

ENGINEERING STATEMENT  
IN SUPPORT OF AN APPLICATION FOR  
CONSTRUCTION PERMIT  
FOR THE PROPOSED DIGITAL TV OPERATION OF  
WFQX-DT, CADILLAC, MICHIGAN  
APRIL 2009

This engineering statement has been prepared on behalf of Cadillac Telecasting Co. (“CTC”), licensee of television station WFQX-TV, Cadillac, Michigan and is in support of its application for a construction permit to operate on TV Channel 32 (578-584 MHz) for station’s digital TV operation.

At present WFQX-TV, Facility ID Number 25396, is authorized to operate its analog TV facilities on Channel 33 with 776 kW effective radiated power (ERP) and 297 meters antenna height above average terrain (HAAT) using a non-directional TV antenna. In MB Docket 08-252, RM-11509, the Commission has allotted TV Channel 32 (578-584 MHz) for the DTV operation of WFQX-DT with 175 kW ERP, 426 meters HAAT and a directional TV antenna. CTC is filing the instant application for a construction permit to operate on DTV Channel 32 with 175 kW ERP and 422 meters HAAT. The proposed operation would be with a directional TV antenna which is slightly different than requested with the petition for rule making filed for DTV Channel 32. However, as indicated in the attached map (Figure 1) the proposed 41 dBu contour does not extend the allotted 41 dBu contour in any direction. Therefore, the proposed operation is compatible with the Commission’s allotted facilities and it is believed the proposal does not require further coordination with Canada.

The following information provides pertinent data for the proposed WFQX-DT operation.

Name of the Licensee:	Cadillac Telecasting Co.
Station Location:	MI-Cadillac
Channel:	32

Hours of Operation: Unlimited

Transmitter: Type Accepted

Antenna Type: MCI, 975124-32

Beam Tilt: 1.0 degrees

Antenna Coordinates: North Latitude: 44 deg 08 min 12 sec  
West Longitude: 85 deg 20 min 33 sec

Transmitter output power: As required to achieve authorized ERP

Maximum effective radiated power (Average): 175 kW  
22.43 dBk

Elevation of site above mean sea level: 519.5 meters

Overall height of the tower above ground: 393.3 meters

Height of radiation center above ground (meters): 305 meters

Height of radiation center above mean sea level (meters): 824.5 meters

Height of radiation center above average terrain (meters): 422 meters

Antenna Structure Registration No.: 1002422

**Response to questions listed on the FCC Form 301, Section III-D-DTV**

**Engineering**

**Question 1. (a)**

WFQX-TV is proposing digital television operation on TV Channel 32 as allotted by the Commission in MB Docket No. 08-252, RM-11509.

**Question 1. (d)**

An interference study conducted (see attached Table I) according to the FCC OET Bulletin 69 indicates the proposed WFQX-DT operation would not cause any interference to other DTV stations exceeding the Commission's guidelines.

**Question 1. (e)**

The proposed DTV operation on Channel 32 would serve 506,271 people within the noise limited service area as compared to 512,000 or 98.9% of the predicted population listed in MB Docket No. 08-252.

**Question 2.**

The attached environmental statement demonstrates that there will not be any significant environmental impact from the proposed DTV operation in accordance with 47 C.F.R. Section 73.1307.

**Question 3.**

The attached map shows the proposed WFQX-DT 48 dBu contour will encompass the allotted principal community of Cadillac, Michigan (see Figure 2).

**Question 4.**

The proposed WFQX-DT facility complies with Section 73.1030 of the Commission's rules; therefore, notification to radio astronomy installations, radio receiving installations and FCC monitoring stations is not required.

**Question 5.**

WFQX-DT would be operating from the existing tower which is registered (ASR No. 1002422) by the Commission and no changes are proposed to require a change in the registration.

Table I

TW Census data selected 2000  
 Post Transition Data Base Selected /space/software/cdb/pt\_tvdb.sff

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 04-30-2009 Time: 10:08:03

Record Selected for Analysis

WFQX-TV USERRECORD-01 CADILLAC MI US  
 Channel 32 ERP 175. kW HAAT 422. m RCAMSL 00825 m  
 Latitude 044-08-12 Longitude 0085-20-33  
 Status APP Zone 2 Border  
 Dir Antenna Make usr Model WFQX-NEWDA Beam tilt N Ref Azimuth 135.  
 Last update Cutoff date Docket  
 Comments  
 Applicant

Cell Size for Service Analysis 2.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Facility meets maximum height/power limits

Azimuth (Deg)	ERP (kW)	HAAT (m)	41.0 dBu F(50,90) (km)
0.0	51.504	390.9	82.3
45.0	71.456	422.1	86.3
90.0	140.964	435.5	91.7
135.0	175.000	441.8	93.7
180.0	138.151	407.9	90.1
225.0	69.017	434.8	86.7
270.0	52.170	436.9	84.9
315.0	66.621	407.3	85.0

Evaluation toward Class A Stations

No Spacing violations or contour overlap to Class A stations

Class A Evaluation Complete

SPACING VIOLATION FOUND BETWEEN STATION

WFQX-TV 32 CADILLAC MI USERRECORD01

and station

SHORT TO: WGTU 29 TRAVERSE CITY MI BLCT 20041012AIJ  
 044-44-53 0085-04- 8  
 Req. separation => 24.1 <= 96.6 Actual separation 71.3 Short 25.3( 47.2) km

SHORT TO: WFQX-DR 32 CADILLAC MI BPRM 20080620AOP  
 044-08-12 0085-20-33  
 Req. separation 223.7 Actual separation 0.0 Short 223.7 km

KHANNA & GULL, Inc. - Consulting Engineers

SHORT TO: WACY 32 APPLETON WI BSTA 20090219AAP  
 044-21-30 0087-58-48  
 Req. separation 244.6 Actual separation 212.1 Short 32.5 km

SHORT TO: WACY 32 APPLETON WI BMLCT 19990831LF  
 044-21-30 0087-58-48  
 Req. separation 244.6 Actual separation 212.1 Short 32.5 km

LANDMOBILE SPACING VIOLATIONS FOUND

NONE

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quiet zone

Proposed facility OK toward Table Mountain

Proposed facility is within the Canadian coordination distance  
 Distance to border = 232.5km

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

\*\*\*\*\*

Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN
32	WFQX-TV	CADILLAC MI	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
29	WOMS-CA	MUSKEGON MI	113.6	LIC	BLTTA	-20060926AEA
31	WPXD	ANN ARBOR MI	221.4	CP MOD	BMPCDT	-20080619AHZ
31	WPXD	ANN ARBOR MI	221.4	PLN	DTVPLN	-DTVP1142
32	WBUW	JANESVILLE WI	354.7	LIC	BLCDT	-20040930BHL
32	WBUW	JANESVILLE WI	354.7	PLN	DTVPLN	-DTVP1200
33	WOHO-CA	HOLLAND MI	154.9	CP	BDFCDTA	-20060330AMF
33	WOHO-CA	HOLLAND MI	154.9	APP	BMPDTA	-20080804ADV

%%%

Analysis of Interference to Affected Station 1

Analysis of current record

Channel	Call	City/State	Application	Ref. No.
29	WOMS-CA	MUSKEGON MI	BLTTA	-20060926AEA

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
21	WCMW	MANISTEE MI	91.6	CP	BPEDT	-20080222ABG
21	WCMW	MANISTEE MI	91.6	PLN	DTVPLN	-DTVP0763
21	WCMW	MANISTEE MI	91.6	APP	BMPEDT	-20080617ABS
26	WCMU-TV	MOUNT PLEASANT MI	88.5	CP MOD	BMPEDT	-20080619AFX
26	WCMU-TV	MOUNT PLEASANT MI	88.5	PLN	DTVPLN	-DTVP0952
29	WMAQ-TV	CHICAGO IL	199.9	LIC	BLCDT	-20010531ACY
29	WMAQ-TV	CHICAGO IL	199.9	PLN	DTVPLN	-DTVP1063
29	WTTK	KOKOMO IN	375.1	CP MOD	BMPCDT	-20080620AHB

KHANNA & GULL, Inc. - Consulting Engineers

29	WTTK	KOKOMO IN	375.1	PLN	DTVPLN	-DTVP1064
29	WTTK	KOKOMO IN	325.1	LIC	BLCT	-19880523KI
29	WUHQ-LP	GRAND RAPIDS MI	46.0	LIC	BLTTL	-20030404AAA
29	WGTU	TRAVERSE CITY MI	183.7	CP	BPCDT	-20080619AJY
29	WGTU	TRAVERSE CITY MI	183.7	PLN	DTVPLN	-DTVP1068
29	WGTU	TRAVERSE CITY MI	183.7	LIC	BLCT	-20041012AIJ
29	WGTE-TV	TOLEDO OH	280.8	LIC	BLEDT	-20031110AKO
29	WGTE-TV	TOLEDO OH	280.8	PLN	DTVPLN	-DTVP1081
29	W29DJ	SHEBOYGAN WI	149.3	CP	BPTTL	-20080311ABX
32	WFQX-DR	CADILLAC MI	113.6	APP	BPRM	-20080620AOP
43	WZPX	BATTLE CREEK MI	104.7	LIC	BLCT	-19961017KE
44	WZPX	BATTLE CREEK MI	104.7	LIC	BLCDT	-20020510AAG
44	WZPX	BATTLE CREEK MI	104.7	PLN	DTVPLN	-DTVP1577
32	WFQX-TV	CADILLAC MI	113.6	APP	USERRECORD-01	

Proposed station is beyond the site to nearest cell evaluation distance

#####

Analysis of Interference to Affected Station 2

Analysis of current record

Channel	Call	City/State	Application Ref. No.
31	WPXD	ANN ARBOR MI	BMPCDT -20080619AHZ

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
30	WEYI-TV	SAGINAW MI	97.9	LIC	BLCDT -20040123ASH
30	WEYI-TV	SAGINAW MI	97.9	PLN	DTVPLN -DTVP1105
30	WBNX-TV	AKRON OH	225.1	LIC	BLCDT -20070430AXX
30	WBNX-TV	AKRON OH	225.1	PLN	DTVPLN -DTVP1110
30	WBNX-TV	AKRON OH	225.1	APP	BPCDT -20080619AFL
31	WFLD	CHICAGO IL	299.1	CP	BPCDT -20080616AAN
31	WFLD	CHICAGO IL	299.1	PLN	DTVPLN -DTVP1136
31	WFLD	CHICAGO IL	299.1	LIC	BLCDT -20050606ABF
31	WANE-TV	FORT WAYNE IN	169.5	CP MOD	BMPCDT -20080313AAW
31	WANE-TV	FORT WAYNE IN	169.5	PLN	DTVPLN -DTVP1137
32	WFQX-DR	CADILLAC MI	221.4	APP	BPRM -20080620AOP
32	WFQX-TV	CADILLAC MI	221.4	APP	USERRECORD-01

Proposed station is beyond the site to nearest cell evaluation distance

#####

Analysis of Interference to Affected Station 3

Analysis of current record

Channel	Call	City/State	Application Ref. No.
31	WPXD	ANN ARBOR MI	DTVPLN -DTVP1142

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
30	WEYI-TV	SAGINAW MI	97.9	LIC	BLCDT -20040123ASH
30	WEYI-TV	SAGINAW MI	97.9	PLN	DTVPLN -DTVP1105
30	WBNX-TV	AKRON OH	225.1	LIC	BLCDT -20070430AXX
30	WBNX-TV	AKRON OH	225.1	PLN	DTVPLN -DTVP1110
30	WBNX-TV	AKRON OH	225.1	APP	BPCDT -20080619AFL
31	WFLD	CHICAGO IL	299.1	CP	BPCDT -20080616AAN
31	WFLD	CHICAGO IL	299.1	PLN	DTVPLN -DTVP1136
31	WFLD	CHICAGO IL	299.1	LIC	BLCDT -20050606ABF
31	WANE-TV	FORT WAYNE IN	169.5	CP MOD	BMPCDT -20080313AAW
31	WANE-TV	FORT WAYNE IN	169.5	PLN	DTVPLN -DTVP1137
32	WFQX-DR	CADILLAC MI	221.4	APP	BPRM -20080620AOP

KHANNA & GULL, Inc. - Consulting Engineers

32 WFQX-TV CADILLAC MI 221.4 APP USERRECORD-01

Proposed station is beyond the site to nearest cell evaluation distance

#####

Analysis of Interference to Affected Station 4

Analysis of current record

Channel	Call	City/State	Application	Ref. No.
32	WBUW	JANESVILLE WI	BLCDT	-20040930BHL

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
31	WFLD	CHICAGO IL	200.0	CP	BPCDT	-20080616AAN
31	WFLD	CHICAGO IL	200.0	PLN	DTVPLN	-DTVP1136
31	WFLD	CHICAGO IL	200.0	LIC	BLCDT	-20050606ABF
31	WFXX-DR	WITTENBERG WI	222.9	APP	BPRM	-20080612ADX
31	WFXX	WITTENBERG WI	222.9	PLN	DTVPLN	-DTVP1160
31	WFXX	WITTENBERG WI	222.9	CP MOD	BMPCDT	-20081117ACB
32	WTJR	QUINCY IL	374.9	CP MOD	BMPCDT	-20080919ABT
32	WTJR	QUINCY IL	375.0	PLN	DTVPLN	-DTVP1176
32	WFQX-DR	CADILLAC MI	354.7	APP	BPRM	-20080620AOP
32	WCCO-TV	MINNEAPOLIS MN	367.5	LIC	BLCDT	-20010921ABB
32	WCCO-TV	MINNEAPOLIS MN	367.5	PLN	DTVPLN	-DTVP1180
33	WITI	MILWAUKEE WI	129.2	APP	BMPCDT	-20081204ADM
33	WITI	MILWAUKEE WI	129.2	PLN	DTVPLN	-DTVP1234
33	WITI	MILWAUKEE WI	128.6	CP MOD	BMPCDT	-20080620ANH
32	WFQX-TV	CADILLAC MI	354.7	APP	USERRECORD-01	

Proposal causes no interference

#####

Analysis of Interference to Affected Station 5

Analysis of current record

Channel	Call	City/State	Application	Ref. No.
32	WBUW	JANESVILLE WI	DTVPLN	-DTVP1200

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
31	WFLD	CHICAGO IL	200.0	CP	BPCDT	-20080616AAN
31	WFLD	CHICAGO IL	200.0	PLN	DTVPLN	-DTVP1136
31	WFLD	CHICAGO IL	200.0	LIC	BLCDT	-20050606ABF
31	WFXX-DR	WITTENBERG WI	222.9	APP	BPRM	-20080612ADX
31	WFXX	WITTENBERG WI	222.9	PLN	DTVPLN	-DTVP1160
31	WFXX	WITTENBERG WI	222.9	CP MOD	BMPCDT	-20081117ACB
32	WTJR	QUINCY IL	374.9	CP MOD	BMPCDT	-20080919ABT
32	WTJR	QUINCY IL	375.0	PLN	DTVPLN	-DTVP1176
32	WFQX-DR	CADILLAC MI	354.7	APP	BPRM	-20080620AOP
32	WCCO-TV	MINNEAPOLIS MN	367.5	LIC	BLCDT	-20010921ABB
32	WCCO-TV	MINNEAPOLIS MN	367.5	PLN	DTVPLN	-DTVP1180
33	WITI	MILWAUKEE WI	129.2	APP	BMPCDT	-20081204ADM
33	WITI	MILWAUKEE WI	129.2	PLN	DTVPLN	-DTVP1234
33	WITI	MILWAUKEE WI	128.6	CP MOD	BMPCDT	-20080620ANH
32	WFQX-TV	CADILLAC MI	354.7	APP	USERRECORD-01	

Proposal causes no interference

#####

Analysis of Interference to Affected Station 6

KHANNA & GULL, Inc. - Consulting Engineers

Analysis of current record

Channel	Call	City/State	Application Ref. No.
33	WOHO-CA	HOLLAND MI	BDFCDTA -20060330AMF

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
32	WFQX-DR	CADILLAC MI	154.9	APP	BPRM -20080620AOP
33	WSTR-TV	CINCINNATI OH	419.5	APP	BMPCDT -20080620AHH
33	WSTR-TV	CINCINNATI OH	419.5	PLN	DTVPLN -DTVP1221
33	WSTR-TV	CINCINNATI OH	419.5	CP MOD	BMPCDT -20070720AAM
33	WITI	MILWAUKEE WI	160.9	APP	BMPCDT -20081204ADM
33	WITI	MILWAUKEE WI	160.8	PLN	DTVPLN -DTVP1234
33	WITI	MILWAUKEE WI	161.5	CP MOD	BMPCDT -20080620ANH
34	WHTV	JACKSON MI	129.7	CP MOD	BMPCDT -20070125ACI
34	WHTV	JACKSON MI	125.1	PLN	DTVPLN -DTVP1253
34	WHTV	JACKSON MI	129.7	APP	BPCDT -20080620AGY
34	WISN-TV	MILWAUKEE WI	163.8	LIC	BLCDT -20050412ADP
34	WISN-TV	MILWAUKEE WI	163.8	PLN	DTVPLN -DTVP1275
32	WFQX-TV	CADILLAC MI	154.9	APP	USERRECORD-01

Proposed station is beyond the site to nearest cell evaluation distance

#####

Analysis of Interference to Affected Station 7

Analysis of current record

Channel	Call	City/State	Application Ref. No.
33	WOHO-CA	HOLLAND MI	BMPDTA -20080804ADV

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
32	WFQX-DR	CADILLAC MI	154.9	APP	BPRM -20080620AOP
33	WSTR-TV	CINCINNATI OH	419.5	APP	BMPCDT -20080620AHH
33	WSTR-TV	CINCINNATI OH	419.5	PLN	DTVPLN -DTVP1221
33	WSTR-TV	CINCINNATI OH	419.5	CP MOD	BMPCDT -20070720AAM
33	WITI	MILWAUKEE WI	160.9	APP	BMPCDT -20081204ADM
33	WITI	MILWAUKEE WI	160.8	PLN	DTVPLN -DTVP1234
33	WITI	MILWAUKEE WI	161.5	CP MOD	BMPCDT -20080620ANH
34	WHTV	JACKSON MI	129.7	CP MOD	BMPCDT -20070125ACI
34	WHTV	JACKSON MI	125.1	PLN	DTVPLN -DTVP1253
34	WHTV	JACKSON MI	129.7	APP	BPCDT -20080620AGY
34	WISN-TV	MILWAUKEE WI	163.8	LIC	BLCDT -20050412ADP
34	WISN-TV	MILWAUKEE WI	163.8	PLN	DTVPLN -DTVP1275
32	WFQX-TV	CADILLAC MI	154.9	APP	USERRECORD-01

Proposed station is beyond the site to nearest cell evaluation distance

#####

Analysis of Interference to Affected Station 8

Analysis of current record

Channel	Call	City/State	Application Ref. No.
32	WFQX-TV	CADILLAC MI	USERRECORD-01

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
31	WPXD	ANN ARBOR MI	221.4	CP MOD	BMPCDT -20080619AHZ
31	WPXD	ANN ARBOR MI	221.4	PLN	DTVPLN -DTVP1142
32	WBUW	JANESVILLE WI	354.7	LIC	BLCDT -20040930BHL
32	WBUW	JANESVILLE WI	354.7	PLN	DTVPLN -DTVP1200

Total scenarios = 2

Result key: 1  
 Scenario 1 Affected station 8  
 Before Analysis

Results for: 32A MI CADILLAC USERRECORD01 APP  
 HAAT 422.0 m, ATV ERP 175.0 kW

	POPULATION	AREA (sq km)
within Noise Limited Contour	510404	24616.8
not affected by terrain losses	506296	24412.6
lost to NTSC IX	0	0.0
lost to additional IX by ATV	25	8.0
lost to ATV IX only	25	8.0
lost to all IX	25	8.0

Potential Interfering Stations Included in above Scenario 1

32A WI JANESVILLE BLCDT 20040930BHL LIC

Result key: 2  
 Scenario 2 Affected station 8  
 Before Analysis

Results for: 32A MI CADILLAC USERRECORD01 APP  
 HAAT 422.0 m, ATV ERP 175.0 kW

	POPULATION	AREA (sq km)
within Noise Limited Contour	510404	24616.8
not affected by terrain losses	506296	24412.6
lost to NTSC IX	0	0.0
lost to additional IX by ATV	25	8.0
lost to ATV IX only	25	8.0
lost to all IX	25	8.0

Potential Interfering Stations Included in above Scenario 2

32A WI JANESVILLE DTVPLN DTVP1200 PLN

#####

FINISHED FINISHED FINISHED FINISHED FINISHED FINISHED

## **ENVIRONMENTAL PROTECTION ACT**

Since WFQX-DT will be using its currently licensed tower (ASR No. 1002422), for the DTV operation the environmental concerns listed in Section 1.1307(a) of the Commission's rules are not pertinent; therefore, those issues have not been addressed.

An evaluation has been made to determine compliance with the Commission's specified standards for human exposure to RF fields as set forth in the OET Bulletin No. 65 dated August 1997. For a maximum effective radiated power of 175 kW and a radiation center of 305 meters above ground level, the proposed Channel 32 DTV operation would have a maximum of 2.5 microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ) RF field at 2 meters above the base of tower assuming an antenna field factor of 0.2 in the downward direction.

The Commission's guidelines for Channel 32 are  $1,927 \mu\text{W}/\text{cm}^2$  for the occupational/controlled, and  $385 \mu\text{W}/\text{cm}^2$  for the general population/uncontrolled environment.

The above analysis indicates that members of the public and personnel working around the WFQX-DT tower would not be exposed to RF fields exceeding the Commission's guidelines. With respect to work performed on the tower, WFQX-DT will establish procedures to ensure that workers are not exposed to RF fields above the Commission's guidelines, by reducing or turning off the power, as appropriate.

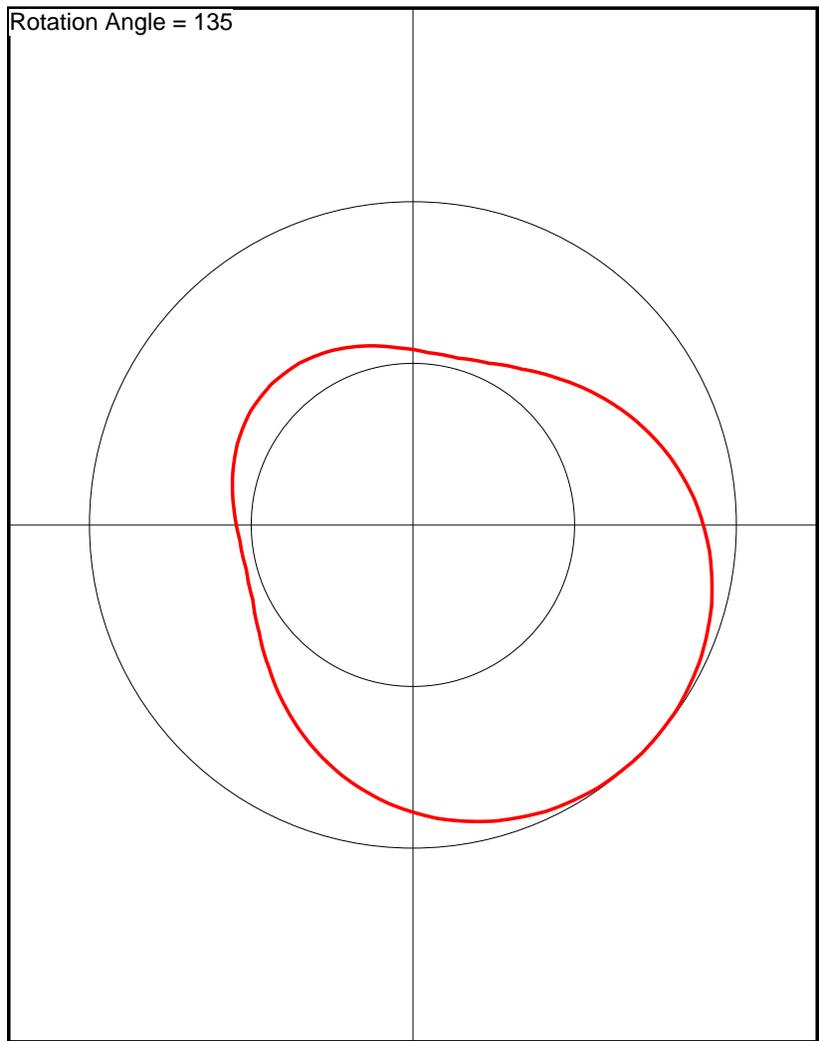
For the reasons stated above, it is believed this proposal complies with Section 1.1307(a) and (b) of the Commission's Rules; therefore, under Section 1.1306, it is categorically excluded from environmental processing.

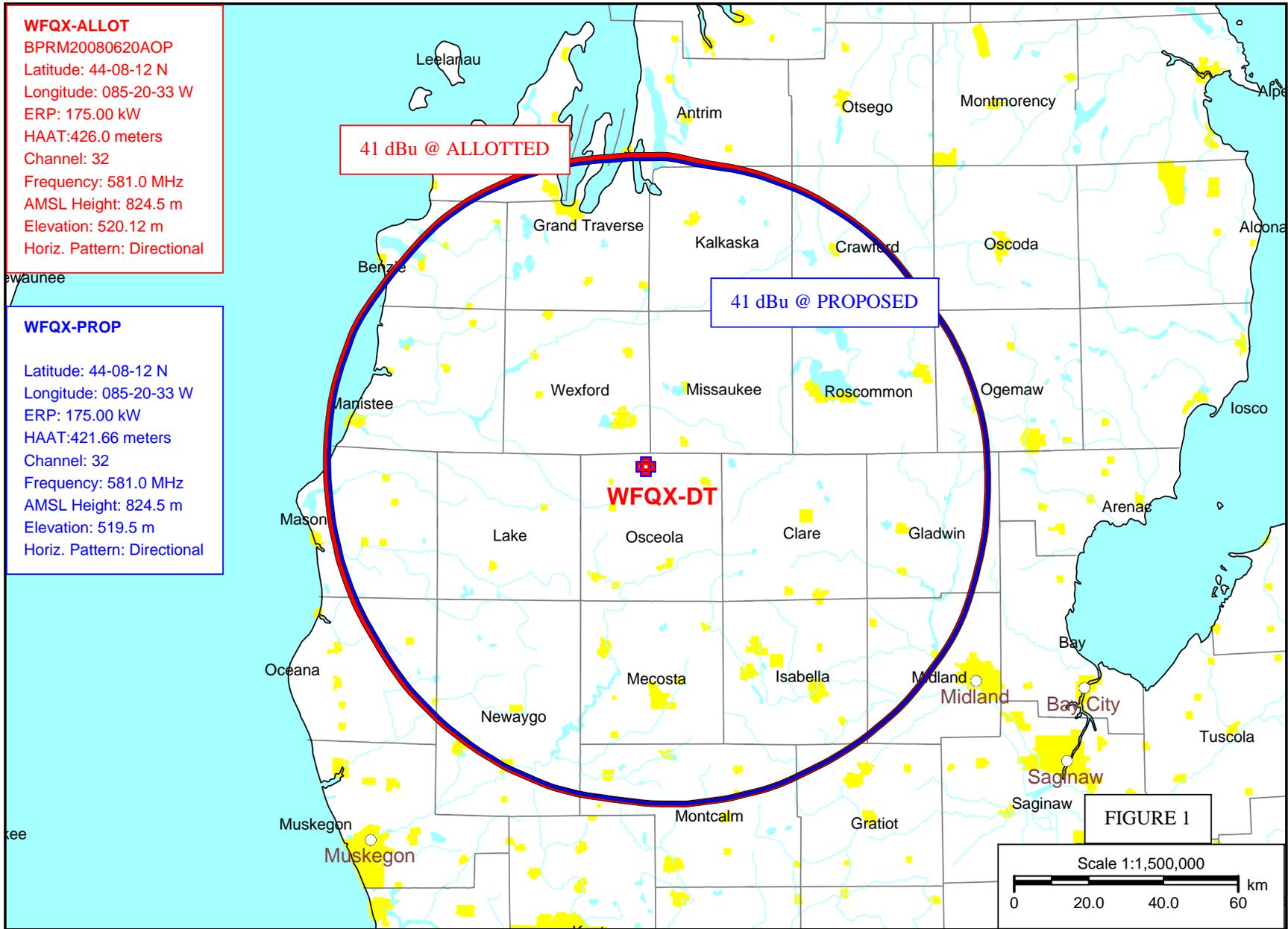
# WFQX-DT Antenna Pattern

Pre-Rotation Antenna Pattern....

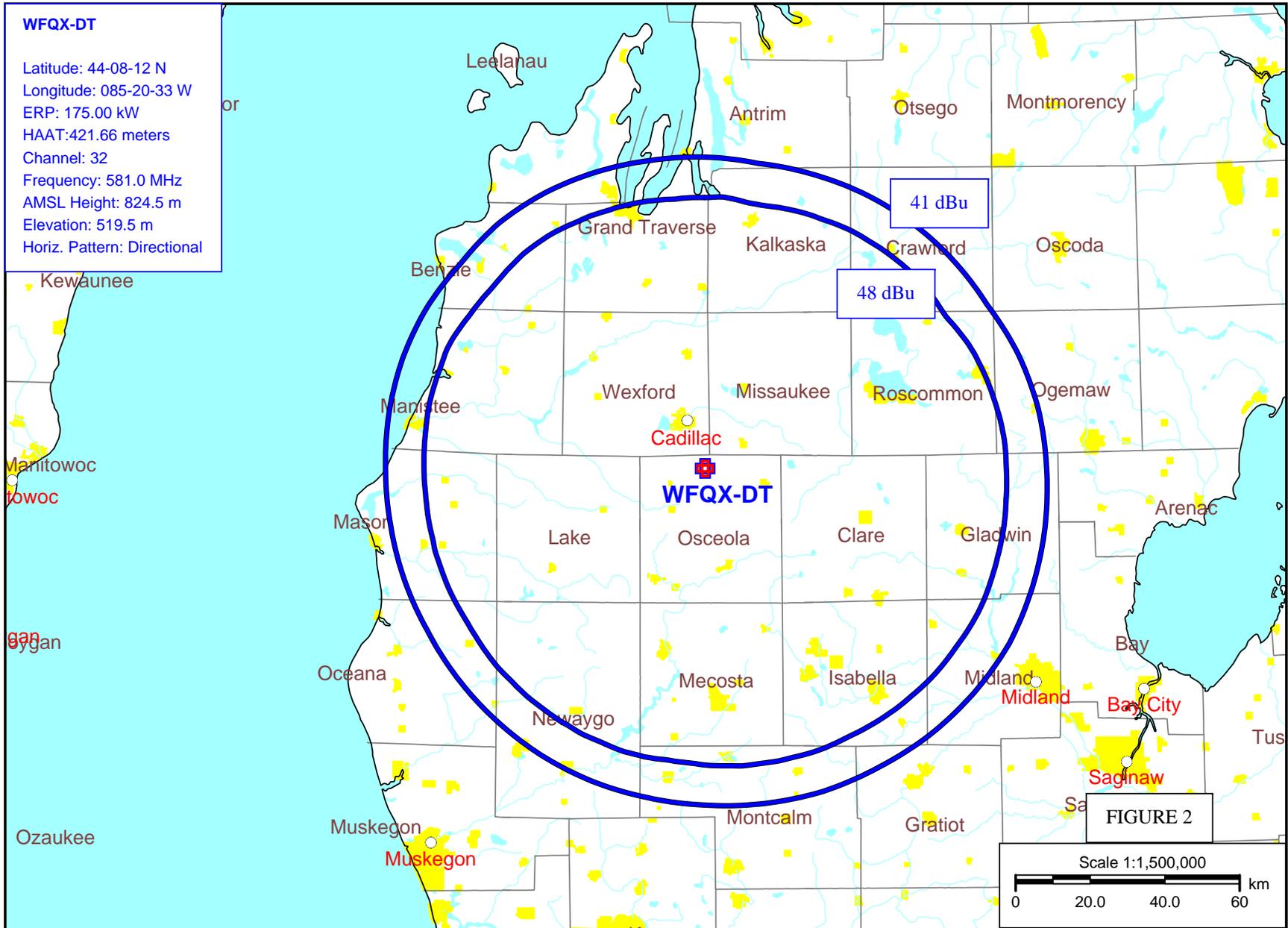
Azimuth (deg)	Effective Field
0.0	1.000
10.0	0.994
20.0	0.977
30.0	0.949
40.0	0.912
50.0	0.865
60.0	0.810
70.0	0.749
80.0	0.687
90.0	0.628
100.0	0.580
110.0	0.546
120.0	0.533
130.0	0.537
140.0	0.555
150.0	0.577
160.0	0.598
170.0	0.613
180.0	0.617
190.0	0.611
200.0	0.595
210.0	0.573
220.0	0.550
230.0	0.535
240.0	0.534
250.0	0.552
260.0	0.588
270.0	0.639
280.0	0.699
290.0	0.761
300.0	0.821
310.0	0.875
320.0	0.920
330.0	0.956
340.0	0.981
350.0	0.996

Rotation Angle = 135





COMPUTED 41 dBu CONTOURS FOR THE ALLOTTED AND PROPOSED DTV OPERATION OF WFQX-DT, CADILLAC, MICHIGAN



COMPUTED COVERAGE CONTOURS FOR THE PROPOSED DTV OPERATION OF WFQX-DT, CADILLAC, MICHIGAN