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**SONSHINE FAMILY TELEVISION, INC.**

**LICENSEE OF WBPH-TV**

**NTSC CHANNEL 60 AND**

**PERMITTEE OF WBPH-DT CHANNEL 59**

**BETHLEHEM, PENNSYLVANIA**

**FAC ID# 60850**

**ENGINEERING EXHIBIT IN SUPPORT OF**

**A MODIFICATION OF CP BPCDT-19991101AHO TO SPECIFY**

**OPERATION ON CH 9 AS A RESULT OF THE**

**COMMISSION DECISION IN MM DOCKET 02-81 TO SUBSTITUTE**

**DTV CH 9 FOR DTV CH 59 AT BETHLEHEM PA**

**Larry H. Will, P.E.  
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**SONSHINE FAMILY TELEVISION, INC.**

**BETHLEHEM, PENNSYLVANIA**

**MINOR MODIFICATION OF CP**

**ENGINEERING EXHIBIT EE-1**

**TABLE OF CONTENTS**

DECLARATION.....3

INTRODUCTION.....4

ALLOCATION FACTORS.....4

ENVIRONMENTAL CONSIDERATIONS.....5

FAA.....9

FIGURE 1 WBPH-DT CH 9 COVERAGE MAP.....10

TABLE 2 WBPH-DT PROPOSED AZIMUTH TABULATION.....11

TABLE 3 WBPH-DT PROPOSED ELEVATION TABULATION.....12

FIGURE 2 WBPH-DT PROPOSED AZIMUTH AND  
ELEVATION PATTERN PLOT.....13

**SONSHINE FAMILY TELEVISION, INC.**

**DECLARATION OF LARRY H. WILL**

Larry H. Will declares and says:

That he prepared the attached Engineering Exhibit on behalf of Sonshine Family Television, Inc., Bethlehem, Pennsylvania, Licensee of WBPH-TV and Permittee of WBPH-DT for a modification of CP to specify DTV CH 9 at Bethlehem, PA.

That he has been involved in radio and television broadcast engineering for over 35 years, and that his credentials are a mater of record with the Federal Communications Commission.

That he is a Registered Professional Engineer in Pennsylvania and New Jersey.

That all statements contained within this exhibit are true and accurate to the best of his knowledge and belief, and as to such statements made of belief, they are believed to be true, except for information for which the Federal Communications Commission takes official notice.

(s) Larry H. Will

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Date: 21 May 2003

**SONSHINE FAMILY TELEVISION, INC.**

**BETHLEHEM, PENNSYLVANIA**

**MODIFICATION OF CP**

**ENGINEERING EXHIBIT EE-1**

**1. INTRODUCTION**

Sonshine Family Television, Inc. has a Construction Permit for DTV Channel 59 for use at Bethlehem, PA (FCC File No: BPCDT-19991101AHO). As a result of the Commission decision in MM Docket 02-81, we are submitting an application to modify the Construction Permit BPCDT-19991101AHO to specify DTV operation on CH 9 with a directional ERP of 3.2 kW.

**2. ALLOCATION FACTORS**

In our request for Rulemaking, Sonshine submitted full documentation regarding the protection of all existing facilities, allotments, and Class A stations by operating at a power of 3.2 kilowatts (DA), 284 meters HAAT (430 meters RCAMSL), and at 40-33-52N 075-26-24W<sup>1</sup>. Since our application for Rulemaking was filed, the Commission adopted Longley Rice protection criteria for Class A TV stations and for this application this office conducted a further Longley-Rice study utilizing the facilities of Techware, Inc. of Chantilly, VA. This study showed that, by use of the Longley-Rice method, the facilities proposed herein provide full protection to Class A station W52CC (CH 9) (BPTVL-20010404ABQ), with transmitter at Clarks Summit, PA. Accordingly then, we have omitted any showing utilizing classical terrain shielding to protect W52CC as it is no longer necessary. The ERP, HAAT, and DA parameters included herein fully protect W52CC operation on CH 9 at Clarks Summit. The results of this Longley-Rice Study are not included herein but are available if needed by the MM staff.

Figure 1 is a coverage map showing the WBPH-DT Channel 9 43 and 36 dBu (F50,90) coverage contours. The proposed operation herein on Channel 9 by WBPH provides the required City Grade DTV signal over Bethlehem.

The transmitting antenna proposed is PSI Model PSIVLP4BPHC1-9. Table 2 is a tabulation of the proposed WBPH-DT Channel 9 directional antenna azimuth parameters used for the interference study.

Table 3 is a tabulation of the proposed WBPH-DT Channel 9 directional antenna elevation parameters.

Figure 2 is a plot of the proposed WBPH-DT Channel 9 azimuth and elevation pattern.

### 3. ENVIRONMENTAL CONSIDERATIONS

The instant application is excluded under 1.1306. Using the procedures outlined in Supplement A, OET Bulletin 65, Edition 97-01 and specifically Equation 10, I have evaluated the RFR energy radiation from the antenna system of proposed WBPH-DT as follows:

The proposed WBPH-DT is one of several FM and television broadcast antennas at the station location required to be considered by 47 CFR 1.1307(b).

WBPH-DT is proposing to utilize an average ERP of 3.2 kilowatts (maximum DA) with horizontal polarization. The WBPH-DT transmitting antenna is a high gain unit with an elevation power gain of 4.6X side mounted approximately 146 meters up the tower. Because of the high gain, the ERP at angles departing +/- 10 degrees from the horizon is attenuated by a minimum of 10 dB. For occupational/controlled environment (1.0 mW/cm<sup>2</sup> at 186 MHz) and utilizing Equation 10 of OET Bulletin 65 and allowing for 10 dB at steep angles, the required physical separation is 3.3 meters. For general population/uncontrolled environment (0.20 mW/cm<sup>2</sup>), the required physical spacing is 7.3 meters. Since the bottom of the antenna is approximately 142 meters above the ground, the height of the structure limits the possible excessive radiation values to at least 134.7 meters above the ground. Again using Equation 10 of OET Bulletin 65, and using the total average RF power corrected for steep angles, the *actual RF level at 2 meters above the ground from WBPH-DT is calculated to be 0.55 uW/cm<sup>2</sup> or 0.3 %*

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1 These coordinates and heights are the same as shown in the WBPH-DT CH 59 CP.

*of the total allowable at 186 MHz. The proposed WBPH-DT operation would contribute less than 5% of the total RFR energy emanating from this combined user site.*

WBPH-TV (NTSC) is operating with an ERP of 2850 kilowatts visual and 285 kilowatts aural with horizontal polarization (1966 kW total average power). The WBPH-TV transmitting antenna is a high gain unit with a power gain of 33X side mounted approximately 146 meters up the tower. Because of the high gain, the ERP at angles departing +/- 10 degrees from the horizon is attenuated by a minimum of 15 dB. For occupational/controlled environment ( $2.49 \text{ mW/cm}^2$  at 747 MHz) and utilizing Equation 10 of OET Bulletin 65 and allowing for 15 dB at steep angles, the required physical separation is 28.9 meters. For general population/uncontrolled environment ( $0.497 \text{ mW/cm}^2$ ), the required physical spacing is 64.6 meters. Since the bottom of the antenna is approximately 132 meters above the ground, the height of the structure limits the possible excessive radiation values to at least 67.4 meters above the ground. Again using Equation 10 of OET Bulletin 65, and using the total average RF power corrected for steep angles, the *actual RF level at 2 meters above the ground from WBPH-TV is calculated to be  $118.9 \text{ uW/cm}^2$  or 23.9 % of the total allowable at 747 Mhz.*

WFMZ-TV (NTSC) is operating with an ERP of 5000 kilowatts visual and 500 kilowatts aural with horizontal polarization (3460 kW total average power). The WFMZ-TV transmitting antenna is a high gain unit with a power gain of 33X side mounted approximately 182 meters up the tower. Because of the high gain, the ERP at angles departing +/- 10 degrees from the horizon is attenuated by a minimum of 15 dB. For occupational/controlled environment ( $2.68 \text{ mW/cm}^2$  at 803 MHz) and utilizing Equation 10 of OET Bulletin 65 and allowing for 15 dB at steep angles, the required physical separation is 40.6 meters. For general population/uncontrolled environment ( $0.536 \text{ mW/cm}^2$ ), the required physical spacing is 90.7 meters. Since the bottom of the antenna is approximately 172 meters above the ground, the height of the structure limits the possible excessive radiation values to at least 81.3 meters above the ground. Again using Equation 10 of OET Bulletin 65, and using the total average RF power corrected for steep angles, the *actual RF level at 2 meters above the ground from WFMZ-TV is calculated to be  $125.9 \text{ uW/cm}^2$  or 23.5 % of the total allowable at 803 Mhz.*

WFMZ-DT is proposing to utilize an average ERP of 500 kilowatts (maximum DA) with horizontal polarization. The WFMZ-DT transmitting antenna is a high gain unit with a power

gain of 16X side mounted approximately 161 meters up the tower. Because of the high gain, the ERP at angles departing +/- 10 degrees from the horizon is attenuated by a minimum of 15 dB. For occupational/controlled environment ( $2.21 \text{ mW/cm}^2$  at 663 MHz) and utilizing Equation 10 of OET Bulletin 65 and allowing for 15 dB at steep angles, the required physical separation is 15.5 meters. For general population/uncontrolled environment ( $0.442 \text{ mW/cm}^2$ ), the required physical spacing is 34.5 meters. Since the bottom of the antenna is approximately 154 meters above the ground, the height of the structure limits the possible excessive radiation values to at least 119.5 meters above the ground. Again using Equation 10 of OET Bulletin 65, and using the total average RF power corrected for steep angles, the *actual RF level at 2 meters above the ground from WFMZ-DT is calculated to be  $22.8 \text{ uW/cm}^2$  or 5.28 % of the total allowable at 663 Mhz.*

WLEV(FM) utilizes an ERP of 10.9 kilowatts horizontal and vertical. The WLEV(FM) 3 bay FM transmitting antenna is top mounted on the same uniform guyed tower at 204 meters in elevation. For occupational/controlled environment and utilizing Table 5, with interpolation, the required physical separation is from between 9.0 and 16.9 meters. Since the radiation center is 195.5 meters above ground, the height of the structure limits the possible excessive radiation values to at least 178.6 meters above the ground. For general population/uncontrolled environment, and utilizing Table 6, the required physical separation is 17.5 to 35.1 meters. Since the radiation center is 195.5 meters above ground, the height of the structure limits the possible excessive radiation values to at least 160.4 meters above the ground. Using Equation 10 of OET Bulletin 65, and using the total average RF power corrected for steep angles, the *actual RF level at 2 meters above the ground from WLEV(FM) is calculated to be  $20.6 \text{ uW/cm}^2$  or 10.3 % of the total allowable at 101 Mhz.*

WJCS(FM), CH 207A operates with an ERP of 0.12 kilowatts vertical only. The WJCS(FM) transmitting antenna is side mounted approximately 113.5 meters up the tower. For occupational/controlled environment and utilizing Table 5, with interpolation, the required physical separation is from between 2.3 and 2.6 meters. Since the radiation center is 113.5 meters above ground, the height of the structure limits the possible excessive radiation values to at least 110.9 meters above the ground. For general population/uncontrolled environment, and utilizing Table 6, the required physical separation is 2.6 to 4.5 meters. Since the radiation center is 113.5 meters above ground, the height of the structure limits the possible excessive radiation

values to at least 109 meters above the ground. Using Equation 10 of OET Bulletin 65, and using the total average RF power corrected for steep angles, the *actual RF level at 2 meters above the ground from WJCS(FM) is calculated to be 0.4 uW/cm<sup>2</sup> or 0.3 % of the total allowable at 89 MHz.*

WDIY(FM), CH 201A operates with an ERP of 0.12 kilowatts DA vertical only. The transmitting antenna is side mounted approximately 114.0 meters up the tower. For occupational/controlled environment and utilizing Table 5, with interpolation, the required physical separation is from between 2.3 and 2.6 meters. Since the radiation center is 114 meters above ground, the height of the structure limits the possible excessive radiation values to at least 111.4 meters above the ground. For general population/uncontrolled environment, and utilizing Table 6, the required physical separation is 2.6 to 4.5 meters. Since the radiation center is 114 meters above ground, the height of the structure limits the possible excessive radiation values to at least 109.5 meters above the ground. Using Equation 10 of OET Bulletin 65, and using the total average RF power corrected for steep angles, the *actual RF level at 2 meters above the ground from WJCS(FM) is calculated to be 0.34 uW/cm<sup>2</sup> or 0.2 % of the total allowable at 88 MHz.*

Therefore the total levels of all RFR energy sources at all points on the ground are below that required for protection of both the employees and the general public as required by ANSI 95.1-1992 or FCC OET 65, Edition 97-01. The combined radiofrequency levels from all sources are calculated to not exceed 81.3% of the allowable anywhere on the ground in the area of the tower. Neither workers nor the public will be exposed to electromagnetic fields exceeding the maximum permissible exposure (MPE) levels set forth in Section 1.1310 of the Rules. The antenna supporting structure is enclosed by a chain-link fence to prevent unauthorized access.

As a precaution to employees, a suitable sign is posted at the base of the tower alerting maintenance personnel to the presence of non-ionizing radiofrequency radiation so that appropriate action can be taken when access on the tower above 81 meters above ground is required.

Also the applicant does not own the tower and not all broadcast transmitters co-located on the site are owned by the applicant. The applicant further states that he has prepared an

electromagnetic radiation abatement plan to educate employees and workers as to the potential hazards when working on the tower. During periods of maintenance where workers on the tower could be exposed to excessive levels of non-ionizing radiation, any transmitting system that could pose a hazard will be either turned off or reduced in power to insure that workers are not subject to excessive values of non-ionizing radiation.

With these procedures in place, we believe the proposed WBPH-DT operation is in compliance with the RFR energy radiation requirements of 47 CFR 1.1307(b).

#### **4. FAA NOTIFICATION**

The FAA has not been notified of the proposed changes since the physical height of the previously approved structure is not changing. The FCC tower registration number is 1031215.



<p><b>SIGNAL™ WBPH-DT_9_coverage.map</b></p> <p>Prop. model: FCC-FCC          Time: 90.0% Loc.: 50.0%          Prediction Confidence Margin: 0.0dB          Climate: Continental Temperata          Land use (clutter): none          Atmospheric Abs.: none          K Factor: 1.333          RX Antenna - Type: OMNI          Height: 1.9 m AGL Gain: 0.00 dBd</p> <p>Sites</p> <p>Site: WBPH-TV9 Latest Antenna          N40°33'54.00" W75°26'26.00" 265.0 m          WBPH-DT Tx Ht AGL: 145.0 m Total ERP: 5.05e6kW          Gcp: 1 directional-horizontal/0.0° 184.0000 MHz</p> <p>Reference Grid (spacing: 30')</p>	<p><b>Notes</b></p> <p>Plot of the FCC 36 ans 43 dBu F(50,90)          Contours for WBPH DT CH 9 with          3.2 kW (DA) ERP at          264 M HAAAT          prepared by          Larry H. Will, P.E.          Glen Mills, PA 19342</p>
<p>KILOMETERS</p>	<p><b>COVERAG MAP</b></p> <p>WBPH-DT CH 9</p>
<p>Figure 1</p>	<p>06/21/2003</p>

**SONSHINE FAMILY TELEVISION, Inc.**

**WBPH-DT BETHLEHEM, PA**

**EXHIBIT EE-1 - TABLE 2**

PROPOSED PSI MODEL PSIVLP4BPHC1-9  
AZIMUTH PATTERN

**10 Degree**

Angle	Field	ERP (kW)	ERP (dBk)
0	0.51	0.83	-0.797
10	0.52	0.87	-0.628
20	0.510	0.83	-0.797
30	0.520	0.87	-0.628
40	0.540	0.93	-0.301
50	0.560	1.00	0.015
60	0.600	1.15	0.615
70	0.650	1.35	1.310
80	0.700	1.57	1.953
90	0.770	1.90	2.781
100	0.840	2.26	3.537
110	0.910	2.65	4.232
120	0.965	2.98	4.742
130	0.995	3.17	5.008
140	1.000	3.20	5.051
150	0.990	3.14	4.964
160	0.965	2.98	4.742
170	0.953	2.91	4.633
180	0.922	2.72	4.346
190	0.862	2.38	3.762
200	0.825	2.18	3.381
210	0.788	1.99	2.982
220	0.753	1.81	2.587
230	0.711	1.62	2.089
240	0.654	1.37	1.363
250	0.617	1.22	0.857
260	0.525	0.88	-0.545
270	0.452	0.65	-1.846
280	0.422	0.57	-2.442
290	0.452	0.65	-1.846
300	0.525	0.88	-0.545
310	0.653	1.36	1.350
320	0.692	1.53	1.854
330	0.653	1.36	1.350
340	0.585	1.10	0.395
350	0.545	0.95	-0.221

**Cardinal**

Angle	Field	ERP (kW)	ERP (dBk)
0	0.51	0.83	-0.797
45	0.550	0.97	-0.141
90	0.770	1.90	2.781
135	0.997	3.18	5.025
180	0.922	2.72	4.346
225	0.733	1.72	2.354
270	0.452	0.65	-1.846
315	0.673	1.45	1.612

**Maxima**

Angle	Field	ERP (kW)	ERP (dBk)
140	1.000	3.20	5.051

**Minima**

Angle	Field	ERP (kW)	ERP (dBk)
280	0.422	0.57	-2.442

prepared by  
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ERP= 3.2 kW  
CALL WBPH-DT

**SONSHINE FAMILY TELEVISION CORPORATION**

**WBPH-TV BETHLEHEM, PA**

**TABLE 3**

PROPAGATION SYSTEMS, INC PSIVLP4BPHC1-9  
ELEVATION PATTERN

**Elevation**

Angle	Field	ERP (kW)	ERP (dBk)
3.00	0.600	1.15	0.615
2.50	0.800	2.05	3.113
2.00	0.900	2.59	4.136
1.50	0.950	2.89	4.606
1.00	0.970	3.01	4.787
0.50	0.990	3.14	4.964
0.00	1.000	3.20	5.051
-0.50	0.990	3.14	4.964
-1.00	0.970	3.01	4.787
-1.50	0.950	2.89	4.606
-2.00	0.900	2.59	4.136
-2.50	0.800	2.05	3.113
-3.00	0.600	1.15	0.615
-3.50	0.500	0.80	-0.969
-4.00	0.470	0.71	-1.507
-4.50	0.420	0.56	-2.484
-5.00	0.300	0.29	-5.406
5.50	0.260	0.22	-6.649
-6.00	0.200	0.13	-8.928
-6.50	0.100	0.03	-14.949
-7.00	0.020	0.00	-28.928
-7.50	0.100	0.03	-14.949
-8.00	0.150	0.07	-11.427
-8.50	0.170	0.09	-10.340
-9.00	0.200	0.13	-8.928
-9.50	0.220	0.15	-8.100
-10.00	0.230	0.17	-7.714
-10.50	0.220	0.15	-8.100
-11.00	0.200	0.13	-8.928

ERP= 3.2 kW  
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**FIGURE 2 - WBPH-DT CH 9 ELEVATION AND AZIMUTH PATTERN PLOTS**

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