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Engineering Statement
Minor Modification of K19FG-D
Channel 19 at Jackson, WY
August 2021

I. Background

This Engineering Statement has been prepared on behalf of Central Wyoming College ("CWC"), licensee of digital TV translator station K19FG-D. This material has been prepared in connection with an application for minor modification.

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, beyond the allowed values of 0.5% to full-power and Class A stations, and 2.0% to low-power 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: 2021.08.02 16:53:39

Study build station data: LMS TV 2021-08-02

```
    Proposal: K19FG-D D19 LD APP JACKSON, WY
 File number: K19FG-MOD
 Facility ID: 10033
Station data: User record
   Record ID: 1288
     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	K16CS	N16	TX	LIC	PINEDALE, ETC., WY	BLTT19931112IK	85.0 km
No	K18KV-D	D18	LD	CP	SHELLY, ID	BNPDTL20100609AHL	110.1
No	K18JJ-D	D18	LD	LIC	CROWHEART, WY	BLANK0000112983	152.9
No	K18JA-D	D18	LD	LIC	PINEDALE, WY	BLDTT20100308ABP	85.0
No	K19IK-D	D19	LD	CP	GLENN'S FERRY, ID	BNPDTL20090825BMB	365.4
No	K19NA-D	D19	LD	CP	IDAHO FALLS, ID	BLANK0000150844	108.5
No	K19IL-D	D19	LD	CP	MALTA, ID	BNPDTL20090825BOJ	232.3
No	K19KA-D	D19	LD	CP	MONIDA, ID	BNPDTL20100609AHY	172.8
No	K19DQ-D	D19	LD	LIC	MONTPELIER, ID	BLDTT20111115AGV	129.8
No	K19KY-D	D19	LD	LIC	POCATELLO, ID	BLANK0000152185	156.9
No	K19EW-D	D19	LD	LIC	PRESTON, ID	BLDTT20111116AIF	170.4
No	K19CY-D	D19	LD	LIC	ROCKLAND, ID	BLDTT20090624AAS	200.5
No	K45KS-D	D19	LD	CP	BILLINGS, MT	BLANK0000051841	313.9
No	KWYB	D19	DT	LIC	BUTTE, MT	BLCDT20080424ABB	312.7
No	K19JM-D	D19	LD	LIC	EMIGRANT, MT	BLDTT20120619ACG	208.3
No	K19JO-D	D19	LD	LIC	HARLOWTON, ETC, MT	BLDTT20120611ACE	324.7
No	K19MH-D	D19	LD	LIC	FRUITLAND, UT	BLANK0000095177	362.2
No	K19LR-D	D19	LD	LIC	HUNTSVILLE, ETC., UT	BLANK0000074712	251.6
No	K19EY-D	D19	LD	LIC	MYTON, UT	BLDTT20120113ABB	344.7
No	KJZZ-TV	D19	DT	LIC	SALT LAKE CITY, UT	BLANK0000113900	333.7
No	K19DU-D	D19	LD	LIC	SUMMIT COUNTY, UT	BLDTT20100201AED	295.9
No	K19GX-D	D19	LD	LIC	BUFFALO, WY	BLDTT20110420ABL	338.6
No	K49AI	D19z	LD	LIC	CODY, POWELL, WY	BLANK0000074850	196.7
No	K19KW-D	D19	LD	LIC	GREYBULL, WY	BLANK0000064170	244.6
No	K19JG-D	D19	LD	CP	MIDWEST, WY	BNPDTL20100510ACO	337.1
No	K19HJ-D	D19	LD	LIC	PINEDALE, ETC., WY	BLDTT20080305AEZ	85.0
No	K19MG-D	D19	LD	LIC	RAWLINS, WY	BLANK0000083954	343.5
No	K20KU-D	D20	LD	LIC	MONTPELIER, ID	BLDTT20111115AGX	117.1
No	K47JK-D	D20	LD	CP	POCATELLO, ID	BLANK0000052033	157.9
No	K20MQ-D	D20	LD	LIC	REXBURG, ID	BLANK0000080478	104.3
No	K20LT-D	D20	LD	LIC	DIAMOND BASIN, ETC., WY	BLDTT20130807AAN	170.9
No	K22IY	N22	TX	LIC	BIG PINEY, WY	BLTT20100119AAE	85.0

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

```
    Channel: D19
       Mask: Simple
   Latitude:  43 27 43.30 N (NAD83)
  Longitude: 110 45 12.80 W
Height AMSL: 2440.3 m
       HAAT: 0.0 m
   Peak ERP: 0.900 kW
    Antenna: K75010402 340.0 deg
Elev Pattrn: Generic
```

49.3 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.898 kW	482.2 m	49.1 km
45.0	0.595	346.2	42.2
90.0	0.149	-290.6	11.5
135.0	0.007	92.9	9.5
180.0	0.015	413.1	23.6

```
225.0      0.091      454.4     34.3
270.0      0.506      352.2     41.5
315.0      0.859      352.7     44.6

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m   Computed HAAT: 275 m

Distance to Canadian border: 615.4 km

Distance to Mexican border: 1243.1 km

Conditions at FCC monitoring station: Grand Island NE
Bearing: 101.3 degrees   Distance: 1052.4 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 127.1 degrees   Distance: 585.4 km

No land mobile station failures found


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 K19FG-D facility were calculated for an elevation of 2 meters above ground using the manufacturer's vertical plane pattern for the horizontally-polarized Kathrein 75010402 antenna proposed in this application. The highest calculated power density from the proposed antenna alone occurs at a point 3 meters from the base of the antenna support structure. At this point the power density from the proposed facility is calculated to be 37.0 µW/cm², which is 11.1% of 333.3 µW/cm² (the FCC maximum for uncontrolled environments at the

Channel 19 frequency). Snow King Mountain is a multiple user communications site. Previous on-site measurements have found the site to be in compliance with the FCC MPE for uncontrolled environments. The licensee can undertake additional post-construction measurements should the Commission so require as a condition for licensing.

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.

August 3, 2021

Erik C. Swanson, P.E.

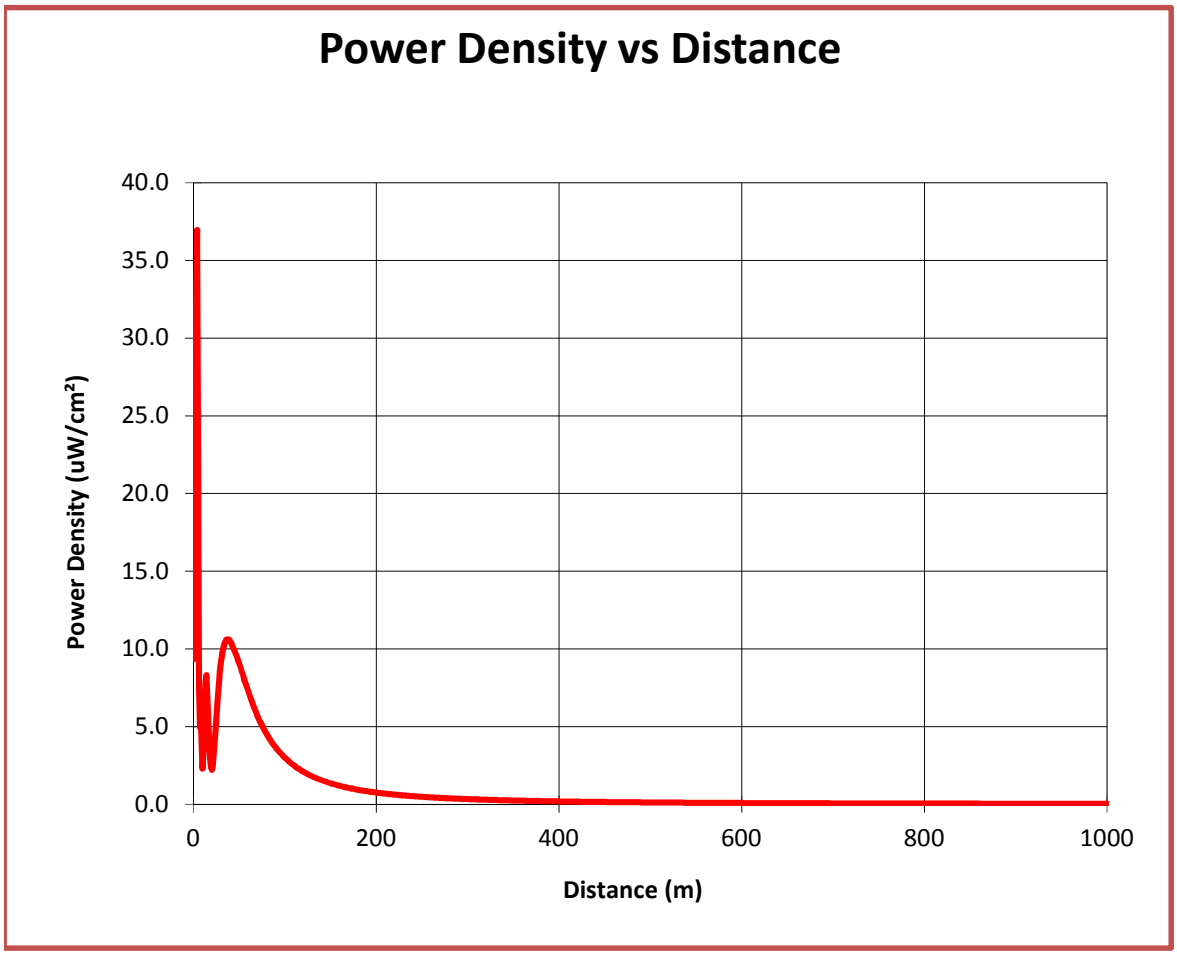
K19FG-D Jackson WY

Ground-Level Power Density Calculations

Using Manufacturer's Vertical Plane Pattern

Antenna	75010402			
ERP	900	Watts H (avg)		
	-	Watts V (avg)		
Antenna AGL	7.3	meters less 2m is	5.3	meters above the reference plane
MBT	0	degrees		

Calculated Maximum is 37.0 uW/cm² at 3 meters from the tower



K19FG-D Jackson WY
Ground-Level Power Density Calculations
Using Manufacturer's Vertical Plane Pattern

Distance From Tower (meters)	Hypotenuse (meters)	Depression Angle (with MBT adjust) (degrees)	Interpolated Rel Field	Adjusted ERP (watts)	Power Density uW/cm²
0	5.30	90.00	0.094	7.9	9.37
1	5.39	79.32	0.132	15.6	17.97
2	5.66	69.33	0.185	30.9	32.14
3	6.09	60.49	0.214	41.0	36.97
4	6.64	52.96	0.182	29.8	22.54
5	7.29	46.67	0.115	11.9	7.50
6	8.01	41.46	0.103	9.5	4.96
7	8.78	37.13	0.123	13.6	5.90
8	9.60	33.52	0.109	10.8	3.91
9	10.44	30.49	0.091	7.5	2.30
10	11.32	27.92	0.122	13.4	3.48
11	12.21	25.73	0.172	26.6	5.95
12	13.12	23.83	0.211	40.0	7.76
13	14.04	22.18	0.233	49.0	8.30
14	14.97	20.74	0.235	49.5	7.38
15	15.91	19.46	0.222	44.4	5.86
16	16.85	18.33	0.202	36.8	4.32
17	17.81	17.32	0.180	29.1	3.07
18	18.76	16.41	0.167	25.0	2.37
19	19.73	15.59	0.169	25.8	2.22
20	20.69	14.84	0.186	31.3	2.44
21	21.66	14.16	0.216	42.0	2.99
22	22.63	13.54	0.253	57.5	3.75
23	23.60	12.98	0.290	75.7	4.54
24	24.58	12.45	0.333	99.7	5.51
25	25.56	11.97	0.372	124.9	6.39
26	26.53	11.52	0.411	152.3	7.23
27	27.52	11.11	0.447	180.1	7.95
28	28.50	10.72	0.481	208.2	8.57
29	29.48	10.36	0.512	236.2	9.08
30	30.46	10.02	0.542	264.0	9.50
31	31.45	9.70	0.570	292.0	9.86
32	32.44	9.40	0.596	319.6	10.15
33	33.42	9.12	0.621	346.7	10.37
34	34.41	8.86	0.643	372.5	10.51
35	35.40	8.61	0.664	397.1	10.59
36	36.39	8.38	0.684	421.0	10.62
37	37.38	8.15	0.703	444.3	10.63
38	38.37	7.94	0.720	466.5	10.59
39	39.36	7.74	0.735	486.8	10.50
40	40.35	7.55	0.750	506.6	10.39
41	41.34	7.37	0.764	525.7	10.28
42	42.33	7.19	0.778	544.3	10.15
43	43.33	7.03	0.790	562.3	10.01
44	44.32	6.87	0.803	579.9	9.86

45	45.31	6.72	0.814	596.9	9.71
46	46.30	6.57	0.826	613.5	9.56
47	47.30	6.43	0.836	629.5	9.40
48	48.29	6.30	0.847	645.1	9.24
49	49.29	6.17	0.857	660.3	9.08
50	50.28	6.05	0.866	675.0	8.92
51	51.27	5.93	0.874	687.4	8.73
52	52.27	5.82	0.881	697.9	8.53
53	53.26	5.71	0.887	708.2	8.34
54	54.26	5.61	0.893	718.1	8.15
55	55.25	5.50	0.899	727.7	7.96
56	56.25	5.41	0.905	737.1	7.78
57	57.25	5.31	0.911	746.2	7.61
58	58.24	5.22	0.916	755.0	7.44
59	59.24	5.13	0.921	763.6	7.27
60	60.23	5.05	0.926	771.9	7.11
61	61.23	4.97	0.930	778.9	6.94
62	62.23	4.89	0.933	784.0	6.76
63	63.22	4.81	0.936	788.9	6.59
64	64.22	4.73	0.939	793.8	6.43
65	65.22	4.66	0.942	798.5	6.27
66	66.21	4.59	0.945	803.0	6.12
67	67.21	4.52	0.947	807.5	5.97
68	68.21	4.46	0.950	811.8	5.83
69	69.20	4.39	0.952	816.0	5.69
70	70.20	4.33	0.955	820.1	5.56
71	71.20	4.27	0.957	824.1	5.43
72	72.19	4.21	0.959	828.0	5.31
73	73.19	4.15	0.961	831.8	5.19
74	74.19	4.10	0.963	835.5	5.07
75	75.19	4.04	0.966	839.1	4.96
76	76.18	3.99	0.967	842.3	4.85
77	77.18	3.94	0.969	844.6	4.74
78	78.18	3.89	0.970	846.7	4.63
79	79.18	3.84	0.971	848.9	4.52
80	80.18	3.79	0.972	850.9	4.42
81	81.17	3.74	0.974	853.0	4.32
82	82.17	3.70	0.975	855.0	4.23
83	83.17	3.65	0.976	856.9	4.14
84	84.17	3.61	0.977	858.8	4.05
85	85.17	3.57	0.978	860.6	3.96
86	86.16	3.53	0.979	862.4	3.88
87	87.16	3.49	0.980	864.2	3.80
88	88.16	3.45	0.981	865.9	3.72
89	89.16	3.41	0.982	867.6	3.65
90	90.16	3.37	0.983	869.3	3.57
91	91.15	3.33	0.984	870.9	3.50
92	92.15	3.30	0.985	872.5	3.43
93	93.15	3.26	0.985	874.1	3.37
94	94.15	3.23	0.986	875.6	3.30
95	95.15	3.19	0.987	877.1	3.24
96	96.15	3.16	0.988	878.5	3.18