

**APPLICATION FOR CONSTRUCTION PERMIT**  
**WHRB, Facility ID 26341, Cambridge, MA**  
**CH 237A 1.45 kW 185 M**

**Engineering Statement**

**Contingent application**

This minor modification application by Harvard Radio Broadcasting Company, Inc. ("Harvard"), licensee of WHRB, Cambridge, Mass. (channel 237A), Facility ID 26341, is being filed concurrently with a contingent minor modification application by Capstar Tx, LLC, licensee of WSKX, York Center, Maine (ch. 237A), Facility ID 35218. The parties have developed a plan for mutual improvement of their stations, based on concurrent changes. The applications are related in that grant of each is necessary to permit grant of the other. Per section 73.3517(e), a copy of an agreement between the parties for coordinated facility modification is included in each application. The agreement (please see *Agreement for Mutual Improvement in FM Transmitting Facilities*) gives additional details on the nature of the two applications' interrelatedness.

**Contour protection**

Conditional upon grant of both applications, provisions of a consent agreement contracted in January 1990 between Harvard and a previous licensee of WSKX are to be nullified, which required WHRB to use a directional antenna and greatly attenuate its signal toward the WSKX service area. WSKX is currently a contour protection station relative to hypothetical facilities of WHRB. Each station is electing section 73.215 status relative to the other station's actual new facilities, as proposed. The stations jointly propose contours adjusted to avoid any prohibited overlap. Processing under section 73.215 is hereby requested for WHRB relative to WSKX. Site to site spacing is 101 km. This exceeds the 92 km minimum required per section 73.215(e), and thus this proposal is permitted under the rules.

**Radio station WHRB(FM)  
Cambridge, Massachusetts  
June 2011**

**Broadcast Signal Lab, LLC  
Cambridge, Massachusetts**

### **General plan**

As a condition of the 1990 contract, which permitted a mutual power increase, Harvard agreed to suppress its signal toward WCQL-FM (the call sign of WSKX at that time), with the intent of providing enhanced interference protection, though no such overprotection was required by FCC rules. With the consent of Capstar Tx, LLC and the technical support of Clear Channel Communications, Inc., Harvard now proposes to undo the directionalizing involved, and eliminate the severe signal attenuation that such directionalizing produced to the north and northeast. Overall population and area in the WHRB 60 dBu service contour will increase, despite a reduction in ERP to achieve compliance with section 73.215 toward WSKX, and with section 73.213 relative to another station, WBRU. For its part, WSKX seeks to realize a major expansion of its service area and population, particularly to the west and southwest, by altering its directional pattern.

### **Short spacings**

In terms of section 73.207 requirements, WHRB is short-spaced with regard to WSKX, and also to WBRU, Providence, R.I. (ch. 238B) and WXTK, West Yarmouth, Mass. (ch. 236B). WSKX is correcting coordinates, with no effect on site spacing rounded to the nearest kilometer. No other spacing changes are proposed, and both stations will remain at their current sites.

The short spacing with WSKX (then WCQL-FM) came about involuntarily in October 1989 when required spacing was increased from 105 km to 115 km with the advent of increased power limits for qualifying Class A stations, per MM Docket 88-375. WCQL-FM became a 6 kW-equivalent Class A station ("A6") through its

mutual upgrade agreement with WHRB. WHRB became an A6 station through the agreement with WCQL-FM and a parallel mutual upgrade agreement with Brown Broadcasting Service, Inc., licensee of WBRU. When WCQL-FM applied in 1992 to move closer to WHRB, which it did in 1993, its application was ultimately processed and granted under section 73.215 with regard to not increasing overlap with assumed maximum permissible Class A facilities for WHRB.<sup>1</sup>

WXTK became short spaced to WHRB in 1997 when WXTK moved from channel 239B to channel 238B. At that time WXTK engineered its facilities for contour protection relative to WHRB's assumed maximum permissible facilities, and received a grant conditioned on section 73.215. That protection will continue. The grant now sought for WHRB is for sub-maximal facilities, and gives 28 km or more of contour clearance with WXTK. WHRB is not requesting 73.215 status relative to WXTK.

Under section 73.213(a), WHRB and WBRU are a pair of grandfathered, historically short-spaced stations that found themselves short spaced upon the inception of the spacing rules in 1964, and have remained continuously short spaced ever since. The instant proposal does not involve changing the existing spacing.

---

<sup>1</sup>The 1993 modification by WCQL-FM eliminated all overlap of WHRB's maximum permissible 60 dBu protected contour by WCQL-FM's 40 dBu interfering contour, and reduced the overlap of WCQL-FM's 60 dBu protected contour by WHRB's maximum permissible 40 dBu interfering contour. The coordinated plan, of which the instant proposal is part, will permanently eliminate the possibility of the latter overlap, which per our calculations encompasses an area over land of 85.7 square km with a population of 27,785.

**Public interest showing per section 73.213(a)**

An interference analysis for WBRU and WHRB was performed,<sup>2</sup> following the methodology prescribed in section 73.213(a). Map studies are presented in Exhibit B. The results, as tabulated below, show that the total area and population subject to first-adjacent channel interference, caused and received, would be decreased. Net area and population subject to such interference caused by WHRB to WBRU individually would also decrease.

	<u>Area (sq. km)</u>	<u>Population (2000)</u>
Existing interference to WBRU	1,291.43	781,846
Proposed interference to WBRU	1,279.54	779,803
Change in interference to WBRU	( 11.89)	( 2,043)
Existing interference to WHRB	349.24	203,049
Proposed interference to WHRB	343.90	194,025
Change in interference to WHRB	( 5.34)	( 9,024)
Total change	( 17.23)	( 11,067)

---

<sup>2</sup>The commissioned study was performed by Doug Vernier  
Telecommunications Consultants, Cedar Falls, Iowa.

**Radio station WHRB(FM)  
Cambridge, Massachusetts  
June 2011**

**Broadcast Signal Lab, LLC  
Cambridge, Massachusetts**

Per the map studies, new interference to WHRB is predicted to occur in three small areas, one in the western suburbs of Boston (near Wayland, Mass.), one in the southeastern suburbs (near South Weymouth, Mass.), and one to the south (between Sherborn and Stoughton, Mass.) New interference to WBRU is predicted to occur in a thin strip between Holliston and Easton, Mass. We have ascertained that all parts of these four areas are within the predicted 1 mV/m service contours of 19 or more other FM facilities and the predicted 5 mV/m contours of two or more full time AMs.<sup>3</sup> The number of remaining aural services in these areas will therefore greatly exceed the "5 or more" required per section 73.213(a)(2). Per section 73.213(a)(3), a copy of the instant application will be served upon Brown Broadcasting Service, Inc., licensee of WBRU.

#### **Other public interest benefits**

Our calculations show that grant of the instant application will increase 60 dBu population for WHRB from 2,337,784 to 2,416,890, bringing primary service to an additional 79,106 persons (2000 census figures). Similar calculations for WSKX show 60 dBu population increasing from 161,384 to 207,979, a gain of 46,595. In tandem, grant of the two contingent applications as a package will bring service to an aggregated 125,701 additional persons in Massachusetts, New Hampshire and Maine (not counting potential listenership in the extended service areas beyond the stations' 60 dBu contours). As detailed above, it will decrease area and population subject to interference (in Massachusetts), and eliminate additional area and population potentially subject to interference (in Maine and New Hampshire).

---

<sup>3</sup> Detailed listings of remaining aural services can be provided upon request.

**Radio station WHRB(FM)  
Cambridge, Massachusetts  
June 2011**

**Broadcast Signal Lab, LLC  
Cambridge, Massachusetts**

We respectfully represent that a combined grant will therefore serve the public interest.

Due to the existing deep attenuation to the north and northeast, WHRB has had a notably weakened signal in Essex County and portions of northern Middlesex County (both in Massachusetts).<sup>4</sup> It now seeks to expand and enhance its service in those areas in particular.

Also please see accompanying *Supplemental Public Interest Statement* by David R. Elliott, Chairman of Trustees, WHRB.

#### **Exhibits**

- Exhibit A1 is a map study showing the proposed contours for WHRB and WSKX, demonstrating mutual protection. Exhibit A2 is an enlarged (detail) map, for improved visibility of contour clearance. Overlap occurs only offshore.
- Exhibit B consists of the map studies and their contour worksheets for the section 73.213(a) public interest showing.
- Exhibit C is a map showing the licensed and proposed 60 dBu contours for WHRB.
- Exhibit D is a study and statement regarding Radio Frequency Radiation compliance.

---

<sup>4</sup>Please see Exhibit C.

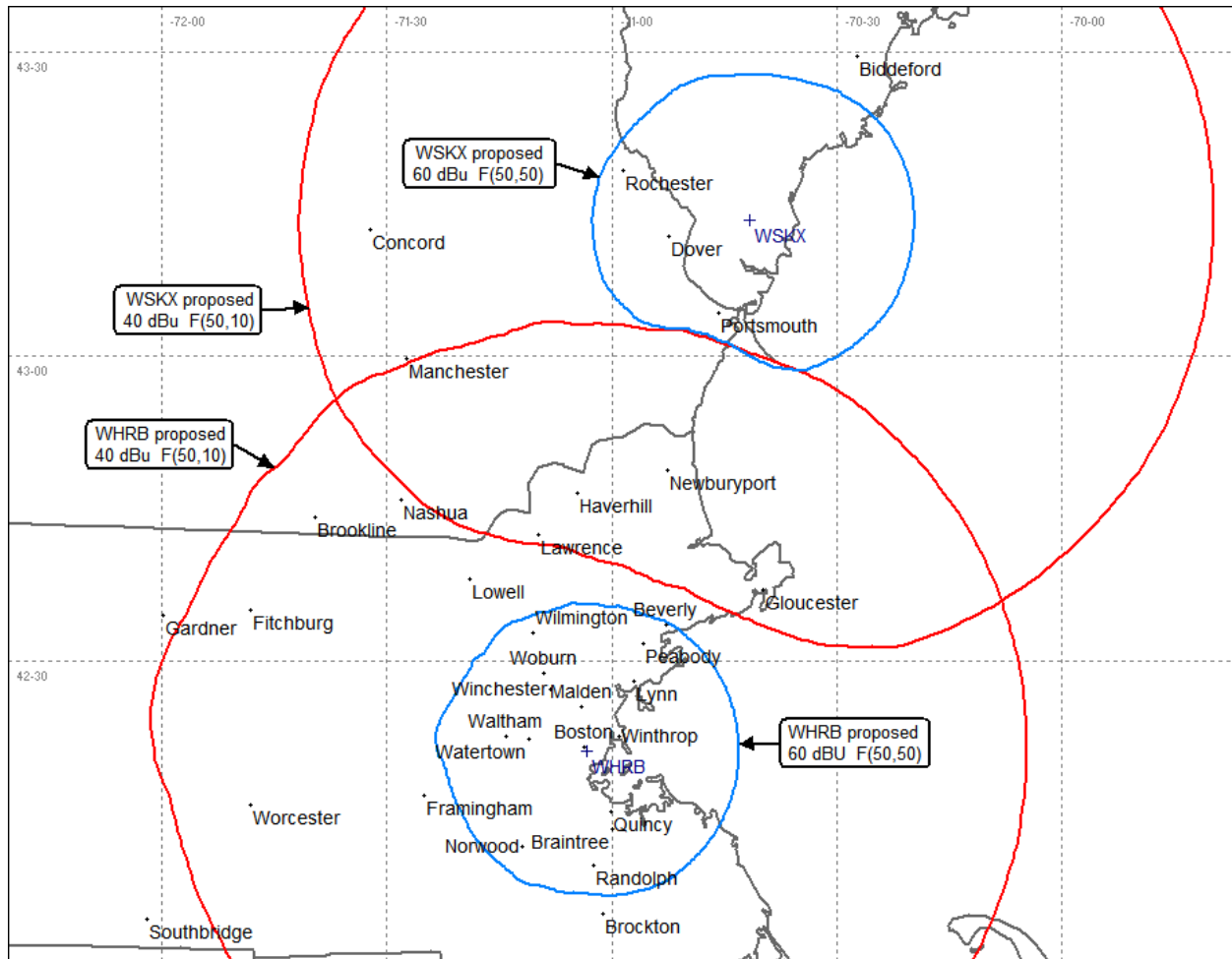
Radio station WHRB(FM)  
Cambridge, Massachusetts  
June 2011

Broadcast Signal Lab, LLC  
Cambridge, Massachusetts

### Summary of requested changes for WHRB

- Contour protection status relative to WSKX
- Change to a nondirectional antenna
- Change ERP
- Change antenna height

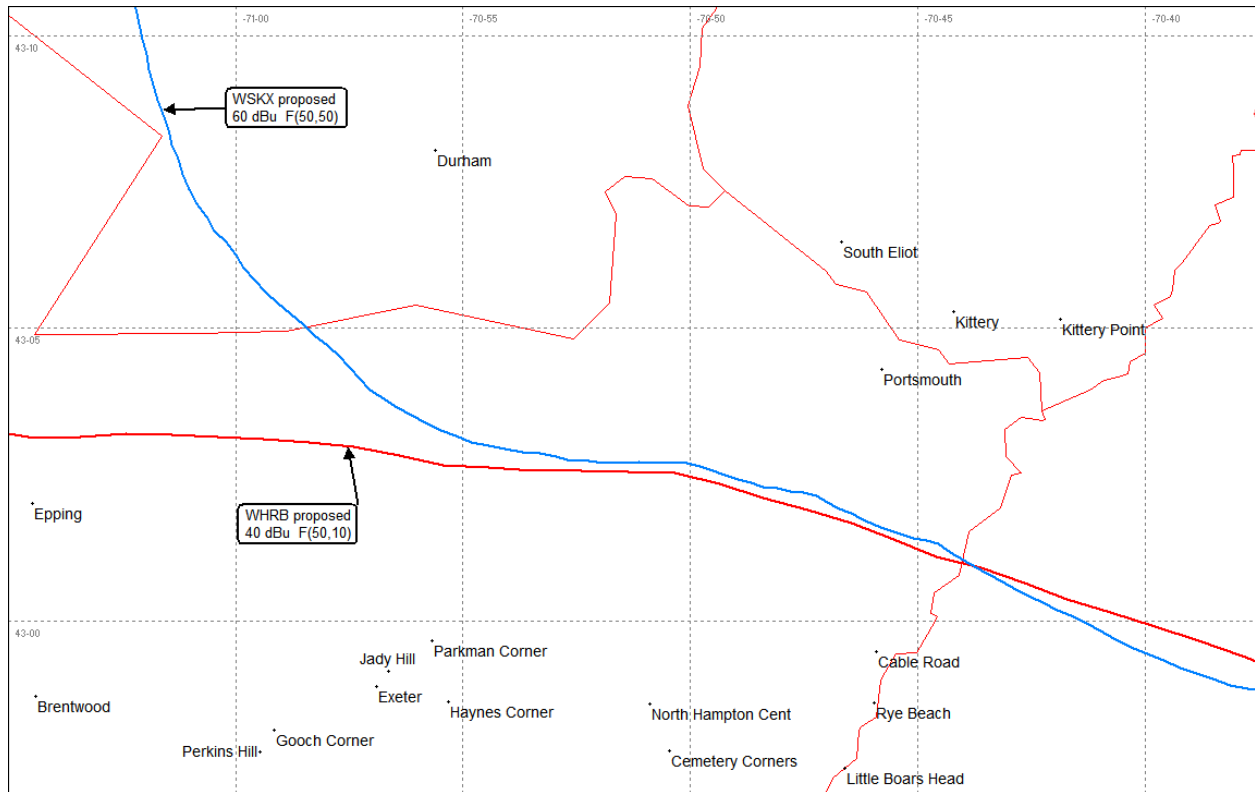
### Exhibit A1



Radio station WHRB(FM)  
Cambridge, Massachusetts  
June 2011

Broadcast Signal Lab, LLC  
Cambridge, Massachusetts

Exhibit A2





## Existing U/D Interference Area to WBRU

### WBRU

BLH19990723KD  
 Latitude: 41-49-40 N  
 Longitude: 071-22-09 W  
 ERP: 18.50 kW  
 Channel: 238  
 Frequency: 95.5 MHz  
 AMSL Height: 170.0 m  
 Elevation: 11.0 m  
 Horiz. Pattern: Omni  
 Vert. Pattern: No  
 Prop Model: FCC

### WHRB

BLH19950830KE  
 Latitude: 42-21-08 N  
 Longitude: 071-03-25 W  
 ERP: 1.70 kW  
 Channel: 237  
 Frequency: 95.3 MHz  
 AMSL Height: 202.0 m  
 Elevation: 5.0 m  
 Horiz. Pattern: Directional  
 Vert. Pattern: No

2000 Population Centroids  
 are shown

Total Population: 781,846  
 Housing Units: 296,433  
 Polygon Area: 1291.43 sq. km

FCC 30 arc-second  
 terrain database

**Doug Vernier**  
 401 Main Street, Suite 213  
 Cedar Falls, Iowa 50613  
 Telecommunication Consultants  
 dvernier@v-soft.com 319.266.8402

Scale 1:520,513  
 0 6 12 18 km

V-Soft Communications LLC ©

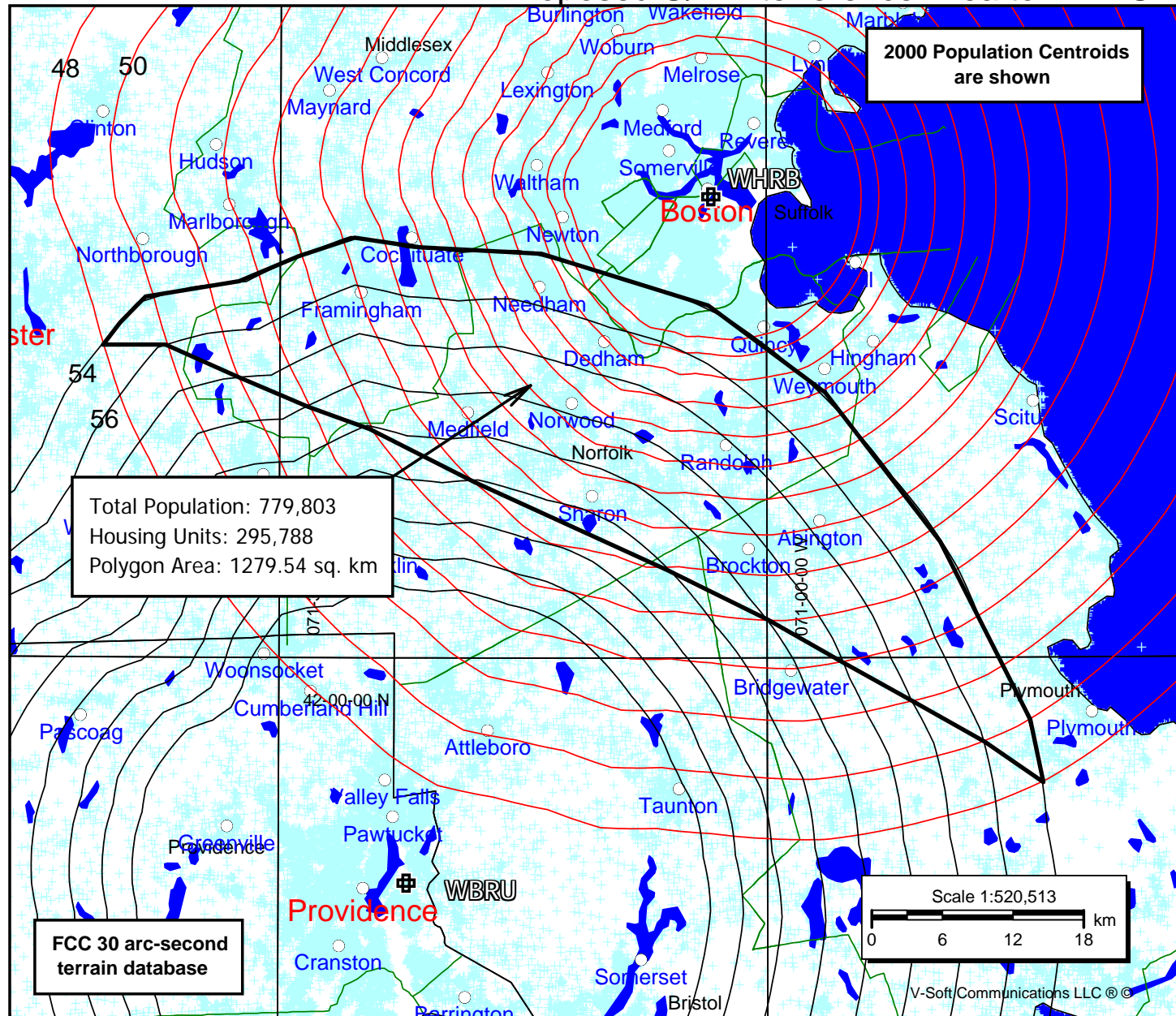
# Proposed U/D Interference Area to WBRU

## WBRU

BLH19990723KD  
 Latitude: 41-49-40 N  
 Longitude: 071-22-09 W  
 ERP: 18.50 kW  
 Channel: 238  
 Frequency: 95.5 MHz  
 AMSL Height: 170.0 m  
 Elevation: 11.0 m  
 Horiz. Pattern: Omni  
 Vert. Pattern: No  
 Prop Model: FCC

## WHRB

BLH19950830KE  
 Latitude: 42-21-08 N  
 Longitude: 071-03-25 W  
 ERP: 1.45 kW  
 Channel: 237  
 Frequency: 95.3 MHz  
 AMSL Height: 201.0 m  
 Elevation: 5 m  
 Horiz. Pattern: Omni  
 Vert. Pattern: No





# Changed U/D Interference Area to WBRU

## WBRU

BLH19990723KD

Latitude: 41-49-40 N

Longitude: 071-22-09 W

ERP: 18.50 kW

Channel: 238

Frequency: 95.5 MHz

AMSL Height: 170.0 m

Elevation: 11.0 m

Horiz. Pattern: Omni

Vert. Pattern: No

Prop Model: FCC

## WHRB

BLH19950830KE

Latitude: 42-21-08 N

Longitude: 071-03-25 W

ERP: 1.70 kW

Channel: 237

Frequency: 95.3 MHz

AMSL Height: 202.0 m

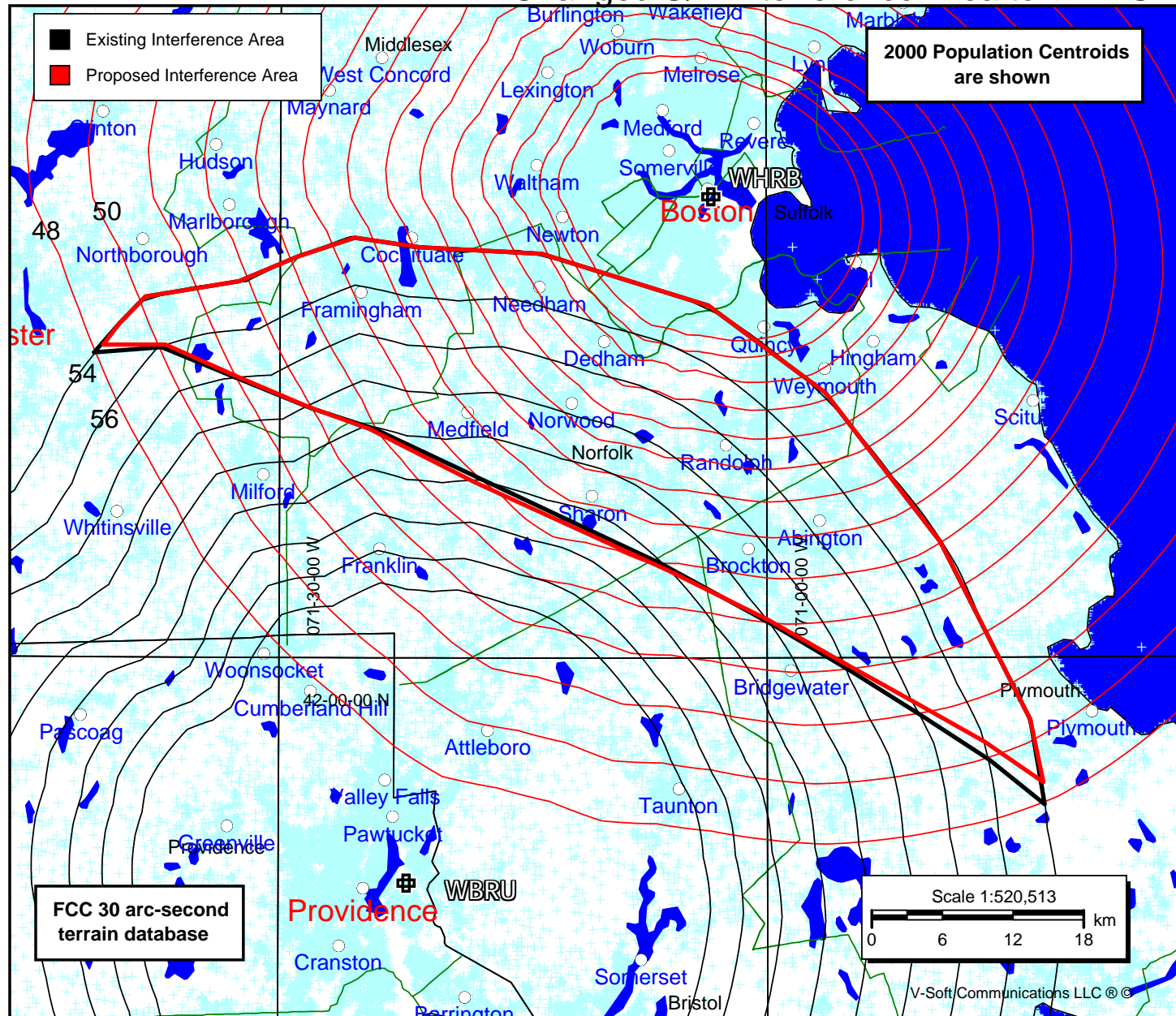
Elevation: 5.0 m

Horiz. Pattern: Directional

Vert. Pattern: No

**Doug Vernier**  
401 Main Street, Suite 213  
Cedar Falls, Iowa 50613

Telecommunication Consultants  
dvernier@v-soft.com 019266-8402



## Existing U/D Interference Area to WHRB

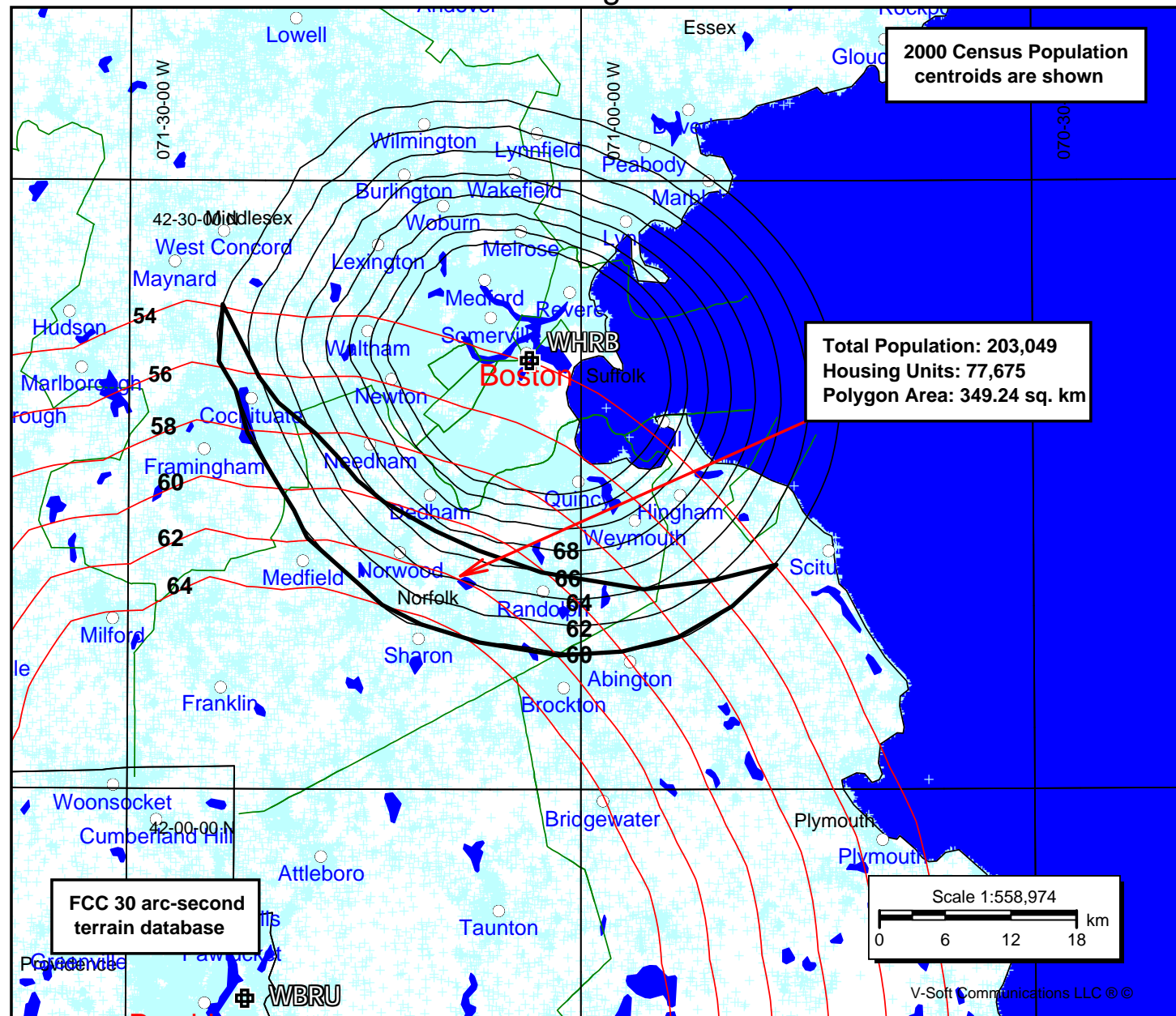
### WHRB

BLH19950830KE  
 Latitude: 42-21-08 N  
 Longitude: 071-03-25 W  
 ERP: 1.70 kW  
 Channel: 237  
 Frequency: 95.3 MHz  
 AMSL Height: 202.0 m  
 Elevation: 5.0 m  
 Horiz. Pattern: Directional  
 Vert. Pattern: No

### WBRU

BLH19990723KD  
 Latitude: 41-49-40 N  
 Longitude: 071-22-09 W  
 ERP: 18.50 kW  
 Channel: 238  
 Frequency: 95.5 MHz  
 AMSL Height: 170.0 m  
 Elevation: 11.0 m  
 Horiz. Pattern: Omni  
 Vert. Pattern: No  
 Prop Model: FCC

**V** Doug Vernier  
 401 Main Street, Suite 213  
 Cedar Falls, Iowa 50613  
 Telecommunication Consultants  
 dvernier@vsoft.com (319) 266-8402





## Proposed U/D Interference Area to WHRB

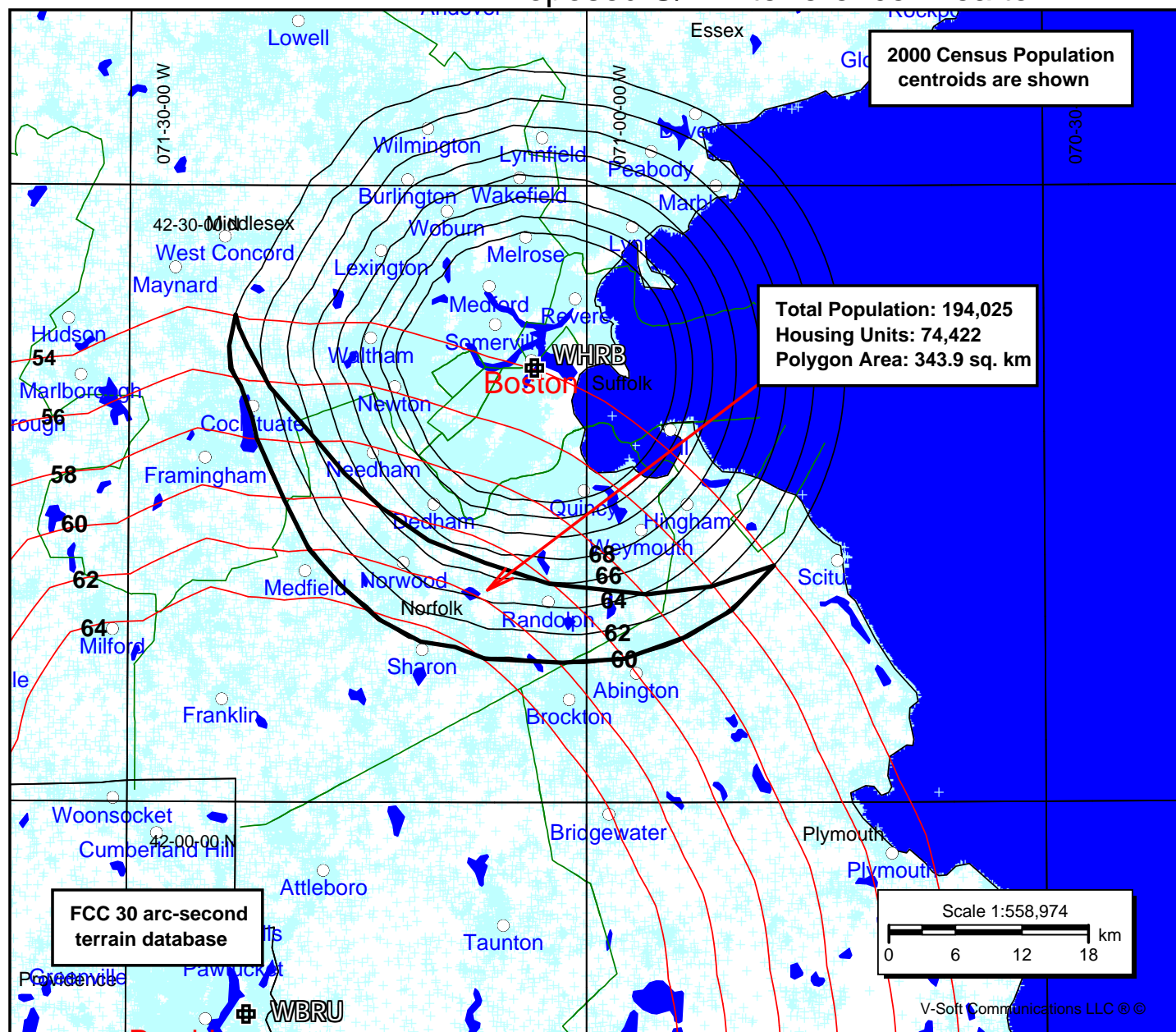
### WHRB

BLH19950830KE  
 Latitude: 42-21-08 N  
 Longitude: 071-03-25 W  
 ERP: 1.45 kW  
 Channel: 237  
 Frequency: 95.3 MHz  
 AMSL Height: 201.0 m  
 Elevation: 5 m  
 Horiz. Pattern: Omni  
 Vert. Pattern: No

### WBRU

BLH19990723KD  
 Latitude: 41-49-40 N  
 Longitude: 071-22-09 W  
 ERP: 18.50 kW  
 Channel: 238  
 Frequency: 95.5 MHz  
 AMSL Height: 170.0 m  
 Elevation: 11.0 m  
 Horiz. Pattern: Omni  
 Vert. Pattern: No  
 Prop Model: FCC

**V** Doug Vernier  
 401 Main Street, Suite 213  
 Cedar Falls, Iowa 50613  
 Telecommunication Consultants  
 dvernier@v-soft.com (319)266-8402



## Change U/D Interference Area to WHRB

### WHRB

BLH19950830KE

Latitude: 42-21-08 N

Longitude: 071-03-25 W

ERP: 1.70 kW

Channel: 237

Frequency: 95.3 MHz

AMSL Height: 202.0 m

Elevation: 5.0 m

Horiz. Pattern: Directional

Vert. Pattern: No

### WBRU

BLH19990723KD

Latitude: 41-49-40 N

Longitude: 071-22-09 W

ERP: 18.50 kW

Channel: 238

Frequency: 95.5 MHz

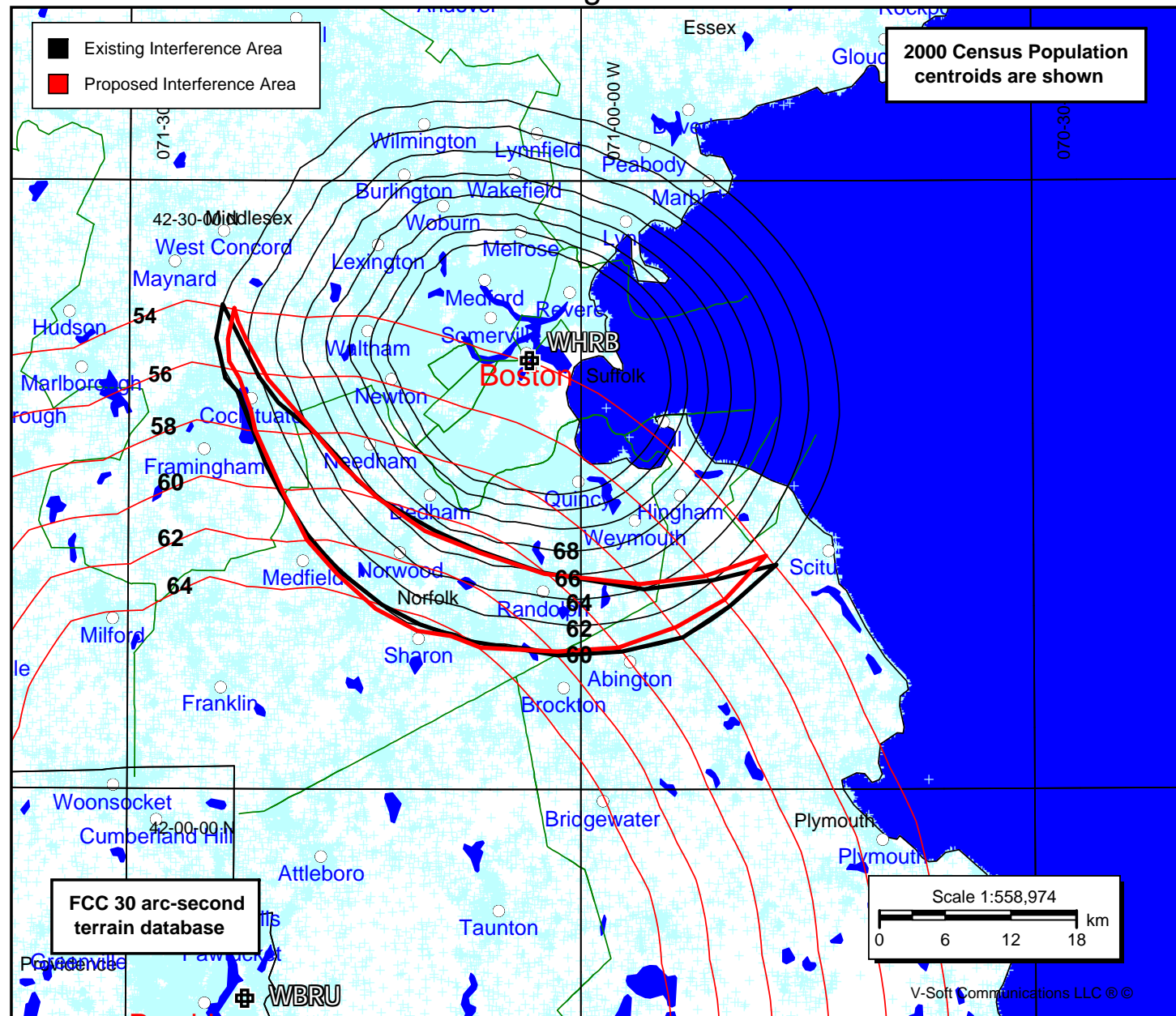
AMSL Height: 170.0 m

Elevation: 11.0 m

Horiz. Pattern: Omni

Vert. Pattern: No

Prop Model: FCC



N. Lat. = 414940.0 W. Lng. = 712209.0  
 HAAT and Distance to Contour,  
 FCC, FM 2-10 Mi, 51 pts Method - FCC 30 SEC

WBRU, Brown Broadcasting Service, I, BLH19990723KD

Azi.	AV EL	HAAT	ERP kW	dBk	Field	54-F5	56-F5	58-F5	60-F5	62-F5	64-F5
345	33.9	136.1	18.5000	12.67	1.000	53.77	49.61	45.50	41.60	37.83	34.13
355	32.8	137.2	18.5000	12.67	1.000	53.93	49.78	45.66	41.75	37.97	34.26
005	32.8	137.2	18.5000	12.67	1.000	53.93	49.78	45.66	41.75	37.97	34.26
015	29.6	140.4	18.5000	12.67	1.000	54.38	50.23	46.10	42.16	38.36	34.63
025	29.6	140.4	18.5000	12.67	1.000	54.38	50.23	46.10	42.16	38.36	34.63
035	29.0	141.0	18.5000	12.67	1.000	54.46	50.31	46.18	42.23	38.43	34.70
045	29.0	141.0	18.5000	12.67	1.000	54.46	50.31	46.18	42.23	38.43	34.70
055	32.9	137.1	18.5000	12.67	1.000	53.91	49.76	45.64	41.73	37.95	34.25
065	32.9	137.1	18.5000	12.67	1.000	53.91	49.76	45.64	41.73	37.95	34.25

AMSL= 170 M

N. Lat. = 414940.0 W. Lng. = 712209.0  
 HAAT and Distance to Contour,  
 FCC, FM 2-10 Mi, 51 pts Method - FCC 30 SEC

WBRU , Brown Broadcasting Service, I, BLH19990723KD

Azi.	AV EL	HAAT	ERP kW	dBk	Field	54-F1	56-F1	58-F1	60-F1	62-F1
345	33.9	136.1	18.5000	12.67	1.000	62.41	56.89	51.69	46.58	41.84
355	32.8	137.2	18.5000	12.67	1.000	62.59	57.05	51.84	46.73	41.98
005	32.8	137.2	18.5000	12.67	1.000	62.59	57.05	51.84	46.73	41.98
015	29.6	140.4	18.5000	12.67	1.000	63.10	57.51	52.28	47.15	42.37
025	29.6	140.4	18.5000	12.67	1.000	63.10	57.51	52.28	47.15	42.37
035	29.0	141.0	18.5000	12.67	1.000	63.19	57.60	52.36	47.23	42.45
045	29.0	141.0	18.5000	12.67	1.000	63.19	57.60	52.36	47.23	42.45
055	32.9	137.1	18.5000	12.67	1.000	62.57	57.04	51.83	46.71	41.96
065	32.9	137.1	18.5000	12.67	1.000	62.57	57.04	51.83	46.71	41.96

AMSL= 170 M



N. Lat. = 422108.0 W. Lng. = 710325.0  
 HAAT and Distance to Contour,  
 FCC, FM 2-10 Mi, 51 pts Method -

WHRB, Harvard Radio Broadcasting Co, BLH19950830KE - F(50-50) - Existing Facility

Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5	62-F5	64-F5	66-F5	68-F5
130	1.8	200.2	1.7000	2.30	1.000	28.97	26.10	23.52	21.14	18.89
140	6.1	195.9	1.7000	2.30	1.000	28.68	25.85	23.30	20.93	18.70
150	6.3	195.7	1.6662	2.22	0.990	28.53	25.72	23.18	20.83	18.60
160	15.0	187.0	1.5831	2.00	0.965	27.62	24.92	22.46	20.16	17.96
170	21.8	180.2	1.4862	1.72	0.935	26.80	24.18	21.78	19.52	17.36
180	35.4	166.6	1.4078	1.49	0.910	25.58	23.08	20.75	18.54	16.40
190	33.0	169.0	1.3617	1.34	0.895	25.55	23.06	20.73	18.52	16.38
200	33.0	169.0	1.3315	1.24	0.885	25.43	22.94	20.62	18.41	16.28
210	34.4	167.6	1.3315	1.24	0.885	25.34	22.85	20.54	18.33	16.21
220	39.2	162.8	1.3315	1.24	0.885	25.01	22.55	20.25	18.05	15.93
230	42.2	159.8	1.3617	1.34	0.895	24.92	22.47	20.17	17.97	15.85
240	49.5	152.5	1.4078	1.49	0.910	24.58	22.16	19.87	17.67	15.55
250	46.9	155.1	1.4703	1.67	0.930	25.02	22.56	20.25	18.04	15.91
260	42.9	159.1	1.5995	2.04	0.970	25.78	23.26	20.92	18.69	16.54
270	18.4	183.6	1.7000	2.30	1.000	27.84	25.12	22.64	20.34	18.14
280	23.3	178.7	1.7000	2.30	1.000	27.52	24.83	22.39	20.10	17.91
290	43.0	159.0	1.7000	2.30	1.000	26.12	23.57	21.21	18.97	16.81

AMSL= 202 M

N. Lat. = 422108.0 W. Lng. = 710325.0  
 HAAT and Distance to Contour,  
 FCC, FM 2-10 Mi, 51 pts Method -

WHRB - Harvard Radio Broadcasting Co., Inc. Proposed Protected F(50-50) Contours										
Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5	62-F5	64-F5	66-F5	68-F5
135	6.1	194.9	1.4500	1.61	1.000	27.59	24.88	22.41	20.10	17.91
145	6.1	194.9	1.4500	1.61	1.000	27.59	24.88	22.41	20.10	17.91
155	15.0	186.0	1.4500	1.61	1.000	27.02	24.38	21.96	19.68	17.51
165	15.0	186.0	1.4500	1.61	1.000	27.02	24.38	21.96	19.68	17.51
175	35.4	165.6	1.4500	1.61	1.000	25.68	23.17	20.84	18.62	16.48
185	35.4	165.6	1.4500	1.61	1.000	25.68	23.17	20.84	18.62	16.48
195	33.0	168.0	1.4500	1.61	1.000	25.85	23.32	20.98	18.76	16.62
205	33.0	168.0	1.4500	1.61	1.000	25.85	23.32	20.98	18.76	16.62
215	39.2	161.8	1.4500	1.61	1.000	25.41	22.93	20.60	18.39	16.25
225	39.2	161.8	1.4500	1.61	1.000	25.41	22.93	20.60	18.39	16.25
235	49.5	151.5	1.4500	1.61	1.000	24.67	22.24	19.94	17.74	15.62
245	49.5	151.5	1.4500	1.61	1.000	24.67	22.24	19.94	17.74	15.62
255	42.9	158.1	1.4500	1.61	1.000	25.15	22.68	20.37	18.16	16.03
265	42.9	158.1	1.4500	1.61	1.000	25.15	22.68	20.37	18.16	16.03
275	23.3	177.7	1.4500	1.61	1.000	26.49	23.91	21.53	19.28	17.13

Ave El= 31.02 M HAAT= 169.98 M AMSL= 201 M

N. Lat. = 422108.0 W. Lng. = 710325.0  
 HAAT and Distance to Contour,  
 FCC, FM 2-10 Mi, 51 pts Method -

WHRB, Harvard Radio Broadcasting Co, BLH19950830KE - Existing F(50-10) Interfering Contours

Azi.	AV EL	HAAT	ERP kW	dBk	Field	48-F1	50-F1	52-F1	54-F1	56-F1	58-F1	60-F1
135	6.1	195.9	1.7000	2.30	1.000	58.40	53.18	48.06	43.25	38.89	34.84	31.06
145	6.1	195.9	1.6830	2.26	0.995	58.28	53.07	47.95	43.15	38.80	34.76	30.98
155	15.0	187.0	1.6244	2.11	0.977	56.84	51.63	46.52	41.87	37.63	33.69	30.04
165	15.0	187.0	1.5343	1.86	0.950	56.19	50.99	45.91	41.32	37.13	33.21	29.63
175	35.4	166.6	1.4467	1.60	0.923	53.02	47.84	43.04	38.72	34.70	30.92	27.64
185	35.4	166.6	1.3847	1.41	0.903	52.53	47.35	42.61	38.32	34.33	30.59	27.35
195	33.0	169.0	1.3466	1.29	0.890	52.52	47.35	42.61	38.32	34.33	30.60	27.37
205	33.0	169.0	1.3315	1.24	0.885	52.39	47.23	42.50	38.22	34.24	30.52	27.29
215	39.2	162.8	1.3315	1.24	0.885	51.59	46.46	41.81	37.57	33.60	29.93	26.77
225	39.2	162.8	1.3466	1.29	0.890	51.72	46.58	41.92	37.67	33.70	30.02	26.84
235	49.5	152.5	1.3847	1.41	0.903	50.67	45.60	41.01	36.79	32.81	29.20	26.11
245	49.5	152.5	1.4389	1.58	0.920	51.10	46.00	41.38	37.13	33.13	29.48	26.35
255	42.9	159.1	1.5343	1.86	0.950	52.70	47.53	42.76	38.44	34.40	30.63	27.37
265	42.9	159.1	1.6494	2.17	0.985	53.52	48.33	43.48	39.10	35.02	31.19	27.85
275	23.3	178.7	1.7000	2.30	1.000	56.38	51.16	46.05	41.46	37.27	33.35	29.75

AMSL= 202 M

N. Lat. = 422108.0 W. Lng. = 710325.0  
 HAAT and Distance to Contour,  
 FCC, FM 2-10 Mi, 51 pts Method -

WHRB - Harvard Radio Broadcasting Co., Inc. Proposed Interfering F(50-10) Contours

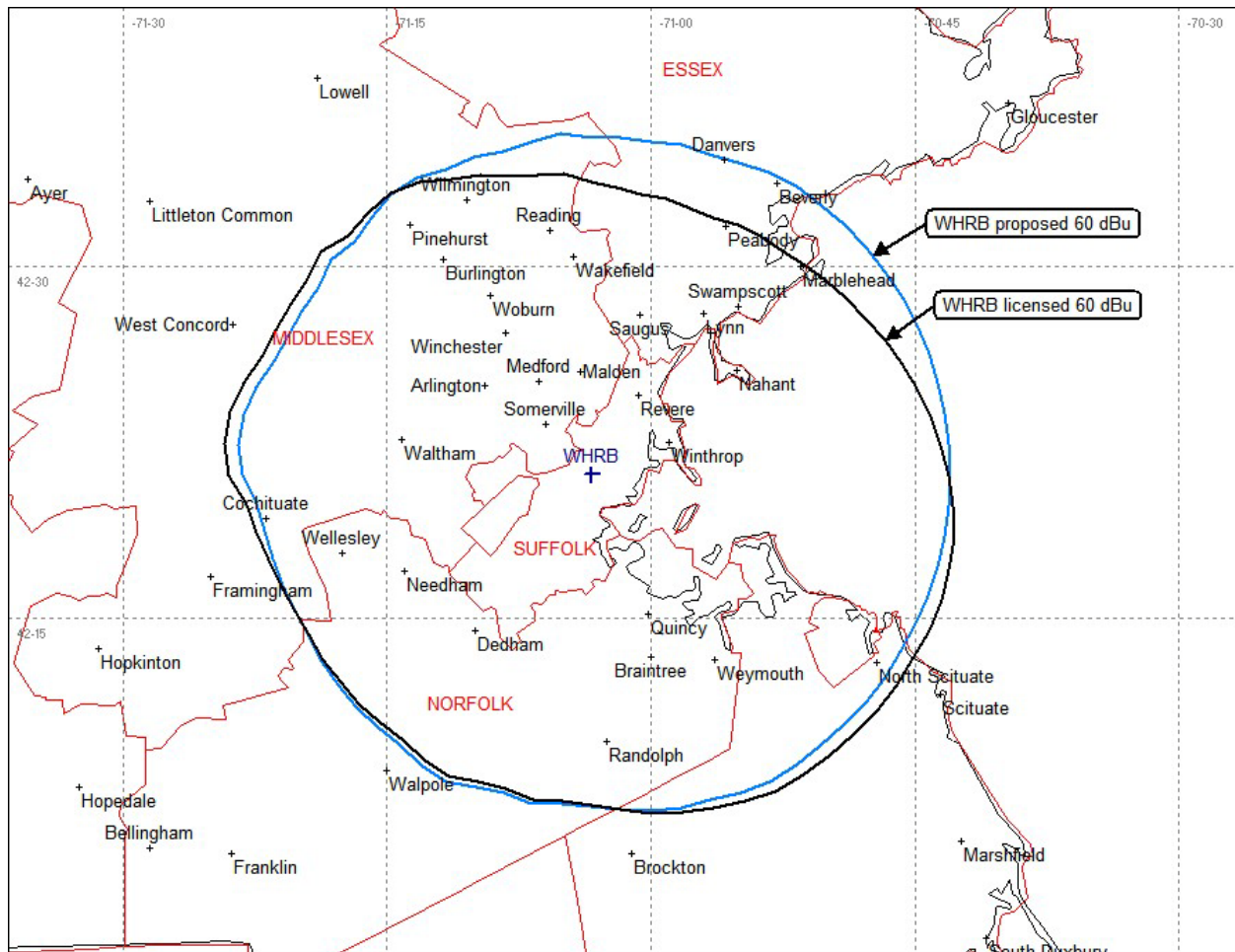
Azi.	AV EL	HAAT	ERP kW	dBk	Field	48-F1	50-F1	52-F1	54-F1	56-F1	58-F1	60-F1
135	6.1	194.9	1.4500	1.61	1.000	56.46	51.29	46.22	41.60	37.37	33.42	29.80
145	6.1	194.9	1.4500	1.61	1.000	56.46	51.29	46.22	41.60	37.37	33.42	29.80
155	15.0	186.0	1.4500	1.61	1.000	55.42	50.24	45.21	40.69	36.54	32.66	29.16
165	15.0	186.0	1.4500	1.61	1.000	55.42	50.24	45.21	40.69	36.54	32.66	29.16
175	35.4	165.6	1.4500	1.61	1.000	52.92	47.74	42.95	38.63	34.61	30.84	27.57
185	35.4	165.6	1.4500	1.61	1.000	52.92	47.74	42.95	38.63	34.61	30.84	27.57
195	33.0	168.0	1.4500	1.61	1.000	53.23	48.04	43.22	38.89	34.86	31.08	27.78
205	33.0	168.0	1.4500	1.61	1.000	53.23	48.04	43.22	38.89	34.86	31.08	27.78
215	39.2	161.8	1.4500	1.61	1.000	52.42	47.26	42.52	38.23	34.22	30.47	27.24
225	39.2	161.8	1.4500	1.61	1.000	52.42	47.26	42.52	38.23	34.22	30.47	27.24
235	49.5	151.5	1.4500	1.61	1.000	51.05	45.96	41.34	37.08	33.08	29.43	26.31
245	49.5	151.5	1.4500	1.61	1.000	51.05	45.96	41.34	37.08	33.08	29.43	26.31
255	42.9	158.1	1.4500	1.61	1.000	51.93	46.79	42.10	37.82	33.82	30.10	26.91
265	42.9	158.1	1.4500	1.61	1.000	51.93	46.79	42.10	37.82	33.82	30.10	26.91
275	23.3	177.7	1.4500	1.61	1.000	54.44	49.25	44.30	39.87	35.79	31.96	28.55

AMSL= 201 M

Radio station WHRB(FM)  
Cambridge, Massachusetts  
June 2011

Broadcast Signal Lab, LLC  
Cambridge, Massachusetts

### Exhibit C



**Exhibit D. Radio frequency radiation compliance**

The WHRB antenna is located atop One Financial Center in Boston, a group site with three FM broadcast facilities and numerous land mobile and other relatively low power facilities. The main (lower) roof is surmounted by an upper (penthouse) roof supporting a variety of transmitting antennas, mounted principally on two masts. The lower roof is maintained as a public/uncontrolled area, while the upper roof is administered as an occupational/controlled area. A radiofrequency energy survey of this composite site is conducted annually. The latest survey was performed on April 22, 2011 by Broadcast Signal Lab, LLC. The maximum whole body average levels measured were 12% of the ANSI Radiofrequency Protection Guide (RFPG) on the lower roof and 39% on the upper roof, well within the public and occupational limits, respectively. These measurements include RF energy from the existing WHRB facility.

Per the building construction drawings, distance horizontally to the farthest point from the WHRB antenna mast is 43.3 meters on the lower roof and 25.9 meters on the upper roof. For the proposed facility, using a Shively 6810-4D-SS (half-wave spaced) antenna with center of radiation 16.0 meters above the lower roof and 13.3 meters above the upper roof, the maximum value calculated by the OET FM Model program for a 2 meter height anywhere in the rooftop areas, is  $12 \mu\text{W}/\text{cm}^2$ . At VHF this represents 1.2% of RFPG. For a worst-case result, we treat the proposed, modified WHRB facility as an entirely new facility that adds its maximum contribution to the maximum levels from the survey. Adding 1.2% RFPG to the measured maxima gives predicted combined maximum levels of less than 14% RFPG on the lower roof (where 20% is allowable), and less than 41% on the upper

**Radio station WHRB(FM)**  
**Cambridge, Massachusetts**  
**June 2011**

**Broadcast Signal Lab, LLC**  
**Cambridge, Massachusetts**

roof (where 100% is allowable). The composite site will therefore remain well within the required limits, other than aloft on the masts themselves.

Extensive warning signage is posted and a strictly enforced policy governs access to the upper roof and masts. Work requiring climbing either mast is coordinated with the various licensees to arrange for transmitter shutdown or power reduction as needed to ensure that workers are not exposed to excessive RF energy levels.

Since the time the last survey measurements were made, no changes have taken place at the site that would alter its overall state of compliance and affect the basic conclusions of this Exhibit.

The preceding report is to my information and belief true and correct.



Rick Levy, CSRE  
Technical Advisor, WHRB

June 10, 2011

Date