

Report of Field Measurements of Radio Frequency Radiation (RFR) Electromagnetic Field Strength

for the

**Combined operation of
KHIC 98.5 MHz / KFXX 99.5 MHz**

**Located at "KAGO Hill"
Klamath Falls, Oregon**

**Measurements collected on
June 17, 2017**

Prepared By	Prepared For
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- Report of Findings for RFR Electromagnetic Field Strength Measurements
- Exhibit A – KHIC-FM Construction Permit

Scope of Report

Basin Mediactive, LLC was granted a construction permit (permit file number BPH-20170214AAV, Exhibit B) to build a facility for KHIC-FM 98.5 MHz at facility ID 190240 at what is known as "KAGO Hill", coordinates 42-12-56 N, 121-47-51W. This facility is a combined operation with KFXX-FM 99.5 MHz into a common antenna that is mounted on an AM tower, ASRN 1034073. The tower is fully enclosed by a chain link fence and by two walls of the concrete block building housing the FM transmitters.

One condition of the construction permit is stated as:

Special operating conditions or restrictions:

4 Permittee has specified use of the antenna listed below to demonstrate compliance with the FCC radiofrequency electromagnetic field exposure guidelines. If any other type or size of antenna is to be used with the facilities authorized herein, THE AUTOMATIC PROGRAM TEST PROVISIONS OF 47 C.F.R. SECTION 73.1620 WILL NOT APPLY. In this case, a FORMAL REQUEST FOR PROGRAM TEST AUTHORITY must be filed in conjunction with FCC Form 302-FM, application for license, BEFORE program tests will be authorized. The request must include a revised RF field showing to demonstrate continued compliance with the FCC guidelines.

Opposed "V" dipole (EPA Type 2), six sections, 0.5 wavelength spaced antenna

The actual antenna that is to be used for this combined operation is a Shively 6-bay, full wavelength spaced antenna, Model 6810-6-EF-BB.

This report describes the radio frequency (RF) measurement campaign conducted in the vicinity of the tower to determine the level of total field strength on the ground and to plan corrective action in the event levels exceed allowable limits.

Summary of Findings

Outside the Fence

In probe scans up to ~2 meters above the ground in the area outside the fence and out to the guy wire radius, the maximum power density recorded was less than 20% of the occupational/controlled limits. For frequencies of interest at this site, the general public limit is 20% of the occupational/controlled limit, therefore no levels exceeding either the general population or occupational/controlled limits were found.

Inside the Fence

In probe scans up to ~2 meters above the ground inside the fenced area around the tower, the maximum power density recorded was >100% of the occupational/controlled limits. The fenced area already has controlled access with signage stating:

BEYOND THIS POINT:

Radio frequency fields at this site may exceed FCC rules for human exposure For your safety, obey all posted signs and site guidelines for working in radio frequency environments In accordance with Federal Regulations on frequency emissions.

There is no public access inside the fence. For personnel having authorized access inside the fence, any of the following operational conditions must be followed prior to access to comply with occupational/controlled limits:

Operating State for Inside Fence Access	KHIC-FM 98.5 MHz	KFXX-FM 99.5 MHz
State 1	OFF	<=70% TPO
State 2	Full TPO	<=20% TPO
State 3	<=45% TPO	<=45% TPO

All personal with access to this fenced area are trained on the hazards related to both RF exposure as well as the high voltage potential across the insulator of the AM tower. RFR measurements on the tower were not made.

Measurement Plan

The measurements in this report were conducted by Eric Wandel, P.E. of Wavepoint Research, Inc. on Saturday, June 17, 2017, with KHIC and KHIC operating at full licensed ERP.

A Narda meter Model NBM-550 and shaped probe Model EA5091 were used for all measurements. The probe is an E-field shaped probe to the FCC limits and reports 0.5 to 600% of FCC occupational/controlled limits. This equipment data and calibration date are listed in Table 1.

Table 1 - Narda Meter and Probe Info

	Meter	Probe
Model	NBM-550	EA5091
Prod. ID	9154-017	US 01018
S/N	A-0227	01018
Cal Date	2/3/2017	2/2/2017
Cal Due Date	2/3/2018	2/2/2018

A photo of this model of Narda meter and probe is shown in Figure 1.



Figure 1 - Narda Meter Model NBM-550 with Shaped Probe Model EA5091

A Google maps satellite image showing the general layout of the KHIC-KFXX site on KAGO Hill is shown in Figure 2.

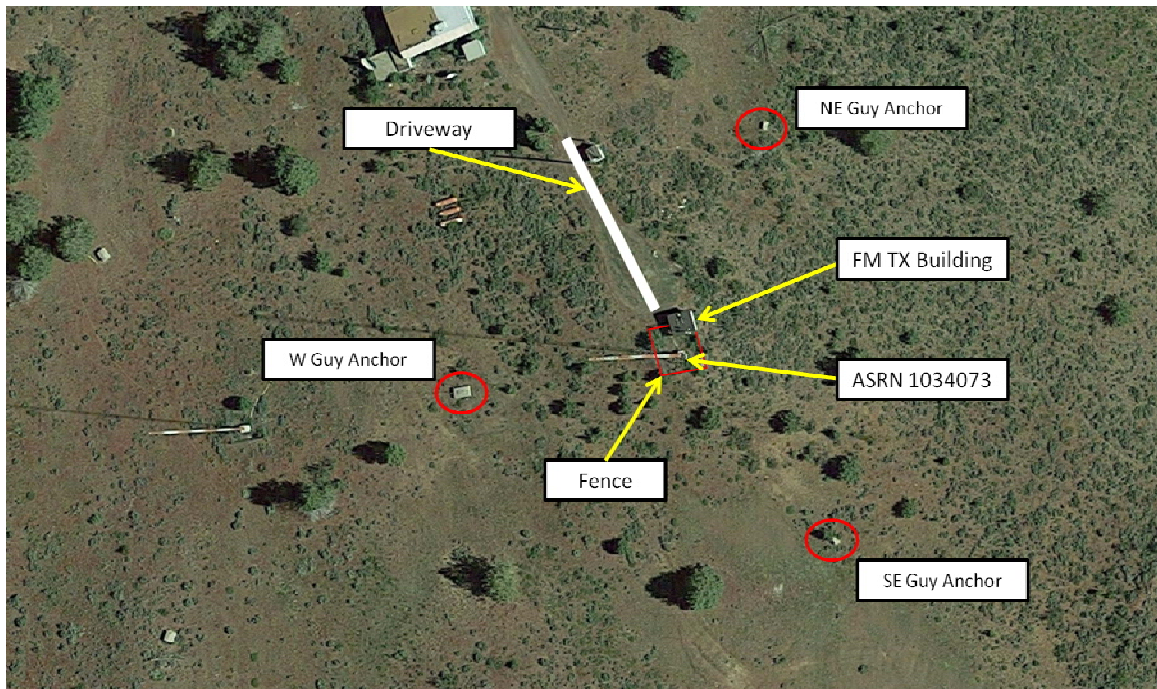


Figure 2 - Google Image of KAGO Hill Layout

Key measurement locations are summarized in Table 2 and illustrated in Figure 3 with labels A through S.

Table 2 - Measurement Location Descriptions

Measurement Label	Description
A	North building and fence, walk E to W
B	West fence, walk N to S
C	South fence, walk W to E
D	East fence, walk S to N
E	East building wall, walk S to N
F	Walk drive from translator building toward KHIC-KFXX building
G	Near NE guy anchor
H	Walk from NE guy anchor toward tower to fence
I	Near W guy anchor
J	Walk from W guy anchor toward tower to fence
K	Near SE guy anchor
L	Walk from SE guy anchor toward tower to fence
M	Spatial averages along outside of East fence, southern third
N	Spatial averages along outside of East fence, middle third
O	Spatial averages along outside of East fence, northern third
P	Meander along hillside east of tower
Q	Inside fence, AM on
R	Inside fence, AM off
S	Inside fence, AM on

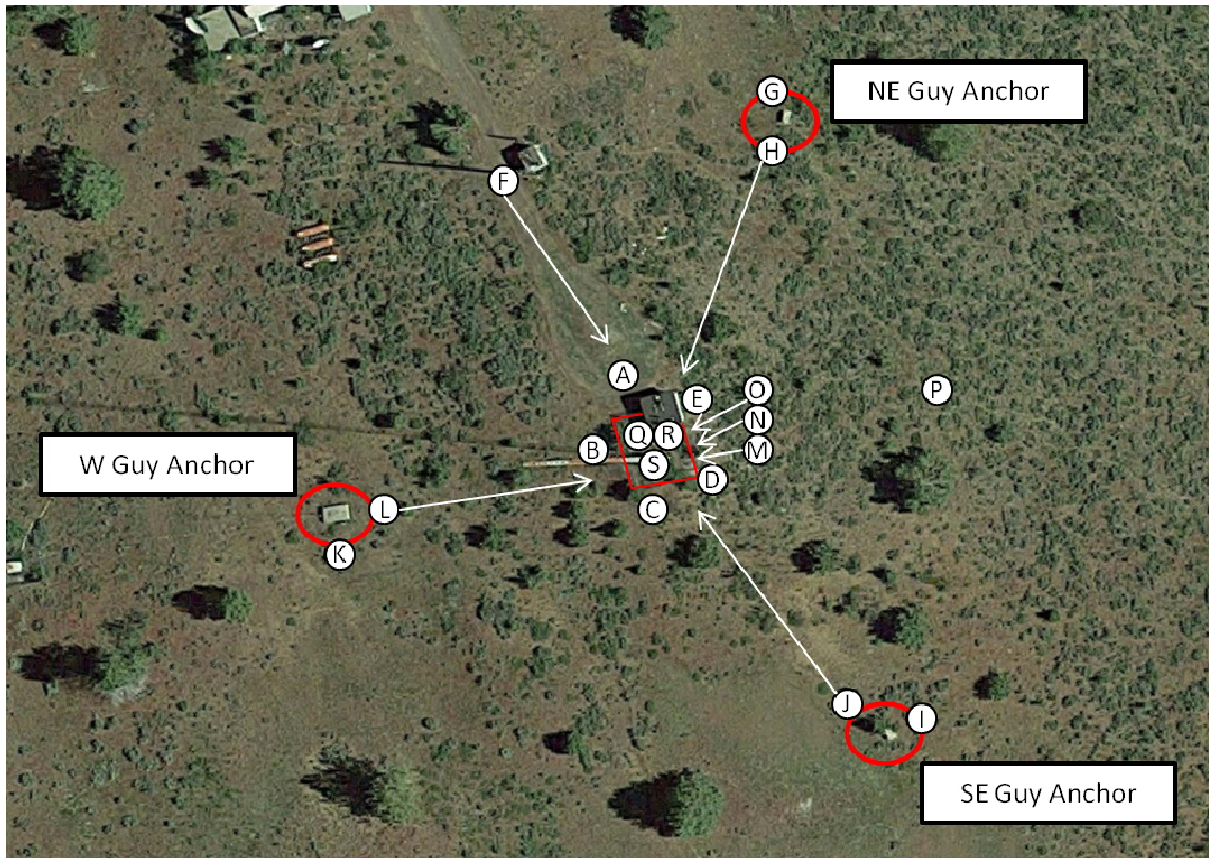


Figure 3 - Measurement Locations at KAGO Hill

Measurements Recorded

Weather on the day of measurements was fair with light clouds, mostly sunny, temperature 64 deg F with 53% humidity being reported by local weather stations at 10 a.m. local time.

A thorough measurement campaign was conducted in the vicinity of the tower by scanning the probe through 2 to 6 feet above ground while slowly walking and observing readings. The data logger feature was set to record min/max/average power density readings at 1 second intervals to allow later review of the data. In two of the measurement locations, instances of maximum readings were observed that exceeded standards, including:

- Along the outside of the easterly fence
- Inside the fence

Further investigation at these two locations was conducted.

Spatial Average Along Easterly Fence

Spatial average measurements were made in three locations along the outside of the easterly fence, where the probe was scanned from approximately 2 to 6 feet during the averaging process, see Figure 4. As summarized in Table 3, no measurements exceeded the general population limit.



Figure 4 - Spatial Averaging Along Easterly Fence

Table 3 - Spatial Average Measurement Summary

Measurement Label	Description	Average Reading [% STD]
M	Spatial averages along outside of East fence, southern third	14.31
N	Spatial averages along outside of East fence, middle third	9.78
O	Spatial averages along outside of East fence, northern third	16.18

Measurements Inside Fence

Inside the fence, readings were observed that exceeded the occupational/controlled limits. A reading of 209% of occupational levels was observed near the isolation transformer with both KHIC and KFXX on the air at full power. Additional measurements were made in this location for various conditions of KHIC 98.5 MHz and KFXX 99.5 MHz being on/off as summarized below:

Table 4 - Inside Fence Measurement Summary

KHIC 98.5 MHz %TPO	KFXX 99.5 MHz %TPO	% STD
100%	100%	209%
0%	100%	137%
100%	100%	200%
100%	0%	62%
0%	0%	<1%
100%	0%	62%
100%	100%	203%

In probe scans up to ~2 meters above the ground inside the fenced area around the tower, the maximum power density recorded was >100% of the occupational/controlled limits as shown above. RFR measurements on the tower were not made. The fenced area already has controlled access with signage stating:

BEYOND THIS POINT:

Radio frequency fields at this site may exceed FCC rules for human exposure For your safety, obey all posted signs and site guidelines for working in radio frequency environments In accordance with Federal Regulations on frequency emissions.

There is no public access inside the fence. For personnel having authorized access inside the fence, any of the following operational conditions must be followed prior to access to comply with occupational/controlled limits:

Table 5 - Conditions for Occupational/Controlled Access Inside Fence

Operating State for Inside Fence Access	KHIC-FM 98.5 MHz	KFXX-FM 99.5 MHz
State 1	OFF	<=70% TPO
State 2	Full TPO	<=20% TPO
State 3	<=45% TPO	<=45% TPO


Basin Mediactive, LLC has implemented a plan to clearly mark the area with appropriate visual warning signs which describe the nature of the hazard. These signs in addition to the already restricted access to the rooftop should be sufficient measures to prevent the exposure of humans to the RF fields in excess of the FCC Guidelines (OET Bulletin No. 65, Edition 97-01, August 1997). All personal with access to this fenced area are trained on the hazards related to both RF exposure as well as the high voltage potential across the insulator of the AM tower.

AFFIDAVIT

I, Eric R. Wandel, employed by Wavepoint Research, Inc. and under the commission of Basin Mediactive, LLC, have performed the preparation of all technical information contained in this document and to my knowledge have made no misrepresentations or false claims.

My qualifications to perform this work are supported as follows:

1. Education includes:
 - a) The degree of Bachelor of Science in Electrical Engineering from Rose-Hulman Institute of Technology, Terre Haute, Indiana
 - b) The degree of Bachelor of Science in Applied Optics from Rose-Hulman Institute of Technology, Terre Haute, Indiana
 - c) The degree of Master of Science in Electrical Engineering from Rensselaer Polytechnic Institute, Troy, New York
2. Experience includes:
 - a) 25 years of experience in systems engineering work related to RF engineering, signal processing, antenna and filter design, including design, installation and field checkout of high power broadcast systems involving combined operation of multiple stations.
3. Licensed Professional Engineer
 - a) State of Indiana, Registration No. 19900140


Eric R. Wandel, P.E.

June 26, 2017
Date

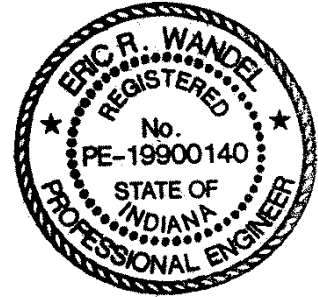
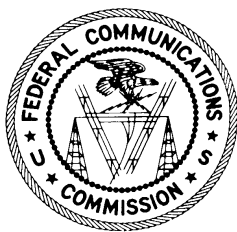


Exhibit A – KHIC-FM Construction Permit



United States of America
FEDERAL COMMUNICATIONS COMMISSION
FM BROADCAST STATION CONSTRUCTION PERMIT

Authorizing Official:

Official Mailing Address:

BASIN MEDIACTIVE, LLC
404 MAIN STREET
SUITE 4
KLAMATH FALLS OR 97601

Rodolfo F. Bonacci
Assistant Chief
Audio Division
Media Bureau

Facility ID: 190240

Call Sign: KHIC

Permit File Number: BPH-20170214AAV

Grant Date: April 13, 2017

This permit expires 3:00 a.m.
local time, 36 months after the
grant date specified above.

Subject to the provisions of the Communications Act of 1934, as amended, subsequent acts and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions set forth in this permit, the permittee is hereby authorized to construct the radio transmitting apparatus herein described. Installation and adjustment of equipment not specifically set forth herein shall be in accordance with representations contained in the permittee's application for construction permit except for such modifications as are presently permitted, without application, by the Commission's Rules.

Commission rules which became effective on February 16, 1999, have a bearing on this construction permit. See Report & Order, Streamlining of Mass Media Applications, MM Docket No. 98-43, 13 FCC RCD 23056, Para. 77-90 (November 25, 1998); 63 Fed. Reg. 70039 (December 18, 1998). Pursuant to these rules, this construction permit will be subject to automatic forfeiture unless construction is complete and an application for license to cover is filed prior to expiration. See Section 73.3598.

Equipment and program tests shall be conducted only pursuant to Sections 73.1610 and 73.1620 of the Commission's Rules.

Name of Permittee: BASIN MEDIACTIVE, LLC

Station Location: OR-KENO

Frequency (MHz): 98.5

Channel: 253

Class: C3

Hours of Operation: Unlimited

Transmitter: Type Accepted. See Sections 73.1660, 73.1665 and 73.1670 of the Commission's Rules.

Transmitter output power: As required to achieve authorized ERP.

Antenna type: Non-Directional

Antenna Coordinates: North Latitude: 42 deg 12 min 56 sec
West Longitude: 121 deg 47 min 51 sec

	Horizontally Polarized Antenna	Vertically Polarized Antenna
Effective radiated power in the Horizontal Plane (kW):	20.0	20.0
Height of radiation center above ground (Meters):	65	65
Height of radiation center above mean sea level (Meters):	1439	1439
Height of radiation center above average terrain (Meters):	112	112
Antenna structure registration number: 1034073		

Overall height of antenna structure above ground (including obstruction lighting if any) see the registration for this antenna structure.

Special operating conditions or restrictions:

- 1 Upon grant of a license application to cover this construction permit, the assignment will be downgraded as follows:

Community	Channel No.
Keno, OR	Add 253C3, Delete 253C2
- 2 BEFORE PROGRAM TESTS COMMENCE, sufficient measurements shall be made to establish that the operation authorized in this construction permit is in compliance with the spurious emissions requirements of 47 C.F.R. Sections 73.317(b) through 73.317(d). All measurements must be made with all stations simultaneously utilizing the shared antenna. These measurements shall be submitted to the Commission along with the FCC Form 302-FM application for license.
- 3 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 electromagnetic fields in excess of FCC guidelines.

Special operating conditions or restrictions:

- 4 Permittee has specified use of the antenna listed below to demonstrate compliance with the FCC radiofrequency electromagnetic field exposure guidelines. If any other type or size of antenna is to be used with the facilities authorized herein, THE AUTOMATIC PROGRAM TEST PROVISIONS OF 47 C.F.R. SECTION 73.1620 WILL NOT APPLY. In this case, a FORMAL REQUEST FOR PROGRAM TEST AUTHORITY must be filed in conjunction with FCC Form 302-FM, application for license, BEFORE program tests will be authorized. The request must include a revised RF field showing to demonstrate continued compliance with the FCC guidelines.

Opposed "V" dipole (EPA Type 2), six sections, 0.5 wavelength spaced antenna

*** END OF AUTHORIZATION ***