

TECHNICAL EXHIBIT  
MINOR AMENDMENT APPLICATION  
NEW FM STATION (FACILITY ID 164286)  
DOUGLAS, WYOMING

FEBRUARY 23, 2005

CH 223C1 5.4 KW 972 M

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Technical Narrative

This Technical Exhibit was prepared on behalf of a new FM radio station at Douglas, Wyoming, in support of an amendment to the pending application. The pending application specifies a Class C3 operation on channel 223 (92.5 MHz) with an effective radiated power (ERP) of 25 kilowatts with an antenna height above average terrain (HAAT) of 100 meters (BNPH-20050103AHL). By this instant application, it is proposed to modify the station class to Channel 223C1 employing the “one-step” allotment process.

One-Step Upgrade

It is proposed to modify the station class from the present Class C3 to Class C1 via the “one-step” upgrade process. A fully-spaced Channel 223C1 allotment reference site is described by the following geographic coordinates:

42° 28' 12" North Latitude  
105° 15' 58" West Longitude

Figure 1 is a topographic site map showing the allotment reference site. As can be seen from Figure 1, the assumed reference site is suitable for a transmission facility. Figure 2 is an Allocation Study for Channel 223C1 at the reference allotment site. The proposed allotment reference site satisfies the Commission's minimum distance separations

contained in Section 73.207(b) of the Commission's Rules toward all other stations and allotments.

Figure 3 is a coverage map showing that the allotment site's FCC predicted 70 dBu contour entirely encompasses the principal community of Douglas.

#### Proposed Transmitter Location

The transmitting facility will be located on a new tower structure on Laramie Peak (see Figure 4). A sketch showing the proposed antenna and existing supporting structure is shown on Figure 5. The proposed structure meets the FCC's TOWAIR minimum slope requirement and therefore does not require registration with the FCC. The location is uniquely described by the following geographic coordinates:

42° 16' 05" North Latitude  
105° 26' 33" West Longitude

#### Interference Concerns

The 115 dBu predicted "blanketing" contour of the proposed station would extend radially 0.9 kilometer from the transmitting site. The applicant recognizes its responsibility to resolve complaints of interference, including blanketing and receiver-induced interference as required by Sections 73.315(b), 73.316(e) and 73.318.

#### FCC Predicted Coverage Contours

The predicted coverage contours for the proposed operation were calculated in accordance with the provisions of Section 73.313. Pursuant with current FCC practice, the distances to the contours were calculated without consideration given to terrain roughness correction factors.

The average terrain elevations from 3 to 16 kilometers along eight radials evenly spaced at 45 degree intervals were obtained from N.G.D.C. 30-second digitized terrain

database. The terrain elevations were then used in combination with the effective radiated power for determining the distances to coverage contours.

Sheet 1 of Figure 6 is a map showing the predicted coverage contours for the proposed operation. As the proposal does not cover 80 percent of Douglas using the normal FCC prediction method, use of alternate propagation techniques as described in the following paragraph results in compliance with the principal community coverage requirement of Section 73.315(a).

#### Alternate Propagation Methods

When the terrain in one or more directions from the antenna site departs widely from the average terrain, the FCC rules permit use on an alternative or supplemental coverage showing (see Section 73.313). The Commission staff has established that “Where  $\Delta H$  is used as the sole determinate that the terrain along a radial widely departs from the 50 meter standard, a  $\Delta H$  of 20 meters or less, or 100 meters or more”. With respect to this proposal and the 4 degrees True radial, the  $\Delta H$  was determined to be 490 meters, which demonstrates compliance with the  $\Delta H$  requirement of 100 meters or more.

As shown in Sheet 2 of Figure 6, the 70 dBu contour determined by the use of Longley-Rice propagation provides service to all of Douglas. The Longley-Rice propagation method has been widely used and accepted by the FCC, therefore details of its use are not provided. In the calculation of the Longley-Rice coverage, a roughness correction factor of 3 dB was employed. Sheet 1 of Figure 7 shows three graphs of the Longley-Rice field strength versus distance for the radials in Figure 6.

Also shown on Sheet 2 of Figure 6 is the proposed 70 dBu contour based on the Point-to-Point (PTP) model. Using this method, 70 dBu coverage is also provided to all of Douglas. The FCC’s Office of Engineering Technology developed the PTP method. Sheet 2 of Figure 7 shows the graphical results of the PTP study on the three radials indicated in Figure 6.

Based on use of two alternate propagation methods, 70 dBu coverage of all of Douglas is easily obtained.

The following tabulates the distance to the 70 dBu contours along each radial based on the FCC's F(50,50) method, the Longley-Rice model (with the 3-dB clutter factor) and the Point-to-Point model.

Radial	70 dBu Field Strength (km)		Difference		PTP Distance to 70 dBu (KM)
	FCC F(50,50)	Longley-Rice	KM	Percent	
0°	51.3	94.2	42.9	+84	76
4°	51.5	96.6	45.1	+88	86
8°	51.5	73.4	21.9	+43	89

The difference between the distances to the 70 dBu contours for the Longley-Rice model exceeds the FCC predicted field strength distance for each radial substantially more than the minimum 10 percent, as required by FCC policy on supplemental showings. If waiver of the provisions of Section 73.315(a) is still required, it is respectfully requested.

#### Site Allocation Study

Channel 223C1 at the proposed site will satisfy the Commission's minimum separation distance requirements, specified in Section 73.207(b) of the Rules, to all assignments.

#### Radiofrequency Electromagnetic Field Exposure

The proposed FM facilities were evaluated in terms of potential radio frequency (RF) energy exposure at ground level to workers and the general public. The radiation center for the proposed 8-bay antenna is located 24.4 meters above ground level. The total ERP (horizontal & vertical polarizations) is 10.8 kW. A "conservative" relative field value of 0.25 was assumed for the calculation (see Figure 9). Therefore, the "worst-case" calculated power density at a point 2 meters above ground level will be 0.045 mW/cm<sup>2</sup>. This is 22% of the FCC's recommended limit of 0.2 mW/cm<sup>2</sup> for FM frequencies for an

“uncontrolled” environment. Since there are no other known high-powered emitters in the site vicinity, this is believed to comply with the recommended guidelines.

Access to the transmitting site will be restricted and appropriately marked with warning signs. As this is a multi-user site and agreement will control access. In the event that workers or other authorized personnel enter restricted areas or climb the tower, appropriate measures will be taken to assure worker safety with respect to radio frequency radiation exposure. Such measures include reducing the average exposure by spreading out the work over a longer period of time, wearing "accepted" RFR protective clothing and/or RFR exposure monitors or scheduling work when the stations are at reduced power or shut down.

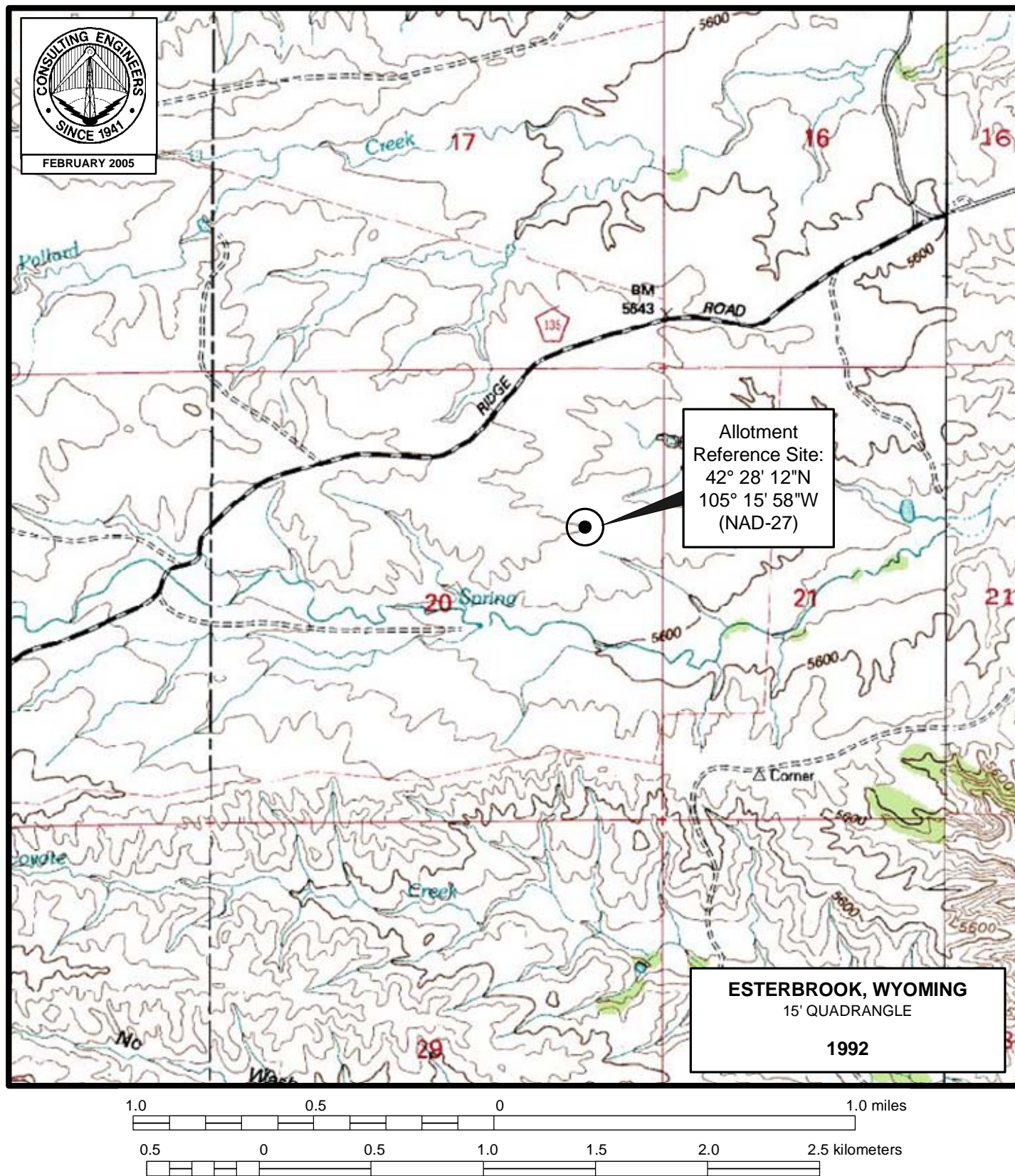


Jonathan N. Edwards

du Treil, Lundin & Rackley, Inc.  
201 Fletcher Avenue  
Sarasota, Florida 34237  
(941) 329-6000

February 23, 2005

Figure 1



## ALLOTMENT REFERENCE SITE

NEW FM STATION  
DOUGLAS, WYOMING  
CH 223C1 5.4 KW 972 M

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

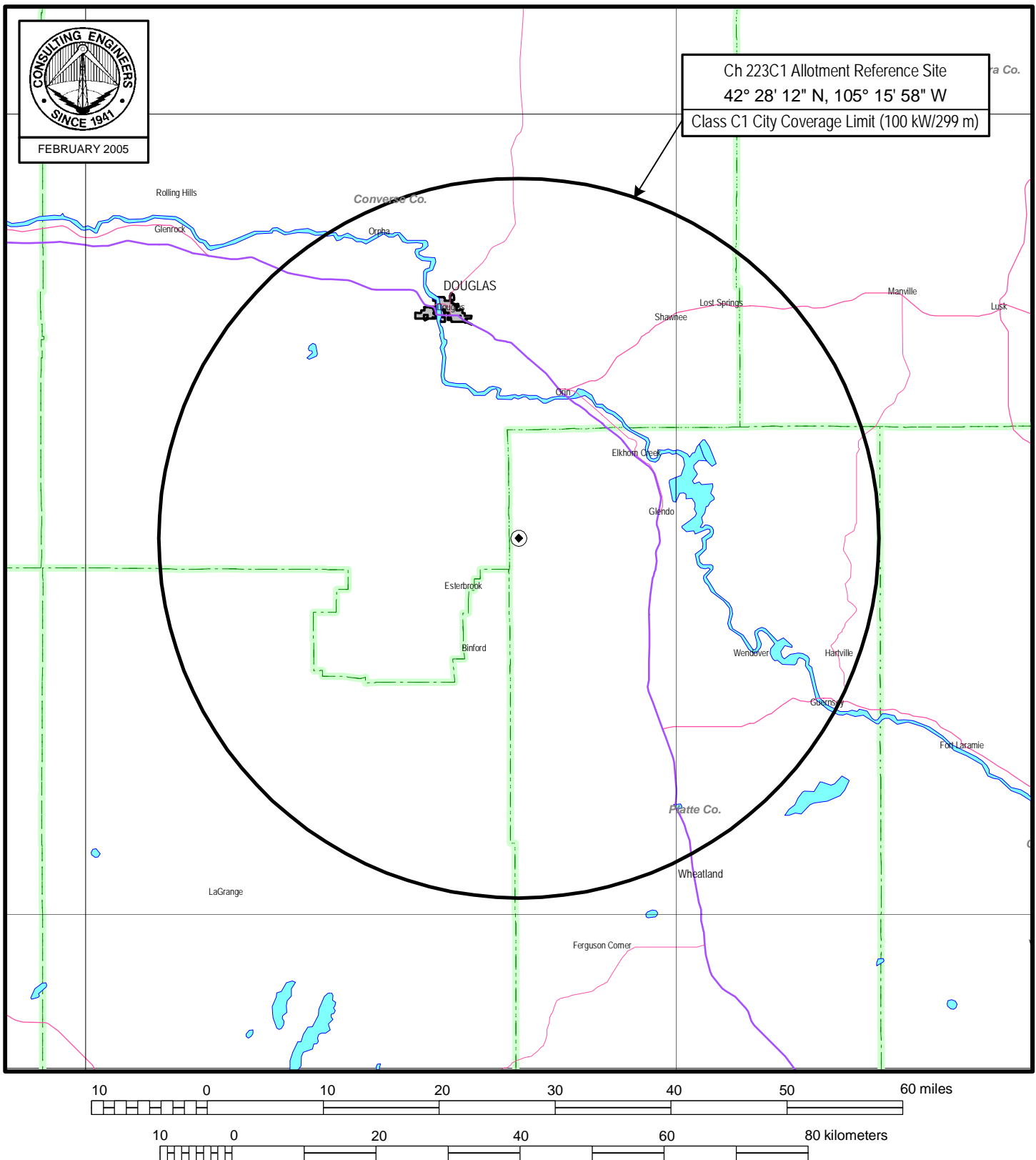


Figure 2

CDBS FM SEPARATION STUDY - REFERENCE SITE

Channel: 223C1											Separation Buffer: 32 km		
											Coordinates: 42-28-12 N 105-15-58 W		
Call Id	City St	File Status	Num	Channel Freq	ERP HAAT	DA Id	Latitude Longitude	73 215	Bear	Dist. (km)	Req. (km)		
											73.215	73.207	
KUWR 69131	LARAMIE WY	BLIC C	19941031KW	220 C 91.9	100.000 335	N	41-18-36 105-27-17	N	187.0	129.79 24.79	99.0	105.0	Clear
	KAYCEE WY	RM VAC C	9278	222 C1 92.3	0.000	N	43-27-55 106-58-40	N	309.1	178.12 1.12	158.0	177.0	Close
NEW 164286	DOUGLAS WY	BSFH APP C	20040806ALS	223 C1 92.5	0.000		42-40-19 105-05-05		33.4	26.93			
	DOUGLAS WY	RM VAC C	9320	223 C1 92.5	0.000	N	42-40-19 105-05-05	N	33.4	26.93			
NEW 164286	DOUGLAS WY	BNPH APP C	20050103AHL	223 C3 92.5	25.000 100	N	42-51-29 105-14-02	N	3.5	43.19			
KDJM 59972	BROOMFIELD CO	BLH LIC C	20010501AAA	223 C1 92.5	57.000 377	Y 37861	40-05-47 104-54-04	N	173.3	265.38 20.38	224.0	245.0	Clear
KDJM 59972	BROOMFIELD CO	RM USE C	9716	223 C1 92.5	0.000	N	40-03-15 105-04-12	N	176.4	268.80 23.80	224.0	245.0	Clear
94679	CENTENNIAL WY	VAC C		224 A 92.7	0.000	N	41-19-03 105-59-55	N	205.6	141.71 8.71	111.0	133.0	Close
	WRIGHT WY	RM VAC C	9958	224 A 92.7	0.000		43-50-02 105-28-29		353.7	152.47 19.47	111.0	133.0	Clear
	WHEATLAND WY	RM ADD C	rfs91	277 A 103.3	0.000		42-04-28 104-56-51		149.1	51.20 29.20	0.0	22.0	Clear

Figure 3



## REFERENCE SITE COVERAGE MAP

NEW FM STATION

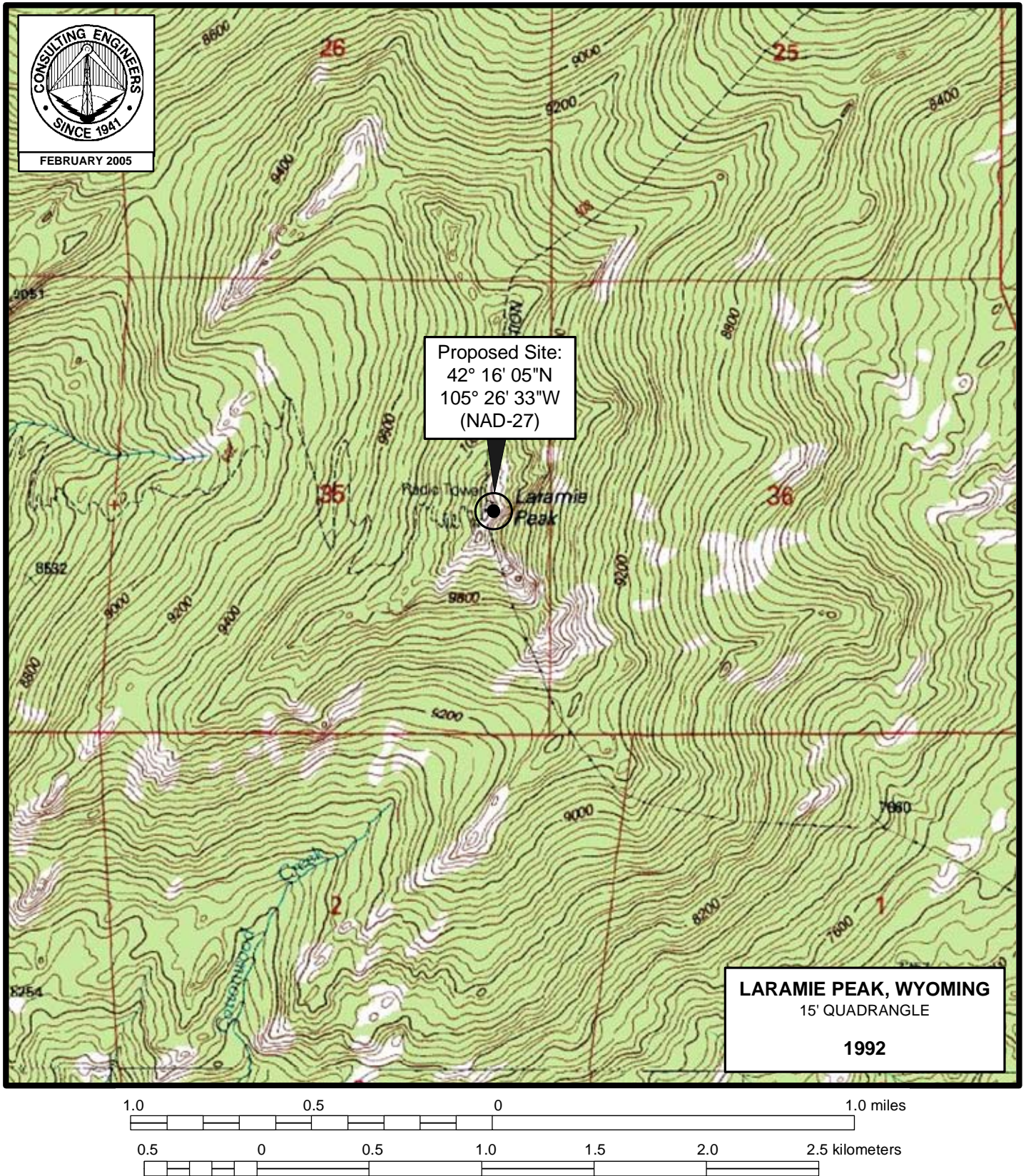
DOUGLAS, WYOMING

CH 223C1 100 KW 299 M

du Treil, Lundin & Rackley, Inc Sarasota, Florida



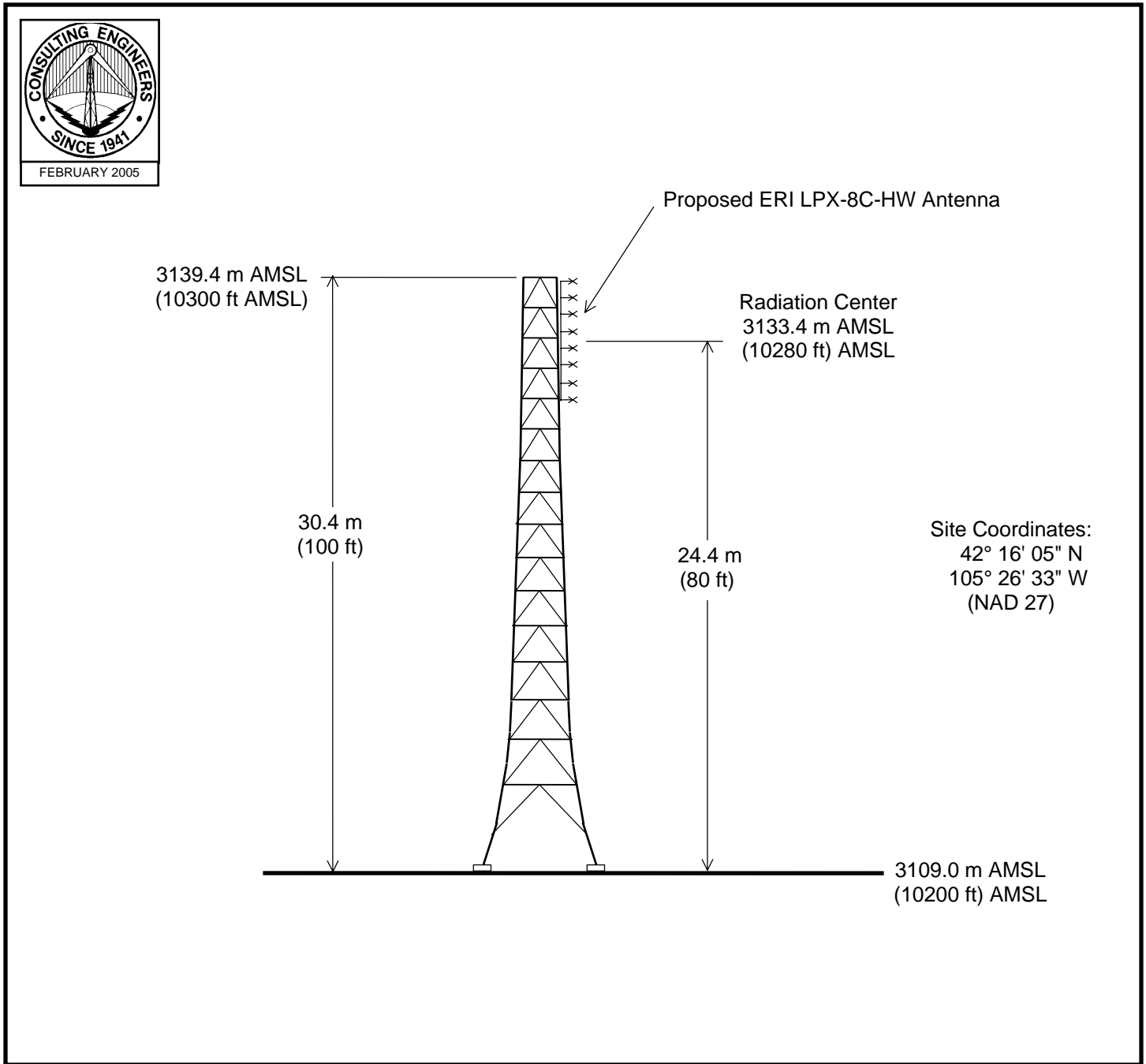
Figure 4



## PROPOSED TRANSMITTER SITE

NEW FM STATION  
DOUGLAS, WYOMING  
CH 223C1 5.4 KW 972 M

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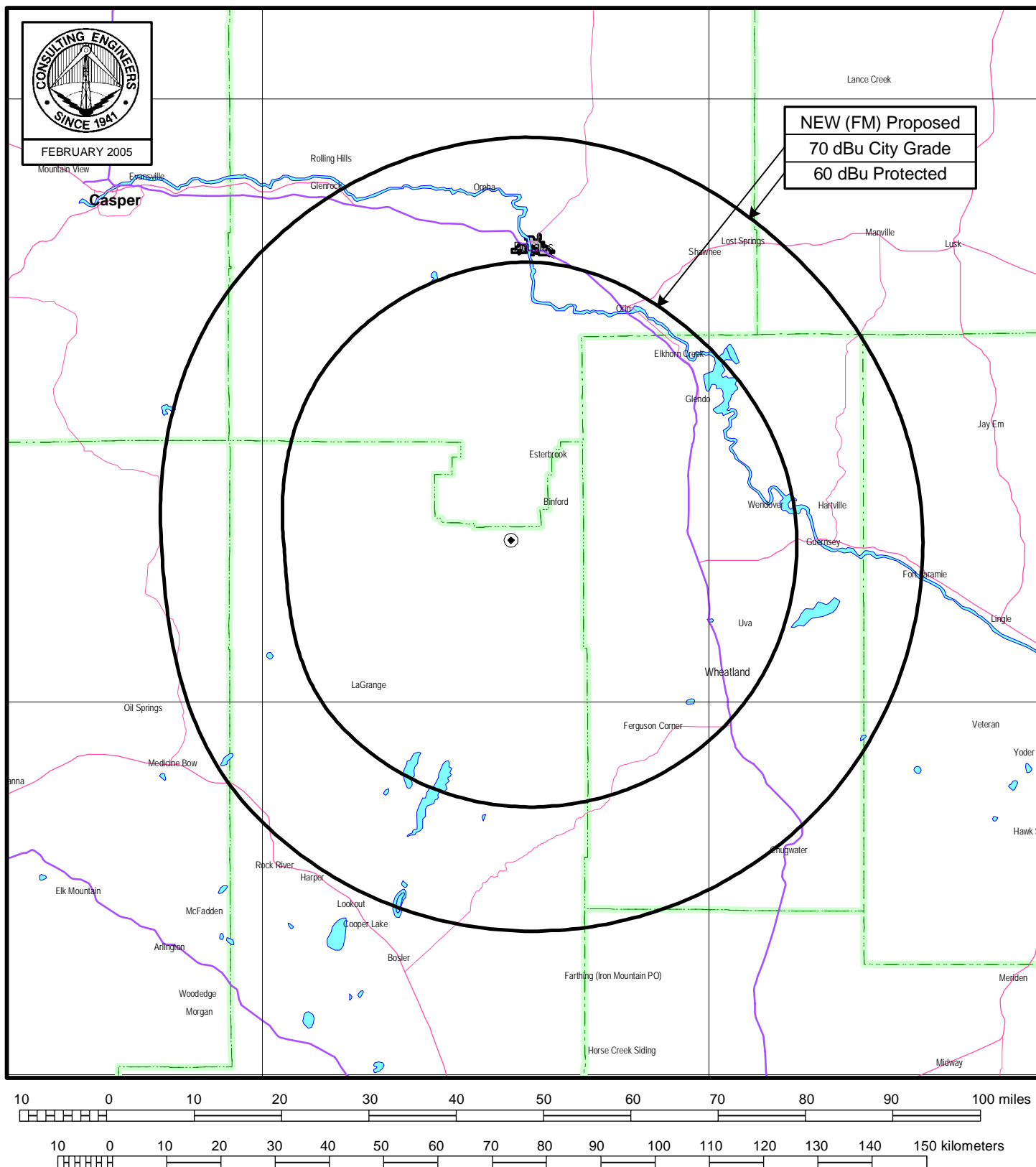


## **PROPOSED ANTENNA AND SUPPORTING STRUCTURE**

NEW FM STATION  
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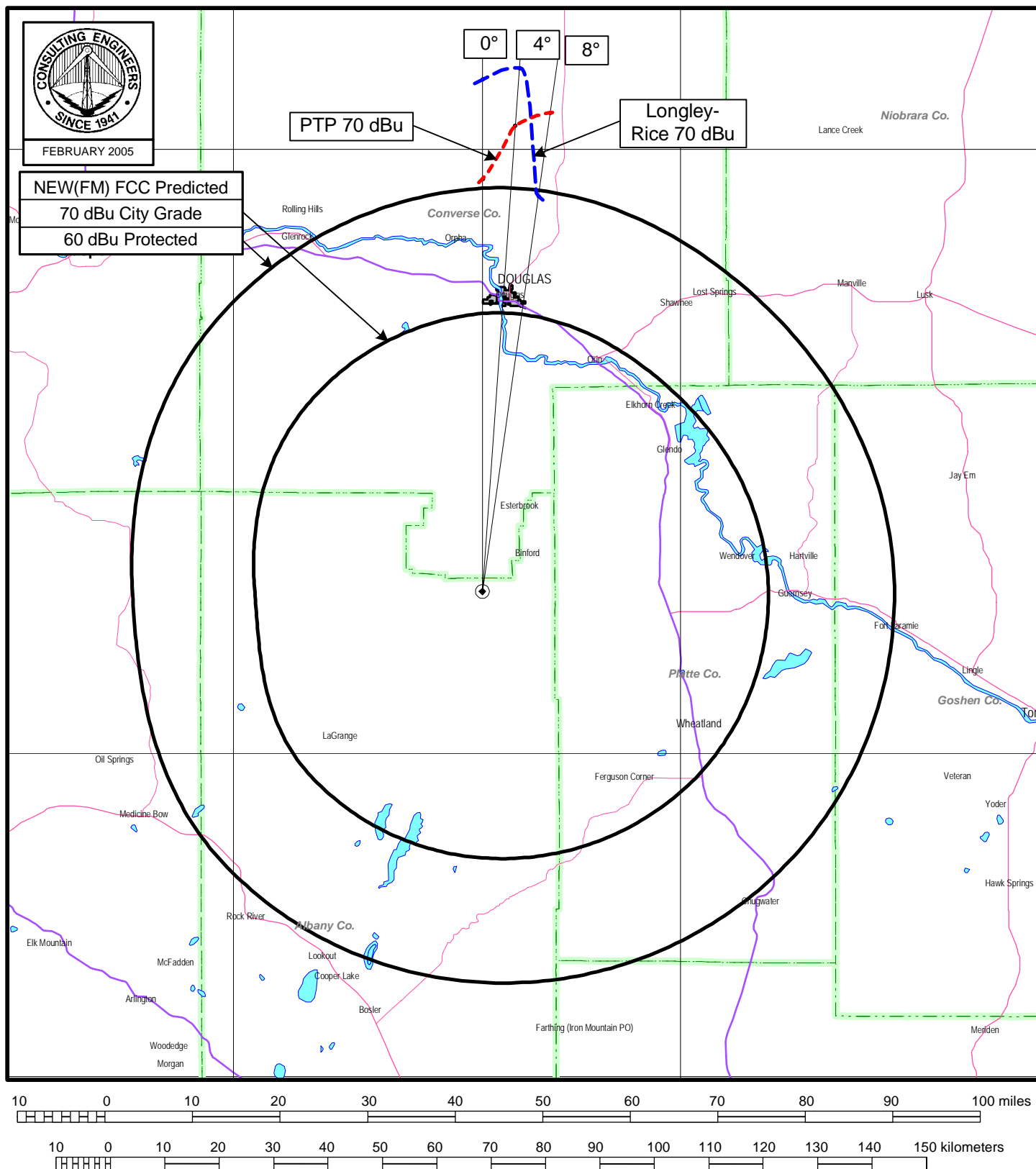
## **FCC PREDICTED COVERAGE CONTOURS**

**NEW FM STATION**

**DOUGLAS, WYOMING**

**CH 223C1 5.4 KW 972 M**

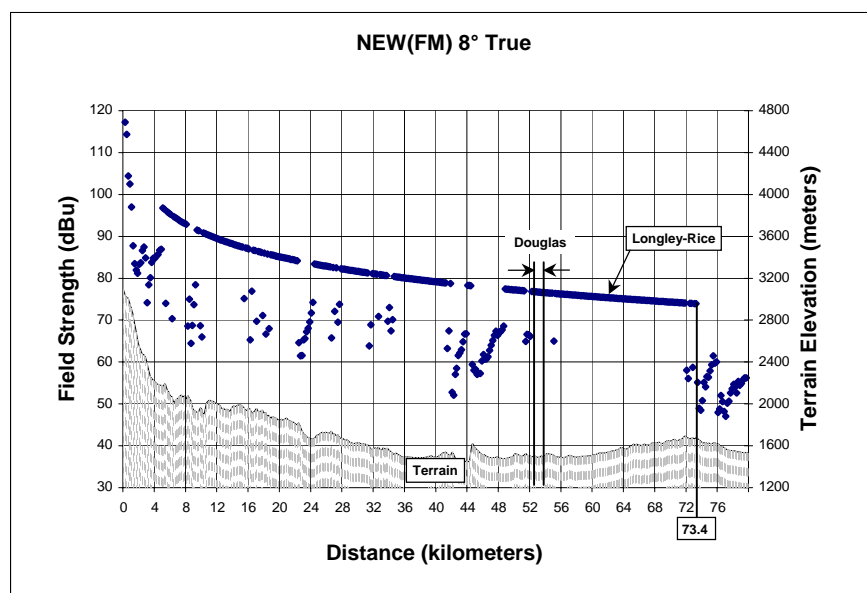
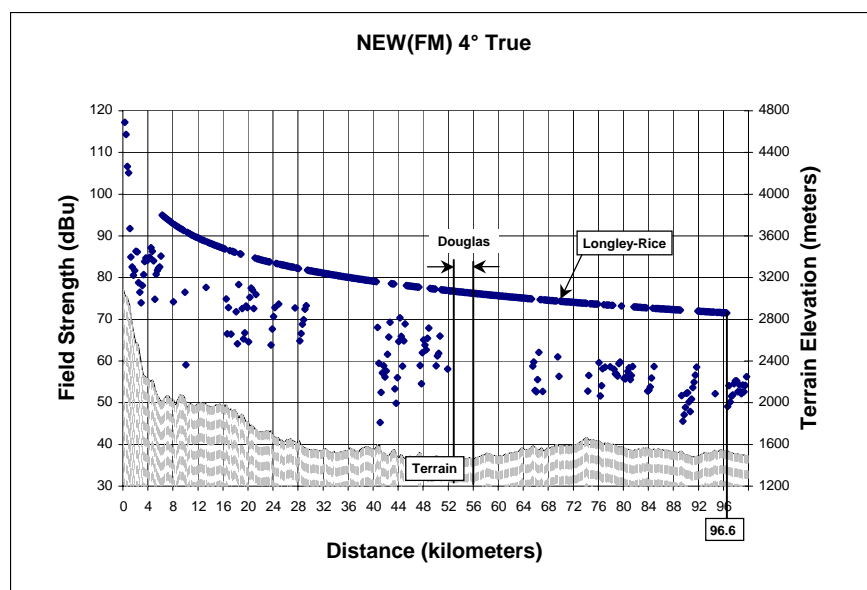
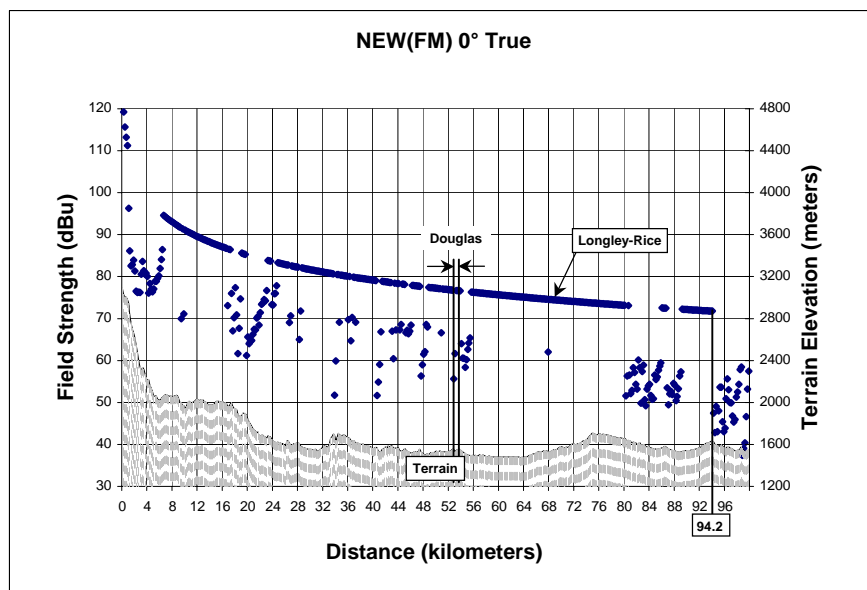
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## COVERAGE BASED ON ALTERNATE PROPAGATION METHODS

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# **LONGLEY-RICE DATA**



# POINT-TO-POINT (PTP) DATA

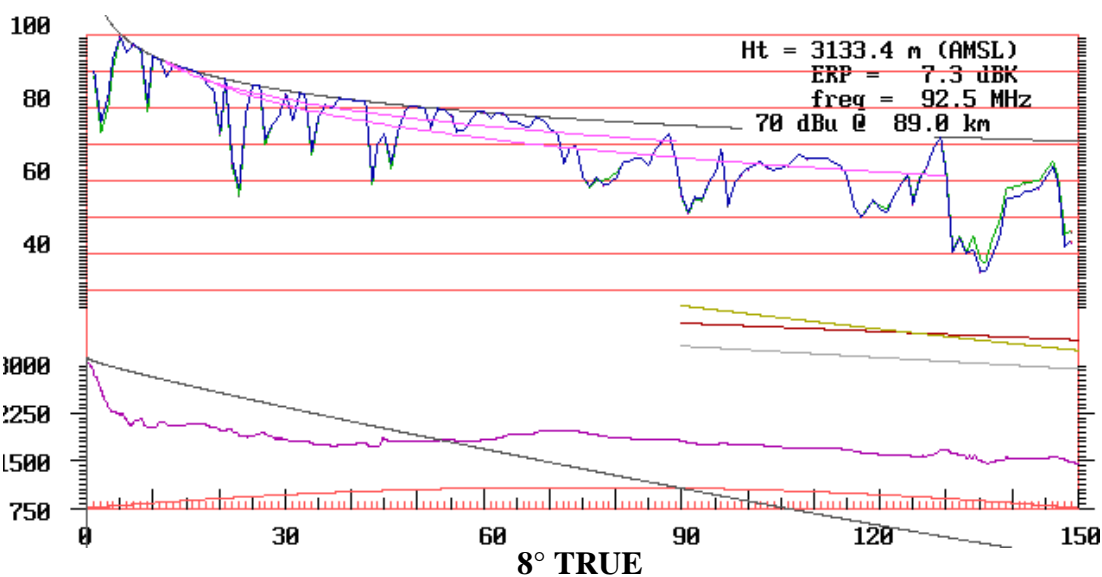
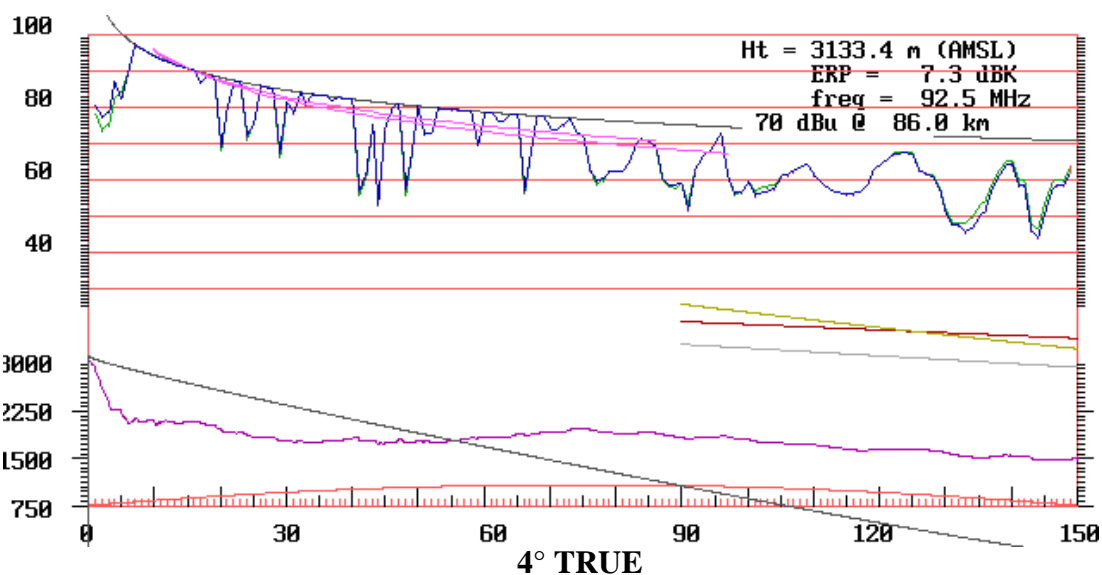
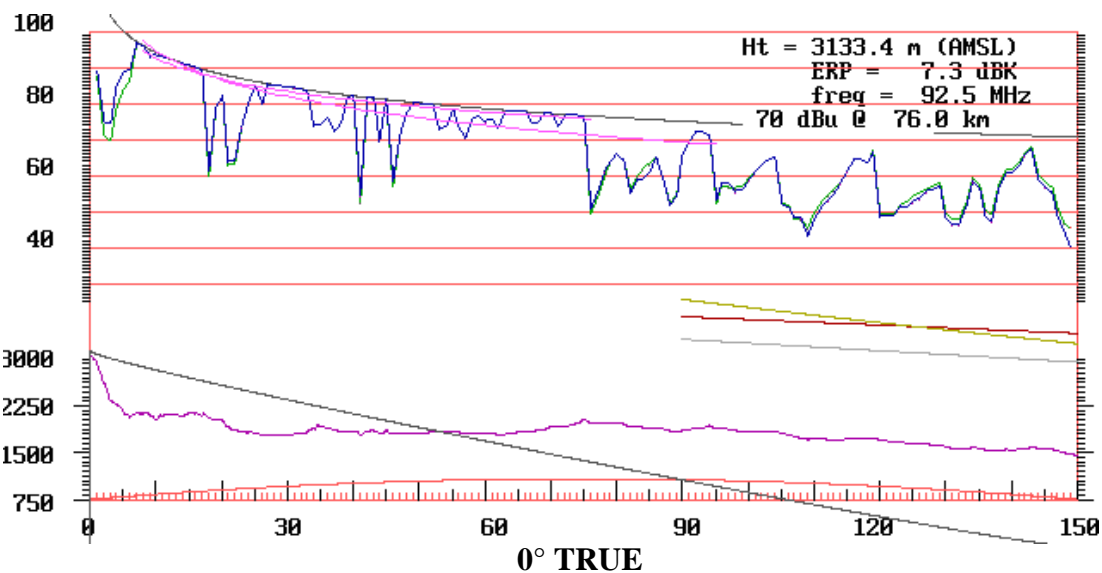




Figure 8

CDBS FM SEPARATION STUDY - PROPOSED SITE

Channel: 223C1											Separation Buffer: 32 km		
											Coordinates: 42-16-05 N 105-26-33 W		
Call Id	City St	File Status	Num	Channel Freq	ERP HAAT	DA Id	Latitude Longitude	73 215	Bear	Dist. (km)	Req. (km)		
											73.215	73.207	
KUWR 69131	LARAMIE WY	BLIC C	19941031KW	220 C 91.9	100.000 335	N	41-18-36 105-27-17	N	180.5	106.41 1.41	99.0	105.0	Close
	KAYCEE WY	RM VAC C	9278	222 C1 92.3	0.000	N	43-27-55 106-58-40	N	317.3	182.84 5.84	158.0	177.0	Close
	DOUGLAS WY	RM VAC C	9320	223 C1 92.5	0.000	N	42-40-19 105-05-05	N	33.0	53.65			
NEW 164286	DOUGLAS WY	BSFH APP C	20040806ALS	223 C1 92.5	0.000		42-40-19 105-05-05		33.0	53.65			
NEW 164286	DOUGLAS WY	BNPH APP C	20050103AHL	223 C3 92.5	25.000 100	N	42-51-29 105-14-02	N	14.5	67.74			
KDJM 59972	BROOMFIELD CO	BLH LIC C	20010501AAA	223 C1 92.5	57.000 377	Y 37861	40-05-47 104-54-04	N	169.2	245.42 0.42	224.0	245.0	Close
KDJM 59972	BROOMFIELD CO	RM USE C	9716	223 C1 92.5	0.000	N	40-03-15 105-04-12	N	172.7	247.84 2.84	224.0	245.0	Close
94679	CENTENNIAL WY	VAC C		224 A 92.7	0.000	N	41-19-03 105-59-55	N	203.8	115.25	111.0	133.0	
<i>To channel 248A per MB Docket No. 03-258, RM-10833, RM-10864, released 6/25/2004</i>													
KIQZ 46737	RAWLINS WY	BLH LIC C	19811119AI	224 A 92.7	3.000 91	N	41-46-16 107-14-15	N	250.2	158.59 25.59	111.0	133.0	Clear
KIQZ 46737	RAWLINS WY	USE C		224 A 92.7	0.000	N	41-46-16 107-14-15	N	250.2	158.59 25.59	111.0	133.0	Clear
	WHEATLAND WY	RM ADD C	rfs91	277 A 103.3	0.000		42-04-28 104-56-51		117.7	46.21 24.21	0.0	22.0	Clear

ELECTRONICS RESEARCH, INC.  
108 MARKET STREET  
NEWBURGH, IN. 47630

FIGURE H8

----- THEORETICAL -----

VERTICAL PLANE RELATIVE FIELD

8 ERI TYPE SHP, SHPX, LP, OR LPX ELEMENTS  
0 DEGREE(S) BEAM TILT  
0 PERCENT FIRST NULL FILL  
0 PERCENT SECOND NULL FILL

MAY 24, 1953

ELEMENT SPACING:  
2.5 WAVELENGTH

POWER GAIN IS 2.519 IN THE HORIZONTAL PLANE(2.519 IN THE MAX.)

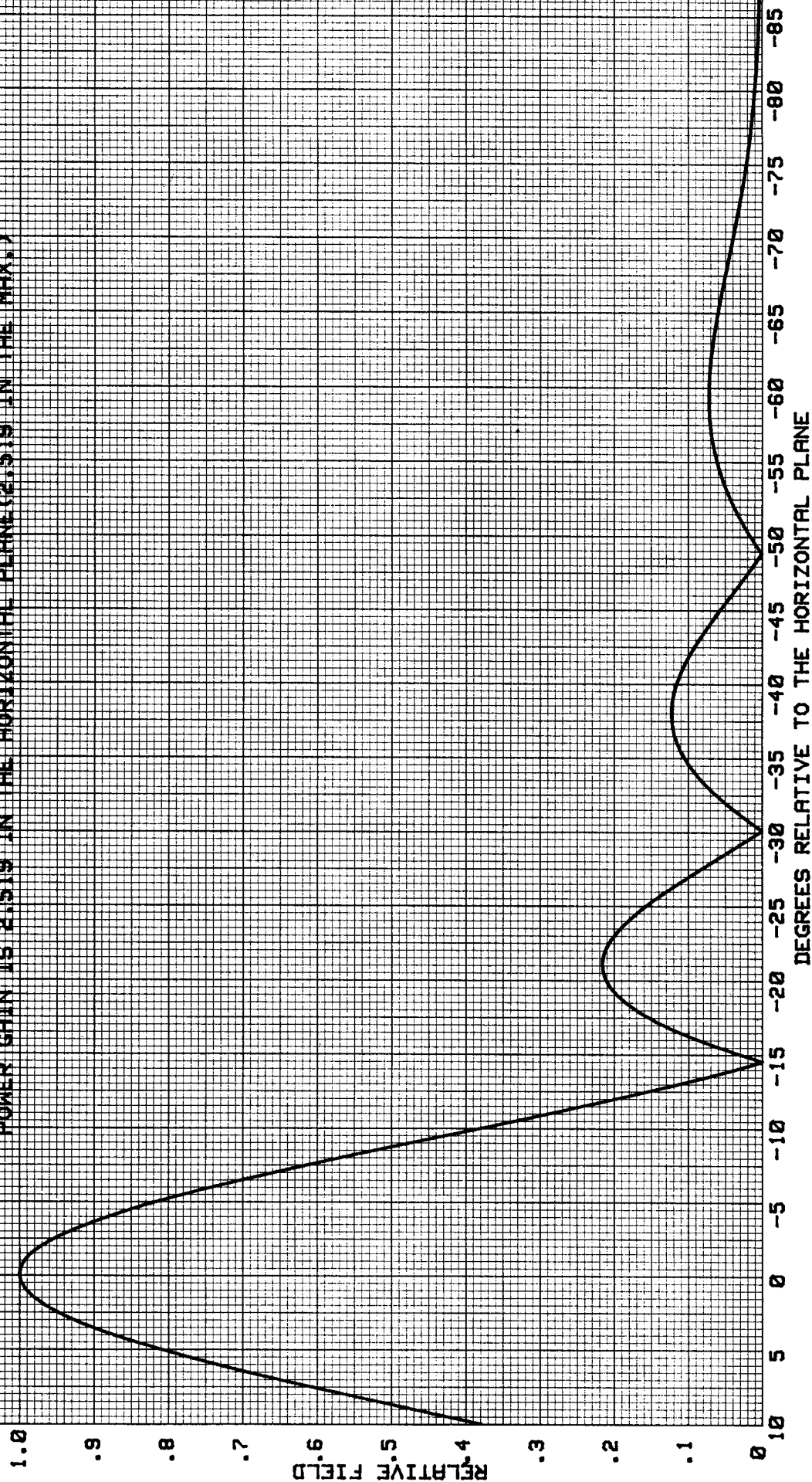


Figure 9