

FM Translator W229BH, Facility ID 81887  
February 2021 Application for Minor Modification  
**ENGINEERING EXHIBIT**

Sound of Life, Inc. requests a minor modification of FM Translator W229BH to change antenna location, antenna elevation, antenna type, and effective radiated power. The primary station (also licensed to Sound of Life) will be changed from WFGB(FM) to WLJP(FM). The proposed antenna will mount on an existing structure registered under FCC ASR Number 1003197 and will be shared with FM Translator W243EM, which now operates at that site. W243EM's existing antenna, a Shively model 6812-1R, will be removed and replaced with an American Amplifier Technologies broadband model IV-CP-BB-1 at the same elevation. Both antennas are single-bay circularly-polarized omnidirectional designs. A cavity filter combiner will provide isolation between transmitters. Following installation, measurements will be taken to confirm compliance with 47 CFR §74.1236, then the licensee of W243EM will notify the Audio Division of any change in transmitter power output required to maintain its licensed effective radiated power of 100 watts.

**Figure 1** is an FCC "FM Model" plot showing that the proposed facility, assuming a total ERP of 110 watts H and V from a single layer EPA Type 2 antenna, would produce a power density of  $0.156 \mu\text{W}/\text{cm}^2$  at two meters above ground level, a fraction of one percent of the applicable General Population/Uncontrolled guideline. In coordination with other users, applicant will reduce power or cease operation of W229BH as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

**Figure 2** shows that the proposed 60 dBu coverage contour overlaps that of the present facility and is within the authorized 60 dBu contour of WLJP.<sup>1</sup>

**Figure 3** demonstrates that all co-channel and 1st-adjacent FM stations will be fully protected from prohibited contour overlap.

**Figure 4** shows the proposed location of W229BH in relation to the service contours of 2nd-adjacent stations WBWZ and W231BP. The predicted field strength of WBWZ, Channel 227A at the proposed antenna site is 60.5 dBu and is the lesser of the two; therefore, the relevant interference contour is 100.5 dBu.

**Figure 5** is a detail of both 2nd-adjacent contours plotted on a topographic map, showing that the proposed 100.5 dBu free-space contour extends 209.4 meters in the horizontal plane -- however, field strength at ground level will be reduced. The following table, based on the antenna manufacturer's elevation pattern, demonstrates that the 100.5 dBu contour clears ground by at least 11.3 meters. This area is primarily low density residential, as shown in recent satellite photo **Figure 6**. Applicant believes this showing satisfies requirements of §74.1204(d) in accordance with the "Living Way" precedent.

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<sup>1</sup> WLJP Construction Permit BPED-20170414ADH, Application for License to Cover L2C-0000112485

Depression Angle ( Degrees)	Rel Field	ERP (kW)	ERP (dBk)	Slant Dist to Int (Meters)	Clearance Above Ground (Meters)
0	1.000	0.0100	-20.00	209.4	116.0
1	1.000	0.0100	-20.00	209.4	112.3
2	0.999	0.0100	-20.01	209.2	108.7
3	0.999	0.0100	-20.01	209.2	105.1
4	0.998	0.0100	-20.02	209.0	101.4
5	0.996	0.0099	-20.03	208.6	97.8
6	0.995	0.0099	-20.04	208.4	94.2
7	0.993	0.0099	-20.06	207.9	90.7
8	0.990	0.0098	-20.09	207.3	87.1
9	0.988	0.0098	-20.10	206.9	83.6
10	0.985	0.0097	-20.13	206.3	80.2
11	0.982	0.0096	-20.16	205.6	76.8
12	0.978	0.0096	-20.19	204.8	73.4
13	0.974	0.0095	-20.23	204.0	70.1
14	0.970	0.0094	-20.26	203.1	66.9
15	0.966	0.0093	-20.30	202.3	63.6
16	0.961	0.0092	-20.35	201.2	60.5
17	0.956	0.0091	-20.39	200.2	57.5
18	0.951	0.0090	-20.44	199.2	54.5
19	0.946	0.0089	-20.48	198.1	51.5
20	0.940	0.0088	-20.54	196.8	48.7
21	0.934	0.0087	-20.59	195.6	45.9
22	0.927	0.0086	-20.66	194.1	43.3
23	0.921	0.0085	-20.71	192.9	40.6
24	0.914	0.0084	-20.78	191.4	38.1
25	0.906	0.0082	-20.86	189.7	35.8
26	0.899	0.0081	-20.92	188.3	33.5
27	0.891	0.0079	-21.00	186.6	31.3
28	0.883	0.0078	-21.08	184.9	29.2
29	0.875	0.0077	-21.16	183.2	27.2
30	0.866	0.0075	-21.25	181.4	25.3
31	0.857	0.0073	-21.34	179.5	23.6
32	0.848	0.0072	-21.43	177.6	21.9
33	0.839	0.0070	-21.52	175.7	20.3
34	0.829	0.0069	-21.63	173.6	18.9
35	0.819	0.0067	-21.73	171.5	17.6
36	0.809	0.0065	-21.84	169.4	16.4
37	0.799	0.0064	-21.95	167.3	15.3
38	0.788	0.0062	-22.07	165.0	14.4
39	0.777	0.0060	-22.19	162.7	13.6
40	0.766	0.0059	-22.32	160.4	12.9
41	0.755	0.0057	-22.44	158.1	12.3
42	0.743	0.0055	-22.58	155.6	11.9
43	0.731	0.0053	-22.72	153.1	11.6
44	0.719	0.0052	-22.87	150.6	11.4
45	0.707	0.0050	-23.01	148.1	11.3
46	0.695	0.0048	-23.16	145.5	11.3
47	0.682	0.0047	-23.32	142.8	11.5

48	0.669	0.0045	-23.49	140.1	11.9
49	0.656	0.0043	-23.66	137.4	12.3
50	0.643	0.0041	-23.84	134.7	12.9
51	0.629	0.0040	-24.03	131.7	13.6
52	0.616	0.0038	-24.21	129.0	14.3
53	0.602	0.0036	-24.41	126.1	15.3
54	0.588	0.0035	-24.61	123.1	16.4
55	0.574	0.0033	-24.82	120.2	17.5
56	0.559	0.0031	-25.05	117.1	19.0
57	0.545	0.0030	-25.27	114.1	20.3
58	0.530	0.0028	-25.51	111.0	21.9
59	0.515	0.0027	-25.76	107.8	23.6
60	0.500	0.0025	-26.02	104.7	25.3
61	0.485	0.0024	-26.29	101.6	27.2
62	0.469	0.0022	-26.58	98.2	29.3
63	0.454	0.0021	-26.86	95.1	31.3
64	0.438	0.0019	-27.17	91.7	33.6
65	0.423	0.0018	-27.47	88.6	35.7
66	0.407	0.0017	-27.81	85.2	38.1
67	0.391	0.0015	-28.16	81.9	40.6
68	0.375	0.0014	-28.52	78.5	43.2
69	0.358	0.0013	-28.92	75.0	46.0
70	0.342	0.0012	-29.32	71.6	48.7
75	0.259	0.0007	-31.73	54.2	63.6
80	0.174	0.0003	-35.19	36.4	80.1
85	0.087	0.0001	-41.21	18.2	97.9

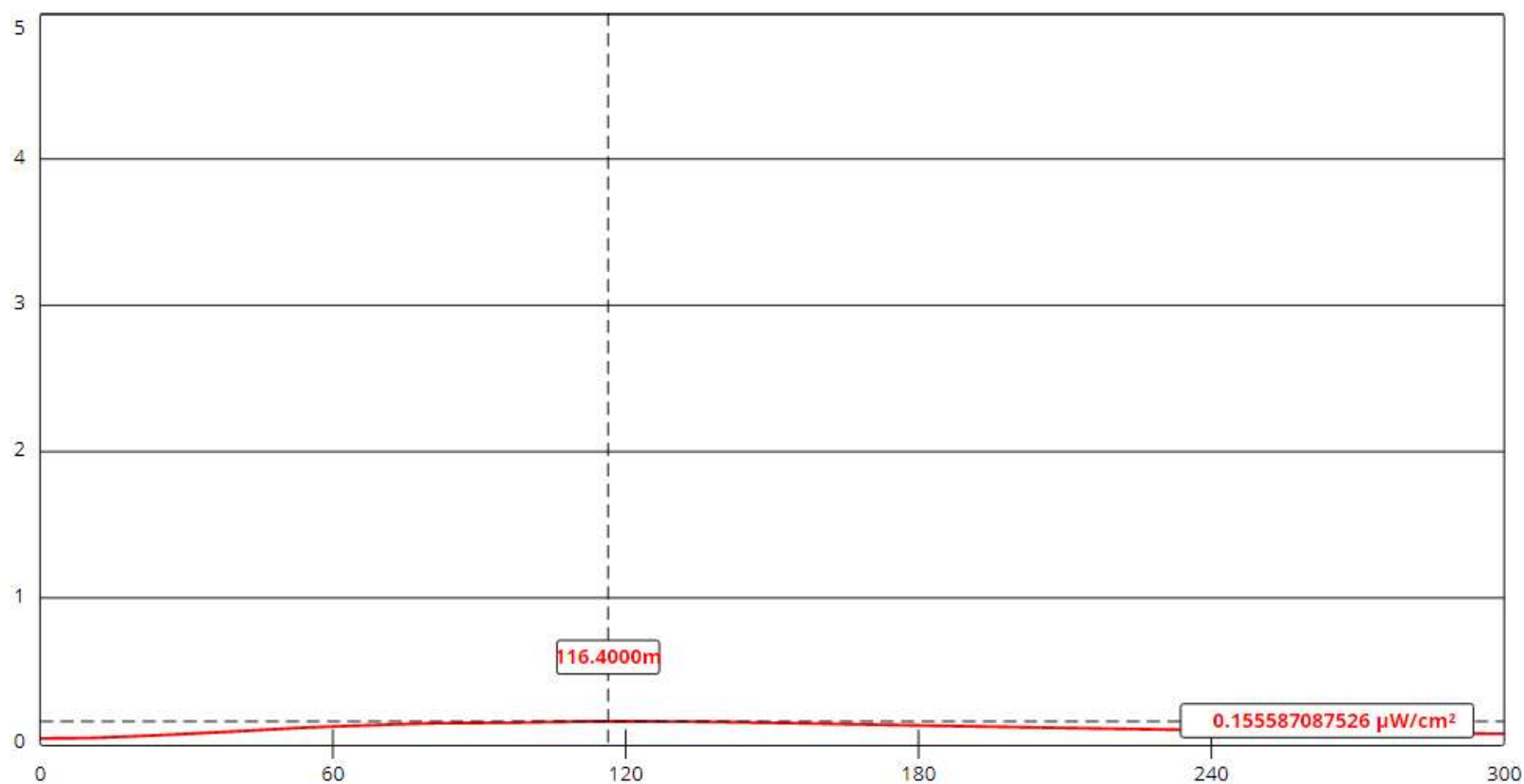
# 1-Bay Elevation (Vertical) Pattern

Elevation Pattern



Degree	Relative Field	Degree	Relative Field	Degree	Relative Field	Degree	Relative Field	Degree	Relative Field
-10	0.985	11	0.982	32	0.848	53	0.602	74	0.276
-9	0.988	12	0.978	33	0.839	54	0.588	75	0.259
-8	0.99	13	0.974	34	0.829	55	0.574	76	0.242
-7	0.993	14	0.97	35	0.819	56	0.559	77	0.225
-6	0.995	15	0.966	36	0.809	57	0.545	78	0.208
-5	0.996	16	0.961	37	0.799	58	0.53	79	0.191
-4	0.998	17	0.956	38	0.788	59	0.515	80	0.174
-3	0.999	18	0.951	39	0.777	60	0.5	81	0.156
-2	0.999	19	0.946	40	0.766	61	0.485	82	0.139
-1	1	20	0.94	41	0.755	62	0.469	83	0.122
0	1	21	0.934	42	0.743	63	0.454	84	0.105
1	1	22	0.927	43	0.731	64	0.438	85	0.087
2	0.999	23	0.921	44	0.719	65	0.423	86	0.07
3	0.999	24	0.914	45	0.707	66	0.407	87	0.052
4	0.998	25	0.906	46	0.695	67	0.391	88	0.035
5	0.996	26	0.899	47	0.682	68	0.375	89	0.017
6	0.995	27	0.891	48	0.669	69	0.358	90	0
7	0.993	28	0.883	49	0.656	70	0.342		
8	0.99	29	0.875	50	0.643	71	0.326		
9	0.988	30	0.866	51	0.629	72	0.309		
10	0.985	31	0.857	52	0.616	73	0.292		

Figure 1 -- RF Power Density Plot



[View Tabular Results +](#)

Channel Selection	Channel 229 (93.7 MHz) ▼		
Antenna Type +	EPA Type 2: Opposed V Dipole ▼		
Height (m)	<input type="text" value="116"/>	Distance (m)	<input type="text" value="300"/>
ERP-H (W)	<input type="text" value="110"/>	ERP-V (W)	<input type="text" value="110"/>
Num of Elements	<input type="text" value="1"/>	Element Spacing (λ)	<input type="text" value="1"/>
Num of Points	<input type="text" value="500"/>	<input type="button" value="Apply"/>	

Figure 2  
Proposed Coverage Contour

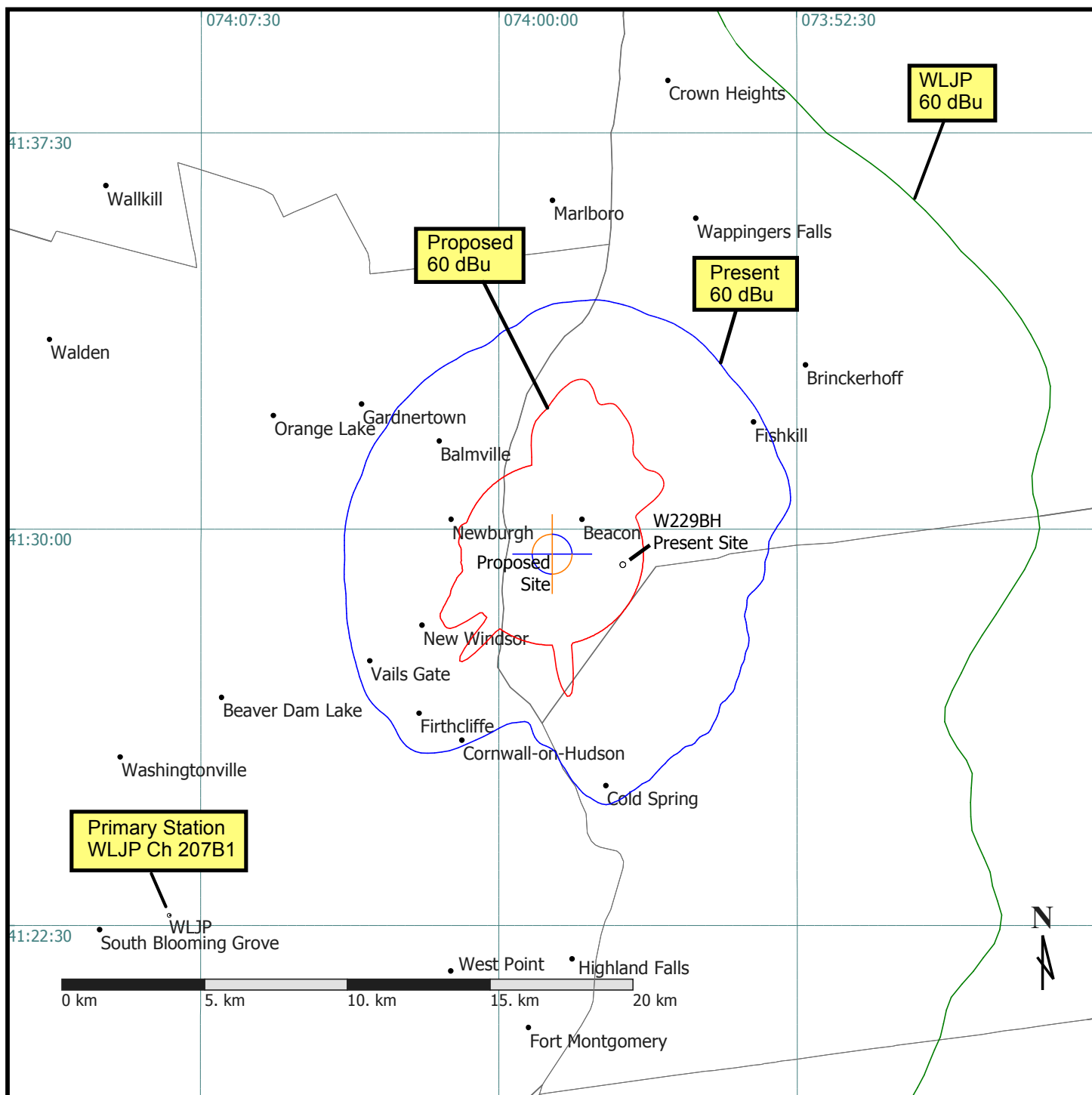


Figure 3  
Co-Channel and 1st-Adjacent Contour Protection

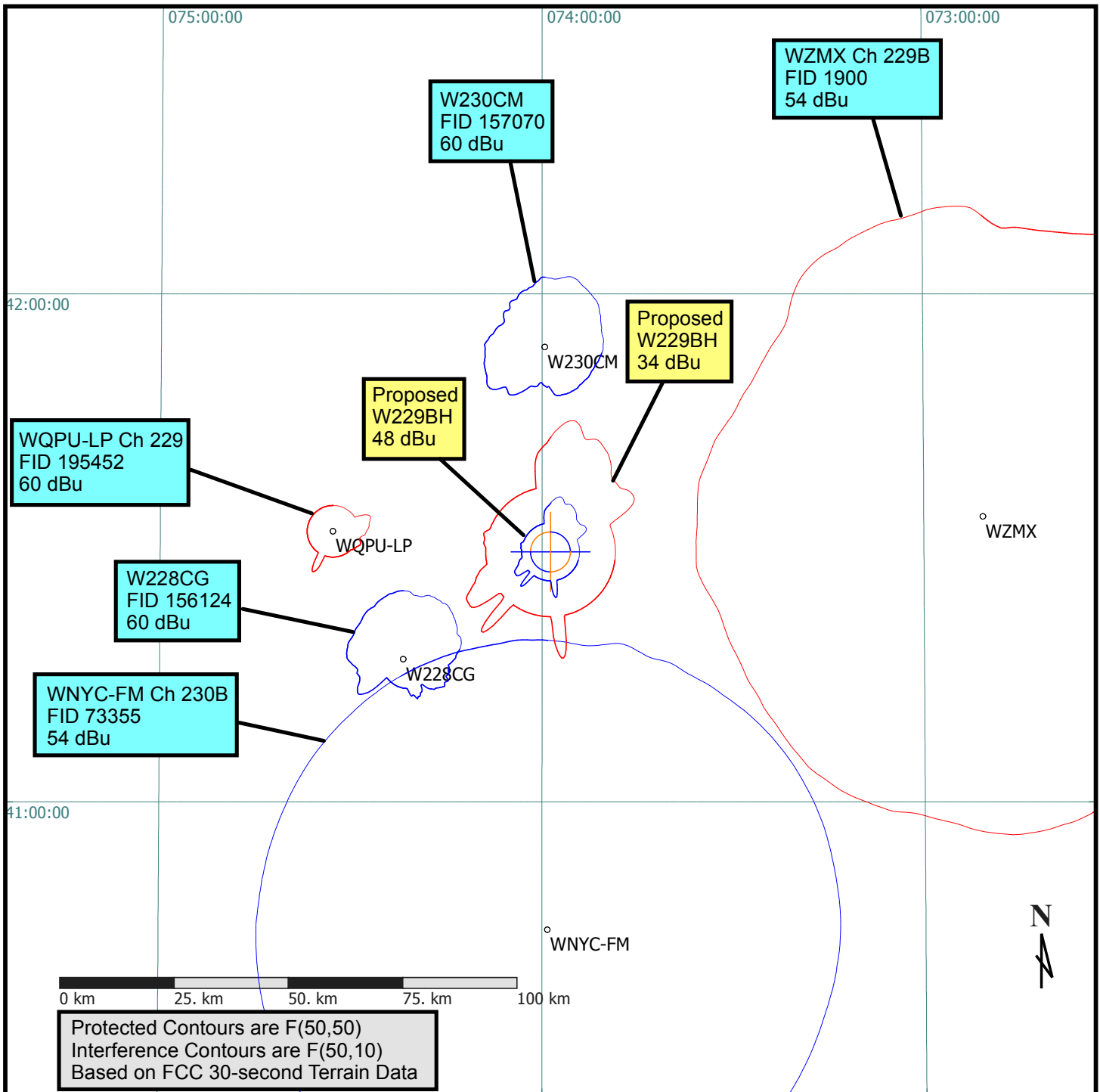
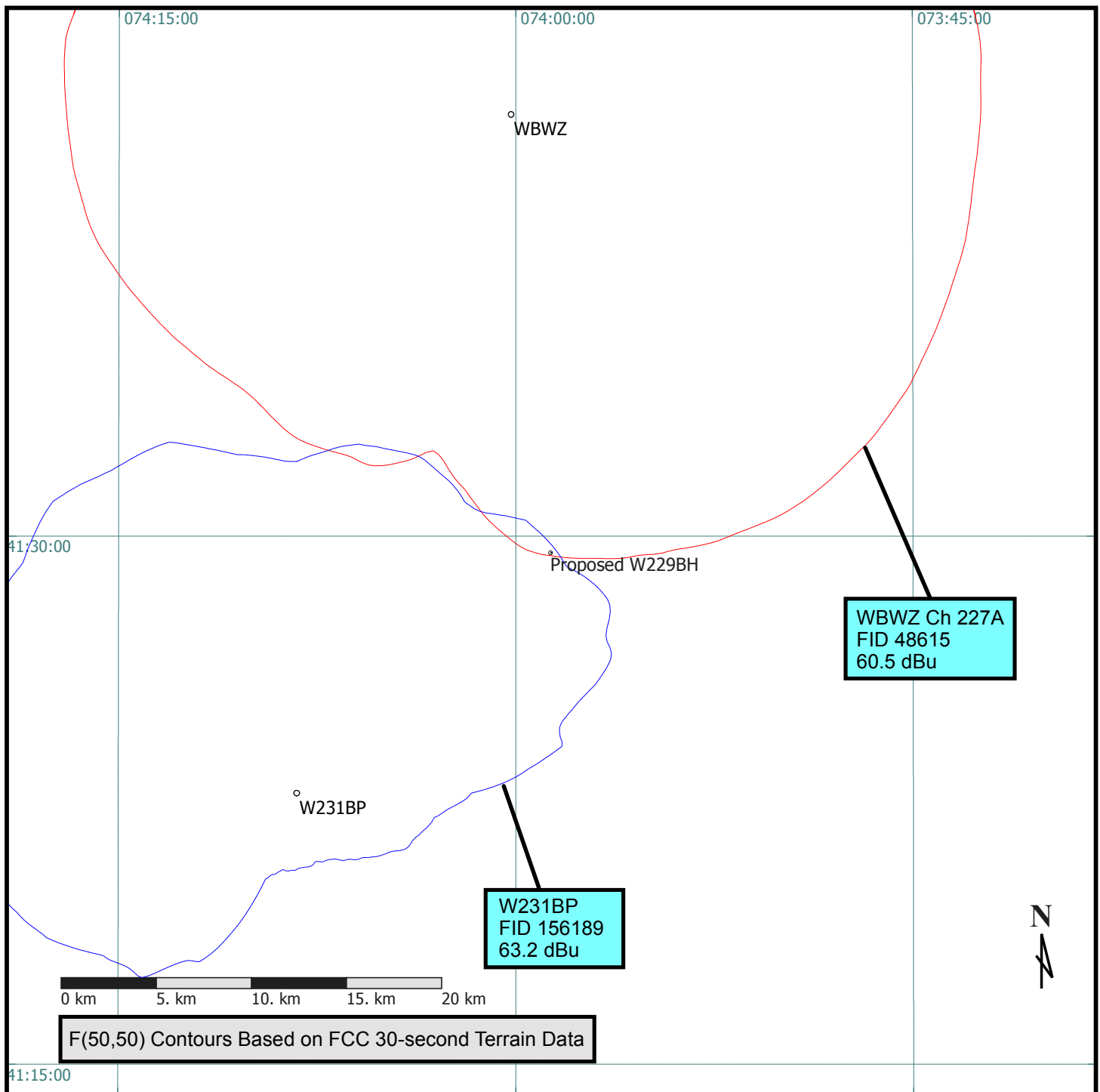


Figure 4  
2nd-Adjacent Contours at Proposed Site





**Figure 5**  
**2nd-Adjacent Interference Detail**

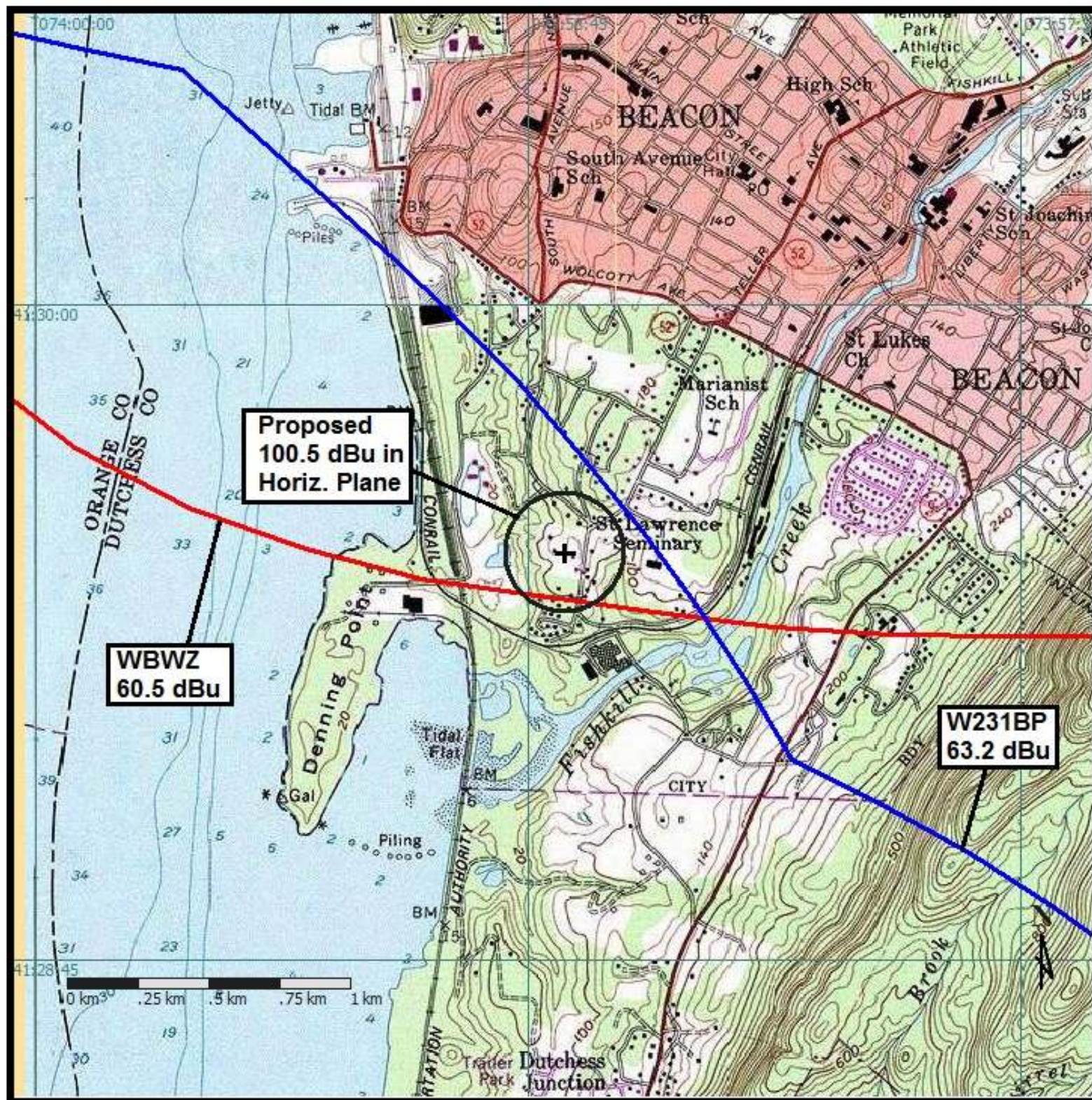
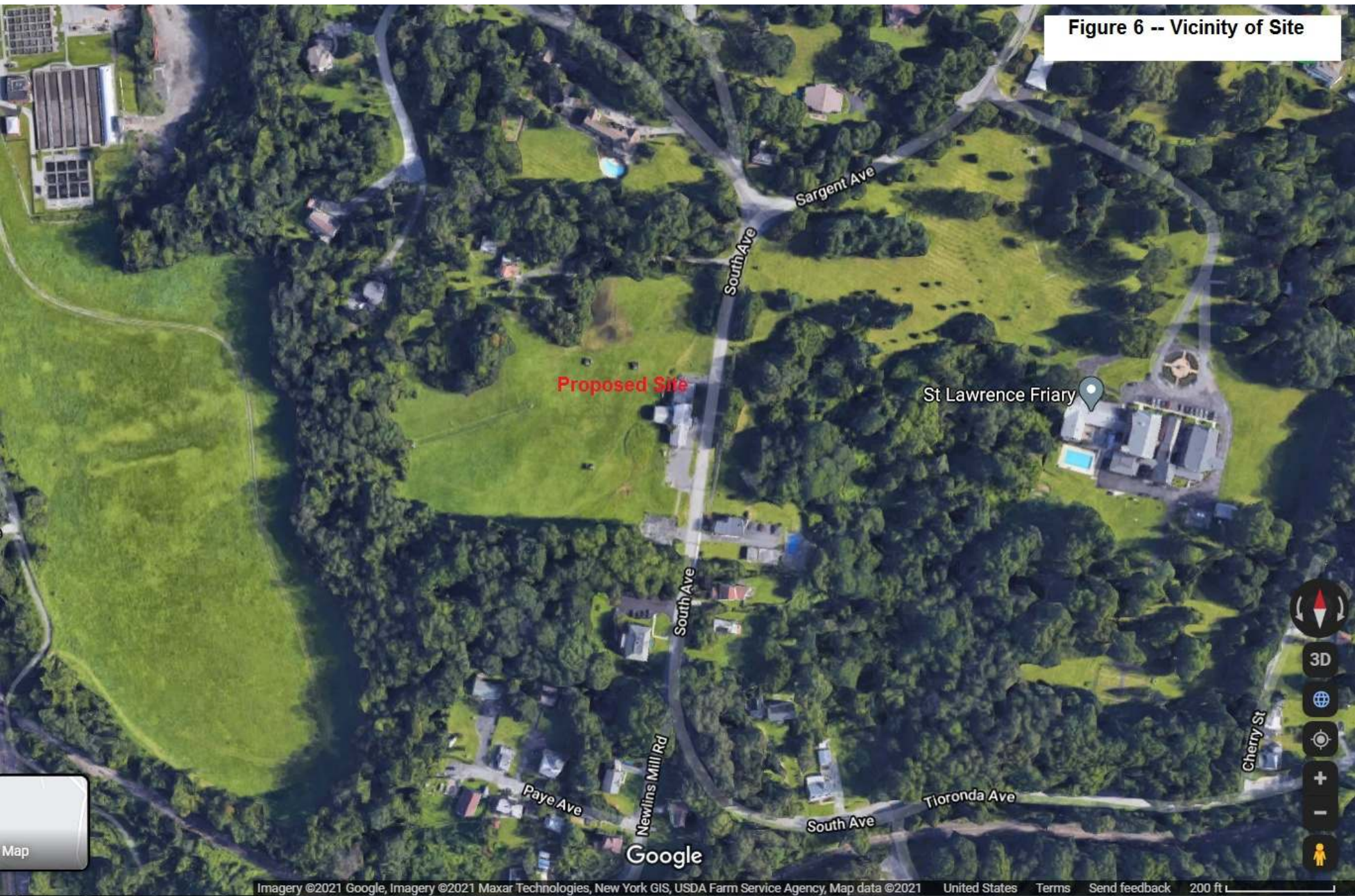




Figure 6 -- Vicinity of Site



Map