ALLTEL RF Engineering

Non–Ionizing Electromagnetic Radiation (NIER) Tower Analysis

Site Name: *MCDOWELL MTN RANCH*

Site Number: *TBD*

Location: *10421 E. MC DOWELL MOUNTAIN RANCH ROAD*

Prepared By: *TRUNG QUACH*

Data Created: *5/13/2004*

Maximum Public Exposure (%)

General Public: *72.63*

Occupational: *14.53*

Results: ***This analysis determined that there is no area accessible to the general public that will exceed maximum permissible limits set by the FCC and specified by the Bulletin OET-65.***

39-DR-2004
5/20/04

The purpose of this engineering statement is to document the results of a non-ionizing electromagnetic radiation (NIER) analysis performed for the proposed installation or modification of wireless communications equipment at the above site and location.

BackGround

A NIER analysis is typically performed for new radio communications sites, or for modifications to existing radio communication sites to verify that the levels of RF energy do not exceed the levels that have been deemed safe by the Federal Communications Commission (FCC) for both the general public and occupational categories. The FCC has determined (see FCC OET Bulletin 65) safety limits for occupational exposure (those that are trained and familiar with the risks and limitations of working in the vicinity of RF transmitters) and general public exposure (those untrained and unfamiliar with the risks and limitations of working in the vicinity of RF transmitters). Appendix A contains some tables and charts from FCC OET-65.

Appendix A

(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^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	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

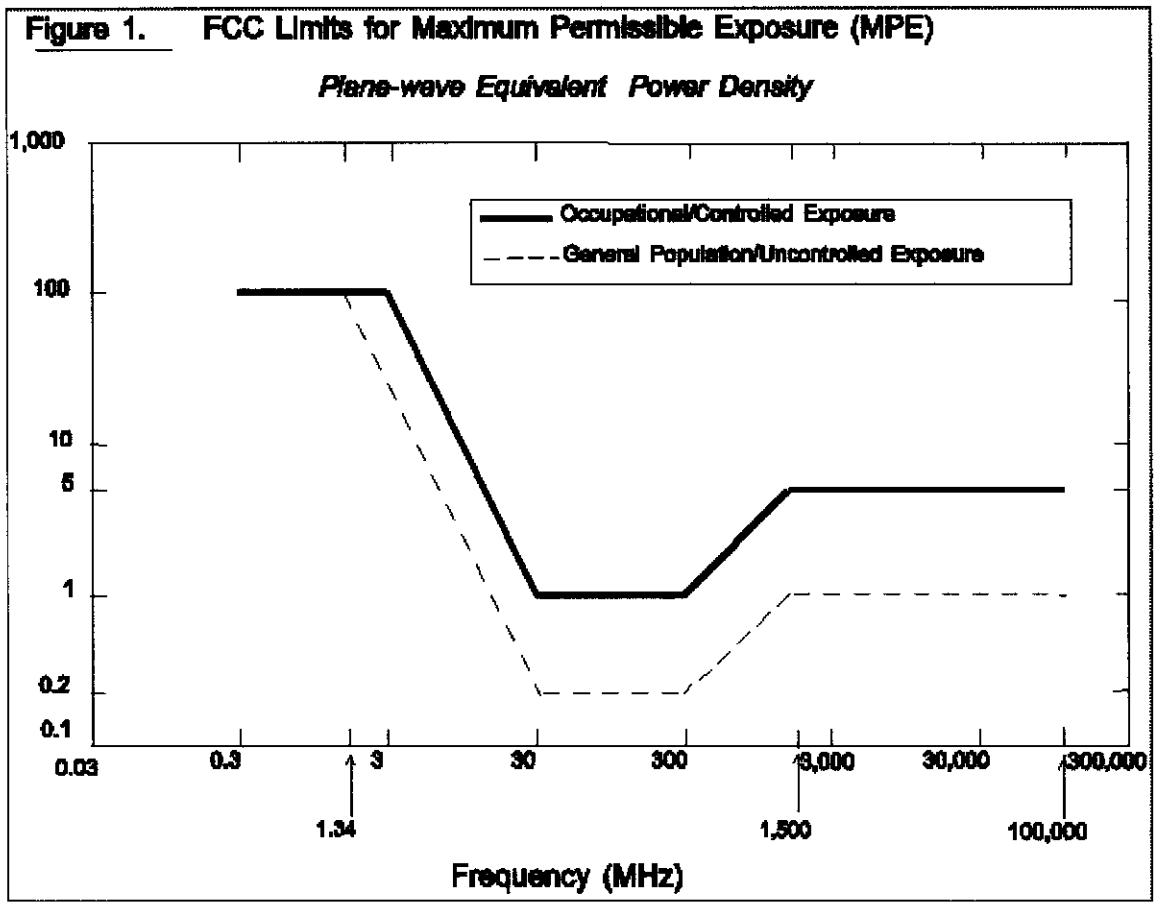
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--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

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)



**Appendix A provided by FCC OET Bulletin 65 Edition 97-01*

Analysis

This analysis was performed using industry accepted techniques that are consistent with those described in FCC Bulletin OET-65. This analysis used the worst-case, point source scenario to calculate the maximum RF exposure at a human head height of 6 feet. This analysis included all emitters aggregated by carrier and height that were indicated to be present, and their operating parameters. The results are tabulated in Appendix B. These results describe per carrier the maximum permissible power density limits as described in Appendix A for both the Occupational and the General Public (controlled and uncontrolled group). Also shown is the percent of the maximum limit that each carrier emits at the specified distance from the bottom of the tower and a cumulative total is calculated which represents the maximum public exposure for both the General and Occupational groups. These values are calculated at incremental steps from 0-1000 feet.

Transmitters

Name	Frequency (MHz)	EIRP (dBm)	Channels/ Carriers	Azimuth (Degrees)	Height (ft)	Gain (dBi)	Antennas		
ALLTEL (Tx1)	869	50.14	5	10	35	14.64	Panel	Antel	BXA80090-6CF
ALLTEL (Tx2)	869	50.14	5	160	35	14.64	Panel	Antel	BXA80090-6CF

MPE Exposure Calculations

Site Name: MCDOWELL MTN RANCH

Site Number: TBD

Latitude: 33.631972

Longitude: -111.848667

Datum: NAD 83

Appendix B

Distance (ft)	Carrier	General Public Maximum Limit (mW/cm^2)	General Public (%)	Occupational Maximum Limit (mW/cm^2)	Occupational (%)
0	ALLTEL	0.58	72.63	2.9	14.53
	Total:		72.63		14.53
5	ALLTEL	0.58	70.53	2.9	14.11
	Total:		70.53		14.11
10	ALLTEL	0.58	64.91	2.9	12.98
	Total:		64.91		12.98
15	ALLTEL	0.58	57.3	2.9	11.46
	Total:		57.3		11.46
20	ALLTEL	0.58	49.22	2.9	9.84
	Total:		49.22		9.84
25	ALLTEL	0.58	41.66	2.9	8.33
	Total:		41.66		8.33
30	ALLTEL	0.58	35.08	2.9	7.02
	Total:		35.08		7.02
35	ALLTEL	0.58	29.56	2.9	5.91
	Total:		29.56		5.91
40	ALLTEL	0.58	25.02	2.9	5
	Total:		25.02		5
45	ALLTEL	0.58	21.31	2.9	4.26
	Total:		21.31		4.26
50	ALLTEL	0.58	18.28	2.9	3.66
	Total:		18.28		3.66
55	ALLTEL	0.58	15.8	2.9	3.16
	Total:		15.8		3.16

60	ALLTEL	0.58	13.75	2.9	2.75
	Total:		13.75		2.75
65	ALLTEL	0.58	12.06	2.9	2.41
	Total:		12.06		2.41
70	ALLTEL	0.58	10.64	2.9	2.13
	Total:		10.64		2.13
75	ALLTEL	0.58	9.45	2.9	1.89
	Total:		9.45		1.89
80	ALLTEL	0.58	8.44	2.9	1.69
	Total:		8.44		1.69
85	ALLTEL	0.58	7.57	2.9	1.51
	Total:		7.57		1.51
90	ALLTEL	0.58	6.83	2.9	1.37
	Total:		6.83		1.37
95	ALLTEL	0.58	6.19	2.9	1.24
	Total:		6.19		1.24
100	ALLTEL	0.58	5.63	2.9	1.13
	Total:		5.63		1.13
125	ALLTEL	0.58	3.71	2.9	0.74
	Total:		3.71		0.74
150	ALLTEL	0.58	2.62	2.9	0.52
	Total:		2.62		0.52
175	ALLTEL	0.58	1.94	2.9	0.39
	Total:		1.94		0.39
200	ALLTEL	0.58	1.5	2.9	0.3
	Total:		1.5		0.3
300	ALLTEL	0.58	0.67	2.9	0.13
	Total:		0.67		0.13
400	ALLTEL	0.58	0.38	2.9	0.08
	Total:		0.38		0.08
500	ALLTEL	0.58	0.24	2.9	0.05
	Total:		0.24		0.05
600	ALLTEL	0.58	0.17	2.9	0.03
	Total:		0.17		0.03
700	ALLTEL	0.58	0.12	2.9	0.02
	Total:		0.12		0.02
800	ALLTEL	0.58	0.1	2.9	0.02
	Total:		0.1		0.02
900	ALLTEL	0.58	0.08	2.9	0.02

	Total:		**0.08**		**0.02**
1000	**ALLTEL**	**0.58**	**0.06**	**2.9**	**0.01**
	Total:		**0.06**		**0.01**