

Community of License Coverage from Proposed Antenna Coordinates

The geographical coordinates of the proposed KQMX(FM) antenna location are shown at Question 3 of the associated FCC Form 301, Section III-B. These coordinates identify the location of the proposed KQMX(FM) tower site.

Using the FCC F(50,50) propagation curves, the KQMX(FM) city grade (70 dBu) contour covers no portion of Lost Hills, the station's authorized community of license. However, as demonstrated herein, when the Longley-Rice alternate propagation prediction method is used to predict the city grade contour distance, the KQMX(FM) technical facility covers 100% of Lost Hills.

Terrain Roughness Analysis

In the context of coverage of the community of license, the Commission has established that it is willing to consider supplemental showings (like the Longley Rice alternate prediction method) to predict the city grade contour distance provided that the terrain departs widely from the average terrain assumed in the F(50,50) propagation curves.<sup>1</sup> The Audio Division, in coordination with the FCC Office of Engineering and Technology, set forth the following guidelines to define "terrain departs widely":<sup>2</sup>

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<sup>1</sup> See In the Matter of Amendments to Parts 73 and 74 of the Commission's Rules to Permit Certain Minor Changes Without a Construction Permit, FCC 97-290, 12 FCC Rcd 12371 (1997) at 12401-12403 (paragraphs 67-72).

<sup>2</sup> See Audio Division Letter dated August 8, 2002, In re: KMAJ-FM Topeka, Kansas, Facility ID No. 42012, Application BPH-20000316ACF.

- (1) Where delta H is used as the sole determinant that the terrain along a radial widely departs from the 50 meter standard if the delta H value is 20 meters or less, or the delta H value is 100 meters or more.

Or,

- (2) Where the antenna height above average terrain (HAAT) along “extended radials” toward the community of license vary by more than 30% from form the HAAT obtained from the “standard radials” toward the community of license.

Table 1 contains data from a terrain analysis from the proposed KQMX(FM) tower site along the radials that span the Lost Hills city-limits. The terrain analysis was performed using a 3-second terrain database and the radials were spaced at 1 degree intervals.

As shown in Table 1, the minimum delta H value along the 12 pertinent radials through the community of license is 175.0 meters and the maximum delta H value is 183.0 meters. Because the delta H value exceeds 100 meters in every case, the terrain between the proposed KQMX(FM) tower site and the community of license is excessively irregular and “departs widely” from the delta H value of 50 meters assumed in the FCC’s standard prediction method.

Further, Table 1 also shows that the average extended radial HAAT varies from the standard radial HAAT by 31.5%. Therefore the 30% extended radial threshold is satisfied in this instance.

Although only one of the two criteria listed above must be satisfied in order to justify use of the alternate prediction method, the instant proposal satisfies both

criteria. Table 1 demonstrates that the KQMX(FM) city-grade contour as predicted by the alternate method is at least 10% greater than the distance predicted by the standard contour prediction method (in this instance the Longley-Rice city-grade contour extends an average of 138% further).

#### Longley-Rice Field Strength Analysis

The Longley-Rice Irregular Terrain Model (version 1.2.2), using a United States 3 arc-second database that was generated from the 30 meter National Elevation Dataset, was employed to predict the proposed KQMX(FM) 70 dBu contour distance toward Lost Hills. The Longley-Rice input parameters were as follows:

Effective Radiated Power	= 1.65 kW
Frequency	= 105.7 MHz
Transmit Antenna Height	= 1039 meters AMSL
Receiver Antenna Height	= 9.1 meters AMSL
Transmit site ground elevation	= 1017 meters AMSL
Reliability	= F(50,50)

In addition, the appropriate radio climate, dielectric constant, conductivity and refractivity for the unique radio path considering the proposed transmitter site location and the surrounding terrain characteristics were determined by the computer model. Calculations were performed every 0.1 km to a maximum study distance of 100 kilometers at one degree intervals.

Because the Longley-Rice model is intended for computer use, sample calculations are not included herein. However, an explanation of the methodology used to compute the mean 70 dBu Longley-Rice contour shown on Exhibit 1 follows.

In the Longley-Rice area study the predicted field strength along each radial bearing was analyzed. The Longley-Rice 70 dBu contour distance was determined by averaging the distance to the first occurrence of a predicted field strength of 70 dBu with the distance to the last occurrence of the predicted 70 dBu field strength along each radial. For example, along the 50 degree radial the distance to the first occurrence was 77.2 km and the distance to the last occurrence was 84.8 km. Therefore, along the 50 degree radial, the Longley-Rice 70 dBu contour distance was determined to be 81.0 km. The average Longley-Rice 70 dBu contour shown in Exhibit 1 was computed in one degree intervals using this method.

Table 1 also contains the tabulated distance to the 70 dBu contour along each radial through the authorized city of license using both the standard prediction model (FCC's F(50,50) curves) and the alternate prediction model (Longley-Rice).

Exhibit 1 is a map that shows the Lost Hills, California, city-limits; the proposed facility's 70 dBu coverage using the FCC's propagation curves; and the

proposed facility's 70 dBu coverage using the Longley-Rice alternative model.<sup>3</sup>

As shown the alternate propagation prediction model predicts that the proposed KQMX(FM) city-grade covers 100% of the authorized community of license, Lost Hills, CA.

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<sup>3</sup> Exhibit 1 also shows the predicted F(50,50) 57 dBu Class B1 protected service contour encompasses the authorized community of license.

TABLE 1

**TERRAIN ANALYSIS AND DISTANCE TO CITY-GRADE CONTOUR  
FROM THE QMX TRANSMITTER SITE TOWARD THE COMMUNITY OF LICENSE  
QMX(FM), LOST HILLS, CA**

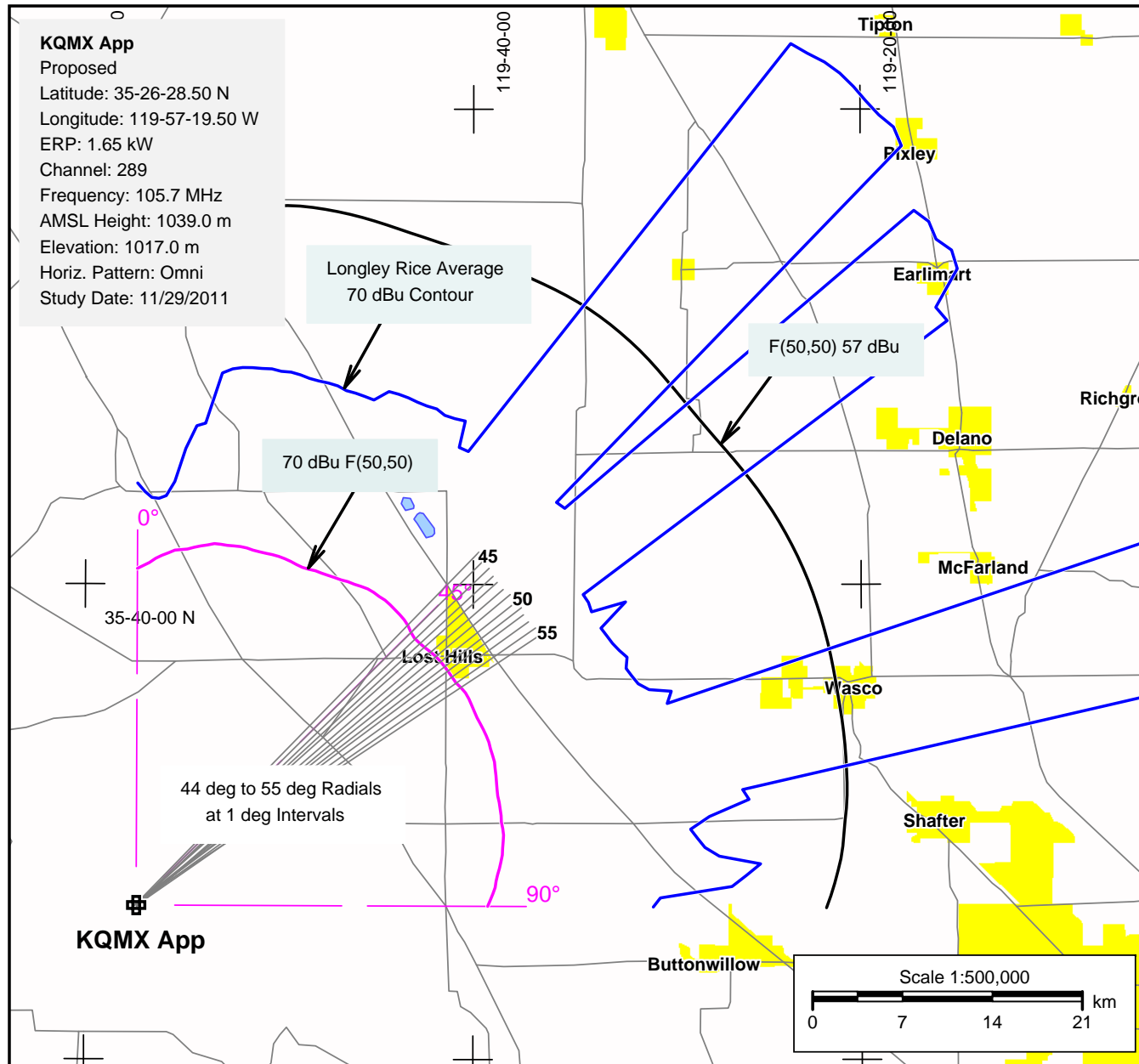
Radials Through City * (Azimuth degrees)	Terrain Roughness Factor (delta H)	Antenna Height Above Average Terrain (meters)			Distance to the 70 dBu Contour in kilometers		
		Standard 3 km to 16 km Radial ( A )	Extended Radial to Community ( B )	% Difference $[(B - A) / A] \times 100$	Using F(50,50) Curves ( F )	Using Supplemental Method ( S )	% Difference $[(S - F) / F] \times 100$
44	175.0	652.8	850.2	30.2	30.3	84.5	178.9
45	175.5	644.4	850.7	32.0	30.1	83.9	178.7
46	176.2	639.3	851	33.1	30.0	45.3	51.0
47	176.5	640.5	851.1	32.9	30.0	45.5	51.7
48	178.6	642.9	851.6	32.5	30.0	81.2	170.7
49	179.1	647.4	852.3	31.6	30.2	81.4	169.5
50	180.1	650.9	852.9	31.0	30.3	81.0	167.3
51	181.3	652.8	853	30.7	30.3	81.4	168.6
52	181.1	653	853.5	30.7	30.3	80.8	166.7
53	180.7	652.7	853.9	30.8	30.3	77.7	156.4
54	181.2	651.8	854.1	31.0	30.3	77.8	156.8
55	183.0	651.7	854.6	31.1	30.3	42.3	39.6
		Average Percent Difference		31.5	Average Percent Difference		138.0

\* The arc which encompasses the city-limits of Lost Hills spans from 44° to 55° true. Lost Hills is 30.7 km from the QMX transmitter site

The standard radial HAAT was computed using a 3-second terrain database from 3 km to 16 km using terrain data points every 0.1 km.

The extended radial HAAT was computed using a 3-second terrain database from 3 km to 31.0 km using terrain data points every 0.1 km.

## Exhibit 1 - Community Coverage - Proposed KQMX (FM)



### KQMX (FM) Lost Hills CA

Proposed Technical Facility  
Coverage to City of License  
Lost Hills. See Terrain Analysis  
in Exhibit 27.

### Lost Hills, CA

City of license  
geographical  
coordinates are  
35 36 59.0 N Lat  
119 41 36.0 W Lng

Lost Hills is 30.7  
kilometers from the  
proposed tower  
site.