

ENGINEERING NARRATIVE
IN SUPPORT OF APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT
FOR INCENTIVE AUCTION REASSIGNMENT CHANNEL

Prepared for

CMCG PUERTO RICO, LLC

WOST CH 20 Facility ID 60357 50 kW DA RC 414 M AMSL

MAYAGUEZ, PUERTO RICO

NOVEMBER 2017

Summary

CMCG Puerto Rico, LLC ("CMCG") specifies herein its proposed maximized post-auction CH 20 transmission facilities. The proposed facility is based on operation from a new tower site carrying FCC Tower Registration 1010409. The tower proposed to support the TV antenna is 110 meters AGL with appurtenances. The proposed antenna is an elliptically polarized, slot type, with a horizontal plane radiation pattern similar to the replication pattern. This antenna replaces an existing horizontal only polarized slot antenna. At this site and RC AMSL of 52 meters the proposed ERP is 50 Kw as compared to the currently authorized 47.7 Kw ERP as specified in FCC file number 0000028147. The entire community boundary of Mayaguez, Puerto Rico is located well inside the city grade contour.

Attached herein is the TVStudy version 2.2.3 output which demonstrates that the proposed facility will cause no impermissible interference to any station and the proposed population is 105.4 percent of the baseline population.

Environmental

The proposed antenna system is an Alive Telecom model ATC-BCE414BR-VP1-20, elliptically polarized, UHF, slot type, TV antenna. The radiation center is 52 meters above ground. Utilizing formula 10 OF OET Bulletin No. 65, Edition 97-01, a value F of 0.1 has been used to calculate the power density 2 meters above ground. The maximum power density is 8.68 microwatts/cm squared calculated for an ERP of 50,000 watts H. polarization and 15,000 watts V. polarization. This value is 2.6% of the General Population exposure per section 1.1310. Based on this analysis it is believed that the proposed facility follows OET-65 Guidelines.

The applicant will reduce power or cease transmission as required to meet FCC OET-65 Worker Safety Guidelines.

TVSTUDY VERSION 2.2.3 Allocation Study Using LMS database dated 10/23/2017

WOST CH 20 MAYAGUEZ, PUERTO RICO

Study created: 2017.10.26 13:07:51

Study build station data: LMS TV 2017-10-23 (14)

Proposal: WOST D20 DT CP MAYAGUEZ, PR
File number: BLANK0000028147
Facility ID: 60357
Station data: User record
Record ID: 132
Country: U.S.
Zone: II

Stations affected by proposal:

Call	Chan	Svc	Status	City, State	File Number	Distance
WQTO	D19	DD	CP	PONCE, PR	BLANK0000028318	53.5 km
WQTO	D19	(D25)DD	BL	PONCE, PR	DTVBL2175	53.5
WJPX	D21	DT	LIC	SAN JUAN, PR	BLANK0000030022	141.2

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D20
Latitude: 18 18 44.00 N (NAD83)
Longitude: 67 11 29.00 W
Height AMSL: 414.0 m
HAAT: 367.0 m
Peak ERP: 50.0 kW
Antenna: ATC-BCE414BR-VP1-20 95.0 deg
Elev Pattn: Generic
Elec Tilt: 1.00

39.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	27.5 kW	392.4 m	80.7 km
45.0	42.6	317.9	77.2
90.0	3.32	251.5	58.7
135.0	29.3	337.8	76.7
180.0	38.5	414.0	84.2
225.0	3.98	414.0	69.4
270.0	1.00	411.7	60.8
315.0	2.23	382.8	64.0

Database HAAT does not agree with computed HAAT

Database HAAT: 367 m Computed HAAT: 365 m

**Proposal service area extends beyond baseline plus 1.0%
Proposal service area population is more than 95.0% of baseline

Distance to Canadian border: 2464.9 km

Distance to Mexican border: 3169.2 km

Conditions at FCC monitoring station: Santa Isabel PR
Bearing: 111.5 degrees Distance: 92.7 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 311.9 degrees Distance: 4363.8 km

No land mobile station failures found

Study cell size: 2.00 km
Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%
Maximum new IX to LPTV: 2.00%

Proposal receives 5.06% interference from scenario 1
Proposal receives 5.06% interference from scenario 2
No IX check failures found.

WOST CH 20 MAYAGUEZ, PUERTO RICO TVIX STUDY DETAIL :

tvstudy v2.2.3 (ujVPF2)
Database: 127.0.0.1, Study: BLANK0000028147, Model: Longley-Rice
Start: 2017.10.26 13:08:20

Study created: 2017.10.26 13:07:51

Study build station data: LMS TV 2017-10-23 (14)

Proposal: WOST D20 DT CP MAYAGUEZ, PR
File number: BLANK0000028147
Facility ID: 60357

Station data: User record
Record ID: 132
Country: U.S.
Zone: II

Stations affected by proposal:

Call	Chan	Svc	Status	City, State	File Number	Distance
WQTO	D19	DD	CP	PONCE, PR	BLANK0000028318	53.5 km
WQTO	D19 (D25)	DD	BL	PONCE, PR	DTVBL2175	53.5
WJPX	D21	DT	LIC	SAN JUAN, PR	BLANK0000030022	141.2

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D20
Latitude: 18 18 44.00 N (NAD83)
Longitude: 67 11 29.00 W
Height AMSL: 414.0 m
HAAT: 367.0 m
Peak ERP: 50.0 kW
Antenna: ATC-BCE414BR-VP1-20 95.0 deg
Elev Pattn: Generic
Elec Tilt: 1.00

39.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	27.5 kW	392.4 m	80.7 km
45.0	42.6	317.9	77.2
90.0	3.32	251.5	58.7
135.0	29.3	337.8	76.7
180.0	38.5	414.0	84.2
225.0	3.98	414.0	69.4
270.0	1.00	411.7	60.8
315.0	2.23	382.8	64.0

Database HAAT does not agree with computed HAAT

Database HAAT: 367 m Computed HAAT: 365 m

**Proposal service area extends beyond baseline plus 1.0%
 Proposal service area population is more than 95.0% of baseline

Distance to Canadian border: 2464.9 km

Distance to Mexican border: 3169.2 km

Conditions at FCC monitoring station: Santa Isabel PR
 Bearing: 111.5 degrees Distance: 92.7 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
 Bearing: 311.9 degrees Distance: 4363.8 km

No land mobile station failures found

Study cell size: 2.00 km
 Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%
 Maximum new IX to LPTV: 2.00%

 Interference to BLANK0000028318 CP, scenario 1

Desired:	Call WQTO	Chan D19	Svc DD	Status CP	City, State PONCE, PR	File Number BLANK0000028318	Distance
Undesireds:	WOST	D20	DT	BL	MAYAGUEZ, PR	DTVBL60357	53.4 km
	WOST	D20	DT	CP	MAYAGUEZ, PR	BLANK0000028147	53.5
	WECN	D18	DT	LIC	NARANJITO, PR	BLCDT20090610ABG	56.1
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
30324.6	2,864,201	28508.0	1,923,424	27853.3	1,902,128	27581.9 1,900,702	0.97 0.07
Undesired		Total IX		Unique IX, before		Unique IX, after	
WOST D20 DT BL		614.7	17,342	574.8	17,342		
WOST D20 DT CP		894.0	18,768			846.1 18,768	
WECN D18 DT LIC		79.9	3,954	40.0	3,954	32.0 3,954	

Interference to DTVBL2175 BL, scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance		
Desired:	WQTO	D19	DD	BL	PONCE, PR	DTVBL2175			
Undesireds:	WOST	D20	DT	BL	MAYAGUEZ, PR	DTVBL60357	53.4 km		
	WOST	D20	DT	CP	MAYAGUEZ, PR	BLANK0000028147	53.5		
	WECN	D18	DT	LIC	NARANJITO, PR	BLCDT20090610ABG	56.1		
Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
30328.7	2,864,201	28516.0	1,926,216	27861.3	1,905,022	27590.0	1,903,946	0.97	0.06
Undesired				Total IX	Unique IX, before	Unique IX, after			
WOST	D20	DT	BL	614.7	17,240	574.8	17,240		
WOST	D20	DT	CP	894.0	18,316		846.1	18,316	
WECN	D18	DT	LIC	79.9	3,954	40.0	3,954	32.0	3,954

Interference to BLANK0000030022 LIC, scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance		
Desired:	WJPX	D21	DT	LIC	SAN JUAN, PR	BLANK0000030022			
Undesireds:	WOST	D20	DT	BL	MAYAGUEZ, PR	DTVBL60357	141.0 km		
	WOST	D20	DT	CP	MAYAGUEZ, PR	BLANK0000028147	141.2		
	WZVI	D21	DT	CP	CHARLOTTE AMALIE, VI	BLANK0000027488	97.9		
	WSJN-CD	D22	DC	CP	SAN JUAN, PR	BLANK0000028045	33.1		
Service area		Terrain-limited		IX-free, before		IX-free, after		Percent	New IX
40275.6	3,254,481	39018.8	3,008,658	38866.9	2,990,987	38862.8	2,990,958	0.01	0.00
Undesired				Total IX	Unique IX, before		Unique IX, after		
WOST	D20	DT	BL	12.0	871	12.0	871		
WOST	D20	DT	CP	16.0	900		16.0	900	
WZVI	D21	DT	CP	8.0	0	8.0	0	8.0	0
WSJN-CD	D22	DC	CP	131.9	16,800	131.9	16,800	131.9	16,800

Interference to BLANK0000030022 LIC, scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WJPX	D21	DT	LIC	SAN JUAN, PR	BLANK0000030022	
Undesireds:	WOST	D20	DT	BL	MAYAGUEZ, PR	DTVBL60357	141.0 km
	WOST	D20	DT	CP	MAYAGUEZ, PR	BLANK0000028147	141.2

WZVI	D21	DT	CP	CHARLOTTE AMALIE, VI	BLANK0000027488	97.9
WSJN-CD	D22	DC	BL	SAN JUAN, PR	DTVBL48239	33.1

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
40275.6 3,254,481	39018.8 3,008,658	38866.9 2,990,987	38862.8 2,990,958	0.01 0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
WOST D20 DT BL	12.0 871	12.0 871	
WOST D20 DT CP	16.0 900		16.0 900
WZVI D21 DT CP	8.0 0	8.0 0	8.0 0
WSJN-CD D22 DC BL	131.9 16,800	131.9 16,800	131.9 16,800

Interference to BLANK0000030022 LIC, scenario 3

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WJPX	D21	DT	LIC	SAN JUAN, PR	BLANK0000030022	
Undesireds:	WOST	D20	DT	BL	MAYAGUEZ, PR	DTVBL60357	141.0 km
	WOST	D20	DT	CP	MAYAGUEZ, PR	BLANK0000028147	141.2
	WZVI	D21	DT	BL	CHARLOTTE AMALIE, VI	DTVBL83270	97.9
	WSJN-CD	D22	DC	CP	SAN JUAN, PR	BLANK0000028045	33.1

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
40275.6 3,254,481	39018.8 3,008,658	38866.9 2,990,987	38862.8 2,990,958	0.01 0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
WOST D20 DT BL	12.0 871	12.0 871	
WOST D20 DT CP	16.0 900		16.0 900
WZVI D21 DT BL	8.0 0	8.0 0	8.0 0
WSJN-CD D22 DC CP	131.9 16,800	131.9 16,800	131.9 16,800

Interference to BLANK0000030022 LIC, scenario 4

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WJPX	D21	DT	LIC	SAN JUAN, PR	BLANK0000030022	
Undesireds:	WOST	D20	DT	BL	MAYAGUEZ, PR	DTVBL60357	141.0 km
	WOST	D20	DT	CP	MAYAGUEZ, PR	BLANK0000028147	141.2
	WZVI	D21	DT	BL	CHARLOTTE AMALIE, VI	DTVBL83270	97.9
	WSJN-CD	D22	DC	BL	SAN JUAN, PR	DTVBL48239	33.1

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
40275.6 3,254,481	39018.8 3,008,658	38866.9 2,990,987	38862.8 2,990,958	0.01 0.00

Undesired		Total IX	Unique IX, before	Unique IX, after
WOST D20 DT BL	12.0	871	12.0	871
WOST D20 DT CP	16.0	900		16.0 900
WZVI D21 DT BL	8.0	0	8.0	8.0 0
WSJN-CD D22 DC BL	131.9	16,800	131.9	16,800

Interference to proposal, scenario 1
5.06% interference

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WOST	D20	DT	CP	MAYAGUEZ, PR	BLANK0000028147	
Undesireds:	WQTO	D19	DD	CP	PONCE, PR	BLANK0000028318	53.5 km
	WJPX	D21	DT	LIC	SAN JUAN, PR	BLANK0000030022	141.2

Service area	Terrain-limited	IX-free	Percent IX
16294.3 964,084	15569.3 836,984	14752.3 794,644	5.25 5.06

Undesired	Total IX	Unique IX	Prcnt Unique IX
WQTO D19 DD CP	541.4 29,642	541.4 29,642	3.48 3.54
WJPX D21 DT LIC	275.7 12,698	275.7 12,698	1.77 1.52

Interference to proposal, scenario 2
5.06% interference

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WOST	D20	DT	CP	MAYAGUEZ, PR	BLANK0000028147	
Undesireds:	WQTO	D19	DD	BL	PONCE, PR	DTVBL2175	53.5 km
	WJPX	D21	DT	LIC	SAN JUAN, PR	BLANK0000030022	141.2

Service area	Terrain-limited	IX-free	Percent IX
16294.3 964,084	15569.3 836,984	14752.3 794,644	5.25 5.06

Undesired	Total IX	Unique IX	Prcnt Unique IX
WQTO D19 DD BL	541.4 29,642	541.4 29,642	3.48 3.54
WJPX D21 DT LIC	275.7 12,698	275.7 12,698	1.77 1.52

60357	BLCDT20090813AAM	WOST	20	MAYAGUEZ	PR	DT	13574.2	921993	12913.3	801692	12204.5	753684
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Interference free population is 105.4% of the baseline population.

Conclusion

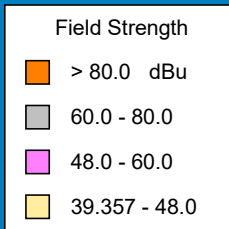
Based on the information supplied herein, and accompanying application for construction permit, it is believed that the proposed facilities meet all applicable FCC requirements for modification of construction permit.

The foregoing was prepared on behalf of CMCG Puerto Rico, LLC by Clarence M. Beverage of *Communications Technologies, Inc.*, Marlton, New Jersey, whose qualifications are a matter of record with the Federal Communications Commission. The undersigned certifies, under penalty of perjury, that the statements herein are true and correct of his own knowledge, except such statements made on information and belief, and as to these statements he believes them to be true and correct.

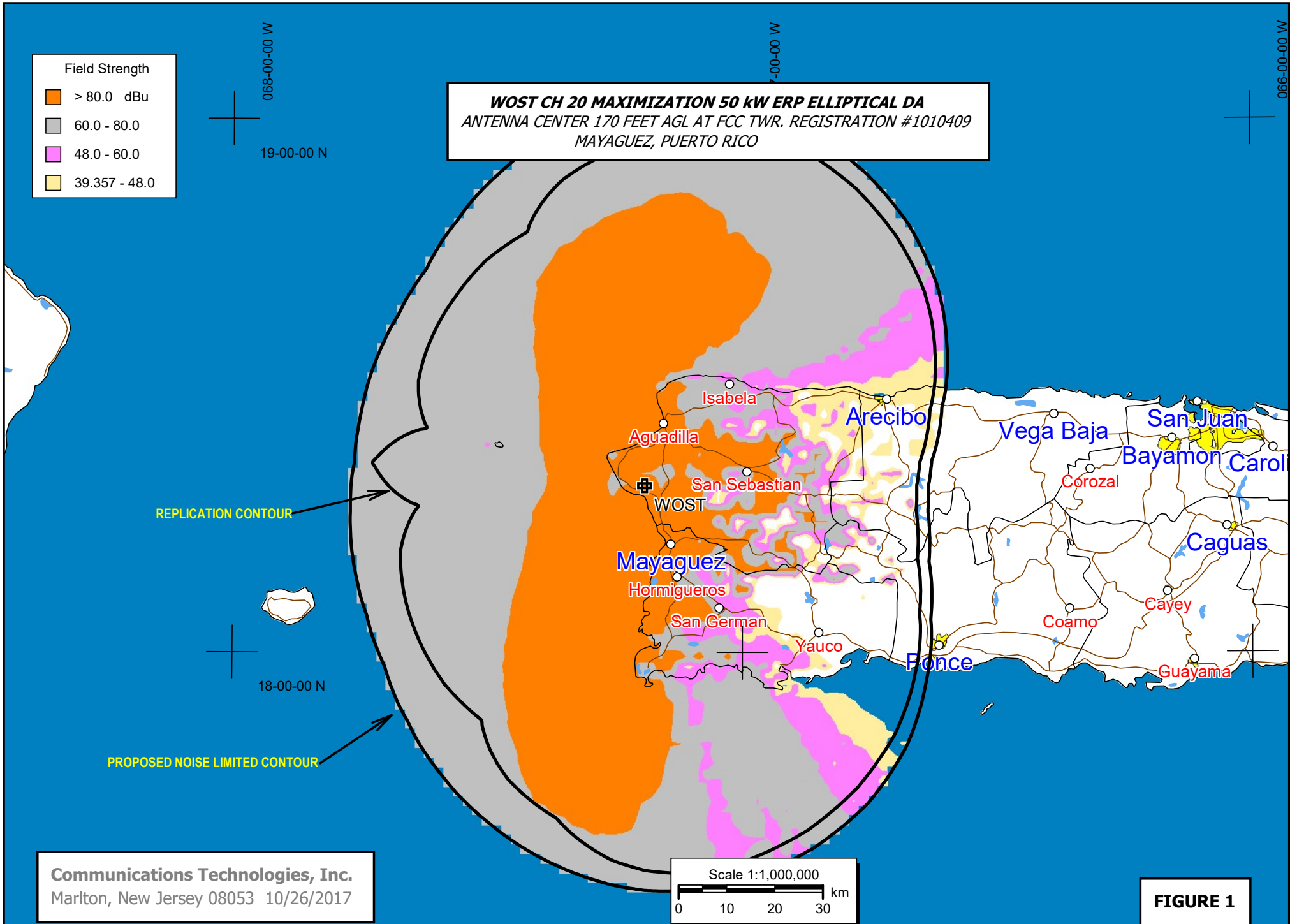


By _____

Clarence M. Beverage
for Communications Technologies, Inc.
Marlton, New Jersey
November 1, 2017



WOST CH 20 MAXIMIZATION 50 kW ERP ELLIPTICAL DA
 ANTENNA CENTER 170 FEET AGL AT FCC TWR. REGISTRATION #1010409
 MAYAGUEZ, PUERTO RICO



Communications Technologies, Inc.
 Marlton, New Jersey 08053 10/26/2017

FIGURE 1