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**Engineering Statement
Engineering STA for K32NR-D (formerly K47CH-D)
Channel 32 at Winnemucca, NV
January 2019**

I. Background

This Engineering Statement has been prepared on behalf of Humboldt County ("HC"), licensee of digital TV translator station K47CH-D at Winnemucca, NV, which holds a displacement construction permit as K32NR-D.

Construction of the authorized displacement facility is part-and-parcel of a project which also involves construction of a new tower on Winnemucca Mountain. It is now winter on Winnemucca Mountain, and consequently the tower construction will not be completed until later this year. In the meanwhile, T-Mobile has sent HC a letter indicating that T-Mobile is commencing 600 MHz operations in this area, and requesting that HC cease operation of this translator on its licensed channel. T-Mobile had previously provided its 120-day notification to HC, but that deadline has passed.

HC therefore requests an Engineering STA to operate on Ch32 on a temporary basis from the existing K23FR-D antenna system (coordinates and pattern corrected as specified herein). Grant of this Engineering STA will ensure continued service to the public. The alternative would be that HC would have to shut down this translator until the new tower construction project can be completed, in which case over-the-air viewers in Winnemucca (and in the wider area, as this translator provides a feed to other translators) would lose their access to CBS network programming.

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: 2019.01.18 11:05:29

Study build station data: LMS TV 2019-01-17

Proposal: K47CH-D D32 LD STA WINNEMUCCA, NV
File number: WINN32STA
Facility ID: 28101
Station data: User record
Record ID: 789
Country: U.S.

Build options:

Protect pre-transition records not on baseline channel

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	K18GW	N18	TX	LIC	BEOWAWE, NV	BLTTL20051006ADO	100.3 km
No	K30HF	N30	TX	LIC	BEOWAWE, NV	BLTT20051006ADT	100.3
No	K31LB	N31	TX	LIC	ELKO, NV	BLTT20111122EKG	160.2
No	K31FU-D	D31	LD	LIC	GOLCONDA, NV	BLDTT20120203ACA	29.3
No	K32MJ-D	D32	LD	LIC	LITCHFIELD, CA	BLANK0000063162	237.3
No	K32LM-D	D32	LD	CP	REDDING, CA	BLANK0000004699	374.3
No	KSTV-LP	D32-	LD	CP	SACRAMENTO, CA	BLANK0000036383	387.1
No	KAID	D32	LD	LIC	BOISE, ID	BLEDT20100903ABZ	291.6
No	K32JK-D	D32	LD	LIC	BOISE, ID	BLDTL20140121ABL	302.9
No	K53EF-D	D32	LD	CP	GARDEN VALLEY, ID	BDISDTL20110802AAQ	371.2
No	K53EF-D	D32	LD	LIC	GARDEN VALLEY, ID	BLDTT20130123ADK	371.2
No	K32JM-D	D32	LD	LIC	TWIN FALLS, ID	BLDTL20140121ABI	336.5
Yes	K32CA-D	D32	LD	LIC	BATTLE MOUNTAIN, NV	BLDTT20120514ADD	100.3
No	K32GW-D	D32	LD	LIC	CARSON CITY, NV	BLDTT20070529ADO	255.1
No	K32GK-D	D32	LD	LIC	ELKO, NV	BLDTT20090716AAE	174.5
No	K32CJ-D	D32	LD	LIC	ELY, NV	BLDTT20100111AAL	341.2
Yes	K32LD-D	D32	LD	CP	LOVELOCK, NV	BNPDTL20100512AHA	128.3
No	K40GA-D	D32	LD	CP	MINA / LUNING, NV	BLANK0000052573	291.7
No	K40GA-D	D32	LD	LIC	MINA / LUNING, NV	BLANK0000064419	291.7
Yes	K32KQ-D	D32	LD	LIC	OROVADA, NV	BLDTT20120321ADT	57.1
No	K32CQ-D	D32	LD	LIC	SHURZ, NV	BLDTT20110609AAT	246.5
No	KUTH-DT	D32	DT	CP	PROVO, UT	BPCDT20100921AAY	469.3
No	K33NC-D	D33	LD	CP	BATTLE MOUNTAIN, NV	BNPDTL20100512AHM	100.4
No	K33DP	N33	TX	LIC	CARLIN, NV	BLTTL19931014JJ	142.7
No	K33GB-D	D33	LD	LIC	GOLCONDA, NV	BLDTT20120329ADK	29.3
No	K40CA	N40	TX	LIC	BEOWAWE, NV	BLTT19881003IB	101.7

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: 41 0 36.60 N (NAD83)
Longitude: 117 45 51.70 W
Height AMSL: 2061.0 m
HAAT: 0.0 m
Peak ERP: 0.110 kW
Antenna: SCA-1X2KBBU (ID 20718) 135.0 deg
Elev Pattnr: Generic

50.5 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.000 kW	495.7 m	10.2 km
45.0	0.021	728.0	29.3
90.0	0.105	702.9	38.6
135.0	0.095	462.8	33.1
180.0	0.105	738.3	39.1
225.0	0.021	724.5	29.2
270.0	0.000	595.2	10.9
315.0	0.000	712.1	10.7

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 645 m

Distance to Canadian border: 888.1 km

Distance to Mexican border: 936.3 km

Conditions at FCC monitoring station: Livermore CA
Bearing: 224.5 degrees Distance: 500.8 km

Proposal is not within the West Virginia quiet zone area

Hatfield & Dawson Consulting Engineers

Conditions at Table Mountain receiving zone:
Bearing: 91.1 degrees Distance: 1059.5 km

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.

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 (5 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 0.200 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Kathrein broadband panel antenna array proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 4.4 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 4.1 $\mu W/cm^2$, which is 1.1% of 385.3 $\mu W/cm^2$ (the FCC maximum for uncontrolled environments at the Channel 32 frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit

at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicant's proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required in this application.

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.

January 18, 2019

Erik C. Swanson, P.E.