

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

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

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
KACS Signal Strength at K293AY
July 2019**

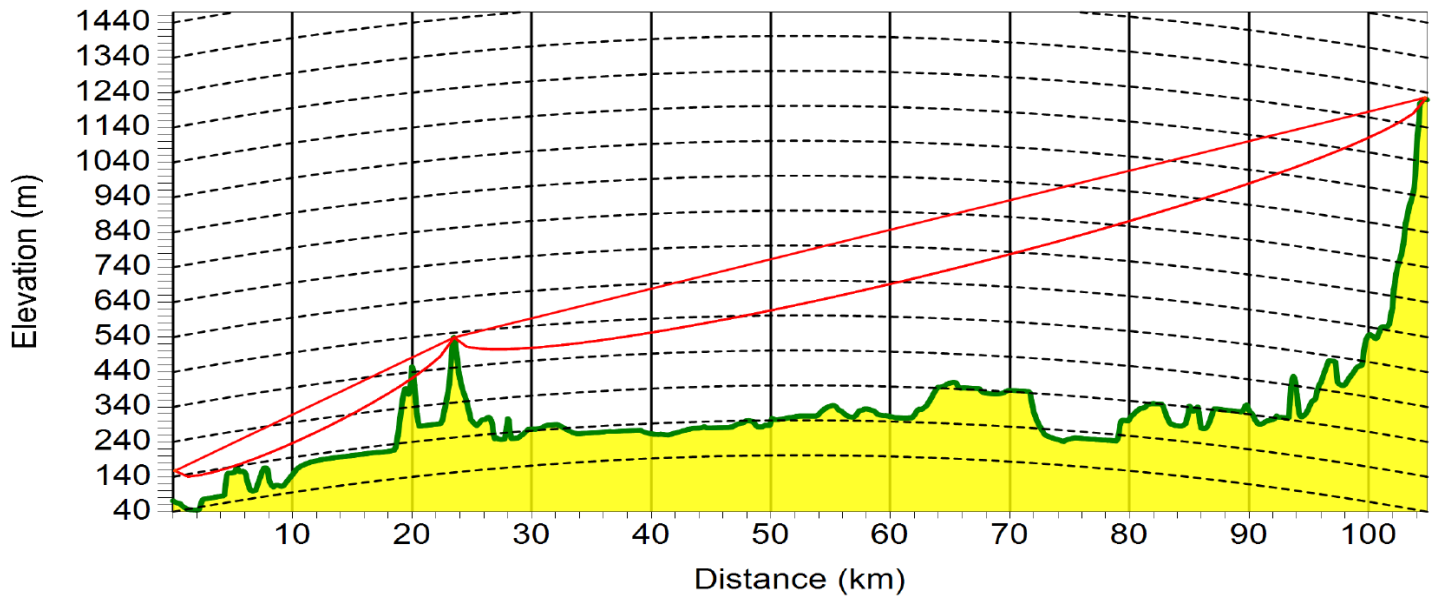
This Engineering Statement has been prepared on behalf of Chehalis Valley Educational Foundation ("CVEF"). CVEF proposes to rebroadcast its reserved-band FM station KACS on FM translator K293AY, and this analysis has been prepared in order to certify the viability of reception of KACS at the K293AY transmitter site.

A point-to-point Longley-Rice study has been performed to determine the KACS signal strength at the K293AY transmitter site. In performing this study, it was assumed that a Scala CL-FM/RX log periodic receive antenna (a typical antenna for these purposes) would be employed at the receive site, having an antenna height of 20 feet above ground and a gain of 6.5 dBd. The results of that study are depicted on the following page. While there is a single obstacle on the path, the predicted received signal level is -50.42 dBmW, which is equal to 63.8 dBu at the KACS frequency of 90.5 MHz.

Separately, it is noted that Doug Fisher of Comtek Service has visited the K293AY transmitter site and determined that KACS can be received reliably and with good quality at that location. Accordingly, it is the undersigned's professional opinion that KACS can provide a reliable over-the-air programming feed to FM translator K293AY.

KACS to K293AY

Link: Tx001 -> Rx001



Transmitter	
Description	Data
Link end 1 ID	Tx001
Site name	KACS
Latitude	N46°43'51.00"
Longitude	W123°01'29.00"
Transmitter Frequency	91 MHz
Polarization	horizontal
Antenna Height (AGL)	54.00 m
Antenna elevation (AMSL)	158.00 m
Point az. to link end 2	58.38°
Antenna gain to link end 2	0.00 dBd
ERPd toward link end 2	7.78 dBkW

Receiver	
Description	Data
Link end 2 ID	Rx001
Site name	K293AY
Latitude	N47°13'10.00"
Longitude	W121°50'30.00"
Received signal level	-50.42 dBmW
Antenna Height (AGL)	6.10 m
Antenna elevation (AMSL)	1225.04 m
Point az. to link end 1	239.25°
Antenna gain	6.5 dBd

Link Statistics	
Description	Data
Path	Tx001 -> Rx001
Length	104.8990 km
Number of obstacles	1
Excess pathloss	17.00 dB
Propagation Model	Longley-Rice
K factor	1.333

Statement of Engineer

This Engineering Statement has been prepared by Erik C. Swanson. I am a partner in the firm of Hatfield & Dawson Consulting Engineers and am registered as a Professional Engineer in the States of Washington and Colorado. I hereby declare that the facts set out in the foregoing Engineering Statement, except those of which official notice may be taken, are true and correct.

Signed this 12th day of July, 2019



Erik C. Swanson, P.E.