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**NORTHEASTERN PENNSYLVANIA TV ASSOCIATION**

**LICENSEE OF WVIA-TV/DT**

**SCRANTON, PENNSYLVANIA**

**FAC ID# 47929**

**FCC FILE #s BLEDT-20010109AAP  
BPEDT-20080619ADK**

**APPLICATION FOR A REPLACEMENT TRANSLATOR**

**ON CH 51 – WILLIAMSPORT, PA**

**(MINOR CHANGE)**

**ENGINEERING EXHIBIT 11**

**August 21, 2009**

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**EXHIBIT 11**

**REASON FOR SERVICE NEED, FACILITIES PROPOSED, AND REQUEST FOR  
WAIVER REGARDING 41 dBu COVERAGE**

**REASON FOR SERVICE NEED AND FACILITIES REQUESTED**

NORTHEASTERN PENNSYLVANIA TV ASSOCIATION (“NEPATVA”), is filing this application to request authority to construct a “replacement translator” on Channel 51 in Williamsport, Pennsylvania for use with WVIA-DT, Channel 41, Scranton, PA. The purpose of this application is for NEPATVA to continue providing service to the community of Williamsport, Pennsylvania, located in rural upstate and in a very mountainous area. In fact Williamsport is located along a winding narrow valley containing the Susquehanna River. The normal river level is some 400+ meters below the nearby mountain peaks.

Analog translators have served the City of Williamsport for years from other Pennsylvania TV stations including WVIA-TV<sup>1</sup>. Williamsport has only one full power allotment that is not yet on air<sup>2</sup>.

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<sup>1</sup> WVIA has been utilizing the facilities of W55AG (FCC File No. BLTT-1923) to rebroadcast WVIA-TV, owned by Mission Broadcasting, Inc. (“Mission”), since at least 1994.

## **PRESENT SITUATION**

Mission Broadcasting, Inc. has applied for and has received a displacement allotment on Channel 8 (W08AD-D, BDISDTT-20060403ACY). However, there are numerous reasons why WVIA-DT cannot utilize Channel 8 as authorized to Mission.

1: The WVIA-DT engineering staff has determined that the site where W55AG and all the other present Williamsport translator facilities are presently located cannot provide sufficient off-air signal from WVIA-DT to provide a satisfactory digital translator.

2: The antenna supporting structure at the existing site will not support a suitable Channel 8 antenna to effectively cover the same region that W55AG previously covered.

3: NEPATVA has obtained preliminary authorization to relocate to another existing tower immediately south of Williamsport on top of Bald Mountain.

## **CHANNEL 51 REPLACEMENT TRANSLATOR PROPOSED OPERATION**

With this application, NEPATVA is requesting authority to construct a replacement translator for WVIA-DT on Channel 51 and located on Bald Eagle Mountain at a site just south of the City of Williamsport and as shown in the accompanying Tech Box of FCC Form 346.

## **REQUEST FOR A WAIVER OF PROPOSED 74.787 REGARDING THE 41 dBu COVERAGE OUTSIDE THE PARENT STATION AND 74.706 and 74.708 REGARDING BEAM TILT ERP**

The facilities of analog W55AG authorized by the Commission include an ERP of 1.21 kW visual and 0.06 kW aural. Comparing the allowable ERP of low power analog facilities as

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<sup>2</sup> The first known TV station application for Williamsport was listed in the TV Factbook, No. 13 as Central Pennsylvania Corp of State College, PA, FCC File No. BPCT-520.

specified in 74.735(a) to the allowable digital ERP of low power digital facilities in 74.735(b)<sup>3</sup>, it is clear that the commission, in each case, reduced the allowable ERP for low power stations from analog to digital by 10 dB. A 10 dB reduction in ERP for digital service came about because of the planning factors of FCC OET 69.

The existing and proposed translator sites for WVIA-DT's operation in Williamsport is within the authorized WVIA-DT 41 dBu F(50,90) service contour of BPEDT-20080619ADK but not within the original 64 dBu F(50,50) service contour of WVIA-TV (BLEDT-20010109AAP).

Another change between analog and digital replacement translators occurs with the value of the protected service contours. For the analog service, the Rules in 74.707(a)(1) specify the 74 dBu F(50,50) contour for the low power station rather than the 64 dBu F(50,50) used by full power stations as the UHF service contour<sup>4</sup>. However, the Rules at 74.787 for replacement digital translators continue to utilize the 41 dBu F(50,90) contour as opposed to the logical 51 dBu contour<sup>5</sup>.

Because of the very rugged terrain very near the proposed transmitter site with the majority of the population over 400 meters below the mountain tops, there is a need to construct the translator transmitting antenna with 3.0 degrees of electrical beam tilt to direct the signal downward<sup>6</sup>. While the analog TV translator Rules (74.705 and 74.707) and commission policy allowed for LPTV analog stations with electrical beam tilt to complete interference analysis by utilizing the actual ERP on the horizon rather than the maximum ERP in the main lobe, the

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<sup>3</sup> 74.735(a) allows a maximum of 150 kW ERP for UHF analog low power stations while 74.735(b) allows a maximum of 15 kW, a difference of 10 dB.

<sup>4</sup> The reasoning behind the LPTV 74 dBu service contour is contained in the original decision that discussed that it would be expected that LPTV stations viewers would be using minimal antennas and that an additional 10 dB strength would be required for satisfactory reception.

<sup>5</sup> This limitation was brought about due to the commission's desire to not have replacement translators act as de-facto service extenders.

<sup>6</sup> Depending on the antenna utilized, this fact alone reduces radiated power towards the horizon by 5 to 10 dB.

digital LPTV rules (74.706 and 74.708) do not provide for this option. Based on measurements on WVIA-DT conducted by the undersigned earlier in the DTV process<sup>7</sup>, there is reason to believe, based on the nature of the 8-VSB signal, that the disturbance to digital off-air reception from the expected multipath effects for the rough terrain in the Williamsport, PA (and indeed other rugged terrain regions within the USA) would not dictate that a stronger received signal should be employed for digital translators just as it has been for decades for analog translators.

Thus NEPATVA believes that a waiver of the above Rules and any other that the Commission staff deems appropriate is justified in this instant case to insure that WVIA-DT continues to provide adequate public broadcasting service to Williamsport and surrounding areas. Specifically we are proposing to utilize the 51 dBu F(50,90) as the practical service contour and an ERP of 0.121 kW to maintain the analog/digital transmitter power ratio to the typical +10 dB that was contemplated in 74.735.

To this end, first a complete engineering study was performed by MSW, Incorporated and this study showed that no prohibited interference to any other stations as required by the recently proposed Replacement Translator Rules. This study assumed no translator transmitting antenna beam tilt as required by the Rules. As stated before, this replacement translator is in a very rugged area of northeastern Pennsylvania, which limits the range of any translator in practice. A copy of the study results can be supplied to staff, if needed.

Second, Figure 1 attached hereto shows that the extension of the 41 dBu with these parameters is di-minimis as required by 74.787 and that the 51-dBu F(50,90) contour basically stays within the calculated WVIA-DT 41 dBu F(50,90) contour<sup>8</sup>. The total coverage area for

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<sup>7</sup> These measurements were conducted for a Federal Grant application for WSKG-TV/DT in Binghamton, NY and were not submitted to the FCC as part of that process. They can be made available if needed by the staff.

<sup>8</sup> While the administrative 41 dBu F(50,90) WVIA-DT service contour covers the region, the NEPATVA engineering staff has already determined that even at the present translator "head-end", reliable reception is not possible. The new proposed location will have sufficient received signal for reliable translator operation.

WVIA-DT in BPEDT-20080619ADK is 33,964.5 km<sup>2</sup>. The excursion of the proposed CH 51 DTV replacement translator for Williamsport outside the WVIA-DT 41 dBu contour is a total of 167.3 km<sup>2</sup> or 0.49% of the total WVIA-DT coverage area, a di-minimis amount.

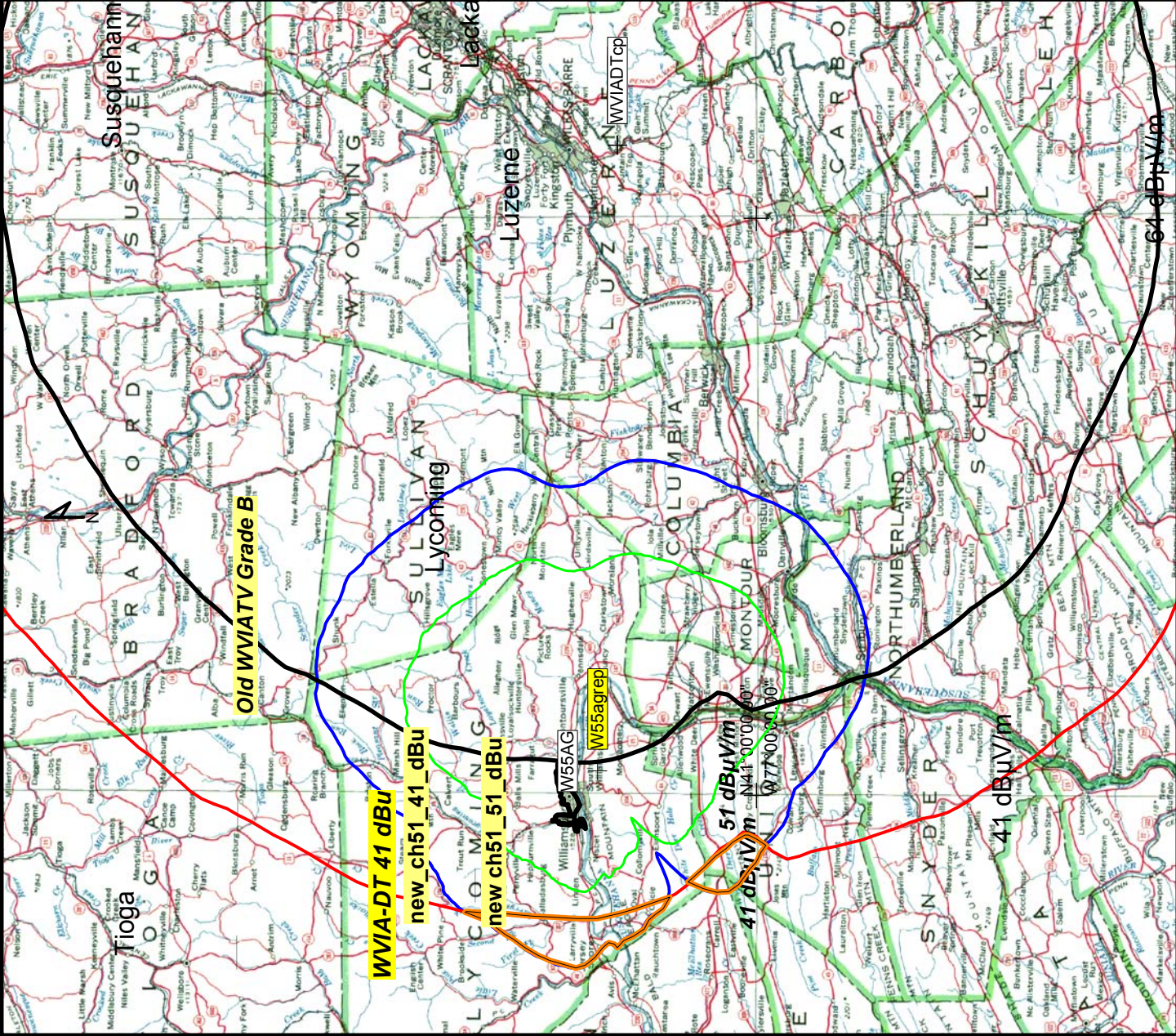
Thus NORTHEASTERN PENNSYLVANIA TV ASSOCIATION believes that, as a practical matter, the amount of calculated contour extension is di-minimis and further believes that a waiver of proposed 74.787 is justified in this case.

## **CONCLUSIONS**

By the unique terrain factors outlined above under “PRESENT SITUATION” in this instant case, and by DTV and NTSC power and receiver sensitivity ratios, and by using the FCC recognized Longley-Rice terrain model and receiver antenna directivity, we have shown that the instant proposal meets the requirements for a “replacement digital translator” on Channel 51, and as a practical matter, the 0.49% amount of calculated contour extension is di-minimis.

NEPATVA further believes that a waiver of proposed 74.787 and 74.706 and 74.708 is justified in this case and we believe that this proposal for DTV operation of said station on Channel 51 should be GRANTED.





SIGNAL™: W55agrep replacement map

Sites

Site: Williamsport\_51  
N41°12'31.70" W76°57'31.10" 605.2 m  
W55agrep Tx.Ht.AGL: 33.0 m Total ERPd: -9.17dBW  
Grp: 1 directional-horizontal/85.0° 701.3000 MHz

- NEW\_51\_area\_1
- NEW\_51\_area\_2
- W55agrep\_365
- quick contours

Interference contour study

Propagation methods: : FCC-FCC 90.0%  
service contour : FCC-EDX 90.0%  
cochannel interference : FCC-EDX 90.0%

**51.0 dBuV/m service contour**  
**41.0 dBuV/m cochannel interference**  
Williamsport\_city

Notes

Plot of the service contour for  
W55agrep (RED), proposed NEW  
replacement translator 51 dBu service  
contour (GREEN) and 41 dBu secondary  
service contour (BLUE) and NTSC Grade B (BLACK)  
and excursion area in ORANGE. See Text.

Williamsport City Limits in BLACK  
prepared by  
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COVERAGE MAP  
W55agrep REPLACEMENT XLTR

8/22/2009

Figure 1