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**Engineering Statement
Post-Auction Technical Facilities for KVEW
Channel 27 at Kennewick, WA
June 2017**

Repack Application

This Engineering Statement has been prepared on behalf of Apple Valley Broadcasting, Inc., licensee of digital television station KVEW at Kennewick, Washington. KVEW presently operates on Channel 44. The instant application is being filed in response to the Commission's *Channel Reassignment Public Notice* (DA 17-314), released on April 13, 2017, specifying the station's post-auction facilities on Channel 27.

The following table lists the KVEW assigned post-auction facilities, as well as the requested facilities as proposed in this Form 2100 application:

	Technical Parameters from Post Auction Table	Technical Parameters from Proposed Form 2100
Channel	27	27
ERP	114 kW	114 kW
HAAT	404 meters	406 meters
Antenna	nondirectional	nondirectional DIE TFU-30GTH/VP R O4
Coordinates (NAD83)	46-06-11.4 119-08-00.6	46-06-11.4 119-08-00.6

Interference Study

The KVEW antenna is top-mounted on the tower, and replacement of the Channel 44 antenna with a Channel 27 antenna of the same model will of necessity slightly increase the height of the radiation center, owing to the longer wavelength. Therefore, an interference study for the proposed facility has been conducted using the Commission's TVStudy software. The results of that study demonstrate that this proposal will have no additional interference impact on other stations, and will not expand the service area more than 1% beyond the baseline.

Study created: 2017.06.05 15:07:17

Study build station data: LMS TV 2017-05-30 (16)

Proposal: KVEW D27 DT APP KENNEWICK, WA
 File number: KVEW27
 Facility ID: 2495
 Station data: User record
 Record ID: 30
 Country: U.S.

Stations potentially affected:

Call	Chan	Svc	Status	City, State	File Number	Distance
KNDU	D26	DT	LIC	RICHLAND, WA	BLCDT20091007ACO	0.2 km
K27DX-D	D27	DC	LIC	MCCALL, ID	BLDTA20140915ACG	272.9
KBTC-TV	D27	DT	LIC	TACOMA, WA	BLEDT20130805ACW	288.9
KAYU-TV	D28	DT	LIC	SPOKANE, WA	BLCDT20091029ACN	215.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D27
 Latitude: 46 6 11.40 N (NAD83)
 Longitude: 119 8 0.60 W
 Height AMSL: 724.8 m
 HAAT: 406.0 m
 Peak ERP: 114 kW
 Antenna: Omnidirectional

40.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	114 kW	552.2 m	100.3 km
45.0	114	574.8	101.8
90.0	114	480.5	94.7
135.0	114	323.1	83.1
180.0	114	335.4	84.4
225.0	114	343.5	85.3
270.0	114	207.6	73.0
315.0	114	441.3	92.1

Database HAAT does not agree with computed HAAT
 Database HAAT: 406 m Computed HAAT: 407 m

Proposal service area is within baseline plus 1.0%
Proposal service area population is more than 95.0% of baseline

Distance to Canadian border: 322.0 km

Distance to Mexican border: 1508.8 km

Conditions at FCC monitoring station: Ferndale WA
Bearing: 322.2 degrees Distance: 407.9 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 115.5 degrees Distance: 1303.1 km

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%

No IX check failures found.

Facilities Proposed

The proposed operation will be on Channel 27 with an effective radiated power of 114 kilowatts. Operation is proposed with a Dielectric model TFU-30GTH/VP R O4 antenna, which will be mounted on an existing tower at the Jump Off Joe Butte communications site. The FCC Antenna Structure Registration Number for this tower is 1263786.

RF Exposure Calculations

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 (73.6 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 0.054 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized RFS model RD16A-LP antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 332.4 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 is calculated to be 2.1 $\mu W/cm^2$, which is 0.6% of 365.3 $\mu W/cm^2$ (the FCC maximum for uncontrolled environments at the Channel 27 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 applicants 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.