

**November 2013**  
**KNVO-FM Channel 266C2**  
**Port Isabel, TX**  
**Principal Community Coverage Study**

The 70 dBu contour from the proposed facility, as calculated using the standard contour prediction methodology described in §73.313 of the Commission's Rules, does not encompass the entire community of Port Isabel. The far side of Port Isabel is located approximately 37.5 kilometers from the proposed transmitter site. The standard 70 dBu contour extends approximately 31.7 kilometers towards Port Isabel. However, it is believed that a supplemental showing using alternative contour prediction methodology is justified in this instance in accordance with §73.313(e).

The entire community of Port Isabel is encompassed by the 60 dBu contour. The attached map exhibits depict the city boundaries of Port Isabel as taken from the 2010 Census.

**Longley-Rice**

Study has been made of the predicted 70 dBu field strength over Port Isabel, using the Longley-Rice v1.2.2 methodology. This study has been conducted using the software program SIGNAL™ from EDX Wireless.

A sample calculation has been made to a location within the community boundary of Port Isabel to verify the presence of 70 dBu service, using the formula:

$$\text{Field Strength} = \text{Free Space} - \text{Diffraction Loss} - \text{Clutter}$$
$$\text{Where Free Space} = 106.9 + \text{power in dBk} - 20\log(\text{distance in km to point of interest})$$

For the path studied (16.99 dBk over a 35 km path), the result of this calculation is:

<b>Radial</b>	<b>Free Space Field</b>	<b>Minus Diffraction Loss</b>	<b>Yields</b>
142 deg	93.01 dBu	17.44 dB	75.57 dBu

Attached is a plot of the terrain path from the transmitter site to the sample location in Port Isabel. The attached terrain path plot includes a list of the Longley-Rice study parameters.

It should be noted that the Longley-Rice calculations in this study utilize a K factor (effective earth radius) of 1.489. This value has been determined by reference to Figure 1 on Page 5 of the 1968 Longley-Rice report.<sup>1</sup> Figure 1 reports a minimum monthly surface refractivity value of 350 in the vicinity of Port Isabel, Florida. Using this value for  $N_0$  in Formula 2 of the Longley-Rice report, and assuming an  $h_s$  value of 0.001 kilometers for this line-of-sight path, one arrives at an  $N_s$  value of 350 in this area.

$$N_s = N_0 \exp(-0.1057 h_s) \quad \text{Formula 2}$$

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<sup>1</sup> *Prediction of Tropospheric Radio Transmission Loss Over Irregular Terrain*, A.G. Longley and P.L. Rice, NTIS, 1968.

Using Formula 1 of the Longley-Rice report, this  $N_s$  value corresponds to an effective earth radius of 9486 kilometers, which is equal to 1.489 of the actual earth radius.

$$a = 6370 [1 - 0.04665 \exp(0.005577 N_s)]^{-1} \text{ km} \quad \text{Formula 1}$$

### Longley-Rice Contour

The location of the Longley-Rice 75 dBu contour (chosen to allow for 5 dB of local clutter loss at the receive locations) in the direction of Port Isabel has been determined for 1-degree increment radials passing through Port Isabel. This contour has been plotted on the attached contour map exhibit, and encompasses 97% of the population of Port Isabel. (4,816 of 4,949 persons per the 2010 Census)

Radial	F(50,50) 70 dBu	L-R 75 dBu	L-R exceeds F(50,50) by
142	31.7 km	36.0 km	14%



