

# TECHNICAL EXHIBIT

This exhibit details a proposed modification to a construction permit authorized through FCC application BNPL 20131112AAQ Facility ID: 195291 .

The new antenna site is at: 36°15'30.22" N 94°08'09.57" W NAD 27 datum.

The applicants propose to operate at this new location from a small tower with an ERP of 40 watts, a radiation center at 34 meters HAAT and centered at 19 meters AGL.

The new location is fully spaced to 3<sup>rd</sup> adjacent KXXM CH286-A and the applicants understand the requirements of §73.810 and will make the announcements as required.

The proposed site is short spaced to 2<sup>nd</sup> adjacent KXNA and the applicants are asking for a waiver under Section §73.807(e).

Distance between:

36 15 30.22 N Latitude, 94 8 9.57 W Longitude (Point 1)

As decimals: 36.2583944 Latitude, -94.1359917 Longitude

and

36 10 48. N Latitude, 94 5 7. W Longitude (Point 2)

As decimals: 36.1800000 Latitude, -94.0852778 Longitude

**Distance = 9.821 km (6.103 miles)**

via the method in Sections 73.208 and 73.611(d)

This method is only suitable for distances up to 475 km (295 miles).

Azimuth, Point 1 to Point 2: 152.42° True

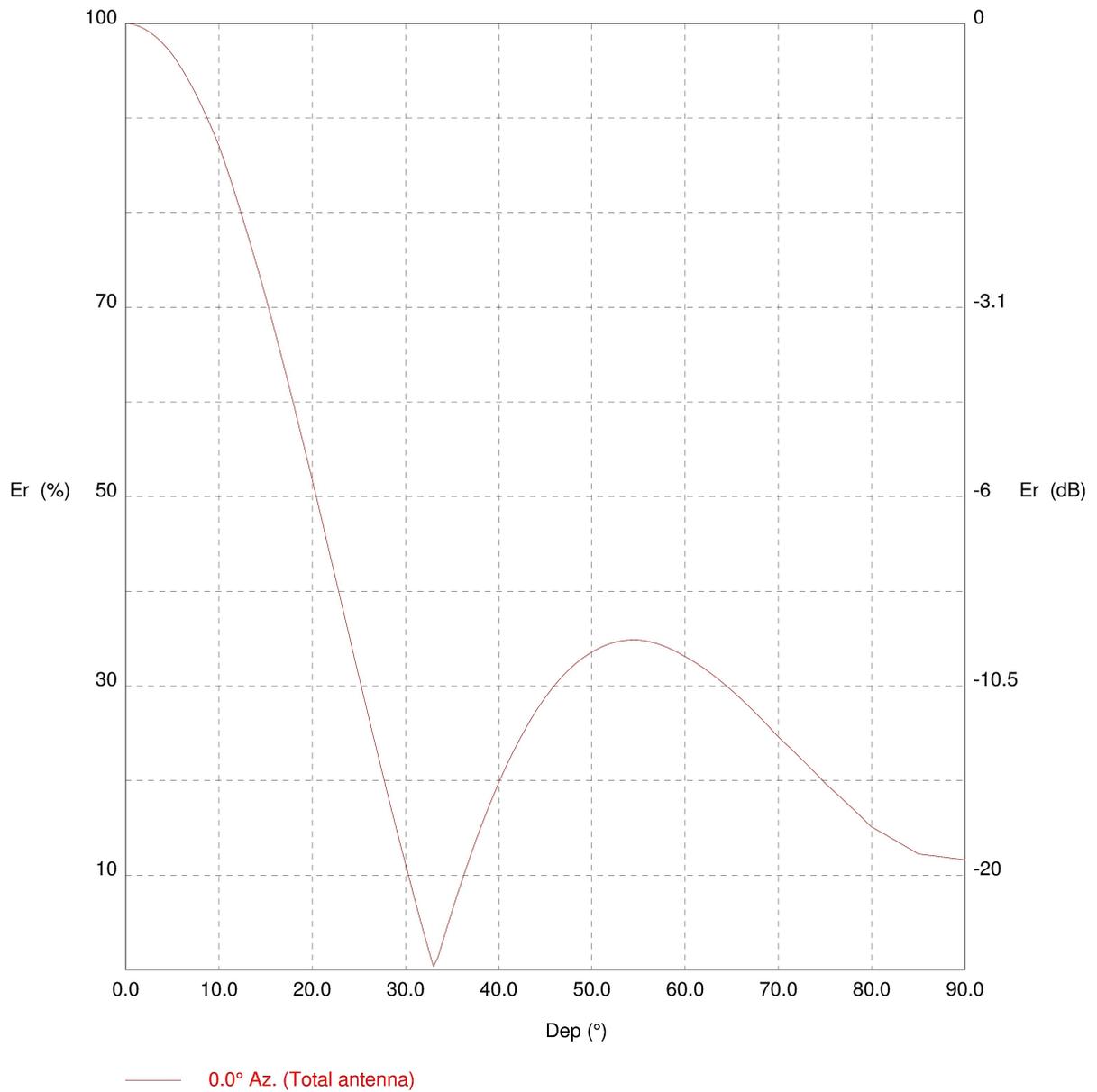
Azimuth, Point 2 to Point 1: 332.45° True

KXNA Facility ID # 71703 radiates 2.75kW at 148 meters HAAT in general. Using FCC bearing and HAAT data KXNA places a 77.452 dBu F(50, 50) service contour at the proposed new antenna location. Utilizing the U/D method, the proposed station is predicted to produce an undesired overlap of the KXNA contour with a signal of 117.4 dBu. The applicants will use a two-bay Nicom BKG-77 antenna with  $\frac{3}{4}$  wave spacing that attenuates downward signal levels. This will prevent the 117.4 dBu contour from reaching the ground or any potential listeners. The manufacturer's antenna data is shown in the graph below.

TX station: BKG77/2 GENERIC  
Frequency: 98.10 MHz

Site name: 3/4 WAVE SEPARATION

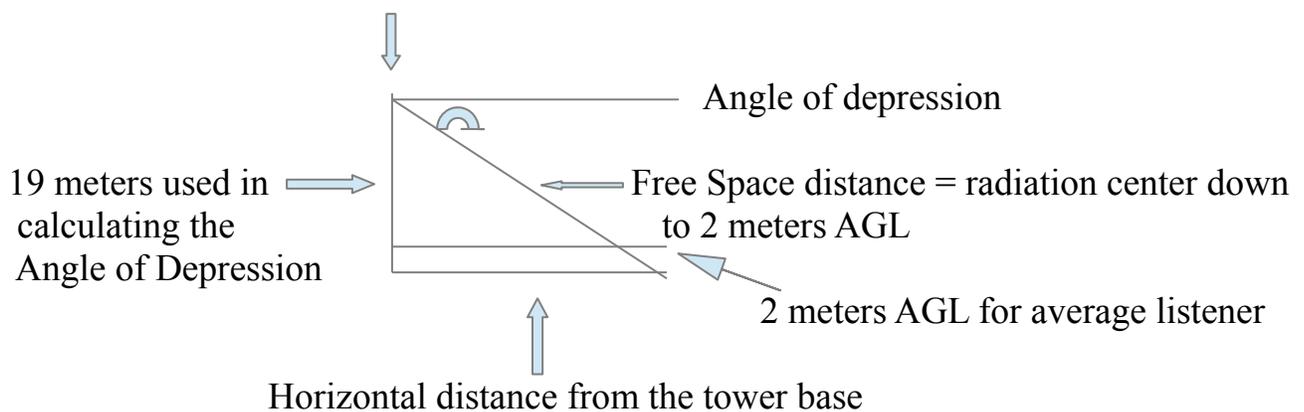
Vertical diagram



The overhead plan view below shows the proposed antenna site and tower at the south end of 313 N. Bloomington St. in Lowell, AR., the closest three buildings that could be occupied and the respective distances from the tower base.



Radiation center at 19 meters above ground level



Using the Inverse Tangent function, the Angle of Depression looking down at each building from the radiation center was calculated using the horizontal distance from the tower base. Then the Free Space distance from the radiation center to a point 2 meters AGL at each building was determined. The Depression Angles, dB loss in signal and resultant F(50,50) signal dBu levels are listed in the following table.

For the closest building the Angle of Depression is the inverse tangent of 19\23 yielding 39.5 degrees. The depression angle vs. dB loss in the above graph shows a minimum of 16 dB loss. From the radiation center to the building at the 2 meter above ground level the free space distance is 26.7 meters. The FCC Propagation Curves program shows the resultant F(50,50) field strength at 108.4 dBu, weaker than the 117.4 dBu interference.

The adjacent business is 36 meters from the tower. The inverse tangent of 19/36 shows the depression angle at 27.8 degrees. The Nicom antenna graph shows a loss of 15 dB at that downward angle. From the radiation center to the building at a point 2 meters AGL at the building the free space distance is 36.4 meters. The FCC curves calculator shows the F(50,50) field strength to be 106.7 dBu for any potential listener there.

The local church lot is measured at 33 meters from the tower base. The inverse tangent from 19/33 calculates to a depression angle of 29.9 degrees with a signal loss of 19 dB. From the radiation center to a point 2 meters above ground at the building the free space distance is 34.0 meters. The field strength calculates to be 103.3 dBu and is less than the interfering contour of 117.4 dBu.

The Main Studio will be located inside this building a couple of meters from the tower base and 19 meters directly below the antenna. A signal level of 107.9 dBu or less is calculated to be inside this building.

<b>Total Slope Distance from the Radiation Center in Meters</b>	<b>Angle of Depression</b>	<b>Reference dBm</b>	<b>Signal Loss dB</b>	<b>Resultant dBm</b>	<b>2 m AGL Free Space Distance</b>	<b>F(50,50) dBu at Receiver</b>
Small Office 29.8 meters	39.5	46.02	-16	30.02	26.7 m	108.4
Adjacent Business 40.7 meters	27.8	46.02	-15	31.02	36.4 m	106.7
Local Church 38.0 meters	29.9	46.02	-19	27.02	34.0 m	103.3
Studio/Office Tower Site	85 to 90 below	46.02	-19	27.02	20.0 m	107.9
Tower Base	90	46.02	-19	27.02	19.0 m	108.3

The 117.4 dBu contour is present down to 6.7 meters directly below the antenna center (19 meters AGL) and does not reach the ground, any major highways or potential listeners at any angle of depression in any direction.



The studio will be located in a building at 313 N. Bloomington St. Lowell, AR. and is shown above with the proposed antenna site (not to scale) depicted by a red line on the south end of the building. The property owner and business belongs to a member of the Iglesia Ciudad De Refugio Church.