Broadcast Signal Lab

WBRS Spectrum Study – Expansion of 100.1 FM Signal Coverage

Summary Findings
March 14, 2006

APPENDIX A

CONTOUR MAPS

PREDICTED COVERAGE MAPS

For the max-strength plots, the colors represent the following values:

White (center)	=	100 dB+ (primarily to indicate the facility's location)
Red	=	70 – 100 dB (city-grade signal)
Yellow	=	54 – 70 dB (receivable by most radios)
Green	=	40 – 54 dB (receivable, but only by good radios with good antennas)
White (outer)	=	40 – 0 dB (not receivable)

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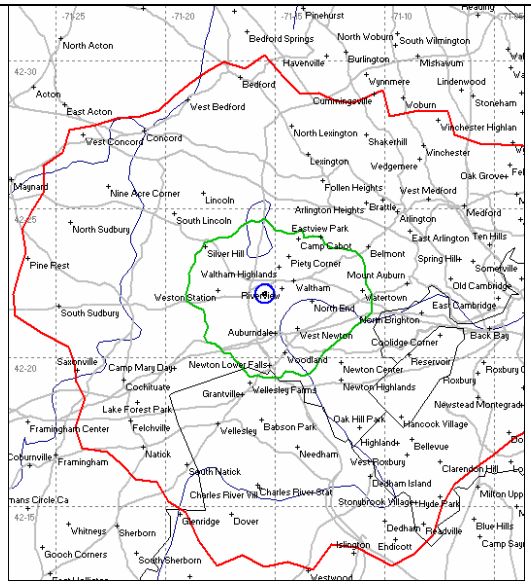
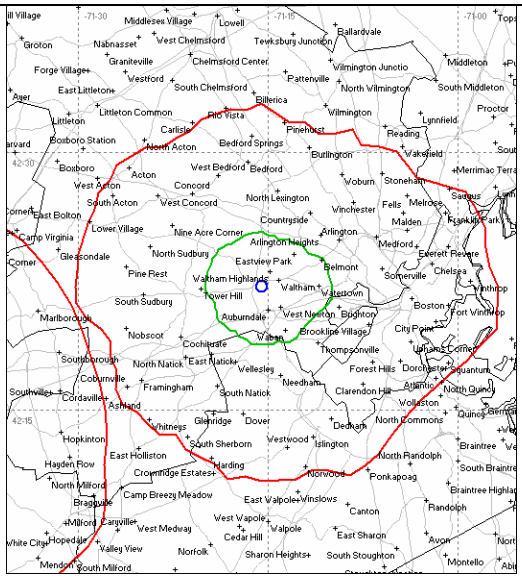
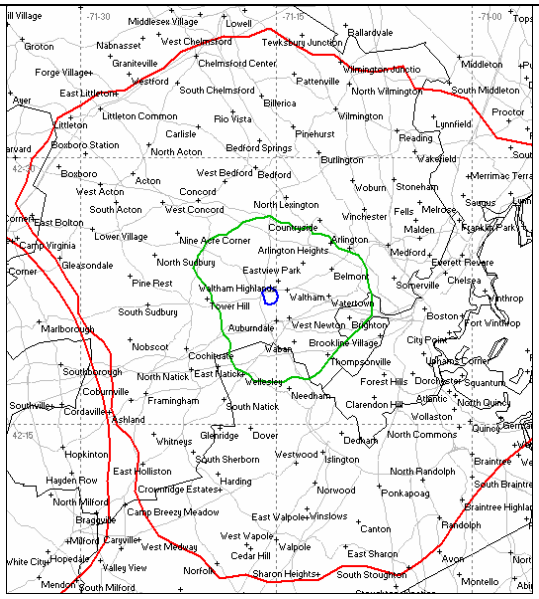
FCC CONTOUR MAPS



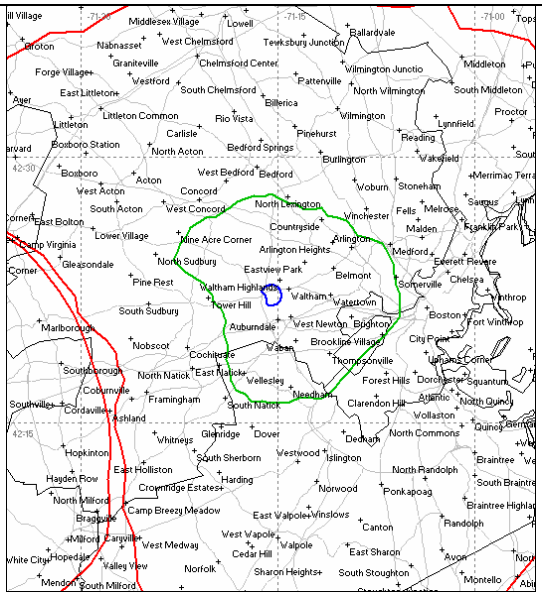
Existing WBRS facility
ND 25 W @ 49.88M HAAT



Water Tank
ND 25 W @ 75.68 M HAAT



Water Tank
DIR 100 W @ 75.68M HAAT



Water Tank
DIR 250 W @ 75.68 M HAAT

These contour maps represent existing WBRS facility and three hypothetical facilities on the Water Tank adjacent to the Brandeis campus. The red contour on the left in some maps is the 60dBu F(50,50) protected contour of WWFX 100.1FM in Southbridge. The red contour of WBRS is the 40dBu F(50,10) interfering contour; it cannot overlap WWFX's 60dBu. Green is WBRS's 60dBu protected contour. Blue contours are 100dBu F(50,10) interfering and help show the location of the transmission facility.

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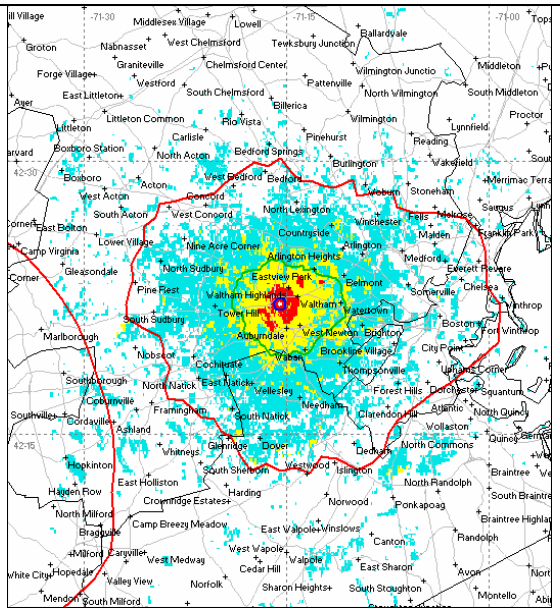
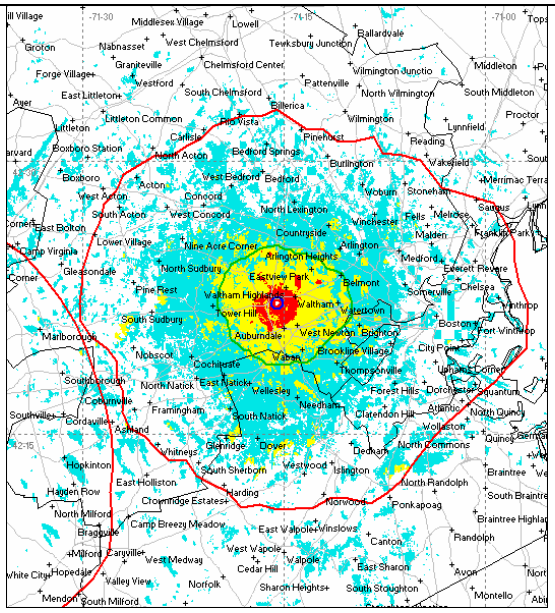
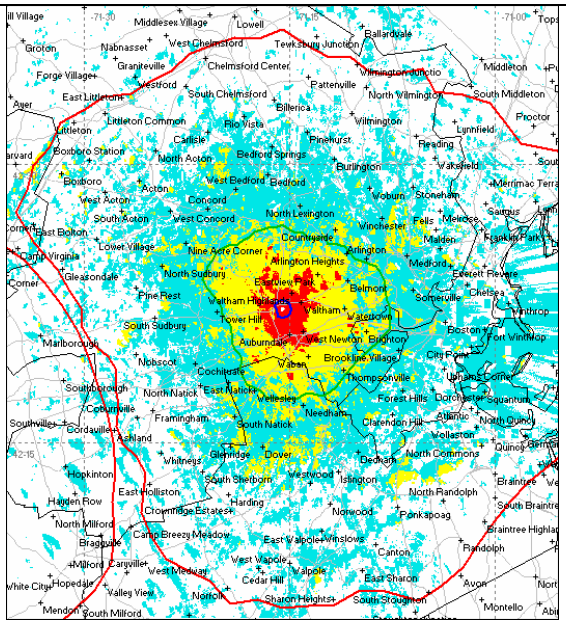
LONGLEY-RICE SIGNAL PLOTS - MAXIMUM FIELD STRENGTH (50,50)



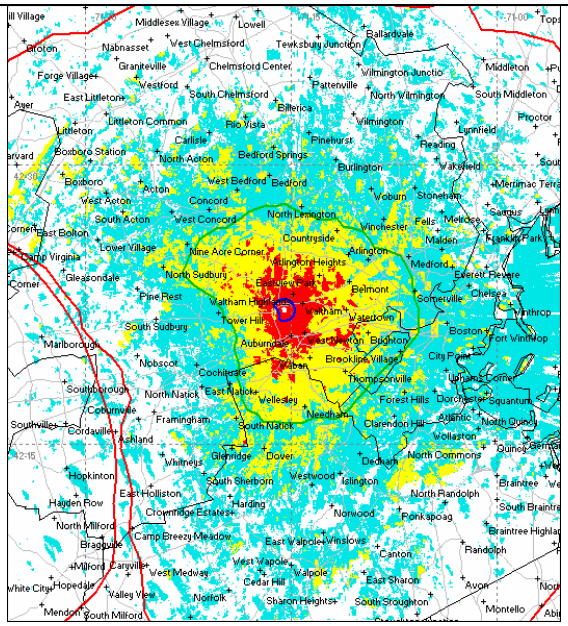
Existing WBRS facility
ND 25 W @ 49.88M HAAT



Water Tank
ND 25 W @ 75.68 M HAAT



Water Tank
DIR 100 W @ 75.68 M HAAT



Water Tank
DIR 250 W @ 75.68 M HAAT

These signal plots' colors represent the following signal levels.

Red = 100 – 70dB (very strong signal)
Yellow = 70 – 54dB (city grade signal)
Light Blue = 54 to 40dB (need good radios & antennas)
White = 40dB or lower (likely not receivable)

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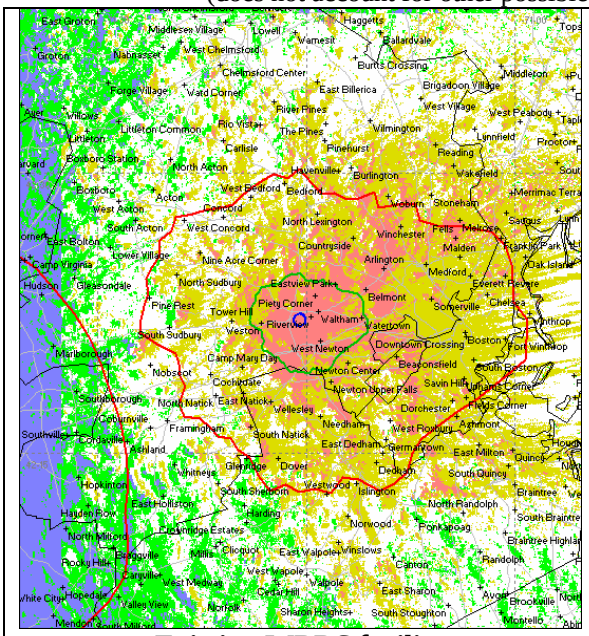
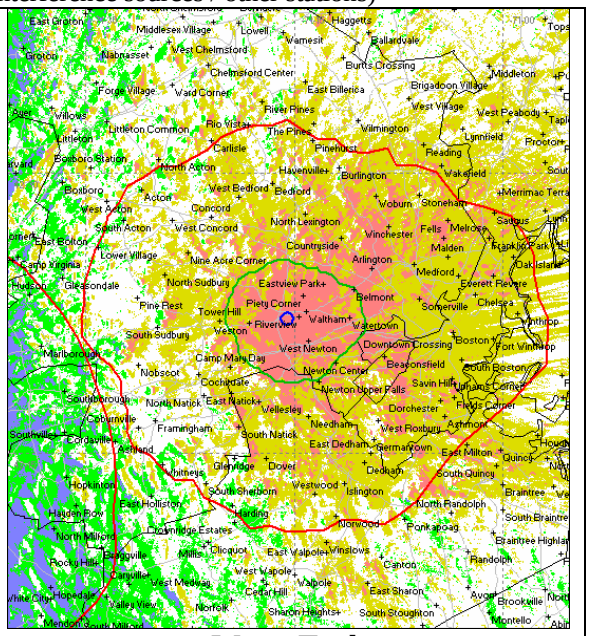
LONGLEY-RICE SIGNAL PLOTS - DIFFERENCE WITH WWFX 100.1

(does not account for other possible interference sources / other stations)



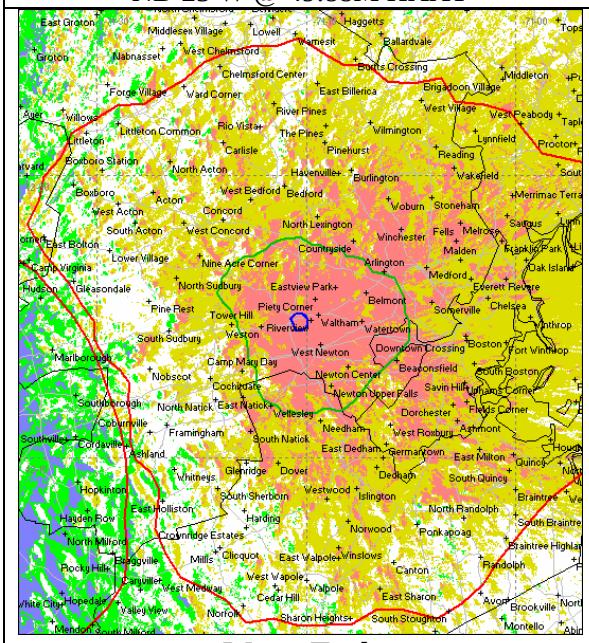
Existing WBRS facility

ND 25 W @ 49.88M HAAT



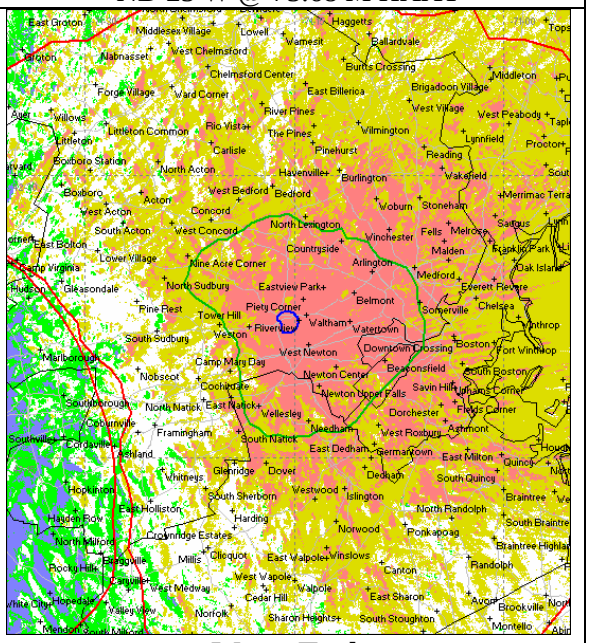
Water Tank

ND 25 W @ 75.68 M HAAT



Water Tank

DIR 100 W @ 75.68 M HAAT



Water Tank

DIR 250 W @ 75.68 M HAAT

Most radios need at least +20dB more of WBRS's signal to reject WWFX's signal. So areas in red are most reliable. Yellow is "possible" with a good radio & antenna. White means WBRS is probably not receivable. Blue & Green mean WWFX swamps WBRS.

Red = WBRS is 40 to 20dB stronger

Yellow = WBRS is 20 to 0dB stronger

White = WBRS is 0 to 20dB weaker

Green = WBRS is 20 to 40dB weaker

Blue = WBRS is 40 to 43dB weaker

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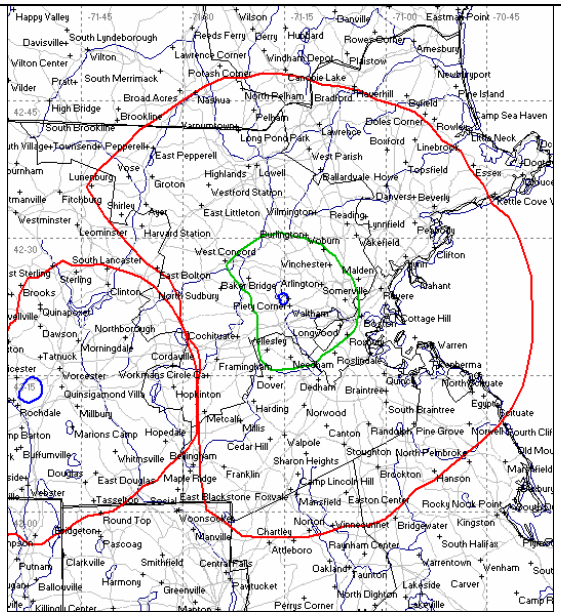
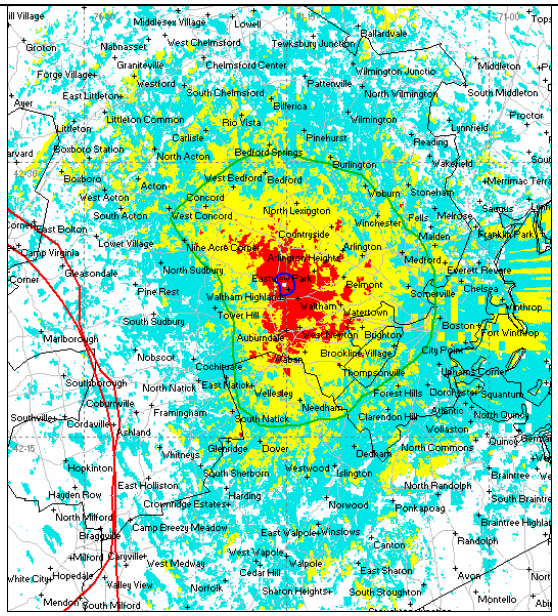
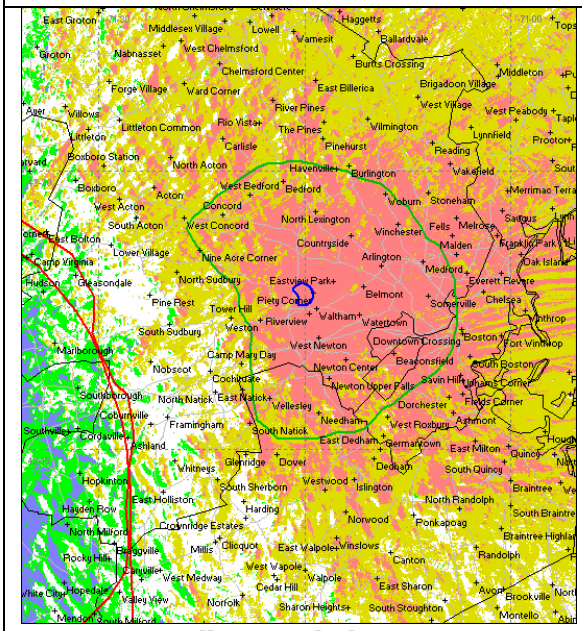
PROSPECT HILL using 250 WATT DIRECTIONAL



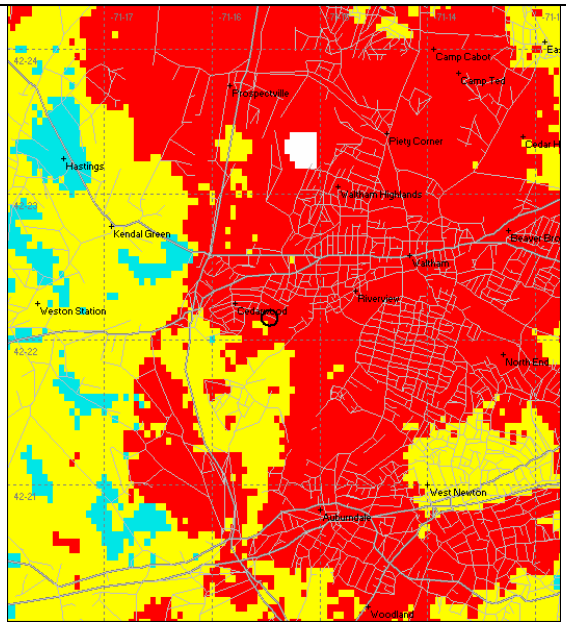
Prospect Hill – Contours vs. WWFX
DIR 250 W @ 114.84 M HAAT



Prospect Hill – Signal Plot (Max)
DIR 250 W @ 114.84 M HAAT



Prospect Hill – Signal Plot (vs. WWFX)
DIR 250 W @ 114.84 M HAAT



Prospect Hill – Signal Plot (Max)
DIR 250 W @ 114.84 M HAAT
Shows coverage on Brandeis campus
(existing site marked with black circle)

These maps show the hypothetical 250 watt directional facility on Prospect Hill.

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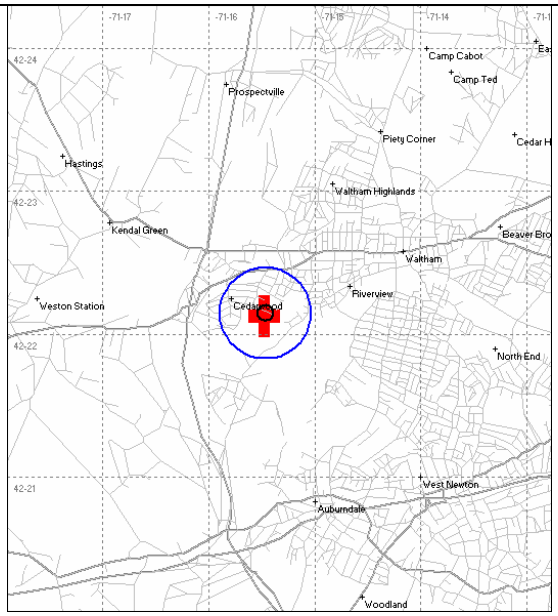
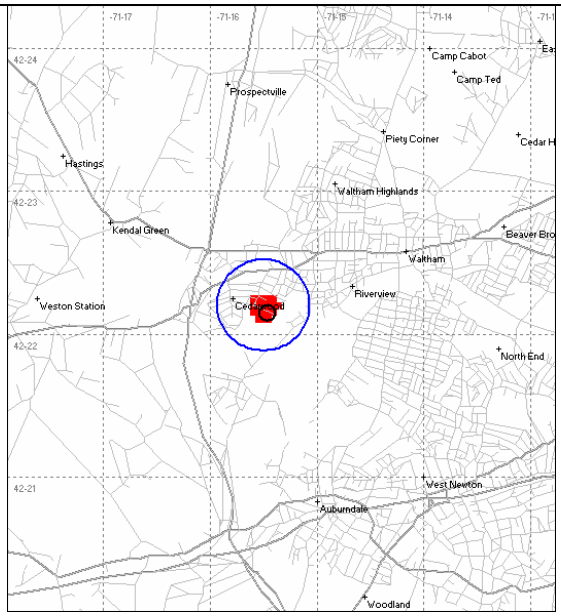
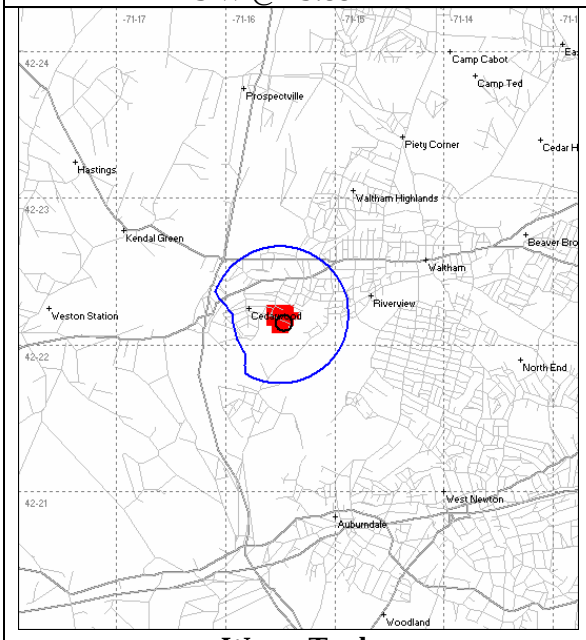
100dBu INTERFERING CONTOUR / PLOTS – CLOSEUP VIEWS (WATER TANK)



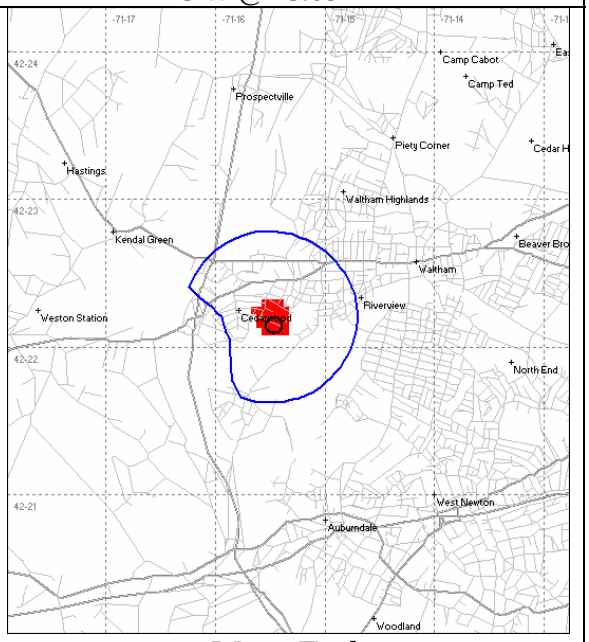
Existing WBRS facility
ND 25 W @ 49.88M HAAT



Water Tank
ND 25 W @ 75.68 M HAAT



Water Tank
DIR 100 W @ 75.68 M HAAT



Water Tank
DIR 250 W @ 75.68 M HAAT

The black circle indicates the existing WBRS facility. Blue contours are the 100dBu (50,10) interfering contour. The red area is a Longley-Rice contour plot showing the 100 – 70 dB signal.

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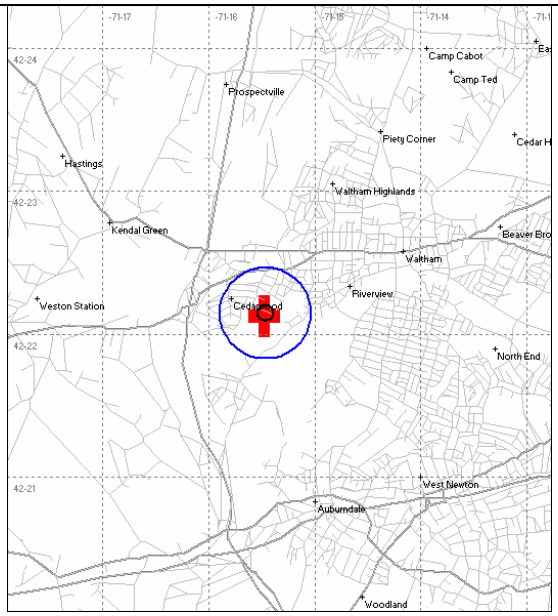
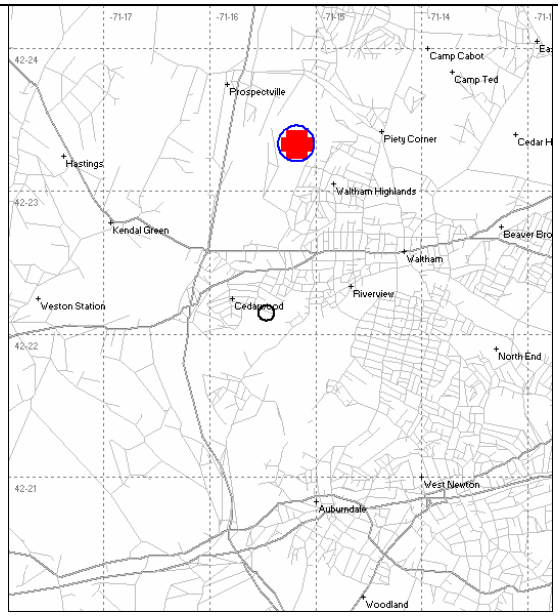
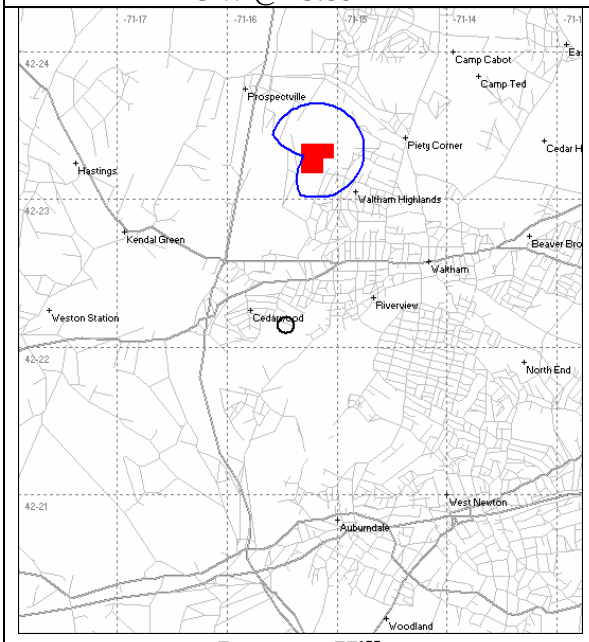
100dBu INTERFERING CONTOUR / PLOTS – CLOSEUP VIEWS (PROSPECT HILL)



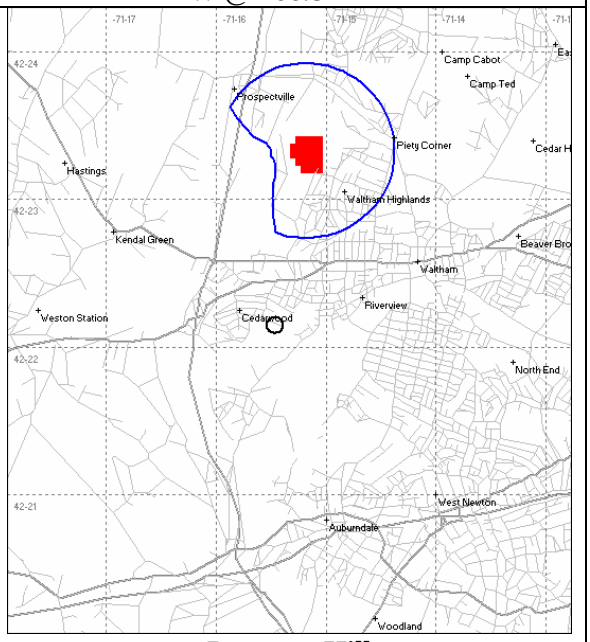
Existing WBRS facility
ND 25 W @ 49.88M HAAT



Prospect Hill
ND 4 W @ 166.84 M HAAT



Prospect Hill
DIR 25 W @ 166.84 M HAAT



Prospect Hill
DIR 250 W @ 114.84M HAAT

The black circle indicates the existing WBRS facility. Blue contours are the 100dBu (50,10) interfering contour. The red area is a Longley-Rice contour plot showing the 100 – 70 dB signal.

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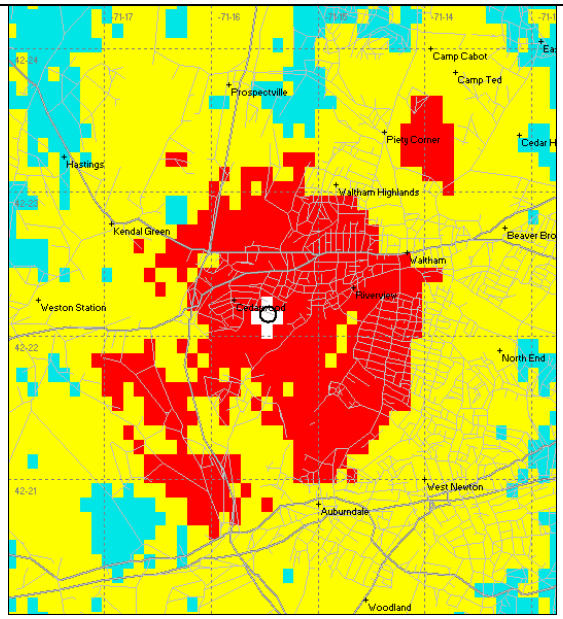
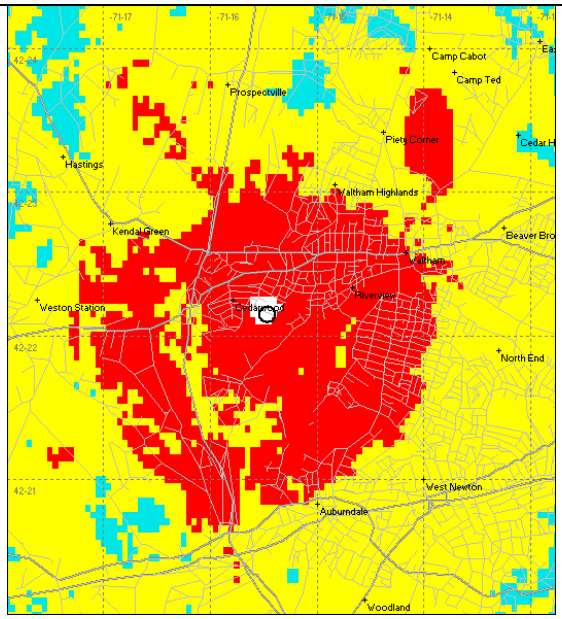
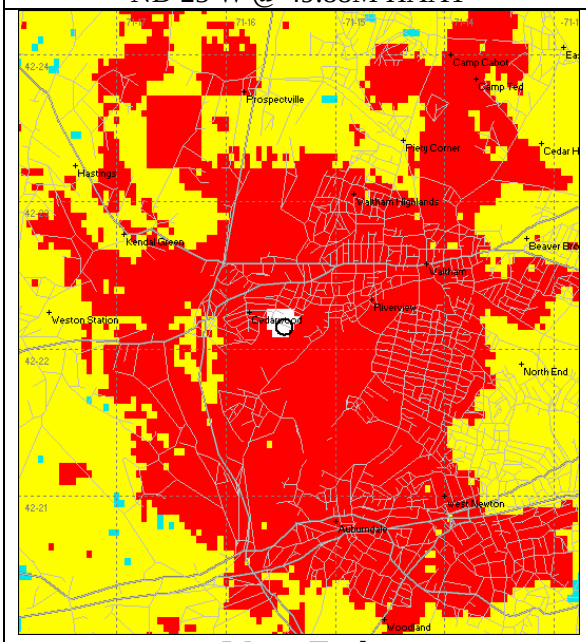
CAMPUS COVERAGE – WATERT ANK



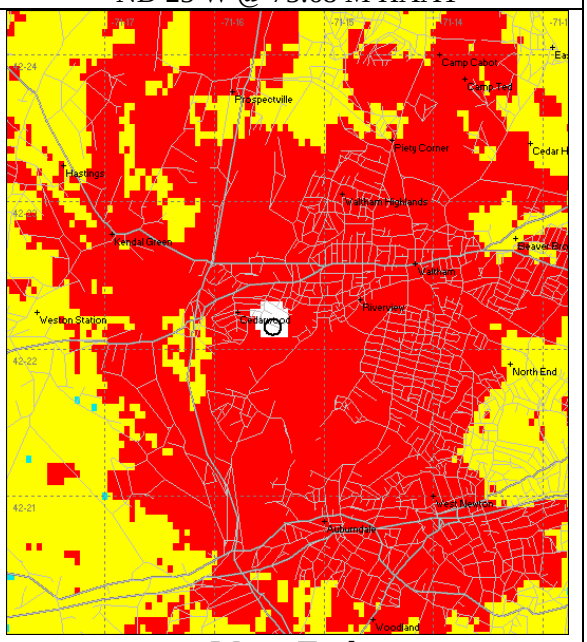
Existing WBRS facility
ND 25 W @ 49.88M HAAT



Water Tank
ND 25 W @ 75.68 M HAAT



Water Tank
DIR 100 W @ 75.68 M HAAT



Water Tank
DIR 250 W @ 75.68 M HAAT

These signal plots' colors represent the following signal levels.

White = 100dB or greater
Red = 100 – 70dB (very strong signal)
Yellow = 70 – 54dB (city grade signal)
Light Blue = 54 to 40dB (need good radios & antennas)

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APPENDIX B

CONTOUR MAPS

PREDICTED COVERAGE MAPS

(individual maps shown full-size)

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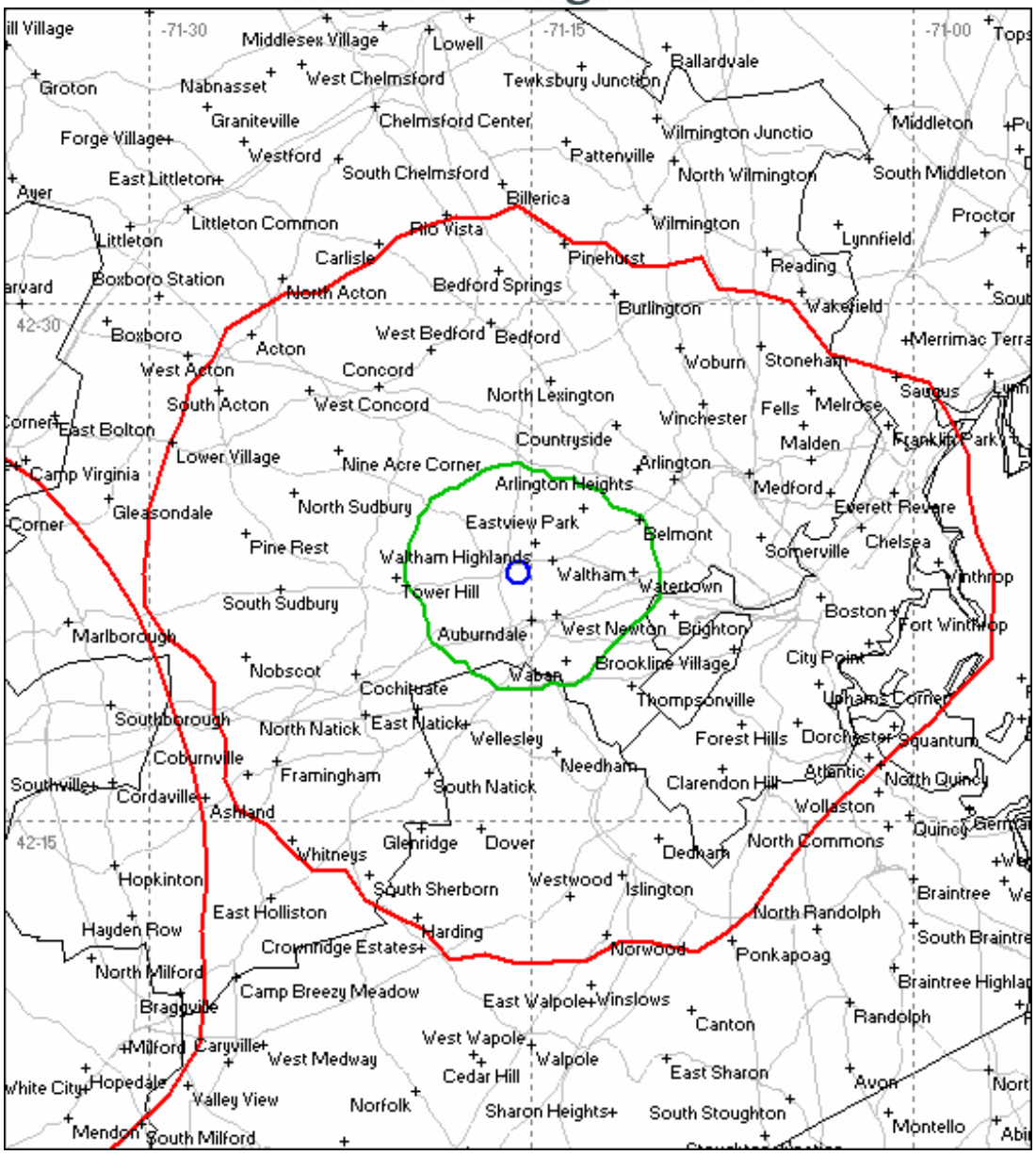

WATER TANK – ND 25 W @ 75.68 M HAAT

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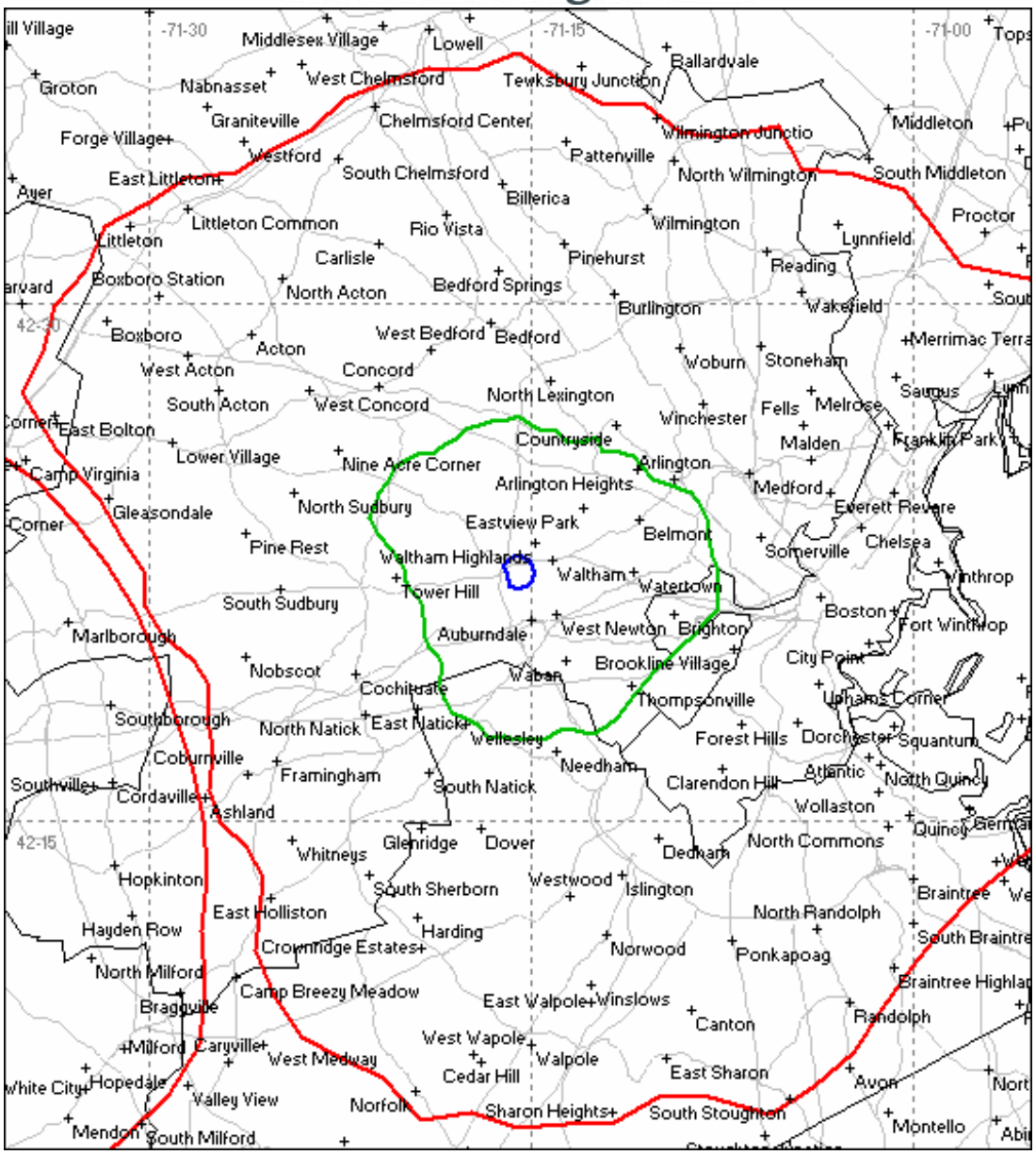

WATER TANK – DIR 100 W @ 75.68 M HAAT

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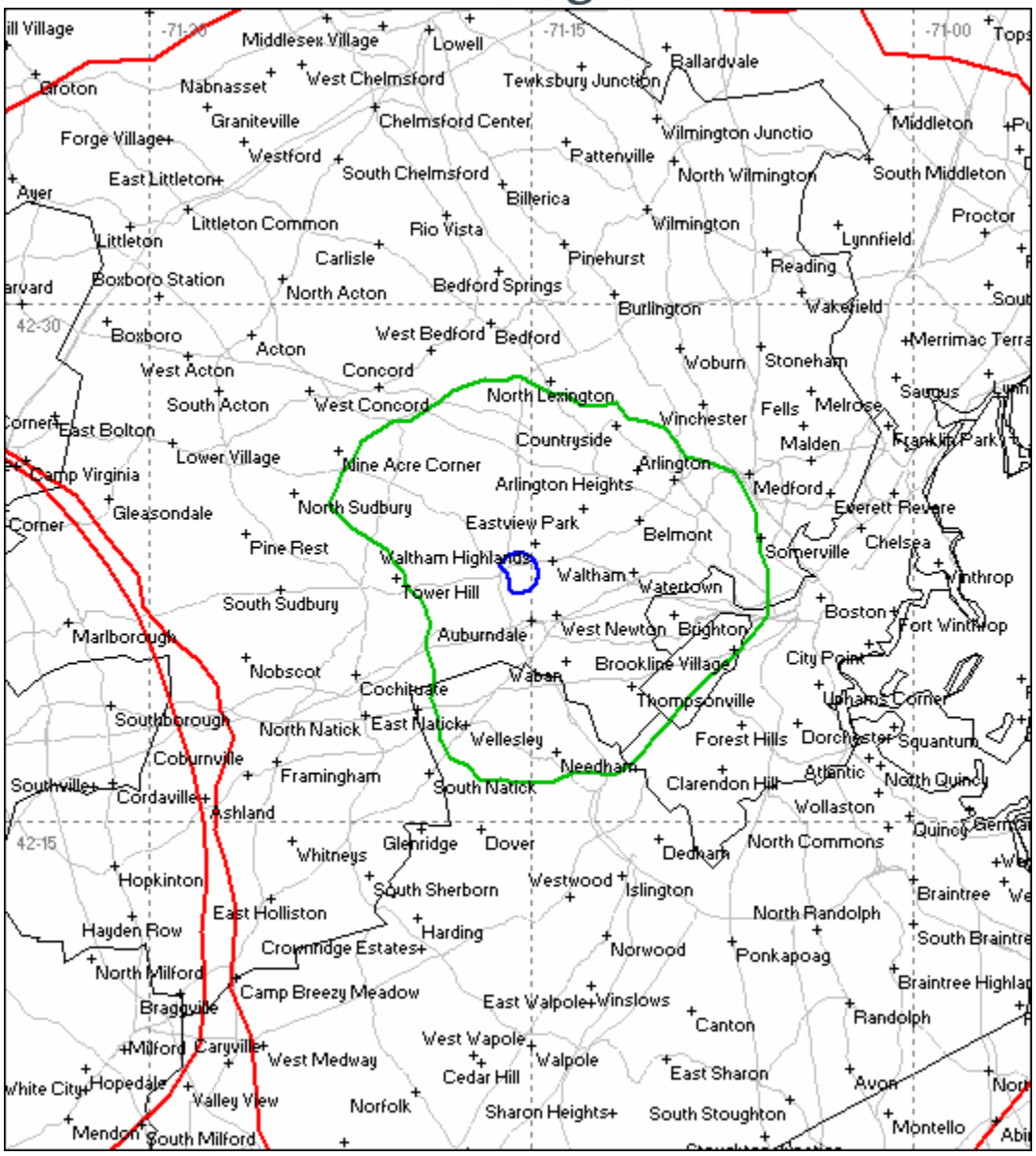

WATER TANK – ND 250 W @ 75.68 M HAAT

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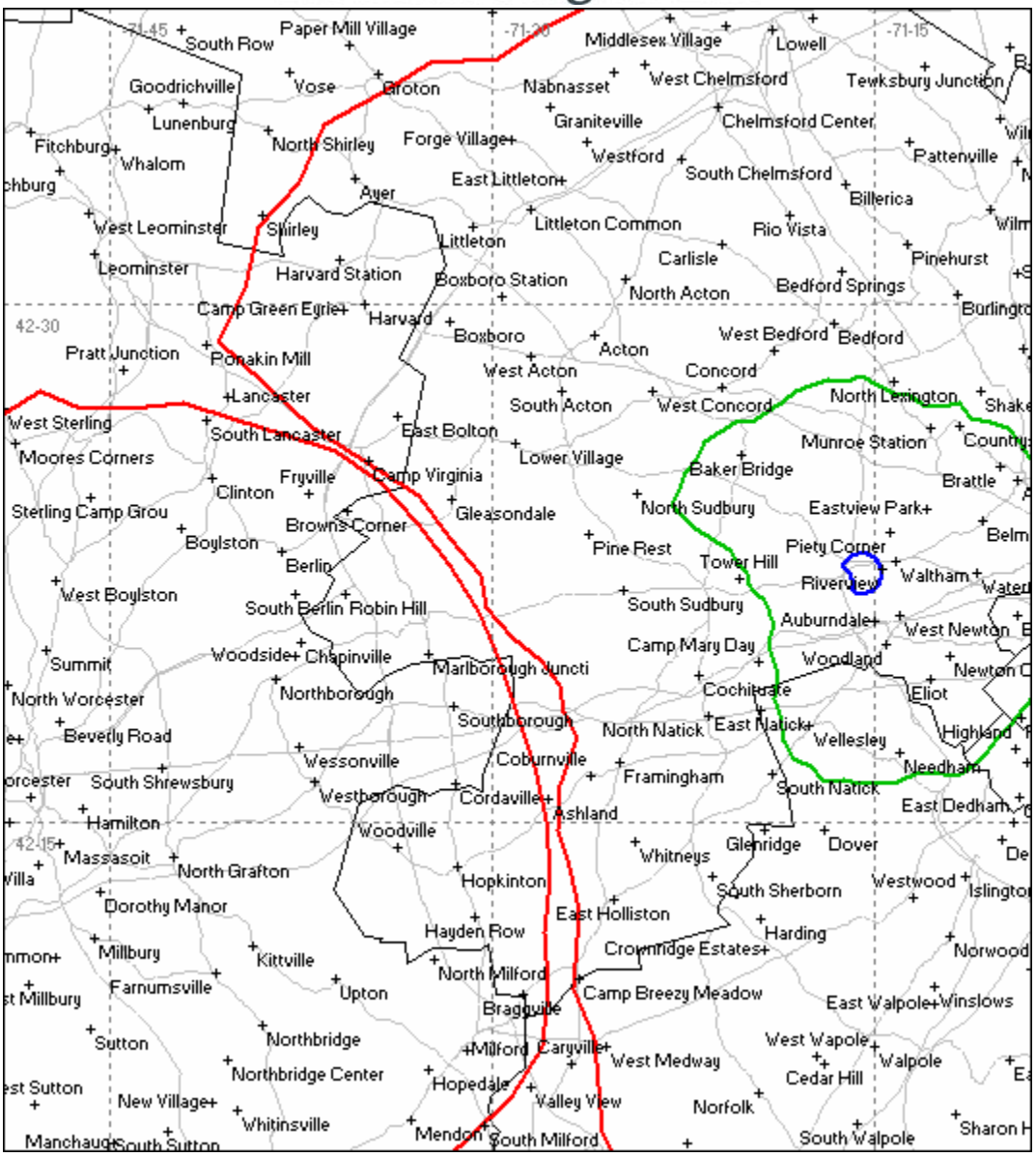

WATER TANK – ND 25 W @ 75.68 M HAAT

Closeup view showing no overlap between WBRS 40dBu contour and WWFX 60dBu contour.

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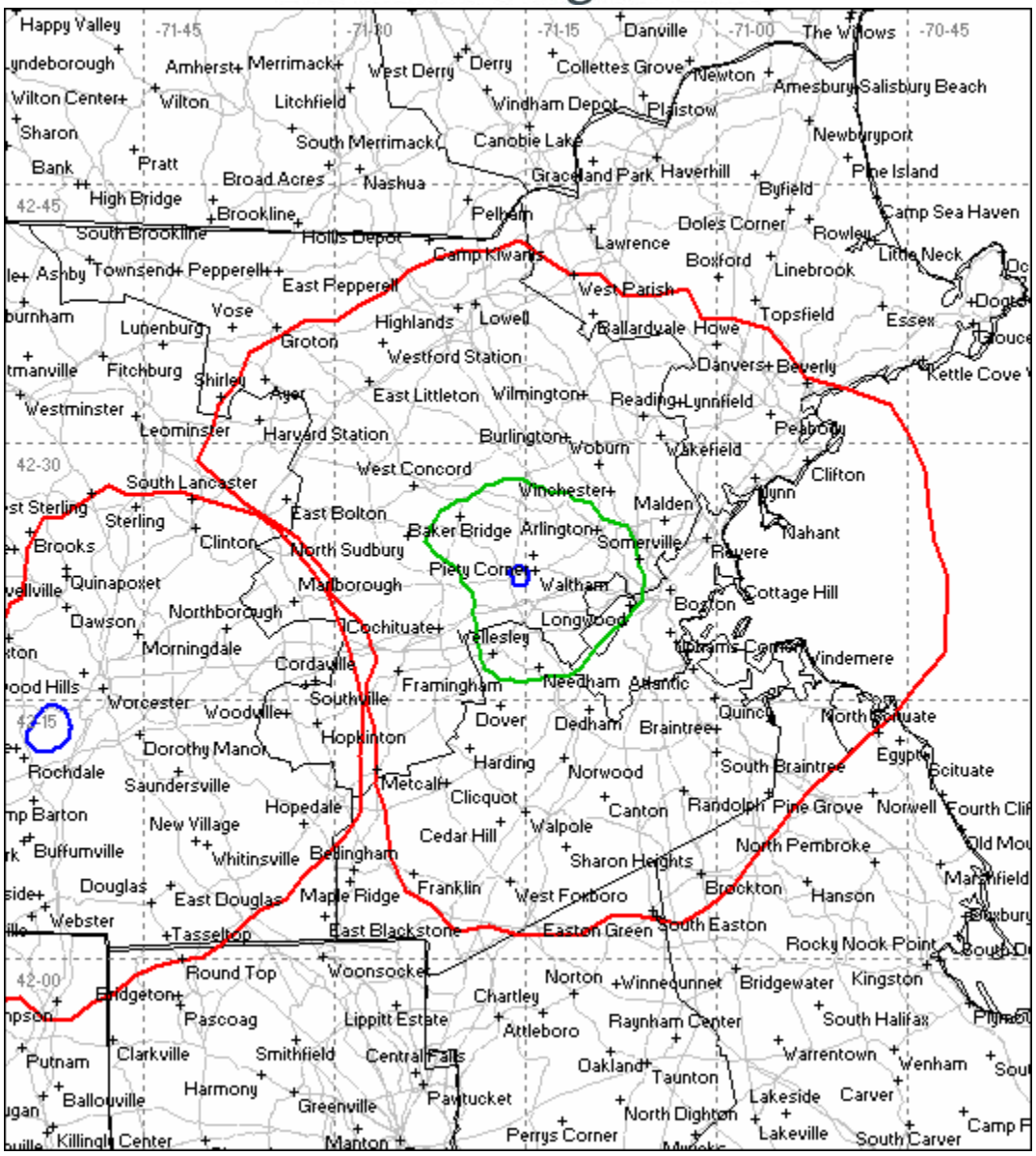

WATER TANK – ND 250 W @ 75.68 M HAAT

Wide view showing entire WBRS 40dBu

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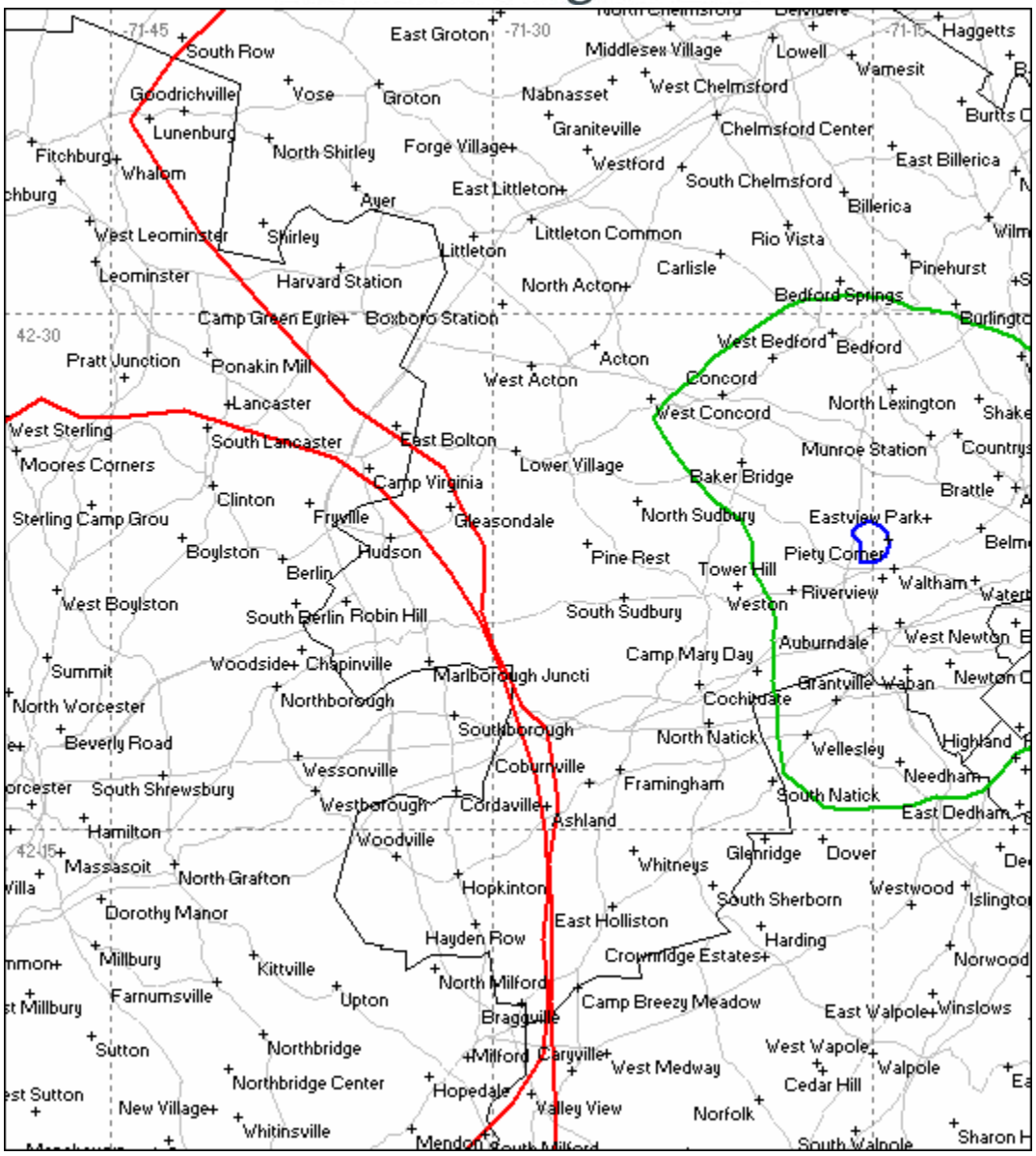

PROSPECT HILL – DIR 250 W @ 114.84 M HAAT

Closeup view showing no overlap between WBRS 40dBu contour and WWFX 60dBu contour.

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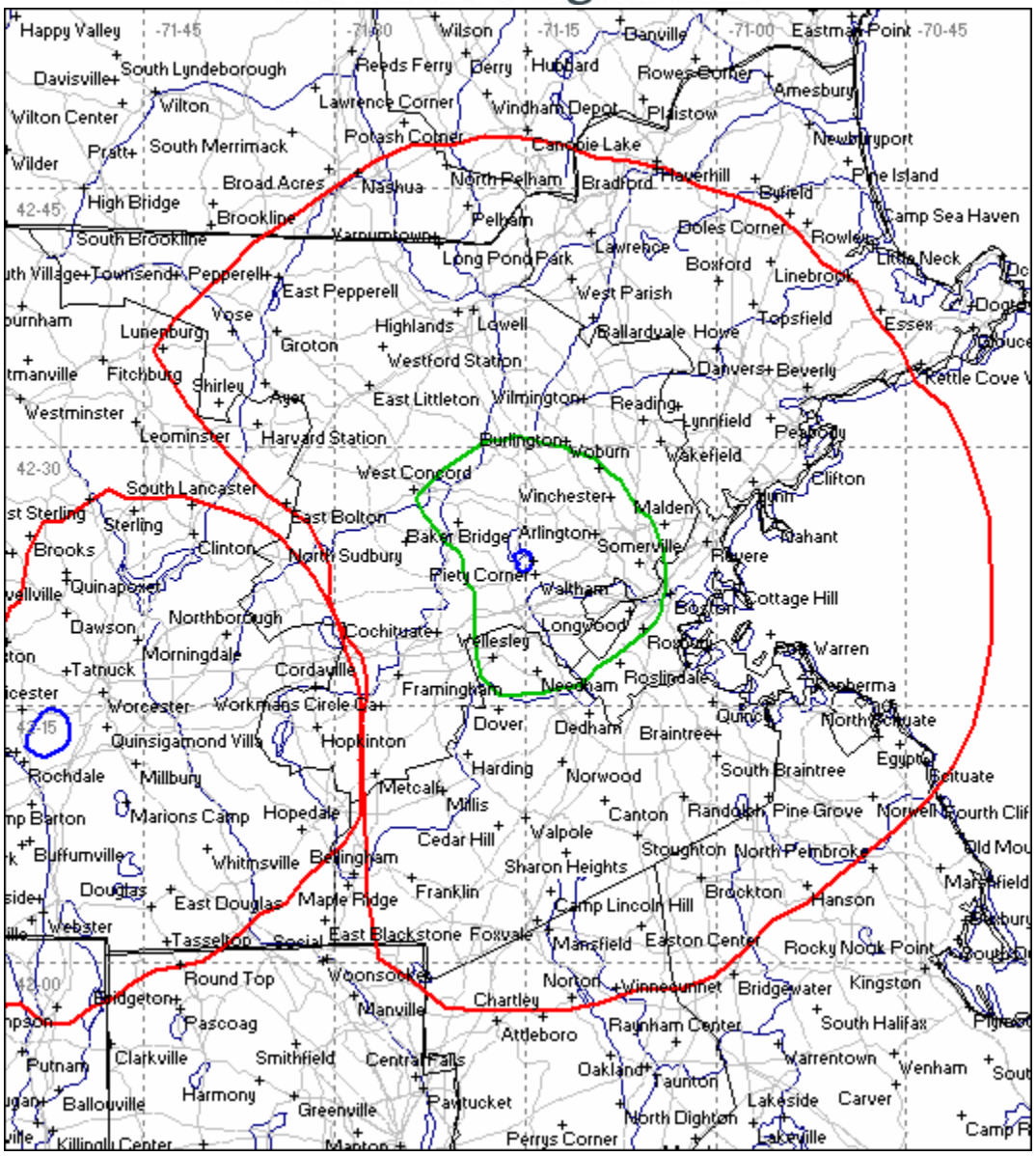

PROSPECT HILL – DIR 250 W @ 114.84 M HAAT

Wide view showing entire WBRS 40dBu

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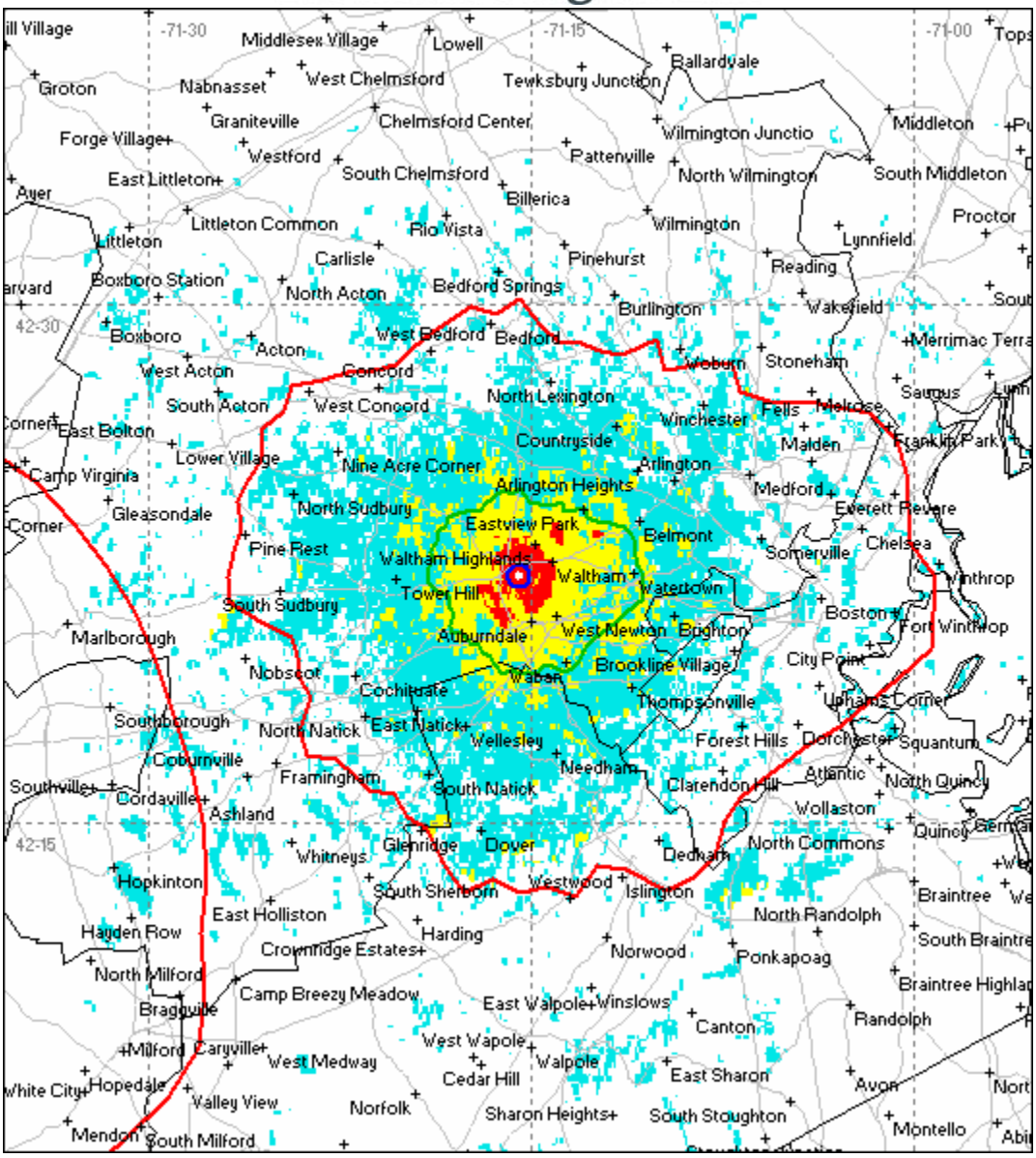

LONGLEY-RICE PLOT – MAXIMUM SIGNAL
EXISTING FACILITY
ND 25 W @ 49.88 M HAAT

Red = 100 – 70dB (very strong signal)
Yellow = 70 – 54dB (city grade signal)
Light Blue = 54 to 40dB (need good radios & antennas)
White = 40dB or lower (likely not receivable)

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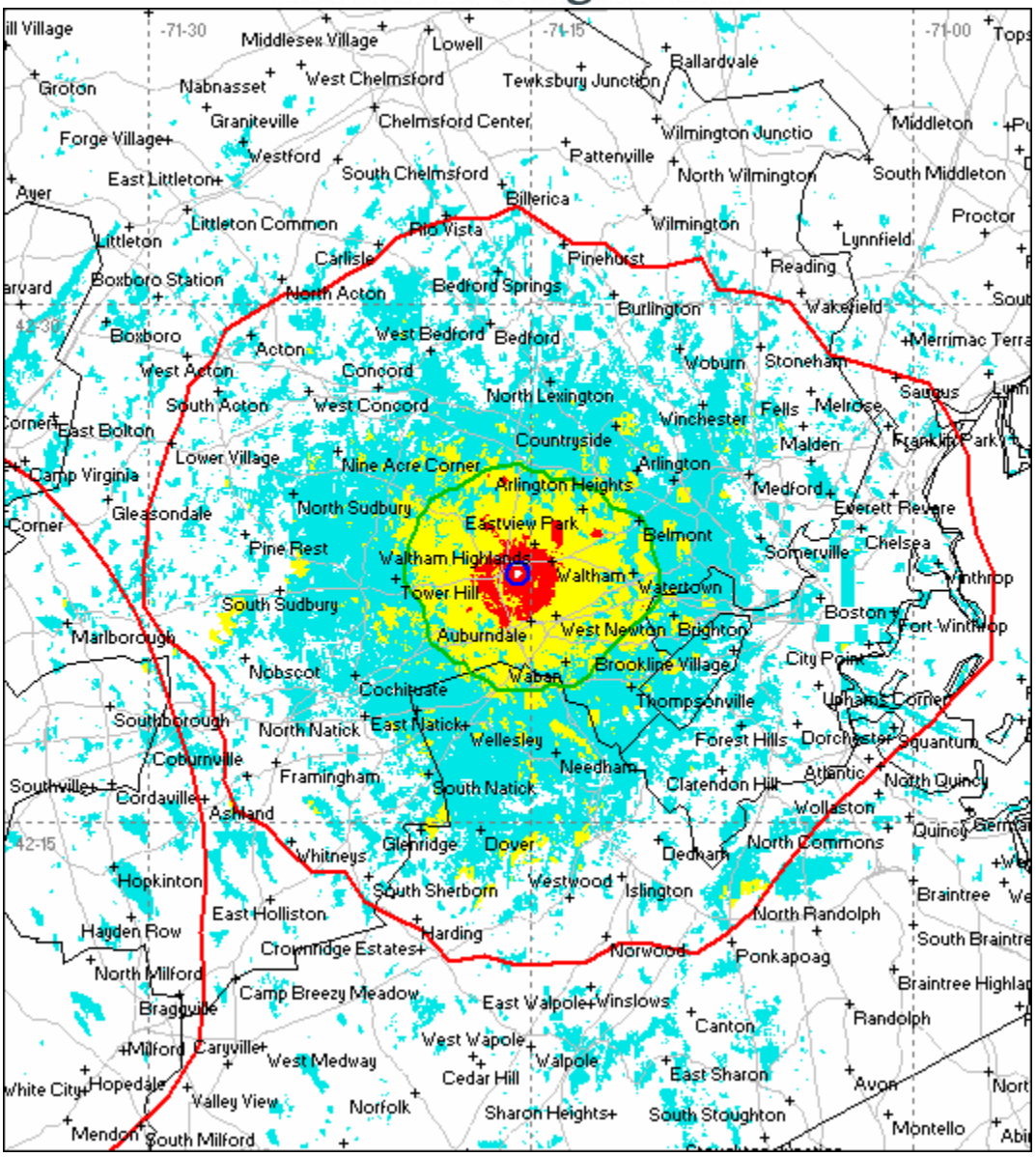

LONGLEY-RICE PLOT – MAXIMUM SIGNAL
WATER TANK
ND 25 W @ 75.68 M HAAT

Red = 100 – 70dB (very strong signal)
Yellow = 70 – 54dB (city grade signal)
Light Blue = 54 to 40dB (need good radios & antennas)
White = 40dB or lower (likely not receivable)

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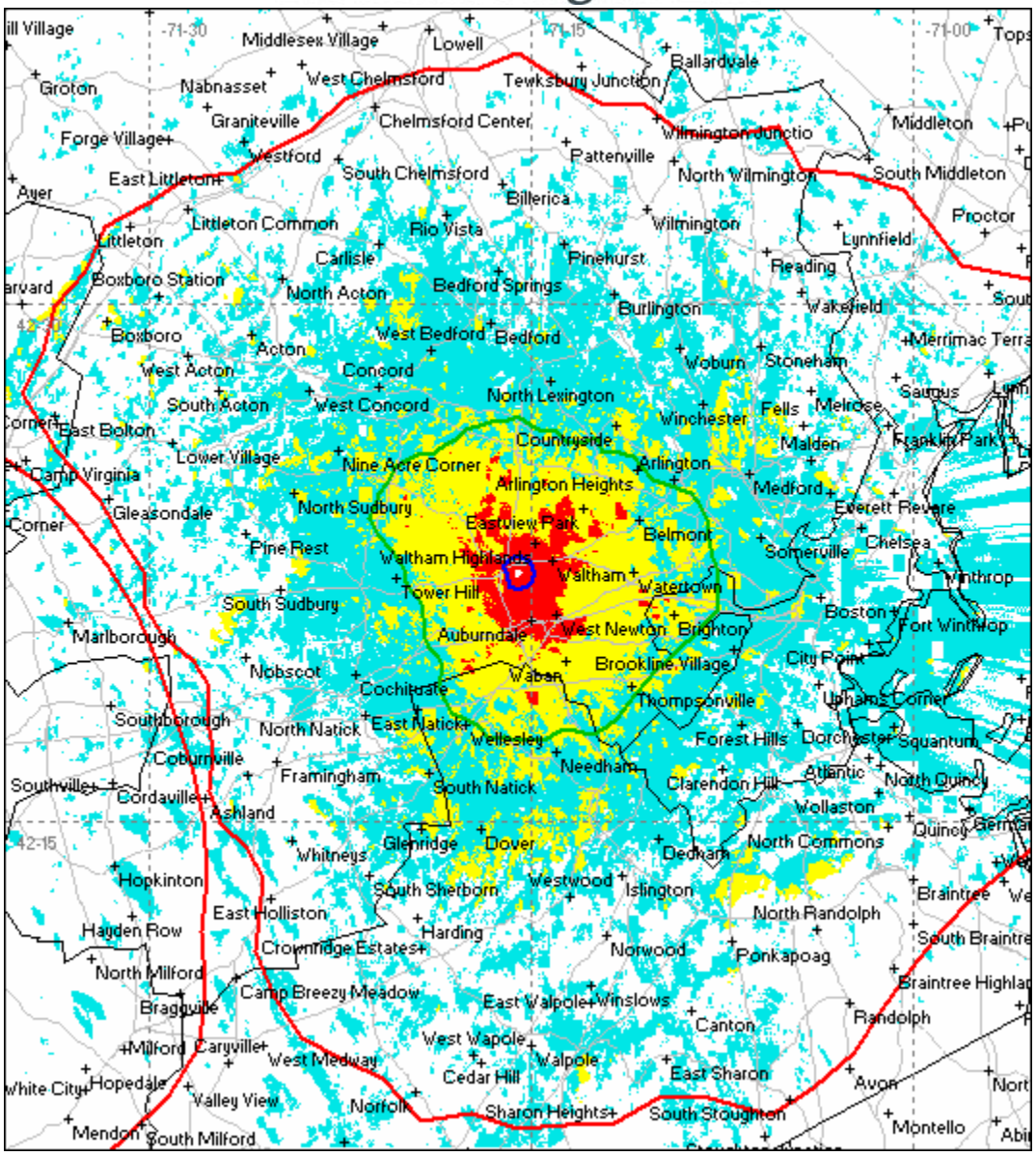

LONGLEY-RICE PLOT – MAXIMUM SIGNAL
WATER TANK
DIR 100 W @ 75.68 M HAAT

Red = 100 – 70dB (very strong signal)
Yellow = 70 – 54dB (city grade signal)
Light Blue = 54 to 40dB (need good radios & antennas)
White = 40dB or lower (likely not receivable)

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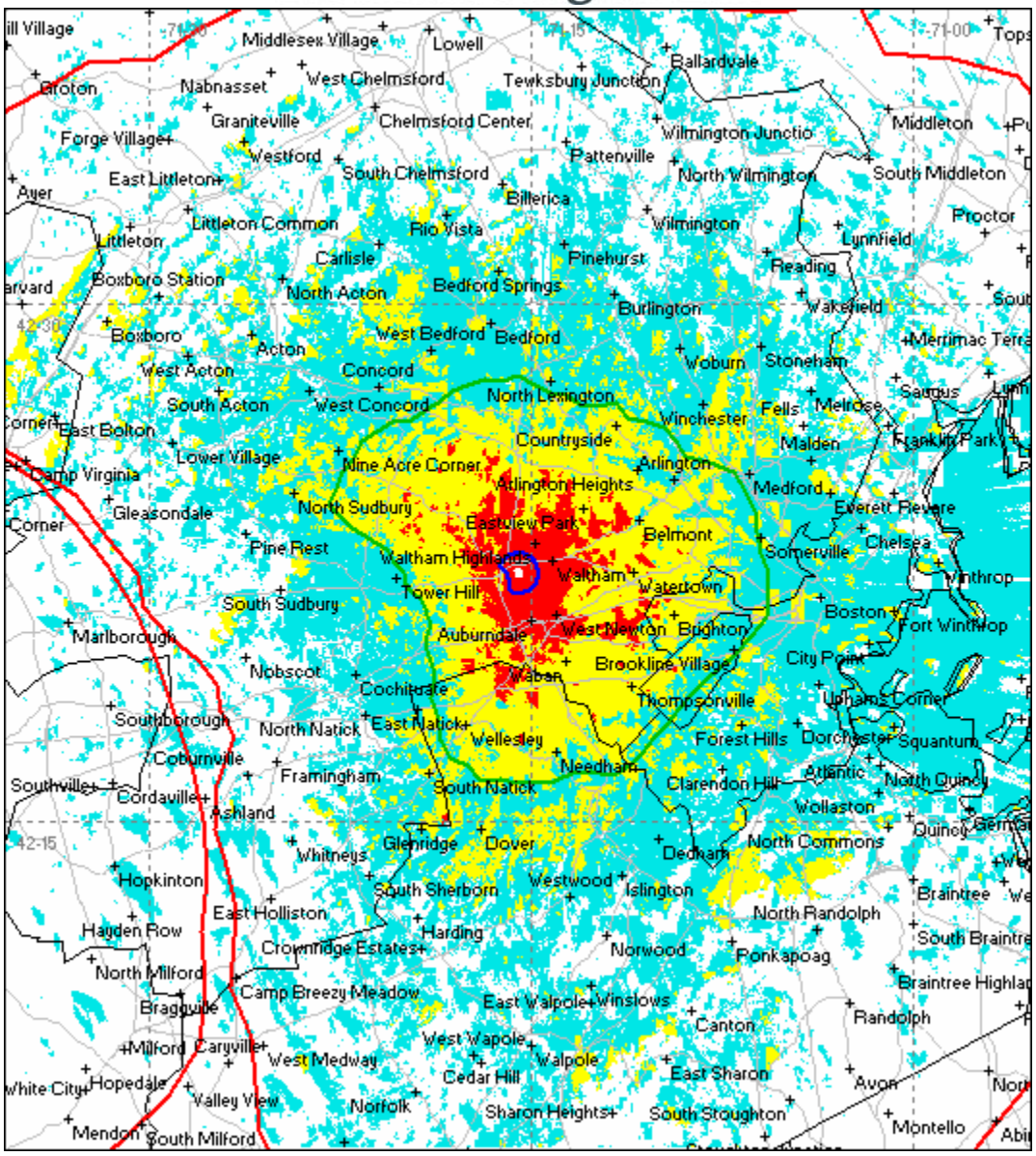

LONGLEY-RICE PLOT – MAXIMUM SIGNAL
WATER TANK
DIR 250 W @ 75.68 M HAAT

Red = 100 – 70dB (very strong signal)
Yellow = 70 – 54dB (city grade signal)
Light Blue = 54 to 40dB (need good radios & antennas)
White = 40dB or lower (likely not receivable)

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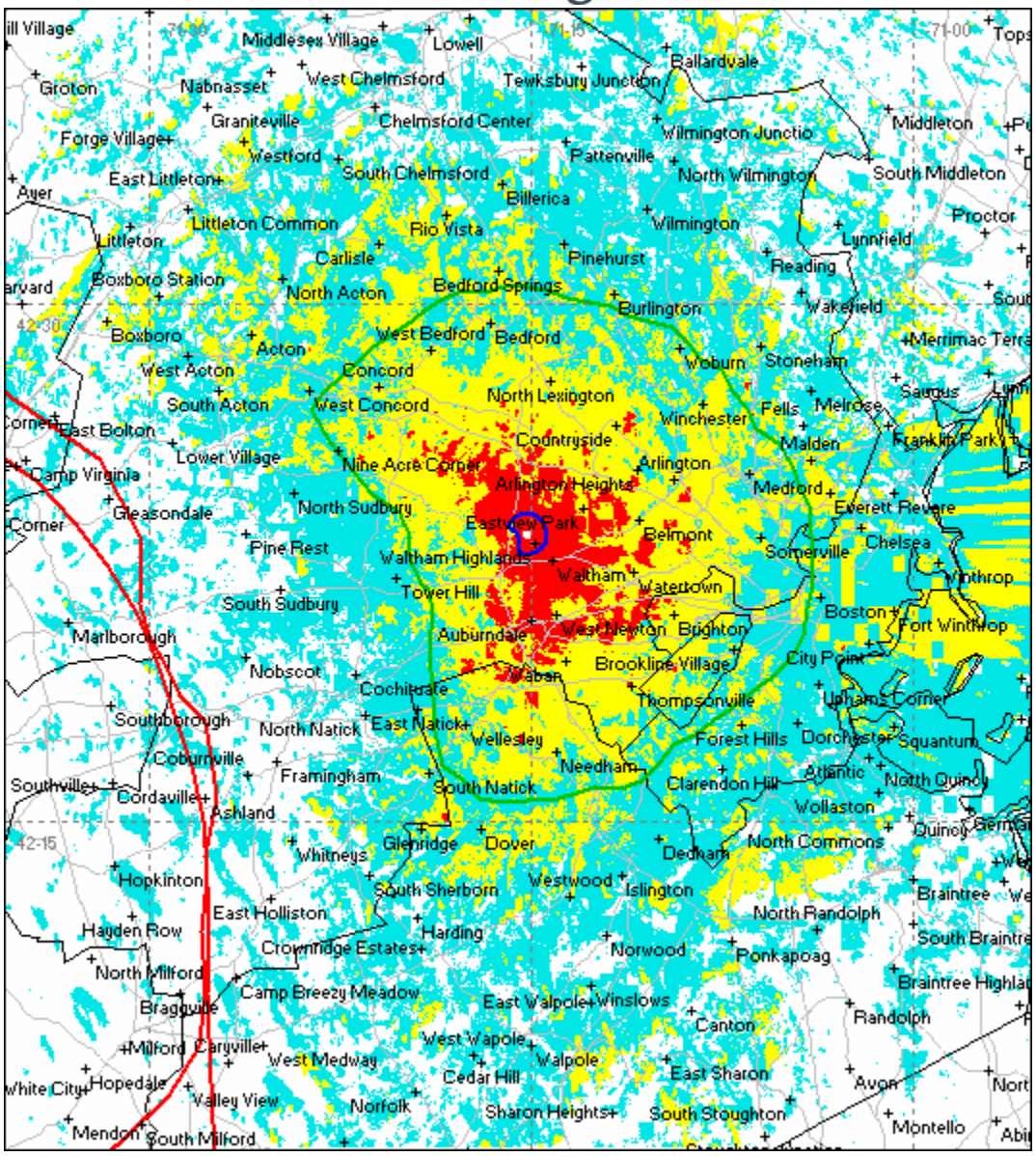

LONGLEY-RICE PLOT – MAXIMUM SIGNAL
PROSPECT HILL
DIR 250 W @ 114.84 M HAAT

Red = 100 – 70dB (very strong signal)
Yellow = 70 – 54dB (city grade signal)
Light Blue = 54 to 40dB (need good radios & antennas)
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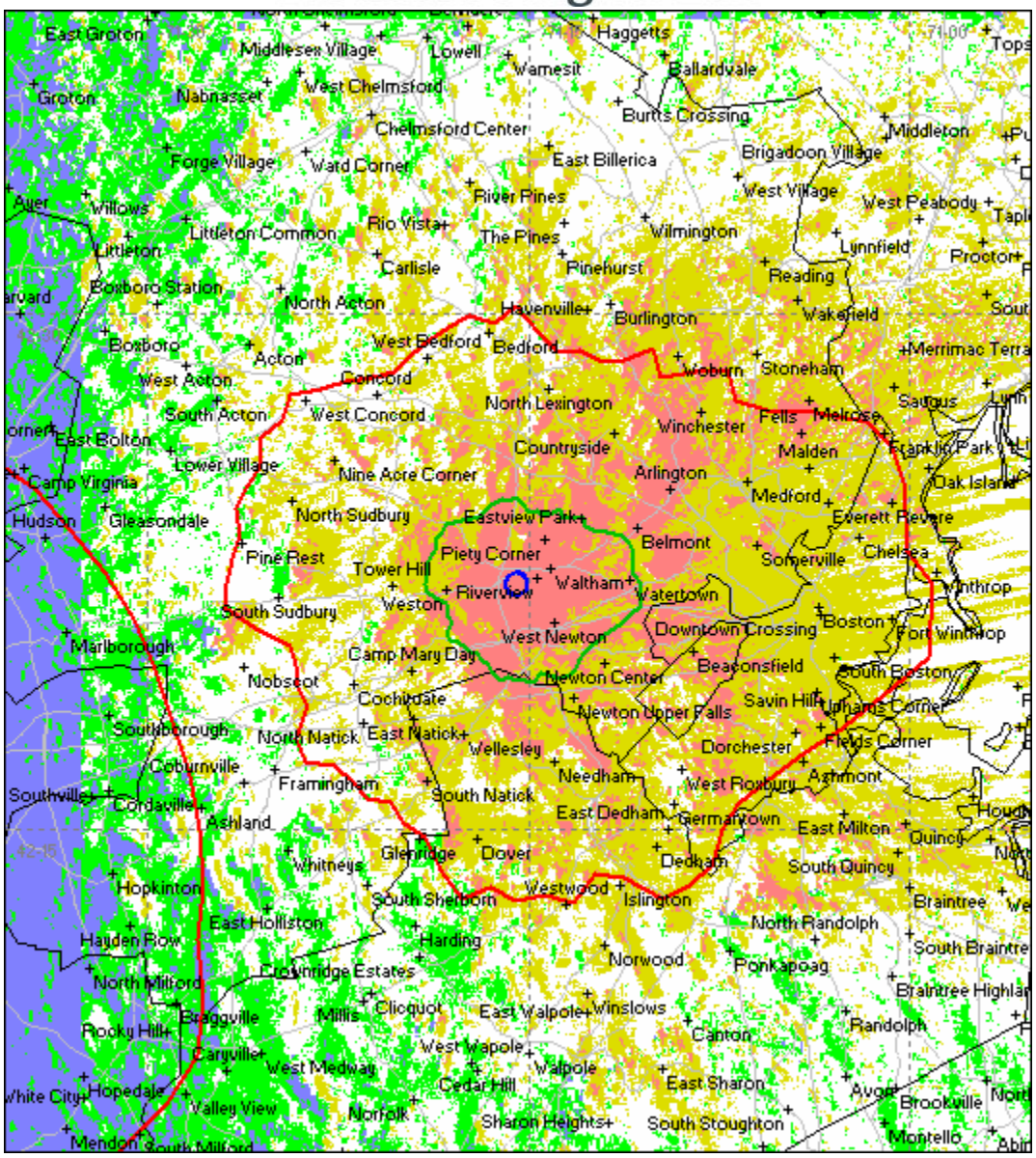

LONGLEY-RICE PLOT – SIGNAL DIFFERENCE
EXISTING FACILITY
ND 25 W @ 49.88 M HAAT

Most radios need at least +20dB more of WBRS's signal to reject WWFX's signal. So areas in red are most reliable. Yellow is "possible" with a good radio & antenna. White means WBRS is probably not receivable. Blue & Green mean WWFX swamps WBRS.

Red = WBRS is 40 to 20dB stronger
Yellow = WBRS is 20 to 0dB stronger

White = WBRS is 0 to 20dB weaker
Green = WBRS is 20 to 40dB weaker
Blue = WBRS is 40 to 43dB weaker

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503 Main Street / Medfield, MA 02052
(508) 359-8833 voice / (508) 359-8837 fax

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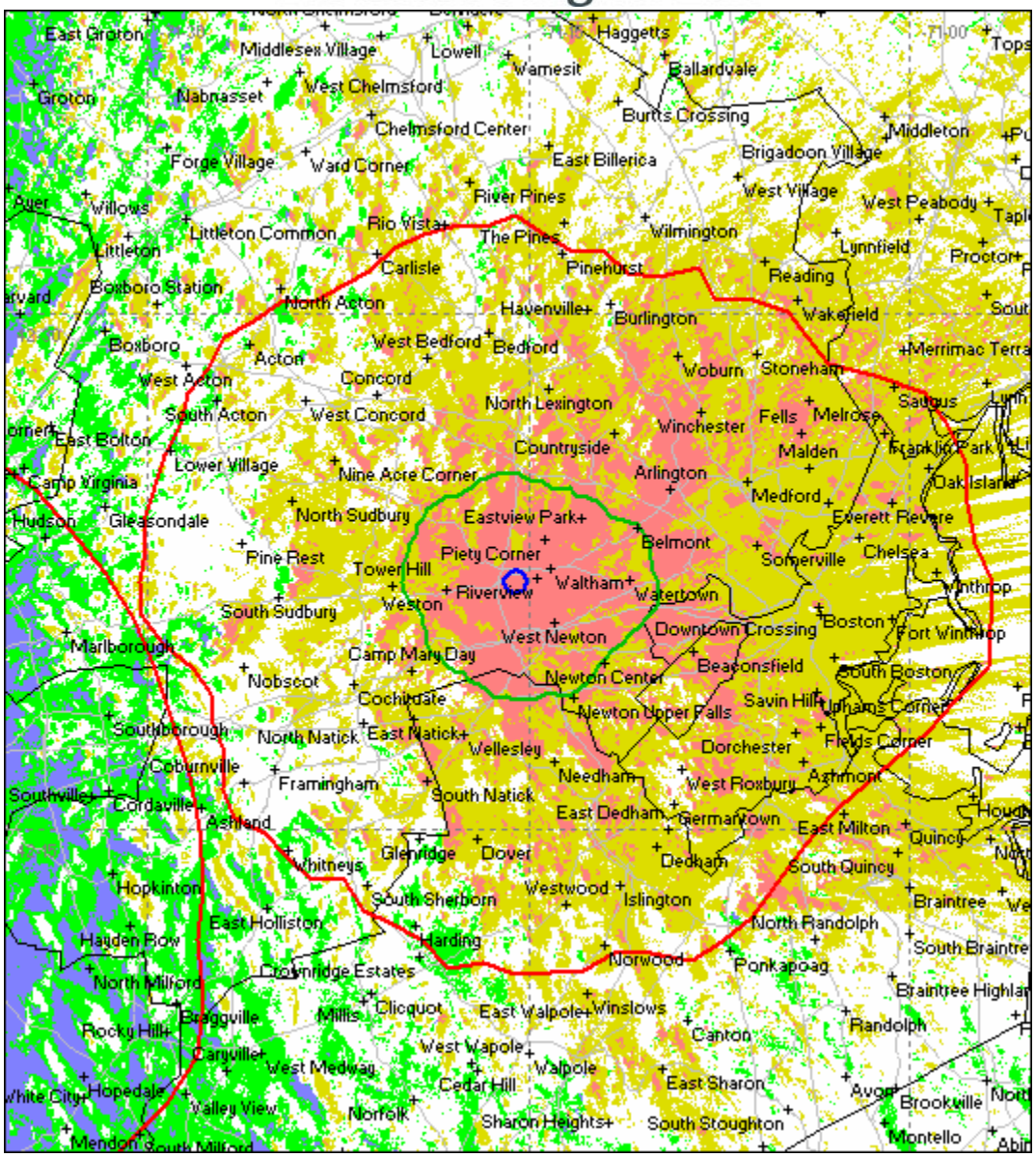

LONGLEY-RICE PLOT – SIGNAL DIFFERENCE
WATER TANK
ND 25 W @ 75.68 M HAAT

Most radios need at least +20dB more of WBRS's signal to reject WWFX's signal. So areas in red are most reliable. Yellow is "possible" with a good radio & antenna. White means WBRS is probably not receivable. Blue & Green mean WWFX swamps WBRS.

Red = WBRS is 40 to 20dB stronger
Yellow = WBRS is 20 to 0dB stronger

White = WBRS is 0 to 20dB weaker
Green = WBRS is 20 to 40dB weaker
Blue = WBRS is 40 to 43dB weaker

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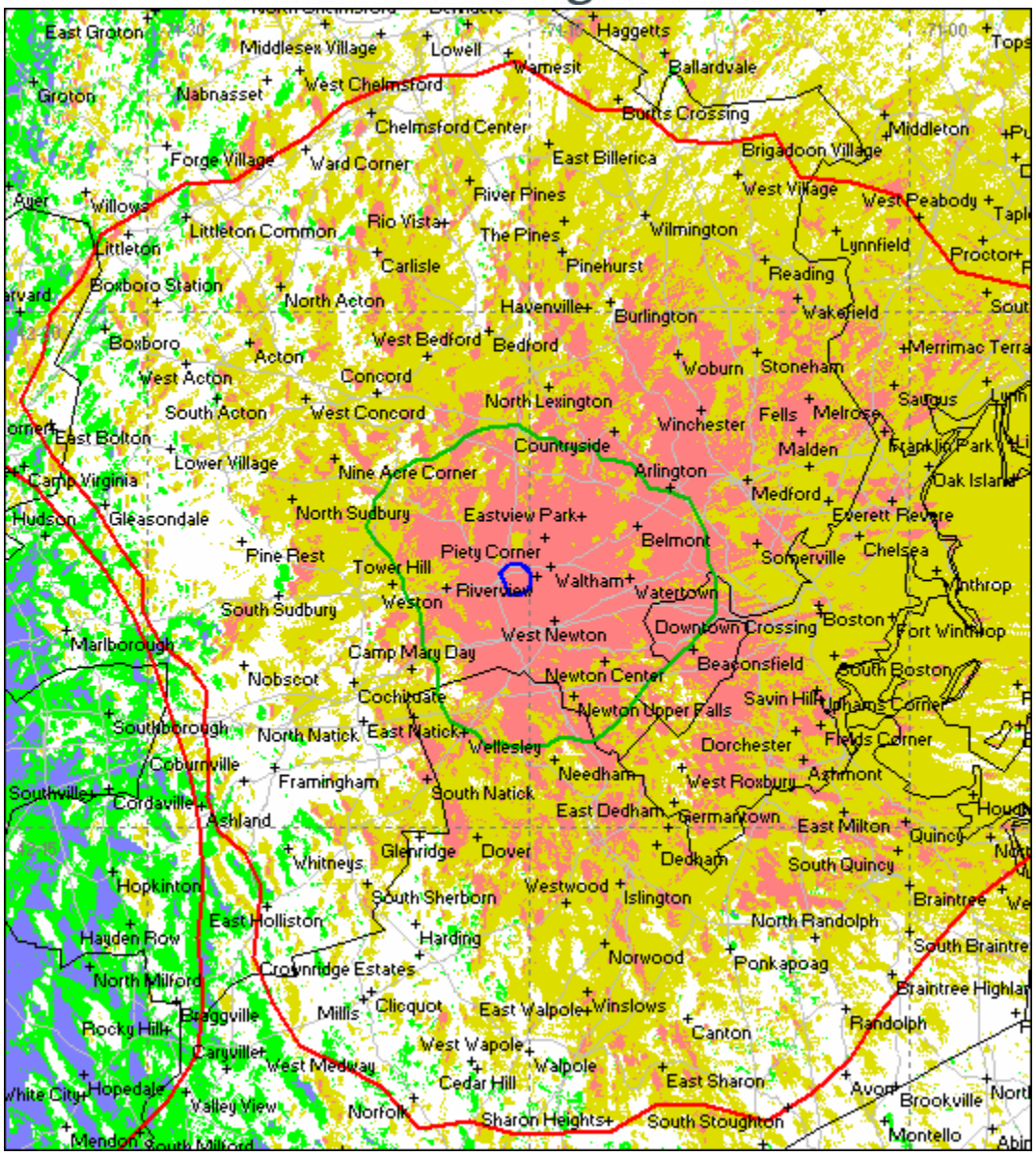

LONGLEY-RICE PLOT – SIGNAL DIFFERENCE
WATER TANK
DIR 100 W @ 75.68 M HAAT

Most radios need at least +20dB more of WBRS's signal to reject WWFX's signal. So areas in red are most reliable. Yellow is "possible" with a good radio & antenna. White means WBRS is probably not receivable. Blue & Green mean WWFX swamps WBRS.

Red = WBRS is 40 to 20dB stronger
Yellow = WBRS is 20 to 0dB stronger

White = WBRS is 0 to 20dB weaker
Green = WBRS is 20 to 40dB weaker
Blue = WBRS is 40 to 43dB weaker

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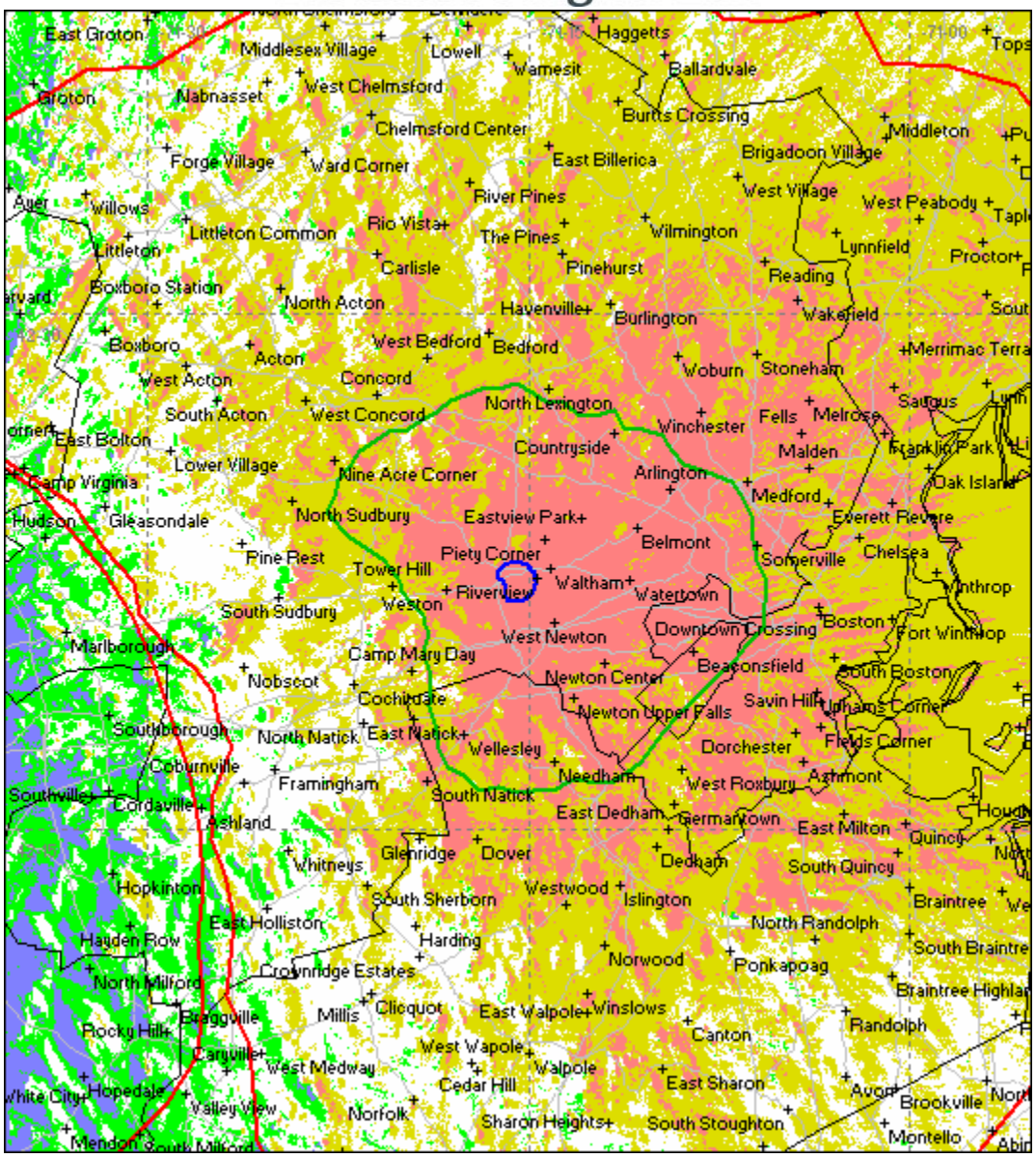

LONGLEY-RICE PLOT – SIGNAL DIFFERENCE
WATER TANK
DIR 250 W @ 75.68 M HAAT

Most radios need at least +20dB more of WBRS's signal to reject WWFX's signal. So areas in red are most reliable. Yellow is "possible" with a good radio & antenna. White means WBRS is probably not receivable. Blue & Green mean WWFX swamps WBRS.

Red = WBRS is 40 to 20dB stronger
Yellow = WBRS is 20 to 0dB stronger

White = WBRS is 0 to 20dB weaker
Green = WBRS is 20 to 40dB weaker
Blue = WBRS is 40 to 43dB weaker

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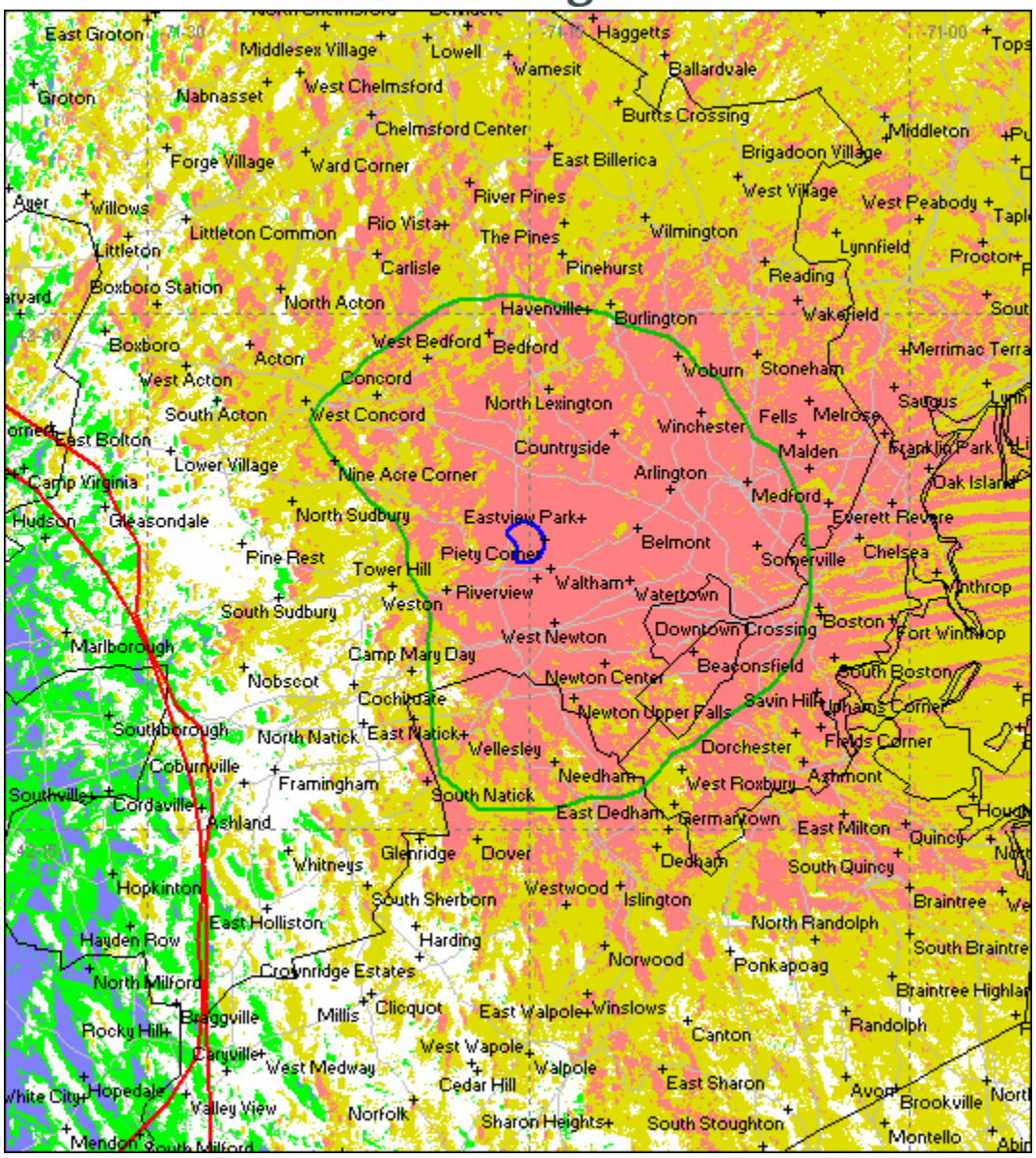

LONGLEY-RICE PLOT – SIGNAL DIFFERENCE
PROSPECT HILL
DIR 250 W @ 114.84 M HAAT

Most radios need at least +20dB more of WBRS's signal to reject WWFX's signal. So areas in red are most reliable. Yellow is "possible" with a good radio & antenna. White means WBRS is probably not receivable. Blue & Green mean WWFX swamps WBRS.

Red = WBRS is 40 to 20dB stronger
Yellow = WBRS is 20 to 0dB stronger

White = WBRS is 0 to 20dB weaker
Green = WBRS is 20 to 40dB weaker
Blue = WBRS is 40 to 43dB weaker

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503 Main Street / Medfield, MA 02052
(508) 359-8833 voice / (508) 359-8837 fax