



**EXHIBIT SHOWING NO INTERFERENCE TO  
FM TRANSLATOR W227DU, CH. 227D, WELCH, WV  
BASED ON THE LONGLEY-RICE METHOD AND THE  
ACTUAL ELEVATIONS IN THE INTERVENING TERRAIN**

**Proposed W227DS (93.3 MHz) Power Increase to 130 Watts  
Rural Retreat, Virginia**

The contour protection study conducted in connection to this request for increased power for W227DS in Rural Retreat (in accordance with §74.1204(a) of the FCC rules) shows that the proposed W227DS 40 dBu interference contour overlaps the W227DU in Welch 60 dBu service contour. See the attached maps that show both contours.

As per §74.1204(d) of the FCC rules, a supplemental engineering study has been done to demonstrate that no actual interference would occur to W227DU inside its predicted 60 dBu service contour due to intervening terrain between the two stations. The V-Soft software program Probe 4 was used to conduct the study. The Longley-Rice method was selected as the basis of propagation and signal level calculations. On the next two pages of this exhibit are the parameters and assumptions used in the study.

In Probe 4, the contour overlap area formed between the predicted Welch 60 dBu service contour and the proposed predicted Rural Retreat 40 dB interference contour is divided into small cells (2.5 kilometers squared). At each cell, the predicted average Welch signal level (using Longley-Rice) is determined. If the Welch signal at a cell is greater than the threshold level of F(50,50) 60 dBu (the minimum for service), the average F(50,10) signal level from Rural Retreat is determined at that cell (again using Longley-Rice). If the Rural Retreat signal is more than 20 dB below the Welch signal, it is determined that no interference would occur. However, if the Rural Retreat signal is less than 20 dB below the Welch signal, that cell is considered an interference "hit". If the Welch signal is less than 60 dBu, the cell is considered a no-service cell, and therefore no interference from Rural Retreat in that cell is indicated.

On the following pages are maps showing the progression from many interference hits to no hits as we start at an assumed desired-to-undesired signal ratio from 40 dB and progressively decrease to 20 dB D/U in steps of 5 dB, the 20 dB ratio being the FCC standard for FM co-channel interference. As seen in the last map, at the 20 dB D/U ratio, there are no interference hits at all. Thus the requirement of §74.1204(d) is satisfied.



## **FM Interference Study Information**

### **W227DS Rural Retreat, VA into W227DU Welch, WV**

Protected contour: FCC F(50-50): 60 dBu  
Interference contour: FCC F(50-10): 40 dBu  
Contour calculation interval: 0.5 degrees

Interference considered within contour overlap.  
Signal Resolution: 0.25 km

Study Date: 3/22/2019

Land Cover was not considered in this study.

Terrain Database used: NED 3 Second US Terrain  
Coordinate System: NAD27

Transmitters:

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Transmitter Information:

Call Letters: W227DU  
File Number: BNPFT-20180319BNO  
Latitude: 37-25-01 N  
Longitude: 081-36-58 W  
ERP: 0.25 kW  
Channel: 227  
Frequency: 93.3 MHz  
AMSL Height: 681.0 m  
Elevation: 616.0 m  
Horiz. Antenna Pattern: Omni  
Vert. Elevation Pattern: No  
Propagation Model: Longley-Rice  
Climate: Continental temperate  
Conductivity: 0.0050  
Dielectric Constant: 15.0  
Refractivity: 301.0  
Receiver Height AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 50.0%  
Situation Variability: 50.0%  
ITM Mode: Broadcast  
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Transmitter Information:

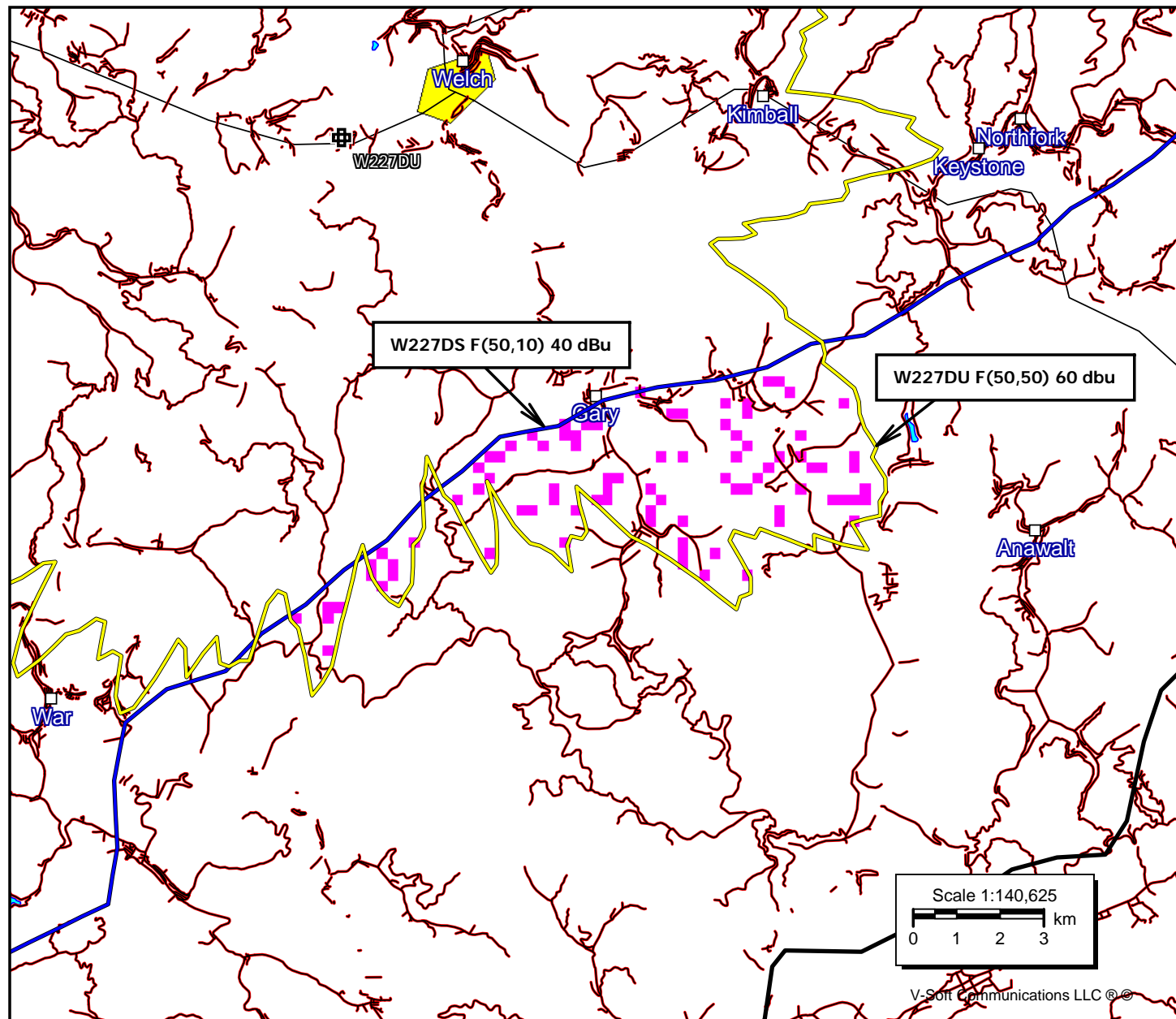
Call Letters: W227DS  
File Number: BLFT-20180730AAM  
Latitude: 36-54-26.80 N  
Longitude: 081-04-07.90 W  
ERP: 0.13 kW  
Channel: 227  
Frequency: 93.3 MHz  
AMSL Height: 1124.0 m  
Elevation: 1113.0 m  
Horiz. Antenna Pattern: Omni  
Vert. Elevation Pattern: No  
Propagation Model: Longley-Rice  
Climate: Continental temperate  
Conductivity: 0.0050  
Dielectric Constant: 15.0  
Refractivity: 301.0  
Receiver Height AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 10.0%  
Situation Variability: 50.0%  
ITM Mode: Broadcast

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## Predicted Interference Cells assuming Co-Channel D/U Ratio = 40 dB

### W227DU

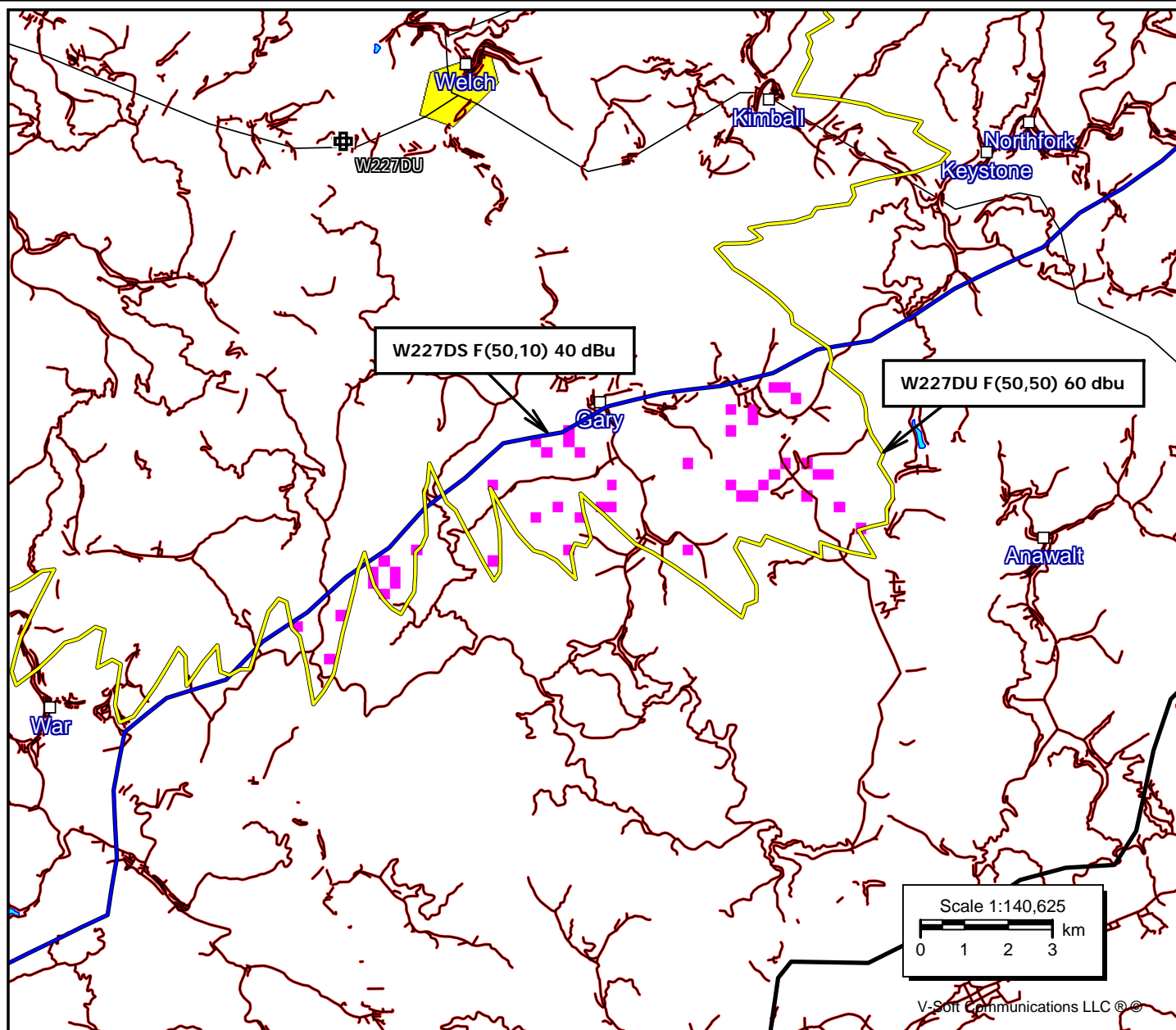
BNPFT-20180319BNO  
Latitude: 37-25-01 N  
Longitude: 081-36-58 W  
ERP: 0.25 kW  
Channel: 227  
Frequency: 93.3 MHz  
AMSL Height: 681.0 m  
Elevation: 616.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: Longley-Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 301.0  
Receiver Ht AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 50.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast



## Predicted Interference Cells assuming Co-Channel D/U Ratio = 35 dB

### W227DU

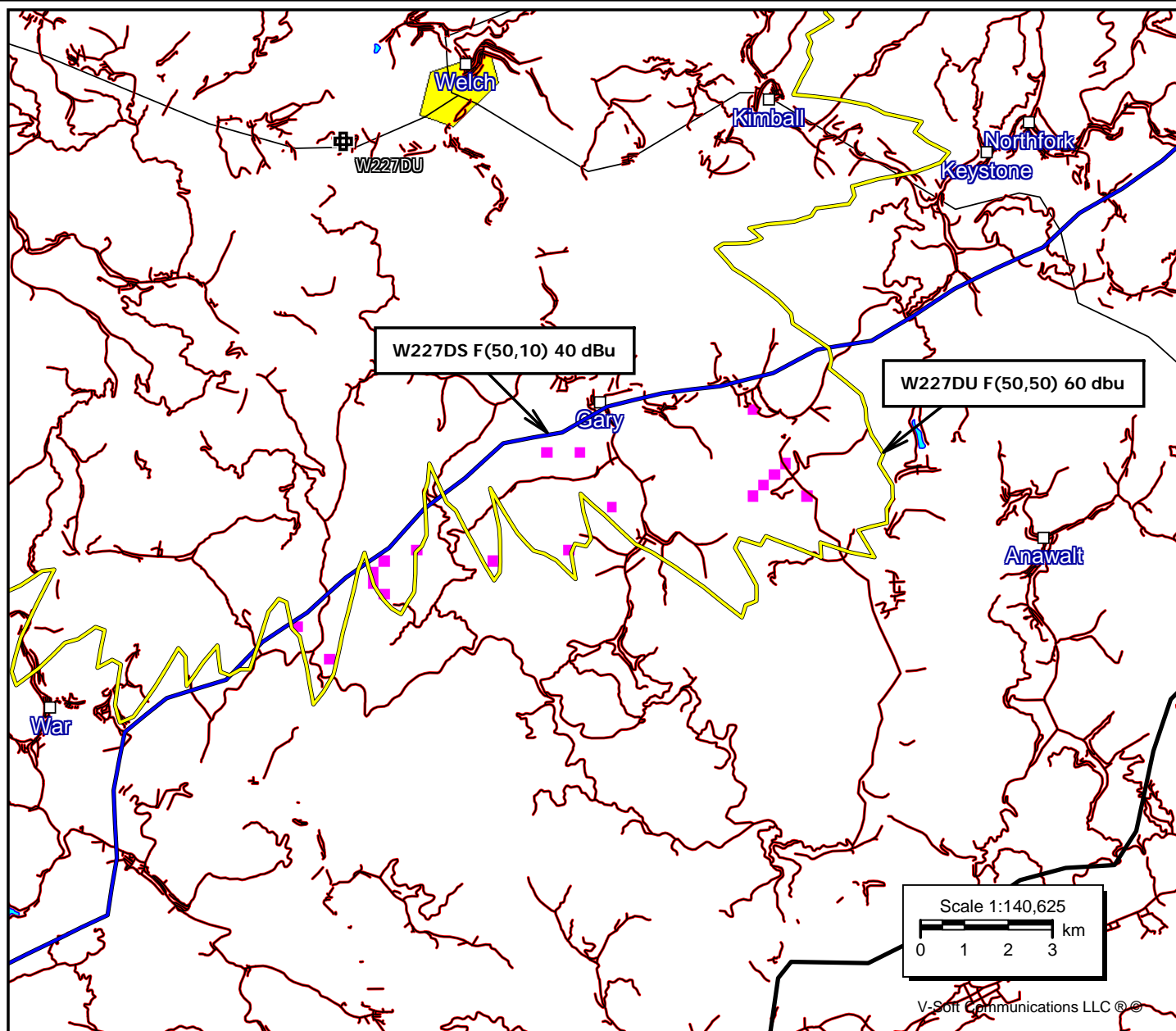
BNPFT-20180319BNO  
Latitude: 37-25-01 N  
Longitude: 081-36-58 W  
ERP: 0.25 kW  
Channel: 227  
Frequency: 93.3 MHz  
AMSL Height: 681.0 m  
Elevation: 616.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: Longley-Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 301.0  
Receiver Ht AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 50.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast



## Predicted Interference Cells assuming Co-Channel D/U Ratio = 30 dB

### W227DU

BNPFT-20180319BNO  
Latitude: 37-25-01 N  
Longitude: 081-36-58 W  
ERP: 0.25 kW  
Channel: 227  
Frequency: 93.3 MHz  
AMSL Height: 681.0 m  
Elevation: 616.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: Longley-Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 301.0  
Receiver Ht AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 50.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast

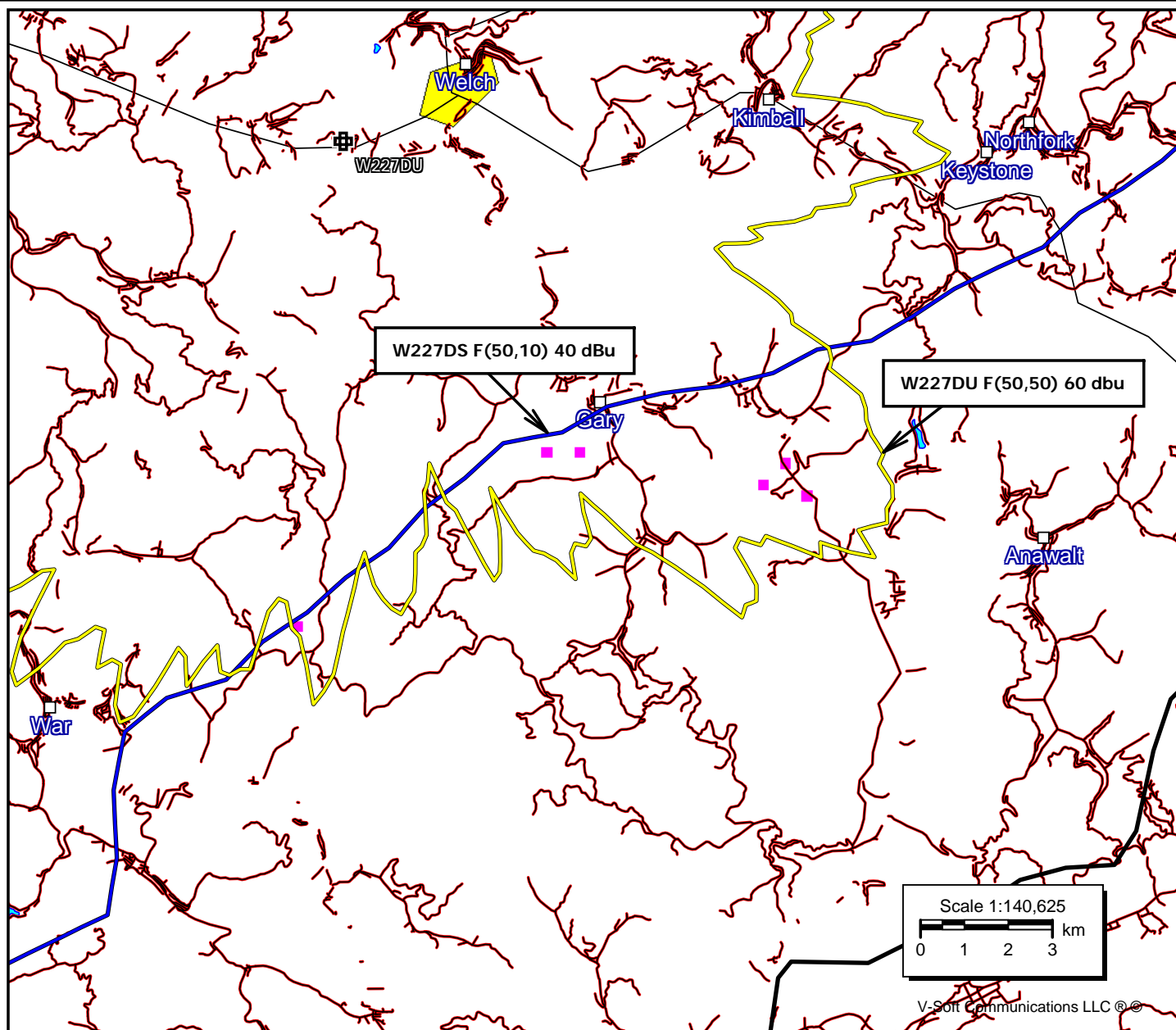




## Predicted Interference Cells assuming Co-Channel D/U Ratio = 25 dB

### W227DU

BNPFT-20180319BNO  
Latitude: 37-25-01 N  
Longitude: 081-36-58 W  
ERP: 0.25 kW  
Channel: 227  
Frequency: 93.3 MHz  
AMSL Height: 681.0 m  
Elevation: 616.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: Longley-Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 301.0  
Receiver Ht AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 50.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast



## Predicted Interference Cells using FCC Co-Channel D/U Ratio of 20 dB

### W227DU

BNPFT-20180319BNO  
Latitude: 37-25-01 N  
Longitude: 081-36-58 W  
ERP: 0.25 kW  
Channel: 227  
Frequency: 93.3 MHz  
AMSL Height: 681.0 m  
Elevation: 616.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: Longley-Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 301.0  
Receiver Ht AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 50.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast

