

ENGINEERING EXHIBIT
APPLICATION FOR SPECIAL TEMPORARY AUTHORITY
BAE SYSTEMS, INC.
FORT A.P. HILL
EXPERIMENTAL FIELD DEPLOYABLE AM SYSTEM

ENGINEERING STATEMENT

By the instant application, BAE Systems, Inc. (BAES) requests special temporary authority for six months to operate an experimental field deployable SOAMS-B AM broadcast band transmitter and antenna system for brief periods of time during daytime hours only on the grounds of Fort A.P. Hill near Bowling Green, Virginia. The proposed short-term experimental operation is requested for the purpose of conducting field strength measurements to empirically determine the efficiency of this uncommon antenna system at various operating frequencies in the AM broadcast band. The approximate geographic coordinates of the SOAMS-B system during the proposed experimental operation will be 38° 07' 59" North Latitude, 77° 19' 49" West Longitude (1927 North American Datum). The specified location is a clear area in the Fort A.P. Hill paratroop practice drop zone. BAES has assembled this system under a government contract with Naval Air Systems Command for military use outside of the United States and for possible deployment within the United States in the event of a large-scale disaster.

The contract calls for supervised performance testing of the system. This application addresses the performance testing requirement while maintaining compliance with the interference prevention requirements as outlined in Section 73.37 of the FCC rules.

BAES proposes to operate on the following frequencies and power levels:

Frequency (kHz)	TPO (Watts)	Radiation Limit Set By
760	200	WBMD, Baltimore, MD
1180	2,000	WBIS, Annapolis
1410	500	WKCW, Warrenton, VA WDOV, Dover, DE
1630	1,0000	No limiting station

Permissible antenna input power levels were determined by calculating the efficiency of the test antenna for each proposed frequency using Numerical Electromagnetic Code (NEC-2) modeling techniques. These calculated antenna efficiencies together with soil conductivities obtained from Figure M3 were then used to calculate the location of the daytime coverage contours using standard groundwave equivalent distance techniques. The prohibited field strength contour overlaps set forth in Section 73.37(a) of the FCC Rules were used as a guide in preparing the studies contained herein.

760 kHz Operation

The calculated efficiency of the SOAMS-B antenna system is 253 mV/m/kW at 760 kHz or approximately 82.9% of the nominal radiation efficiency of a 90 degree quarterwave vertical with 120 ground radials.

The following AM broadcast stations are proximate in both frequency and distance to the proposed experimental operation on 760 kHz:

Call Sign, City of License Facilities	Geographic Coordinates	Distance from Proposed Test Facility (km)
WKDL, Alexandria, Virginia 730 kHz, 8.0 kW-D, 0.025 kW-N, ND2	38° 44' 43" N 77° 05' 58" W	70.9
WMBG, Williamsburg, Virginia 740 kHz, 500 W-D, 8 W-N, ND1	37° 16' 37" N 76° 45' 07" W	107.8
WBMD, Baltimore, Maryland 750 kHz, 730 W-D, NDD	39° 19' 26" N 76° 32' 56" W	148.6
WABS, Arlington, Virginia 780 kHz, 5.0 kW-D, NDD	38° 53' 44" N 77° 08' 04" W	86.4
WSVG, Mount Jackson, Virginia 790 kHz, 1.0 kW-D, 0.040 kW-N, ND1	38° 46' 15" N 78° 37' 17" W	133.1

Of these six stations, only WBMD, Baltimore, Maryland, has a predicted 0.5 mV/m contour that is sufficiently close to the proposed calculated interfering contour as specified in Section 73.37(a) of the FCC rules. The calculated 0.005 mV/m contour of the proposed experimental facility falls well short of the calculated 0.100mV/m contour of Class A WJR, Detroit, Michigan. The absence of prohibited contour overlap between

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the calculated 0.5 mV/m contour for WBMD and the calculated 0.25 mV/m contour of the proposed experimental facility is shown in Figure 1 of this exhibit.

1180 kHz Operation

The calculated efficiency of the SOAMS-B antenna system is 273.5 mV/m/kW at 1180 kHz or approximately 89.6% of the nominal radiation efficiency of a 90 degree quarterwave vertical with 120 ground radials.

The following AM broadcast stations are proximate in both frequency and distance to the proposed experimental operation on 1180 kHz:

Call Sign, City of License Facilities	Geographic Coordinates	Distance from Proposed Test Facility (km)
WNLR, Churchville, Virginia 1150 kHz, 2.5 kW-D, 0.035 kW-N, ND2	38° 12' 39" N 79° 07' 53" W	158.1
WMET, Gaithersburg, Maryland 1160 kHz, 50 kW-D, 1.5 kW-N, DA2	39° 11' 16" N 77° 12' 56" W	117.5
WBIS, Annapolis, Maryland 1190 kHz, 10 kW-D, 5.0 kW-N, DA2	39° 24' 29" N 76° 46' 32" W	116.4
WAGE, Leesburg, Virginia 1200 kHz, 5.0 kW-D, 1.0 kW-N, DAN	39° 07' 25" N 77° 37' 31" W	112.9

Of these four stations, only WBIS, Annapolis, Maryland, has a predicted 0.5 mV/m contour that is sufficiently close to the calculated interfering contours as specified in Section 73.37(a) of the FCC rules. In the case of WBIS, the station is currently operating with reduced power of 875 watts diplexed into one of the WNAV, Annapolis, Maryland, towers and is operating under the provisions of a Special Temporary Authorization (STA). Both the licensed and STA calculated 0.5 mV/m contours are shown in Figure 2 of this exhibit. The absence of prohibited contour overlap between the calculated 0.5 mV/m contours for WBIS (STA) and the 0.25 mV/m calculated contour of the proposed experimental facility is shown in Figure 2 of this exhibit.

Testing is expected to be complete long before WBIS resumes operation with its licensed facilities. BAES will contact WBIS prior to beginning operation of the proposed experimental facility on 1180, and BAES will immediately respond to any listener complaints received.

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1410 kHz Operation

The calculated efficiency of the SOAMS-B antenna system is 276.9 mV/m/kW at 1410 kHz or approximately 90.8% of the nominal radiation efficiency of a 90 degree quarterwave vertical with 120 ground radials.

The following AM broadcast stations are proximate in both frequency and distance to the proposed experimental operation on 1410 kHz:

Call Sign, City of License Facilities	Geographic Coordinates	Distance from Proposed Test Facility (km)
WBTK, Richmond, Virginia 1380 kHz, 5.0 kW-D, 5.0 kW-N, DA2	37° 37' 16" N 77° 26' 56" W	57.8
WHZF, Arlington, Virginia 1390 kHz, 5.0 kW-D, 5.0 kW-N, DA2	38° 54' 15" N 77° 09' 54" W	86.8
WKAV, Charlottesville, Virginia 1400 kHz, 1.0 kW-U, ND1	38° 01' 49" N 78° 29' 22" W	102.3
WOND, Pleasantville, New Jersey 1400 kHz, 1.0 kW-U, ND1	39° 23' 24" N 74° 30' 45" W	281.8
WPCE, Portsmouth, Virginia 1400 kHz, 1.0 kW-U, ND1	36° 49' 45" N 76° 19' 23" W	169.9
WWIN, Baltimore, Maryland 1400 kHz, 1.0 kW-U, ND1	39° 19' 21" N 76° 36' 33" W	147.2
WDOV, Dover, Delaware 1410 kHz, 5.0 kW-D, 5.0 kW-N, DA2	39° 12' 03" N 75° 33' 55" W	194.0
WKCW, Warrenton, Virginia 1420 kHz, 10.0 kW-D, 0.017 kW-N, ND2	38° 45' 05" N 77° 44' 38" W	77.6
WXGM, Gloucester, Virginia 1420 kHz, 0.74 kW-D, 0.058 kW-N, ND1	37° 24' 36" N 76° 32' 52" W	105.8
WHAN, Ashland, Virginia 1430 kHz, 50.0 kW-D, 1.0 kW-N, ND1	37° 44' 46" N 77° 29' 44" W	45.3
WNAV, Annapolis, Maryland 1430 kHz, 5.0 kW-D, 1.0 kW-N, DAN	38° 59' 00" N 76° 31' 21" W	45.3

Of these eleven stations, only WDOV, Dover, Delaware, and WKCW, Warrenton, Virginia, have predicted 0.5 mV/m contours which are sufficiently close to the respective proposed calculated interfering contours as specified in Section 73.37(a) of the FCC rules. The absence of prohibited contour overlap between the calculated 0.5 mV/m contour for WDOV and the calculated 0.025 mV/m contour of the proposed experimental facility shown in Figure 3 of this exhibit. Close examination of Figure 3 will reveal a minor area of contour overlap between the calculated 0.5 mV/m contour for WKCW and the calculated 0.25 mV/m contour of the proposed experimental facility. The total area of overlap is approximately 5.25 square kilometers which, with the exception of two small points of land, the largest of which is less than 180 acres in area, falls entirely over the waters of the Potomac River and Occoquan Bay. There are no census population centroids attributed to the overlap area.

1630 kHz Operation

The calculated efficiency of the SOAMS-B antenna system is 284.9 mV/m/kW at 1630 kHz or approximately 93.4% of the nominal radiation efficiency of a 90 degree quarterwave vertical with 120 ground radials.

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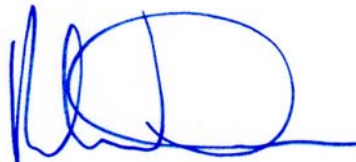
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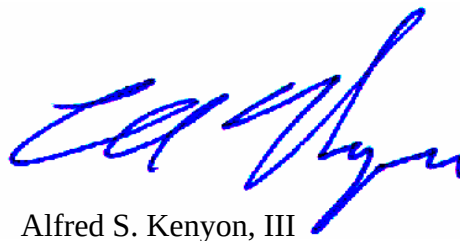
The closest co-channel and adjacent channel stations to the proposed 1630 operation are:

Call Sign, City of License Facilities	Geographic Coordinates	Distance from Proposed Test Facility (km)
WHL Y, South Bend, Indiana 1620 kHz, 10.0 kW-D, 1.0 kW-N, ND1	41° 38' 11" N 86° 17' 06" W	859.1
WRDW, Augusta, Georgia 1630 kHz, 10.0 kW-D, 1.0 kW-N, ND1	33° 31' 00" N 82° 00' 36" W	664.2
No station within 1000 km 1640 kHz		>1000

Due to the limited number of stations operating above 1600 kHz operation of the proposed experimental facility with ten kilowatts input power at the coordinates specified in the instant application will be fully compliant with Section 73.37 of the FCC rules.

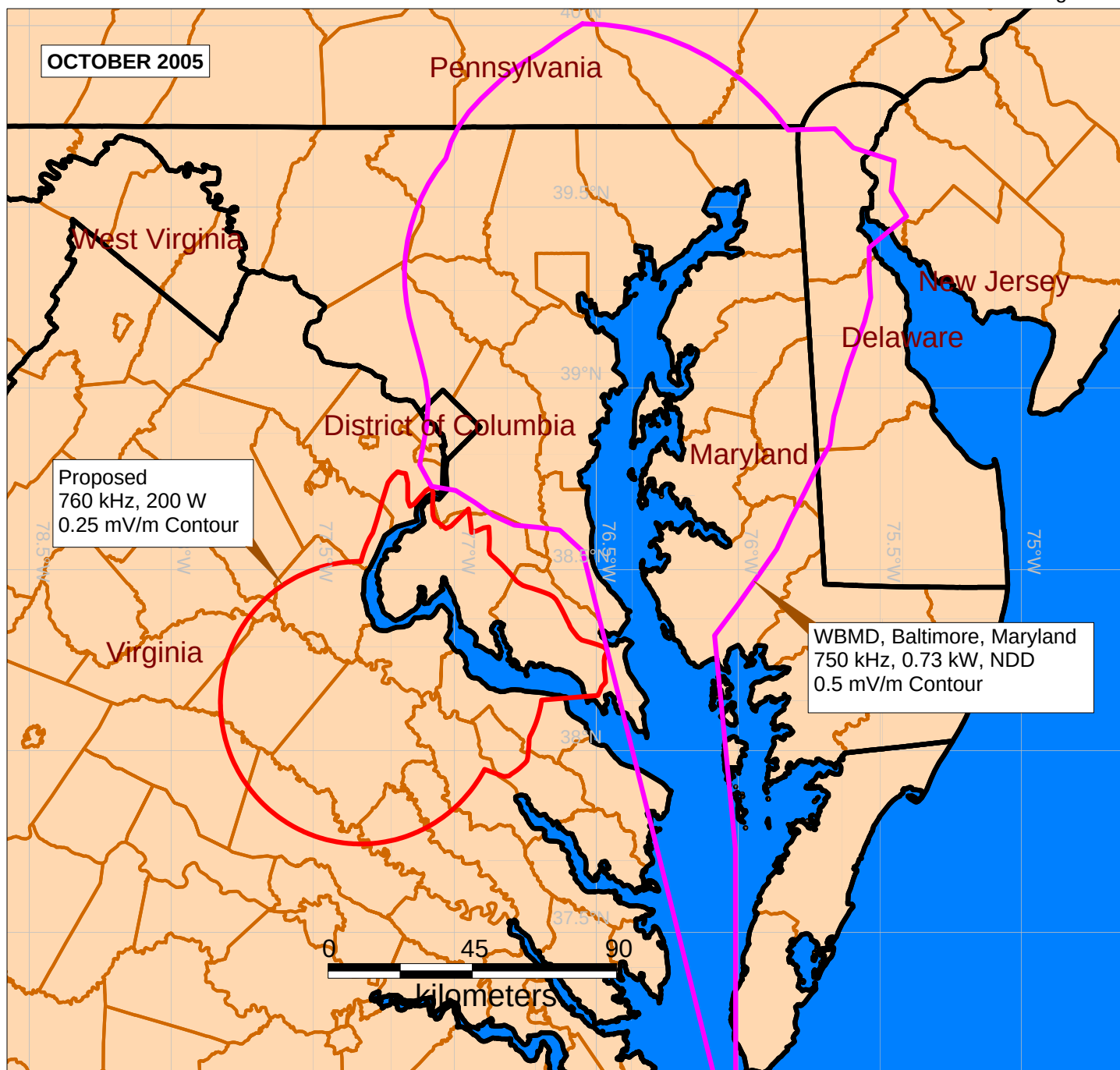

Robert W. Denny, Jr., P.E.




Alfred S. Kenyon, III

October 12, 2005

Figure 1

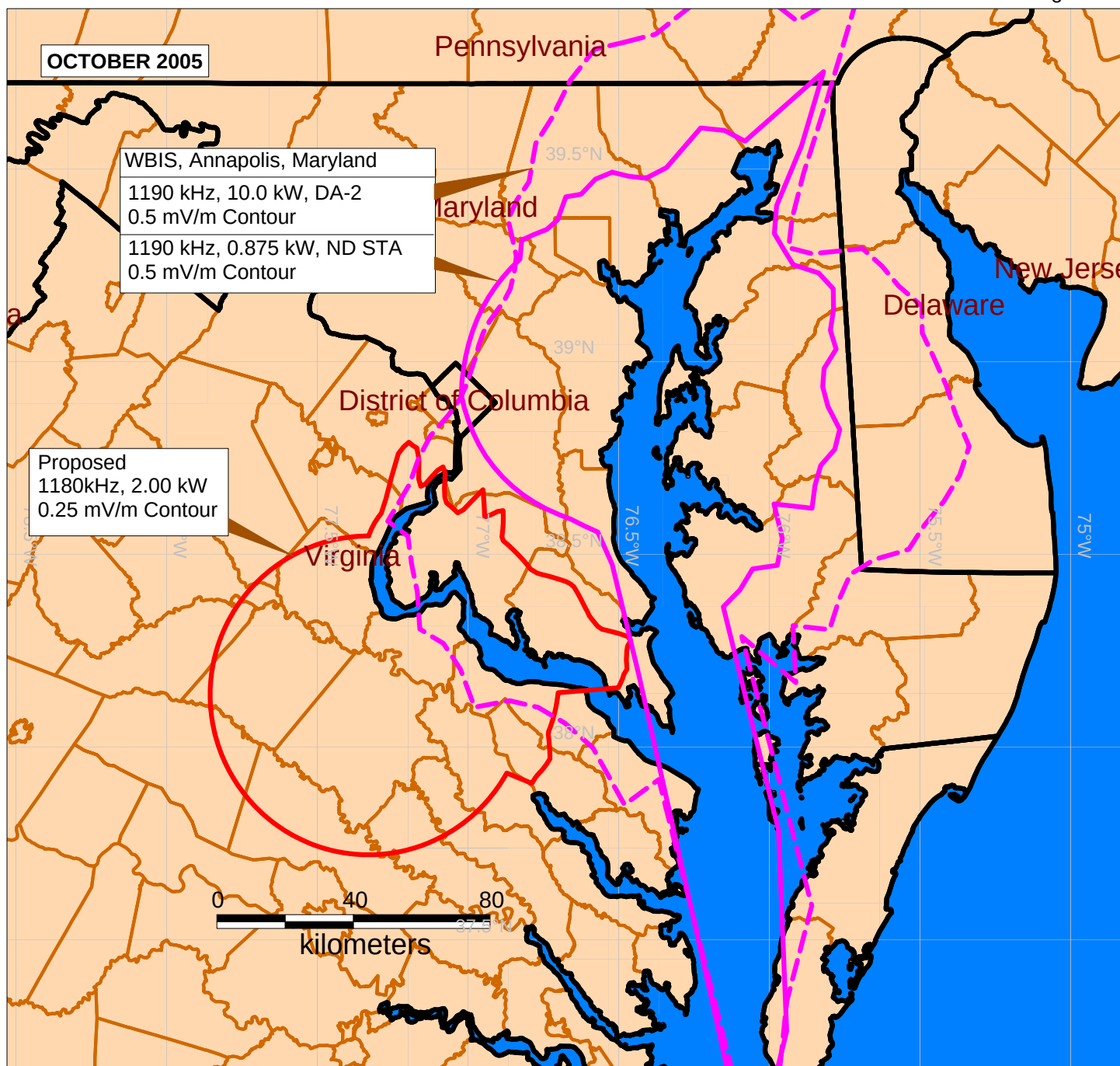


PROPOSED EXPERIMENTAL 760 kHz OPERATION CONTOUR NONOVERLAP STUDY

Prepared for
BAE SYSTEMS, INC.
SOAMS-B ANTENNA TESTING
FORT A.P. HILL BOWLING GREEN, VIRGINIA

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Figure 2

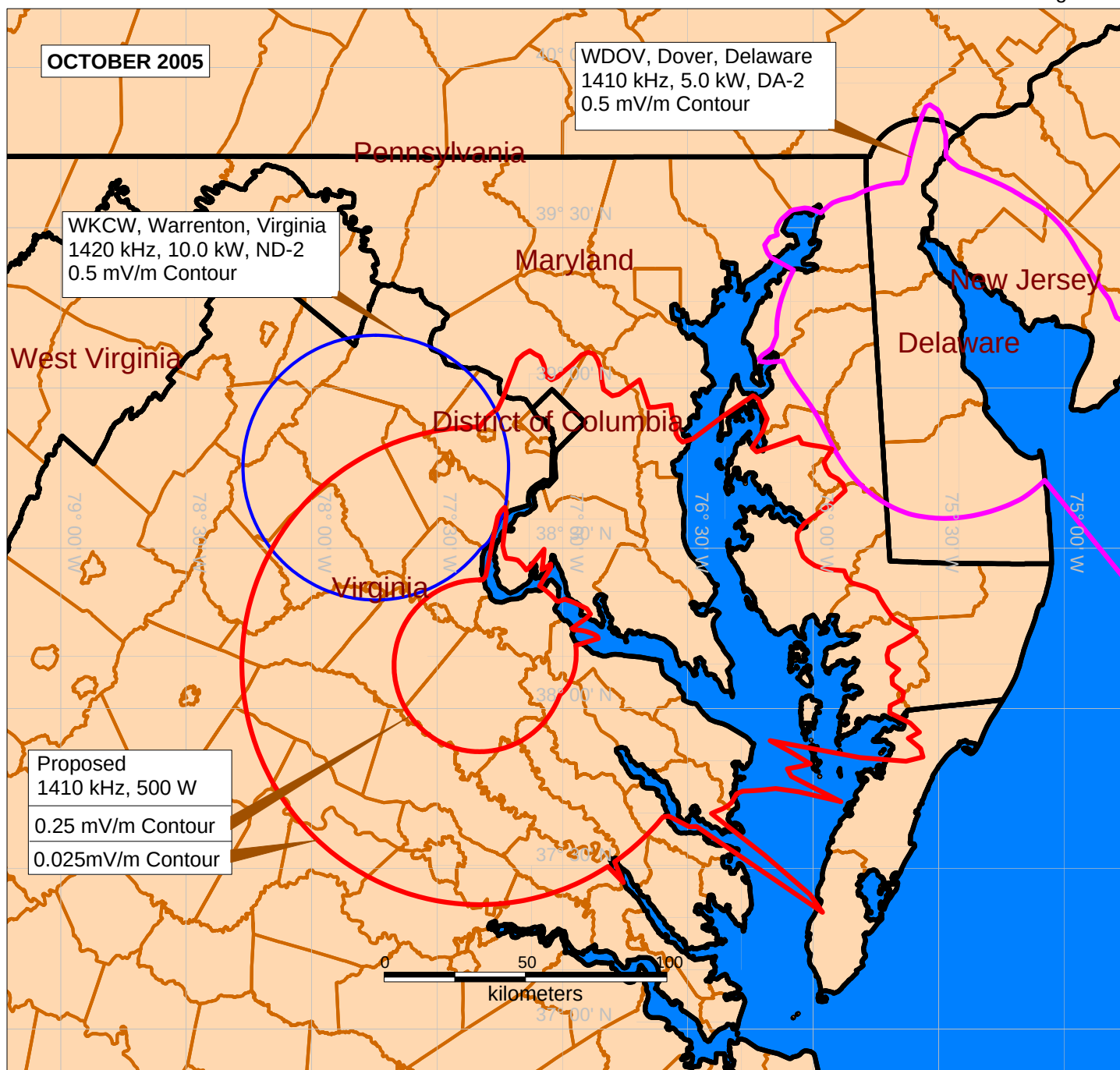


PROPOSED EXPERIMENTAL 1180 kHz OPERATION CONTOUR NONOVERLAP STUDY

Prepared for
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SOAMS-B ANTENNA TESTING
FORT A.P. HILL BOWLING GREEN, VIRGINIA

Denny & Associates, P.C. Consulting Engineers

Figure 3



PROPOSED EXPERIMENTAL 1410 kHz OPERATION CONTOUR STUDY

Prepared for
BAE SYSTEMS, INC.
SOAMS-B ANTENNA TESTING
FORT A.P. HILL BOWLING GREEN, VIRGINIA

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