

WRBT Comprehensive Engineering Exhibit.

Channel 235B Harrisburg, PA

May 30, 2007

This application seeks to relocate the directional antenna of WRBT Harrisburg, PA from one tower to another within a de facto antenna farm area.

By this application it is sought to locate upon proposed tower that does not require registration, located at 40-18-58.1/76-57-07.4 (NAD 27) with a total overall height of 45.7 meters. The ground elevation at this location is 341.4 meters AMSL. It is proposed that the WRBT directional antenna be located 39.6 meters above ground level, and that the effective radiated power be 22 kilowatts, with a calculated height above average terrain of 223 meters. The proposed radiation pattern is to be the same as presently licensed for WRBT in BMLH-20020131AAD.

An existing short spacing with respect to WBLJ-FM will continue and continuation of a waiver of Section 73.207 granted for WRBT in construction permit BPH-19860407IE is requested. Support for this waiver request is contained both in this exhibit, as well as the previous construction permit application, BPH-19860407IE, which has been made part of this application exhibit. In Table 1 and Figures 1 - 7 below the allocations situation for this proposed move is illustrated.

Due to the complexity of the surrounding terrain as well as nearby non-exempt radiators, WRBT will take power density measurements prior to filing of an application for license to demonstrate compliance with 74CRR 1.1306.

Table 1.

ComStudy 2.2 search of channel 235 (94.9 MHz Class B) at 40-18-58.1 N, 76-57-07.4 W.

Callsign	State	City	Freq	Ch	ERP_w	Class	Status	Dist_km	Sep	Clr
WIKZ	PA	CHAMBERSBURG	95.1	236	50000	B	LIC	76.64	169	-92.4
WRBS-FM	MD	BALTIMORE	95.1	236	50000	B	LIC	120.1	169	-48.9
WZZO	PA	BETHLEHEM	95.1	236	30000	B	LIC	144.65	169	-24.3
WTGB-FM	MD	BETHESDA	94.7	234	20500	B	LIC	150.74	169	-18.3
WBLJ-FM	PA	SHAMOKIN	95.3	237	1250	A	LIC	60.47	69	-8.5
WRDX	DE	DOVER	94.7	234	50000	B	LIC	171.61	169	2.6
WDAC	PA	LANCASTER	94.5	233	13500	B	CP	76.59	74	2.6
WDAC	PA	LANCASTER	94.5	233	19000	B	LIC	76.57	74	2.6

Figure 1.

First adjacent WIKZ Chambersburg, PA. Spaced pursuant Section 73.213. The grandfathered short spacing with WIKZ will be improved by 0.1 kilometer by the proposed WRBT tower change. As demonstrated graphically below, the proposal will result in less contour overlap than is presently licensed.

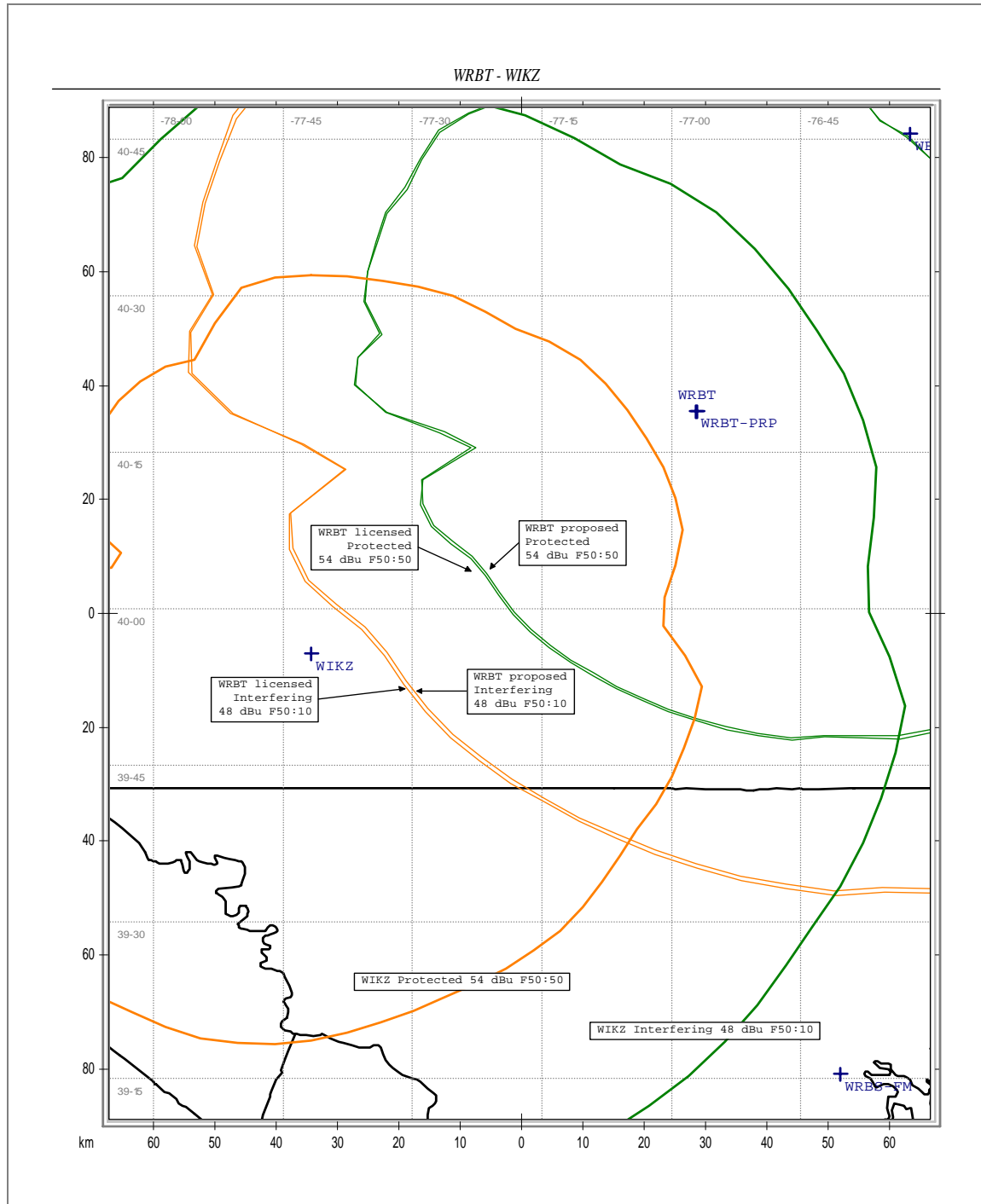


Figure 2.

First adjacent WRBS-FM Baltimore, MD. Spaced pursuant Section 73.213. This tower change will result in no change in the existing separation of WRBS and WRBT. As demonstrated graphically below, the proposal will result in less contour overlap than is presently licensed.

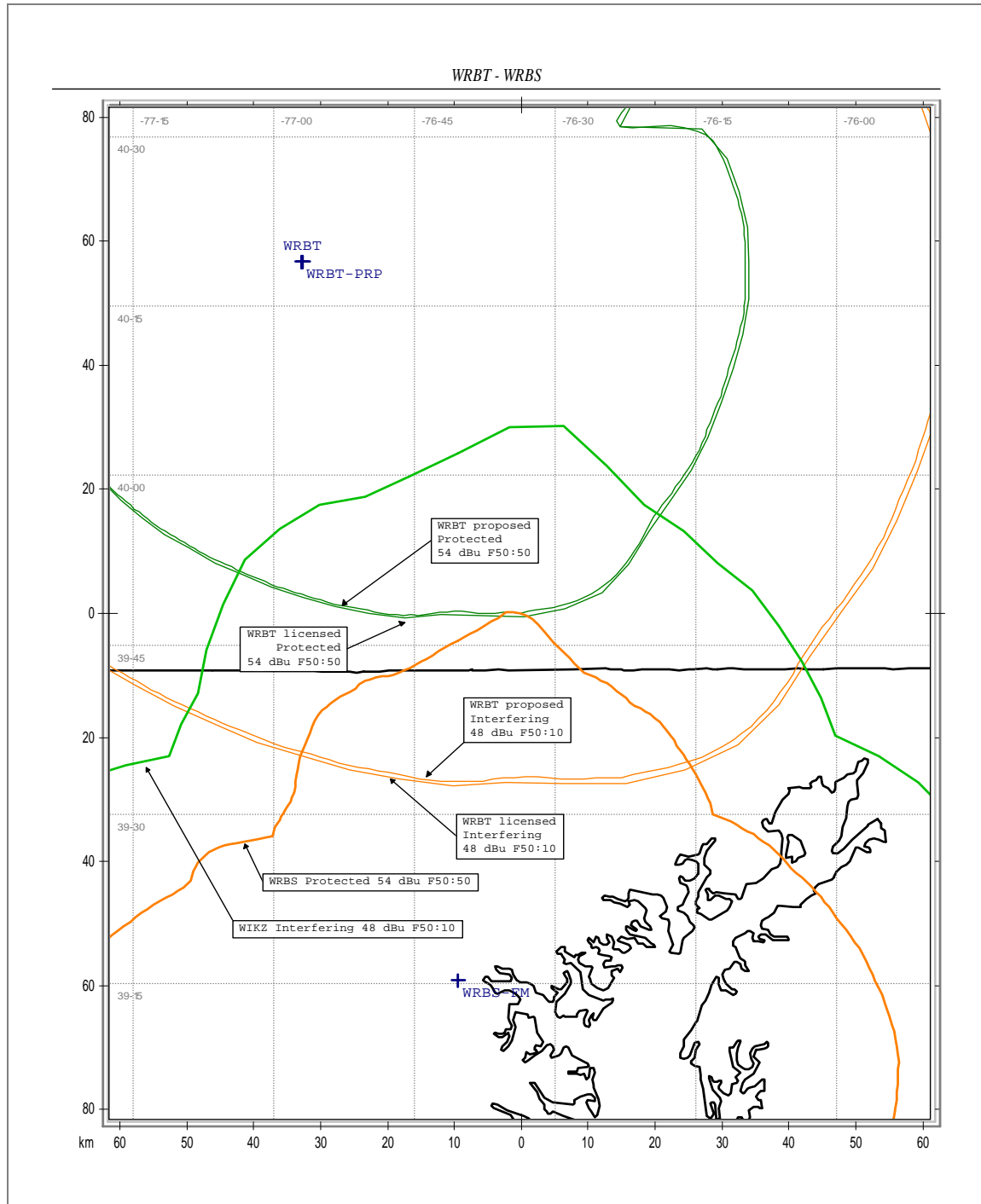


Figure 3.

First adjacent WZZO Bethlehem, PA. Spaced pursuant Section 73.213. The proposed change in tower will decrease the separation to WZZO by 0.1 kilometers. As demonstrated graphically below, the proposal will result in less contour overlap than is presently licensed

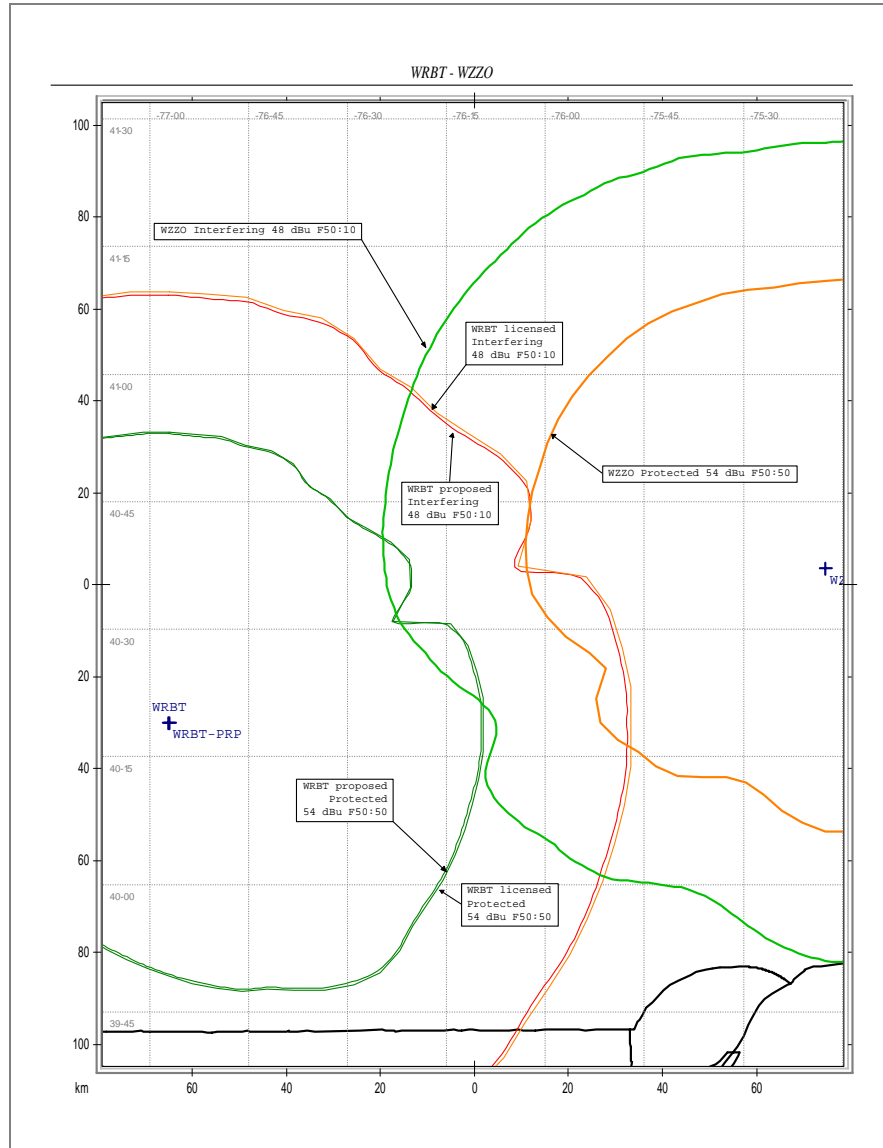


Figure 4.

First adjacent WTGB-FM Bethesda, MD. Spaced pursuant Section 73.213. This tower change will result in no change in the existing separation of WTGB-FM and WRBT. As demonstrated graphically below, the proposal will result in less contour overlap than is presently licensed.

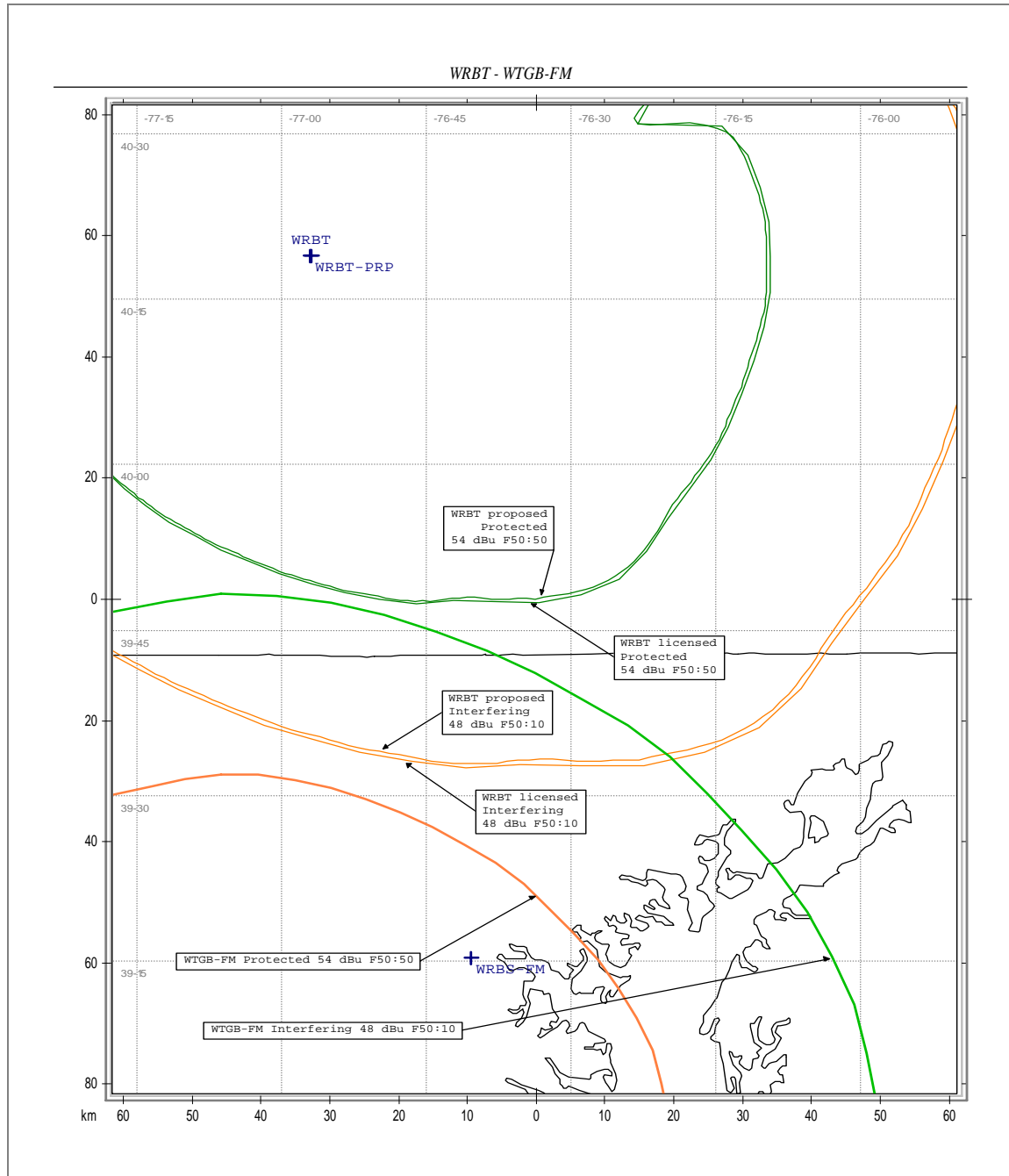
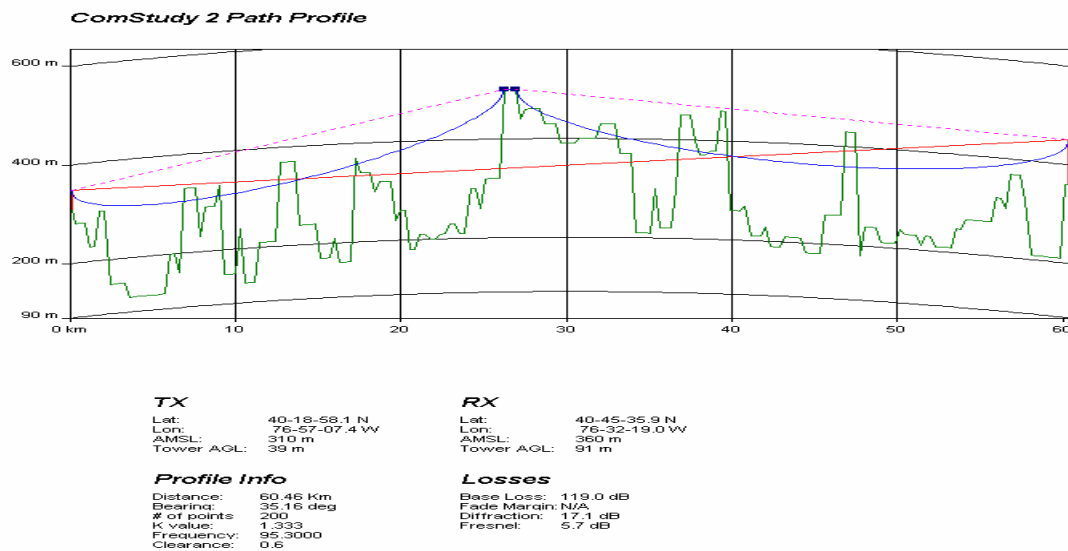


Figure 5.

Second adjacent WBLJ-FM Shamokin, PA. Continuation of 73.207 waiver required. The proposed change in tower will decrease the separation to WBLJ-FM by 0.1 kilometers. The presently licensed antenna for WRBT was built pursuant construction permit BPH-19860407IE. That permit was granted a waiver of 73.207 of the rules to allow construction of the present WRBT facility. A copy of that permit application has been made part of this application for reference.

As this instant application is seeking only a minor change in location from one antenna structure to another in the same tower farm, either a continuation or new grant of this waiver is requested. The existing short spacing or this requested modification does not result in any interference to either station. Below is an elevation profile between the transmitter sites of WRBT and WBJL-FM demonstrating that contour shielding continues to exist between the two facilities. Consequently, it is requested that the Section 73.207 waiver already in place for this station be continued for this very minor change.



Copied from PRR original 8/31/92
BPH-860407IE

ORIGINAL

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LAW OFFICES

APR 7 - 1986

TIERNEY & SWIFT

SUITE 200

1020 NINETEENTH STREET, N.W.

WASHINGTON, D. C. 20036

APR 8 10 52 AM '86

FCC
Office of the Secretary

**AUDIO SERVICES
DIVISION**

TELEPHONE
(202) 293-7979

JOHN L. TIERNEY
RICHARD F. SWIFT
ANN BAVENDER*

*MARYLAND BAR

April 7, 1986

Mr. William J. Tricarico
Secretary
Federal Communications Commission
Washington, D.C. 20554

Re: Market Square Presbyterian Church
FM Broadcast Station WMSP
Harrisburg, Pennsylvania
Application for
Construction Permit

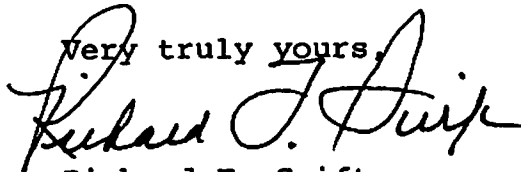
Dear Mr. Tricarico:

Transmitted herewith in triplicate, on behalf of Market Square Presbyterian Church, is an application for a construction permit to relocate the transmitter site of FM broadcast station WMSP, Harrisburg, Pennsylvania and to increase antenna height above average terrain.

The application also requests waiver of the mileage separation requirements of Section 73.207 of the Rules.

Should any questions arise with respect to this application, please communicate with this office.

Very truly yours,



Richard F. Swift

Attorney for
Market Square Presbyterian
Church

RFS:jrn

Enclosure

For Commission Use Only
File No. **BPH-8604071E**

United States of America
Federal Communications Commission
Washington, D.C. 20554

Approved by OMB
: 3080-0027
Expires 12/31/87

APPLICATION FOR CONSTRUCTION PERMIT FOR COMMERCIAL BROADCAST STATION
(Carefully read instructions before filling out Form - RETURN ONLY FORM TO FCC)

APR 7 - 1986

Section I

General Information

1. Name of Applicant

Market Square Presbyterian
Church

Street Address
FCC
Office of the Secretary

City
HARRISBURG

State
PA

ZIP Code
17101

Telephone No.
(Include Area Code)
(717) 257-1300

Send notices and communications to the following named person at the address below:

Name

Heath L. Allen, Chairman
WMSP

Street Address

24 SOUTH SECOND ST

City
HARRISBURG

State
PA

ZIP Code
17101

Telephone No.
(Include Area Code)
(717) 257-1300

2. This application is for: ☐ AM ☒ FM ☐ TV

(a) Channel No. or Frequency: 235B

(b) Community of license:

City

State

HARRISBURG

PA

(c) Check one of the following boxes:

New Station
☐
Modification of
Construction Permit
☐

Change in existing station
Major ☐ Minor ☒
Call Letters WMSP
WWKL

Amendment to pending
Application
☐
Give reference No. _____

NOTE: It is not necessary to use this form to amend a previously filed application. Should you do so, however, please submit only Section I and those other portions of the form that contain the amended information.

3. Is this application mutually exclusive with a renewal application?

☐ YES ☒ NO

If Yes, state:

Call letters:

Community of license:

City

State

Section V-B

FM Broadcast Engineering Data

Name of Applicant Market Square Presbyterian Church

1. Purpose of authorization applied for:

☐ Construct a new station☐ Install Auxiliary systemChange: ☒ Effective radiated power☐ Frequency☒ Antenna height above average terrain☒ Transmitter location☐ Studio location outside community of license☒ Other (Summarize briefly the nature of the changes proposed.) Directional antenna

2. Station location:

State
PennsylvaniaCity or Town
Harrisburg

3. Facilities requested:

Frequency
94.9 MHz Channel No.
235

Class (Check one below)

☐ A ☒ B ☐ C

4. Geographic coordinates of antenna (to nearest second)

North Latitude 40° 18' 57" West Longitude 76° 57' 02"

5. Effective radiated power:

PolarizationHorizontal PlaneMaximum (Beam tilt only)Horizontal 25 kW N/A kWVertical 25 kW N/A kW

6. Height of antenna radiation center:

Antenna height above:

	<u>Average terrain (HAAT)</u>		<u>Mean Sea Level</u>		<u>Ground</u>
Horizontal	<u>700</u> ft. (213 meters)		<u>1214</u> ft.		<u>134</u> ft.
Vertical	<u>700</u> ft. (213 meters)		<u>1214</u> ft.		<u>134</u> ft.

7. Is a directional antenna being proposed?

YES ☒ NO ☐

If Yes, attach as Exhibit No. Eng - an engineering statement with all data specified in Section 73.316(d) of the Commission's Rules.

15. Tabulation of Terrain Data. (Calculated in accordance with the procedure prescribed in Section 73.313 of the Commission's Rules utilizing 7-1/2 minute topographic maps, if available).

Radial bearing (degrees true)	Height of antenna, radiation center above average elevation of radial (2-10 mi) Feet	ERP (dBk)	Predicted Distance	
			To the 3.16 mV/m contour Miles	To the 1 mV/m contour Miles
0°	665	14.0	19.0	31.8
45°	549	14.0	18.2	29.8
90°	737	14.0	21.0	33.0
135°	869	14.0	22.6	35.0
180°	786	8.1	15.8	26.1
225°	767	4.2	12.5	21.5
270°	539	10.7	15.2	25.5
315°	685	14.0	20.1	32.0
(.) _____	_____	_____	_____	_____

(•) Radial over principal community if not included above. Do not include in Average.

16. Environmental Statement, See Part I, Subpart 1 of the Commission's Rules.

Would a Commission grant of this application be a major action as defined by Section 1.1305 of the Commission's Rules? ☐ YES ☒ NO

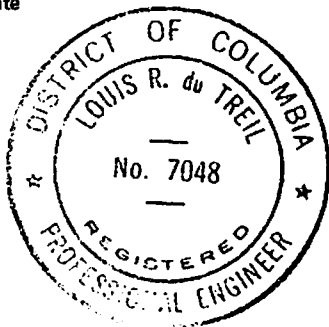
If Yes, attach as Exhibit No. _____ a narrative statement in accordance with Section 1.1311 of the Commission's Rules.

If No, explain briefly. Proposed antenna will be mounted on an existing tower without increasing height.

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

February 5, 1986

Date



Louis R. du Treil, P. E.

Name
Louis R du Treil

Signature (check appropriate box below)

1200 18th Street, N. W., Suite 607

Address (include ZIP Code)

Washington, D. C. 20036

(202) 659-3055

Telephone No. (include Area Code)

☐ Technical Director

☒ Registered Professional Engineer

☐ Chief Operator

☐ Technical Consultant

☐ Other (Specify)

ANTENNA AND SITE INFORMATION

Name of Applicant Market Square Presbyterian Church	Call Sign WMSP	Station Location Harrisburg, Pennsylvania
Purpose of Application (Put "X" in appropriate box) <input type="checkbox"/> New antenna construction <input checked="" type="checkbox"/> Alteration of existing antenna structure <input type="checkbox"/> Change in location	Facilities Requested CH 235B, 25 kW (MAX-DA), 213 meters	

1. Location of Antenna:
 State: Pennsylvania County: Cumberland City or Town: near Summerdale

Exact antenna location (street address). If outside city limits, give name of nearest town and distance and direction of antenna from town.
 One mile west northwest of Summerdale, atop Blue Mountain

Geographical coordinates (to nearest second). For directional antenna give coordinates of center of array. For single vertical radiator give tower location.

North Latitude 40° 18' 57" West Longitude 76° 57' 02"

2. Is the proposed site the same transmitter-antenna site of other stations authorized by the Commission or specified in another application pending before the Commission? ☒ YES ☐ NO

If Yes, give call sign: WHTM-TV, WNNK (FM)

3. Has the FAA been notified of proposed construction? ☐ YES ☒ NO
 If Yes, give date and office where notice was filed. Antenna to be mounted on existing tower without increasing the height

4. List all landing areas within 5 miles of antenna site. Give distance and direction to the nearest boundary of each landing area from the antenna site.

	Landing Area	Distance	Direction
(a)	Mt. View (pvt.)	1.5 miles	South
(b)			
(c)			

5. Attach as Exhibit No. Eng. a description of the antenna system, including whether tower(s) are self-supporting or guyed. If a directional antenna, give spacing and orientation of towers.

Tower	#1	#2	#3	#4	#5	#6
Overall height above ground (include obstruction lighting)	609					
Overall height above mean sea level (include obstruction lighting)	1689					

du Treil - Rackley
Consulting Engineers • Washington, D.C.

ENGINEERING EXHIBIT
APPLICATION FOR FM CONSTRUCTION PERMIT
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA

February 5, 1986

CH 235B

25 KW (MAX-DA)

213 M

ENGINEERING EXHIBIT
APPLICATION FOR FM CONSTRUCTION PERMIT
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA
CH 235B 25 KW (MAX-DA) 213 M

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Certification of Louis R. du Treil, P. E.

ENGINEERING EXHIBIT
APPLICATION FOR FM CONSTRUCTION PERMIT
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA
CH 235B 25 KW (MAX-DA) 213 M

Engineering Statement

This engineering exhibit has been prepared on behalf of Market Square Presbyterian Church (herein WMSP), Harrisburg, Pennsylvania. Station WMSP operates on channel 235B with effective radiated power of 50 kilowatts and antenna height above average terrain of 205 feet (62.5 meters). WMSP seeks a construction permit to relocate its transmitter site and to increase antenna height above average terrain to 700 feet (213 meters). A minor short spacing would occur with respect to one existing station, and a waiver of the provisions of Section 73.207 of the FCC Rules is requested. Support for the waiver is contained herein.

The construction proposed would not constitute a major environmental action as defined by Section 1.1305 of the Federal Communications Commission's Rules and Regulations, as it is proposed to side mount the transmitting antenna on an existing tower and radiofrequency exposure to humans resulting from the addition of the FM antenna will be below ANSI C95.1-1982 guidelines. No increase in height of the existing tower

Engineering Statement
Harrisburg, Pennsylvania

is proposed. Engineering specifications for the proposed operation are included herein as Figure 1.

Proposed Operation

The proposed directional antenna will be side mounted on the uniform cross-section, guyed tower which presently supports the antennas of WHTM-TV, (channel 27) and WNNK(FM), (channel 281B). The WHTM-TV tower is located 6.9 kilometers from the existing WMSP site. The new location is described by the following geographic coordinates which were obtained from the WHTM-TV license:

40° 18' 57" North Latitude

76° 57' 02" West Longitude.

The attached Figure 2 is a map showing the proposed transmitter site. AM broadcast station WHP, licensed to serve Harrisburg, Pennsylvania on 580 kHz, is located 0.9 mile south. The addition of the proposed side mounted FM antenna to an existing support structure is not expected to have an adverse impact on the operation of WHP.

Proposed Equipment

WMSP proposes to employ a four-bay Shively type 6810-4D-DA directional antenna having a maximum estimated power gain of 3.0 in the horizontal plane for both horizontal and vertical polarization. The idealized

Engineering Statement
Harrisburg, Pennsylvania

radiation patterns are shown as Figure 5. The actual measured directional pattern will be supplied to the Commission in a subsequent application. Cablewave Systems type HCC 158-50J, 1-5/8 inch coaxial cable, 150 feet in length, will be employed to transfer energy from the transmitter to the antenna. The transmission line has a power transfer efficiency of 94 percent at 94.9 MHz.

A Harris type FM-10K, 10-kilowatt transmitter is proposed to be employed. With the transmitter operating at an output power level of 8.86 kilowatts, taking into account the transmission line loss and the antenna gain, the maximum effective radiated power will be 25 kilowatts for both horizontal and vertical polarization.

Allocation Considerations

The stations listed below are pertinent to the proposed operation of WMSP:

Station Call	Location	Channel No.	Separation (km)		Required
			From ^{/1} Proposed Site	From ^{/2} Existing Site	
WDAC	Lancaster, PA	233B	76.4	70.2	74
WLTT	Bethesda, MD	234B	150.6	145.1	169

^{/1}Proposed site: 40° 18' 57" N. Lat., 76° 57' 02" W. Long.

^{/2}Existing site: 40° 15' 44" N. Lat., 76° 54' 37" W. Long.

Engineering Statement
Harrisburg, Pennsylvania

Station Call	Location	Channel No.	Separation (km)		Required
			From ^{/1} Proposed Site	From ^{/2} Existing Site	
WDSD	Dover, DE	234B	171.5	164.8	169
WIKZ	Chambersburg, PA	236B	76.7	76.6	169
WRBS	Baltimore, MD	236B	120.0	113.4	169
WZZO	Bethlehem, PA	236B	144.5	142.7	169
WSPI	Shamokin, PA	237A	60.3	63.5	69

The allocation situation with respect to each station will be discussed in the following paragraphs.

WDAC Lancaster, PA (channel 233B). Short spacing with second adjacent channel station WDAC will be eliminated by the WMSP move. The new site will provide an excess of 2.4 kilometers over the required 74 kilometers, while the existing site is 3.8 kilometers short spaced. This short spacing did not exist prior to adoption of new separations in Docket No. 80-90.

WLTT Bethesda, MD (channel 234B). The separation between WLTT and WMSP will be increased 5.5 kilometers to 150.6 kilometers; however, the grandfathered short spacing remains. Class B stations operating on first adjacent channels and separated 129 to 169 kilometers are permitted by Section 73.213 to operate

^{/1}Proposed site: 40° 18' 57" N. Lat., 76° 57' 02" W. Long.

^{/2}Existing site: 40° 15' 44" N. Lat., 76° 54' 37" W. Long.

Engineering Statement
Harrisburg, Pennsylvania

with maximum facilities of 50 kilowatts (ERP) and 150 meters (HAAT).

WDSD Dover, DE (channel 234B). The move by WMSP will eliminate an existing 4.2 kilometer short spacing with WDSD. From the proposed site, 2.5 kilometers in excess of the 169 kilometer requirement will exist.

WIKZ Chambersburg, PA (channel 236B). The grandfathered short spacing with WIKZ will be improved by 0.1 kilometer by the proposed WMSP site change. Section 73.213 of the rules permits first adjacent channel class B stations which are separated less than 80 kilometers to operate with facilities not exceeding 5 kilowatts (ERP) and 150 meters (HAAT). As the proposed separation will be 76.7 kilometers, WMSP proposes to install a directional antenna to limit radiation to a maximum of 5 kilowatts in the direction of WIKZ (236 degrees true).

WRBS Baltimore, MD (channel 236B). The site change by WMSP will increase the existing separation of 113.4 kilometers with WRBS by 6.6 kilometers. Grandfathered short spaced class B stations on first adjacent channels are permitted to operate with 20 kilowatts (ERP) and 150 meters (HAAT) by the provisions of Section 73.213 of the rules. A directional antenna will be installed at the proposed WMSP site to limit the effective radiated power to 20 kilowatts in the direction of WRBS (169 degrees true).

WZZO Bethlehem, PA (channel 236B). The proposed

Engineering Statement
Harrisburg, Pennsylvania

change in site for WMSP will increase the separation to WZZO from 142.7 to 144.5 kilometers. WZZO and WMSP are grandfathered short spaced stations where power of 50 kilowatts (ERP) and 150 meters (HAAT) are permitted by Section 73.213 of the rules for stations so short spaced.

WSPI Shamokin, PA (channel 237A). A class A and class B station operating on second adjacent channels are required to be separated by 69 kilometers. Prior to adoption of new separation requirements the required separation was 40 miles (64 kilometers). The existing WMSP site was not short spaced with WSPI under pre-Docket No. 80-90 rules, but is under current rules. The change in transmitter site by WMSP will result in a 2.7 kilometer short spacing with respect to old spacing requirements and 8.7 kilometers with respect to new spacing requirements. Waiver of the provisions of Section 73.207 is requested.

The proposed short spacing with WSPI will not result in any interference to either station. Figure 7 is an elevation profile between the transmitter sites of WSPI and WMSP. As is obvious, terrain blockage prevents interference between the stations. With this fact in mind and in view in an overall improvement in separations to existing stations, the request for waiver of the provisions of Section 73.207 appears warranted. In addition, the proposal permits WMSP to achieve full class B status resulting in greatly improved coverage to Harrisburg and surrounding areas.

Engineering Statement
Harrisburg, Pennsylvania

Predicted Coverage Contours

Figure 4 is a tabulation of average elevations, ERP, and distances to predicted coverage contours, determined in accordance with Section 73.313 of the FCC Rules. Terrain roughness correction factors were not employed, as is current FCC practice. The 2 to 10 mile average elevations employed were acquired from the WHTM-TV file for the standard eight radials. Elevation averages of pertinent intermediate radials were determined by linear interpolation.

The effective antenna heights for each of the standard eight 45 degree spaced radials and other intermediate radials were used in conjunction with the F(50,50) curves of Figure 1 of Section 73.333 of the Rules to determine distances to 70 dBu (3.16 mV/m) and 60 dBu (1.0 mV/m) service contours. The map of Figure 6 depicts the calculated 70 dBu and 60 dBu contours. All of Harrisburg is expected to receive a signal level in excess of the minimum 70 dBu requirement.

Radiofrequency Exposure Considerations

In order to evaluate the radiofrequency exposure levels to be expected at ground level from the proposed operation, the total power density level for radiation from proposed WMSP and from existing stations WNNK-FM and WHTM-TV was calculated. Formula 4 of Section II of OST Bulletin No. 65 was used to calculate the power density level for the existing and proposed FM stations, while

Engineering Statement
Harrisburg, Pennsylvania

formula 5 was used for the existing television station.

The proposed WMSP FM antenna will have its lowest element at approximately 119 feet above ground level. For this height, and assuming downward radiation of 20 percent of the total of horizontally and vertically polarized effective radiated power, the power density at ground level was computed to be 0.254 milliwatts per square centimeter, or 25.4 percent of the permitted level.

The existing WNNK-FM antenna will have its lowest element at approximately 369 feet above ground level. For this height, and assuming a worst case value, 100 percent of the total of horizontally and vertically polarized effective radiated power, 29,600 watts, the power density at ground level was computed to be 0.078 milliwatts per square centimeter, 7.8 percent of the permitted level.

The existing WHTM-TV channel 27 antenna has its bottom element slightly higher than 500 feet above ground level. For a 500 foot height, and assuming a 10 percent relative field factor, visual horizontally polarized effective radiated power of 2,382,000 watts, and the aural horizontally polarized effective radiated power of 238,200 watts, the power density at ground level was computed to be 0.171 milliwatts per square centimeter. The television station operates on a band of frequencies within the range of 300 MHz to 1500 MHz, where the ANSI Radiofrequency Protection Guide is 1.83 milliwatts per

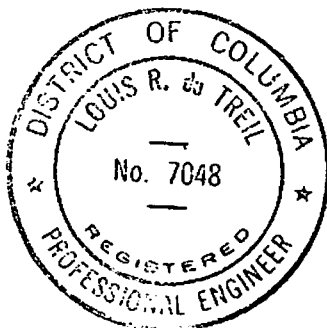
Engineering Statement
Harrisburg, Pennsylvania

square centimeter for the center frequency of 551 mHz.
The television station therefore contributes 9.3 percent
of the permitted level.

By summing the percentage of the permitted level
by proposed WMSP (25.4%), WNNK-FM (7.8%) and WHTM-TV
(9.3%) a total level of 42.5 percent of the limit
permitted will be present on the ground at the
transmitter location. The proposed operation of WMSP
therefore does not reach the threshold level to present a
hazard for exposure of humans to nonionizing radiation.

Population and Area Data

In order to determine the population within the
proposed 60 dBu contour, use was made of the 1980 census.
The proposed 60 dBu contour was transferred to a county
subdivision map for Pennsylvania and an enumeration was
made of the population within the contour assuming
uniform distribution of population within each town or
urbanized area and uniform distribution of population
within the remaining rural area. The area within the
proposed 60 dBu contour was determined by use of a polar
planimeter taking into account the appropriate map scale
factor.



Louis R. du Treil
Louis R. du Treil, P. E.

February 5, 1986

ENGINEERING EXHIBIT
APPLICATION FOR FM CONSTRUCTION PERMIT
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA
CH 235B 25 KW (MAX-DA) 213 M

Engineering Specifications

Channel	235B
Frequency Band	94.9 MHz
Site coordinates	40° 18' 57" North Latitude 76° 57' 02" West Longitude
Site elevation above mean sea level	1080'
Average elevation above mean sea level of standard eight radials, 2 - 10 miles	514'
Overall height of proposed antenna structure (with obstruction lighting)	
Above ground	609'
Above mean sea level	1689'
Height of FM antenna radiation center	
Above ground	134'
Above mean sea level	1214'
Above average terrain	700' (213 meters)
Transmitter	Harris, type FM-10K
Rated power output	10 kW

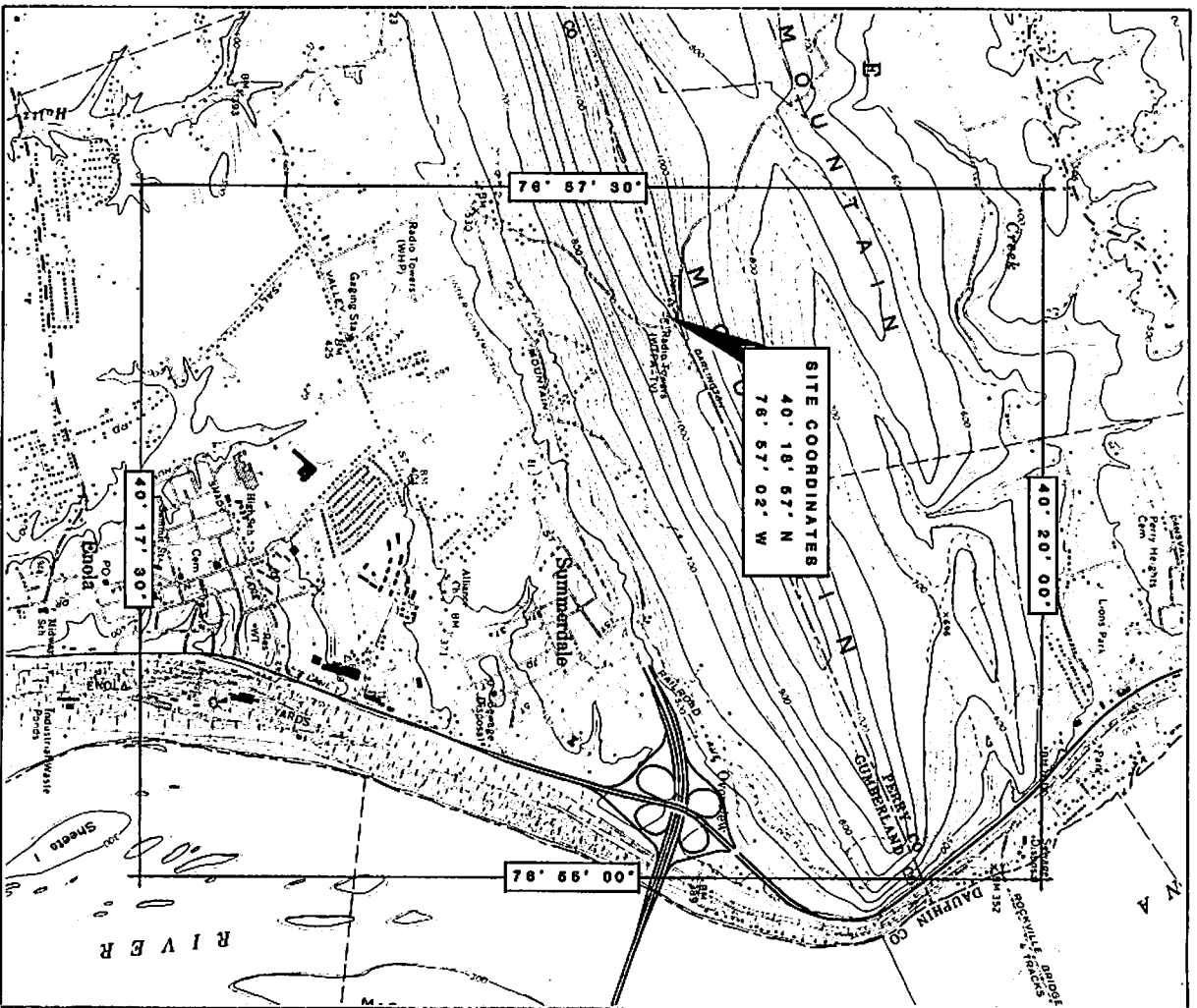
Transmission line	Cablewave Systems, type HCC 158-50J
Nominal diameter	1-5/8"
Length	150'
Efficiency (0.27 dB loss)	94%
Antenna	Shively, type 6810-4D-DA
Number of bays	4
Polarization	Circular
Power gain (estimated)	
Horizontal polarization	3.0
Vertical polarization	3.0

Proposed Operation

Transmitter output power	8.86 kW
Transmission line loss	0.53 kW
Antenna input power	8.33 kW
Effective radiated power (maximum)	
Horizontally polarized	25 kW
Vertically polarized	25 kW

FEBRUARY 1986

FIGURE 2
SHEET 1 OF 2



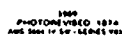
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SW 1/4 HARRISBURG 13 QUADRANGLE
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1969
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AMS 3664 IV SW - SERIES V831

SCALE 1:24,000

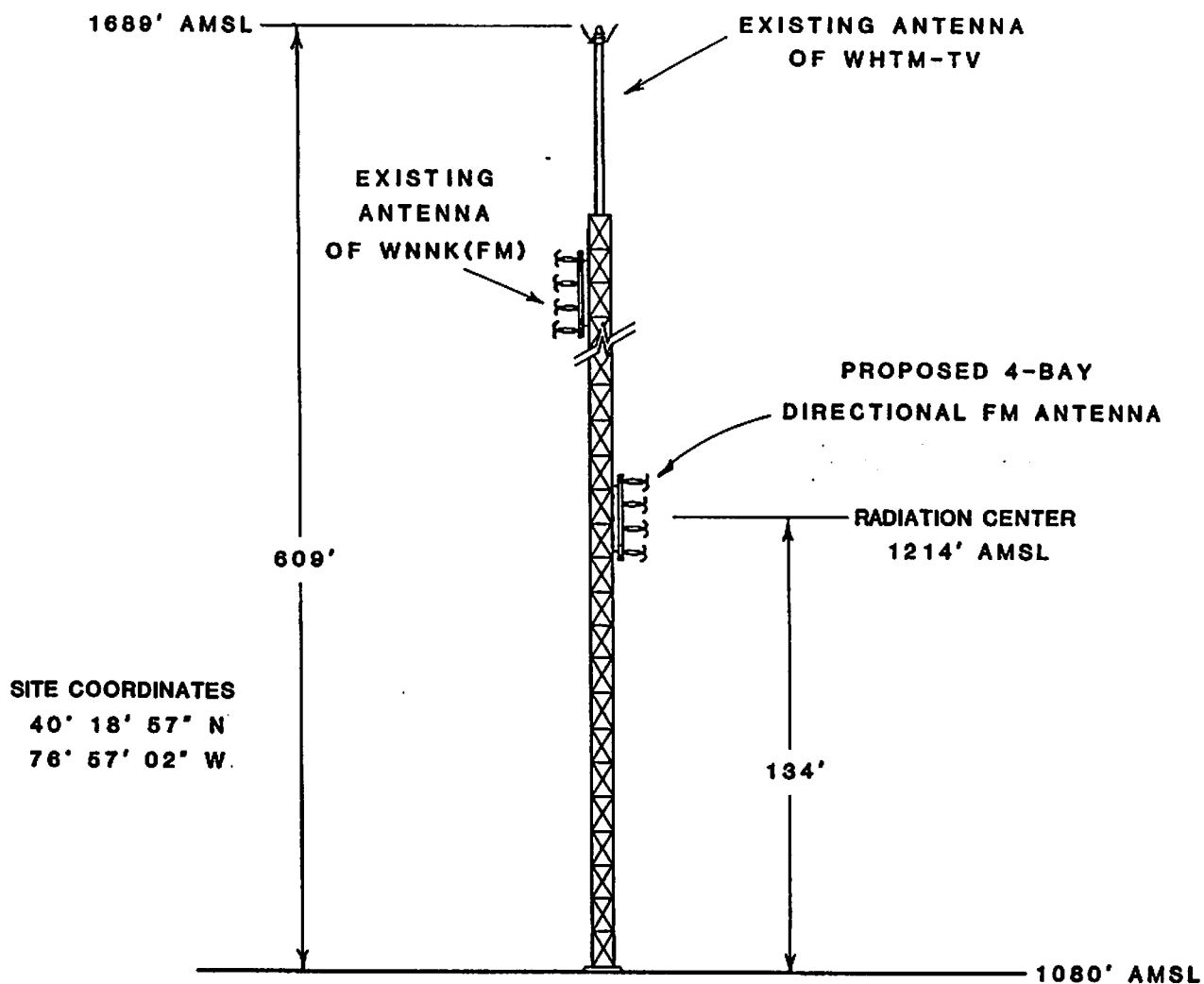


PROPOSED TRANSMITTER SITE AND VICINITY

MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA
CH 235B 25 KW (MAX-DA) 213 M
duffell - Rackley Consulting Engineers



FEBRUARY 1986



PROPOSED ANTENNA AND SUPPORTING STRUCTURE

MARKET SQUARE PRESBYTERIAN CHURCH

RADIO STATION WMSP

HARRISBURG, PENNSYLVANIA

CH 235B 25 KW (MAX-DA) 213 M

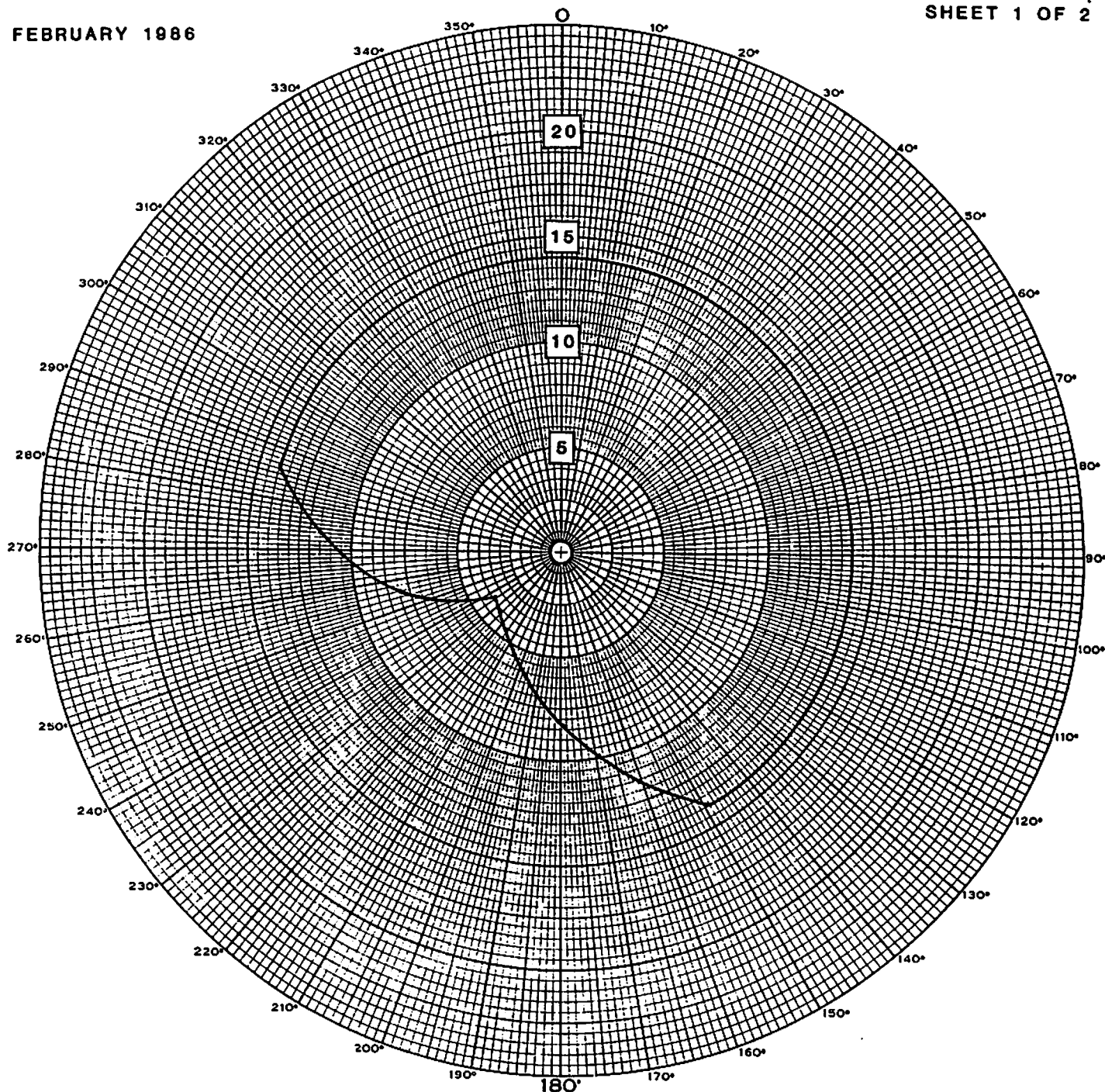
duTreil - Rackley Consulting Engineers

ENGINEERING EXHIBIT
 APPLICATION FOR FM CONSTRUCTION PERMIT
 MARKET SQUARE PRESBYTERIAN CHURCH
 RADIO STATION WMSP
 HARRISBURG, PENNSYLVANIA
 CH 235B 25 KW (MAX-DA) 213 M

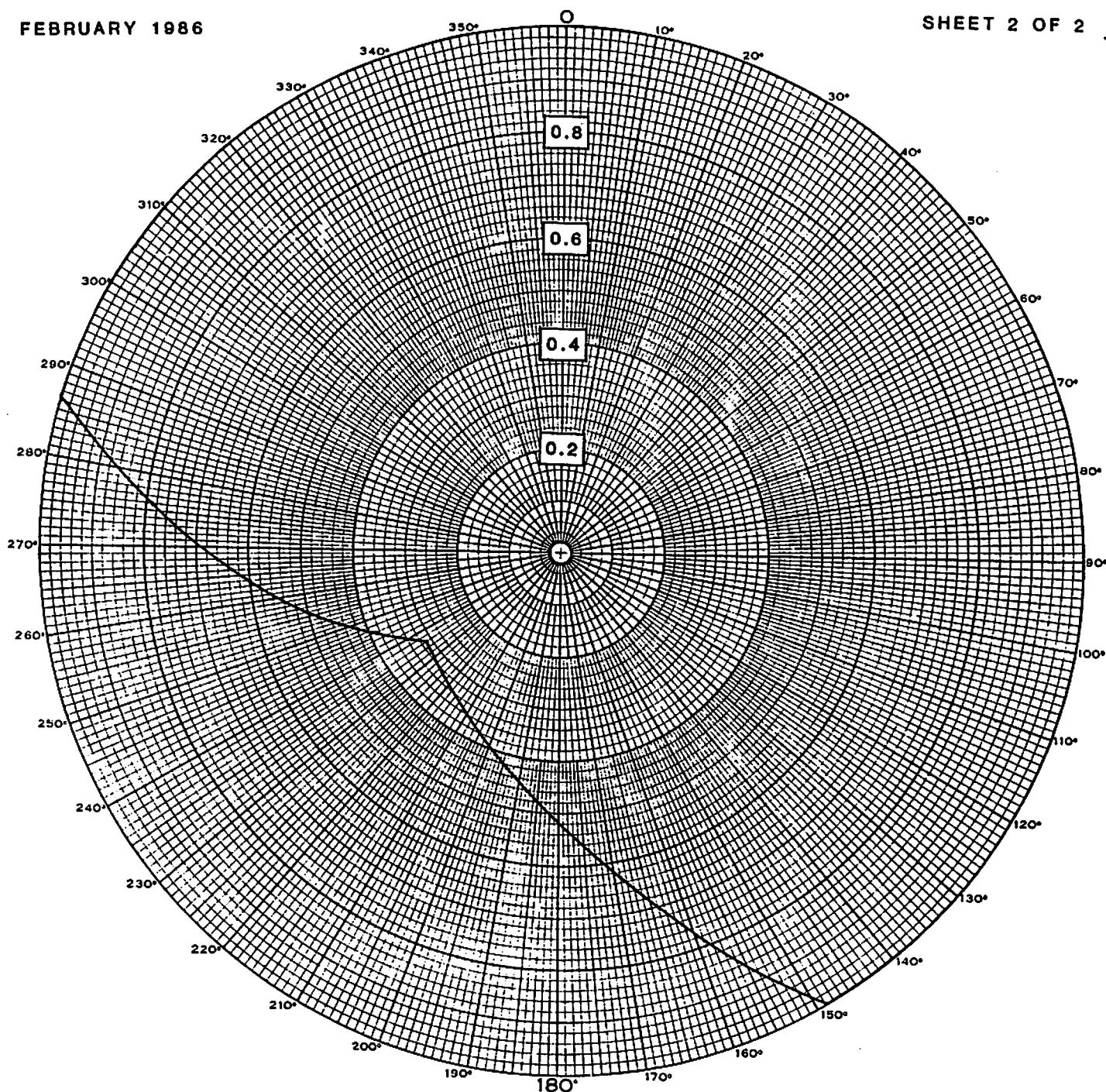
Tabulation of Average Elevations, ERP
 and Distances to Coverage Contours

<u>Azimuth (deg. T.)</u>	<u>2-10 mile Average Elevation (feet AMSL)</u>	<u>Antenna Height Above Average Terrain (feet)</u>	<u>Effective Radiated Power (dBk)</u>	<u>Distance to Contour</u>	
				<u>70 dBu (miles)</u>	<u>60 dBu (miles)</u>
0	549	665	14.0	19.0	31.8
45	665	549	14.0	18.2	29.8
90	477	737	14.0	21.0	33.0
135	345	869	14.0	22.6	35.0
149	371	843	13.9	22.1	34.7
180	428	786	8.1	15.8	26.1
202.5	438	776	5.5	13.6	23.1
225	447	767	4.2	12.5	21.5
236	503	711	3.9	11.9	20.4
247.5	561	653	6.2	13.0	22.2
270	675	539	10.7	15.2	25.5
286	623	591	13.9	18.8	30.2
315	529	685	14.0	20.1	32.0

FEBRUARY 1986

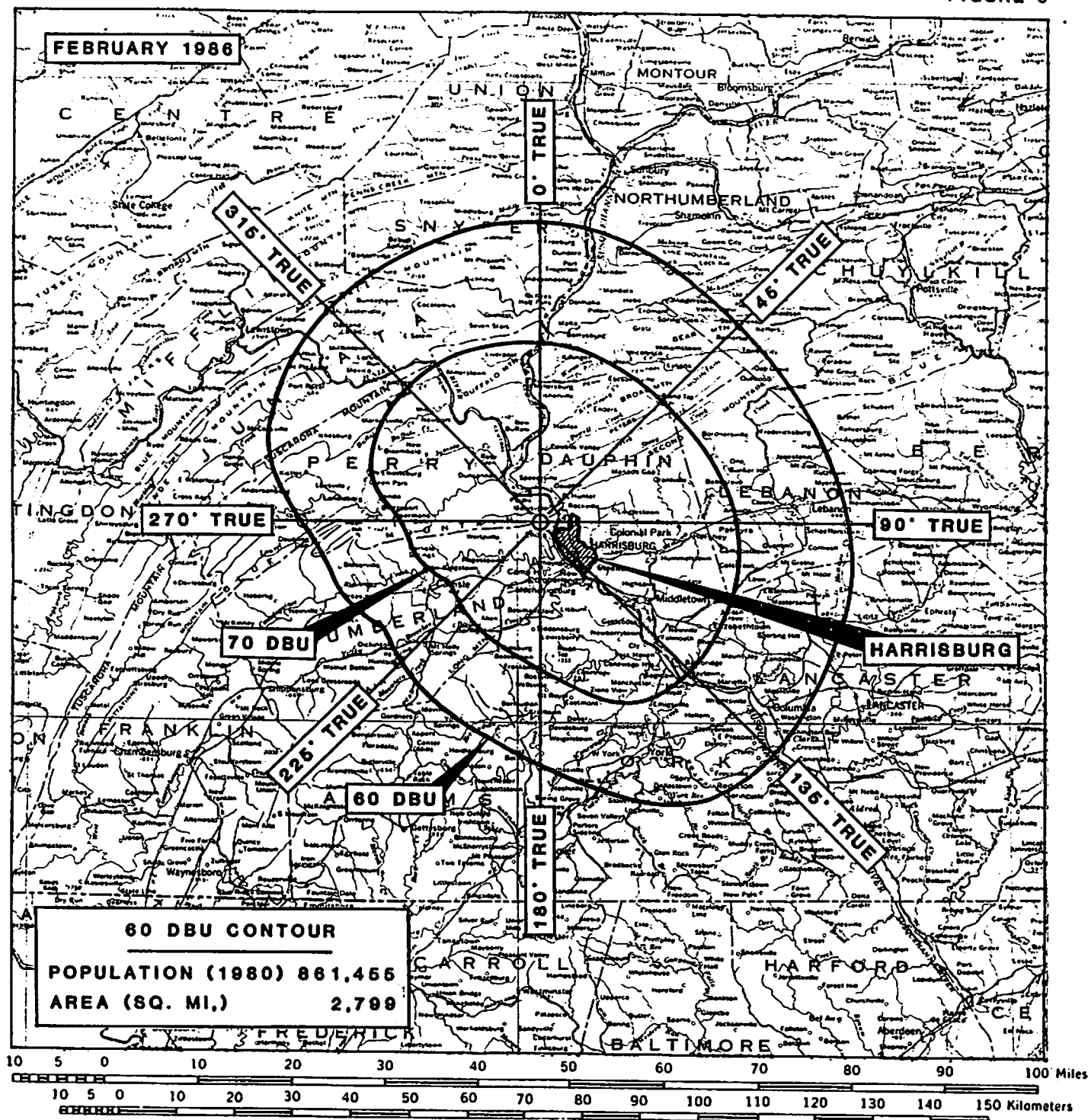


IDEALIZED RADIATION PATTERN
EFFECTIVE RADIATED POWER - DBK
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA
CH 235B 25 KW (MAX-DA) 213 M

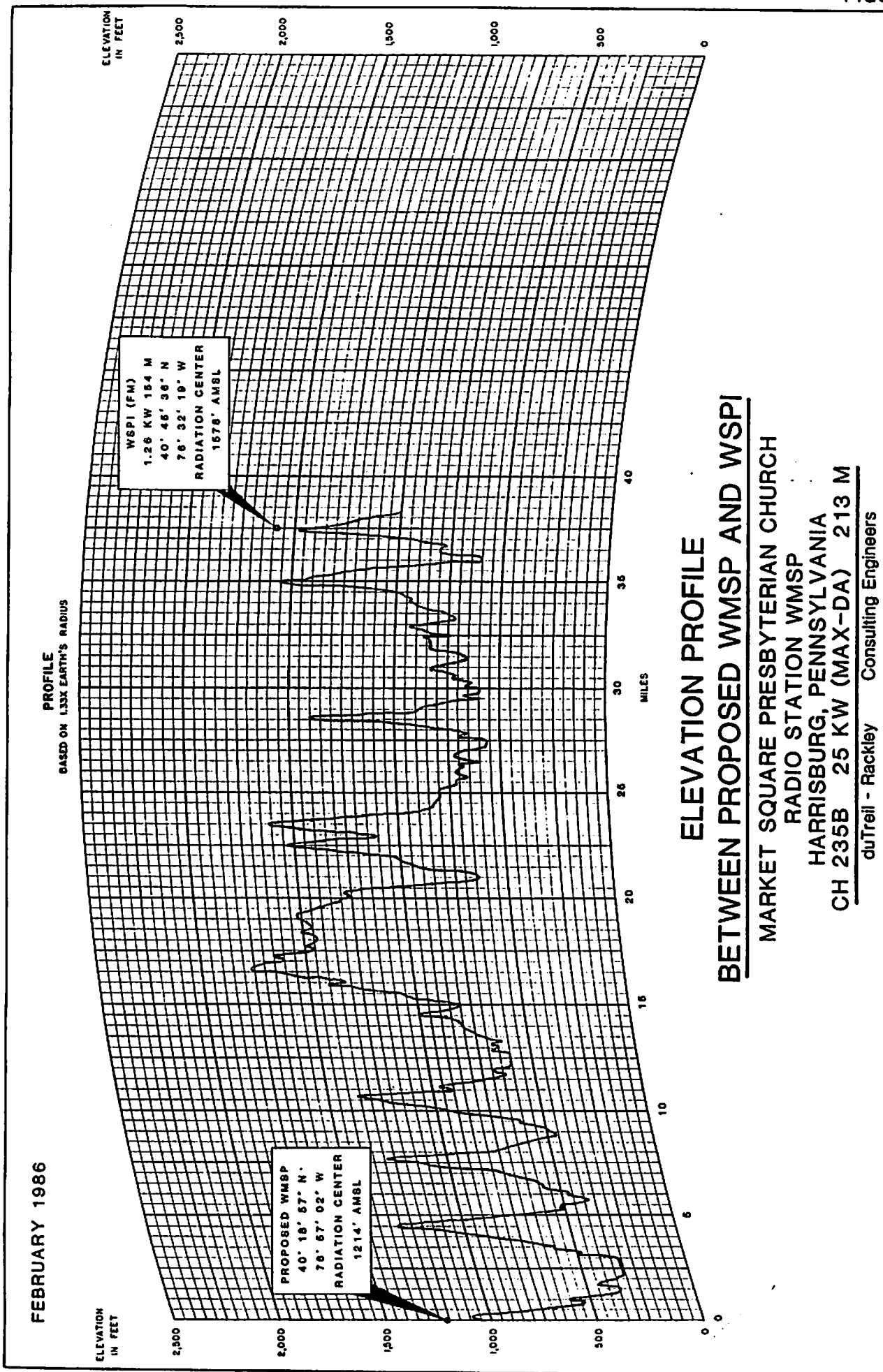


IDEALIZED RADIATION PATTERN
(RELATIVE FIELD)
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA
CH 235B 25 KW (MAX-DA) 213 M

FIGURE 6



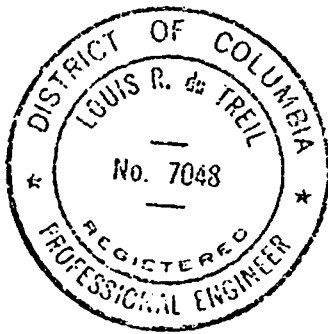
PREDICTED COVERAGE CONTOURS
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA
CH 235B 25 KW (MAX-DA) 213 M



ENGINEERING EXHIBIT
APPLICATION FOR FM CONSTRUCTION PERMIT
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA
CH 235B 25 KW (MAX-DA) 213 M

Certification

Louis R. du Treil certifies that he is a partner in the firm of du Treil-Rackley, Consulting Engineers, with offices in Washington, D. C.; that he is a graduate electrical engineer and is registered as a professional engineer in the District of Columbia (No. 7048) and the State of Louisiana (No. 7977); that his qualifications as an expert in radio and television engineering are known to the Federal Communications Commission; that the foregoing exhibit was prepared by him or under his direction on behalf of Market Square Presbyterian Church, Harrisburg, Pennsylvania; and that the technical information is true and correct to the best of his knowledge and belief.



Louis R. du Treil
Louis R. du Treil, P. E.

February 5, 1986

du Treil - Rackley

Consulting Engineers • Washington, D.C.

**ENGINEERING EXHIBIT
SUPPLEMENT TO APPLICATION FOR
FM CONSTRUCTION PERMIT
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA**

March 25, 1986

ENGINEERING EXHIBIT

SUPPLEMENT TO APPLICATION FOR

FM CONSTRUCTION PERMIT

MARKET SQUARE PRESBYTERIAN CHURCH

RADIO STATION WMSP

HARRISBURG, PENNSYLVANIA

Table of Contents

Engineering Statement

Figure 1 Maps Showing WMSP 60 dBu Gain Area and
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Figure 2 Tabulation of Stations Providing Other
 Service Within WMSP Gain Area

Figure 3 Tabulation of Populations and Areas

Certification of Ronald D. Rackley, P. E.

ENGINEERING EXHIBIT
SUPPLEMENT TO APPLICATION FOR
FM CONSTRUCTION PERMIT
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA

Engineering Statement

This engineering exhibit has been prepared on behalf of Market Square Presbyterian Church (herein "WMSP"), as a supplement to the engineering exhibit dated February 5, 1986. Further support for the requested waiver of Section 73.207 is provided herein.

The proposed WMSP 60 dBu gain area is shown on the maps of Figure 1. Within the gain area of 1,574 square miles, 372,818 persons reside. Population and area information were determined in the same manner as outlined in the February 5, 1986 exhibit. The maps of Figure 1 also show the 60 dBu contours of stations providing other service within the WMSP 60 dBu gain area. These stations and their facilities are tabulated in Figure 2.

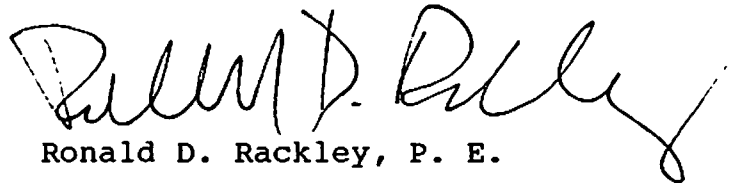
A determination of populations and areas of segments within the WMSP 60 dBu gain area where there are fewer than five existing FM services has been made and is summarized in Figure 3.

Based on this information, it can be seen that

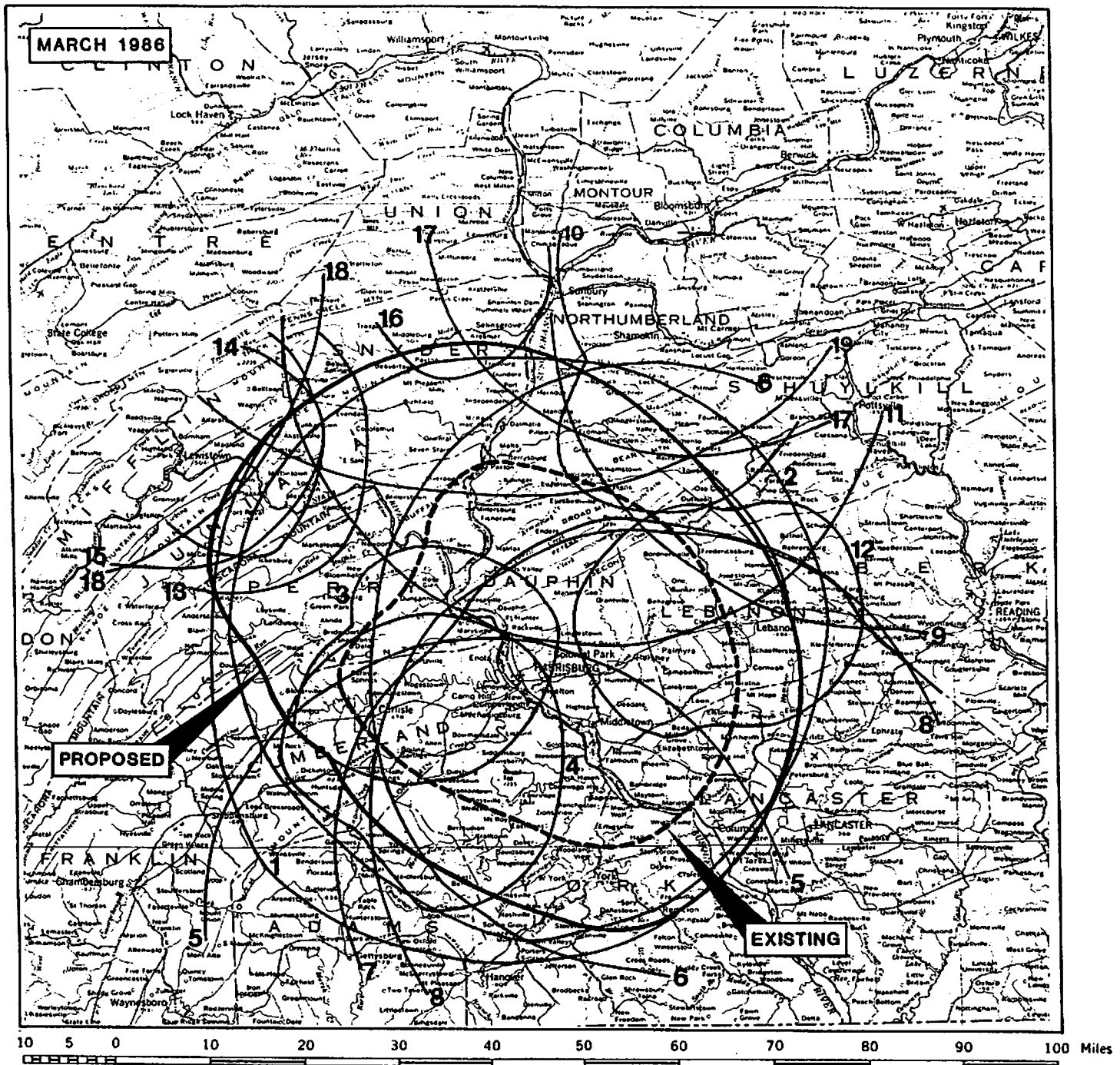
Engineering Statement
Harrisburg, Pennsylvania

WMSP will provide service to populations substantially underserved by other FM facilities. This determination adds further justification for the waiver request.




Ronald D. Rackley, P. E.

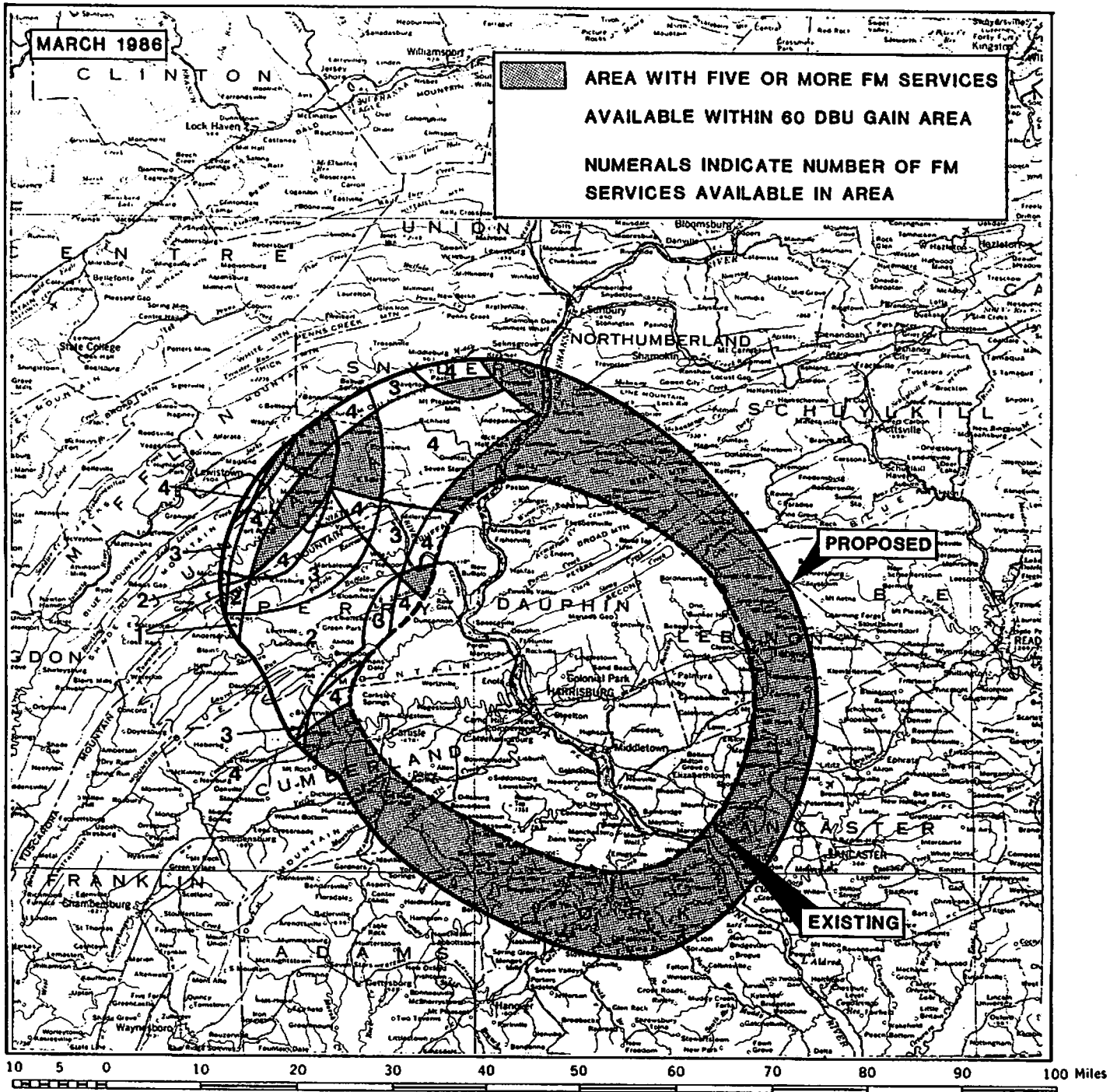
March 25, 1986



**WMSP 60 DBU GAIN AREA AND
OTHER 60 DBU SERVICES AVAILABLE**

**PREPARED FOR
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA**

duTreil - Rackley Consulting Engineers



**WMSP 60 DBU GAIN AREA AND
OTHER 60 DBU SERVICES AVAILABLE**

**PREPARED FOR
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA**

duTreil - Rackley Consulting Engineers

ENGINEERING EXHIBIT
SUPPLEMENT TO APPLICATION FOR
FM CONSTRUCTION PERMIT
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA

Tabulation of Stations Providing
Other Service Within WMSP Gain Area

<u>*Map No.</u>	<u>Call</u>	<u>Location</u>	<u>Facilities</u>
1	WNNK, CP	Harrisburg, PA	CH 281B, 22.5 kW, 726' 40° 18' 59" N 76° 57' 04" W
2	WHP-FM	Harrisburg, PA	CH 247B, 14.0 kW, 840' 40° 20' 44" N 76° 52' 09" W
3	WHYL-FM, CP	Carlisle, PA	CH 272A, 3.00 kW-DA, 328' 40° 17' 22" N 77° 08' 10" W
4	WTPA-FM, CP	Mechanicsburg, PA	CH 228A, 0.58 kW, 735' 40° 07' 20" N 77° 04' 10" W
5	WYCR	York-Hanover, PA	CH 253B, 10.5 kW, 930' 39° 51' 30" N 76° 56' 52" W
6	WRKZ	Hershey, Pa	CH 294B, 48.9 kW, 500' 40° 10' 16" N 76° 35' 50" W
7	WQXA	York, PA	CH 289B, 46.0 kW-DA, 520' 39° 59' 57" N 76° 41' 41" W
8	WSBA-FM	York, PA	CH 277B, 12.0 kW, 890' 40° 01' 37" N 76° 36' 02" W
9	WAVT-FM	Pottsville, PA	CH 270B, 29.0 kW, 560' 40° 49' 50" N 76° 12' 32" W

* See Figure 1 for location of contours.

Tabulation of Stations Providing Other
Service Within WMSP Gain Area
Harrisburg, Pennsylvania

Figure 2
Sheet 2 of 2

<u>*Map No.</u>	<u>Call</u>	<u>Location</u>	<u>Facilities</u>
10	WSPI	Shamokin, PA	CH 237A, 1.26 kW, 505' 40° 45' 36" N 76° 32' 19" W
11	WQKX	Sunbury, PA	CH 231B, 16.0 kW, 880' 40° 47' 07" N 76° 41' 51" W
12	WUFM	Lebanon, PA	CH 261A, 3.0 kW, 270' 40° 21' 37" N 76° 27' 31" W
13	WQJU, CP	Mifflintown, PA	CH 296A, 0.23 kW, 1117' 40° 37' 13" N 77° 28' 42" W
14	WMRF-FM	Lewistown, PA	CH 240A, 1.50 kW, 410' 40° 36' 30" N 77° 34' 45" W
15	New-CP	Lewistown, PA	CH 288A, 0.26 kW, 820' 40° 39' 43" N 77° 34' 28" W
16	WWMC-FM	Mifflinburg, PA	CH 252A, 3.00 kW, 52' 40° 54' 52" N 77° 02' 25" W
17	WHLN-FM	Bloomsburg, PA	CH 293B, 15.0 kW, 567' 40° 59' 42" N 76° 29' 51" W
18	WGMR	Tyrone, PA	CH 266B, 8.50 kW, 1171' 40° 55' 10" N 77° 58' 28" W
19	WKSB	Williamsport, PA	CH 274B, 53.0 kW, 1270' 41° 11' 21" N 76° 58' 53" W

* See Figure 1 for location of contours.

ENGINEERING EXHIBIT
 SUPPLEMENT TO APPLICATION FOR
 FM CONSTRUCTION PERMIT
 MARKET SQUARE PRESBYTERIAN CHURCH
 RADIO STATION WMSP
 HARRISBURG, PENNSYLVANIA

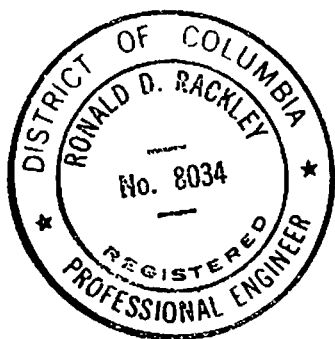
Tabulation of Populations and Areas

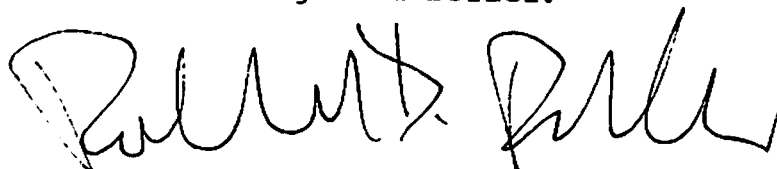
<u>Number of Existing FM Services</u>	<u>Within WMSP 60 dBu Gain Area</u>	
	<u>Population (1980 Census)</u>	<u>Area (sq. mi.)</u>
One	122	4
Two	7,056	135
Three	10,728	125
Four	17,706	299
Five or more	337,206	1,011
Total Service Gain	372,818	1,574

ENGINEERING EXHIBIT
SUPPLEMENT TO APPLICATION FOR
FM CONSTRUCTION PERMIT
MARKET SQUARE PRESBYTERIAN CHURCH
RADIO STATION WMSP
HARRISBURG, PENNSYLVANIA

Certification

Ronald D. Rackley certifies that he is a partner in the firm of du Treil-Rackley, Consulting Engineers, with offices in Washington, D. C.; that he is a graduate electrical engineer and is registered as a professional engineer in the District of Columbia (No. 8034) and the State of Tennessee (No. 15933); that his qualifications as an expert in radio engineering are known to the Federal Communications Commission; that the foregoing exhibit was prepared by him or under his direction on behalf of Market Square Presbyterian Church, Harrisburg, Pennsylvania; and that the technical information is true and correct to the best of his knowledge and belief.




Ronald D. Rackley, P. E.

March 25, 1986

To be included with FCC Form 301, Application to Construct or Make Changes in an Existing Commercial Broadcast Station.

CERTIFICATION OF SITE AVAILABILITY

1. The applicant certifies that it has reasonable assurance in good faith that the site or structure proposed in Items 1 and/or 2, Section V-G, FCC Form 301, as the location of its transmitting antenna, will be available to the applicant for applicant's intended purpose.

YES X NO

If no, explain fully:

2. If reasonable assurance is not based on applicant's ownership of the proposed site or structure, applicant certifies that it has obtained such reasonable assurance by contacting the owner or person possessing control of the site or structure.

William S. Reyner, Jr.

Name of Person Contacted

(202) 331-4510

Telephone Number

Person contacted (check one):

Owner Owner's Agent
Market Square Presbyterian Church

Other (specify) X (see below)

By: Heath L. Allen Board Chairman March 31, 1986
Applicant's Signature Date
Heath L. Allen

Mr. Reyner is a partner in and attorney for Smith Acquisition Corp., proposed assignee of WHTM-TV, Harrisburg. Please see attached letter dated January 16, 1986 for further particulars.

SUITE 600
815 CONNECTICUT AVENUE
WASHINGTON, D. C. 20006

January 16, 1986

Mr. Neil Currie
Neil Currie Associates
Broadcasting Development & Consulting
11837 Gainsborough Road
Potomac, MD 20854

Re: WHTM-TV Tower Space

Dear Mr. Currie:

On behalf of Smith Acquisition Corp., and pursuant to our numerous conversations, this will confirm that Smith Acquisition Corp., the proposed assignee of WHTM-TV, is willing to make space available to Station WMSP-FM on the WHTM-TV transmitter tower, contingent on (a) Smith Acquisition Corp. becoming the licensee of WHTM-TV; (b) the ability of the parties to negotiate mutually acceptable terms and conditions for the lease of the space; and (c) confirmation that any such lease would not interfere with potential plans of Smith Acquisition Corp. to replace the existing tower. The WMSP-FM facilities to be located on the tower would be a 3-bay, side-mounted, directional antenna of 31' in length and with a wind-load factor of approximately 626 pounds with the center of the antenna being located between the 120' and 140' level above ground.

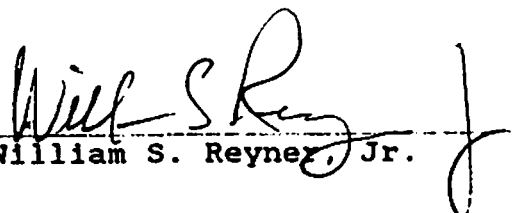
Smith Acquisition Corp. as the proposed assignee hereby authorizes the licensee of WMSP-FM to specify the WHTM-TV tower location in its application to be filed with the FCC, it being understood, however, that Smith

Neil Currie
January 16, 1986
Page 2

Acquisition Corp. may not commit the present licensee and that Smith Acquisition Corp. will not be liable for any expenses or delay caused to WMSP-FM if the parties are unable to reach agreement as to the terms of the lease.

Very truly yours,

SMITH ACQUISITION CORP.

By 
William S. Reyner, Jr.

WSR/ljc
cc: Robert N. Smith, Esq.

REQUEST FOR WAIVER

The applicant respectfully requests waiver of the mileage separation provisions of Section 73.207 of the Rules. The following factors demonstrate why waiver of the Rule is in the public interest.

The two Engineering Exhibits of du Treil-Rackley, Consulting Engineers, show that grant of the WMSP proposal will (a) vastly improve the service rendered by WMSP by providing new service to 372,818 persons; (b) provide a new FM service to significant underserved areas and populations; (c) permit relocation of its antenna at a de facto antenna farm; (d) either eliminate or reduce short-spacing with six other FM broadcast stations, four of which involve improvement of short-spaced mileage separations ranging from 3.8 kilometers to 6.6 kilometers; and (e) immeasurably improve existing service in Harrisburg where reception of the WMSP signal has been severely restricted by multipath and terrain problems. When these significant public interest benefits are weighed against the modest increase in short-spacing to FM broadcast station WSPI, Shamokin, Pennsylvania, there is ample justification for grant of the requested waiver. Indeed, the existing WMSP site was not short-spaced with WSPI under pre-Docket No. 80-90 rules, but is under current rules. The change in transmitter site by WMSP will result in a 2.7 kilometer short-spacing with respect to the old spacing requirements and 8.7 kil-

ometers with respect to the new spacing requirements but will eliminate or reduce short-spacing by 22 kilometers among six other stations.

Additionally, further support for grant of this waiver request is evidenced by the substantial terrain blockage between Stations WSPI and WMSP. Figure 7 to the February 5, 1986 Engineering Exhibit demonstrates that the proposed short-spacing will not result in any interference to either station because of the unusually high terrain elevations occurring between the two transmitter sites in this mountainous area of Pennsylvania.

Importantly, grant of this application will enable WMSP, which has been broadcasting classical music for the residents of Harrisburg for 22 years to vastly improve its service by removing serious reception impediments to its current broadcast operation. At present, however, the station operates with antenna height above average terrain of only 205 feet. The station's current antenna height has been limited by severe FAA restrictions because the antenna site is located on the glide path of the Harrisburg airport. Because of its limited antenna height, reception of its classical music programming in the Harrisburg area has been seriously affected by multipath and terrain problems. From its proposed site, however, WMSP will be able to up-

grade its operation to a full Class B facility and will serve 860,455 persons within its 60 dBu contour, an increase in service to the public of 372,818 persons.

Grant of the application will also enable the station to bring a new service to populations substantially underserved by other FM facilities. For example, Figures 1 and 3 to the March 25, 1986 Engineering Exhibit demonstrate that WMSP will bring a new FM service to significant underserved areas and populations with only one to four FM services.

The applicant's search for a new site from which to better serve its community of license has always been blocked by short-spacing, terrain and FAA considerations in this mountainous locale. However, by locating on an existing tower, WMSP will not create new FAA or environmental concerns but will be placing its antenna at a site atop Blue Mountain with other existing television or radio towers, a de facto antenna farm. In the past, the Commission has recognized the public interest benefit to be derived from locating a broadcast facility on an antenna farm. See Beasley Broadcasting of Phila., Inc., 100 FCC2d 106 (1985); WTCN Television, Inc., 14 FCC2d 870 (Rev. Bd. 1968). The present proposal is consistent with that policy in its enhancement of the public interest.

In sum, the following public interest factors which warrant waiver of the mileage separation provisions of Section 73.207 and grant of this application:

- (1) A new FM broadcast service, emphasizing classical music, news and public affairs programming, will be provided to substantial underserved areas and populations of central Pennsylvania.
- (2) The proposed operation will vastly improve service to the station's community of license by increasing antenna height and thereby eliminating serious multipath and terrain problems which have plagued the station for many years.
- (3) The proposed WMSP operation will provide new service to 372,818 persons within its 60 dBu contour.
- (4) The applicant is hemmed in by short-spaced allocations. However, short-spacing with six FM stations will be eliminated or reduced by grant of this proposal while the interference potential of the only new short-spacing created will be negated by intervening mountainous terrain.
- (5) The public interest is served by location of the antenna at a de facto antenna farm with other existing television and radio antenna.

Section VI

Equal Employment Opportunity Program

1. Does the applicant propose to employ five or more fulltime employees?

☐ YES ☐ NO

If the answer is Yes, the applicant must include an EEO program called for in the separate 5 Point Model EEO Program (FCC 396A).

Section VII

Certification

1. Has or will the applicant comply with the public notice requirement of Section 73.3580 of the Commission's Rules? ☒ YES ☐ NO

The APPLICANT hereby waives any claim to the use of any particular frequency as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended.)

The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations, and that all exhibits are a material part hereof and incorporated herein.

The APPLICANT represents that this application is not filed for the purpose of impeding, obstructing, or delaying determination on any other application with which it may be in conflict.

In accordance with Section 1.65 of the Commission's Rules, the APPLICANT has a continuing obligation to advise the Commission, through amendments, of any substantial and significant changes in information furnished.

**WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND IMPRISONMENT.
U.S. CODE, TITLE 18, Section 1001.**

I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Signed and dated this 31st day of March, 19 86.

Market Square Presbyterian Church
Name of Applicant

Heath L. Allen
Signature

Chairman

Title

**FCC NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT
AND THE PAPERWORK REDUCTION ACT**

The solicitation of personal information requested in this application is authorized by the Communications Act of 1934, as amended. The principal purpose for which the information will be used is to determine if the benefit requested is consistent with the public interest. The staff, consisting variously of attorneys, accountants, engineers, and application examiners, will use the information to determine whether the application should be granted, denied, dismissed, or designated for hearing. If all the information requested is not provided, the application may be returned without action having been taken upon it or its processing may be delayed while a request is made to provide the missing information. Accordingly, every effort should be made to provide all necessary information. Your response is required to obtain the requested Authority.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552a(e)(3) AND THE PAPERWORK REDUCTION ACT OF 1980, P.L. 96-511, DECEMBER 11, 1980, 44 U.S.C. 3507.