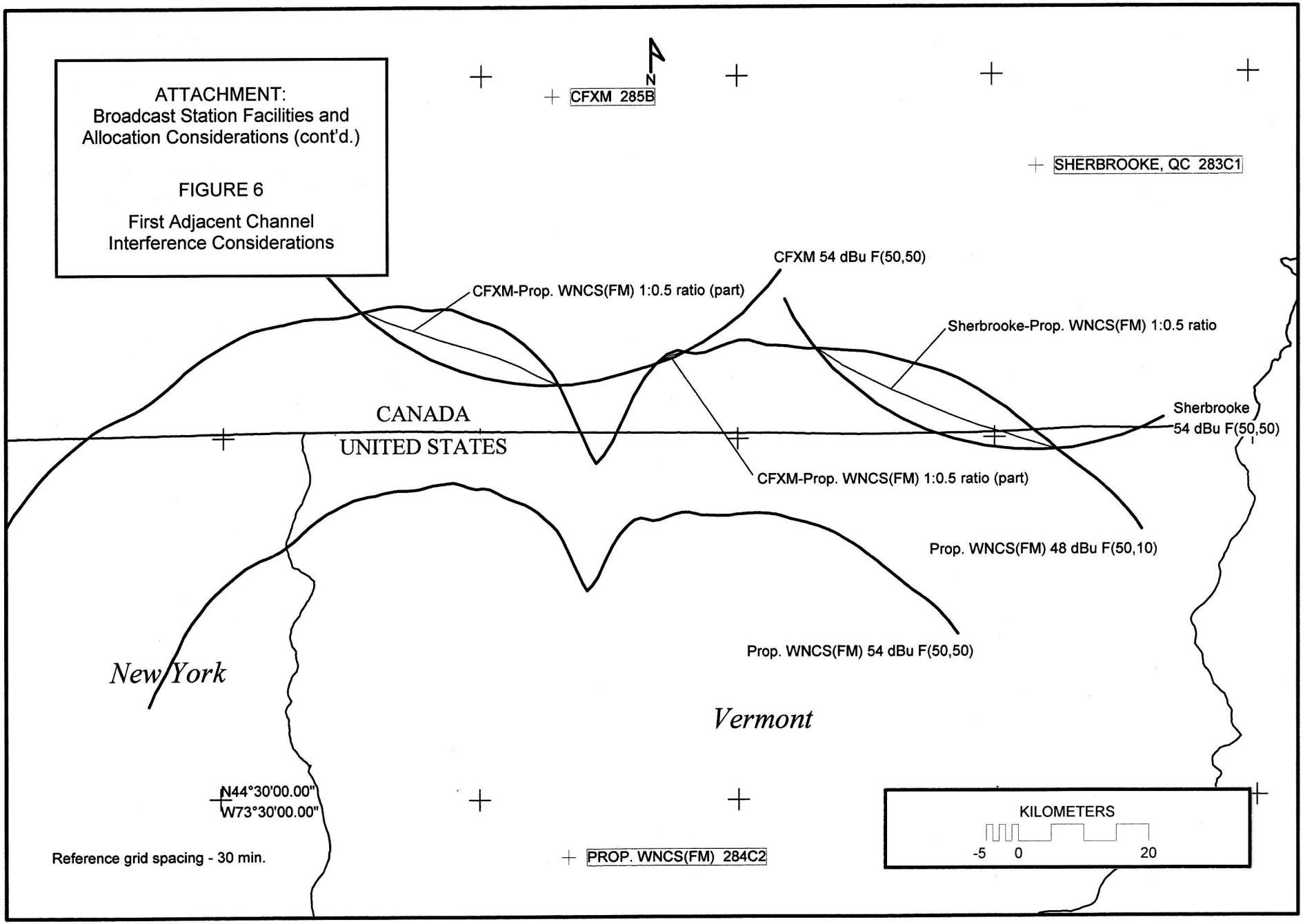
CFXM 285B
SHERBROOKE, QC 283C1
St. Remi
54 dBu F(50,50)
ST. REMI, QC 285A1
Lic. WNCS(FM) 48 dBu F(50,10)
Prop. WNCS(FM) 48 dBu F(50,50)
CFXM 54 dBu F(50,50)
St. Remi
48 dBu F(50,10)
CANADA
UNITED STATES
Sherbrooke
54 dBu F(50,50)
CFXM 48 dBu F(50,10)
Sherbrooke
48 dBu F(50,10)
Prop. WNCS(FM) 54 dBu F(50,50)
Lic. WNCS(FM) 54 dBu F(50,50)
New York
Vermont
KILOMETERS
-5
0
20
N44°30'00.00"
W73°30'00.00"
Reference grid spacing - 30 min.
WNCS(FM) 284C2
ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)
FIGURE 4
First Adjacent Channel
Interference Considerations


ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)
FIGURE 5
First Adjacent Channel
Interference Considerations
N
CFXM 285B
SHERBROOKE, QC 283C1
CFXM 54 dBu F(50,50)
CFXM-Lic. WNCS(FM) 1:0.5 ratio
Sherbrooke-Lic. WNCS(FM) 1:0.5 ratio
Sherbrooke
54 dBu F(50,50)
CANADA
UNITED STATES
Lic. WNCS(FM) 48 dBu F(50,10)
Lic. WNCS(FM) 54 dBu F(50,50)
New York
Vermont
N44°30'00.00"
W73°30'00.00"
WNCS(FM) LIC. 284C2
KILOMETERS
-5 0 20
Reference grid spacing - 30 min.


ATTACHMENT:
Broadcast Station Facilities and
Allocation Considerations (cont'd.)
FIGURE 6
First Adjacent Channel
Interference Considerations
N
CFXM 285B
SHERBROOKE, QC 283C1
CFXM 54 dBu F(50,50)
CFXM-Prop. WNCS(FM) 1:0.5 ratio (part)
Sherbrooke-Prop. WNCS(FM) 1:0.5 ratio
CANADA
UNITED STATES
Sherbrooke
54 dBu F(50,50)
CFXM-Prop. WNCS(FM) 1:0.5 ratio (part)
Prop. WNCS(FM) 48 dBu F(50,10)
Prop. WNCS(FM) 54 dBu F(50,50)
New York
Vermont
N44°30'00.00"
W73°30'00.00"
Reference grid spacing - 30 min.
PROP. WNCS(FM) 284C2
KILOMETERS
-5
0
20