HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
9500 GREENWOOD AVE. N.
SEATTLE, WASHINGTON 98103

THOMAS M. ECKELS, PE
STEPHEN S. LOCKWOOD, PE
DAVID J. PINION, PE
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE

JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
CONSULTANTS

TELEPHONE (206) 783-9151
FACSIMILE (206) 789-9834
E-MAIL hatdaw@hatdaw.com

MAURY L. HATFIELD, PE
(1942-2009)
PAUL W. LEONARD, PE
(1925-2011)

Engineering Statement
Displacement of W39DP-D
Channel 32 at Christiansted, VI
April 2020

I. Background

This Engineering Statement has been prepared on behalf of V.I. Christian Ministries ("VICM"), permittee of digital LPTV station W39DP-D at Christiansted, VI. The translator is currently authorized to operate on a channel above Channel 36, which will be the highest channel remaining for terrestrial television broadcasting per the results of the 2017 spectrum auction. Accordingly, VICM is filing this displacement application.

II. Interference Study

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause interference to any authorized or pending proposed facilities. This study was performed using the Commission's TVStudy software.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations. Based on the foregoing interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Study created: 2020.04.15 14:20:31

Study build station data: LMS TV 2020-04-15

```
    Proposal: CSTED32 D32 LD APP CHRISTIANSTED, VI
 File number: CSTED32
 Facility ID: 125739
Station data: User record
   Record ID: 956
     Country: U.S.
```

Build options:
Protect pre-transition records not on baseline channel

Search options:
Non-U.S. records included

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	W29CB	N29	TX	LIC	ST. THOMAS, VI	BLTTL19971105II	69.1 km
No	W31DV-D	D31	LD	LIC	GUAYAMA, PR	BLANK0000007268	140.9
No	W31DV-D	D31	LD	CP	GUAYAMA, PR	BLANK0000059669	147.4
No	WNJX-TV	D31	DT	CP	MAYAGUEZ, PR	BLANK0000029719	235.1
No	W33DD-D	D31	LD	CP	TUTU, ST THOMAS, VI	BLANK0000053904	68.7
Yes	W32DV-D	D32	LD	LIC	ARROYO, PR	BLANK0000010684	140.9
Yes	WIVE-LP	D32-	LD	CP	CEIBA, PR	BLANK0000072008	109.0
Yes	W23EM-D	D32	LD	CP	CEIBA, PR	BLANK0000073718	141.0
Yes	WIPM-TV	D32	DT	CP	MAYAGUEZ, PR	BLANK0000024551	235.1
No	W32DZ-D	D32	LD	LIC	MAYAGUEZ, PR	BLDTL20140916ACJ	259.3
No	W28EQ-D	N32+	TX	LIC	UTUADO, PR	BLTT19890703IC	212.0
No	W44DH-D	D33	LD	CP	CAGUAS, PR	BLANK0000053906	141.0
No	WRUA	D33	DT	LIC	FAJARDO, PR	BLCDT20090610ABH	122.0
No	WJWN-TV	D33	DT	CP	SAN SEBASTIAN, PR	BLANK0000027870	235.1
No	W34DY-D	D33	LD	CP	VIEQUES, PR	BLANK0000071836	109.0
No	W33DD-D	D33	LD	LIC	TUTU, ST THOMAS, VI	BLANK0000010483	68.7

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

```
    Channel: D32
       Mask: Stringent
   Latitude:  17 45 13.70 N (NAD83)
  Longitude:  64 47 54.50 W
Height AMSL: 341.0 m
       HAAT: 0.0 m
   Peak ERP: 1.00 kW
    Antenna: Omnidirectional
Elev Pattrn: Generic
  Elec Tilt: 1.00
```

50.5 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	1.00 kW	341.0 m	43.3 km
45.0	1.00	334.5	43.0
90.0	1.00	308.4	41.7
135.0	1.00	334.0	42.9
180.0	1.00	335.3	43.0
225.0	1.00	313.4	42.0
270.0	1.00	257.4	39.4
315.0	1.00	341.0	43.3

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 321 m

Distance to Canadian border: 3010.0 km

Distance to Mexican border: 3427.5 km

Conditions at FCC monitoring station: Santa Isabel PR
Bearing: 279.8 degrees Distance: 169.1 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 311.3 degrees Distance: 4594.1 km

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Study cell size: 1.00 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%

No IX check failures found.
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III. RF Exposure Study

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (37 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 45 and 90 degrees below the horizontal. The calculations in this report assume a worst-case relative field value of 0.500 at these angles. This relative field value yields a worst-case adjusted average effective radiated power of 250 watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density from the proposed facility is calculated to be 6.1 µW/cm², which is 1.6% of 385.3 µW/cm² (the FCC maximum for uncontrolled environments at the Channel 32 frequency).

Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken. The

permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.

April 17, 2020
Erik C. Swanson, P.E.