EXHIBIT E

ENGINEERING STATEMENT APPLICATION FOR A DTV CONSTRUCTION PERMIT FOR FLASHCUT FOR AN EXISTING TELEVISION TRANSLATOR K29EB, GRAND RAPIDS, MINNESOTA CHANNEL 29 14.909 KW MAX ERP 607.5 METERS RC/AMSL

JULY 2015

COHEN, DIPPELL AND EVERIST, P.C. CONSULTING ENGINEERS RADIO AND TELEVISION WASHINGTON, D.C.

COHEN, DIPPELL AND EVERIST, P. C.

City of Washington)) ss **District of Columbia** }

Donald G. Everist, being duly sworn upon his oath, deposes and states that:

He is a graduate electrical engineer, a Registered Professional Engineer in the District of Columbia, and is President, Secretary and Treasurer of Cohen, Dippell and Everist, P.C., Consulting Engineers, Radio - Television, with offices at 1420 N Street, N.W., Suite One, Washington, D.C. 20005;

That his gualifications are a matter of record in the Federal Communications Commission:

That the attached engineering report was prepared by him or under his supervision and direction and

That the facts stated herein are true of his own knowledge, except such facts as are stated to be on information and belief, and as to such facts he believes them to be true.

Donald G. Everist

District of Columbia Professional Engineer Registration No. 5714

Subscribed and sworn to before me this $\frac{392}{2}$ day of

J L Lyan lotary Public on Expires: 2/2/20/P

My Commission Expires:



Introduction

This engineering statement has been prepared on behalf of KQDS Acquisition Corp., licensee of TV translator K29EB, Grand Rapids, Minnesota. This statement supports the licensee's request to convert to DTV operation on the currently licensed analog Channel 29, commonly referred to as "flash-cut" with a DTV effective radiated power ("ERP") of 14.909 kW at a radiation center above mean sea level ("RCAMSL") of 607.5 meters. The proposed digital operation for K29EB has received prior Canadian approval from this site and technical operation.

Transmitter Site

The existing antenna will be utilized and no significant alteration of the tower is proposed or required. The existing tower (Exhibit E-1) is located approximately 2 miles north-northwest of Taconite, Minnesota. There is no change in transmitter site. The geographic coordinates of the site follow below:

> North Latitude: 47° 20' 22" West Longitude: 93° 23' 48"

NAD-27

The antenna registration number is 1048885. The application will specify the ASRN NAD-83 coordinates which are:

North Latitude: 47° 20' 22" West Longitude: 93° 23' 49"

NAD-83

PAGE 2

Elevation Data

Elevation of site above mean sea level	461.5 meters (1514 feet)
Center of radiation of antenna above ground level	146 meters (479 feet)
Center of radiation of antenna above mean sea level	607.5 meters (1993 feet)
Overall height of tower above ground level	151.5 meters (497 feet)

Equipment Data

Transmitter:	Type-approved				
Transmission Line:	Cablewave, Type HCC300-50J, 1-5/8", 146.3 meters (480 feet) with 68.8% efficiency				
Antenna:	Bogner, B16UG with maximum gain of 17.5 and 0° electrical beam tilt				
Power Data					
Transmitter:		0.385 kW	-4.14 dBk		
Emission Mask:		Simple			
Transmission Line Loss:		31.2%	0.12 kW		
Input Into Antenna:		0.265 kW	-5.76 dBk		
Antenna Gain:		56.2	17.5 dB		
ERP:		14.909 kW	11.73 dBk		

K29EB, GRAND RAPIDS, MINNESOTA

As indicated above, the transmitter with typical power output of 0.385 kW will deliver 0.265 kW to the input of the antenna. The antenna, having a maximum gain of 17.5 dB and an electrical beam tilt of 0°, will produce maximum ERP of 14.909 kW. A coverage provides the protected contour of the proposed facility compared to the currently licensed operation of K29EB and has been included as Exhibit E-2 of this report. The antenna elevation pattern and associated tabulation and the horizontal pattern and accompanying tabulation are on file at the Commission as this antenna make and model has been designated as "Off-the-Shelf", and is the currently licensed antenna for K29EB with no alterations proposed.

Other Broadcast Facilities

A brief analysis was completed to determine the presence of stations in the vicinity of the K29EB tower using the July 1, 2015, data contained within the Commission's Consolidated Database System ("CDBS"). Within 500 meters of the proposed site, there is one authorized FM radio station, no authorized DTV and NTSC television stations, and no authorized low-power analog television and television translator stations aside from K29EB. There are no AM facilities within 3.2 km of the existing tower. Although no adverse technical affects are expected due to the proposed changes, the licensee will take measures to resolve any problems proven to be related to the changes proposed in this application.

Interference Analysis

A study of predicted interference caused by the proposed K29EB low-power digital operation has been performed using the Longley-Rice program for which the source data has been posted by the Commission on its website at http://www.fcc.gov/oet/dtv/dtv_apps.html. The

K29EB, GRAND RAPIDS, MINNESOTA

FCC's FORTRAN-77 code was modified only to the extent necessary (primarily input/output handling) for the program to run on a Microsoft Windows XP/Intel platform. Comparison of service/interference areas and population indicates this model closely matches the FCC's digital low-power TV/translator evaluation program. Best efforts have been made to use data and calculation identical to the FCC's program. The model employs the Longley-Rice propagation methodology and evaluates in grid cells of approximately 1 sq. km. Using 3-second terrain data sampled approximately every 1.0 km at one-degree azimuth intervals with 2000 census centroids, all studies are based upon data in the current CDBS database update of the FCC's engineering database. A Longley-Rice study was performed with the proposed K29EB low-power digital facilities and all relevant stations listed in the FCC database as of July 1, 2015. The study results and the included stations are listed in Table I.

Other Licensed and Broadcast Facilities

No adverse technical effect is anticipated by the proposed DTV operation to any other FCC licensed facility. If required, the licensee will install filters or take other measures as necessary to resolve the problem.

FCC Rule, Section 1.1307

Pursuant to OET Bulletin No. 65 dated August 1997, these non-broadcast stations are all exempt from RFF evaluations for the following reason:

Station

Licensed Under Part No.

Subpart F Exempt Antenna Height > 10 meters

Reason for Exemption

ERP < 1000 watts

Subpart F Exempt

Part 90

Part 74, Subpart F

Part 90

Part 74, Subpart F

The RFF contribution of each station will be calculated using the following formula:

 $S = \frac{33.4(F^2) \text{ Total ERP}}{R^2}$

where:

 $S = power density in \mu W/cm^2$ F = relative field factorTotal ERP = ERP Horizontal Polarization + ERP Vertical Polarization R = RCAGL - 2 meters

ERP = RMS ERP in watts for DTV Stations

$$\begin{split} ERP &= [0.4 \; ERP_V + ERP_A] \text{ for NTSC Stations} \\ ERP_V &= \text{peak visual ERP in watts} \\ ERP_A &= RMS \text{ aural ERP in watts} \end{split}$$

The proposed 14.909 kW directional operation will utilize a Bogner, Type B16UG antenna (or equivalent) described above with a center of radiation above ground of 146 meters. The proposed antenna is top-mounted on an existing tower with an overall height of 151.5 meters above ground. The proposed digital operation of K29EB will create a radiofrequency field level of $1.5 \,\mu$ W/cm² at the base of the tower. The level is less than 0.4% of the maximum permissible exposure ("MPE") limit for the general population and uncontrolled environment.

K29EB, GRAND RAPIDS, MINNESOTA

Authorized personnel and rigging contractors will be alerted to the potential zone of high field levels on the tower, and if necessary, the station will operate with reduced power or terminate the operation of the transmitter as appropriate when it is necessary for authorized personnel or contractors to perform work on or near the tower. Workers and the general public, therefore, will not be subjected to RFF levels in excess of the current FCC guidelines.

Environmental Assessment

An environmental assessment ("EA") is categorically excluded under Section 1.1306 of

the FCC Rules and Regulations as the tower was constructed prior to the requirements specified

in WT Docket No. 03-128 and the licensee indicates:

(a)(1)	The existing tower is not located in an officially designated wilderness area.
(a)(2)	The existing tower is not located in an officially designated wildlife preserve.
(a)(3)	The proposed facilities will not affect any listed threatened or endangered species or habitats.
(a)(3)(ii)	The proposed facilities will not jeopardize the continued existence of any proposed endangered or threatened species or likely to result in the destruction or adverse modification of proposed critical habitats.
(a)(4)	The proposed facilities located on a tower which was built prior to the adoption of WT Docket No. 03-128 and is grandfathered and has not affected any known districts, sites, buildings, structures, or objects significant in American history, architecture, archaeology, engineering, or culture.
(a)(5)	The existing tower is not located near any known Indian religious sites.
(a)(6)	The existing tower is not located in a flood plain.

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K29EB, GRAND RAPIDS, MINNESOTA

(a)(7)	The installation of the DTV facilities on an existing tower will not involv a significant change in surface features of the ground in the vicinity of the tower.				
(a)(8)	It is not proposed to equip the tower with high intensity white lights unless required by the FAA.				
(b)	Workers and the general public will not be subjected to RFF levels in				

(b) Workers and the general public will not be subjected to RFF levels in excess of the current FCC guidelines contained in OET Bulletin No. 65, Edition 97-01, dated August 1997 and Supplement A.





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TABLE ILONGLEY-RICE INTERFERENCEFOR THE PRELIMINARY ALLOCATION FOR DIGITAL FLASHCUTK29EB, GRAND RAPIDS, MINNESOTACHANNEL 29 14.909 KW ERP 607.5 METERS RC/AMSLJULY 2015

N 47° 20' 22" W 93° 23' 48" NAD-27 Emission Mask: Simple

<u>Channel</u>	<u>Call</u>	City/State	<u>Dist(km)</u>	<u>Status</u>	FCC File No.	<u>Result</u>
15	K15GT	HIBBING MN	33.6	LIC	BLTT-20040909ABE	No interference
15	K15GT	HIBBING MN	33.6	STA	BSTA-20030806DDZ	No interference
28	K28DD	BEMIDJI MN	108.3	LIC	BLTT-20080610AAL	No interference
28	KAWB	BRAINERD MN	130.1	LIC	BLEDT-20101012ADI	No interference
28	K28LN-D	ORR MN	82.7	LIC	BLDTT-20120315AAI	No interference
29	K29KM-D	ASHBY MN	235.4	CP	BNPDTL-20100505AKS	No interference
29	K14PH-D	BAUDETTE MN	171.9	APP	BDISDTT-20100326ACN	No interference
29	K29KE-D	BIG FALLS MN	99.1	LIC	BLDTT-20111123GIL	No interference
29	NEW	DULUTH MN	114.1	APP	BNPDTL-20100513ABM	No interference
29	K29JW-D	GRANITE FALLS MN	328.2	LIC	BLDTT-20110824ACG	No interference
29	WFTC	MINNEAPOLIS MN	254.4	LIC	BLCDT-20100809CJF	0.00%
29	K29IE-D	ST. JAMES MN	371.1	LIC	BLDTT-20090817ACY	0.00%
29	K29KN-D	CASSELTON ND	297.8	CP	BNPDTL-20100505ALD	No interference
29	W29EH-D	WAUSAU WI	392.2	CP	BNPDTL-20100202AAL	No interference
30	K30DK	BEMIDJI MN	108.3	CP	BDFCDTT-20090727ADC	No interference
30	K30DK	BEMIDJI MN	108.3	LIC	BLTT-19920901IC	No interference
30	K30MZ-D	BRAINERD MN	121.9	CP	BNPDTL-20100609AFP	No interference
30	NEW	DULUTH MN	114.1	APP	BNPDTL-20100513ABN	No interference
32	K32FY	PARK RAPIDS MN	130	LIC	BLTT-20020429AAS	0.00%