APPENDIX A: NOISE FLOOR MEASUREMENTS IN PHX AND NYC

Space Data Corporation utilized a spectrum analyzer to measure the spectrum usage and noise floor in the Phoenix metropolitan on the BPCS frequency block A. The operator on this block has deployed CDMA technology. Since CDMA has a reuse pattern of one, it is simple to use a spectrum analyzer to determine the total frequency used in an area since all frequencies being used in each area are present on each site. Other wireless technologies use higher usage patterns so that not all the frequencies being used in and area are present on each tower and thus it is more difficult to observe the amount of spectrum being used.

The PCS A block is a 30 MHz block comprised of pair of 15 MHz wide channels. Each CDMA channel is approximately 1.25 MHz wide. Thus, up to 12 CDMA channels fit within the 30 MHz block; however, one half of a channel is typically left fallow on each end of the block to serve as guard bands. Thus, the operator has the available spectrum to deploy up to 11 CDMA channels in the Phoenix market.

Spectrum analyzer readings were taken at 5 locations around the Phoenix area as shown in Figure A-1. Table A-1 summarizes the results of these readings.

Table A-1: Summary of noise floor and spectrum usage in the BPCS block A in Phoenix

Site	City / Town	Pop. Density	Noise Floor	CDMA Channels
A	Phoenix	4996 ppl. / sq. mi.	- 111 dBm	2
B	Airport	3774 ppl. / sq. mi.	-118 dBm	2
C	Tempe	3979 ppl. / sq. mi.	- 108 dBm	3
D	Apache Junction	1093 ppl. / sq. mi.	-124 dBm	2
E	Tortilla Flat	0.12 ppl. / sq. mi.	-142 dBm	0

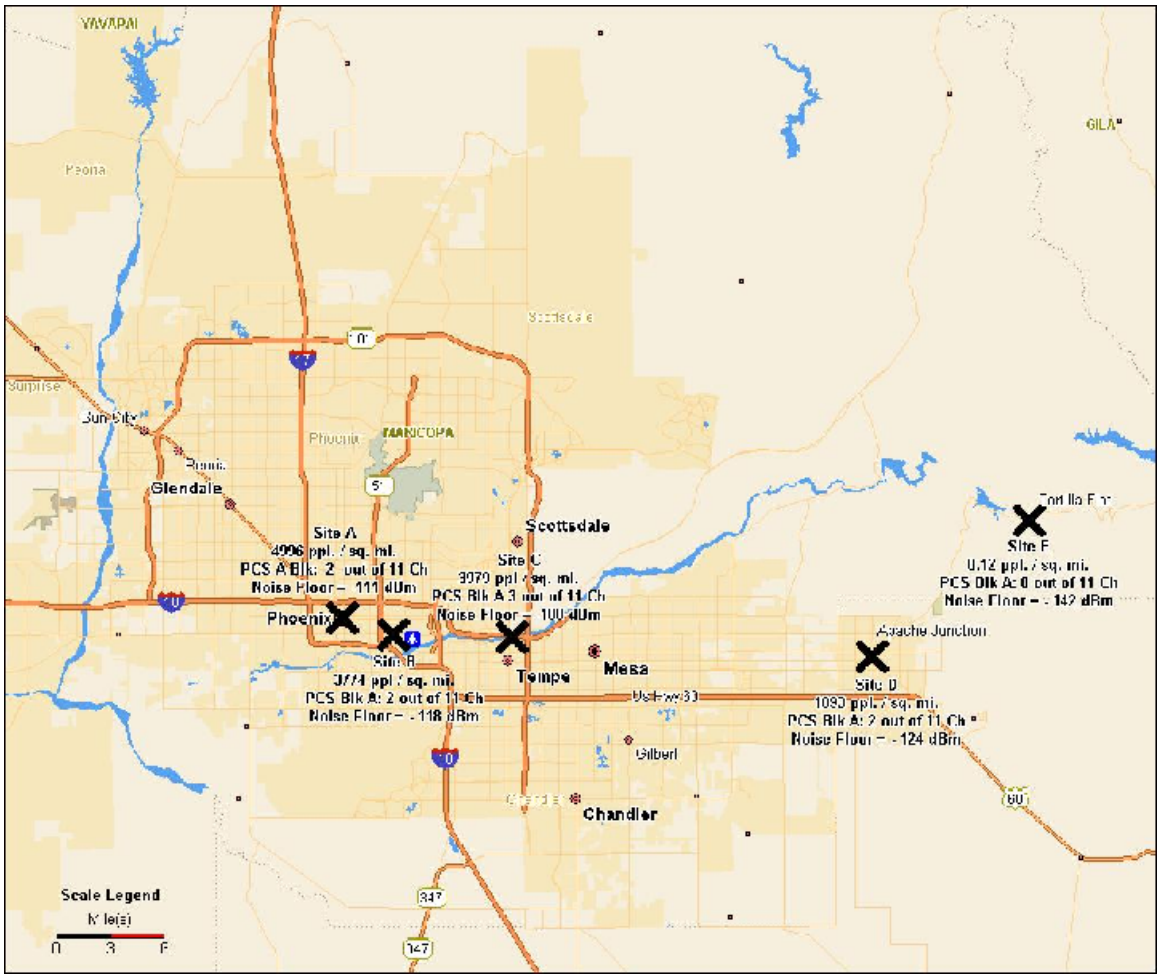
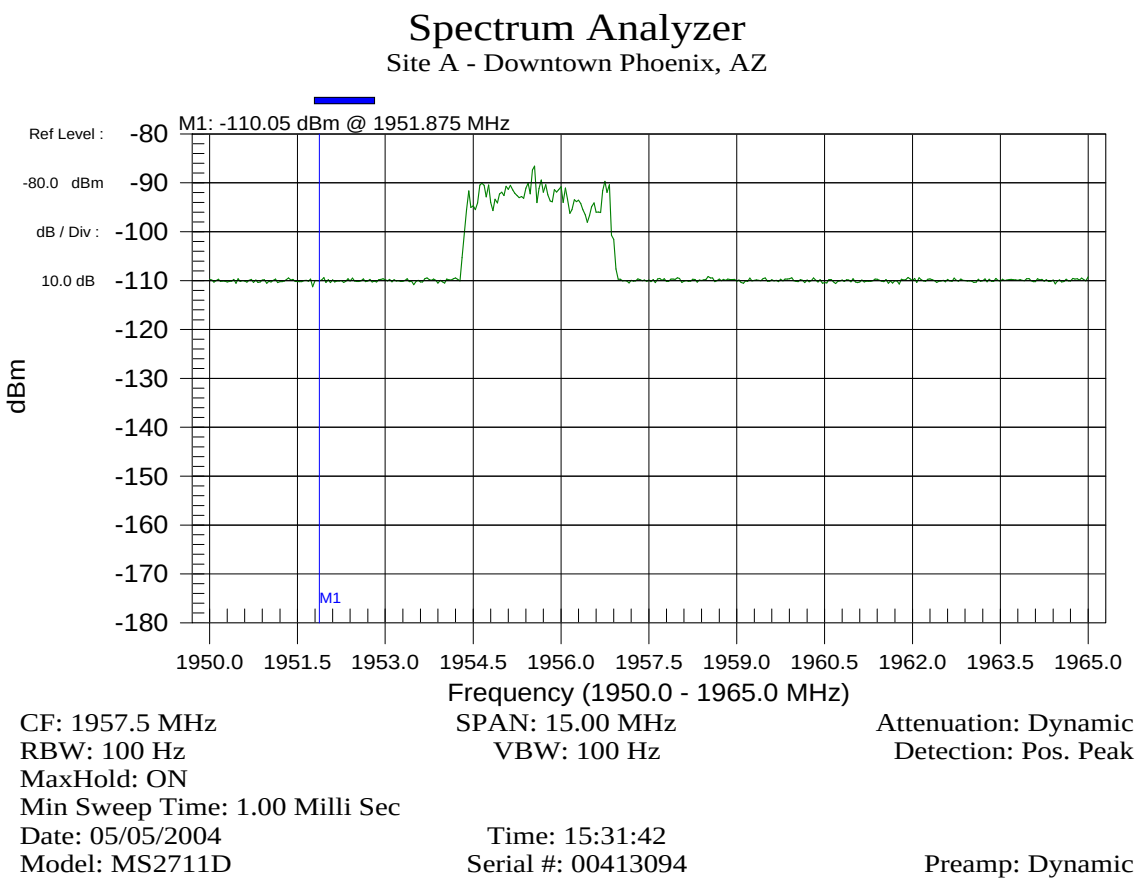


Figure A-1: Map of sites of Noise Floor Measurements

The measurements were made with a calibrated Anritsu MS2711D Spectrum Analyzer with a 1900 MHz PCS antenna. The population densities at each site were calculated by using census block data from the 2000 census averaged for all census blocks located within 4 miles of the measurement site. The spectrum analyzer plots for each site are presented below in figures A-2 through A-6.



CF: 1957.5 MHz SPAN: 15.00 MHz Attenuation: Dynamic
RBW: 100 Hz VBW: 100 Hz Detection: Pos. Peak
MaxHold: ON
Min Sweep Time: 1.00 Milli Sec
Date: 05/05/2004 Time: 15:31:42
Model: MS2711D Serial #: 00413094 Preamp: Dynamic

Figure A-2: Spectrum analyzer plot from site A in Downtown Phoenix.

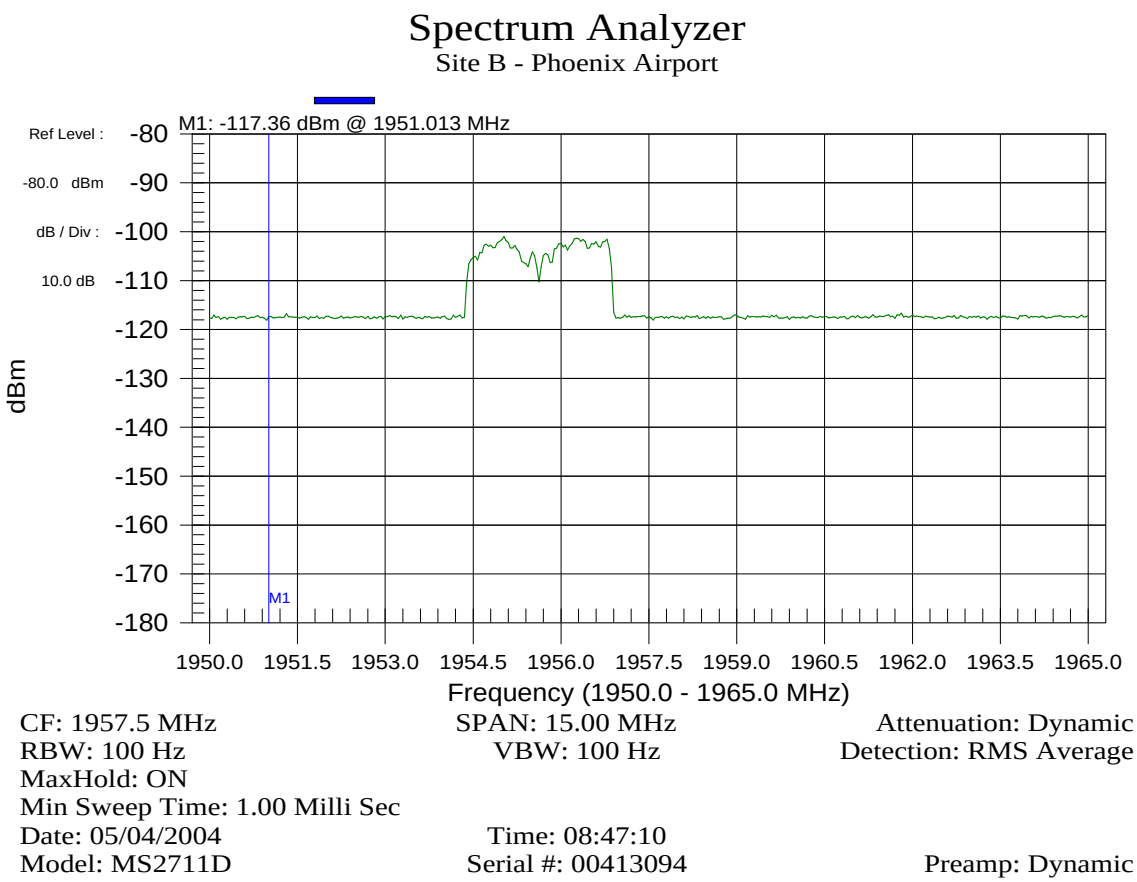
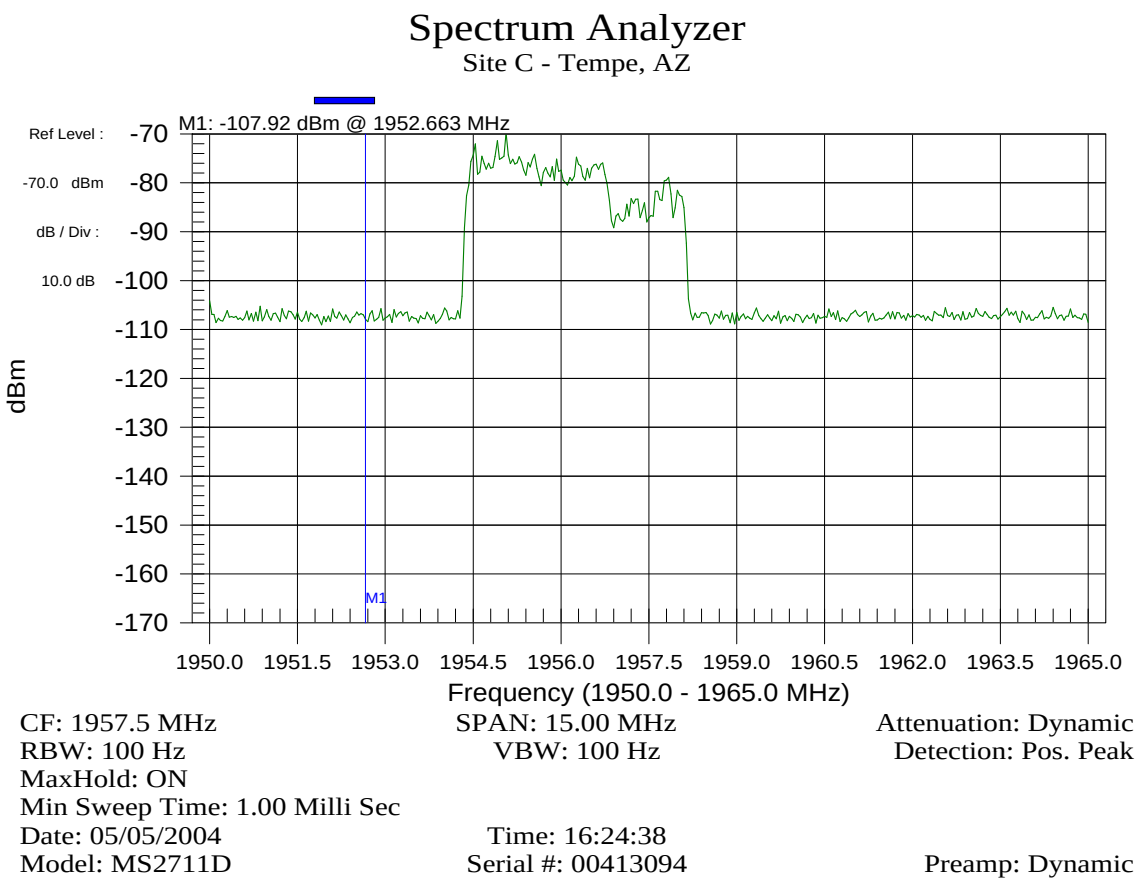


Figure A-3: Spectrum analyzer plot from site B near the Phoenix Airport.

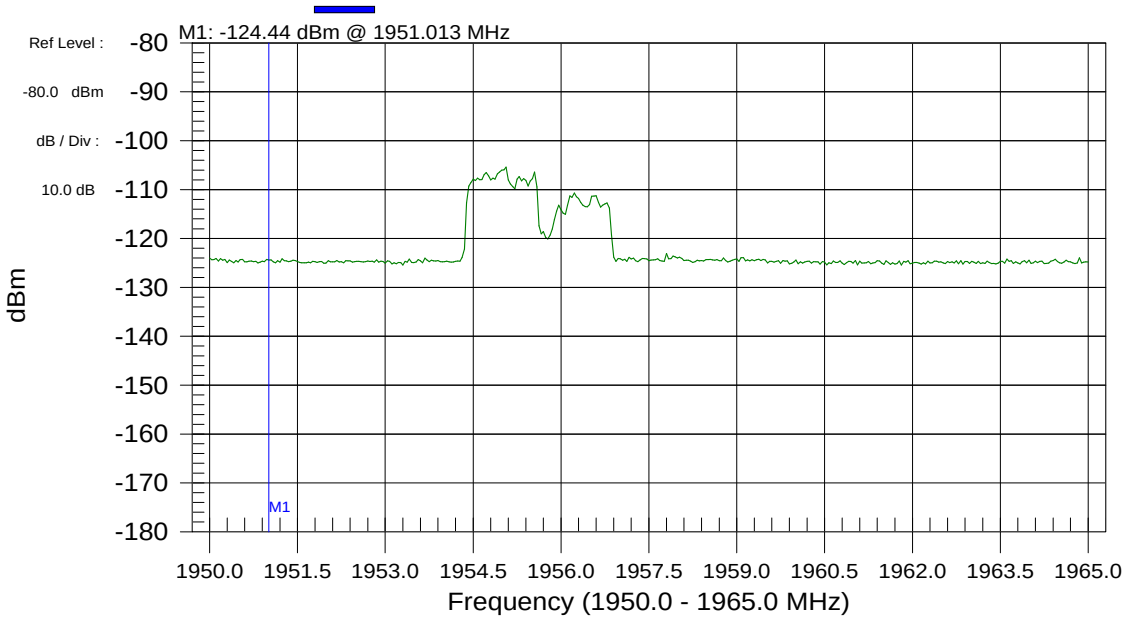


CF: 1957.5 MHz SPAN: 15.00 MHz Attenuation: Dynamic
RBW: 100 Hz VBW: 100 Hz Detection: Pos. Peak
MaxHold: ON
Min Sweep Time: 1.00 Milli Sec
Date: 05/05/2004 Time: 16:24:38
Model: MS2711D Serial #: 00413094 Preamp: Dynamic

Figure A-4: Spectrum analyzer plot from site C in Tempe, AZ.

Spectrum Analyzer

Site D - Apache Junction, AZ



CF: 1957.5 MHz SPAN: 15.00 MHz Attenuation: Dynamic
RBW: 100 Hz VBW: 100 Hz Detection: RMS Average
MaxHold: ON
Min Sweep Time: 1.00 Milli Sec
Date: 05/03/2004 Time: 14:29:12
Model: MS2711D Serial #: 00413094 Preamp: Dynamic

Figure A-5: Spectrum analyzer plot from site D in Apache Junction, AZ.

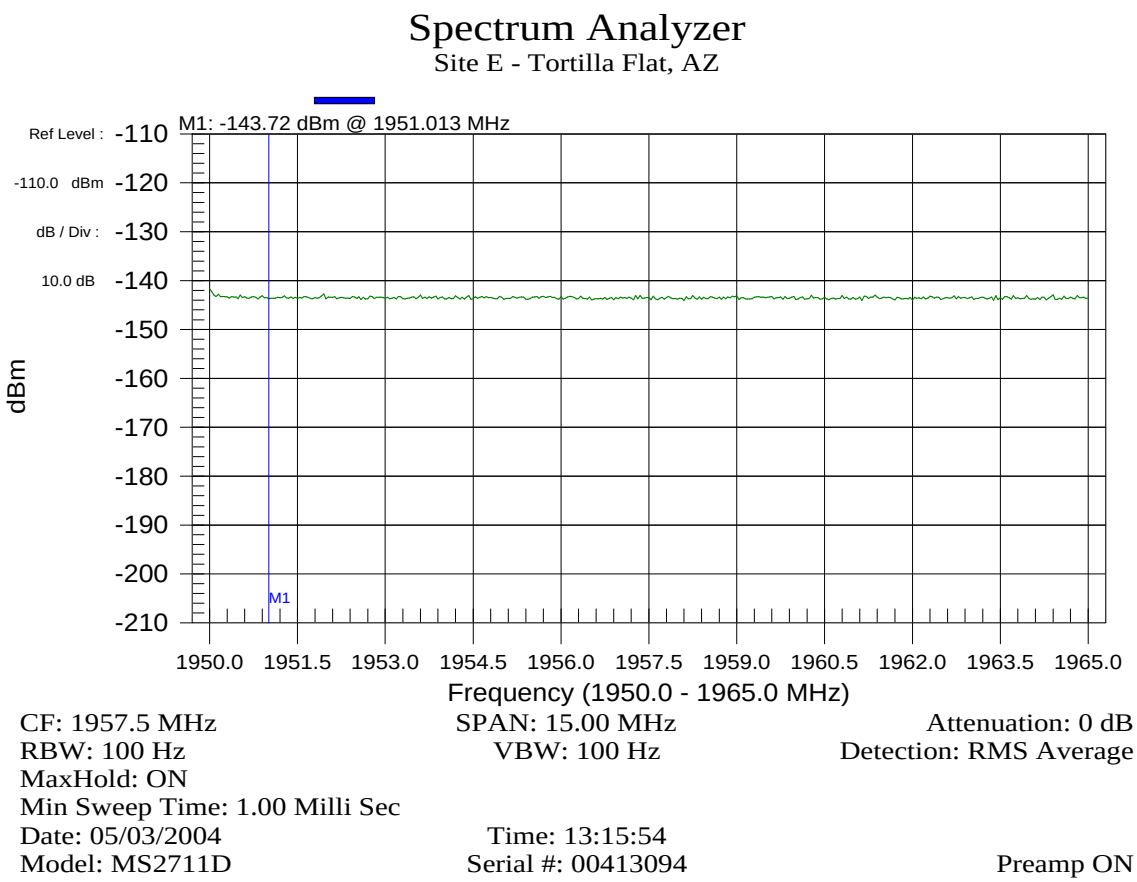


Figure A-6: Spectrum analyzer plot from site E in Tortilla Flat, AZ.