



**Global RF Solutions<sup>SM</sup>**

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## **Evaluation of Human Exposure to Radio Frequency Emissions**



**Analysis of KDKB-FM Tower 10  
Phoenix, AZ**

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# 1. SUMMARY AND CONCLUSION

## Summary:

FCC Licensee KDKB, operating under construction permit: BXPB-20100819AAW is required to perform RF field strength measurements as a condition of their permit. An analysis of this Communications Facility has been completed to determine the FCC Compliance impact of the power down of the main FM transmitter (KDKB-FM) on one tower (Tower 11), and the power up of a back-up transmitter on another tower (Tower 10). The impact analysis is in terms of the compliance guidelines set forth by the Federal Communications Commission (FCC) with regards to maximum human exposure limits. This determination of FCC Compliance has been made with ground and roof level field survey measurements performed with a Narda SRM-3000, PN3001/01 selective radiation meter serial #N-0016 and an SRM E-Field Probe PN3501/02 serial #H-0368. The meter and probe are properly calibrated until 11/08/2012 and 11/10/2012, respectively. The field survey was performed on Friday, March 4<sup>th</sup>, 2011 at 10:30.

## Conclusion:

The RF environment at this Communications Facility includes several FM and TV transmitter towers on and around the tower of the back-up FM transmitter. The survey was performed using the FCC Public standard, as the large amount of serviceable equipment (generators, A/C, utility lines, etc.) indicates the likelihood of non-RF Safety trained personnel having access to the area (Note FCC Occupational levels can be calculated by dividing the FCC Public numbers by 5.) At the time of the measurements, KDKB-FM was transmitting from the back-up transmitter tower location (Tower 10), and transmission power was off at the main transmitter tower location (Tower 11).

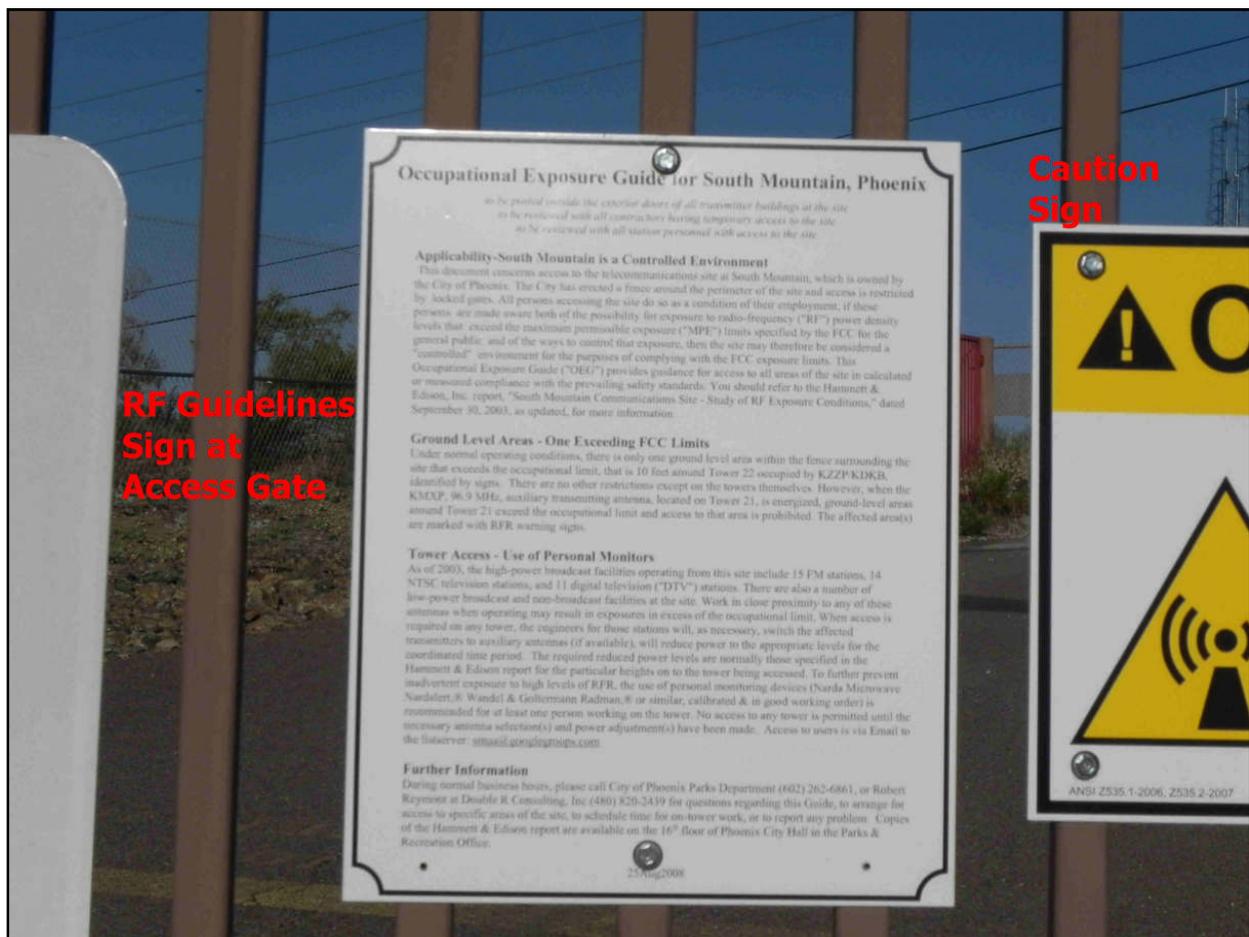
Using SRM-3000 measurements in numerous areas at and around Tower 10 and at some hot spots previously identified by others, KDKB-FM at 93.3 MHz was found not to exceed FCC Public standards at any ground or roof level locations. Further, in accessible areas where measured levels did exceed FCC standards, KDKB-FM was found not to contribute 5% or greater to those levels per FCC guidelines. KDKB-FM **is compliant** as configured with FCC Guidelines and requires no additional mitigation.

## 2. SITE DESCRIPTION

<b>Site ID: N/A</b>		<b>Site Name: KDKB-FM</b>			
<b>Date of Evaluation</b>	<b>March 4, 2011</b>	<b>Site Evaluator (name): Harry Young</b>			
<b>Site Type</b>	<b>Building</b>	<b>Tower/Monopole</b>	<b>XXX</b>	<b>Water Tower</b>	
<b>Address: South Mountain Communications Compound, Phoenix, AZ</b>					
<b>GPS NAD27</b>	<b>N 33 20 01</b>	<b>W 112 04 44</b>	<b>Structure Height AGL</b>	<b>296'</b>	
<b>Access Restricted</b>	<b>Yes</b>				

This communications site is located on a collocated transmitter tower on a mountain top communications facility. Access to the compound is restricted by the City of Phoenix and the service providers. Access to the tower is restricted to EME Awareness trained personnel and an RF Safety plan is in place.

These are photographs of the KDKB-FM Tower 10 site:



## 2. SITE DESCRIPTION (continued)

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## 2. SITE DESCRIPTION (continued)

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### 3. ANALYSIS

The field survey defines exclusion areas at the site. Electromagnetic energy (EME) fields were assessed through direct measurement at the transmitter site, using properly calibrated field probes.

An SRM-3000 Selective Measurement Device was used for the measurement phase of this survey. This meter represents the latest generation of equipment designed to measure RF energy by Narda Safety Test Solutions.

This device uses an isotropic antenna that is calibrated to measure Radio Frequency power densities using specific selectable frequencies. Charts representing the level of RF power measured at different locations at this site are listed in the FCC Public % of Standard.

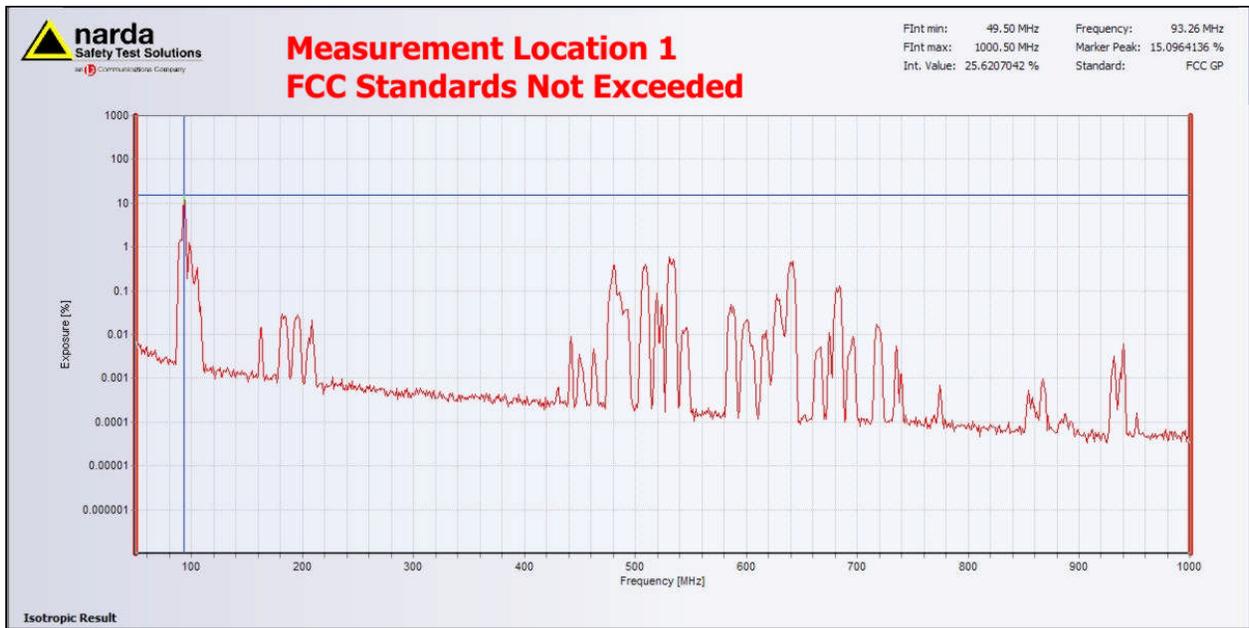
#### **Narda SRM-3000**



# 4. RESULTS

The spatial average RF Power density levels were measured at the locations described in the charts that follow. In the safety analysis tables, the measured levels are in percentage of FCC Public standards. The peak contributor tables (for locations where standards are exceeded) show the frequencies and level of contribution in FCC Public standards of the contributors providing 1% or more to the levels at that location. In the spectrum charts, FInt min and FInt max define the frequency range being measured, with Int. Value indicating the total percentage of the FCC Public standard that levels reach. The blue x,y axis line intersection depicts the peak percentage level and frequency of the highest contributor, textually represented by Frequency and Marker Peak.

 <b>Measurement Location 1</b> <b>FCC Public Standards Not Exceeded</b> <span style="float: right;">Standard: FCC GP</span>			
Service	Value	Lower Frequency	Upper Frequency
	26.7189999 %	50.000 MHz	1000.000 MHz
<b>Total</b>	<b>26.7189999 %</b>	<b>50.000 MHz</b>	<b>1000.000 MHz</b>



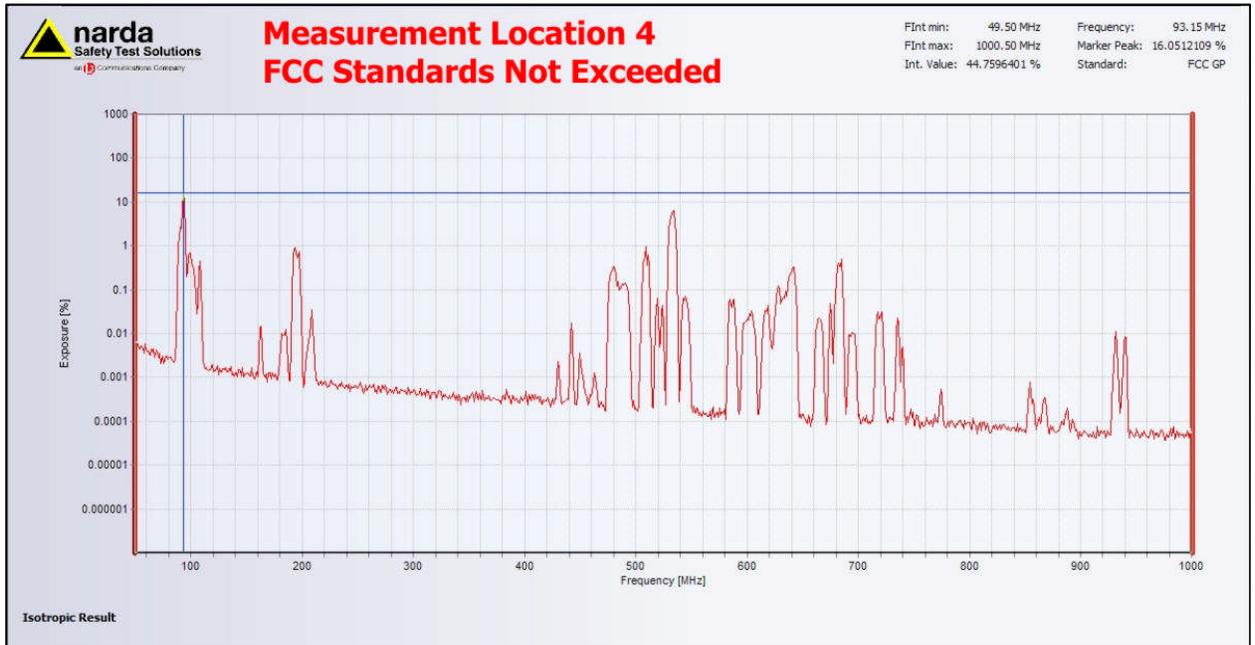
## 4. RESULTS (continued)

	<b>Measurement Location 2</b> <b>FCC Standards Not Exceeded</b>			Standard: FCC GP
	<b>Service</b>	<b>Value</b>	<b>Lower Frequency</b>	<b>Upper Frequency</b>
	19.1790009 %	50.000 MHz	1000.000 MHz	
Total	19.1790009 %	50.000 MHz	1000.000 MHz	

	<b>Measurement Location 3</b> <b>FCC Standards Not Exceeded</b>			Standard: FCC GP
	<b>Service</b>	<b>Value</b>	<b>Lower Frequency</b>	<b>Upper Frequency</b>
	24.4319992 %	50.000 MHz	1000.000 MHz	
Total	24.4319992 %	50.000 MHz	1000.000 MHz	

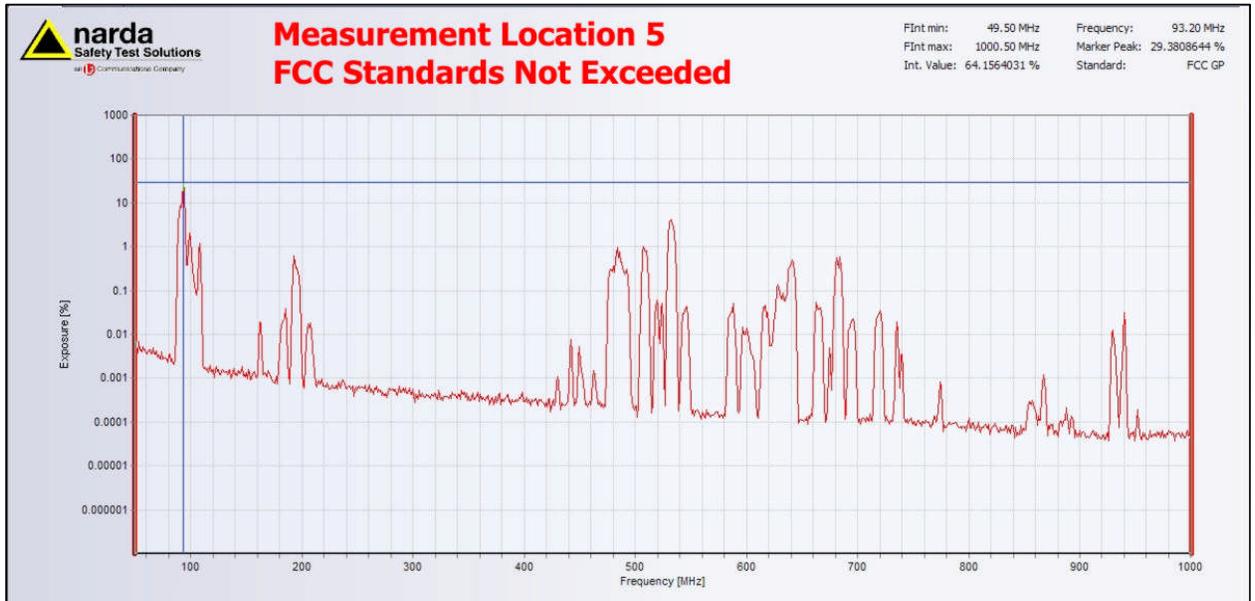
# 4. RESULTS (continued)

		<b>Measurement Location 4</b> <b>FCC Standards Not Exceeded</b>		Standard: FCC GP
Service	Value	Lower Frequency	Upper Frequency	
	59.8979988 %	50.000 MHz	1000.000 MHz	
Total	59.8979988 %	50.000 MHz	1000.000 MHz	



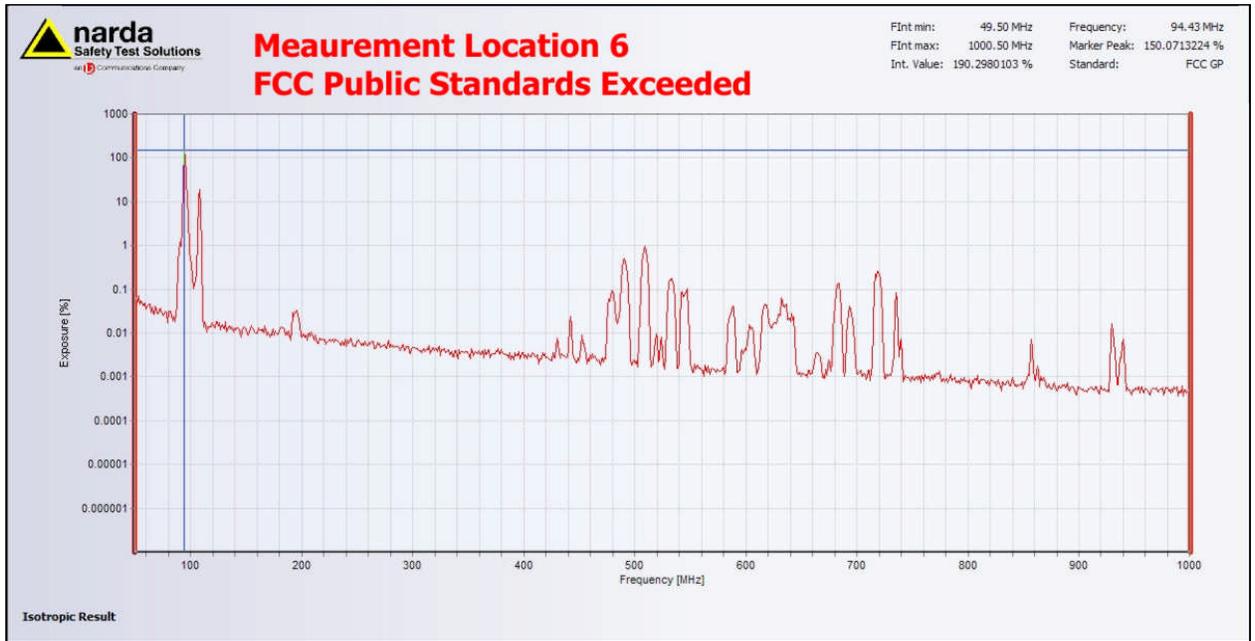
# 4. RESULTS (continued)

		<b>Measurement Location 5</b> <b>FCC Standards Not Exceeded</b>		Standard: FCC GP
Service	Value	Lower Frequency	Upper Frequency	
	84.2890015 %	50.000 MHz	1000.000 MHz	
Total	84.2890015 %	50.000 MHz	1000.000 MHz	



# 4. RESULTS (continued)

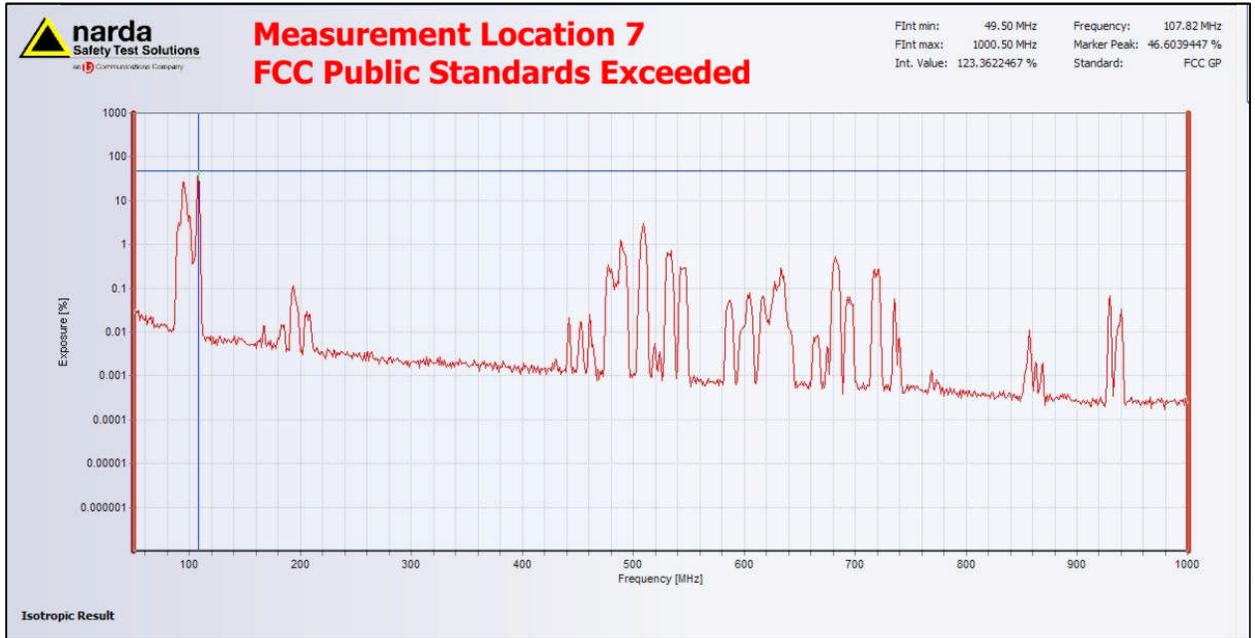
		<b>Measurement Location 6</b> <b>FCC Public Standards Exceeded</b>		Standard: FCC GP
Service	Value	Lower Frequency	Upper Frequency	
	234.1100006 %	50.000 MHz	1000.000 MHz	
Total	234.1100006 %	50.000 MHz	1000.000 MHz	



		<b>Measurement Location 6</b> <b>FCC Public Standards Exceeded</b>		<b>KDKB-FM Contribution</b> <b>&lt; 1%</b>	Standard: FCC GP
Index	Frequency	Level			
1	94.43 MHz	150.0713224 %			
2	107.83 MHz	19.8098880 %			
3	90.34 MHz	1.2419865 %			

# 4. RESULTS (continued)

		<b>Measurement Location 7</b> <b>FCC Public Standards Exceeded</b>		Standard: FCC GP
Service	Value	Lower Frequency	Upper Frequency	
	142.6900024 %	50.000 MHz	1000.000 MHz	
Total	142.6900024 %	50.000 MHz	1000.000 MHz	



		<b>Measurement Location 7</b> <b>FCC Public Standards Exceeded</b>		<b>KDKB-FM Contribution</b> <b>&lt; 1%</b>	Standard: FCC GP
Index	Frequency	Level			
1		107.82 MHz		46.6039447 %	
2		94.46 MHz		28.8309014 %	
3		100.20 MHz		4.5582538 %	
4		90.28 MHz		3.2453636 %	
5		509.14 MHz		2.9519251 %	
6		489.31 MHz		1.3353175 %	

## 4. RESULTS (continued)

 <b>Measurement Location 8</b> <b>FCC Standards Not Exceeded</b> <span style="float: right;">Standard: FCC GP</span>			
Service	Value	Lower Frequency	Upper Frequency
	48.2900009 %	50.000 MHz	1000.000 MHz
Total	48.2900009 %	50.000 MHz	1000.000 MHz

## **5. RECOMMENDATIONS**

KDKB-FM is compliant with FCC Guidelines at this site, and an RF Safety plan is nominally in place.

In order to guarantee the safety of personnel tasked with ground level operations in this environment, a review of the current RF safety plan and supporting EME awareness training program would be in order.

KDKB-FM (Sandusky Communications) must ensure tower access will be restricted to personnel that have been authorized by KDKB-FM (EME Awareness trained personnel only). This would include all maintenance personnel and contractors accessing the tower.

# APPENDIX A- LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(REFERENCE= TABLE 1. Title 47 CFR)

## (A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

## (B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz\*Plane-wave equivalent power density

NOTE 1: **Occupational/controlled** limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2: **General population/uncontrolled** exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.