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# NON-IONIZING RF EXPOSURE SURVEY

PREPARED FOR

**American Tower Corporation**

BLACK MOUNTAIN

Facility 90346, Tower 2

HENDERSON, NEVADA

FEBRUARY 2014

## **INTRODUCTION**

Hatfield & Dawson Consulting Engineers has been retained by the American Tower Corporation (“ATC”) to update and revise a previously completed survey of the radiofrequency (RF) exposure conditions near building 4 at the Black Mountain Telecommunications site, Henderson, Nevada.

## **STATEMENT OF WORK**

Description of the work from ATC Purchase Order #313267: “Site: 90346 Black Mt T2 - Labor and equipment to perform site visit and take RF measurements around building 4 for compliance with RF ground exposure levels. Revise report completed in 2013 based on these findings.”

The undersigned's report for the original RF survey of the Black Mountain Telecommunications site, dated 29 May 2013, found areas of excessive RF exposure in the vicinity of building 4 and tower 2, (FCC ASRN 1025338). The 100.5 MHz KXNT-FM antenna on tower 2 was identified as the primary contributor to the excessive exposure environment.

CBS Radio Stations, Inc., the licensee of KXNT, has reconfigured the station's primary antenna on tower 2. The inter-bay spacing was changed, resulting in the same antenna but with a different ERI model number, DI-8A-SP. According to CBS Chief Engineer Tracy Teagarden, KXNT is now transmitting with 100 kW ERP analog, and with an additional 1kW ERP for the IBOC digital signal. See the May 2013 report for a list of all broadcast facilities at the site.

## **EXECUTIVE SUMMARY**

The reconfiguration of the KXNT antenna has significantly reduced the area of excessive RF exposure around tower 2 and building 4. The rooftop of building 4 and the fuel tank to the south of the building may now be accessed by persons without RF protective clothing because the RF exposure environment in those areas was found to be below the 100% Controlled (i.e., “Occupational”) FCC MPE limit. However, those persons are still subject to the provisions of the site RF Safety Program (RFSP) because the RF exposure environment atop building 4 and near tower 2 remains above the 100% General Population / Uncontrolled (i.e., “Public”) FCC MPE limit.

The only area near tower 2 or building 4 that remains above the Occupational limit is in the vicinity of the pole-mounted personal wireless panel antennas to the east of tower 2. Existing rope barriers and red RF warning signs should be relocated to the north and south of those panel antennas which are close to ground level. The relocated barriers should prevent individuals from approaching to within 10 feet to the north or south of the ground-level panel antennas.

## **SITE DESCRIPTION**

The Black Mountain Telecommunications Site is a multiple tower site located on private land on the remote Horizon Ridge near Henderson, Nevada, 22km southeast of Las Vegas, Nevada. Four towers, numbers 1 through 4, support antennas for full-service FM broadcast facilities. Building 4 houses the transmitters for the FM facilities on towers 2 and 3.

The terrain drops off steeply in all directions from the site. Vehicular access to the site is via a single steep private road suitable only for four-wheel drive vehicles. Two locked gates along the access road prevent unauthorized access. There are no hiking trails leading to the site. "No Trespassing" and RF warning signs are posted on the gates to further discourage casual public access. All tower bases are surrounded by fencing.

FCC/OET Bulletin No. 65, Edition 97-01, released in August 1997, includes the following discussion of access control:

"Restricting access is usually the simplest means of controlling exposure to areas where high RF levels may be present. Methods of doing this include fencing and posting such areas or locking out unauthorized persons in areas, such as rooftop locations, where this is practical. There may be situations where RF levels may exceed the MPE limits for the general public in remote areas, such as mountain tops, that could conceivably be accessible but are not likely to be visited by the public. In such cases, common sense should dictate how compliance is to be achieved. If the area of concern is properly marked by appropriate warning signs, fencing or the erection of other permanent barriers may not be necessary."

Black Mountain is a remote mountain top site on private land that is not likely to be visited by the public. There are no permanent users of this site other than the wireless and broadcast tenants. Any other individuals present on this site who are not associated with the communications facilities are trespassing. No evidence of casual public access, such as litter, hiking trails or footpaths leading to the site, were observed at the time of the survey.

As previously noted, there are “No Trespassing” and RF warning signs posted on the locked gates along the single road that leads to the site. Black Mountain is considered to be remote within the meaning of the Public Notice dated January 28, 1986, “Further Guidance for Broadcasters Regarding Radiation and the Environment” (FCC Public Notice No. 2278).

Appropriate signage and physical rope barriers at the Black Mountain site are used to prevent access to “Controlled” areas where RF exposure conditions exceed the either the Public or Occupational exposure limits. All persons accessing the site should receive instructions on the meanings of the various RF signs in accordance with the site RFSP.

#### **DESCRIPTION OF RF EXPOSURE SURVEY**

An RF exposure measurement survey was conducted on February 19, 2014 by the undersigned. The survey took place on a Wednesday, from approximately 10:00 am to 11:30 am local time. Skies were clear and sunny with ambient temperatures in the 70s.

The equipment and measurement procedures used during the survey conform to the most recent FCC guidelines as set forth in FCC/OET Bulletin No. 65, Edition 97-01, released in August 1997.

Exposure measurements were taken with a Narda model 8718B RF Survey Meter, S/N 6037, and a Narda A8742D Isotropic Shaped-response Electric Field probe, S/N 12004, for Controlled / Occupational environmental measurements. Both meter and probe were calibrated at the factory within the twelve months preceding the survey.

This meter and probe combination is a broadband instrument which measures power densities over a wide spectrum as required by IEEE Standard C95.3-2002, *IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz – 300 GHz*.

The meter/probe combination provide readings of RF exposure conditions in percentage of either the Controlled / Occupational or Uncontrolled / Public Maximum Permissible Exposure (MPE) limits allowed by the FCC guidelines, as specified in *CFR 47 §1.1310*. Compliance is determined by comparing the percent readings with the either the 100% Occupational MPE limit, or the 100% Public MPE limit by multiplying the readings by five.

#### **GROUND LEVEL AND ROOFTOP RF EXPOSURE ENVIRONMENT**

The recent efforts of CBS Radio Stations, Inc., to reduce the downward radiation from the KXNT-FM antenna have dramatically reduced the areas of excessive ground-level and rooftop exposure conditions at tower 2 and building 4.

#### **Areas Where Exposure Conditions were Greater than the Occupational MPE limits**

The highest outdoor exposure conditions were found east of tower 2 in front of the apertures of the pole-mounted personal wireless panel antennas. Portions of these antennas are below head-height for persons standing nearby.

The maximum measured exposure condition was 300% of the Controlled / Occupational Environment MPE limit (on a spatial average basis) as shown by the cross-hatched area on the attached Exhibit A.

Existing rope barriers and red RF warning signs should be relocated to the north and south of the pole-mounted panel antennas to the east of tower 2. The barriers should prevent individuals from approaching to within 10 feet to the north or south of the panel antennas. ATC may wish to explore with the licensee the possibility of raising the panels to well above head-height to eliminate the excessive exposure conditions.

The licensee of the personal wireless facility with the panel antennas to the east of tower 2 must reduce power or cease operation as appropriate to reduce exposure conditions to acceptable levels for those persons who must work or dwell within the rope fenced area.

#### **Areas Where Exposure Conditions were Greater than the Public MPE limits**

The single-slant-line-hatched areas on the attached Exhibit A show the areas where exposure conditions exceed the Public MPE limit. An RF warning sign is posted on the access road near building 4 which describes those public exclusion areas.

#### **RECOMMENDATIONS**

***This report refers to areas which have RF exposure conditions consistent with Controlled / Occupational Environments. Individuals who access any Controlled Environment area must adhere to the provisions of a written Black Mountain site RFSP. Occupational exposure limits apply only to those persons who have received RF safety training. Only individuals who have received the benefits of RF Safety training in accordance with the Black Mountain site RFSP should be allowed access to the outdoor ground level areas and rooftops within the transmitter site compound where RF exposure conditions exceed FCC MPE limits.***

Prominent signage shall be erected along the access road to identify the full extent of the Controlled area that exists near and atop building 4, near building 5, and near the bases of towers 1, 2 and 3. Existing rope barriers and red RF warning signs should be relocated to the north and south of the panel antennas to the east of tower 2. The relocated barriers should prevent individuals from approaching to within 10 feet to the north or south of the panel antennas.

Persons who must work or dwell within any of the Controlled areas, for example those who maintain the A/C units atop building 4, must agree to the provisions of the RFSP and sign a log book to that effect. Persons who have not received training as part of a site-specific RFSP must remain outside of the designated Controlled areas of the site.

**COMPLIANCE**

The licensees of the wireless facilities at the Black Mountain site will take all steps necessary to ensure that the RF exposure of persons who enter the Controlled areas of the site remain below the FCC Controlled / Occupational Environment MPE limit. This will be accomplished through RF safety training and/or power reductions and transmitter shut-downs as described in the Black Mountain Telecommunications site RFSP.

**CONCLUSION**

Analysis of the results of the revised surveyed RF exposure conditions can be used by ATC to create a new site RFSP. The new RFSP will help to ensure that persons who are authorized to access the Black Mountain site will encounter RF exposure conditions that are in compliance with current FCC rules and guidelines regarding exposure to RF electromagnetic fields (EMFs).

Persons who are authorized to access the site are required to follow the written RFSP. The RFSP may specify power reductions of certain wireless transmitters. Additional and/or alternative safety measures, including the wearing of RF protective garments, and the use of time-averaged RF exposure may be incorporated into the site RFSP.

The recommendations and conclusions presented in this report are based on FCC rules and recommendations, and the comparison of predicted and measured RF conditions in specific areas with the corresponding safe exposure limits set forth in the FCC rules. The FCC exposure limits are based on recommendations by federal and private entities with the appropriate expertise in human safety issues. Under the Commission's rules, licensees are required to ensure compliance with the limits for Maximum Permissible Exposure (MPE) established by the FCC. These limits have been developed based on guidelines provided by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and the National Council on Radiation Protection and Measurements (NCRP). Both the NCRP and IEEE guidelines were developed by scientists and engineers with a great deal of experience and knowledge in the area of RF biological effects.

**QUALIFICATIONS**

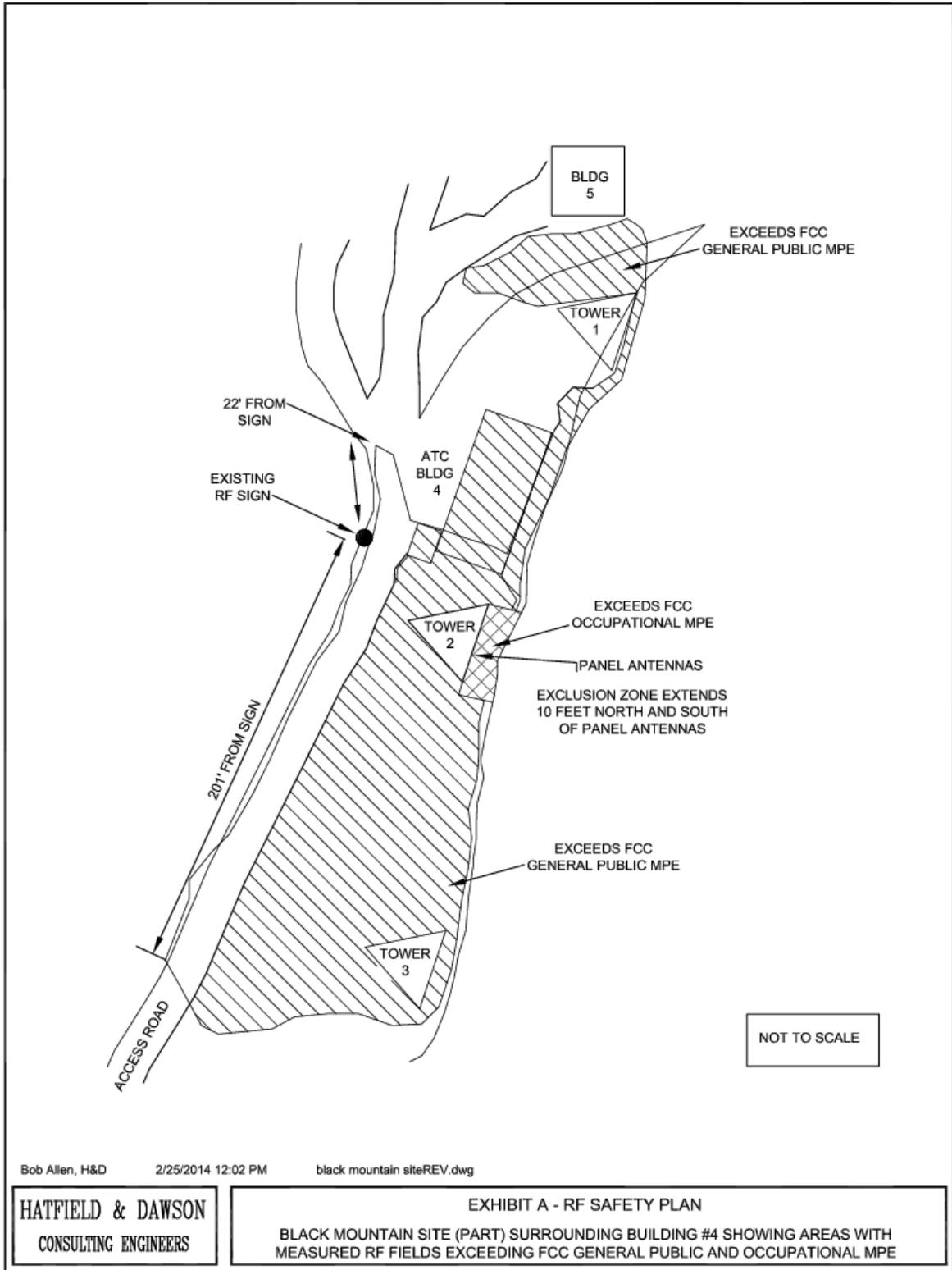
I am a Senior Member of the IEEE. As a partner in the firm of Hatfield & Dawson Consulting Engineers I am registered as a Professional Engineer in the States of Washington, Oregon, California and Hawaii. I am an experienced radio engineer with over 30 years of professional engineering experience, whose qualifications are a matter of record with the Federal Communications Commission, and I hold an FCC General Radiotelephone Operator License PG-12-21740.

All representations contained herein are true to the best of my knowledge.

26 February 2014



David J. Pinion, P.E.



Bob Allen, H&D      2/25/2014 12:02 PM      black mountain siteREV.dwg

<b>HATFIELD &amp; DAWSON</b> CONSULTING ENGINEERS	<b>EXHIBIT A - RF SAFETY PLAN</b> BLACK MOUNTAIN SITE (PART) SURROUNDING BUILDING #4 SHOWING AREAS WITH MEASURED RF FIELDS EXCEEDING FCC GENERAL PUBLIC AND OCCUPATIONAL MPE
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