

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
SINCLAIR MEDIA LICENSEE, LLC)	MB Docket No. 20- _____
)	RM - _____
Petition for Rulemaking to Amend the)	
DTV Table of Allotments for)	
Station KECI-TV, Missoula, MT)	
(Facility ID No. 18084))	

PETITION FOR RULEMAKING

SINCLAIR MEDIA LICENSEE, LLC, licensee of television station KECI-TV, Missoula, MT (Facility ID No. 18084) (“KECI” or the “Station”), hereby requests that the Commission commence a rulemaking pursuant to Section 1.401 of the Commission’s rules¹ in order to amend the DTV Table of Allotments by allotting UHF Channel 20 to KECI in lieu of VHF Channel 13 consistent with the technical parameters as set forth in the attached Engineering Statement.² As demonstrated herein, the proposed channel substitution for KECI from VHF Channel 13 to UHF Channel 20 would allow KECI to significantly improve its over-the-air service to the Station’s viewers in the Missoula, Montana market. As shown below, the proposed channel change from Channel 13 to Channel 20 would result in a substantial increase in signal receivability for KECI’s core viewers and enable viewers to receive the Station’s signal with a significantly smaller antenna.

The proposed channel substitution would serve the public interest because KECI has had a long history of dealing with severe reception problems. The reception issues were

¹ 47 C.F.R. § 1.401.

² See Engineering Statement of John E. Hidle, P.E., In Support of a Petition to Amend the Table of Allotments for KECI, Missoula, MT (“Engineering Statement”).

exacerbated by the analog to digital conversion. This is not surprising as the Commission has long recognized that “VHF channels have certain characteristics that have posed challenges for their use in providing digital television service,” including “propagation characteristics of these channels [that] allow undesired signals and noise to be receivable at relatively farther distances,” and the fact that “reception of VHF signals requires physically larger antennas that are generally not well suited to the mobile applications expected under flexible use, relative to UHF channels.”³ The Commission has also stated that studies have found “large variability in the performance (especially intrinsic gain) of indoor antennas available to consumers, with most antennas receiving fairly well at UHF and the substantial majority not so well to very poor at high-VHF.”⁴

These sound conclusions by the Commission have proven to be absolutely correct and are entirely consistent with the experience of KECI operating on VHF Channel 13. Indeed, KECI has received numerous complaints from viewers unable to receive the Station’s over-the-air signal, despite being able to receive signals from other local stations. Permitting KECI to operate on UHF Channel 20 instead of VHF Channel 13 will alleviate the Station’s reception issues and will improve service to local viewers. Importantly, the proposal will result in more effective building penetration for indoor antenna reception and will also greatly improve the Station’s ability to provide ATSC 3.0 service to homes, vehicles and portable devices, to the ultimate benefit of the Station’s viewers and the public interest in Missoula.

³ *Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF*, NPRM, 25 FCC Rcd 16498, 16511 ¶ 42 (2010) (“*VHF Improvements NPRM*”).

⁴ *Id.* at 16512 ¶ 44. See also *Amendment of Parts 73 and 74 of the Commission’s Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations*, Second R&O, 25 FCC Rcd 10732, 10750 ¶ 37 (2011) (“As a result of the full power digital television transition, some full power stations on VHF channels have experienced reception problems and such problems have not been alleviated even by allowing these stations to operate with the maximum power permitted under the full power television rules.”).

As an initial matter, for the Station's signal to be received at all by viewers, it would require an antenna gain of at least 6 dB (according to planning factors) and an antenna elevated 30 feet above ground! As further evidence of why the requested channel change from VHF Channel 13 is absolutely necessary, attached are charts taken from the instruction manuals for Potomac Instruments Field Strength Meters, which are used to determine the actual physical size of the wavelengths of digital VHF and UHF channels. These charts are specifically utilized to adjust the length of the reference dipole antennas associated with each instrument according to the frequency being measured. As shown in the charts, the dipole antenna length for Channel 13 for the Station, the shortest VHF antenna, would be **over two feet** for a Channel 13 portable device. An antenna of this size is by any measure unrealistic for use in a portable mobile device. In contrast, the charts indicate the dipole length for Channel 14, the longest UHF antenna, to be only **10.2 inches**, which is used in portable devices capable of UHF signal reception which are currently being manufactured. Consequently, the ability of broadcast television stations to use the groundbreaking new ATSC 3.0 technology, which will dramatically enhance the television viewing experience for mobile consumers, depends on those stations being able to broadcast on UHF channels. This fact alone should justify the requested channel change as being overwhelmingly in the public interest.

As shown in the attached Engineering Statement, the proposed migration of KECI from Channel 13 to Channel 20 will be a favorable arrangement of allotments based on the enhanced signal levels that will be delivered to a large percentage of the population within the Station's "protected service area." For example: The percentage of population receiving a signal greater than 100 dBu is miniscule for Channel 13, while the percentage that is predicted to receive a signal greater than 100 dBu is **39.9%** for Channel 20. The respective populations predicted for each channel and signal levels are shown in the Exhibits attached to the Engineering Statement.

As these population figures demonstrate, the proposed channel change from Channel 13 to Channel 20 would result in a substantial increase in signal receivability for KECI's core viewers, without any predicted loss of coverage.⁵ Consequently, the proposed move to Channel 20 would serve the public interest by giving Missoula viewers significantly improved access to KECI's signal.

Now that Phase 10 has been completed and the repack is winding down, and the freeze on the filing of rulemaking petitions for channel changes has been lifted, grant of the instant Petition would have no impact on the Post-Transition Table of DTV Allotments or otherwise affect the analysis of repacking methodologies.⁶ Indeed, the Media Bureau has already permitted full power, Class A, and low power stations to propose substitutions of their assigned channels as part of the post-auction transition.⁷ Additionally, as shown in the attached Engineering Statement, KECI's proposed move from Channel 13 to Channel 20 protects all operating and approved post-Auction facilities in accordance with the Commission's rules. Further, KECI has confirmed with its vendors that they have the capacity to supply the antenna and transmitter equipment necessary for KECI's proposed Channel 20 facility without adversely

⁵ As the Bureau is aware, even where a proposed modification would result in some minimal service loss, the Commission will approve the proposed modification provided that it is "supported by a strong showing of countervailing public interest," such as offsetting service gains. See *Third Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, NPRM, 22 FCC Rcd 9478, 9493 ¶ 38 & n.70.

⁶ See *Amendment of Section 73.622(i), Post-Transition Table of DTV Allotments, Station WNLO(TV), Buffalo, New York*, NPRM, MB Docket No. 19-118, DA 19-316 at ¶ 6 (MB April 23, 2019) (proposing to waive channel-substitution and contour extension freezes "because the underlying purpose of the freeze is not implicated" given that "the incentive auction and repacking have been completed"), *proposal adopted by Report and Order*, MB Docket No. 19-118, DA 19-553 (MB June 12, 2019). See also, *Media Bureau Lifts Freeze on the Filing of Television Station Minor Modification Applications and Rulemaking Petitions Effective Fifteen Days After Publication in the Federal Register*, Public Notice, DA 20-1269 (MB October 29, 2020).

⁷ See *Incentive Auction Closing and Channel Reassignment Public Notice the Broadcast TV Incentive Auction Closes; Reverse Auction and Forward Auction Results Announced; Final TV Band Channel Assignments Announced; Post-Auction Deadlines Announced*, Public Notice, 32 FCC Rcd. 2786 ¶ 71 (2017); *Incentive Auction Task Force and Media Bureau Announce Post Incentive Auction Special Displacement Window April 10, 2018, Through May 15, 2018, And Make Location and Channel Data Available*, Public Notice, 33 FCC Rcd. 1234 ¶ 6 (IATF and MB 2018).

impacting any other station's repack progress. KECI's proposed channel substitution thus does not in any way obstruct the Commission's repacking process, making the instant Petition ripe for Media Bureau approval and grant.

Accordingly, the public interest would be best served by promptly granting KECI's request to move from Channel 13 to Channel 20 with the specifications set forth in the Engineering Statement, so that Missoula, Montana-area viewers may benefit from substantially improved over-the-air broadcast television service as soon as possible, consistent with §73.622(i) of the Commission's Rules.

Conclusion

For the foregoing reasons, the proposed amendment to the DTV Table of Allotments will clearly serve the public interest. Petitioner therefore respectfully requests that the DTV Table of Allotments be amended in accordance with the specifications set forth in the attached Engineering Statement.

Respectfully submitted,

SINCLAIR MEDIA LICENSEE, LLC

By: /s/ Paul A. Cicelski

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Counsel to Sinclair Media Licensee, LLC

Dated: November 27, 2020



**STATEMENT OF JOHN E. HIDLE, P.E.
IN SUPPORT OF A PETITION TO AMEND
THE DIGITAL TELEVISION TABLE OF ALLOTMENTS
KECI-TV - MISSOULA, MONTANA
DTV - CH. 20 - 925 kW - 610 m HAAT**

Prepared for: Sinclair Media Licensee, LLC

I am a Consulting Engineer, an employee in the firm of Carl T. Jones Corporation, with offices located in Springfield, Virginia. My education and experience are a matter of record with the Federal Communications Commission. I am a Licensed Professional Engineer in the Commonwealth of Virginia, No. 7418, and in New York State, No. 63418.

GENERAL

This office has been authorized by Sinclair Media Licensee, LLC, licensee of KECI-TV channel 13, licensed to Missoula, Montana, to prepare this statement in support of a Petition to Amend the Digital Television (DTV) Post Repack Table of Allotments, §73.622(i) of the FCC Rules. The petitioner requests that §73.622(i) of the Commission's Rules be modified to change KECI-TV's allotted channel. DTV channel 13 is currently specified in the Digital Television Table of Allotments for KECI-TV. The petitioner requests herein to substitute DTV channel 20 for DTV channel 13. The proposed arrangement of allotments is made to enhance potential viewers' ability to more easily receive the broadcast signal of KECI-TV. For example, when a signal strength of 80 dBu is compared, channel 13 provides a potential viewer population of 117,004 persons while channel 20 provides a population of 126,702 persons. Further, comparing a signal strength of 60 dBu channel 13 equals 155,077 while channel 20 equals 166,212. A signal level greater than 100 dBu provides the most dramatic comparison. For a predicted

channel 13 signal greater than 100 dBu the predicted population is only 2 persons while the channel 20 predicted greater than 100 dBu population is 87,207 persons. Additionally the UHF channel 20 requires a significantly smaller receiving antenna approximately one-half the size of an equivalent antenna for channel 13. This smaller antenna size by one-half and the >100 dBu signal level population of more than 87,000 persons, instead of 2, bodes well for changing from channel 13 to UHF channel 20, especially when the ATSC 3.0 DTV standard is considered. Even so, serious propagation problems associated with digital television broadcast (DTV) use of high-VHF television channels (7-13) continue to exist. These are also well documented, both before and especially after the initial digital transition on June 12, 2001. These propagation and reception problems for channels 7-13 have been severe enough for the FCC to have, in Zone I where the ERP limit for channels 7-13 is 30 kW at 305 meters HAAT, granted a construction permit for channel 7 with an ERP of 34 kW at 500 meters HAAT. The Zone I ERP Limit for high-VHF channels at 500 meters HAAT is 5.8 kW. 34 kW is more than 5 times the zone I limit. And yet when ATSC 3.0 is considered the remaining problems continue to frustrate DTV broadcasters that use VHF channels, and many of those stations still struggle with propagation problems and the subsequent viewer complaints. This proposal seeks to remedy this well known systemic problem in this instance and to provide viewers with a significant improvement in reception capability.

EXPLANATION OF REASON FOR REQUEST

KECI-TV's licensee has determined that the proposed migration from channel 13 to channel 20 will be a favorable arrangement of allotments based on the enhanced signal levels that will be delivered to a majority of the population within the station's "protected service area". For example: The percentage of population receiving a signal greater than

100 dBu is minuscule for channel 13, 2 persons, while the percentage that is predicted to receive a signal greater than 100 dBu is 39.9% of the total population for channel 20. The populations predicted for each channel and signal levels are shown in the attached map exhibits. Note that a change to channel 20 results in a predicted slight decrease of 2,298 persons in the overall population. However, In light of the myriad advantages set forth above, the licensee believes that changing KECI-TV to operate on channel 20 will serve to improve KECI-TV's potential ability to serve the future ATSC 3.0 portable and mobile smartphone universe, will more than off-set the predicted population loss of 1% and will solve most, if not all of its current reception problems.

ATSC 3.0 PERMISSIBLE DTV STANDARD

A more immediate concern is the future migration to the ATSC 3.0 permissible standard for over-the-air DTV and the multitude of potential benefits expected to accrue. Probably the most anticipated benefit is the ability to reach portable and mobile devices that have become the essence of the ubiquitous smart-phone culture. However, these devices must be small to fit the culture. Therein lies the intractable problem for VHF DTV stations. Channel 13, for example, has a wavelength of 4.62 feet. A simple half-wave dipole antenna, used as a reference with 0 dB gain, must be 2.31 feet long. The DTV planning factors set forth in the Sixth Report and Order (FCC 97-115) call for an antenna with 6 dB of gain elevated to 30 feet above the ground to just barely receive a signal at a strength of 36 dBu. An antenna for channel 13 with 6 dB of gain would measure 2.31 feet wide and at least 9 to 11 feet long. Obviously the required size of antennas for VHF channels precludes their use in the smart-phone culture. Therefore KECI-TV on channel 13 will likely be precluded from participation in ATSC 3.0 serving the portable and mobile users of these services. KECI-TV's licensee has heretofore been unable to consider a

truly effective solution to its reception problems, and sees no viable solution to the portable, mobile problem while broadcasting on its VHF channel 13, until now. KECI-TV's licensee herein seeks an effective solution: change to a UHF channel.

KECI-TV's licensee has determined that the proposed migration to channel 20 will be a favorable arrangement of allotments based on the enhanced signal levels that will be delivered to a majority of the population within the station's "protected service area". As previously noted the percentage of population receiving a signal greater than 100 dBu is minuscule for channel 13, while the percentage that is predicted to receive a signal greater than 100 dBu is 39.9% of the total population for channel 20. The higher signal levels provided by use of channel 20 will enable an ease of reception for mobile and portable devices users, notably the smartphone set. The populations predicted for each channel and signal levels are shown in the attached map exhibits.

DETERMINATION OF THE "LARGEST STATION IN THE MARKET"

It appears from an analysis of the stations that are licensed to communities located in the Missoula, Montana Designated Market Area (DMA) that the largest station in geographic area is the KECI-TV, channel 13, Missoula, Montana with a predicted 36 dBu noise limited contour coverage area of 47,507 square kilometers. In this instance the license of KECI-TV seeks a channel change to 20 with an ERP of 925 kW, which results in a predicted 39.36 dBu noise limited contour coverage area of 47,497 square kilometers. Since KECI-TV is requesting to substitute a UHF channel for a VHF channel the licensee should therefore be entitled, according to Section 73.622(f)(5), to the herein proposed channel 20 ERP of 925 kW in order to maintain its existing service area.

TECHNICAL STUDY

An engineering study of all pertinent allotments, assignments, applications,

construction permits and DTV licenses reveals that DTV channel 20 can be allotted to Missoula, Montana in lieu of channel 13, and meet all of the Commission's interference criteria. The allotment reference coordinates for DTV channel 20 at Missoula, Montana are: 47 01' 04.0" N.L. and 114 00' 50.0" W.L.¹ The Missoula allotment reference site meets the allotment standards in §73.616(b); the requirements set forth in §73.616(f); the requirements set forth in §73.623(e), the requirement set forth in §73.623(f), and the principal community coverage requirements set forth in §73.625(a).

The petitioner proposes to install a new Dielectric model TFU-33ETT/VP-R O6 non-directional antenna for channel 20 at KECI-TV's current centerline height above mean sea level (AMSL) of 2,152.0 meters and 610 meters above average terrain. The proposed changes include the new non-directional antenna, an increase in ERP to 925kW and a change from channel 13 to channel 20, The coverage area and population predicted to be served by KECI-TV are essentially the same. All other station parameters are to remain unchanged.

ALLOCATION CONSIDERATIONS

Post-Transition DTV Considerations

A study was performed, using the FCC's software, *tvstudy* v2.2.5, to determine if the instant petition to amend the post-transition Table is predicted to cause new prohibited interference to DTV stations, construction permits or DTV allotments. Results of the study indicate that the instant petition is predicted to cause no new interference greater than

¹ The channel 20 DTV allotment reference coordinates are the same as the DTV channel 13 allotment reference coordinates (as defined in Section 73.622(i) of the FCC Rules) of the petitioner's licensed KECI-TV, Missoula, Montana tower site. License BLCDT-20100701BOM (See FCC tower registration number 1000779).

0.5% to the populations served by any full-power DTV station, construction permit or allotment. See Appendix B. These results comply with the 0.5% limit for new post-repack interference set forth in §73.616(e) of the Commission's Rules.

International DTV Considerations

The KECI-TV site is located more than 220.2 kilometers from the nearest point on the US-Canadian border and 1,590 kilometers from the nearest point on the US-Mexican border. The nearest Canadian DTV facility on channel 20 is located 366 kilometers away from the KECI-TV site. Therefore the applicant expects no detrimental effect will be caused to any Canadian DTV facility.

Class A Television Allocation Considerations

As required in Section 73.616(f) of the FCC's Rules, the study results in Appendix B shows no Class A station predicted to be affected by the re-allotment of KECI-TV.

Land Mobile and FM radio Considerations

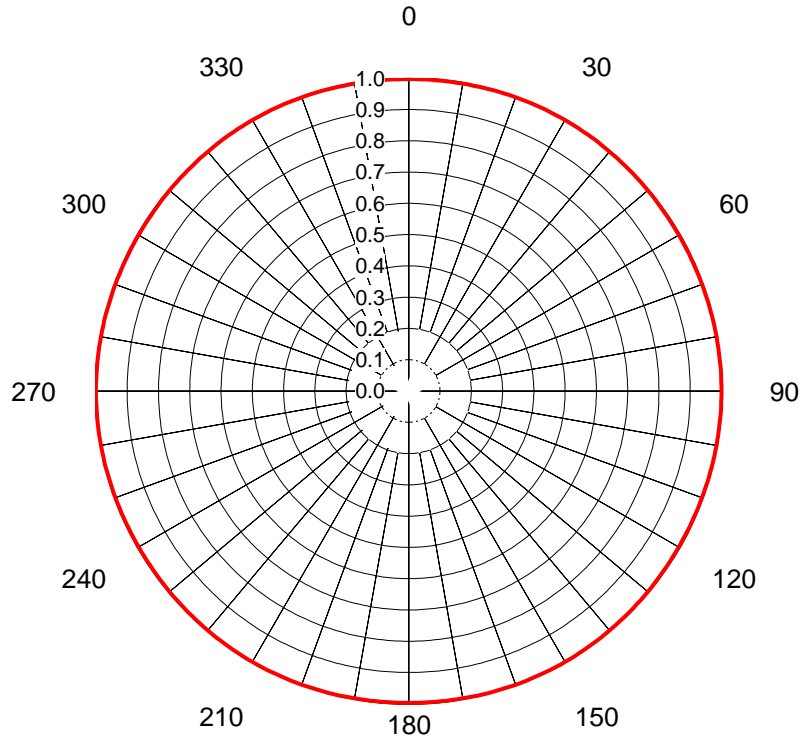
The *tvstudy* results found no Land Mobile violations for this site, and the site is deemed OK toward AM radio stations.

SUMMARY

It is submitted that the instant Petition to Amend the DTV Table of Allotments to substitute DTV channel 20 for DTV channel 13 in Missoula, Montana, as described herein, complies with the Rules, Regulations and relevant Policies of the Federal Communications Commission. This statement was prepared by me, or under my direct supervision, and its contents are believed to be true and correct to the best of my knowledge and belief.

DATED: November 22, 2020



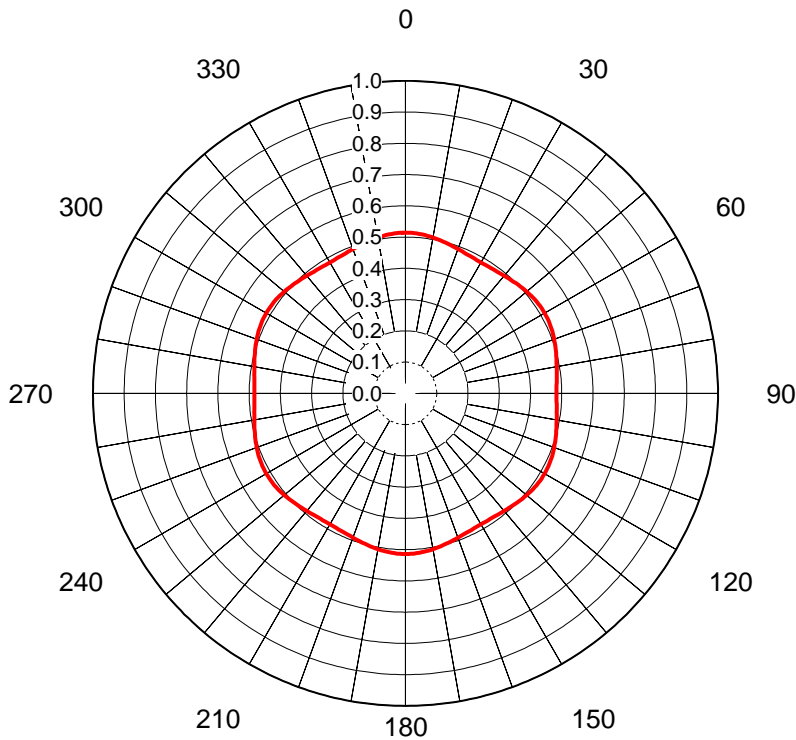


AZIMUTH PATTERN Horizontal Polarization

Proposal No. **C-71636**
 Date **9-Nov-20**
 Call Letters **KECI-TV**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TFU-33ETT/VP-R O6**
 Gain **1 (0.01dB)**
 Calculated
 Circularity **+/- 1.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.997	36	1.000	72	0.998	108	0.998	144	1.000	180	0.997	216	1.000	252	0.998	288	0.998
1	0.997	37	1.000	73	0.998	109	0.998	145	1.000	181	0.997	217	1.000	253	0.998	289	0.998
2	0.997	38	1.000	74	0.998	110	0.998	146	1.000	182	0.997	218	1.000	254	0.998	290	0.998
3	0.997	39	0.999	75	0.999	111	0.998	147	1.000	183	0.997	219	0.999	255	0.999	291	0.998
4	0.997	40	0.999	76	0.999	112	0.998	148	1.000	184	0.997	220	0.999	256	0.999	292	0.998
5	0.997	41	0.999	77	0.999	113	0.998	149	1.000	185	0.997	221	0.999	257	0.999	293	0.998
6	0.997	42	0.999	78	0.999	114	0.997	150	1.000	186	0.997	222	0.999	258	0.999	294	0.997
7	0.998	43	0.999	79	0.999	115	0.997	151	1.000	187	0.998	223	0.999	259	0.999	295	0.997
8	0.998	44	0.999	80	0.999	116	0.997	152	1.000	188	0.998	224	0.999	260	0.999	296	0.997
9	0.998	45	0.999	81	0.999	117	0.997	153	1.000	189	0.998	225	0.999	261	0.999	297	0.997
10	0.998	46	0.998	82	1.000	118	0.997	154	1.000	190	0.998	226	0.998	262	1.000	298	0.997
11	0.998	47	0.998	83	1.000	119	0.997	155	1.000	191	0.998	227	0.998	263	1.000	299	0.997
12	0.998	48	0.998	84	1.000	120	0.997	156	1.000	192	0.998	228	0.998	264	1.000	300	0.997
13	0.998	49	0.998	85	1.000	121	0.997	157	1.000	193	0.998	229	0.998	265	1.000	301	0.997
14	0.998	50	0.998	86	1.000	122	0.997	158	1.000	194	0.998	230	0.998	266	1.000	302	0.997
15	0.999	51	0.998	87	1.000	123	0.997	159	0.999	195	0.999	231	0.998	267	1.000	303	0.997
16	0.999	52	0.998	88	1.000	124	0.997	160	0.999	196	0.999	232	0.998	268	1.000	304	0.997
17	0.999	53	0.998	89	1.000	125	0.997	161	0.999	197	0.999	233	0.998	269	1.000	305	0.997
18	0.999	54	0.997	90	1.000	126	0.997	162	0.999	198	0.999	234	0.997	270	1.000	306	0.997
19	0.999	55	0.997	91	1.000	127	0.998	163	0.999	199	0.999	235	0.997	271	1.000	307	0.998
20	0.999	56	0.997	92	1.000	128	0.998	164	0.999	200	0.999	236	0.997	272	1.000	308	0.998
21	0.999	57	0.997	93	1.000	129	0.998	165	0.999	201	0.999	237	0.997	273	1.000	309	0.998
22	1.000	58	0.997	94	1.000	130	0.998	166	0.998	202	1.000	238	0.997	274	1.000	310	0.998
23	1.000	59	0.997	95	1.000	131	0.998	167	0.998	203	1.000	239	0.997	275	1.000	311	0.998
24	1.000	60	0.997	96	1.000	132	0.998	168	0.998	204	1.000	240	0.997	276	1.000	312	0.998
25	1.000	61	0.997	97	1.000	133	0.998	169	0.998	205	1.000	241	0.997	277	1.000	313	0.998
26	1.000	62	0.997	98	1.000	134	0.998	170	0.998	206	1.000	242	0.997	278	1.000	314	0.998
27	1.000	63	0.997	99	0.999	135	0.999	171	0.998	207	1.000	243	0.997	279	0.999	315	0.999
28	1.000	64	0.997	100	0.999	136	0.999	172	0.998	208	1.000	244	0.997	280	0.999	316	0.999
29	1.000	65	0.997	101	0.999	137	0.999	173	0.998	209	1.000	245	0.997	281	0.999	317	0.999
30	1.000	66	0.997	102	0.999	138	0.999	174	0.997	210	1.000	246	0.997	282	0.999	318	0.999
31	1.000	67	0.998	103	0.999	139	0.999	175	0.997	211	1.000	247	0.998	283	0.999	319	0.999
32	1.000	68	0.998	104	0.999	140	0.999	176	0.997	212	1.000	248	0.998	284	0.999	320	0.999
33	1.000	69	0.998	105	0.999	141	0.999	177	0.997	213	1.000	249	0.998	285	0.999	321	0.999
34	1.000	70	0.998	106	0.998	142	1.000	178	0.997	214	1.000	250	0.998	286	0.998	322	1.000
35	1.000	71	0.998	107	0.998	143	1.000	179	0.997	215	1.000	251	0.998	287	0.998	323	1.000

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AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-71636**
 Date **9-Nov-20**
 Call Letters **KECI-TV**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TFU-33ETT/VP-R O6**
 Gain **1.06 (0.26dB)**
 Calculated
 Circularity **+/- 1.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.514	36	0.486	72	0.503	108	0.503	144	0.486	180	0.514	216	0.486	252	0.503	288	0.503	324	0.486
1	0.514	37	0.487	73	0.502	109	0.505	145	0.486	181	0.514	217	0.487	253	0.502	289	0.505	325	0.486
2	0.514	38	0.489	74	0.500	110	0.506	146	0.485	182	0.514	218	0.489	254	0.500	290	0.506	326	0.485
3	0.513	39	0.490	75	0.499	111	0.508	147	0.484	183	0.513	219	0.490	255	0.499	291	0.508	327	0.484
4	0.513	40	0.491	76	0.497	112	0.509	148	0.484	184	0.513	220	0.491	256	0.497	292	0.509	328	0.484
5	0.512	41	0.493	77	0.496	113	0.510	149	0.484	185	0.512	221	0.493	257	0.496	293	0.510	329	0.484
6	0.511	42	0.494	78	0.494	114	0.511	150	0.484	186	0.511	222	0.494	258	0.494	294	0.511	330	0.484
7	0.510	43	0.496	79	0.493	115	0.512	151	0.484	187	0.510	223	0.496	259	0.493	295	0.512	331	0.484
8	0.509	44	0.497	80	0.491	116	0.513	152	0.484	188	0.509	224	0.497	260	0.491	296	0.513	332	0.484
9	0.508	45	0.499	81	0.490	117	0.513	153	0.484	189	0.508	225	0.499	261	0.490	297	0.513	333	0.484
10	0.506	46	0.500	82	0.489	118	0.514	154	0.485	190	0.506	226	0.500	262	0.489	298	0.514	334	0.485
11	0.505	47	0.502	83	0.487	119	0.514	155	0.486	191	0.505	227	0.502	263	0.487	299	0.514	335	0.486
12	0.503	48	0.503	84	0.486	120	0.514	156	0.486	192	0.503	228	0.503	264	0.486	300	0.514	336	0.486
13	0.502	49	0.505	85	0.486	121	0.514	157	0.487	193	0.502	229	0.505	265	0.486	301	0.514	337	0.487
14	0.500	50	0.506	86	0.485	122	0.514	158	0.489	194	0.500	230	0.506	266	0.485	302	0.514	338	0.489
15	0.499	51	0.508	87	0.484	123	0.513	159	0.490	195	0.499	231	0.508	267	0.484	303	0.513	339	0.490
16	0.497	52	0.509	88	0.484	124	0.513	160	0.491	196	0.497	232	0.509	268	0.484	304	0.513	340	0.491
17	0.496	53	0.510	89	0.484	125	0.512	161	0.493	197	0.496	233	0.510	269	0.484	305	0.512	341	0.493
18	0.494	54	0.511	90	0.484	126	0.511	162	0.494	198	0.494	234	0.511	270	0.484	306	0.511	342	0.494
19	0.493	55	0.512	91	0.484	127	0.510	163	0.496	199	0.493	235	0.512	271	0.484	307	0.510	343	0.496
20	0.491	56	0.513	92	0.484	128	0.509	164	0.497	200	0.491	236	0.513	272	0.484	308	0.509	344	0.497
21	0.490	57	0.513	93	0.484	129	0.508	165	0.499	201	0.490	237	0.513	273	0.484	309	0.508	345	0.499
22	0.489	58	0.514	94	0.485	130	0.506	166	0.500	202	0.489	238	0.514	274	0.485	310	0.506	346	0.500
23	0.487	59	0.514	95	0.486	131	0.505	167	0.502	203	0.487	239	0.514	275	0.486	311	0.505	347	0.502
24	0.486	60	0.514	96	0.486	132	0.503	168	0.503	204	0.486	240	0.514	276	0.486	312	0.503	348	0.503
25	0.486	61	0.514	97	0.487	133	0.502	169	0.505	205	0.486	241	0.514	277	0.487	313	0.502	349	0.505
26	0.485	62	0.514	98	0.489	134	0.500	170	0.506	206	0.485	242	0.514	278	0.489	314	0.500	350	0.506
27	0.484	63	0.513	99	0.490	135	0.499	171	0.508	207	0.484	243	0.513	279	0.490	315	0.499	351	0.508
28	0.484	64	0.513	100	0.491	136	0.497	172	0.509	208	0.484	244	0.513	280	0.491	316	0.497	352	0.509
29	0.484	65	0.512	101	0.493	137	0.496	173	0.510	209	0.484	245	0.512	281	0.493	317	0.496	353	0.510
30	0.484	66	0.511	102	0.494	138	0.494	174	0.511	210	0.484	246	0.511	282	0.494	318	0.494	354	0.511
31	0.484	67	0.510	103	0.496	139	0.493	175	0.512	211	0.484	247	0.510	283	0.496	319	0.493	355	0.512
32	0.484	68	0.509	104	0.497	140	0.491	176	0.513	212	0.484	248	0.509	284	0.497	320	0.491	356	0.513
33	0.484	69	0.508	105	0.499	141	0.490	177	0.513	213	0.484	249	0.508	285	0.499	321	0.490	357	0.513
34	0.485	70	0.506	106	0.500	142	0.489	178	0.514	214	0.485	250	0.506	286	0.500	322	0.489	358	0.514
35	0.486	71	0.505	107	0.502	143	0.487	179	0.514	215	0.486	251	0.505	287	0.502	323	0.487	359	0.514

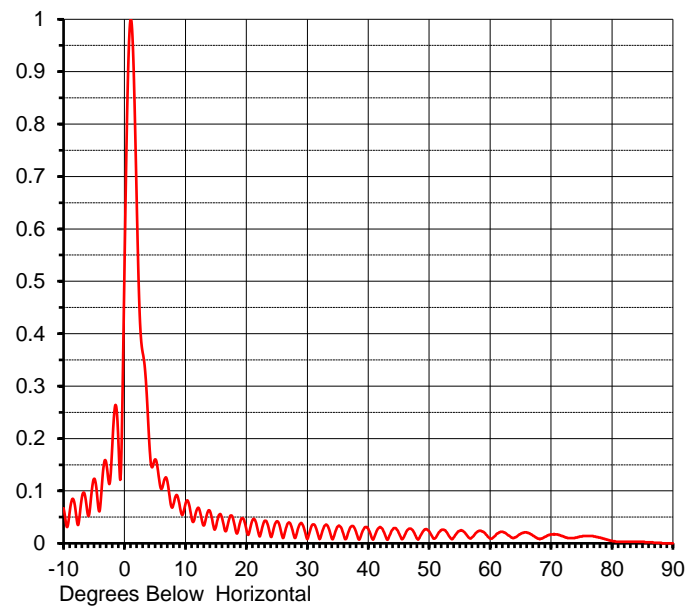
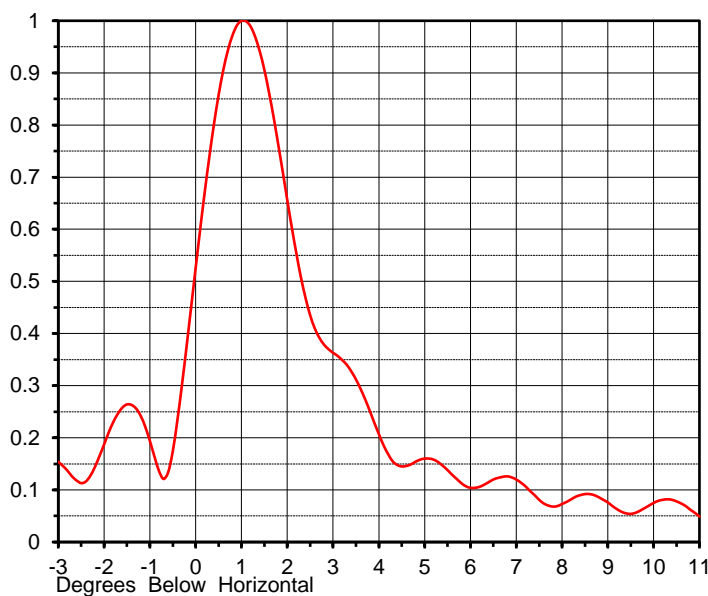
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ELEVATION PATTERN

Proposal No. **C-71636**
 Date **9-Nov-20**
 Call Letters **KECI-TV**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TFU-33ETT/VP-R 06**

RMS Directivity at Main Lobe **30.0 (14.77 dB)**
 RMS Directivity at Horizontal **8.3 (9.19 dB)**
Calculated

Beam Tilt **1.05 deg**
 Pattern Number **105**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.067	10.0	0.075	30.0	0.008	50.0	0.023	70.0	0.017
-9.0	0.059	11.0	0.049	31.0	0.036	51.0	0.010	71.0	0.017
-8.0	0.060	12.0	0.067	32.0	0.008	52.0	0.025	72.0	0.013
-7.0	0.087	13.0	0.034	33.0	0.035	53.0	0.019	73.0	0.010
-6.0	0.054	14.0	0.062	34.0	0.010	54.0	0.011	74.0	0.011
-5.0	0.123	15.0	0.031	35.0	0.032	55.0	0.024	75.0	0.013
-4.0	0.068	16.0	0.049	36.0	0.015	56.0	0.018	76.0	0.014
-3.0	0.154	17.0	0.038	37.0	0.029	57.0	0.011	77.0	0.013
-2.0	0.187	18.0	0.038	38.0	0.022	58.0	0.023	78.0	0.011
-1.0	0.194	19.0	0.041	39.0	0.021	59.0	0.021	79.0	0.008
0.0	0.526	20.0	0.027	40.0	0.028	60.0	0.009	80.0	0.005
1.0	1.000	21.0	0.044	41.0	0.012	61.0	0.017	81.0	0.003
2.0	0.656	22.0	0.019	42.0	0.031	62.0	0.022	82.0	0.003
3.0	0.363	23.0	0.043	43.0	0.009	63.0	0.015	83.0	0.003
4.0	0.207	24.0	0.013	44.0	0.026	64.0	0.011	84.0	0.003
5.0	0.160	25.0	0.042	45.0	0.020	65.0	0.018	85.0	0.003
6.0	0.104	26.0	0.010	46.0	0.016	66.0	0.021	86.0	0.002
7.0	0.120	27.0	0.040	47.0	0.028	67.0	0.015	87.0	0.001
8.0	0.073	28.0	0.010	48.0	0.009	68.0	0.009	88.0	0.001
9.0	0.076	29.0	0.039	49.0	0.023	69.0	0.012	89.0	0.000
								90.0	0.000

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KECI-TV

BLCDT-20100701BOM
Latitude: 47-01-04 N
Longitude: 114-00-50 W
ERP: 41.30 kW
Channel: 13
Frequency: 213.0 MHz
AMSL Height: 2152.0 m
Elevation: 2078.0 m
Horiz. Pattern: Omni
Vert. Pattern: Yes
Elec Tilt: 1.0
Prop Model: Longley-Rice
Climate: Cont temperate
Conductivity: 0.0050
Dielec Const: 15.0
Refractivity: 311.0
Receiver Ht AG: 10.0 m
Receiver Gain: 0 dB
Time Variability: 90.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

KECI-TV - Ch. 13

41.3 kW - 610 m HAAT

POPULATION by Signal

>100 dBu = 2

>80 dBu = 117,004

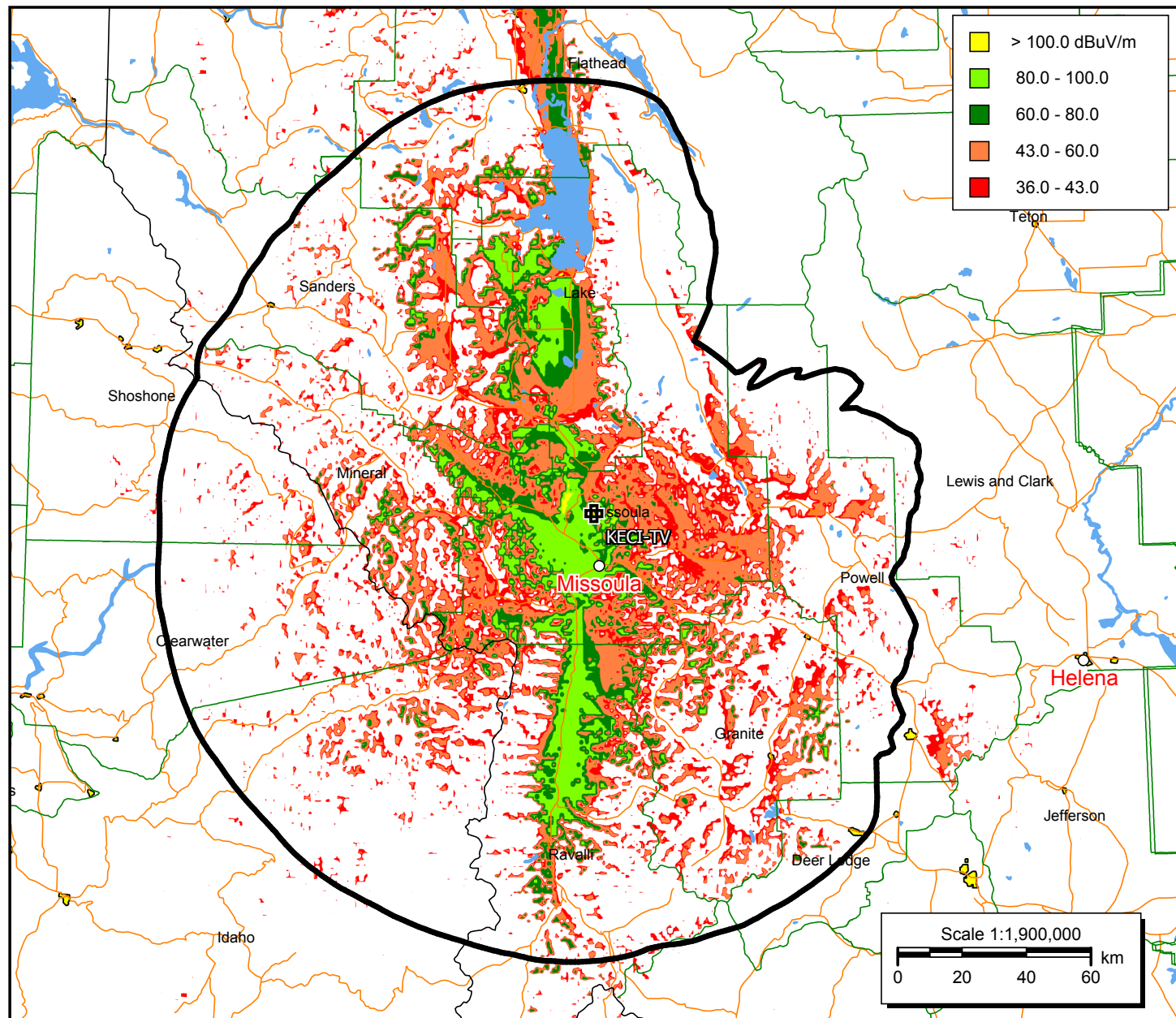
>60 dBu = 155,077

>Principal Community

43 dBu = 197,869

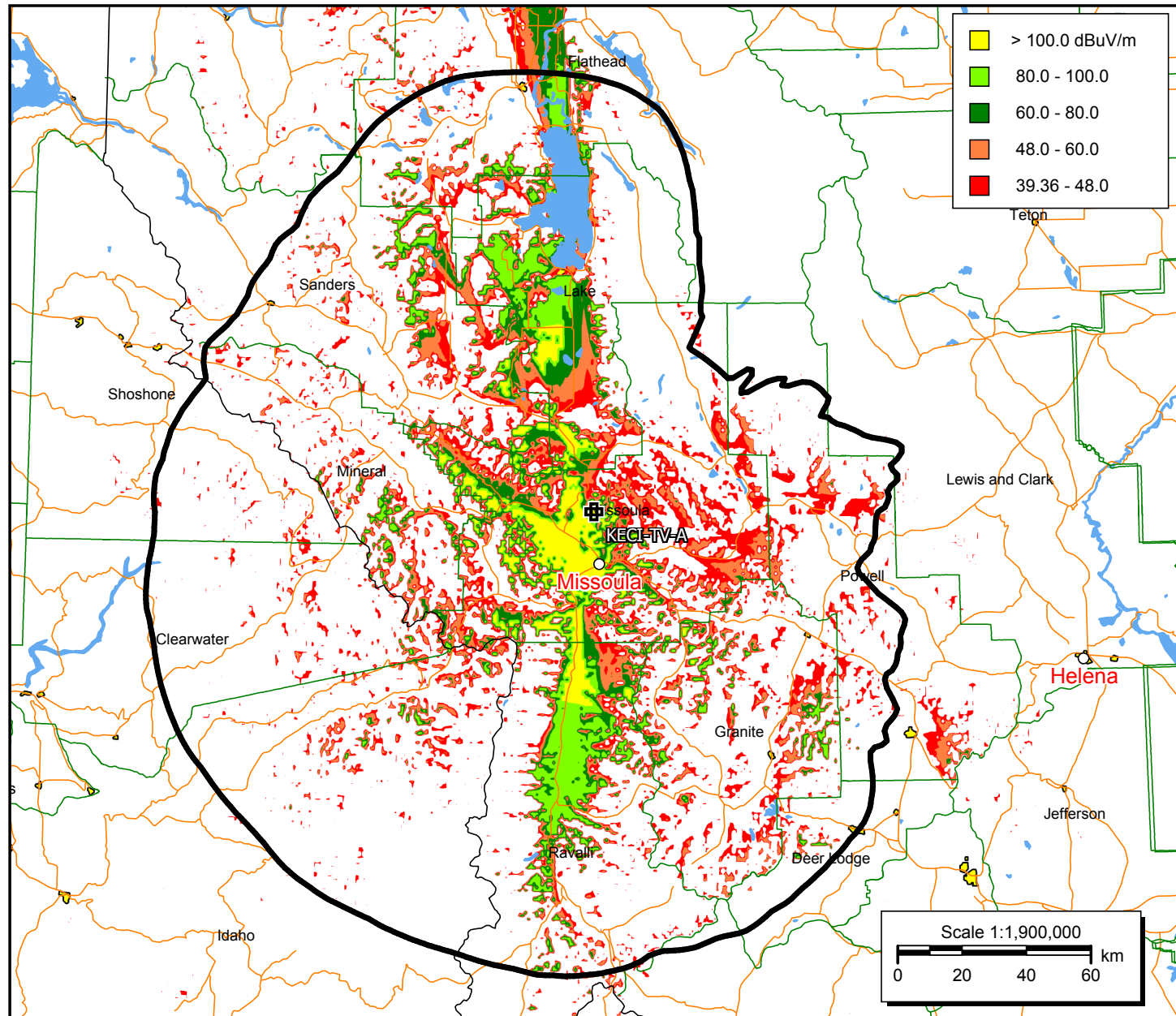
>Noise Limited

36 dBu = 220,797



KECI-TV-A

DTV pet - 20
Latitude: 47-01-03.73 N
Longitude: 114-00-50.40 W
ERP: 925.00 kW
Channel: 20
Frequency: 509.0 MHz
AMSL Height: 2152.0 m
Elevation: 2072.02 m
Horiz. Pattern: Omni
Vert. Pattern: Yes
Elec Tilt: 1.0
Prop Model: Longley-Rice
Climate: Cont temperate
Conductivity: 0.0050
Dielec Const: 15.0
Refractivity: 311.0
Receiver Ht AG: 10.0 m
Receiver Gain: 0 dB
Time Variability: 90.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

KECI-TV - Ch. 20**925 kW - 610 m HAAT****POPULATION by Signal****>100 dBu = 87,207****>80 dBu = 126,702****>60 dBu = 166,212****>Principal Community****48 dBu = 192,444****>Noise Limited****39.36 dBu = 218,499**



KECI-TV - MISSOULA, MONTANA

NOVEMBER 2020

APPENDIX B

Longley-Rice Interference Analysis

tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: KECI AP 20 925KW OMNI 610H, Model: Longley-Rice
Start: 2020.11.19 11:06:31

Study created: 2020.11.19 11:06:30

Study build station data: LMS TV 2020-11-19

Proposal: KECI-TV D20 DT APP MISSOULA, MT
File number: KECI AP 20 925KW OMNI 610H
Facility ID: 18084
Station data: User record
Record ID: 1348
Country: U.S.
Zone: II

Search options:
Non-U.S. records included
Baseline record excluded if station has CP

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
Yes	KWYB	D19	DT	LIC	BUTTE, MT	BLCDT20080424ABB	164.6 km
Yes	KREM	D20	DT	LIC	SPOKANE, WA	BLCDT20050623ABG	255.8
No	KUGF-TV	D21	DT	LIC	GREAT FALLS, MT	BLEDT20101008ACG	213.7
No	CJIL-TV-1	D20	DT	LIC	BOW ISLAND, AB	BLANKCANADA4	366.0
No	CKAL-DT	D20	DT	LIC	CALGARY, AB	BLANKCANADA13	451.0

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D20
Latitude: 47 1 4.00 N (NAD83)
Longitude: 114 0 50.00 W
Height AMSL: 2152.0 m
HAAT: 610.0 m
Peak ERP: 925 kW
Antenna: Omnidirectional
Elev Pattn: Generic
Elec Tilt: 1.00

39.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	925 kW	816.5 m	134.2 km
45.0	925	3.2	59.0
90.0	925	209.8	87.0
135.0	925	578.7	122.3
180.0	925	1016.3	143.3
225.0	925	1052.2	144.7
270.0	925	852.6	135.7
315.0	925	686.8	128.6

Database HAAT does not agree with computed HAAT

Appendix B - Interference Analysis **KECI-TV - Missoula Montana** **Channel 20- 925kW - Page 2**

Database HAAT: 610 m Computed HAAT: 652 m

ERP exceeds maximum

ERP: 925 kW ERP maximum: 282 kW

****Proposal is within coordination distance of Canadian border**

Distance to Canadian border: 220.2 km

Distance to Mexican border: 1590.5 km

Conditions at FCC monitoring station: Ferndale WA

Bearing: 291.9 degrees Distance: 670.5 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

Bearing: 134.2 degrees Distance: 1037.8 km

No land mobile station failures found

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%

----- Interference to BLCDT20080424ABB LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KWYB	D19	DT	LIC	BUTTE, MT	BLCDT20080424ABB	
Undesireds:	KECI-TV	D20	DT	APP	MISSOULA, MT	KECI AP 20 925KW OMNI	164.6 km
	Service area			Terrain-limited	IX-free, before	IX-free, after	Percent New IX
	24693.1	86,495	15189.5	69,598	15189.5	69,598	0.03 0.00
Undesired				Total IX	Unique IX, before	Unique IX, after	
KECI-TV D20 DT APP		4.0		0		4.0 0	

----- Interference to BLCDT20050623ABG LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KREM	D20	DT	LIC	SPOKANE, WA	BLCDT20050623ABG	
Undesireds:	KECI-TV	D20	DT	APP	MISSOULA, MT	KECI AP 20 925KW OMNI	255.8 km
	K21JQ-D	D21	DC	LIC	WALLA WALLA, WA	BLDTA20090721ABT	190.6
	Service area			Terrain-limited	IX-free, before	IX-free, after	Percent New IX
	44728.6	817,619	37775.6	752,113	37731.7	752,113	0.28 0.38
Undesired				Total IX	Unique IX, before	Unique IX, after	
KECI-TV D20 DT APP		104.2		2,831		104.2 2,831	
K21JQ-D D21 DC LIC		43.9		0	43.9	0	

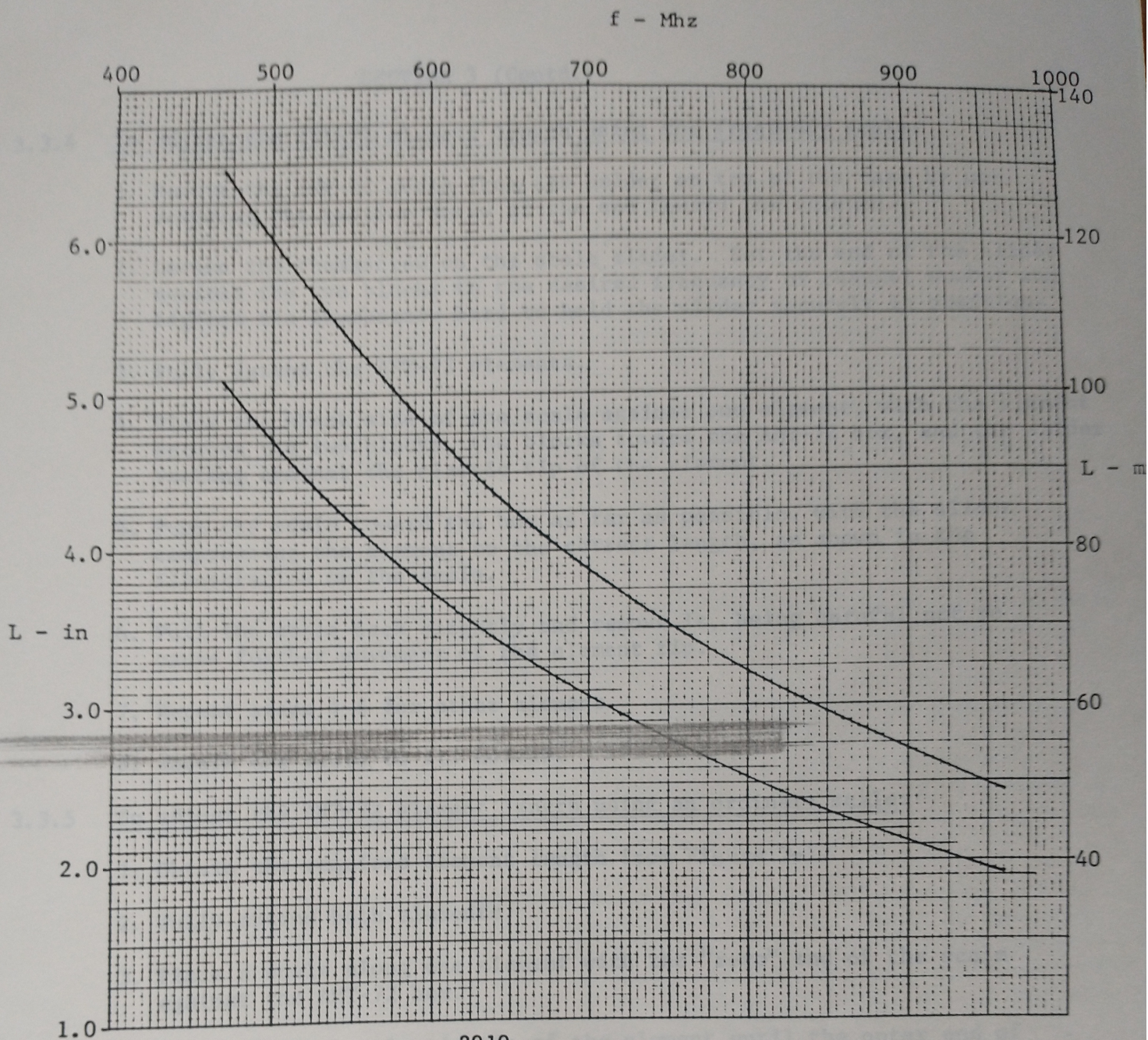
----- Interference to proposal scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KECI-TV	D20	DT	APP	MISSOULA, MT	KECI AP 20 925KW OMNI	
Undesireds:	KWYB	D19	DT	LIC	BUTTE, MT	BLCDT20080424ABB	164.6 km
	KREM	D20	DT	LIC	SPOKANE, WA	BLCDT20050623ABG	255.8
	Service area			Terrain-limited	IX-free	Percent IX	
	48108.7	228,116	38616.5	196,148	38424.0	196,134	0.50 0.01

Appendix B - Interference Analysis
KECI-TV - Missoula Montana
Channel 20- 925kW - Page 3

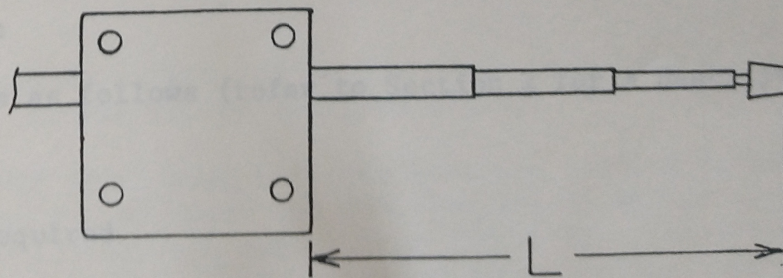
Undesired		Total	IX		Unique	IX	Prcnt	Unique	IX
KWYB D19 DT LIC	12.1		14	12.1	14		0.03	0.01	
KREM D20 DT LIC	180.4		0	180.4	0		0.47	0.00	

ANTENNA PERFORMANCE CHARTS



Formulas for curves: $L = \frac{2910}{f} - 1.10$ f in Mhz, L in inches

$L = \frac{73,914}{f} - 27.9$ L in millimeters



Antenna Element Length vs. Frequency

Figure 3-1

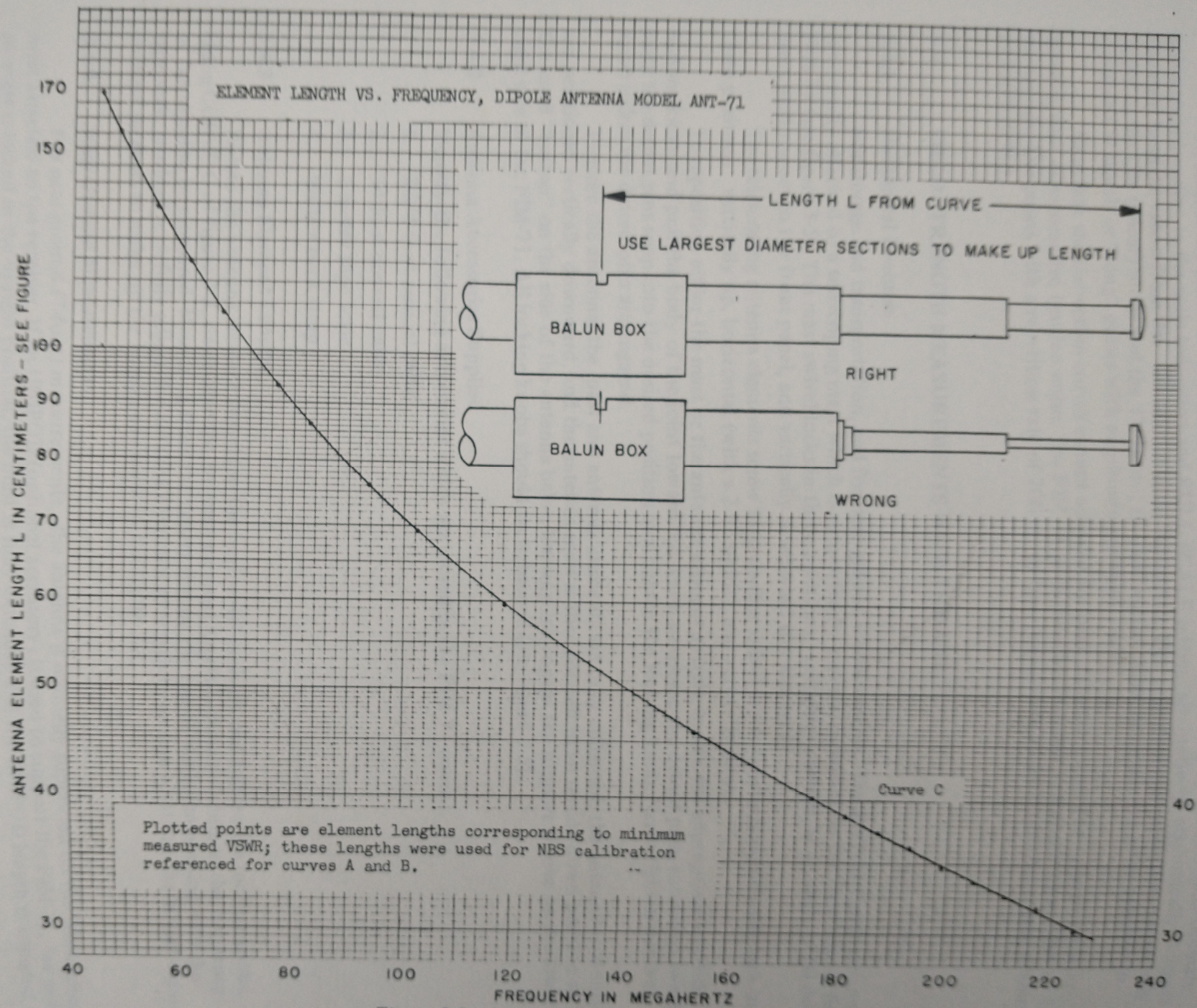


Figure 3-3. Antenna Factors, Curve C