

**ENGINEERING REPORT**  
**Requesting a New**  
**Non-Commercial Educational FM**  
**On Channel 216, 91.1 mHz**  
**At Fayetteville, NC**  
**December, 1996**

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**E. HAROLD MUNN, JR. & ASSOCIATES, INC.**  
Broadcast Engineering Consultants  
Coldwater, MI 49036

# Section V-B - FM BROADCAST ENGINEERING DATA

FOR COMMISSION USE ONLY

File No. \_\_\_\_\_

ASB Referral Date \_\_\_\_\_

Referred by \_\_\_\_\_

Name of Applicant

Bible Broadcasting Network, Inc.

Call letters (if issued)

Is this application being filed in response to a window? ☐ Yes ☒ No

If Yes, specify closing date: \_\_\_\_\_

Purpose of Application: (check appropriate box(es))

☒ Construct a new (main) facility

☐ Construct a new auxiliary facility

☐ Modify existing construction permit for main facility

☐ Modify existing construction permit for auxiliary facility

☐ Modify licensed main facility

☐ Modify licensed auxiliary facility

If purpose is to modify, indicate below the nature of change(s) and specify the file number(s) of the authorizations affected.

☐ Antenna supporting-structure height

☐ Effective radiated power

☐ Antenna height above average terrain

☐ Frequency

☐ Antenna location

☐ Class

☐ Main Studio location

☐ Other (Summarize briefly)

File Number(s) \_\_\_\_\_

## 1. Allocation:

Channel No.	Principal community to be served:		
	City	County	State
216	Fayetteville	Cumberland	NC

Class (check only one box below)

☒ A ☐ B1 ☐ B ☐ C3

☐ C2 ☐ C1 ☐ C ☐ D

## 2. Exact location of antenna.

(a) Specify address, city, county and state. If no address, specify distance and bearing relative to the nearest town or landmark.  
2515 Muchinson Road, Fayetteville, Cumberland Co., NC

(b) Geographical coordinates (to nearest second). If mounted on element of an AM array, specify coordinates of center of array. Otherwise, specify tower location. Specify South Latitude or East Longitude where applicable; otherwise, North Latitude or West Longitude will be presumed.

Latitude	Longitude
35° 05' 20"	78° 54' 37"

3. Is the supporting structure the same as that of another station(s) or proposed in another pending application(s)? ☐ Yes ☒ No

If Yes, give call letter(s) or file number(s) or both. \_\_\_\_\_

If proposal involves a change in height of an existing structure, specify existing height above ground level including antenna, all other appurtenances, and lighting, if any.

DNA

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4. Does the application propose to correct previous site coordinates?

☐ Yes ☒ No

If Yes, list old coordinates.

Latitude	0	'	"	Longitude	0	'	"
----------	---	---	---	-----------	---	---	---

5. Has the FAA been notified of the proposed construction?

☒ Yes ☐ No

If Yes, give date and office where notice was filed and attach as an Exhibit a copy of FAA determination, if available.

Exhibit No.

Date 12-04-1996 Office where filed Southern Region

6. List all landing areas within 8 km of antenna site. Specify distance and bearing from structure to nearest point of the nearest runway.

	Landing Area	Distance (km)	Bearing (degrees True)
(a)	<u>Simmons (AAF)</u>	<u>5.6</u>	<u>330</u>
(b)	<u></u>	<u></u>	<u></u>

7. (a) Elevation: *(to the nearest meter)*

(1) of site above mean sea level; 61 meters

(2) of the top of supporting structure above ground (including antenna, all other appurtenances, and lighting, if any); and 61 meters

(3) of the top of supporting structure above mean sea level  $[(aX1) + (aX2)]$  122 meters

(b) Height of radiation center: *(to the nearest meter)* H = Horizontal; V = Vertical

(1) above ground --- meters (H)

57 meters (V)

(2) above mean sea level  $[(aX1) + (bX1)]$  --- meters (H)

118 meters (V)

(3) above average terrain --- meters (H)

69 meters (V)

8. Attach as an Exhibit sketch(es) of the supporting structure, labelling all elevations required in Question 7 above, except item 7(bX3). If mounted on an AM directional-array element, specify heights and orientations of all array towers, as well as location of FM radiator.

Exhibit No.  
E-3

9. Effective Radiated Power:

(a) ERP in the horizontal plane

--- kw (H\*) 0.5 kw (V\*)

(b) Is beam tilt proposed?

☐ Yes ☒ No

If Yes, specify maximum ERP in the plane of the tilted beam, and attach as an Exhibit a vertical elevational plot of radiated field.

Exhibit No.

--- kw (H\*) --- kw (V\*)

\*Polarization

10. Is a directional antenna proposed?

☐ Yes ☒ No

If Yes, attach as an Exhibit a statement with all data specified in 47 C.F.R. Section 73.316, including plot(s) and tabulations of horizontally and vertically polarized radiated components in terms of relative field.

Exhibit No.

11. Will the main studio be located within the 70 dBu or 3.16 mV/m contour?

☒ Yes ☐ No

If No, attach as an Exhibit justification pursuant to 47 C.F.R. Section 73.1125.

Exhibit No.

12. Are there: (a) within 60 meters of the proposed antenna, any proposed or authorized FM or TV transmitters, or any nonbroadcast *(except citizens band or amateur)* radio stations; or (b) within the blanketing contour, any established commercial or government receiving stations, cable head-end facilities, or populated areas; or (c) within ten (10) kilometers of the proposed antenna, any proposed or authorized FM or TV transmitters which may produce receiver-induced intermodulation interference?

☒ Yes ☐ No

If Yes, attach as an Exhibit a description of any expected, undesired effects of operations and remedial steps to be pursued if necessary, and a statement accepting full responsibility for the elimination of any objectionable interference (including that caused by receiver-induced or other types of modulation) to facilities in existence or authorized or to radio receivers in use prior to grant of this application. *(See 47 C.F.R. Sections 73.315(b), 73.316(d) and 73.318.)*

Exhibit No.

A

13. Attach as an Exhibit a 7.5 minute series U.S. Geological Survey topographic quadrangle map that shows clearly, legibly, and accurately, the location of the proposed transmitting antenna. This map must comply with the requirements set forth in Instruction D for Section V. Further, the map must clearly and legibly display the original printed contour lines and data as well as latitude and longitude markings, and must bear a scale of distance in kilometers.

Exhibit No.

E-5

14. Attach as an Exhibit *(name the source)* a map which shows clearly, legibly, and accurately, and with the original printed latitude and longitude markings and a scale of distance in kilometers:

Exhibit No.

E-1

(a) the proposed transmitter location, and the radials along with profile graphs have been prepared;

(b) the 1 mV/m predicted contour and, for noncommercial educational applicants applying on a commercial channel, the 3.16 mV/m contour; and

(c) the legal boundaries of the principal community to be served.

15. Specify area in square kilometers (1 sq. mi. = 2.59 sq. km.) and population (latest census) within the predicted 1 mV/m contour.

Area 505 sq. km.

Population 191,678

16. Attach as an Exhibit a map *(Sectional Aeronautical charts where obtainable)* showing the present and proposed 1 mV/m (60 dbu) contours.

Exhibit No.

DNA

Enter the following from Exhibit above:

Gain Area \_\_\_\_\_ sq. mi.

Loss Area \_\_\_\_\_ sq. mi.

Percent change (gain area plus loss area as percentage of present area) \_\_\_\_\_ %.

If 50% or more this constitutes a major change. Indicate in question 2(c), Section I, accordingly.

17. For an application involving an auxiliary facility only, attach as an Exhibit a map (*Sectional Aeronautical Chart or equivalent*) that shows clearly, legibly, and accurately, and with latitude and longitude markings and a scale of distance in kilometers:

Exhibit No.  
DNA

(a) the proposed auxiliary 1 mV/m contour; and

(b) the 1 mV/m contour of the licensed main facility for which the applied-for facility will be auxiliary. Also specify the file number of the license. See 47 C.F.R. Section 73.1675. (File No.: \_\_\_\_\_)

18. Terrain and coverage data (*to be calculated in accordance with 47 C.F.R. Section 73.313*).

Source of terrain data: (*check only one box below*)



Linearly interpolated 30-second database



7.5 minute topographic map

(Source: \_\_\_\_\_)



Other (*briefly summarize*)

Radial bearing (degrees True)	Height of radiation center above average elevation of radial from 3 to 16 km (meters)	Predicted Distances to the 1 mV/m contour (kilometers)
0	56.0	11.6
45	83.2	13.9
90	89.5	14.4
135	93.0	14.7
180	68.2	12.7
225	62.5	12.2
270	47.2	10.7
315	52.3	11.3

#### Allocation Studies

(See Subpart C of 47 C.F.R. Part 73)

19. Is the proposed antenna location within 320 kilometers (199 miles) of the common border between the United States and Mexico?



Yes



No

If Yes, attach as an Exhibit a showing of compliance with all provisions of the Agreement between the United States of America and the United Mexican States concerning Frequency Modulation Broadcasting in the 88 to 108 MHz band.

Exhibit No.

20. Is the proposed antenna location within 320 kilometers of the common border between the United States and Canada?

☐ Yes ☒ No

If Yes, attach as an Exhibit a showing of compliance with all provisions of the Working Agreement for Allocation of FM Broadcasting Stations on Channels 201-300 under The Canada-United States FM Agreement of 1947.

Exhibit No.

21. If the proposed operation is for a channel in the range from channel 201 through 220 (88.1 through 91.9 MHz), or if this proposed operation is for a class D station in the range from Channel 221 through 300 (92.1 through 107.9 MHz), attach as an Exhibit a complete allocation study to establish the lack of prohibited overlap of contours with other U.S. stations. The allocation study should include the following:

Exhibit No.

E-7

- (a) The normally protected interference-free and the interfering contours for the proposed operation along all azimuths.
- (b) Complete normally protected interference-free contours of all other proposals and existing stations to which objectionable interference would be caused.
- (c) Interfering contours over pertinent arcs of all other proposals and existing stations from which objectionable interference would be received.
- (d) Normally protected and interfering contours over pertinent arcs, of all other proposals and existing stations, which require study to show the absence of objectionable interference.
- (e) Plot of the transmitter location of each station or proposal requiring investigation, with identifying call letters, file numbers and operating or proposed facilities.
- (f) When necessary to show more detail, an additional allocation study will be attached utilizing a map with a larger scale to clearly show interference or absence thereof.
- (g) A scale of kilometers and properly labeled longitude and latitude lines, shown across the entire Exhibit(s). Sufficient lines should be shown so that the location of the sites may be verified.
- (h) The name of the map(s) used in the Exhibit(s).

22. With regard to any stations separated by 53 or 54 channels (10.6 or 10.8 MHz) attach as an Exhibit information required in 1/ (*separation requirements involving intermediate frequency (i.f.) interference*).

Exhibit No.

E-7

- 23.(a) Is the proposed operation on Channel 218, 219, or 220?

☐ Yes ☒ No

- (b) If the answer to (a) is yes, does the proposed operation satisfy the requirements of 47 C.F.R. Section 73.207?

☐ Yes ☐ No

- (c) If the answer to (b) is yes, attach as an Exhibit information required in 1/ regarding separation requirements with respect to stations on Channels 221, 222 and 223.

Exhibit No.

- (d) If the answer to (b) is no, attach as an Exhibit a statement describing the short spacing(s) and how it or they arose.

Exhibit No.

1/ A showing that the proposed operation meets the minimum distance separation requirements. Include existing stations, proposed stations, and cities which appear in the Table of Allotments; the location and geographic coordinates of each antenna, proposed antenna or reference point, as appropriate; and distance to each from proposed antenna location.

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(e) If authorization pursuant to 47 C.F.R. Section 73.215 is requested, attach as an Exhibit a complete engineering study to establish the lack of prohibited overlap of contours involving affected stations. The engineering study must include the following:

Exhibit No.  
DNA

- (1) Protected and interfering contours, in all directions (360 ), for the proposed operation.
- (2) Protected and interfering contours, over pertinent arcs, of all short-spaced assignments, applications and allotments, including a plot showing each transmitter location, with identifying call letters or file numbers, and indication of whether facility is operating or proposed. For vacant allotments, use the reference coordinates as transmitter location.
- (3) When necessary to show more detail, an additional allocation study utilizing a map with a larger scale to clearly show prohibited overlap will not occur.
- (4) A scale of kilometers and properly labeled longitude and latitude lines, shown across the entire exhibit(s). Sufficient lines should be shown so that the location of the sites may be verified.
- (5) The official title(s) of the map(s) used in the exhibits(s).

24. Is the proposed station for a channel in the range from Channel 201 to 220 (88.1 through 91.9 MHz) and the proposed antenna location within the distance to an affected TV Channel 6 station(s) as defined in 47 C.F.R. Section 73.525?

☒ Yes ☐ No

If Yes, attach as an Exhibit either a TV Channel 6 agreement letter dated and signed by both parties or a map and an engineering statement with calculations demonstrating compliance with 47 C.F.R. Section 73.525 for each affected TV Channel 6 station.

Exhibit No.  
E-8

25. Is the proposed station for a channel in the range from Channel 221 to 300 (92.1-107.9 MHz)?

☐ Yes ☒ No

If Yes, attach as an Exhibit information required in 1/. (Except for Class D (secondary) proposals.)

Exhibit No.

26. Environmental Statement (See 47 C.F.R. Section 1.1307 et seq.)

Would a Commission grant of this application come within Section 1.1307 of the FCC Rules, such that it may have a significant environmental impact?

☐ Yes ☒ No

If you answer Yes, submit as an Exhibit an Environmental Assessment required by Section 1.1311.

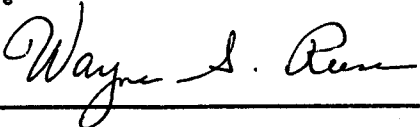
Exhibit No.

If No, explain briefly why not.

This application meets the requirements of OST Bulletin No.65 and is categorically excluded from environmental processing pursuant to §1.1306 of the Commission's Rules, because it does not (1) involve a site location specified under §1.1307(a)(1)-(7); (2) involve high intensity lighting under §1.1307(a)(8); or (3) result in human exposure to radio frequency radiation in excess of the applicable standard specified in §1.1307(b) of the Commission's Rules.

CERTIFICATION

I certify that I have prepared this Section of this application on behalf of the applicant, and that after such preparation, I have examined the foregoing and found it to be accurate and true to the best of my knowledge and belief.

Name (Typed or Printed) Wayne S. Reese, President E.Harold Munn, Jr. & Associates, Inc.	Relationship to Applicant (e.g., Consulting Engineer) Technical Consultant
Signature 	Address (Include ZIP Code) Box 220 Coldwater MI 49036-0220
Date December 4, 1996	Telephone No. (Include Area Code) (517) 278-7339

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## CERTIFICATION OF CONSULTANT

The firm of E. Harold Munn, Jr. & Associates, Inc., Broadcast Engineering Consultants, with offices at 100 Airport Drive, Coldwater, Michigan, has been retained for the purpose of preparing the technical data submitted in this report.

The data utilized in this report was taken from the FCC Secondary Database and other data on file. While this information is believed accurate, errors or omissions in the database and file data are possible. This firm may not be held liable for damages as a result of those data errors or omissions.

The report has been prepared by or under the direction of the undersigned, whose qualifications are a matter of record before the Federal Communications Commission.

I declare under penalty of perjury that the contents of this report are true and accurate to the best of my knowledge and belief.

E. Harold Munn, Jr. & Associates, Inc.

December 4, 1996

by Virgil M. Royer  
Virgil M. Royer, Staff Engineer

by Wayne S. Reese  
Wayne S. Reese, President

100 Airport Drive, Box 220  
Coldwater, Michigan 49036-0220

(517) 278-7339

## DISCUSSION

This firm was retained to prepare the required engineering report in support of an application on behalf of Bible Broadcasting Network, Inc. This application requests a new Educational FM Station, to operate serving Fayetteville, North Carolina. It has been determined that FM Channel 216, 91.1 MHz, may be used at the site proposed, in full conformance with the provisions of the rules. The station will operate with an effective radiated power of 0.50 kW, and an antenna height above terrain of 69 meters. Allocation details concerning the use of this channel are included as Exhibit E-7 of this report. There will be no prohibited contour overlap between the proposed station and any known existing or authorized full-service stations. This application is mutually exclusive with application BPED-960806MA, for Channel 216 at NL 35° 06' 36"; WL 78° 42' 01".

The transmitter site proposed in this application is within the affected radius of a Channel 6 television station. Exhibit E-8 has been included to show conformance with §73.525 of the Rules. Because the NCE-FM station is within the Channel 6 protected contour, it is proposed to employ vertical polarization only, for the FM antenna. A two-bay antenna will be employed, reducing the field on the ground in proximity to the facility. The licensee of WECT, Channel 6, has been notified of this application.

Due consideration has been given to protection against human exposure to radiofrequency radiation. A detailed study is part of this section.

The proposed 1.0 mV/m contour has been calculated in accordance with the Rules, and the plotted data forms Exhibit E-1 of this report. The vertical plan diagram for the support tower is included as Exhibit E-3.

The FAA has been notified of this proposed antenna tower, as there is a military use airport within 8 km.

The service contour exhibit, E-1 used 360 bearings of terrain calculations to develop the data for the computer generated plots. This shows the effect of the terrain on the contour shape. All area computations were based on the contours as plotted.

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## DISCUSSION Cont.

The following tabulation of the distances to the proposed service contours results from calculations performed in accordance with §73.313(d) and §73.333 Figure 1.

### TERRAIN AND CONTOUR DATA Proposed Fayetteville, NC Channel 216A Educational FM

ERP = .5 kW  
FM - 2-6 Tables 30 Sec

Azimuth Deg T.	Ave. Elev. 3 to 16 km Meters AMSL	Effective Antenna Height Meters AAT	ERP (dBk)	F(50-50) Distance to 60 dBu Contour km
0	62.0	56.0	-3.010	11.6
45	34.8	83.2	-3.010	13.9
90	28.5	89.5	-3.010	14.4
135	25.0	93.0	-3.010	14.7
180	49.8	68.2	-3.010	12.7
225	55.5	62.5	-3.010	12.2
270	70.8	47.2	-3.010	10.7
315	65.7	52.3	-3.010	11.3
Ave. = 49 M		69.0 M		

Antenna Radiation Center AMSL = 118.0 M

#### Geographic Coordinates:

North latitude: 35 05 20

West longitude: 78 54 37

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Broadcast Engineering Consultants  
Coldwater, MI 49036

**STATEMENT OF COMPLIANCE WITH RF EXPOSURE GUIDELINES**  
**REVISED FOR NEW Ch.216**  
**at Fayetteville, North Carolina**

The Commission requires an engineering study regarding compliance with the guidelines for human protection from radiofrequency radiation. This report section is in response to that provision of the Rules.

The Federal Communications Commission, as of January 1, 1986, and revised effective January 1, 1997, has set forth guidelines for RF radiation protection as issued by the American National Standards Institute (ANSI). The following steps have been taken by the licensee of this facility to insure proper protection from potentially high RF energy levels to station personnel and the public in general.

The radiation center of the FM antenna is located at a height above ground sufficient to provide full compliance with the FCC guidelines concerning human exposure to radiofrequency radiation to observers on the ground.

In the event repairs or maintenance would be required on the antenna support structure, or the antenna which could result in potential exposure to fields in excess of the ANSI standards, the operating power of the station will be reduced, or the facility shut down for such time as may be required for the repairs and/or maintenance to be completed. An agreement, signed by all parties with access to the site is in effect concerning the required power reductions or cessation of operations.

To verify that this facility as constructed meets the requirements of the guidelines, calculations have been made using the appropriate formulae of OST Bulletin No.65. The antenna in use is expected to be a two (2) bay antenna. The antenna is a Scala bearing a model number FMV-2.

The calculations use the technique outlined in the EPA report titled: An Engineering Assessment of the Potential Impact of Federal Radiation Protection Guidance on the AM, FM, and TV Broadcast Services (Gailey & Tell, April, 1985). All calculations contained herein are based on the measured element patterns for the antenna, and follow the procedure shown in the Gailey & Tell report. The patterns were identified by applying the procedure outlined in the report to the measurement data contained in the report titled Element Pattern Measurements on FM Antennas (EPA-520/6-85-107, June 1985). The antenna has been designated an EPA Type 1 element due to the construction.

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### **RF Exposure Guideline Compliance, Cont.**

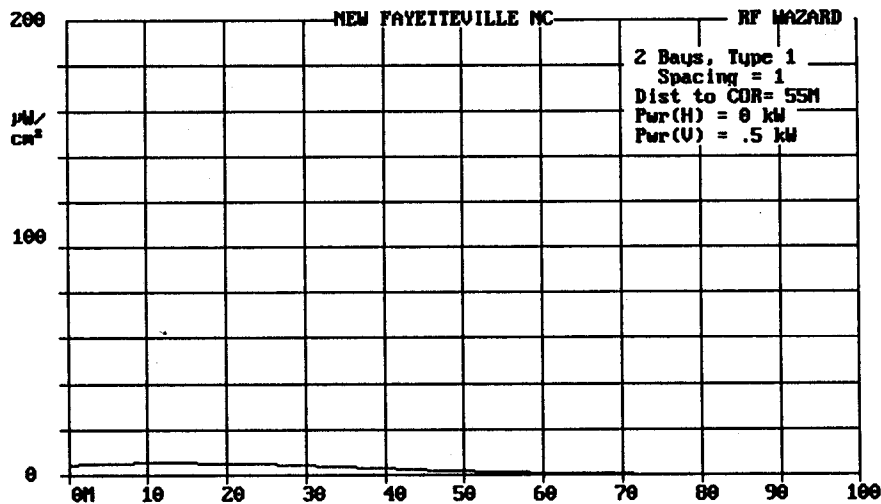
The tabulated and plotted field data which is included in this section shows that the ANSI protection guideline will not be exceeded in proximity to the station.

The data obtained shows that full compliance with the guidelines is attained.

The maximum calculated RF field in proximity to the station at 2 meters above ground is 0.005239 mW/cm<sup>2</sup>, at about 11 meters from the tower base. This is only 0.5239 % of the permitted "controlled access" field of 1.0 mW/cm<sup>2</sup>, and 2.619 % of the "uncontrolled access" limit of 0.2 mW/cm<sup>2</sup>.

In addition to the protection provided by the antenna design, access to the area will be restricted by locked gates and other security measures. The area will be marked with appropriate signs, warning of the potential for exposure to radiofrequency fields.

There are no other FM or TV broadcast transmitters within 100 meters of the antenna site.



DISTANCE FROM RADIATOR (Meters) VERSUS POWER DENSITY (Microwatt/Square cm)

Dist (M)	PD (H)	PD (V)	Total (uW/cm2)
0.00	0.000	4.473	4.473
1.00	0.000	4.517	4.517
2.00	0.000	4.558	4.558
3.00	0.000	4.597	4.597
4.00	0.000	4.632	4.632
5.00	0.000	4.681	4.681
6.00	0.000	4.806	4.806
7.00	0.000	4.928	4.928
8.00	0.000	5.046	5.046
9.00	0.000	5.160	5.160
10.00	0.000	5.238	5.238
11.00	0.000	5.239	5.239
12.00	0.000	5.235	5.235
13.00	0.000	5.226	5.226
14.00	0.000	5.210	5.210
15.00	0.000	5.187	5.187
16.00	0.000	5.149	5.149
17.00	0.000	5.106	5.106
18.00	0.000	5.056	5.056
19.00	0.000	5.001	5.001
20.00	0.000	4.940	4.940
21.00	0.000	4.905	4.905
22.00	0.000	4.863	4.863
23.00	0.000	4.815	4.815
24.00	0.000	4.759	4.759
25.00	0.000	4.697	4.697
26.00	0.000	4.610	4.610
27.00	0.000	4.486	4.486
28.00	0.000	4.360	4.360
29.00	0.000	4.230	4.230
30.00	0.000	4.099	4.099
31.00	0.000	3.966	3.966
32.00	0.000	3.839	3.839
33.00	0.000	3.733	3.733
34.00	0.000	3.625	3.625
35.00	0.000	3.513	3.513
36.00	0.000	3.399	3.399
37.00	0.000	3.284	3.284
38.00	0.000	3.167	3.167
39.00	0.000	3.033	3.033
40.00	0.000	2.884	2.884
41.00	0.000	2.739	2.739
42.00	0.000	2.598	2.598
43.00	0.000	2.460	2.460
44.00	0.000	2.325	2.325
45.00	0.000	2.195	2.195
46.00	0.000	2.069	2.069
47.00	0.000	1.948	1.948
48.00	0.000	1.831	1.831
49.00	0.000	1.718	1.718
50.00	0.000	1.609	1.609
51.00	0.000	1.505	1.505
52.00	0.000	1.406	1.406

Dist (M)	PD (H)	PD (V)	Total (uW/cm2)
53.00	0.000	1.311	1.311
54.00	0.000	1.221	1.221
55.00	0.000	1.135	1.135
56.00	0.000	1.046	1.046
57.00	0.000	0.962	0.962
58.00	0.000	0.884	0.884
59.00	0.000	0.810	0.810
60.00	0.000	0.742	0.742
61.00	0.000	0.678	0.678
62.00	0.000	0.618	0.618
63.00	0.000	0.562	0.562
64.00	0.000	0.510	0.510
65.00	0.000	0.462	0.462
66.00	0.000	0.423	0.423
67.00	0.000	0.391	0.391
68.00	0.000	0.360	0.360
69.00	0.000	0.330	0.330
70.00	0.000	0.302	0.302
71.00	0.000	0.275	0.275
72.00	0.000	0.250	0.250
73.00	0.000	0.226	0.226
74.00	0.000	0.203	0.203
75.00	0.000	0.182	0.182
76.00	0.000	0.162	0.162
77.00	0.000	0.143	0.143
78.00	0.000	0.126	0.126
79.00	0.000	0.110	0.110
80.00	0.000	0.094	0.094
81.00	0.000	0.080	0.080
82.00	0.000	0.067	0.067
83.00	0.000	0.056	0.056
84.00	0.000	0.046	0.046
85.00	0.000	0.045	0.045
86.00	0.000	0.044	0.044
87.00	0.000	0.044	0.044
88.00	0.000	0.043	0.043
89.00	0.000	0.042	0.042
90.00	0.000	0.042	0.042
91.00	0.000	0.041	0.041
92.00	0.000	0.040	0.040
93.00	0.000	0.040	0.040
94.00	0.000	0.039	0.039
95.00	0.000	0.038	0.038
96.00	0.000	0.038	0.038
97.00	0.000	0.037	0.037
98.00	0.000	0.036	0.036
99.00	0.000	0.036	0.036
100.00	0.000	0.035	0.035

## **EXHIBIT A**

The transmitting facility is so located that there is some resident population within the predicted "blanketing" contour, as defined in 47 C.F.R. §73.318. The applicant agrees that full compliance with the procedures and requirements of §73.318(b)(d) will be attained.

The applicant will take such engineering steps as may be required to satisfy complaints of "blanketing" including, but not limited to, the installation of filters, traps, or other devices to satisfy said complaints within the specified time period.

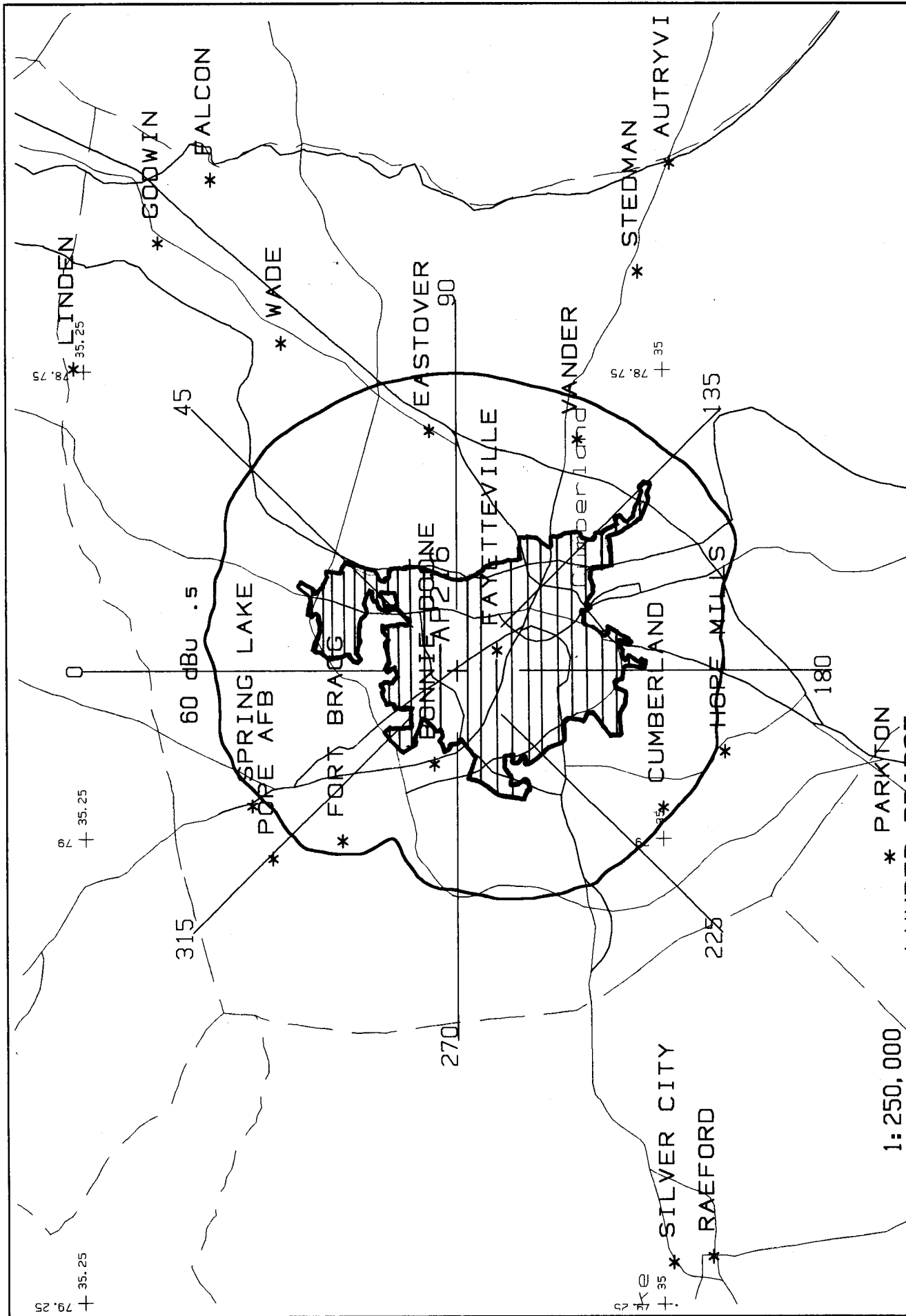
The proposed transmitter is located within 10 km of other existing or proposed FM and TV transmitters. This applicant does not believe that there would be any adverse effects on the operation of any other facility as a result of a grant of this application.

In the event adverse effects are noted, including but not limited to receiver-induced or other types of modulation, the applicant accepts full responsibility for the elimination of any objectionable interference to facilities in existence or authorized, or to radio receivers in use prior to grant of this application.

There are no known non-directional AM antenna systems within 1.6 km of the proposed tower. There is one AM directional antenna system located within 3.2 km. That station is WIDU, which operates on 1600 kHz, utilizing a two tower directional array. WIDU is located 2.4 km from the proposed FM site, on a bearing of 63.9° true.

In conformance with the Rules, prior to and following the construction of the FM tower, a "partial" antenna proof of performance will be done on WIDU, and the results submitted to the AM station. In the event the FM construction has had an appreciable effect on the operation of the WIDU antenna system, appropriate de-tuning circuits will be installed on the FM tower to correct those effects.





<p>1:250,000</p> <p>Scale in km</p> <p>0 10 20</p>	<p>Prop. Fayetteville NC Ch.216 .5kW</p> <p>N. Lat. 35 05 20 W. Lng. 78 54 37</p>
<p>EXHIBIT E-1</p> <p>MUNN &amp; ASSOC 11/96</p>	

## **EXHIBIT E-2**

### **SOURCE OF TOPOGRAPHIC DATA**

The topographic data employed in this application is based on the 30" topographic database, NGDC-TGP-0050. Linear interpolation was employed between datapoints.

The averages calculated include 131 points between 3 and 16 km from the transmitter site proposed in this application.

The transmitter site elevation was determined by means of 7.5' series topographic mapping. The site coordinates were also developed from the 7.5' series map, and are based on NAD-27 datum. A portion of that map is included as Exhibit E-5 .

Elevations in feet have been converted to meters, using the following formula:

$$H(\text{meters}) = h(\text{feet}) * 0.3048$$

For application purposes, the resultant metric elevation has been rounded to the nearest meter.

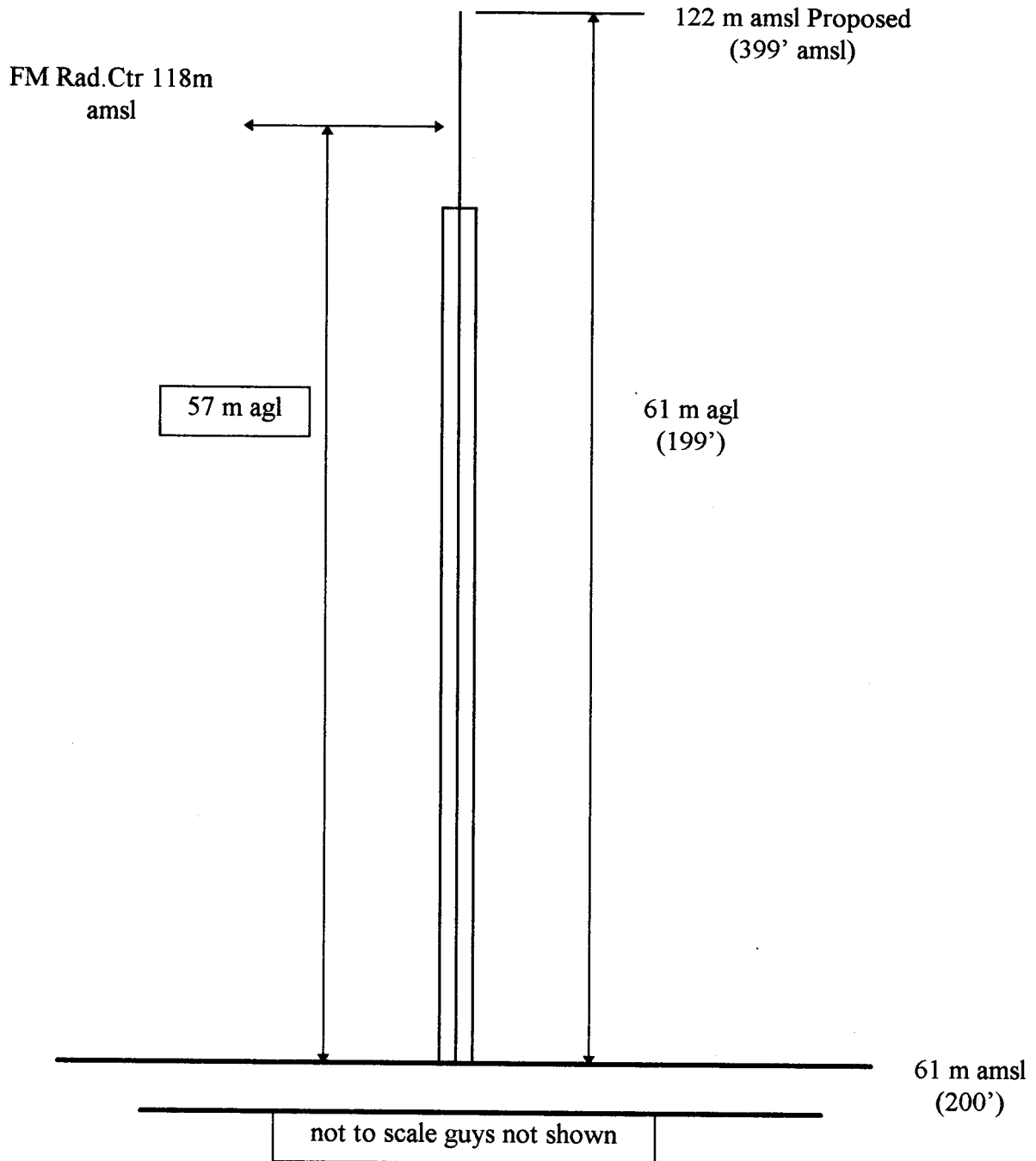
## EXHIBIT E-3

### VERTICAL PLAN

**Site Location:**

**NL:** 35° 05' 20" 2515 Murchison Rd., (St.Rd. 87/210) Fayetteville, Cumberland

**WL:** 078° 54' 37" Co., North Carolina



E. Harold Munn, Jr. & Associates, Inc.  
Broadcast Engineering Consultants  
Coldwater, MI 49036

**EXHIBIT E-4**

## PROPOSED FM OPERATING SPECIFICATIONS

**Applicant-----:** Bible Broadcasting Network, Inc.      **Call:** New  
**City of License:** Fayetteville, North Carolina

**Frequency:** 91.1 MHz      **Channel:** 216 A  
**ERP:** 0.5 kW      **HAAT:** 69 (meters)

**Site Coordinates:** NL 35° 05' 20"; WL 078° 54' 37"

**Transmitter Location:** 2515 Murchison Rd., (St.Rd.87/210)  
Fayetteville  
**County:** Cumberland

**State:** NC

**Proposed Operation: Class A (NCE)**

**Effective Radiated Power:** 0.0(kW) H 0.5 (kW) V (Non-Directional)

**Height of Antenna Radiation Center Above:**

<u>Average Terrain</u>	<u>Mean Sea Level</u>	<u>Ground</u>
<b>Horizontal</b> - -- meters	--- meters	--- meters
<b>Vertical</b> 69 meters	118 meters	57 meters

**Elevation of Tower Site**-----: 61 meters AMSL  
**Overall Height of Tower Above Ground**-----: 61 m (Proposed)  
**Overall Height of Tower Above Mean Sea Level:** 122 m  
 All heights "rounded" to nearest meter for Section V-B of Form 340

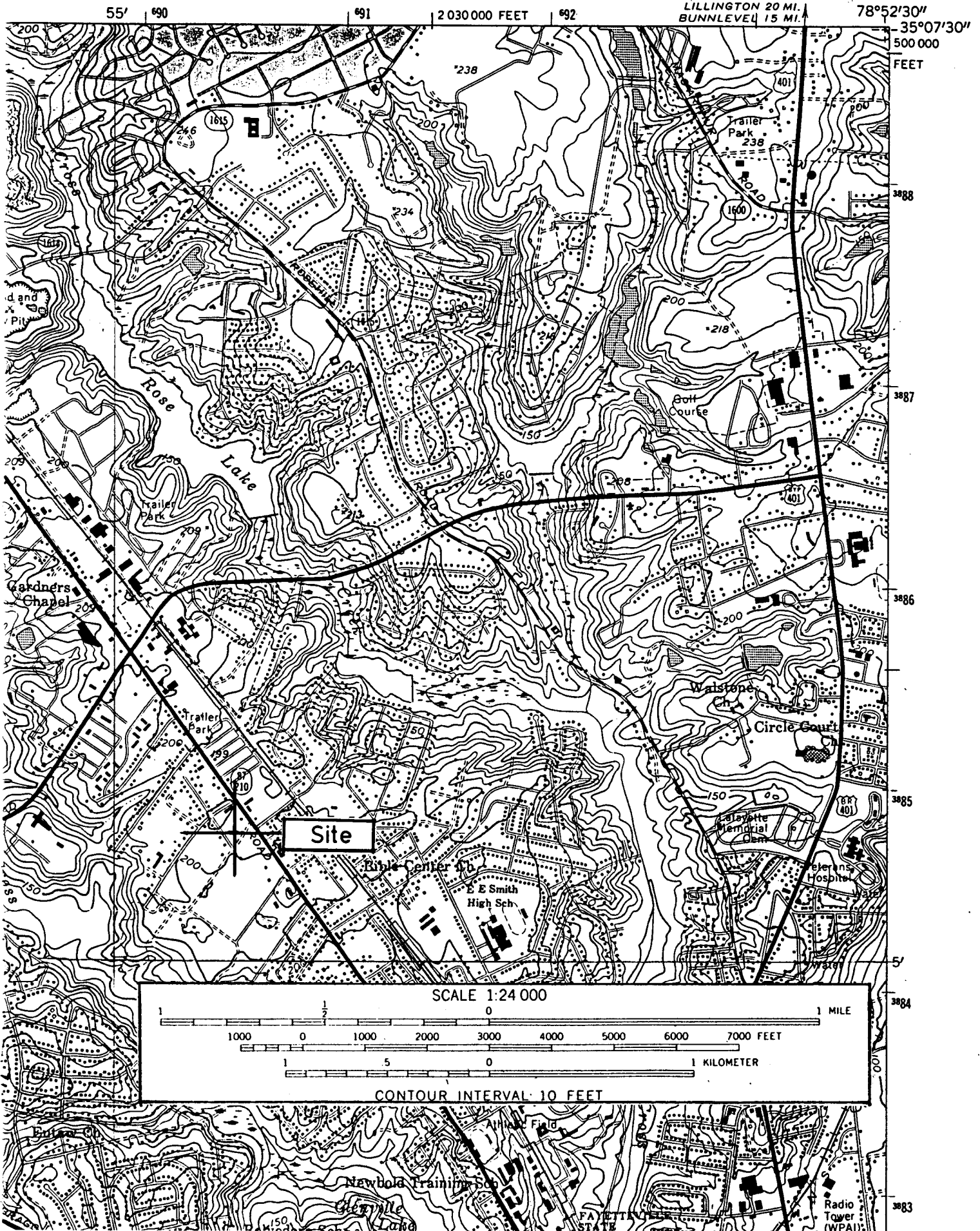
**E. HAROLD MUNN, JR. & ASSOCIATES, INC.**  
Broadcast Engineering Consultants  
Coldwater, MI 49036

EXHIBIT E-5

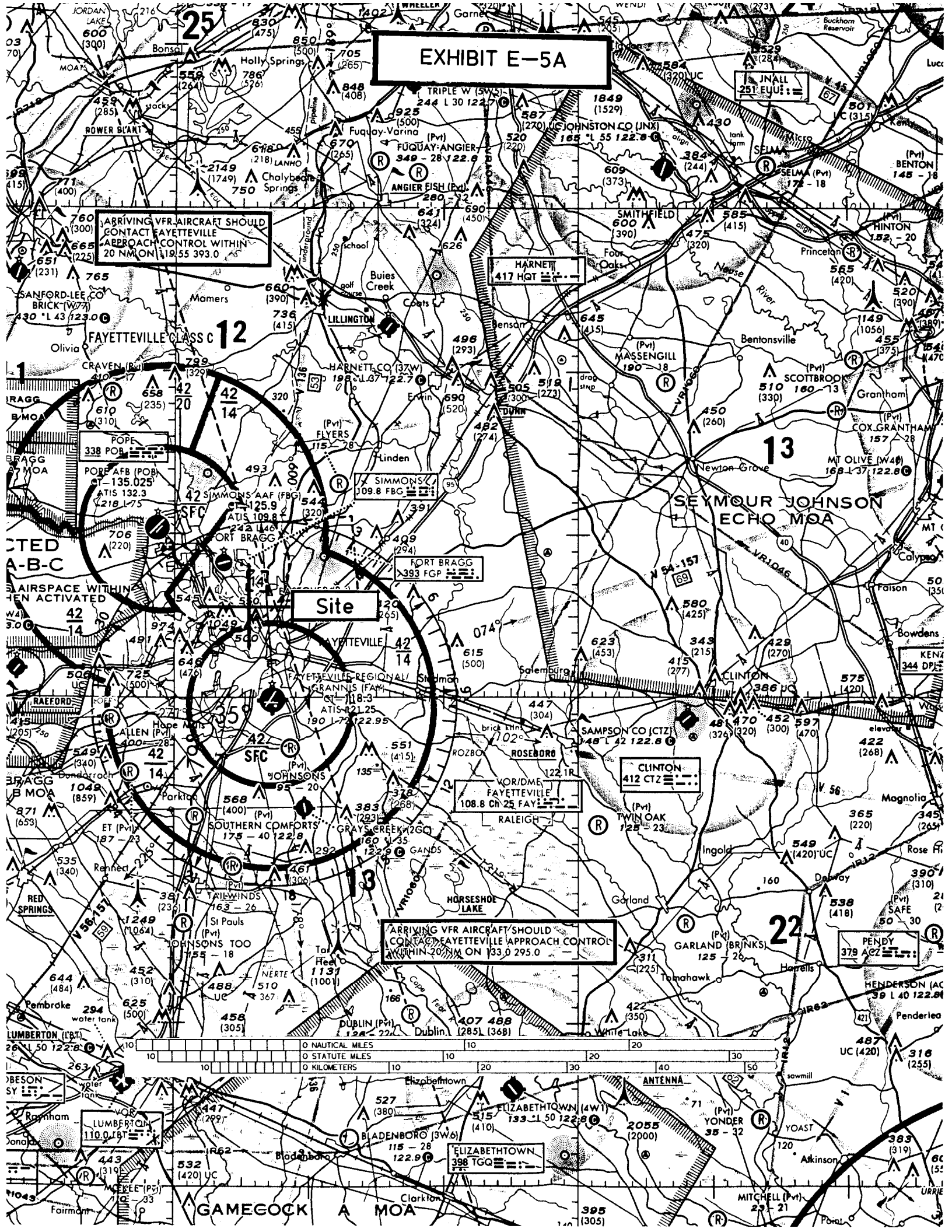
FAYETTEVILLE QUADRANGLE  
NORTH CAROLINA-CUMBERLAND CO.  
7.5 MINUTE SERIES (TOPOGRAPHIC)

SW/4 FAYETTEVILLE 15' QUADRANGLE

5234 III NE  
(SLOCUMB)



# EXHIBIT E-5A



## **EXHIBIT E-6**

### **TABULATION OF POPULATION AND AREA**

**Prop. 216(A)  
Fayetteville, North Carolina**

#### **CONTOUR   POPULATION   AREA**

<b>1.0 mV/m</b>	<b>191,678</b>	<b>505 km<sup>2</sup></b>
-----------------	----------------	---------------------------

The population within the 1.0 mV/m contour was determined by superimposing the desired contour onto U.S. Standard Civil Division maps of the 1990 Census, and assuming uniform population distribution within each minor civil division. The data was computer generated.

The service area was determined by measurement of the contour map Exhibit E-1, using computer calculations and 360 terrain radials.

11-29-1996

E. Harold Munn Jr. &amp; Associates Inc.

517 278-7339

CH# 216A - 91.1 MHz

## EXHIBIT E-7 ALLOCATION STUDY

INTERFERENCE CHECKS WITH NEW, FAYETTEVILLE, NC at N. LAT. 35 05 20 W. LNG. 78 54 37

PWR = .5 kW H.A.A.T. = 69 M C.O.R. = 118 M AMSL

Protected F(50-50) 60 dBu = 12.97 km

F(50-10) 40 dBu = 44.18 54 dBu = 18.88 80 dBu = 3.98 100 dBu = 1.59

CH#	CALL	TYPE	* IN *	* OUT *	BEARING	DISTANCE	LAT.	PWR(kW)	INT(km)	PRO(km)
CITY	STATE	LICENSEE			<---		LNG.	HAAT(M)	COR(M)	FILE #
213A	WDCC	LI CN	32.8	29.6	333.7	47.49 km	35 28 19	3.00	1.69	16.33
Sanford	NC	Central Carolina Technical			153.7	29.51 Mi	79 08 36	46.0	145	BLED820607AL
216A	WRSH.C	CP CN	29.0	20.9	258.3	75.00 km	34 56 59	0.34	33.07	9.96
Rockingham	NC	Richmond County Board of E			78.3	46.60 Mi	79 42 52	49.0	148	BPED960116IL
216A	AP216	AP VN	-77.7	-53.0	82.9	19.29 km	35 06 36	4.20	83.99	28.12
Fayetteville	NC	American Family Associatio			262.9	11.99 Mi	78 42 01	117.0	149	BPED960806MA
216A	WRSH	LI CN	29.0	20.9	258.4	75.07 km	34 57 03	0.34	33.07	9.96
Rockingham	NC	Richmond County Board of E			78.4	46.65 Mi	79 42 56	49.0	148	BLED810921AJ
218C	WUNC *	LI DCN	35.7	2.9	345.0	89.34 km	35 51 59	100.00	41.63	82.78
Chapel Hill	NC	Brd of Trustees of the Uni			165.0	55.51 Mi	79 10 00	439.8*	564	BLED951213KA
> Reference HAAT at 345 degrees = 57.6 M, Pwr.= .5 kW, Pro. Dist. = 12.01 km, Int. Dist. = 3.65 km										
218C	WUNC.C*	CP CN	47.8	19.7	345.0	89.34 km	35 51 59	100.00	29.53	66.00
Chapel Hill	NC	Brd of Trustees of the Uni			165.0	55.51 Mi	79 10 00	223.8*	348	BPED960607IF
FCC Comment > * This is an AUXILIARY facility for WUNC, Chapel Hill, NC *										
> Reference HAAT at 345 degrees = 57.6 M, Pwr.= .5 kW, Pro. Dist. = 12.01 km, Int. Dist. = 3.65 km										

I.F. RELATIONSHIPS: NONE FOUND

Nearest CH 6 Grade B =WECT at-56.21 km, Distance= 71.27 Azimuth = 142.6 Deg. T.

\* Uses actual antenna radial HAAT and power toward reference



TERRAIN AND CONTOUR DATA  
Proposed Ch.216(A)  
EXHIBIT E-7

ERP = .5 kW  
FM - 2-6 Tables 30 Sec

Azimuth Deg T.	Ave. Elev. 3 to 16 km Meters AMSL	Effective Antenna Height Meters AAT	ERP (dBk)	F(50-50)	F(50-10)
				Distance to 60 dBu Contour km	Distance to 80 dBu Contour km
0	62.0	56.0	-3.010	11.6	3.7
10	56.5	61.5	-3.010	12.1	3.8
20	53.6	64.4	-3.010	12.4	3.9
30	48.3	69.7	-3.010	12.8	4.1
40	36.7	81.3	-3.010	13.8	4.4
50	31.7	86.3	-3.010	14.2	4.5
60	31.4	86.6	-3.010	14.2	4.5
70	30.0	88.0	-3.010	14.3	4.6
80	29.2	88.8	-3.010	14.4	4.6
90	28.5	89.5	-3.010	14.4	4.6
100	29.8	88.2	-3.010	14.3	4.6
110	29.2	88.8	-3.010	14.4	4.6
120	27.3	90.7	-3.010	14.5	4.6
130	26.2	91.8	-3.010	14.6	4.7
140	23.0	95.0	-3.010	14.9	4.8
150	22.3	95.7	-3.010	15.0	4.8
160	35.7	82.3	-3.010	13.8	4.4
170	47.3	70.7	-3.010	12.9	4.1
180	49.8	68.2	-3.010	12.7	4.0
190	50.1	67.9	-3.010	12.7	4.0
200	47.2	70.8	-3.010	12.9	4.1
210	51.7	66.3	-3.010	12.5	4.0
220	54.7	63.3	-3.010	12.3	3.9
230	56.0	62.0	-3.010	12.2	3.9
240	57.1	60.9	-3.010	12.1	3.8
250	61.6	56.4	-3.010	11.7	3.7
260	65.9	52.1	-3.010	11.2	3.5
270	70.8	47.2	-3.010	10.7	3.4
280	74.1	43.9	-3.010	10.3	3.2
290	86.1	31.9	-3.010	8.8	2.8
300	74.3	43.7	-3.010	10.3	3.2
310	65.5	52.5	-3.010	11.3	3.6
320	66.6	51.4	-3.010	11.2	3.5
330	64.6	53.4	-3.010	11.4	3.6
340	61.5	56.5	-3.010	11.7	3.7
350	62.7	55.3	-3.010	11.6	3.7
-----					
Ave. = 49.1 M		68.9 M			

Antenna Radiation Center AMSL = 118.0 M

Geographic Coordinates:

North latitude: 35 05 20  
West longitude: 78 54 37

MUNN & ASSOC 30 Sec.  
12-04-1996

EXHIBIT E-7

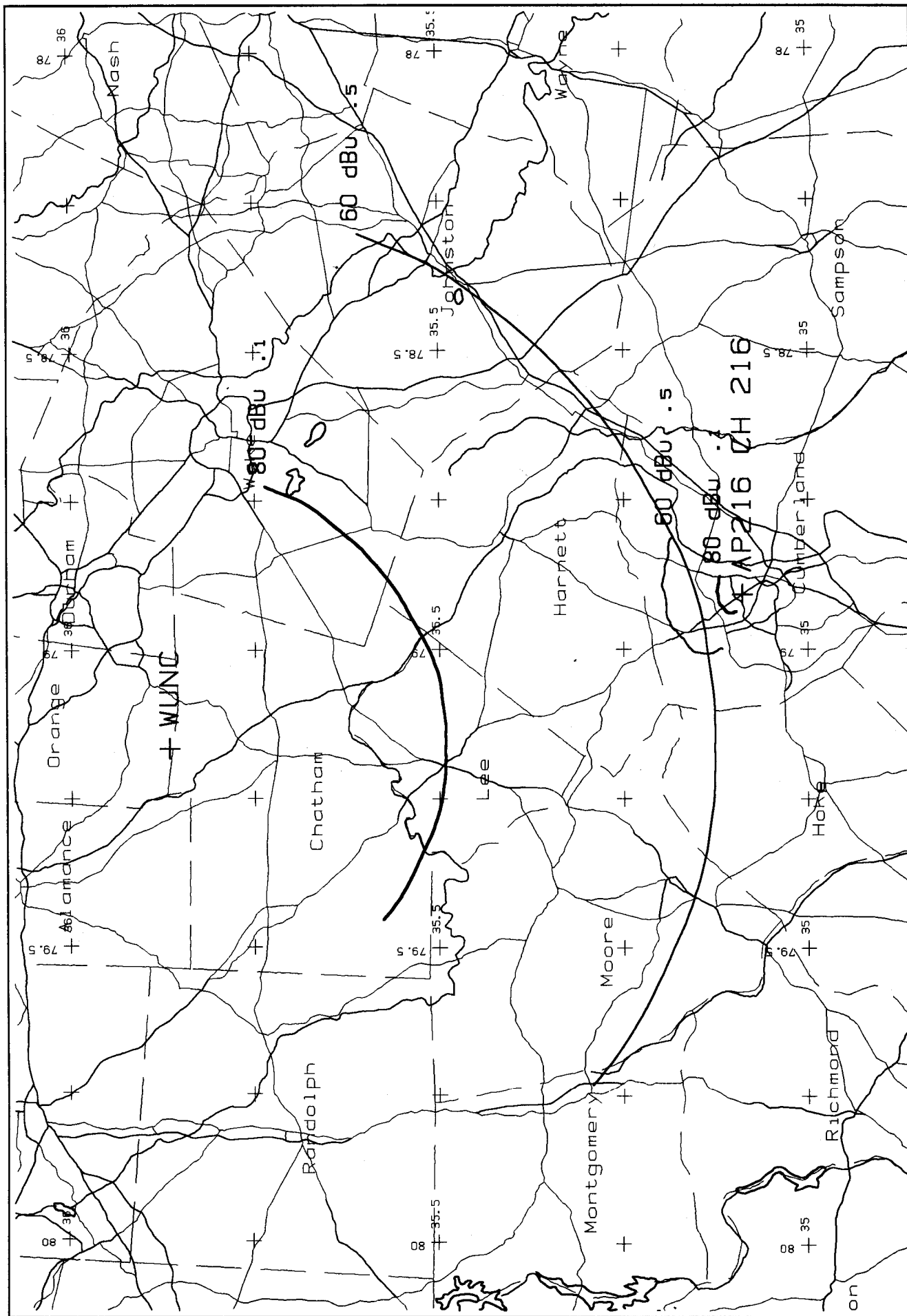
WUNC BLED951213KA  
Channel= 218  
Max ERP = 100 kW  
RCAMSL = 564 M  
N. Lat = 355159  
W. Lng = 791000

AP216  
Channel = 216  
Max ERP = .5 kW  
RCAMSL = 118 M  
N. Lat = 350520  
W. Lng = 785437

Protected  
60 dBu

Interfering  
80 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
150.0	100.000	430.8	82.0	49.3	0.500	86.0	23.4	52.3
151.0	100.000	430.5	82.0	48.3	0.500	85.3	21.9	53.4
152.0	100.000	430.3	82.0	47.3	0.500	84.7	20.5	54.4
153.0	100.000	430.7	82.0	46.3	0.500	83.9	19.1	55.5
154.0	100.000	431.3	82.1	45.1	0.500	83.2	17.8	56.5
155.0	100.000	432.0	82.1	43.6	0.500	82.6	16.4	57.6
156.0	100.000	433.0	82.2	41.9	0.500	82.0	15.0	58.7
157.0	100.000	434.4	82.3	39.8	0.500	81.3	13.7	60.1
158.0	100.000	436.1	82.4	37.2	0.500	80.1	12.4	61.8
159.0	100.000	437.4	82.5	33.8	0.500	76.4	11.1	63.4
160.0	100.000	438.3	82.6	29.3	0.500	68.5	9.9	64.5
161.0	100.000	438.6	82.6	23.3	0.500	64.8	8.9	65.9
162.0	100.000	438.9	82.6	15.7	0.500	61.0	8.0	67.1
163.0	100.000	439.0	82.6	6.2	0.500	61.8	7.3	68.7
164.0	100.000	439.6	82.7	355.1	0.500	54.7	6.8	68.9
165.0	100.000	439.8	82.7	342.9	0.500	57.8	6.7	69.7
166.0	100.000	439.5	82.7	331.0	0.500	54.1	6.9	68.5
167.0	100.000	438.4	82.6	320.5	0.500	51.3	7.5	66.6
168.0	100.000	437.0	82.5	312.0	0.500	52.9	8.4	65.2
169.0	100.000	435.8	82.4	305.2	0.500	48.2	9.3	62.5
170.0	100.000	434.4	82.3	300.0	0.500	43.6	10.5	59.6
171.0	100.000	434.0	82.3	295.6	0.500	38.8	11.6	56.7
172.0	100.000	433.9	82.3	292.0	0.500	32.3	12.9	53.3
173.0	100.000	434.1	82.3	289.1	0.500	32.6	14.1	51.7
174.0	100.000	434.6	82.3	286.7	0.500	36.0	15.4	51.2
175.0	100.000	434.8	82.3	284.8	0.500	38.4	16.7	50.6
176.0	100.000	434.0	82.3	283.5	0.500	39.7	18.1	49.7
177.0	100.000	432.9	82.2	282.5	0.500	41.0	19.5	48.9
178.0	100.000	432.5	82.2	281.6	0.500	42.3	20.9	48.0
179.0	100.000	432.1	82.1	280.8	0.500	43.1	22.3	47.1
180.0	100.000	431.6	82.1	280.2	0.500	43.7	23.7	46.2



<p>Scale in km</p>	<p>WUNC BLED951213KA 218C 100kW</p>	<p>EXHIBIT E-7(A)</p>
<p>Prop. Fayetteville, NC Ch. 216 .5kW</p>	<p>MUNN &amp; ASSOC - 11/96</p>	

## **EXHIBIT E-8**

### **COMPLIANCE WITH SECTION 73.525 - PROTECTION FOR TV CHANNEL 6**

This proposal has been examined for compliance with the provisions of 47 C.F.R. Sec. 73.525, concerning TV Channel 6 protection. An affected TV Channel 6 station is a TV broadcast station which is authorized to operate on Channel 6 that is located within a specified radius of an NCE-FM station operating on Channels 201 through 220.

For an NCE-FM station operating on Channel 216, 91.1 MHz, the affected radius from the Channel 6 facility is 177 km. There is one (1) Channel 6 station within the affected radius of the FM transmitter site. That station is WECT, Wilmington, NC.

The applicant also certifies that in accordance with §73.525(b)(4) early written notice of the proposed application has been given to the affected TV Channel 6 station. An agreement has been obtained from WECT concerning the application. Thus, there is full compliance with Section 73.525, concerning protection to the reception of TV Channel 6.