Comprehensive Technical Statement

Rhode Island Public Radio

Minor Modification to Construction Permit # BNPFT-20181031AAV

W275DA, FCC Facility ID # 202495, Providence, RI

Introduction

The following changes are proposed:

- Transmitter Location
- Effective radiated power
- Antenna
- Directional pattern

Data Sources

Distances were calculated using the FCC method defined in 73.208 of the Commission's Rules.

All contours shown in this report were generated using antenna center above mean sea level, NAD-83 coordinates, and the USGS03 terrain dataset

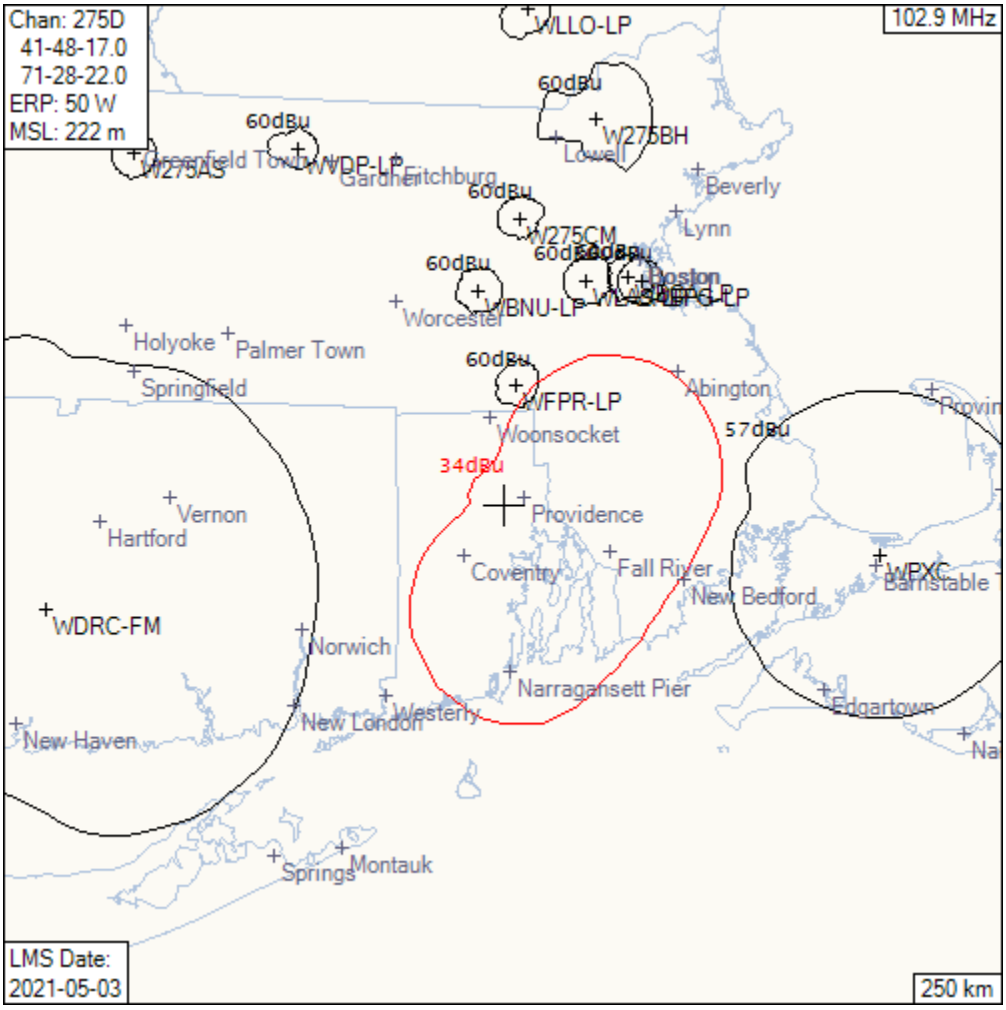
Dates shown on the maps represent the last change date in the LMS downloads in use at the time this statement was prepared.

Detailed Interference Study

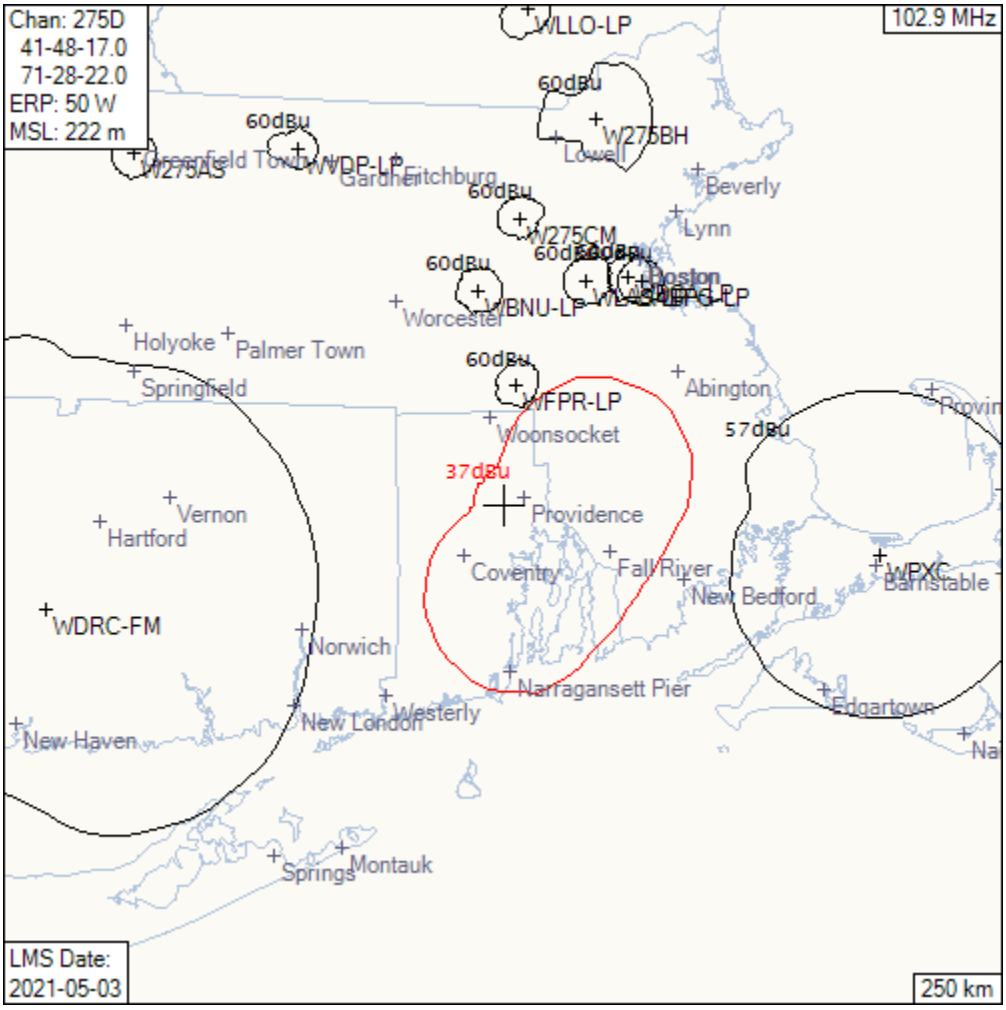
The following collection of maps and the narrative accompanying each show that no prohibited overlap will occur between the proposed facility and any potentially conflicting facility or proposal. Interfering f(50,10) contours are shown as red polygons, and protected f(50,50) contours are shown as black polygons.

Map 1 – Co-channel Outbound Interference

There are three nearby co-channel stations: WDRC-FM, WPXC, and WFPR-LP.



WDRC is Class B, protected to the 54 dBu f(50,50) contour. The proposed interfering 34 dBu f(50,10) contour does not overlap the WDRC-FM protected contour.



WPXC is Class B1, protected to the 57 dBu f(50,50) contour. The proposed interfering 37 dBu f(50,10) contour does not intersect the WPXC protected contour.

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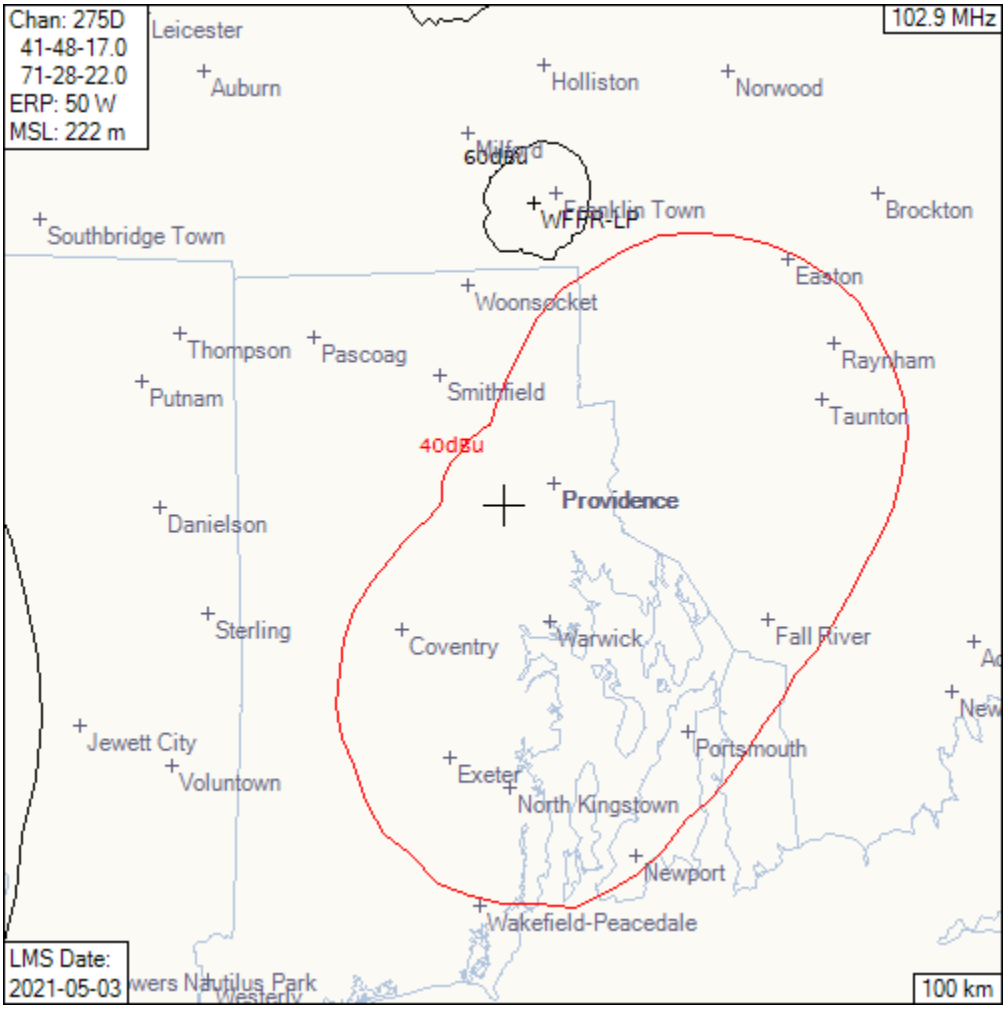

WFPR-LP is Class L1, protected to the 60 dBu f(50,50) contour. The proposed interfering 40 dBu f(50,10) contour does not intersect the WFPR-LP protected contour.

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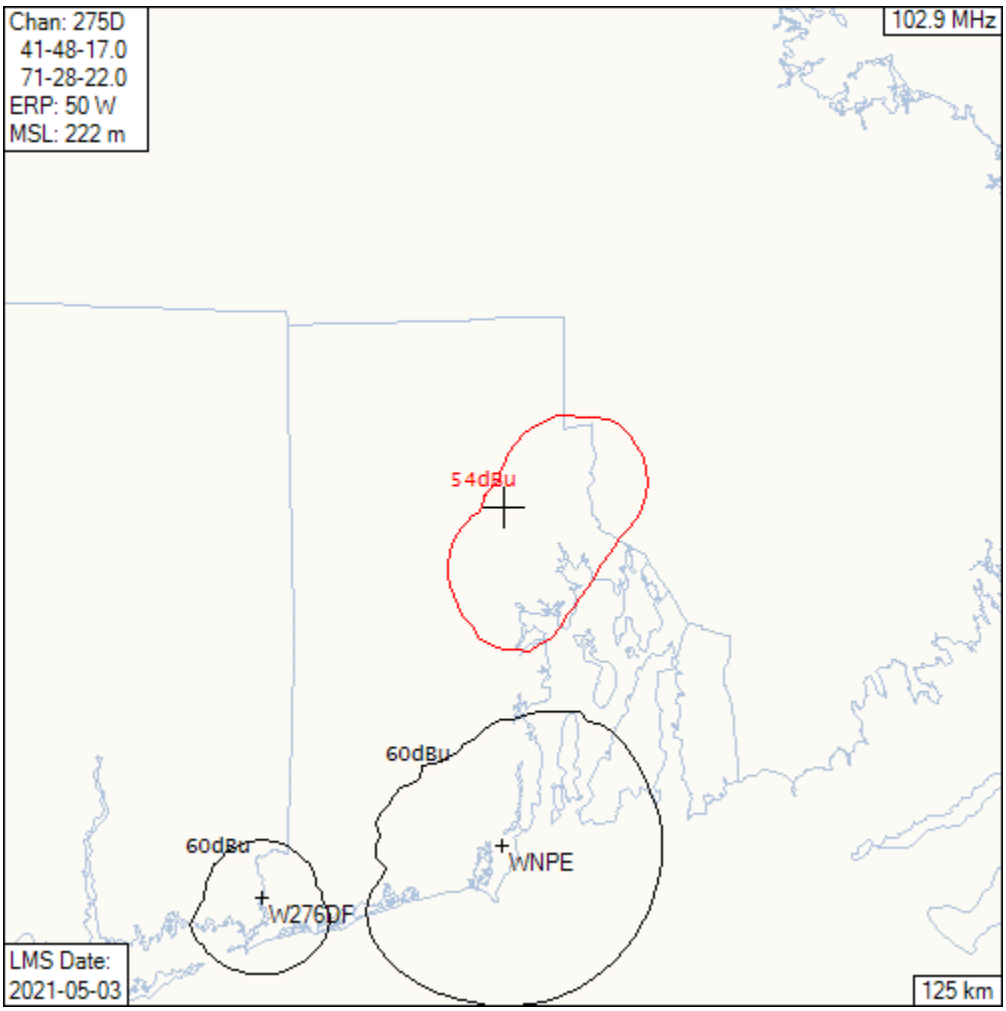
Map 2 – First Adjacent Outbound Interference



WNPE is Class A, and W276DF is a translator. Both are protected to the 60 dBu f(50,50) contour. The interfering contour is 54 dBu f(50,10).

There is no overlap of the interfering contour with the protected contour of any station or proposal.

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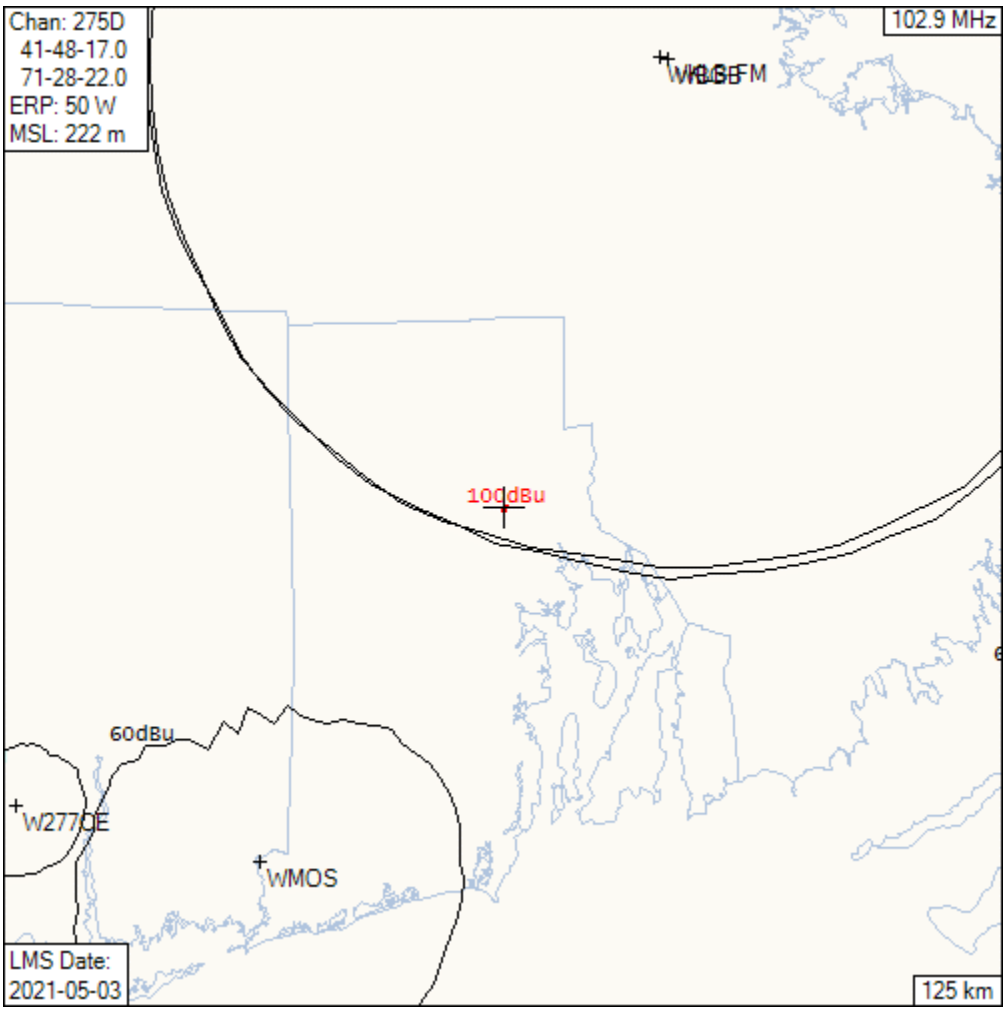
Map 3 – Second- and Third-Adjacent Interference



The proposed location is within the protected contours of WKLB (55.71 dBu at the proposed site) and WBGB (56.04 dBu at the proposed site).

As the weaker station, WKLB is the more critical. The interfering signal level is 95.71 dBu, free-space.

The details on the following pages show that the proposal complies with §74.1204(d) in that the 95.71 dBu free-space signal will not occur in any populated place.

The proposed antenna will be centered at 222 m AMSL and 133 m AGL. The base of the tower is at the highest point in the area, at 89 m AMSL.

The antenna will consist of two levels spaced at 0.9 λ. Each level will consist of two Kathrein-Scala CLFM-S slant-polarized elements. The vertical and horizontal plane pattern tabulations are provided in Attachment 1 to this report.

This Google Earth image shows the extent of the proposed 97.51 dBu free-space contour in the horizontal plane at the height of the antenna center. All areas outside this contour, regardless of elevation, will receive a lower signal level and need not be considered for this discussion.

The area inside the contour is divided up into one unpopulated area northeast of the tower (unlabeled), and ten populated areas. The maximum elevation within each populated area is shown in parentheses.

The following table shows, for each of these areas, the minimum height of the antenna above the area, the distance range and the azimuth range. While there is a clearly some variation in elevation and ERP within each area, using the highest elevation and maximum ERP within each area ensures a conservative result.

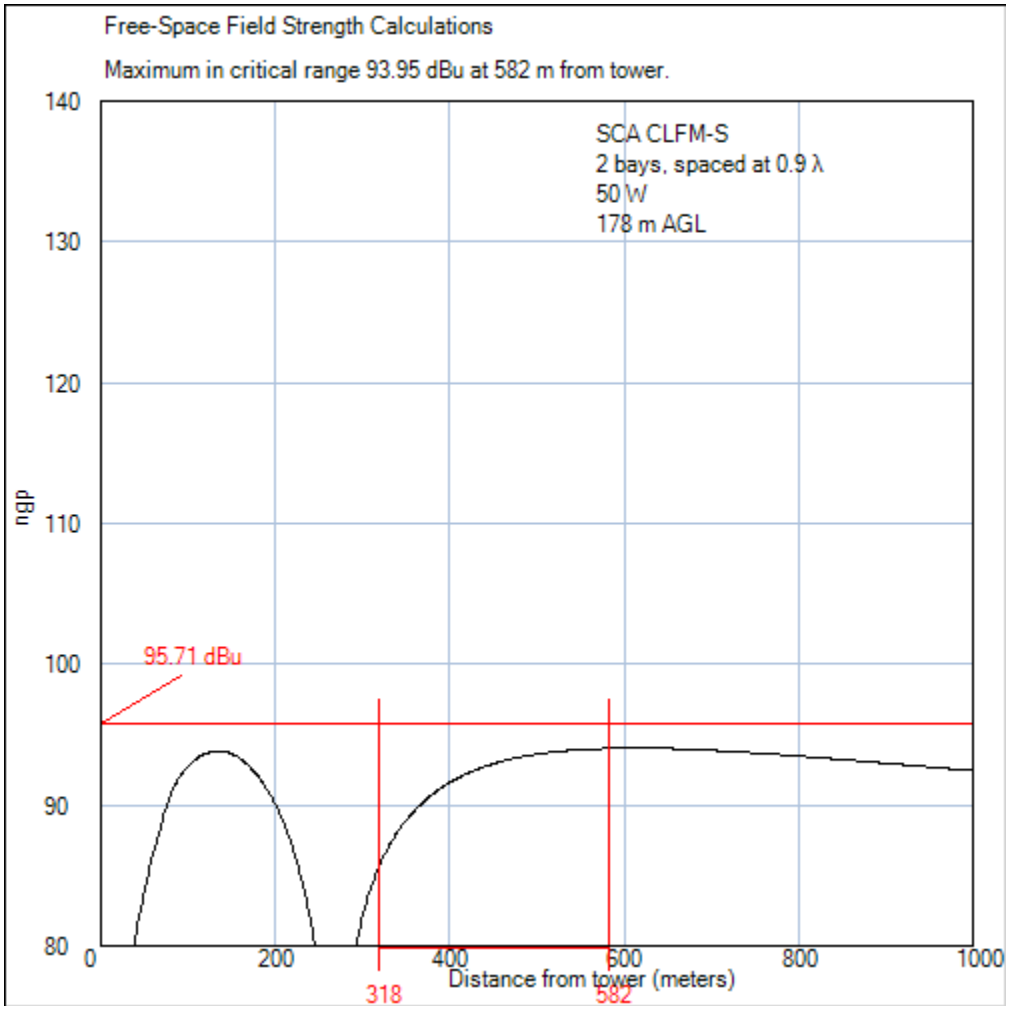
W275DA Second Adjacent Interference Showing											
Populated Area Tabulation											
RCAMSL	222	m									
Max ERP	50.0	W									
Antenna	CLFM-S										
Levels	2										
Spacing	0.9	λ									
Target fs	95.71	dBu									
Area #	Max Elev	Min Az	Max Az	Min Dist	Max Dist	Max ERP	RCAGL	Max fs	Margin	Min Ht	Eval
1	28	56	88	678	1102	50.0	194	93.22	2.49	73.8	OK
2	30	77	204	342	921	50.0	192	93.31	2.40	46.4	OK
3	56	110	153	151	341	30.6	166	91.56	4.15	55.7	OK
4	69	144	233	108	376	50.0	153	95.10	0.61	10.6	CLOSE
5	44	153	196	318	582	50.0	178	93.95	1.76	32.4	OK
6	44	197	222	306	621	41.2	178	93.13	2.58	45.9	OK
7	41	185	199	396	730	48.8	181	93.72	1.99	37.2	OK
8	35	193	212	552	824	44.7	187	93.06	2.65	56.0	OK
9	86	21	56	123	395	44.1	136	95.48	0.23	3.6	CLOSE
10	80	21	36	389	576	24.1	142	92.76	2.95	43.3	OK

Only Areas 4 and 9 are within 1 dB of failing to meet the 95.71 dBu requirement. Area 5 is the next closest, with a margin of 1.76 dB.

It is submitted that the following complete showings with respect to these three areas will demonstrate compliance within the other areas.

Area 5

The maximum ERP in this area is 50 W. The highest terrain is 44 m AMSL, making the minimum antenna height above this area 178 m. This area extends from 318 m to 582 m from the tower.



It is clear that the 95.71 dBu limit is not reached anywhere in this area.

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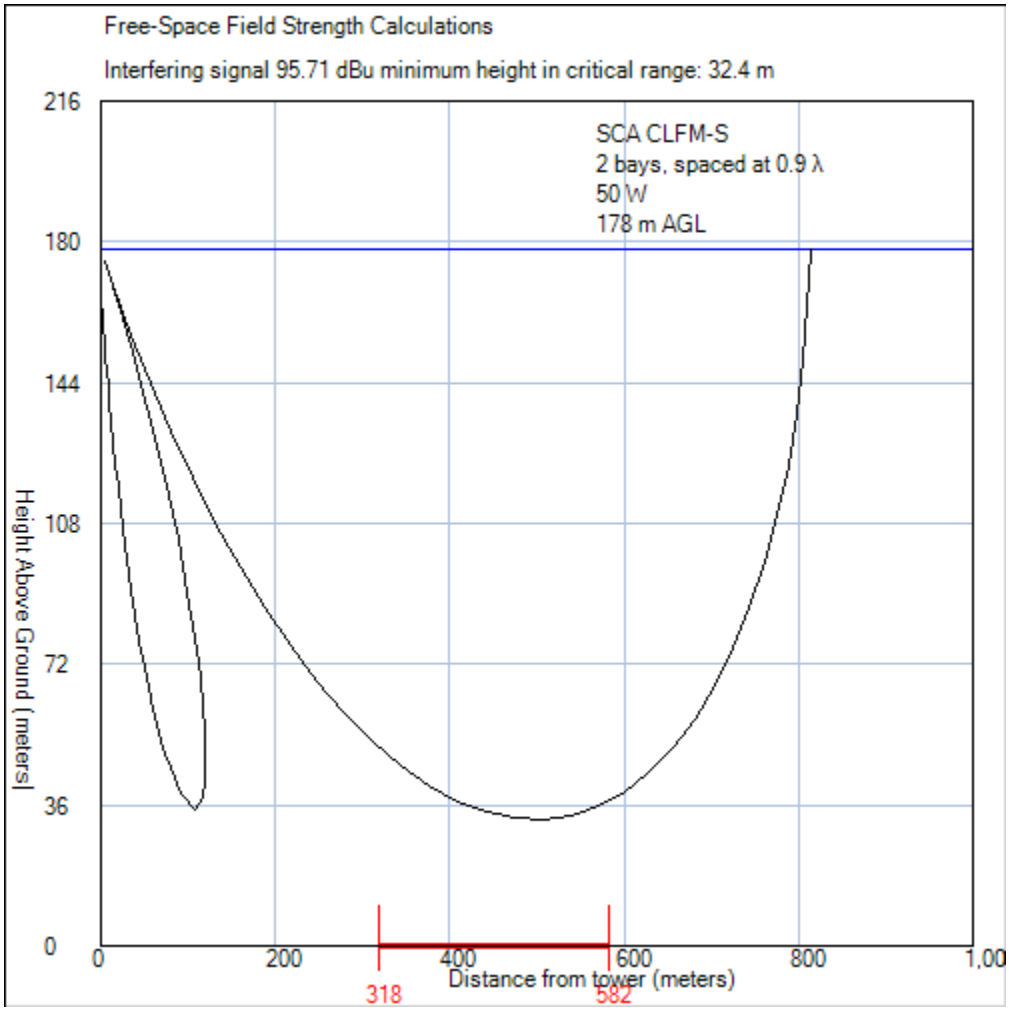
This plot shows the height above ground of the 95.71 dBu free-space signal:

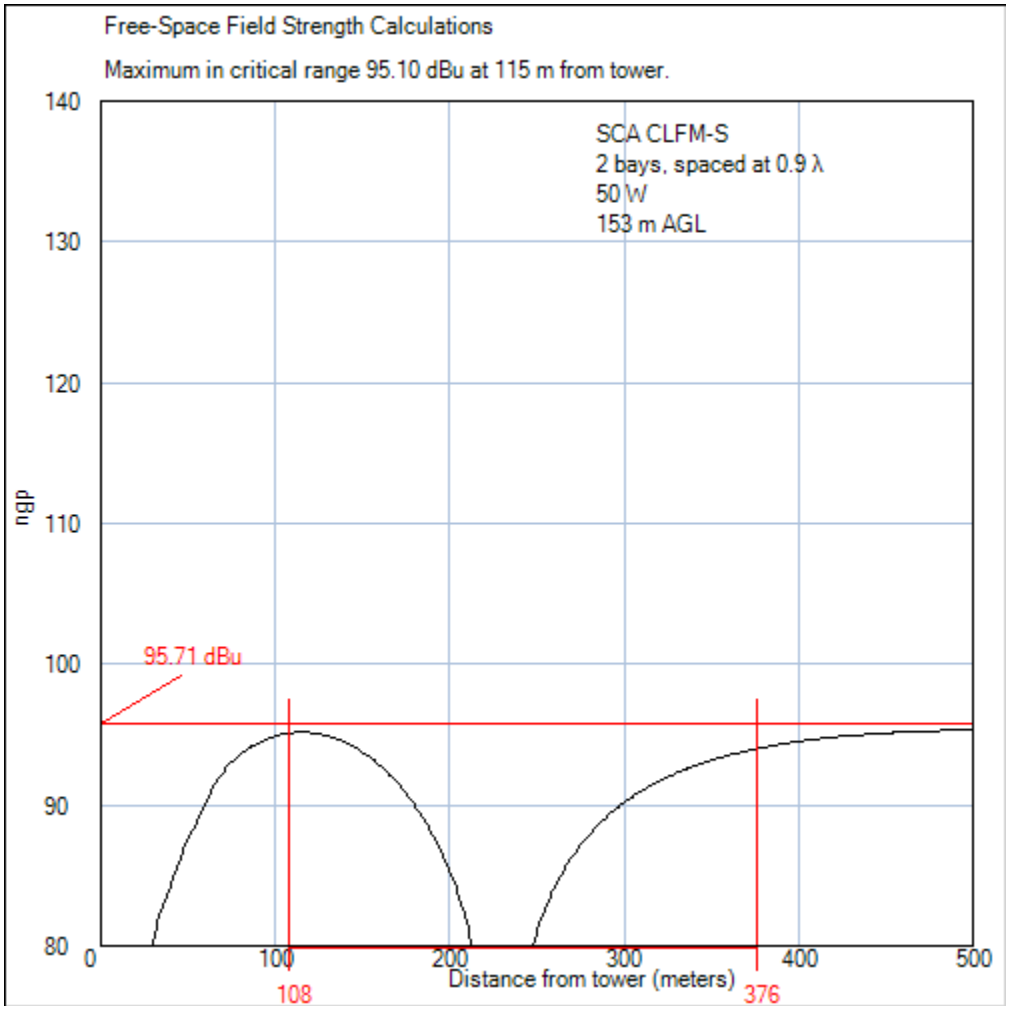


With a minimum elevation above ground of 32.4 m, the interfering signal will clearly not impact any occupied area.

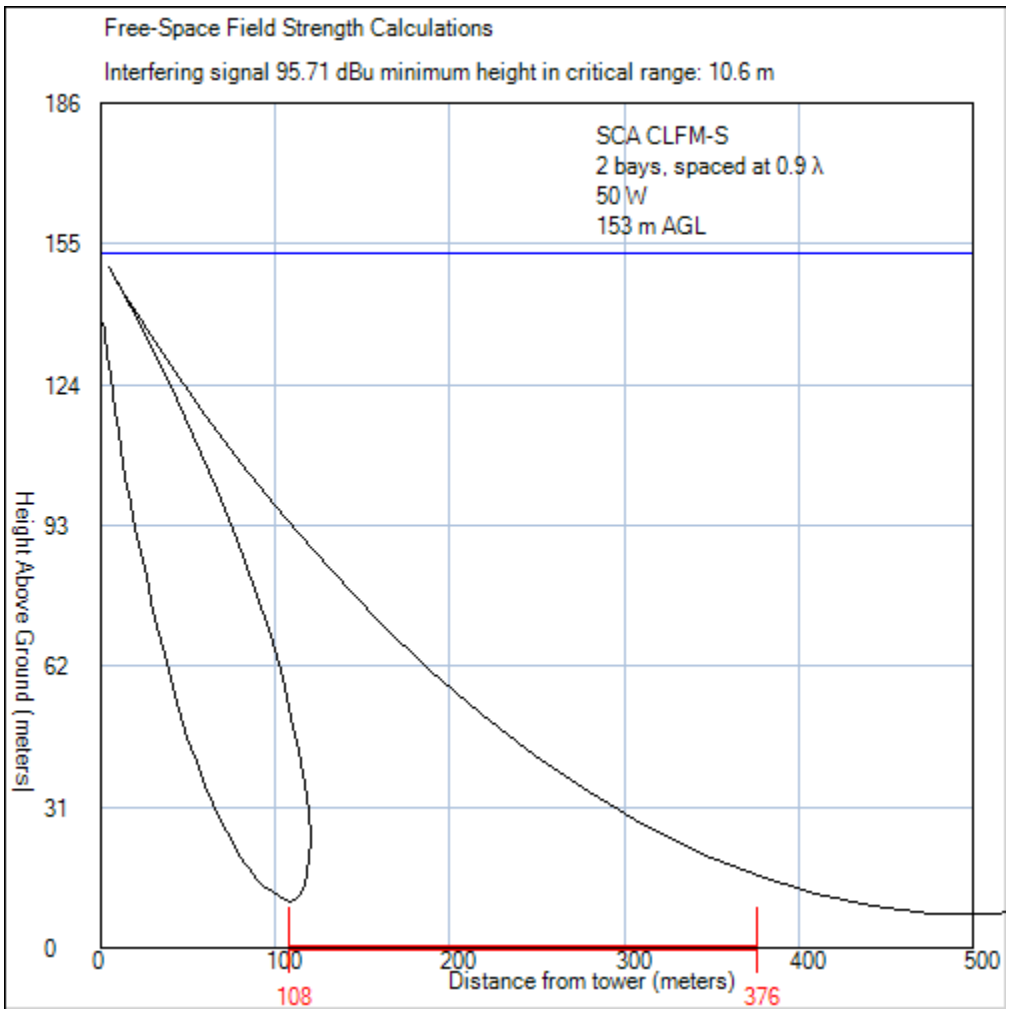
As shown in the table above, areas 1-3, 5-8, and 10 are more conservative with respect to compliance with §74.1204(d). Since Area 5 meets the requirement with a considerable margin, it is submitted that those areas also meet the requirement, and we only need to focus on Areas 4 and 9.

Area 4

The maximum ERP in this area is 50 W. The highest terrain in this area is 69 m, making the minimum height of the antenna above ground 153 m. The area extends from 108 to 376 m from the tower.



The maximum signal level anywhere in the area is 95.10 dBu, which is less than the interfering signal level of 95.71 dBu.



The interfering signal level of 95.71 dBu is at least 10.6 m above ground anywhere in this area.

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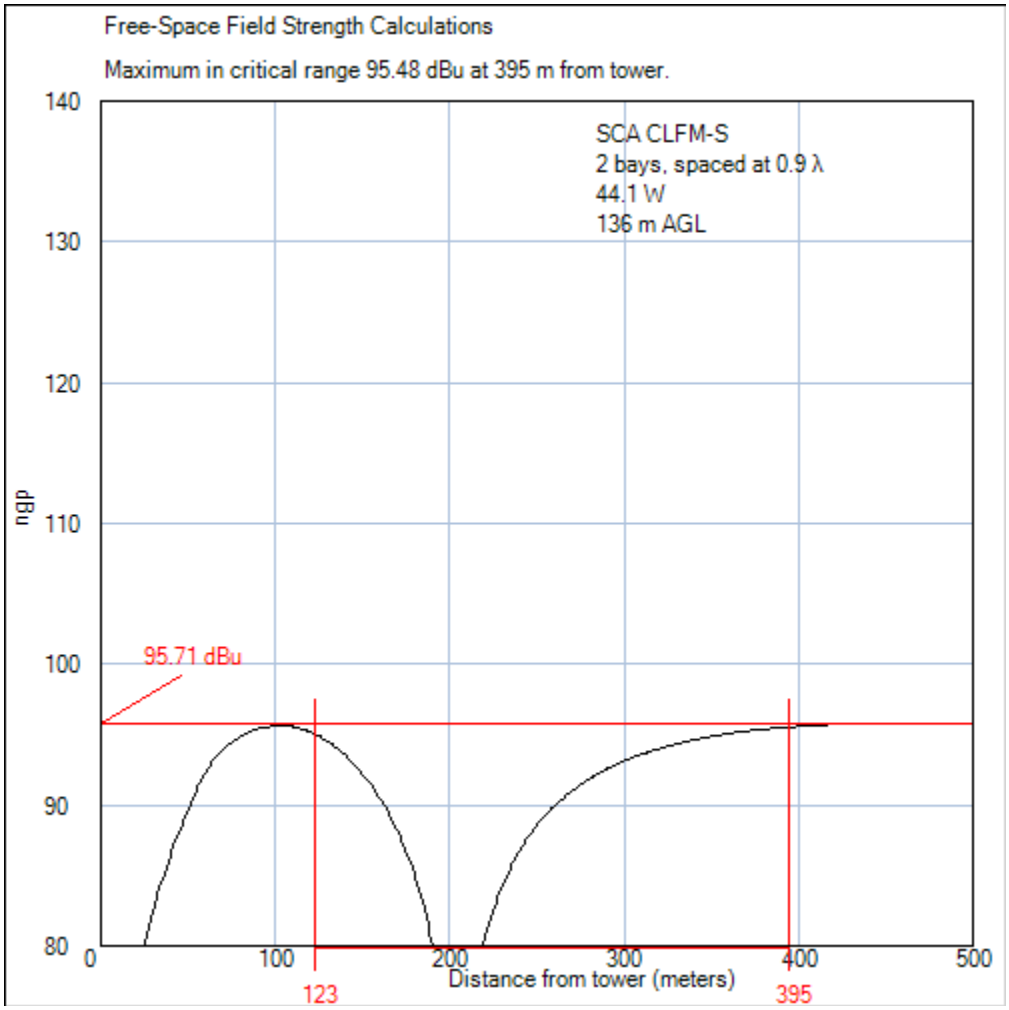
Area 9

The maximum ERP in this area is 44.1W. The highest terrain in this area is 86 m, making the minimum height of the antenna above ground 136 m. The area extends from 123 to 395 m from the tower.



The maximum signal level in the area is 95.48 dBu, which is less than the allowable interfering signal level of 95.71 dBu.

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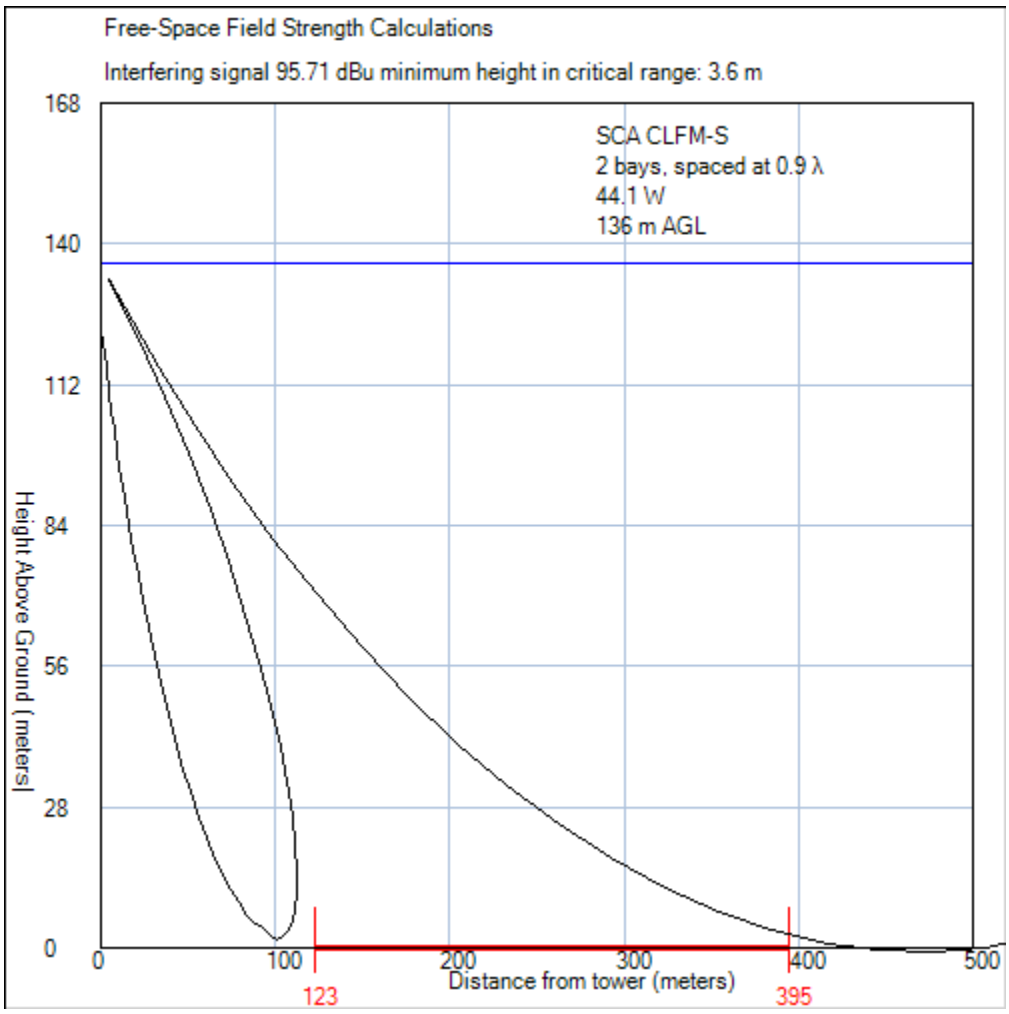

The interfering signal level of 55.71 dBu is at least 3.6 m above ground anywhere in this area.

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IF Separation requirements

There are no IF separation requirements with respect to translators with maximum ERP below 100 W.

Channel 6 Interference

The proposed facility is not on a channel that is implicated in channel 6 interference.

International

The FM Agreements with Canada and Mexico require evaluation and potential coordination of any proposal within 320 km of the border.

The distance to the nearest point along the US/Canada border is 357 km. Coordination with Canada is not required.

The distance to the nearest point along the US/Mexico border is 2,931 km. Coordination with Mexico is not required.

Quiet Zones

The proposed site is outside the National Radio Quiet Zone (National Radio Astronomy Observatory Notification Area) in West Virginia.

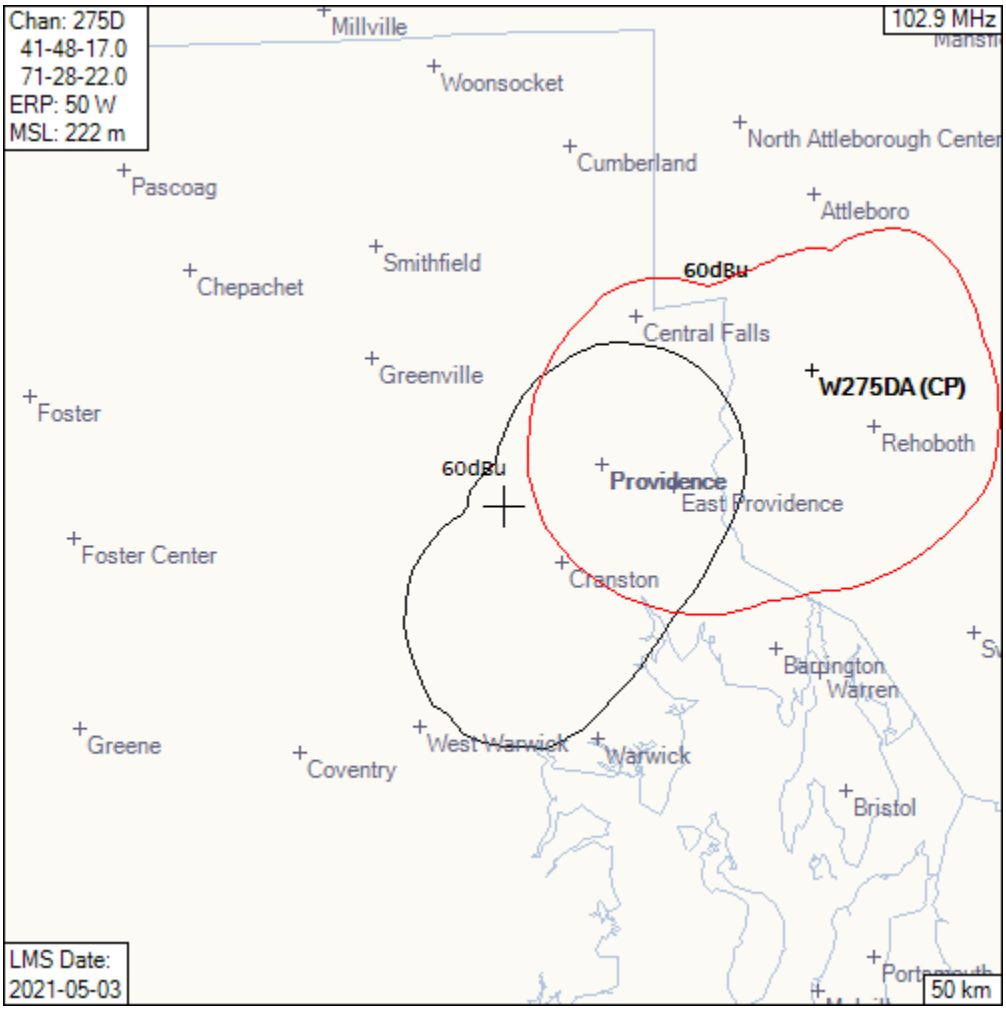
The proposed site is outside the Arecibo Observatory notification area in Puerto Rico.

The proposed site is not within a 100 km extension of the Table Mountain Radio Receiving Zone in Colorado.

Protected Monitoring Stations

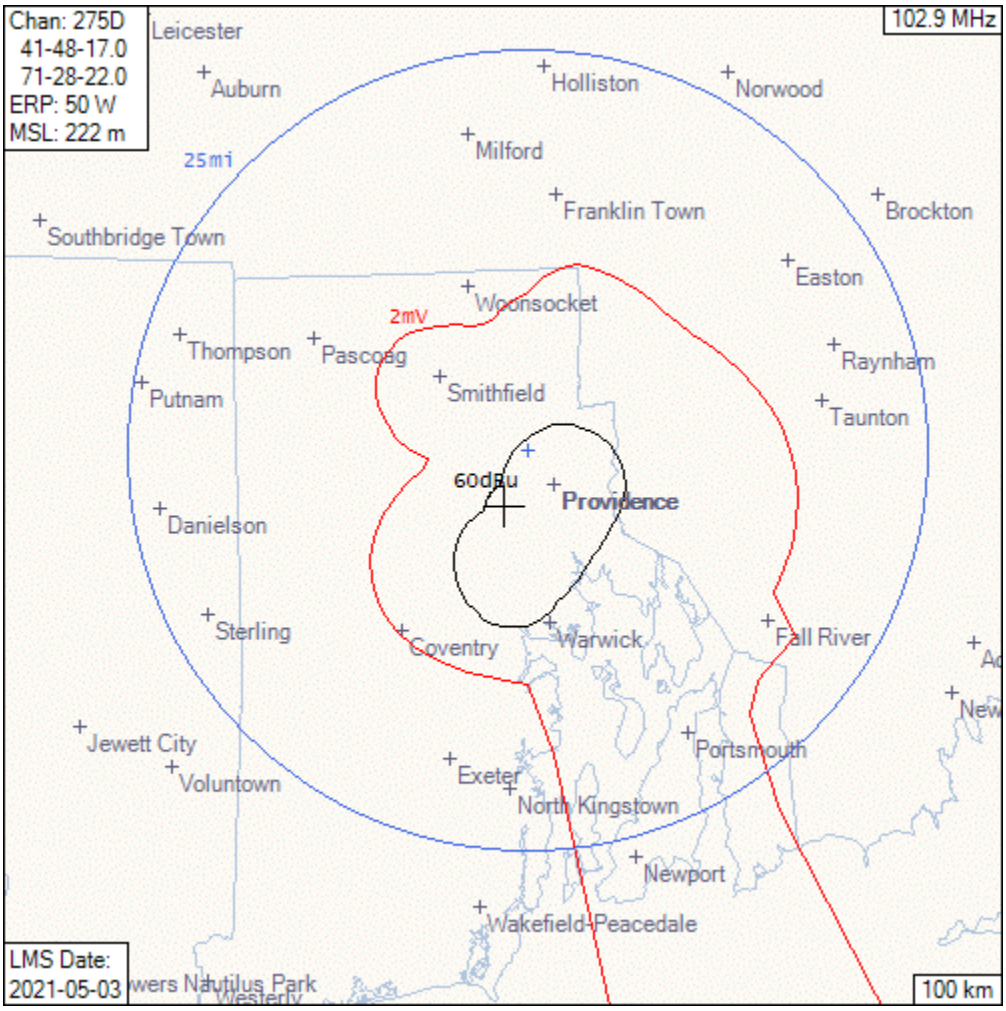
The nearest Protected Monitoring Station is 352 km distant, in Belfast, ME. This is well beyond any potential 80 dBu contour.

Minor Change



The 60 dBu f(50,50) contour of the existing Construction Permit is shown as a red polygon. The proposed 60 dBu f(50,50) contour is shown as a black polygon. The polygons intersect. No change in frequency is proposed. Therefore, the proposal qualifies as a minor change.

Fill-In Translator



The proposed primary station is WPVD, Providence, RI, FCC Facility ID # 48303.

The proposed 60 dBu f(50,50) contour is shown as a black polygon. The WPVD 2 mV/m contour is shown as a red polygon. The 25 mile circle around the WPVD transmitter is shown in blue.

The proposed 60 dBu f(50,50) contour falls entirely within the 25 mile circle and the 2 mV/m contour. The translator is commonly owned with the primary station. The proposal therefore qualifies as fill-in service.

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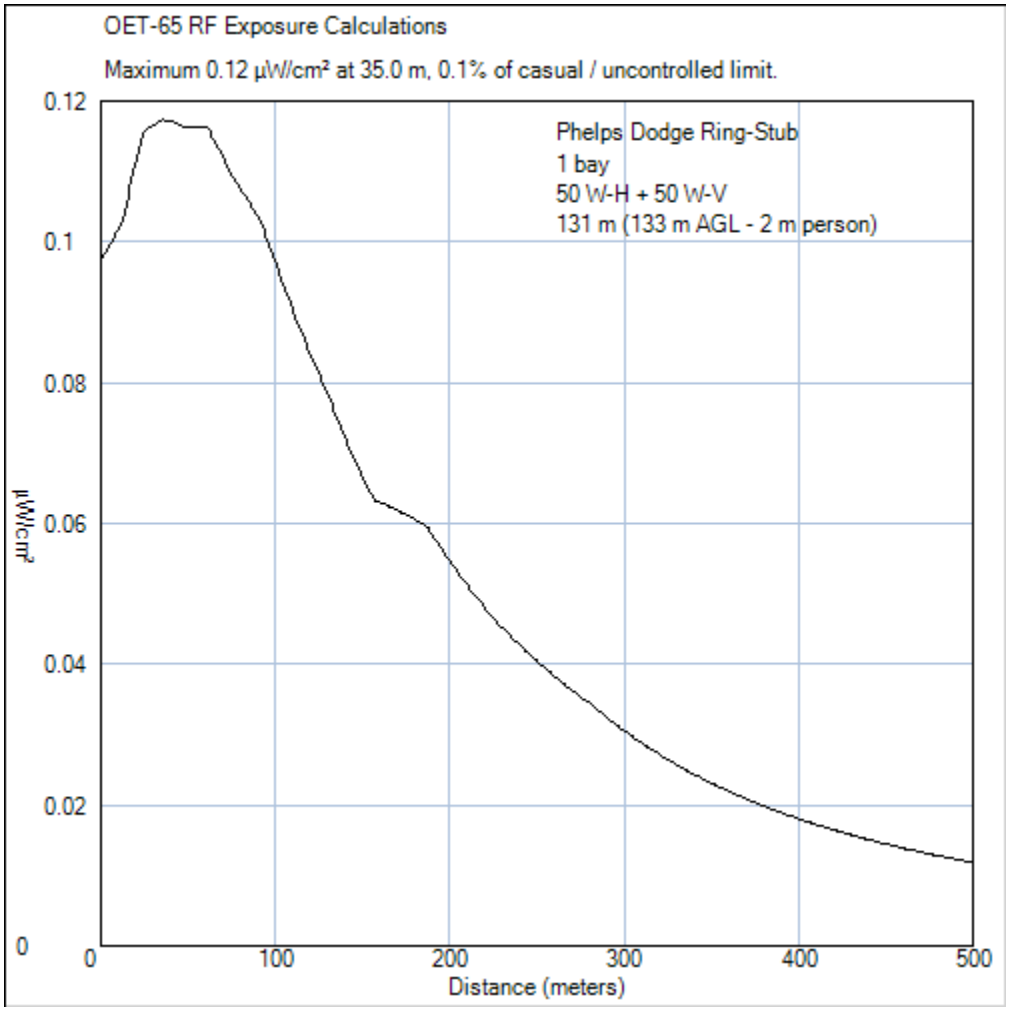
Environmental

The proposed site is an existing tower, ASR # 1021870. No construction, excavation, or increase to the height of the tower is proposed.

The proposed effective radiated power is 50 W-H + 50 W-V. The two-level antenna will be mounted 133 m above ground level. Assuming one bay of the worst-case OET Type 1 antenna model, the OET-65 algorithm returns a maximum exposure of 0.1% of the limit for casual / uncontrolled exposure:



Appropriate access controls and safety signage are provided. The applicant agrees to coordinate with other users of the site to reduce power or shut down in order to protect workers at the site.

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LMS Engineering Data

Channel	275	
Coordinates (NAD-83)	41 48 17.0 N Lat 71 28 22.0 W Lon	
ASR	1021870	
Overall Tower Height AGL	163.1 m	
Site Elevation AMSL	89.0 m	
Radiation Center AGL	133.0 m	
Effective Radiated Power	0.050 kW-H + 0.050 kW-V	
Antenna type	Directional	
Primary Station	Call Sign	WPVD
	Facility ID	48303
	City, State	Providence, RI
Delivery Method	Other (Terrestrial) or as appropriate	
Antenna		
Manufacturer	Scala	
Model	CLFM-S	
# Sections	2	
Section spacing	0.9λ	
Directional Pattern	See Attachment 1	

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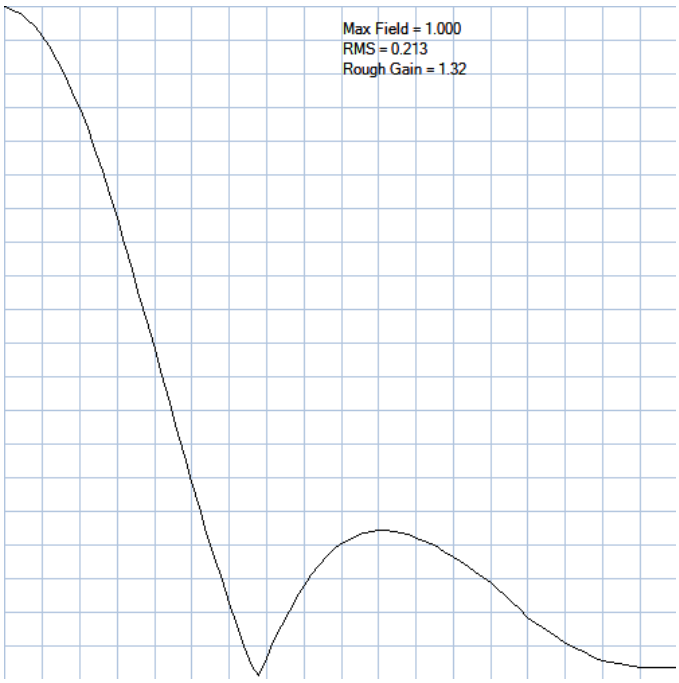
Attachment 1

Antenna Patterns

Vertical Plane Pattern

SCA CLFM-S						
Levels	2					
Spacing	0.90	λ				
d-Angle	eRel		d-Angle	eRel	d-Angle	eRel
0	1.000		30	0.114	60	0.183
1	0.996		31	0.082	61	0.177
2	0.990		32	0.051	62	0.169
3	0.981		33	0.021	63	0.162
4	0.971		34	0.007	64	0.153
5	0.957		35	0.034	65	0.145
6	0.940		36	0.059	66	0.135
7	0.921		37	0.082	67	0.125
8	0.900		38	0.104	68	0.115
9	0.876		39	0.123	69	0.104
10	0.851		40	0.142	70	0.093
11	0.821		41	0.158	71	0.086
12	0.790		42	0.172	72	0.078
13	0.757		43	0.184	73	0.071
14	0.722		44	0.194	74	0.063
15	0.687		45	0.203	75	0.055
16	0.649		46	0.210	76	0.050
17	0.611		47	0.216	77	0.044
18	0.572		48	0.220	78	0.039
19	0.532		49	0.222	79	0.034
20	0.493		50	0.223	80	0.028
21	0.453		51	0.223	81	0.026
22	0.413		52	0.222	82	0.024
23	0.373		53	0.220	83	0.023
24	0.334		54	0.216	84	0.021
25	0.295		55	0.211	85	0.019
26	0.257		56	0.207	86	0.019
27	0.220		57	0.202	87	0.019
28	0.183		58	0.196	88	0.019
29	0.148		59	0.190	89	0.019
30	0.114		60	0.183	90	0.019



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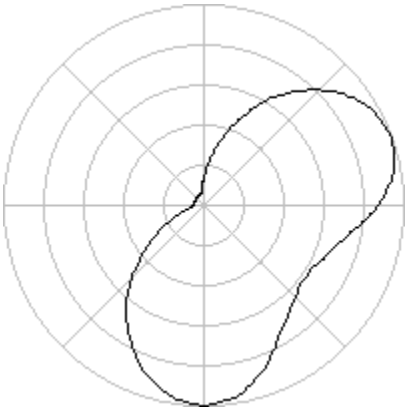
Horizontal Plane Pattern

Scala CLFM-S				
Skewed Array				
	Az	Power		
Element 1	70°	50%		
Element 2	180°	50%		
ROTATION = 0				
Azimuth	eRel		Azimuth	eRel
0	0.137		180	1.000
10	0.268		190	0.969
20	0.424		200	0.878
30	0.602		210	0.748
40	0.748		220	0.602
50	0.878		230	0.424
60	0.969		240	0.268
70	1.000		250	0.137
80	0.966		260	0.064
90	0.871		270	0.054
100	0.746		280	0.053
110	0.672		290	0.051
120	0.623		300	0.050
130	0.623		310	0.050
140	0.672		320	0.051
150	0.746		330	0.053
160	0.871		340	0.054
170	0.966		350	0.064



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