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March 25, 2015

VIA ELECTRONIC FILING

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

**Re: RM-11738
Notice of *Ex Parte* Presentation**

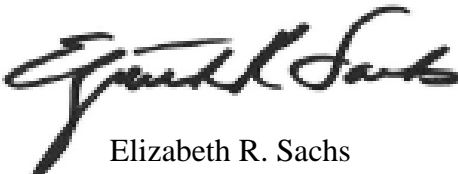
Dear Ms. Dortch:

On March 23, 2015, Mark Crosby, President/CEO of the Enterprise Wireless Alliance (EWA), Morgan O'Brien, Vice-Chairman of Pacific DataVision, Inc. (PDV), Robert Burkhardt of Gnosis LLC and Arif Ansari of Sublime Wireless, Inc., both of whom are technical advisors to EWA/PDV, and undersigned counsel met with the Wireless Telecommunications Bureau and Office of Engineering and Technology staff listed below. With the exception of Mr. Leighton who participated via telephone, the other individuals attended the meeting in person. The parties discussed the technical issues described in the attached presentation that was provided to the FCC attendees. Slide 10 of the presentation has been corrected to reference the Part 27 emission mask. Pursuant to those discussions, EWA/PDV also are providing the attached bibliography of supporting materials for the FCC's consideration.

This letter is being filed electronically, in accordance with Section 1.1206(b) of the Commission's Rules, 47 C.F.R. § 1.1206(b), for inclusion in the record in this proceeding.

Kindly refer any questions or correspondence regarding this matter to the undersigned.

Very truly yours,



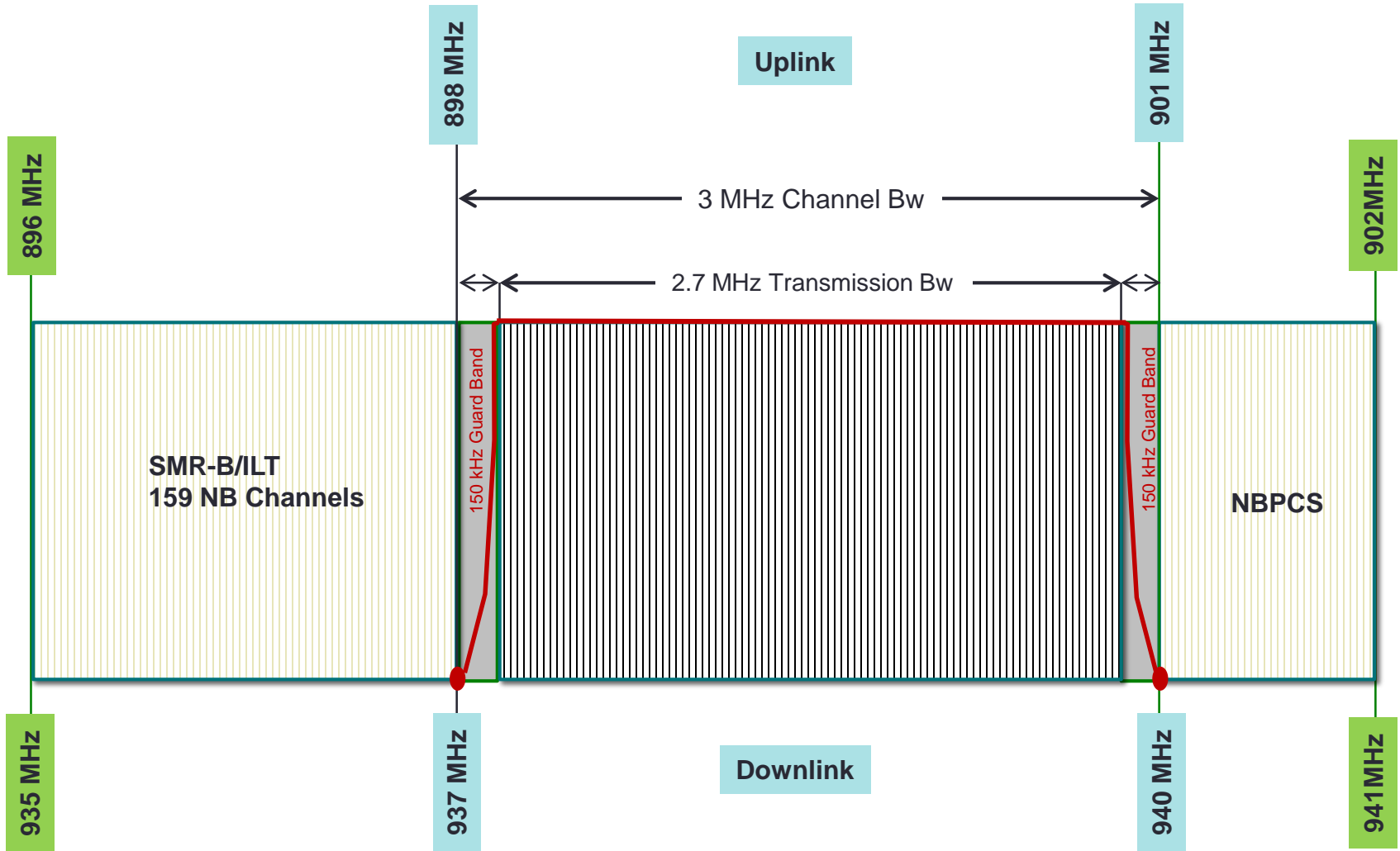
Elizabeth R. Sachs

Attachments

cc: John Leibovitz (via email)
Sean Conway (via email)
Roger Noel (via email)
Scot Stone (via email)
Mel Spann (via email)
Stana Kimball (via email)
Wayne Leighton (via email)
Bruce Romano (via email)
Ira Keltz (via email)

900MHz PEBB
Protecting Adjacent NB Operations
While Delivering
Spectrum Efficient Technology

PEBB Proposed LTE Band Plan & Channel Mask

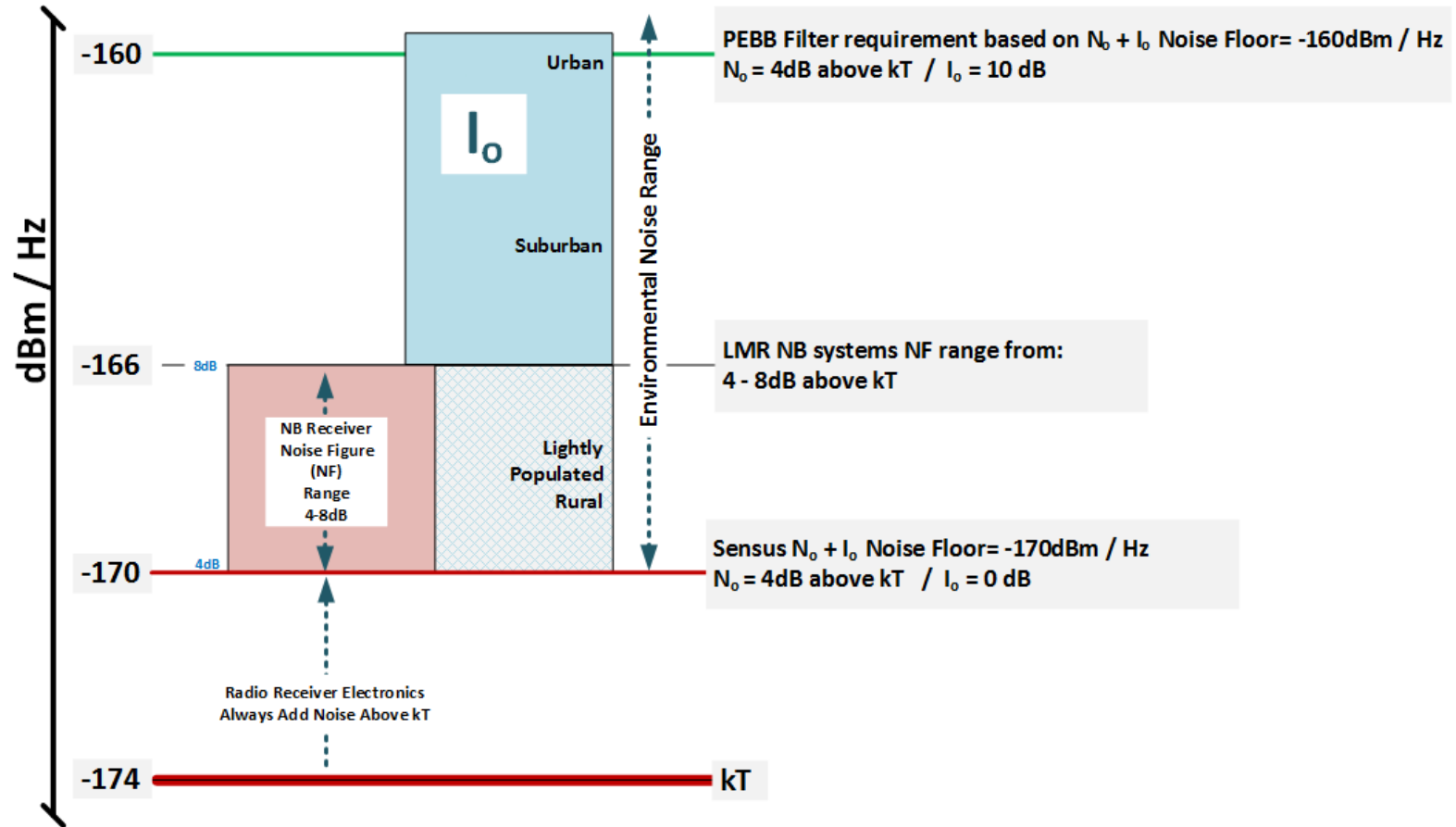


PEBB Adjacent Operations

- Below 937 MHz – NB LMR Voice + Data Systems
 - Typically high-site, high-power facilities
 - Systems configured to provide high-quality, primarily mobile, communications in noise-limited environment; transmissions expected to succeed on first try
 - Equipment designed with interference-rejection capability
- Above 940 MHz – NB “FlexNet” Data Systems
 - Fixed data operations with mix of high/low-site base stations communicating with large numbers of fixed low-power remote endpoints
 - BTS Receivers designed with sensitive receivers to take advantage of low noise floor

WHAT PROTECTS FLEXNET WILL PROTECT LMR

PEBB Attenuation Requirements - Noise Floor Reference



Note:

$I_0 = -160\text{dBm / Hz}$ based on environmental noise values analyzed & normalized from government sponsored studies in the U.S., England and the EU

$N_0 = \text{Noise Figure} + kT$ / For this analysis is considered the same as “Thermal Noise”

PEBB Out of Band Emission (OOBE) Challenges

- Adjacent Narrowband (NB) Technologies and Systems
 - NB PCS – Metering Systems – AMI
 - Railroads - Advanced Train Control Systems - ATCS
 - Utilities, Private Enterprise and SMR – NB LMR Systems
- Aggressive attenuation within the assigned LTE internal channel guard band
- Filter technology to meet attenuation requirements
- Reasonable cost and implementable filter solutions

Proposed Technical Specifications - Emissions

UPLINK – Portables, Fixed Endpoints, Mobiles

- On any frequency outside 898-901MHz (UL) emissions shall be attenuated below the transmitting power (P) by a factor of at least $55+10\log(P)$ dB in a 30kHz segment

DOWNLINK – Base Station and Fixed

- On any frequency outside 937-940MHz (DL) emissions shall be attenuated below the transmitting power (P) by a factor of at least $73+10\log(P)$ dB in a 30kHz segment

Advanced Filter Technology

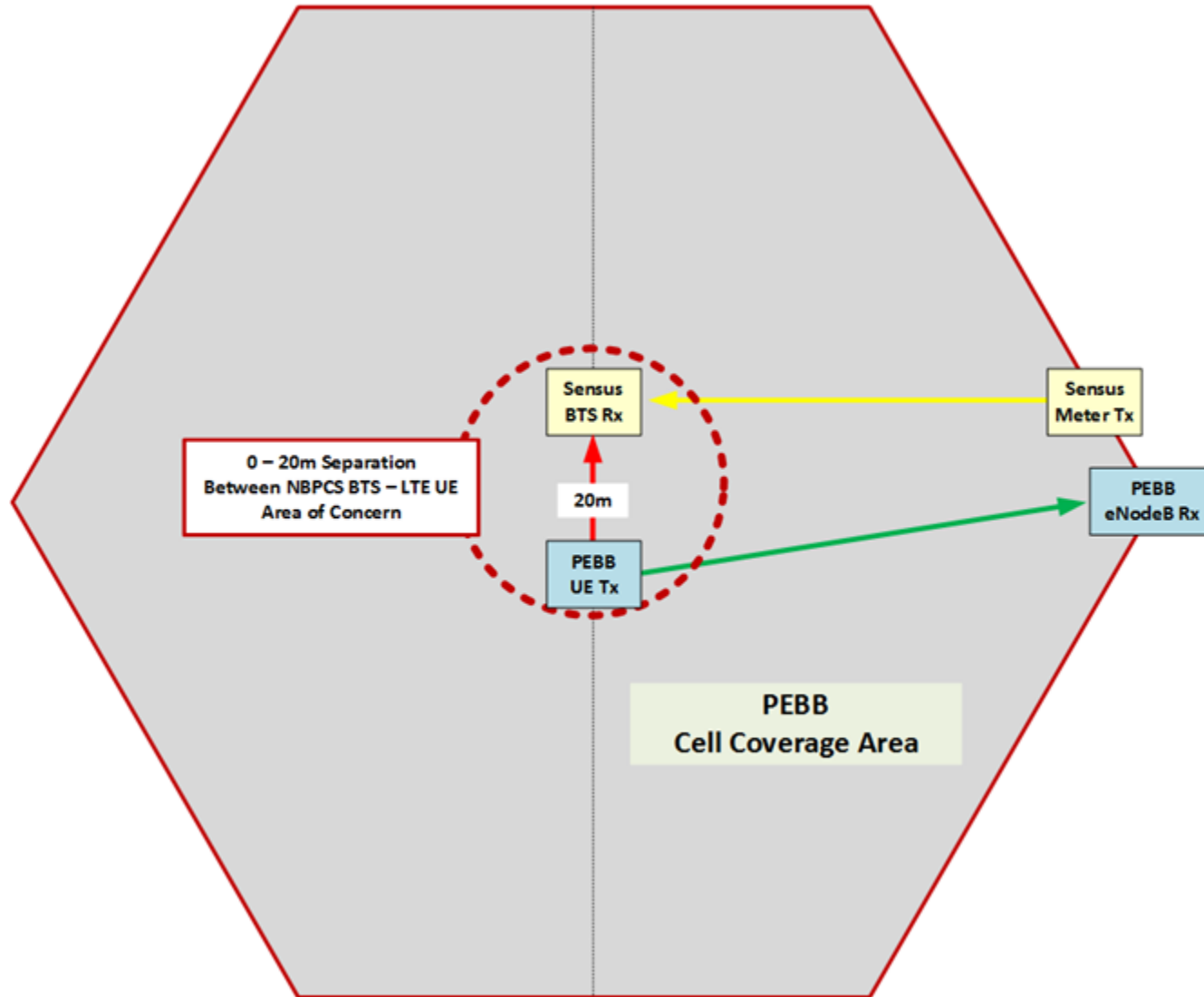
BTS – eNodeB

- Proposed specifications exceed the most stringent current FCC emission rules
- Supplier filter solution simulations prove feasibility
- Production design specification complete
- Production filters available by 1Q2016

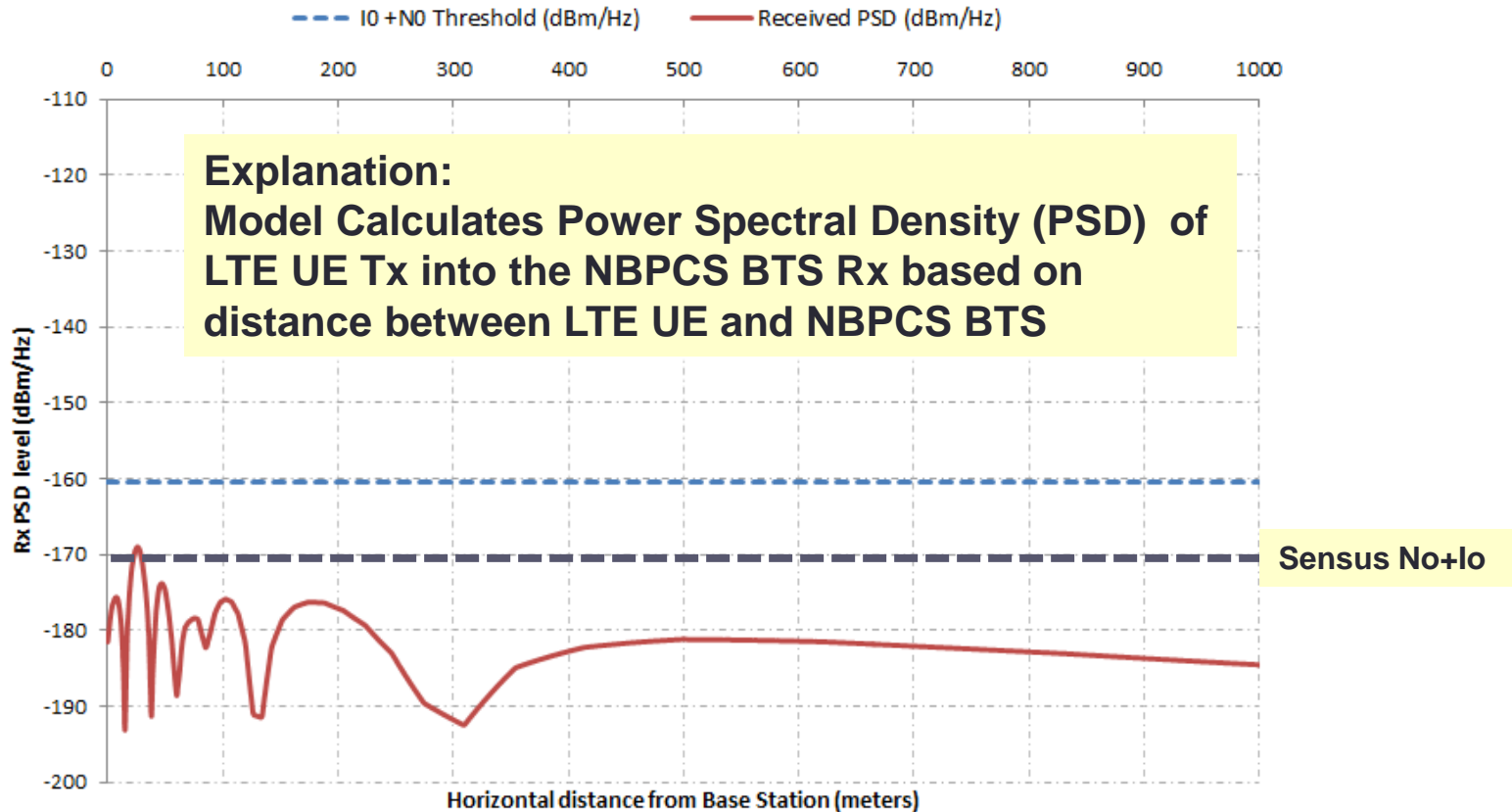
UE – Handheld Device

- Proposed specifications match FCC BC 26 rules
- Filter solutions to meet BC26 rules commercially available

Sensus Expressed Concern Use Case: Classic Near-Far Challenge



UE OOB Filter Resolution Specification

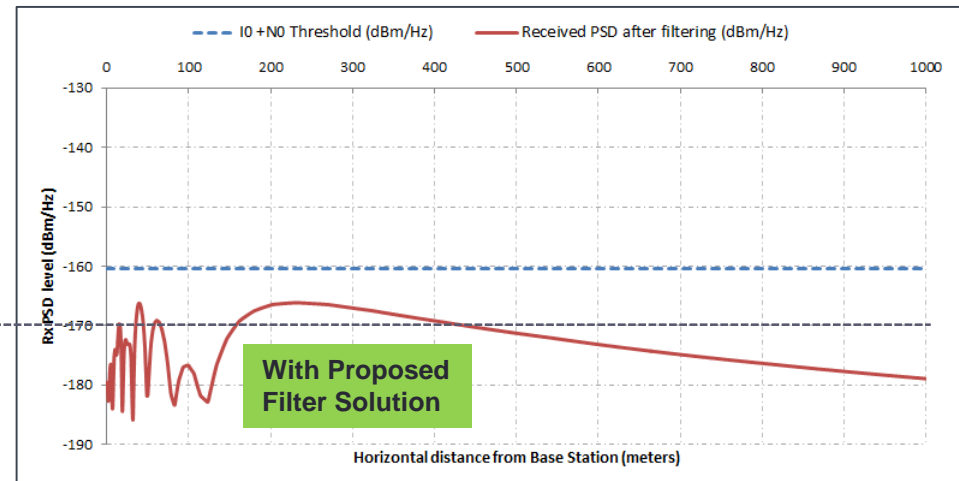
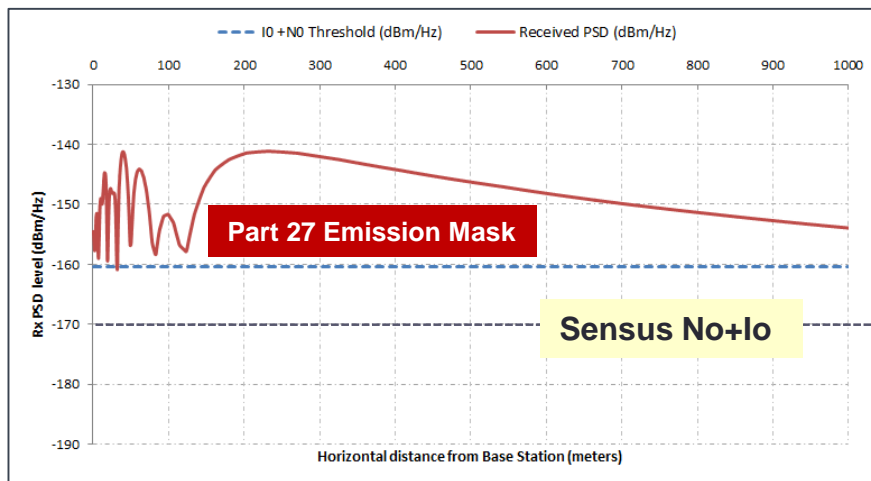


PEBB UE emission mask referenced to $N_o + I_o$ of -160dBm/Hz

BTS OOB Filter Resolution Specification

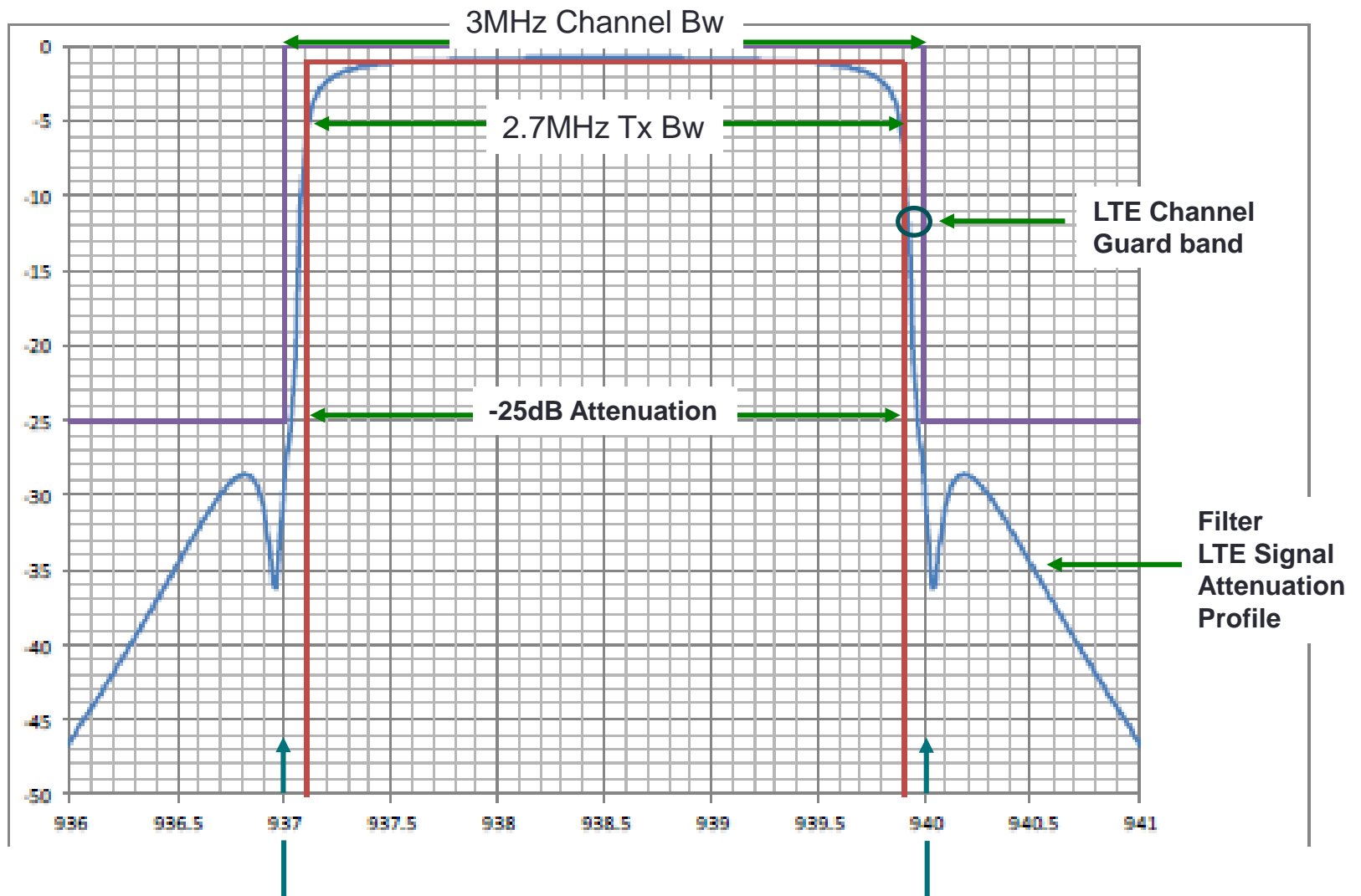
Explanation:

Model Calculates Power Spectral Density (PSD) of LTE eNodeB Tx into the NBPCS UE Rx based on distance between LTE eNodeB and NBPCS UE/End Point



PEBB BTS filter referenced to $N_o + I_o$ of -160dBm/Hz

BTS – eNodeB Emission Mask



Emission Specification Comparison

DOWNLINK - eNodeB					
Rule Name	License Allocation	OOBE	Unit	OET Prescribed Measurement RBW	Normalized To Value 30 KHz RBW
3GPP TS 36.104 - 6.6.3.1	N/A	-5	dBm	100 kHz	40 +10 log(P)
FCC Sections 22.917 / 27.53 (c)	CMRS BC 12 / 13 / 17	-43	dBW	100 kHz	48 +10 log(P)
FCC Sections 90.210 / 90.691	CMRS BC 26	-50	dBW	100 kHz	55 +10 log(P)
PEBB Proposed	TBD		25dB greater than Section 27.53 (c)	100 kHz	73 +10 log(P)
UPLINK - UE					
3GPP TS 36.101 - 6.6.3.1	N/A	-13	dBm	30 kHz	43 +10 log(P)
FCC Parts 22.917 / 27.53 (c)	CMRS BC 12 / 13 / 17	-43	dBW	100 kHz	48 +10 log(P)
FCC Parts 90.210 / 90.691	CMRS BC 26	-50	dBw	100 kHz	55 +10 log(P)
PEBB Proposed (Same as Section 90.691)	TBD	-50	dBw	100 kHz	55 +10 log(P)

Providing Comparable Facilities

Channel Spacing

Impact on system coverage of realigning NB incumbents into 2X2 MHz allocation:

- All incumbents entitled to fully comparable facilities
- ULS identifies only 32 900 MHz sites in the U.S. with > 20 channels
- Closer channel spacing addressed today through use of improved combiners, including in 800 MHz rebanding
- Current products permit spacing as close as 100kHz with insertion loss of -4.2db
- If combiners alone don't achieve comparable coverage, other methods can be implemented, including:
 - replacement of coaxial antenna cable with fiber
 - replacement of antennas / tower top amplifiers
 - increase in output power of base stations
 - additional sites, including any increased operating costs

BIBLIOGRAPHY

3x3MHz Utility Broadband -

1. Communication Networks for Smart Grids, Sec 7.2.2, Table 7.1 & 7.2
Springer Books
ISSN 1617-7975 Computer Communications and Networks
ISBN 978-1-4471-6301-5
2. Long Term Evolution in Bullets, Sec 17.1, Tables 101, 102,103,104,105,106
2nd Edition, Copyright 2010

-160dBm Reference Noise Floor – $N_o + I_o$

1. IEEE 473 1985 -
IEEE Recommended Practice for an Electromagnetic Site Survey (10 kHz to 10 GHz)
2. World Metrological Organization
COMMISSION FOR BASIC SYSTEMS STEERING GROUP ON RADIO FREQUENCY COORDINATION
Results of Ambient RF Environment and Noise Floor Measurements Taken in the U.S. in 2004 and 2005
3. Man Made Noise in Our Living Environment
International Union of Radio Science
No. 334, September 2010
4. CEPT REPORT 19 - Revision 10/30/08
Report from CEPT to the European Commission
in response to the mandate to develop least restrictive technical
conditions for frequency bands addressed in the context of WAPECS

Standards & Rules

3GPP –

TS 36.101 V12.4.0

TS 25.201 V12.4.0

FCC

Section 22.917

Section 27.53(c)

Section 90.210

Section 90.691

Motorola Interference Technical Appendix

Issue 1.41, February 2002

Note:

Studies to determine the -160dBm reference noise floor were difficult to find. Publically available studies deliver mean or median values from a limited amount of samples and some cases had to be extrapolated for this analysis to develop a generalized threshold for use in modeling and determining a baseline ceiling reference $N_o + I_o$ value.