

Engineering Exhibit Long Form Application BNPFT-20180130AGQ Facility ID No. 202574

This exhibit is for Long Form 349 Application of Facility ID No. 202574, BNPFT-20180130AGQ. It specifies no material changes from the short form.

Antenna Location

The proposed antenna is to be mounted on an existing support tower identified by registration number 1271509 at 50 meters above ground, having a horizontal plane azimuth gain pattern as given in **Figure 0** below. Below as **Figure 1** is an overlap and spacing study from which it can be determined that this proposal is within the licensed and permitted protected contour of **second** adjacent channel stations WNNK-FM and WARM-FM.

73.1204 Compliance

We will demonstrate that a lack of population and/or other factors allow this proposal to be compliant with 74.1204. The process commonly called “Living Way”, allows for the use of D/U Analysis, also known as “signal strength ratio methodology” to be utilized to demonstrate compliance. In this instant case the facility to be protected is on a second or third adjacent channel and is to be afforded protection from signals 40 dB stronger than the protected facility presents near the proposed translator antenna location.

Concerning WARM-FM; In **Figure 2** a map showing the predicted 71.9 dBu signal contour of the protected WNNK facilities at the proposed translator antenna location is given. This proposal can only cause predicted interference to the protected facility by having a signal exceeding 111.9 dBu ($71.3 + 40$) in a habitable/populated area. Utilizing the line of sight equation shown in **Figure 3** which considers the vertical elevation pattern of the proposed antenna, it has been determined that a 111.9 dBu signal developed by 170 watts, as proposed, emitted by the proposed antenna mounted 50 meters above ground, will not reach elevated habitable areas or ground level. With examination of the image in **Figure 4** it can be determined that no habitable space extends into the confines of this contour.

Concerning WNNK-FM; In **Figure 2** a map showing the predicted 83.5 dBu signal contour of the protected WNNK-FM facility at the proposed translator antenna location is given. As this is a higher signal level than WARM-FM, protection is assured to this instant facility.

Thus the provisions of the rules section concerning prohibited overlap will not apply as it has been demonstrated that no actual interference will occur due to a lack of population and other factors as applied in this instant proposal.

Fill-in and Minor Change Status

This proposal is to serve as a fill-in translator for station WHP, Facility ID 15322, Harrisburg, PA. The map of **Figure 5** demonstrates that the proposed 60 dBu contour is contained within that of the 2 mV/m of that facility.

As there is no change in location the short and long from facility are considered to have the required service contour overlap.

RF Fields Statement

The proposed facilities were evaluated in terms of potential radio frequency radiation exposure at ground level in accordance with OET Bulletin No. 65, "Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radio frequency Radiation."

The antenna system is an ERI "100A", 2- element; half-wave spaced antenna mounted 50 meters above ground. For purposes of this analysis the FM Model web app has been set to calculate values for a "Ring and Stub or "other"" type of antenna element array, operated with an effective radiated power of 0.170 Kilowatts in both the horizontal and vertical. At 2 meters above the surface, at 75.7 meters from the base of the tower, this proposal will contribute worst case, 0.6 microwatts per square centimeter, or 0.06 percent of the allowable ANSI limit for controlled exposure, and 0.12 percent of the allowable limit for uncontrolled exposure.

This figure is less than 5% of the applicable FCC exposure limit at all locations extending out from the base of the tower. Section 1.1307(b)(3) excludes applications when the calculated level is predicted to be less than 5% of the applicable exposure limit. It is therefore believed that this proposal is in compliance with OET Bulletin Number 65 as required by the Federal Communications Commission.

Further, the applicant will see that signs are posted in the vicinity of the tower, warning of potential radio frequency hazards at the site. The site itself is restricted from public access. The applicant will cooperate with other users of the tower to reduce power of the facility, or discontinue operation, as necessary to limit human exposure to levels less than specified by the Federal Communications Commission should anyone be required to climb the tower for maintenance or inspection..

Figure 0. Antenna Pattern

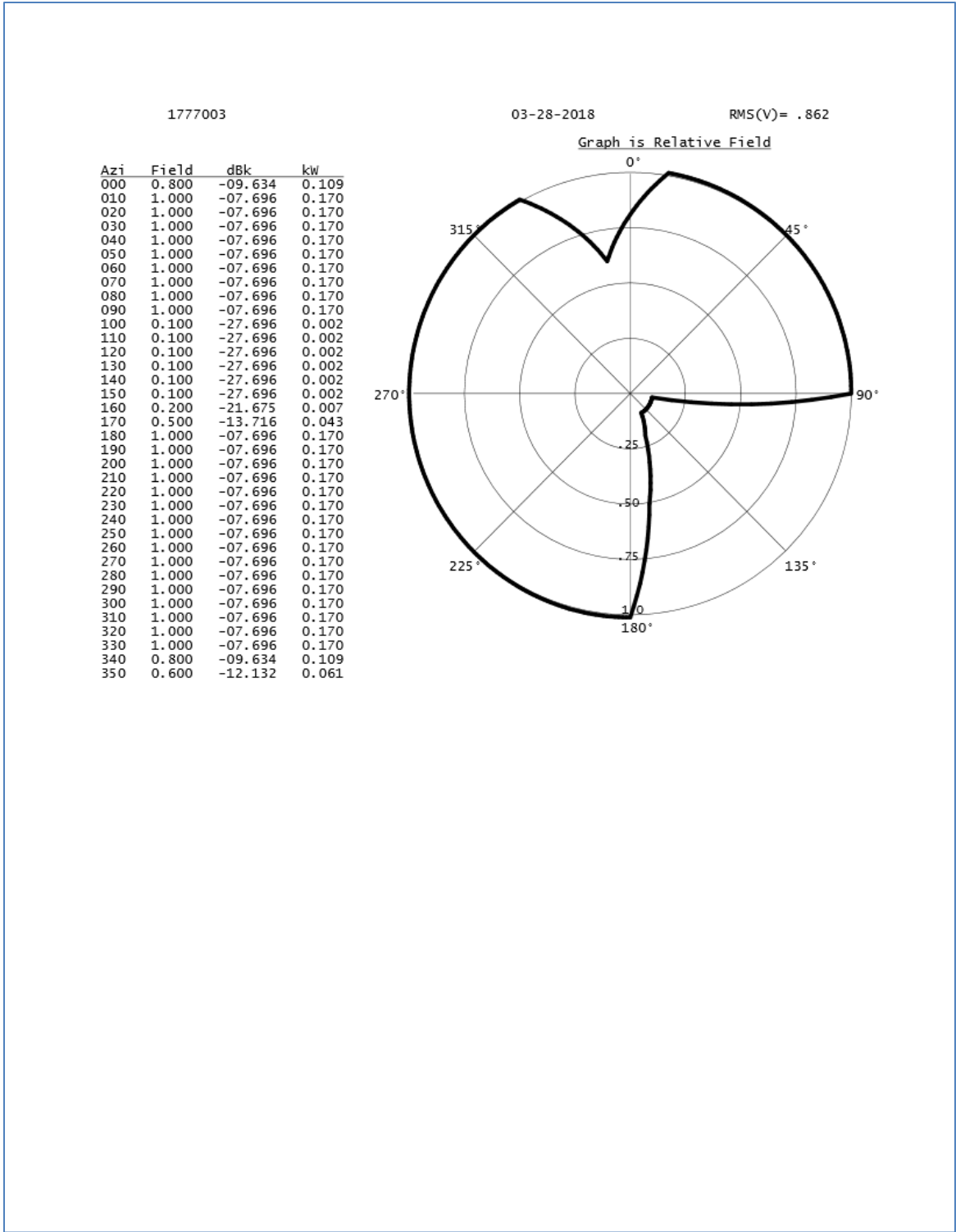


Figure 1. Overlap and Spacing Study

Long Form for 202574 Clear Channel Broadcasting Licenses, Inc.										
REFERENCE 40 11 30.3 N. 76 52 05.1 W.		CH# 279D - 103.7 MHz, Pwr= 0.17 kW DA, HAAT= 0.0 M, COR= 379 M Average Protected F(50-50)= 6.44 km Standard Directional						DISPLAY DATES DATA 03-28-18 SEARCH 03-28-18		
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*
279D	1777003 Harrisburg	APP DC_ PA	0.0 0.0	0.00 BNPFT20180130AGQ	40 11 30.3 76 52 05.1	0.170	0.00 379	0.00 Clear Channel Broadcasting	64.5R	-64.5M
281B	WNNK-FM Harrisburg	LIC _CX PA	333.1 153.0	15.54 BMLH20050804ADH	40 18 59.0 76 57 04.0	22.500 221	6.0 379	66.6 Cumulus Licensing Llc	-8.3*	-52.6*
279B	WXXY Havre De Grace	CP ZCX MD	137.2 317.7	94.53 BPH20160309ABL	39 33 55.0 76 07 08.0	39.000 168	130.4 221	60.7 Delmarva Broadcasting Comp	-41.2*	6.9
279B	WXXY Havre De Grace	LIC DCX MD	136.6 317.1	95.58 BLH20021015ABT	39 33 52.0 76 06 07.0	37.000 168	128.6 217	60.5 Delmarva Broadcasting Comp	-38.4*	8.1
277B	WARM-FM York	LIC _CN PA	128.7 308.8	29.22 BLH19860519KG	40 01 38.0 76 36 00.0	6.400 398	4.7 533	66.6 Radio License Holding Src	19.2	-37.5*
279A	WOCR Lewisburg	LIC NCN PA	346.6 166.4	89.81 BLH19971203KC	40 58 38.0 77 07 00.0	0.950 244	93.3 600	34.9 Backyard Broadcasting Pa,	-19.6*	2.3
279A	WEE0-FM McConnellsburg	LIC NCN PA	252.5 71.8	97.22 BLH19970612KA	39 55 25.0 77 57 20.0	0.135 474	72.5 774	23.1 Magnum Broadcasting, Inc.	6.2	16.0
279D	W279CB Reading	LIC DC_ PA	77.3 257.9	84.15 BLFT20120727ACQ	40 21 15.6 75 53 57.0	0.006 240	27.3 378	8.1 wdac Radio Company	37.6	16.1
279D	W279BS Hamburg	LIC DE_ PA	60.0 240.6	91.00 BLFT20071207ACR	40 35 50.0 75 56 04.0	0.200 299	49.2 496	14.8 Four Rivers Community Broa	22.5	16.1
282B	WZFT Baltimore	LIC ZCX MD	168.8 349.0	96.94 BLH20090123AAG	39 20 10.0 76 38 59.0	13.000 294	4.2 378	56.8 Citicasters Licenses, Inc.	80.8	39.3
279D	W279DK State College	CP _C_ PA	310.1 129.5	107.11 BNPFT20171205AAV	40 48 32.0 77 50 28.0	0.250	23.8 386	7.1 Fm Radio Licenses, Llc	64.5	41.1
280A	WTLF Braddock Heights	LIC _CX MD	213.7 33.3	96.96 BMLH20161214AAC	39 27 53.0 77 29 43.0	0.350 292	38.7 499	25.6 Washington Dc Fcc License	42.8	48.1
278A	WMMZ Berwick	LIC _CN PA	26.4 206.8	111.22 BLH19970801KG	41 05 11.0 76 16 41.0	4.100 118	48.6 379	32.3 Columbia Fm, Inc.	44.0	51.3
278A	WMMZ Berwick	CP _CX PA	27.2 207.6	115.48 BPH20170227ACA	41 06 50.2 76 14 16.7	1.050 239	49.1 517	32.6 Columbia Fm, Inc.	47.7	55.3
278A	WHUN-FM Huntingdon	LIC _CN PA	288.0 107.2	112.47 BLH19890224KD	40 29 51.0 78 08 00.0	0.160 435	41.0 767	26.4 Southern Belle, Llc	52.7	58.1
278B	WTOP-FM Washington	LIC DC_ DC	187.9 7.8	140.92 BMLH20110215ABQ	38 56 10.0 77 05 33.0	44.000 158	59.7 228	51.8 Washington Dc Fcc License	64.3	53.6
279D	W260BD Red Hill	CP DE_ PA	81.6 262.5	120.73 BPFT20160129AOQ	40 20 33.0 75 27 31.0	0.030	18.6 178	5.6 Four Rivers Community Broa	82.8	54.9
281B	WAEB-FM Allentown	LIC _CN PA	61.0 241.8	122.64 BLH7006	40 43 13.0 75 35 44.0	50.000 152	5.7 353	63.3 Capstar TX, Llc	97.6	57.7
280D	W282AP Bloomsburg	CP DC_ PA	20.4 200.6	97.90 BPFT20171215AAI	41 01 00.0 76 27 44.0	0.250	11.4 279	8.0 Columbia Fm, Inc.	67.7	62.1
278D	W278BR Pottstown	LIC DC_ PA	84.5 265.3	105.59 BLFT20141103AAY	40 16 35.0 75 37 44.0	0.200 51	13.2 158	9.5 Four Rivers Community Broa	73.0	67.5
276A	WAPY State College	LIC _CN PA	310.0 129.5	97.48 BLH19980911KD	40 45 09.0 77 45 15.0	0.370 398	1.3 819	29.0 Fm Radio Licenses, Llc	77.3	67.6
276A	WAFY Middletown	LIC _CN MD	212.3 31.9	101.58 BLH19900514KB	39 25 05.0 77 30 03.0	1.000 174	1.9 355	26.0 Manning Broadcasting Inc.	84.2	74.7
282D	1779788 Hagerstown	APP _C_ MD	231.7 51.2	93.49 BNPFT20180315AAD	39 40 04.0 77 43 33.0	0.250	1.1 233	8.1 Hagerstown Broadcasting Co	75.2	84.5
282D	1761275 Hagerstown	APP _C_ MD	231.7 51.2	93.49 BNPFT20170731ADK	39 40 04.0 77 43 33.0	0.250	1.1 233	8.1 Hagerstown Broadcasting Co	75.2	84.5
282D	W282CO Bloomsburg	CP DC_ PA	20.4 200.6	97.90 BNPFT20171215AAN	41 01 00.0 76 27 44.0	0.250	1.1 283	9.2 Columbia Broadcasting Comp	78.1	87.7

Figure 2. Contour Map

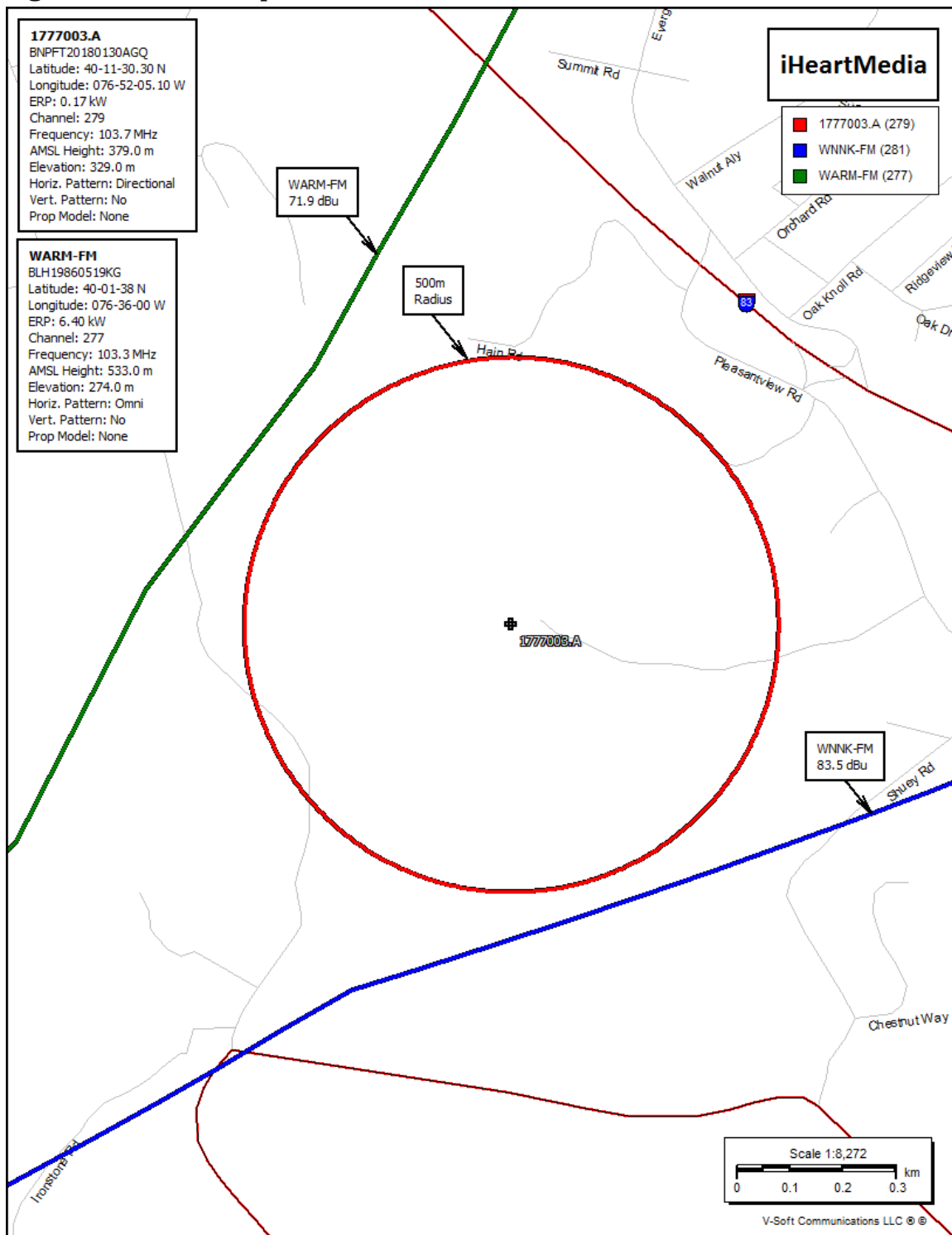


Figure 3. Signal Level at or Near Ground Level

Proposed Antenna: ERI 100A-4F-HW Proposed Power: 0.17 kW Antenna Height AGL: 50 meters Interference Contour: 111.9 dBu f(50:10) Artificial Rcv Antenna Height: 2 meters Distance (Free Space) Equation: $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]) / 20)}) * 1000$ Field Strength (dBu) Equation: $= 106.92 - (20 * (\text{LOG10}[\text{DistMeters} / 1000])) + [\text{ERP in dBk}]$								
Depression				Distance				
Angle	Antenna			from Ant.	Distance	Field Strength	Distance	Field Strength
Below	Relative	ERP	ERP	to Interf	from Ant. to	in dBu @	from Ant.	in dBu @
Horizon	Field	in kW	in dBk	Contour	Artificial Plane	Artificial Plane	to Ground Level	Ground Level
0°	1.000	0.170	-7.70	232.39 m	infinite	---	infinite	---
-5°	0.951	0.154	-8.13	221.01 m	550.74 m	103.97 dBu	573.69 m	103.61 dBu
-10°	0.841	0.120	-9.20	195.44 m	276.42 m	108.89 dBu	287.94 m	108.53 dBu
-15°	0.615	0.064	-11.92	142.92 m	185.46 m	109.64 dBu	193.19 m	109.28 dBu
-20°	0.391	0.026	-15.85	90.87 m	140.34 m	108.12 dBu	146.19 m	107.77 dBu
-25°	0.178	0.005	-22.69	41.37 m	113.58 m	103.13 dBu	118.31 m	102.77 dBu
-30°	0.004	0.000	-55.65	0.93 m	96.00 m	71.62 dBu	100.00 m	71.27 dBu
-35°	0.117	0.002	-26.33	27.19 m	83.69 m	102.14 dBu	87.17 m	101.78 dBu
-40°	0.182	0.006	-22.49	42.30 m	74.67 m	106.96 dBu	77.79 m	106.61 dBu
-45°	0.200	0.007	-21.67	46.48 m	67.88 m	108.61 dBu	70.71 m	108.26 dBu
-50°	0.184	0.006	-22.40	42.76 m	62.66 m	108.58 dBu	65.27 m	108.23 dBu
-55°	0.150	0.004	-24.17	34.86 m	58.60 m	107.39 dBu	61.04 m	107.03 dBu
-60°	0.110	0.002	-26.87	25.56 m	55.43 m	105.18 dBu	57.74 m	104.82 dBu
-65°	0.072	0.001	-30.55	16.73 m	52.96 m	101.89 dBu	55.17 m	101.54 dBu
-70°	0.042	0.000	-35.23	9.76 m	51.08 m	97.52 dBu	53.21 m	97.17 dBu
-75°	0.021	0.000	-41.25	4.88 m	49.69 m	91.74 dBu	51.76 m	91.39 dBu
-80°	0.008	0.000	-49.63	1.86 m	48.74 m	83.53 dBu	50.77 m	83.17 dBu
-85°	0.002	0.000	-61.67	0.46 m	48.18 m	71.59 dBu	50.19 m	71.23 dBu
-90°	0.001	0.000	-67.70	0.23 m	48.00 m	65.60 dBu	50.00 m	65.25 dBu

Figure 4. Image of Proposed Support Tower

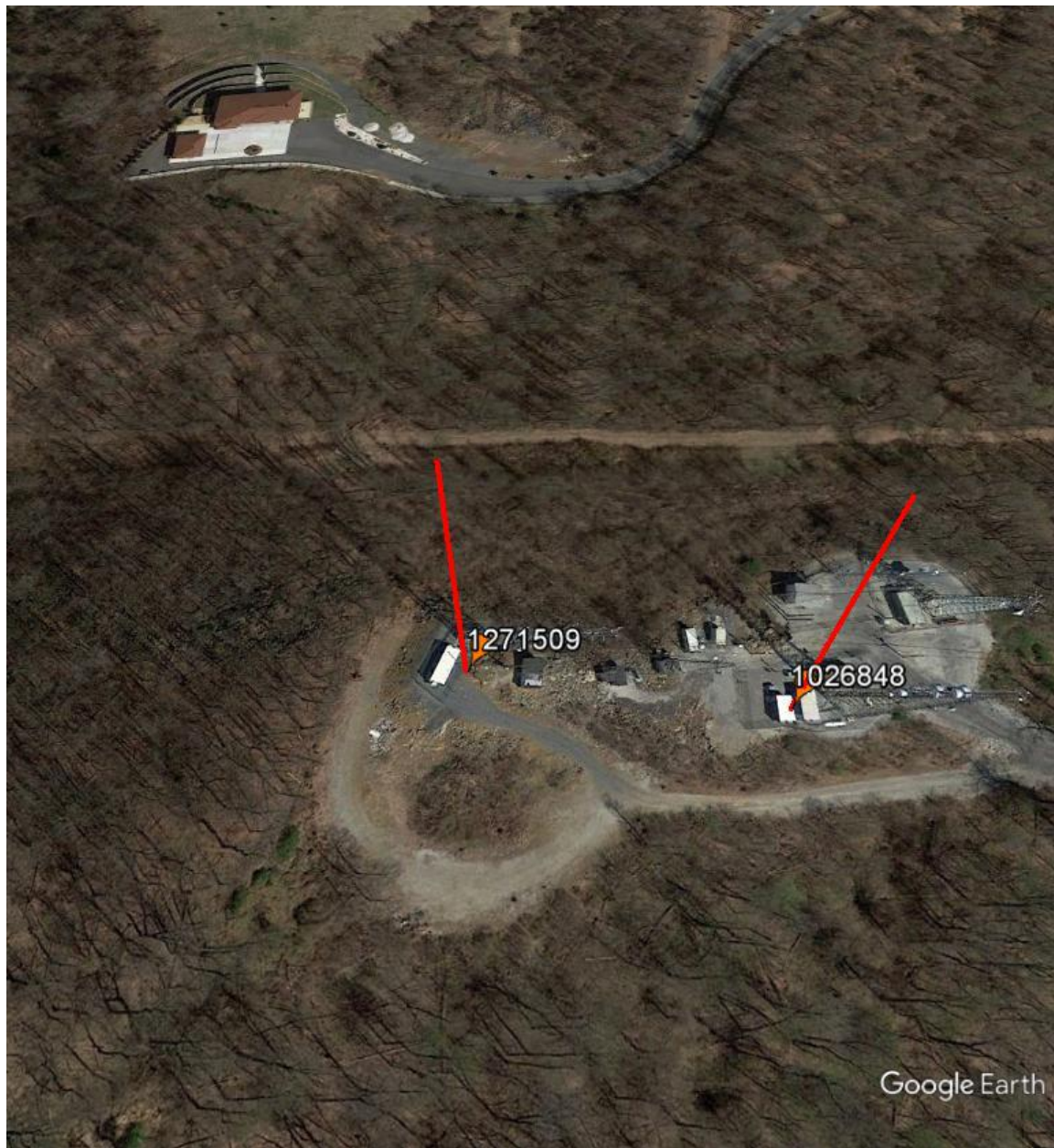


Figure 5. Fill-in and Minor Change Contour Map

