



## WESU / Wesleyan University Spectrum Study - Amendment October 27, 2007

### Purpose

WESU filed an application (20070906AAD) to improve their broadcast facility from 1500 watts ERP (omni-directional) to 6000 watts ERP (directional) at the same height 10m HAAT (44m AGL).

The FCC has asked that WESU submit an amendment to this application with a revised exhibit for TV6 protection; in a clerical oversight, we employed different interfering contour values for the existing WESU facility and the proposed new WESU facility. Our original analysis employed the 6 dB adjustment on the proposed new facility interfering contour pursuant to 73.525 (e)(1)(iii), resulting in a comparison of the new facility's 54dBu contour population versus the existing facility's 48dBu contour population. To maintain comparability of the TV6 interference population counts, the FCC asked that the 54dBu contour be used for both WESU facilities.

### Summary

Of the *affected TV channel 6 stations* (WEDY-DT, WLNE-TV, and WRGB-TV) only two have potential interference overlap requiring further analysis (WEDY-DT and WLNE-TV). This new analysis, using 54dBu interfering contours for WESU's existing and proposed new facilities, demonstrates that the new facility will result in a net reduction of population receiving interference to *affected TV channel 6 stations*:

#### Pop.Overlap<sup>1</sup>

79,714	WESU 54dBu & WEDY-DT 47dBu (existing)
68,548	WESU 54dBu & WEDY-DT 47dBu (new)
-11,166	Difference (WEDY-DT)
0	WESU 54dBu & WLNE-TV 47dbu (existing)
2,846	WESU 54dBu & WLNE-TV 47dbu (new)
+2,846	Difference (WLNE-TV)
<b>-8,320</b>	<b>NET DIFFERENCE</b>

Further analysis is provided on the following pages.

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<sup>1</sup> All population numbers are from the 2000 US Census.

**WEDY-DT New Haven, CT / Channel 6 digital**

As determined by 47 CFR 73.525, the TV Channel 6 WEDY-DT, owned by Connecticut Public Broadcasting is entitled to protection from NCE-FM interference. This presents an interesting issue: WESU already has substantial prohibited overlap<sup>2</sup> (48dBu F(50,10) interfering contour) with WEDY-DT (47dBu F(50,50) contour). Since WEDY-DT is a new digital TV channel (WEDY's migration from analog channel 65) it went on the air well after WESU; FCC rules do not require new DTV channels to adhere to the required NCE-FM protections. Consequently, WESU may maintain or reduce its interference overlap with WEDY-DT, but it may not increase it. If the WESU overlap with WEDY-DT changes, any new WESU interference area to WEDY-DT must be offset by eliminating a certain amount of existing interference to WEDY-DT.

However, the null required to protect WMNR also reduces WESU's interfering contours in relation to WEDY-DT. As such, even though an expanded WESU will still have prohibited overlap, it will be *substantially less* overlap.

The engineering charts of 73.599 dictate that the 48dBu interfering contour of WESU be matched to the 47dBu service contour of WEDY-DT. An extra +6dB is used for WESU's interfering contour (for 54dBu total) as allowed under the directional antenna provision of 73.525 (e)(1)(iii). The proposed WESU interfering contour falls outside of the 68dBu Grade A Service Contour of WLNE-TV. Currently the 54dBu interfering overlap covers 79,714 population, while the proposed facility's overlap covers 68,548 population, a reduction of 11,166 persons.

47 CFR 73.525 (b) states:

(b) Existing NCE-FM Stations. (1) A NCE-FM station license authorized to operate on channels 201-220 as of December 31, 1984, or a permittee, granted a construction permit for a NCE-FM station as of December 31, 1984, are not subject to this section unless they propose either:

- (i) To make changes in operating facilities or location which will increase predicted interference as calculated under paragraph (e) of this section to TV Channel 6 reception in any direction; or,
- (ii) To increase its ratio of vertically polarized to horizontally polarized transmissions.

Since WESU predates this clause, this clause is applicable. The proposed new facility would *reduce* predicted interference; hence point (i) would not apply. Point (ii) does not apply because WESU already operates with a circularly-polarized antenna, and this proposed facility does not include any increase in the power in the vertical polarization with respect to that emitted in the horizontal polarization. As such, the proposed WESU facility is compliant with respect to changes in interference areas with respect to WEDY-DT.

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<sup>2</sup> The WESU 48dBu F(50,10) interfering contour overlaps the WEDY-DT 47dBu F(50,50) protected contour. This creates a technical condition that increases the chances a TV viewer will receive interference from WESU within the overlap area.

**WLNE-TV Providence, RI / Channel 6 analog**

The aggregate population totals for all *affected TV channel 6 stations* (summarized above) show a net reduction in interference to channel 6 TV stations. In the event that the interference areas of the two channel 6 TV stations were disaggregated, interference overlap to WEDY-DT is reduced, but new overlap to WLNE-TV is created. It is reassuring to observe that even when considered separately, the total population affected by proposed WESU overlap with WLNE-TV is less than the 3000 population limit, covering 2,846 population. 47 CFR 73.525 (c) states:

(c) New NCE-FM stations<sup>3</sup>. Except as provided for by paragraph (d) of this section<sup>4</sup>, applicants for NCE-FM stations proposing to operate on Channels 201-220 must submit a showing indicating that the predicted interference area resulting from the proposed facility contains no more than 3,000 persons.

Further, the proposed WESU interfering contour falls outside of the 68dBu Grade A Service Contour of WEDY-DT, thereby invoking no additional interference analysis with respect to the overlap area. Therefore, even when considering the proposed WESU facility with respect only to WLNE-TV, the proposed WESU facility is permissible.

**WRGB-TV Schenectady, NY / Channel 6 analog**

The existing and proposed WESU facility has no relevant contour overlap with WRGB-TV, as demonstrated on the contour maps on subsequent pages.

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<sup>3</sup> 73.525 (b)(2) refers Existing NCE-FM Stations not exempted by 73.525(b)(1) to this section (c) for new-interference limits.

<sup>4</sup> Paragraph (d) refers to NCE-FM stations co-located with the TV Channel 6 in question, which does not apply here.

**Contour and Signal Propagation Plots****Contour Maps : Legend / Key**

Other facilities' contours with the same color represent the matching protected or interfering contour for that facility. Contours of the existing and proposed WESU facilities ideally would not overlap TV channel 6 contours of the same color. Where they do overlap, the intricate rubric of de-rating each of a series of overlap contours with respect to a corresponding protected TV channel 6 contour in a step function (per §73.525(e)(1)(ii)) normally applies. In the interest of simplicity, a worst-case analysis is offered instead, providing the population count within the entire overlap area of the TV channel 6 47 dBu contour and its corresponding WESU interfering contour. This method errs in favor of the TV channel 6 stations by overestimating the populations within the overlap areas.

**WESU CONTOUR**

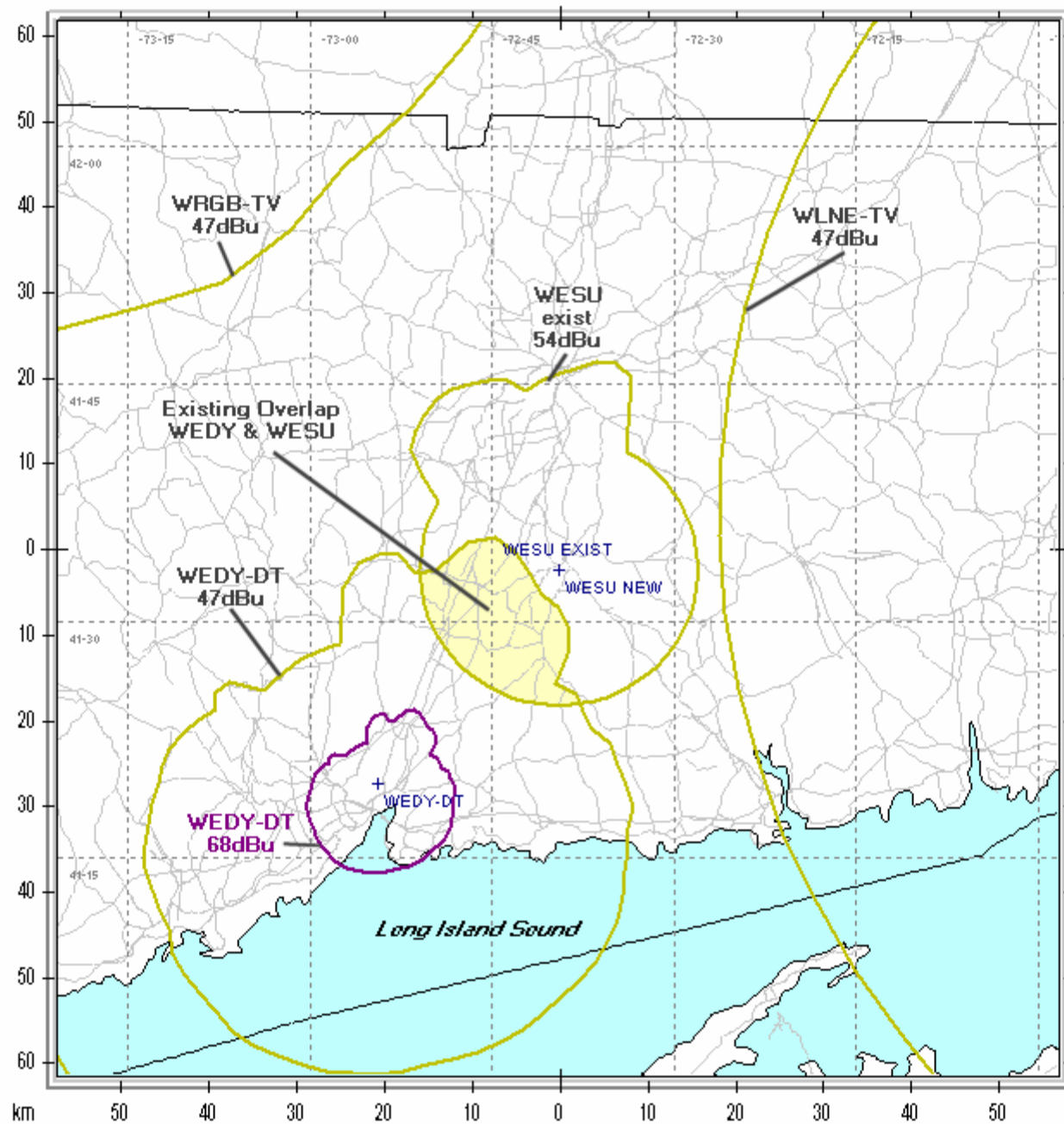
Yellow = 54 dBu interfering (TV 6)

**OTHER STATION'S CONTOUR**

47 dBu city grade protected

Purple = 68 dBu Grade A Service Contour

## WESU Existing Facility - TV6 Protection



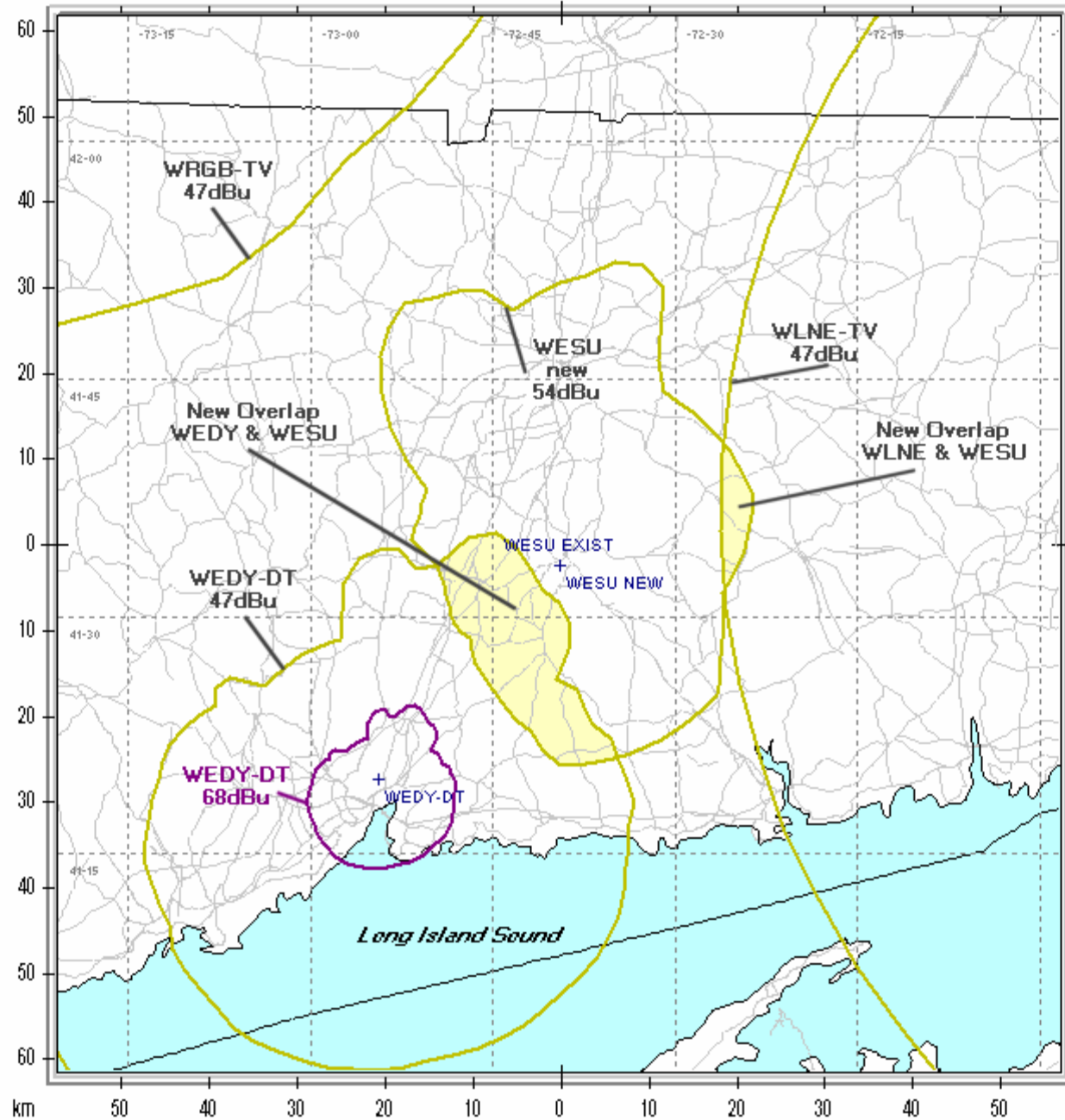
YELLOW CONTOURS: WESU = 54dBu F(50,10) / Others = 47dBu F(50,50)

State Borders      Highways      Lat/Lon Grid

Map Scale: 1:779720    1 cm = 7.80 km    V/H Size: 123.34 x 114.14 km

Existing Overlap w/WEDY-DT & WLNE-TV = 79,714 persons

## WESU New Facility - TV6 Protection



YELLOW CONTOURS: WESU = 54dBu F(50,10) / Others = 47dBu F(50,50)

State Borders      Highways      Lat/Lon Grid

Map Scale: 1:779720    1 cm = 7.80 km    V/H Size: 123.34 x 114.14 km

New Overlap w/WEDY-DT & WLNE-TV = 71,394 persons

## WESU Existing Facility - TV6 Protection - Population

