

Comprehensive Technical Exhibit
Application for Construction Permit
W217BM - Chicago, Illinois
Chicago Public Media Inc.
April, 2012

Application for Construction Permit

The following engineering statement and attached exhibits have been prepared for **Chicago Public Media, Inc.** ("Chicago"), licensee of FM translator station W217BM at Elgin, Illinois, and are in support of their application for construction permit to modify that facility.¹

Under this application, Chicago seeks to relocate the translator from the currently licensed location near Elgin, Illinois to downtown Chicago, Illinois. As part of the relocation of the translator, Chicago is also seeking a change in the community of license from Elgin, Illinois to Chicago, Illinois. Following this relocation, W217BM would serve as a fill-in translator for non-commercial educational FM station WBEZ at Chicago, Illinois.²

Upon relocation, the proposed facility would operate with an effective radiated power of 99 Watts from a center of radiation of 377 meters above ground level. The proposed tower of operation, the west tower at the John Hancock Center, bears antenna structure registration number 1009013. Based on the listed site elevation, the center of radiation for the antenna would be 558 meters above mean sea level. Exhibit E-1 illustrates the resulting 60 dBu service contour from this set of parameters, and demonstrates that the translator contour would be wholly contained within the 60 dBu service contour of WBEZ.

The proposed facility would comply with the provisions of Section 74.1204 of the Commission's Rules. Exhibit E-2 is a tabular allocation study for the proposed facility, and demonstrates that the proposed facility would not have prohibited contour overlap with any facility

¹ The Facility ID for W217BM at Elgin, Illinois is 91647.

² The Facility ID for WBEZ at Chicago, Illinois is 66649.

except the primary facility WBEZ. This allocation study is graphically illustrated by the contour map in Exhibit E-3.

Although the proposed facility would have normally prohibited contour overlap with co-located station WBEZ, no interference would be caused to that facility. The lack of interference is the result of the disparity between the effective radiated power values of both facilities. The ERP of WBEZ is 17.6 dB above the proposed translator ERP. Since the translator field strength will never be exceed the U/D ratio necessary to cause interference to WBEZ, there would be no interference to that facility.

Exhibit E-4 is a single channel spacing study for the proposed facility. This study demonstrates that there are no broadcast television channel six facilities within the affected distance described in Section 73.1205 of the Commission's Rules. The proposed facility would be co-located with low power channel six facility WLFM-LP.³ Due to the difference in the effective radiated power of the two facilities and the high channel of operation, the proposed translator would not cause interference to the existing television channel six LPTV facility.

Chicago respectfully requests a waiver of the provisions of Section 74.1233(a) of the Commission's Rules in order to make the proposed relocation of W217BM. Exhibit E-5 illustrates the predicted 60 dBu service contour of the licensed W217BM facility as well as the predicted 60 dBu service contour from the proposed facility.

Although the proposed 60 dBu service contour does not overlap the licensed 60 dBu service contour, the proposed and licensed facilities would be mutually exclusive with each other. Exhibit

³ The Facility ID for WLFM-LP at Chicago, IL is 128239.

E-6 demonstrates that the predicted 40 dBu F(50,10) contour from the proposed facility would encompass nearly half of the licensed 60 dBu F(50,50) service contour.

In addition, the proposed relocation of W217BM would not preclude existing opportunities for LPFM facilities within the Chicago metropolitan area. W217BM would continue to operate on channel 217, which is on a first adjacent channel to the primary station, WBEZ. Channel 217 has already been precluded from being used for LPFM facilities in the vast majority of the Chicago metro area due not only to the licensed presence of W217BM at Elgin, but more importantly due to the existence of WBEZ on channel 218.

Finally it should be noted that Chicago, and its associated entities, do not have a history of filing serial translator modifications. In fact, W217BM currently operates from the initial facilities authorized, as modified.

The relocation of the translator would serve the public interest in several fashions. First, the proposed relocation in one hop would not constitute an abuse of process nor would it unduly burden the limited resources available to the Staff. Second, the relocation of the translator would provide fill-in service for the primary station WBEZ, which has been broadcasting multiple program streams due to its use of IBOC digital technology. This fill-in service will allow the more than 3,000,000 residents within the 60 dBu contour to receive an additional non-commercial educational program stream that many are not currently able to receive due to limited availability of IBOC receivers.⁴ Finally, the relocation of the translator may have the effect of making available scarce spectrum in the northwest suburbs of Chicago for future LPFM opportunities. For these reasons, it is respectfully submitted that the proposed relocation would serve the public interest.

⁴ The current W217BM 60 dBu contour has a resident population of just under 87,000 persons.

The proposed facility is exempt from environmental processing, and its construction would not have a substantive environmental impact. The proposed facility would utilize the existing John Hancock Center antenna complex in downtown Chicago. The proposed antenna is an existing antenna located on the West Tower of the building. No excavation would be required for the construction of the facility.

As indicated on the form pages, the proposed antenna for use is a single bay ERI SHPX-1AC. This is an antenna with a roto-tiller type design. Using the equations in Appendix A of OET Bulletin 65, the minimum safe distance to the antenna for the uncontrolled environment condition can be solved. The solution is as follows:

$$S = \frac{33.4(E^2)(ERP_h + ERP_v)}{r^2}$$

In this equation, the "E" term represents the relative field of the antenna, which will be set to 1.0 for a worst-case scenario. The ERP variables represent the effective radiated power in the horizontal and vertical polarizations. The "r" term in the denominator corresponds to the distance or radius from the antenna source. These terms are then rearranged to solve for r as follows:

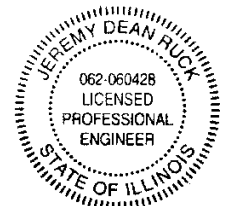
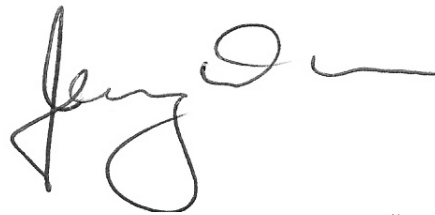
$$r = \sqrt{\frac{33.4(E^2)(ERP_h + ERP_v)}{S}}$$
$$r = \sqrt{\frac{(33.4)(1)(99 + 99)}{200}}$$

The value of 200 for the "S" term is the maximum power density permissible under the uncontrolled environment condition of the applicable safety standard. The expression under the radical reduces to 33.07. The square root of this value is 5.75, which is the minimum permissible

distance from the antenna in meters under the uncontrolled environment condition. This radius, however, would place a person above the roofline of the building, which is a controlled environment area.

Access to the rooftop and antenna structures and any other areas within the building that may exceed exposure limits is strictly controlled by building management. Chicago will continue to participate in the established building RF safety program along with other tenants of the site. The implementation of the program requires tenants to cooperate and coordinate with each other to ensure that workers are not exposed to levels of non-ionizing radiation in excess of the applicable safety standards. Due to the vertical distance, no areas at ground level or accessible by the general public within the building will be exposed to a power density in excess of the upper limits permissible under the uncontrolled environment condition.

The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature
License Expires November 30, 2013

Jeremy D. Ruck, PE
April 25, 2012

WBEZ

BLED20101206AAE
Latitude: 41-53-56 N
Longitude: 087-37-23 W
ERP: 5.70 kW
Channel: 218
Frequency: 91.5 MHz
AMSL Height: 605.7 m
Elevation: 180.7 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

W217BM.X

PROPOSED
Latitude: 41-53-56 N
Longitude: 087-37-23 W
ERP: 0.099 kW
Channel: 217
Frequency: 91.3 MHz
AMSL Height: 557.6 m
Elevation: 177.215 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

D.L. Markley & Associates, Inc.

- WBEZ 60 dBu Service Contour
- Proposed W217BM 60 dBu Service Contour

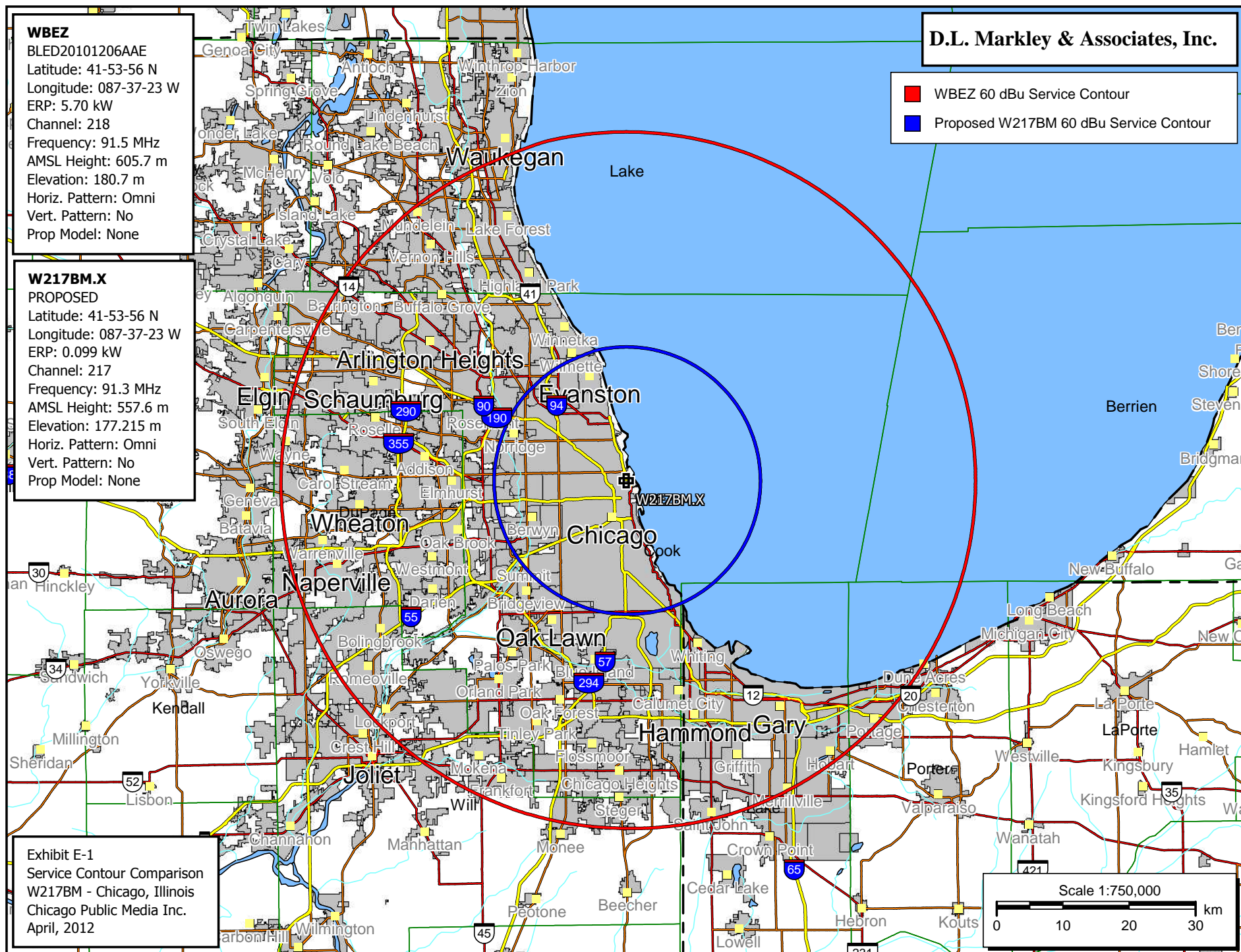


Exhibit E-1
Service Contour Comparison
W217BM - Chicago, Illinois
Chicago Public Media Inc.
April, 2012

D.L. Markley & Associates, Inc.
Consulting Engineers

Exhibit E-2 - Tabular Allocation Study
W217BM - Chicago, Illinois
CH# 217D - 91.3 MHz, Pwr= 0.099 kW, HAAT= 378.7 M, COR= 557.6 M
Average Protected F(50-50)= 20.1 km
Omni-directional

REFERENCE
41 53 56.0 N.
87 37 23.0 W.

DISPLAY DATES
DATA 04-23-12
SEARCH 04-24-12

CH CITY	CALL	TYPE STATE	ANT AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
218B Chicago	WBEZ	LIC _CX IL	0.0 0.0	0.00 BLED20101206AAE	41 53 56.0 87 37 23.0	5.700 425	78.8 606	52.5 Chicago	-98.9*	-82.7*
06 D Chicago	1441857	AP D_N IL	0.0 0.0	0.00 BDCCDVL20080917ABX	41 53 56.0 87 37 23.0	3.000 387	7.4 566	27.2 Wlfm, LLC	34.6R	-34.6M
06-T Chicago	WLFM-LP	LI D_N IL	0.0 0.0	0.00 BLTVL20100111AIE	41 53 56.0 87 37 23.0	3.000 387	8.1 566	18.9 Wlfm, LLC	27.1R	-27.1M
217D Elgin	W217BM	LIC _C_ IL	282.4 101.9	64.29 BLFT20061222ABT	42 01 12.0 88 22 53.0	0.010 152	26.4 417	7.8 Chicago	18.0	-7.1
217B La Salle	WNIW	LIC DVN IL	249.1 68.0	147.89 BLED19981229KA	41 24 47.0 89 16 34.0	36.000 101	122.0 304	41.4 Northern Illinois	5.8	42.6
215A Glen Ellyn	WDCB	LIC _CN IL	260.9 80.6	38.70 BMLED19840113AF	41 50 36.0 88 05 00.0	5.000 91	2.7 314	27.6 College Of Du Page,	16.0	10.4
217A Wonder Lake	WTZY	CP DCX IL	314.7 134.2	91.72 BNPED20071017AGA	42 28 33.0 88 25 03.0	4.000 60	46.1 335	13.2 Calvary Radio Network,	25.6	14.7
216A Valparaiso	980512MP	APP _CX IN	129.9 310.3	65.01 BNPED19980512MP	41 31 22.0 87 01 28.0	0.230 125	23.5 345	15.6 Csn International	21.4	19.3
216A South Haven	980512MV	APP _CN IN	129.5 309.9	65.34 BNPED19980512MV	41 31 25.0 87 01 06.0	0.150 135	21.6 355	14.3 The Wbez Alliance Inc	23.6	20.8
216A Valparaiso	971112MA	APP _CN IN	129.5 309.9	65.34 BNPED19971112MA	41 31 25.0 87 01 06.0	0.150 134	21.6 355	14.3 American Family Associatio	23.6	20.8
220B Joliet	WJCH	LIC _CX IL	225.3 44.9	76.19 BMLED20081124ABB	41 24 55.0 88 16 19.0	50.000 151	6.0 319	52.3 Family Stations, Inc.	50.1	23.2
216A Kenosha	WGTD	LIC DCX WI	346.8 166.7	81.03 BLED20080411AEC	42 36 32.0 87 50 56.0	3.200 62	34.3 279	22.9 Gateway Technical College	26.5	28.0
217B1 Milford	WJCZ	LIC DCX IL	191.1 10.9	148.64 BLED20050127AFE	40 35 07.0 87 57 47.0	25.000 27	100.7 234	23.8 Calvary Radio Network, Inc	27.8	60.6
216D Valparaiso	W216AC	LIC _HN IN	135.5 315.9	65.50 BLFT19870327TK	41 28 40.0 87 04 20.0	0.001 31	3.3 251	2.4 Von Tobel Foundation, Inc.	42.1	33.0
217B Grand Rapids	WCSG	LIC DCN MI	57.7 239.1	190.73 BLED19910801KA	42 47 46.0 85 38 58.0	37.000 174	135.9 400	53.6 Cornerstone University	34.7	72.9
216A Kankakee	WKCC	LIC _CX IL	194.4 14.2	84.62 BLED20080324AAC	41 09 38.9 87 52 29.8	2.600 77	28.4 271	19.4 Kankakee Community College	36.1	35.1
219D Elgin	W219CD	LIC _C_ IL	282.3 101.8	64.28 BLFT20040324AAQ	42 01 11.0 88 22 53.0	0.010 145	0.2 403	7.5 Lifetalk Radio, Inc.	44.1	56.1
217B Milford	WJCZ	CP DCX IL	191.1 10.9	148.64 BPED20101130AHB	40 35 07.0 87 57 47.0	33.000 139	82.1 347	28.0 Calvary Radio Network, Inc	46.4	56.5
06 D Dixon	1330618	AP _N IL	275.3 94.2	131.45 BNPDVL20090825BOQ	41 59 46.0 89 12 11.0	0.300 241	7.3 453	38.7 Km Communications, Inc.	46.0R	85.4M

Terrain database is 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 protected contour.

PROPOSED
Latitude: 41-53-56 N
Longitude: 087-37-23 W
ERP: 0.099 kW
Channel: 217
Frequency: 91.3 MHz
AMSL Height: 557.6 m
Elevation: 177.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None





-  60 dBu F(50,50) Service Contour
-  40 dBu F(50,10) Interference Contour
-  54 dBu F(50,10) Interference Contour
-  100 dBu F(50,10) Interference Contour

Exhibit E-3
Contour Allocation Study
W217BM - Chicago, Illinois
Chicago Public Media Inc.
April, 2012

Scale 1:1,500,000

D.L. Markley & Associates, Inc.
Consulting Engineers
Exhibit E-4 - Single Channel Spacing Study
W217BM - Chicago, Illinois

REFERENCE		DISPLAY DATES
41 53 56.0 N.	CLASS = D Int = D	DATA 04-23-12
87 37 23.0 W.	Current Spacings to 3rd Adj.	SEARCH 04-24-12
----- Channel 217 - 91.3 MHz -----		

Call	Channel	Location	Azi	Dist	FCC	Margin
1441857	AP -D 06 D	Chicago	IL 0.0	0.00	132.5	-132.5
WLFM-LP	LI -D 06-T	Chicago	IL 0.0	0.00	132.5	-132.5
WBEZ	LIC 218B	Chicago	IL 0.0	0.00	61.5	-61.5
1330618	AP 06 D	Dixon	IL 275.3	131.45	132.5	-1.1
W217BM	LIC 217D	Elgin	IL 282.4	64.29	64.5	-0.21
WTZY	CP -D 217A	Wonder Lake	IL 314.7	91.72	84.5	7.2
WDCB	LIC 215A	Glen Ellyn	IL 260.9	38.70	25.5	13.2
WJCH	LIC 220B	Joliet	IL 225.3	76.19	53.5	22.7
980512MP	APP 216A	Valparaiso	IN 129.9	65.01	33.5	31.5
971112MA	APP 216A	Valparaiso	IN 129.5	65.34	33.5	31.8
980512MV	APP 216A	South Haven	IN 129.5	65.34	33.5	31.8
WNIW	LIC-D 217B	La Salle	IL 249.1	147.89	111.5	36.4
WJCZ	CP -D 217B	Milford	IL 191.1	148.64	111.5	37.1
WGTD	LIC-D 216A	Kenosha	WI 346.8	81.03	33.5	47.5

All margins are shown with rounding included

W217BM

BLFT20061222ABT
Latitude: 42-01-12 N
Longitude: 088-22-53 W
ERP: 0.01 kW
Channel: 217
Frequency: 91.3 MHz
AMSL Height: 417.0 m
Elevation: 272.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

W217BM.X

PROPOSED
Latitude: 41-53-56 N
Longitude: 087-37-23 W
ERP: 0.099 kW
Channel: 217
Frequency: 91.3 MHz
AMSL Height: 557.6 m
Elevation: 177.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

Exhibit E-5

60 dBu Service Contour Comparison
W217BM - Chicago, Illinois
Chicago Public Media
April, 2012

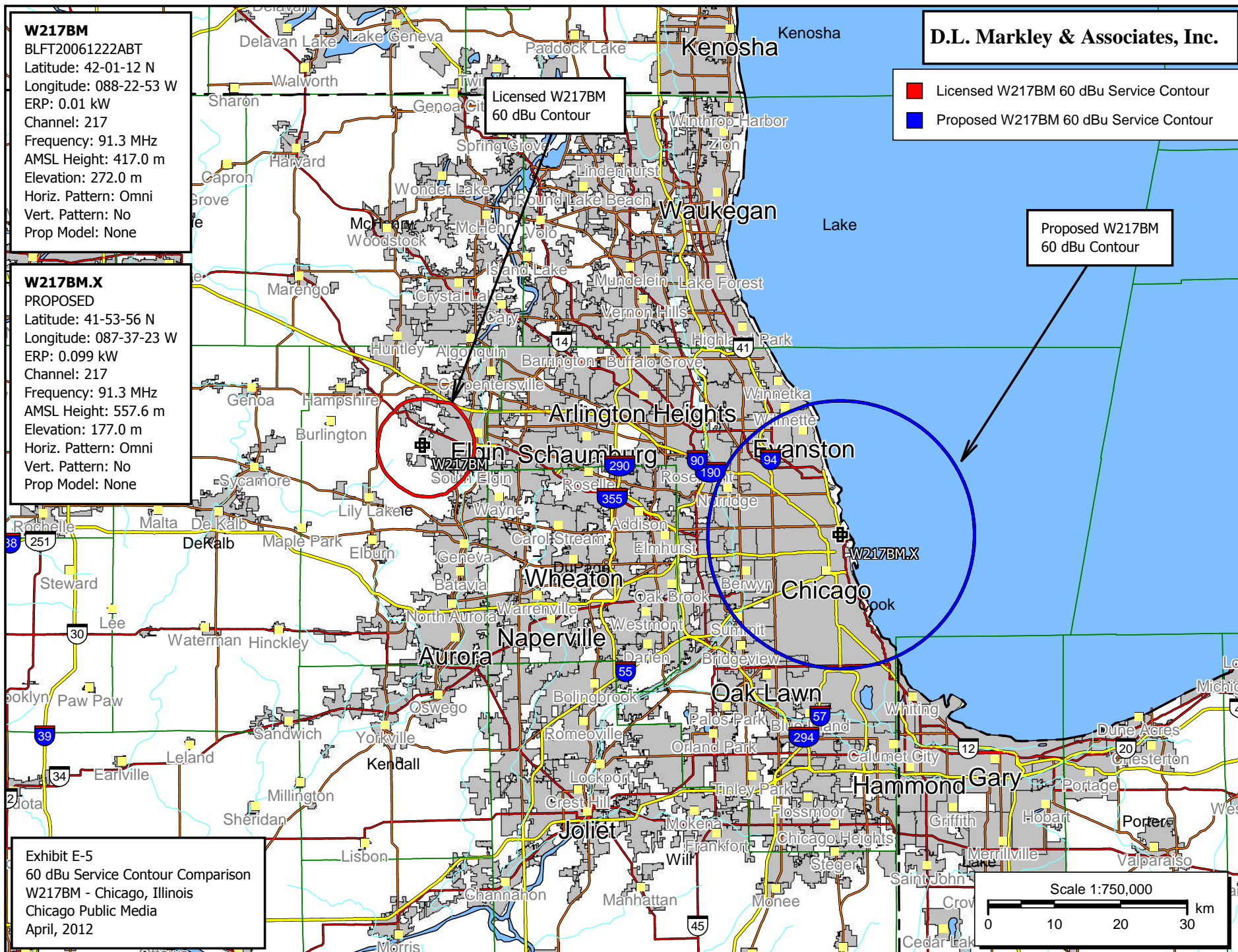
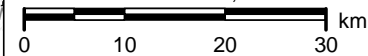
Licensed W217BM
60 dBu Contour

D.L. Markley & Associates, Inc.

- Licensed W217BM 60 dBu Service Contour
- Proposed W217BM 60 dBu Service Contour

Proposed W217BM
60 dBu Contour

Scale 1:750,000



W217BM

BLFT20061222ABT
Latitude: 42-01-12 N
Longitude: 088-22-53 W
ERP: 0.01 kW
Channel: 217
Frequency: 91.3 MHz
AMSL Height: 417.0 m
Elevation: 272.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

W217BM.X

PROPOSED
Latitude: 41-53-56 N
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Channel: 217
Frequency: 91.3 MHz
AMSL Height: 557.6 m
Elevation: 177.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

D.L. Markley & Associates, Inc.

- 60 dBu F(50,50) Service Contour
- 40 dBu F(50,10) Interference Contour
- Contour Overlap Creating Mutual Exclusivity

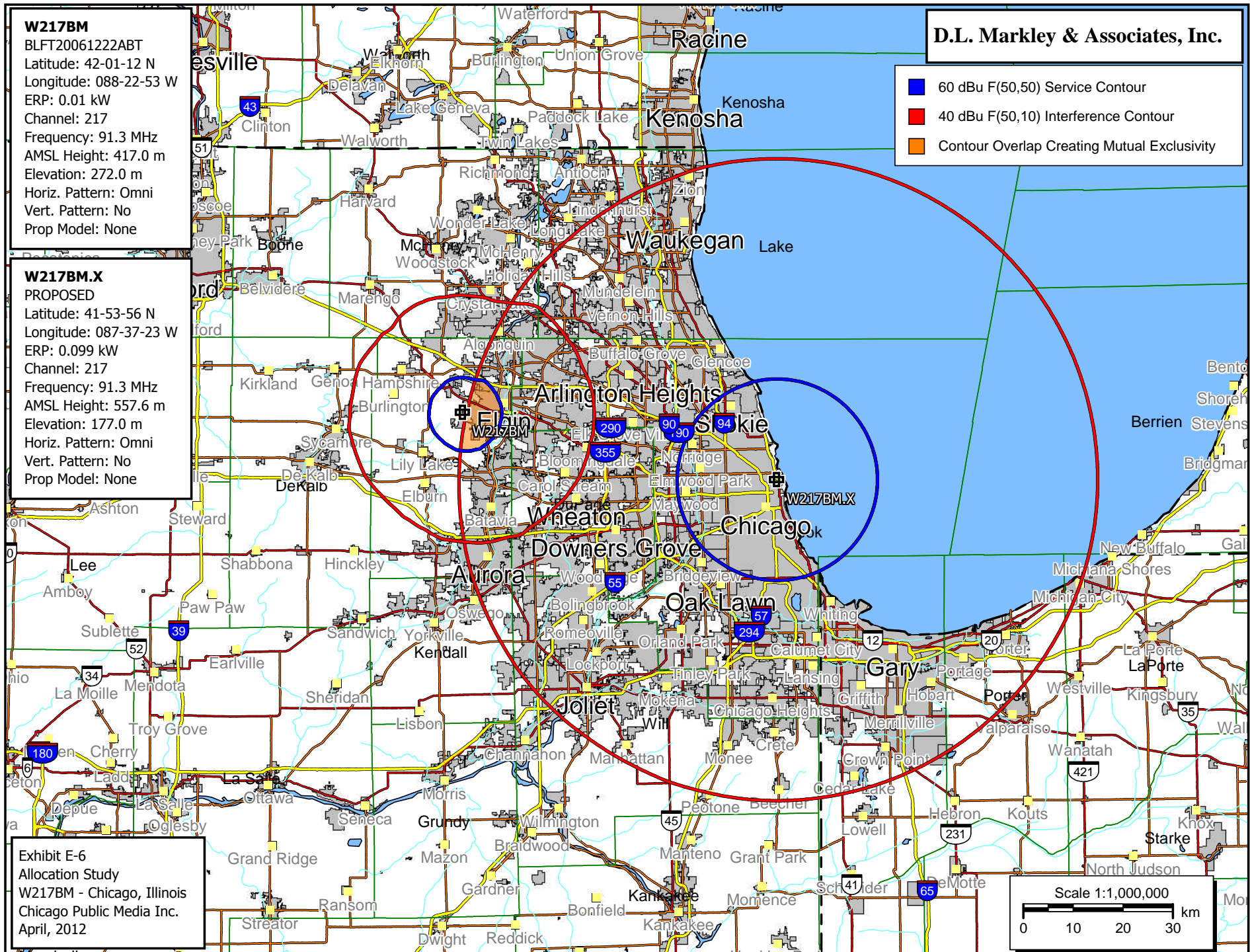


Exhibit E-6

Allocation Study

W217BM - Chicago, Illinois
Chicago Public Media Inc.
April, 2012