

Community Development Department

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MEMORANDUM

TO: Newberg Planning Commission
FROM: Steve Olson, Associate Planner
SUBJECT: Supplemental packet: Additional information from the applicant regarding the cellular communications tower application at 2401 E. Hancock Street.
File DR2-15-003/VAR-15-001
DATE: August 7, 2015

We have received some additional information about the cellular communications tower application at 2401 E. Hancock Street. Please review this information and add this to your meeting packet.

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NON-IONIZING ELECTROMAGNETIC EXPOSURE ANALYSIS
AND

ENGINEERING CERTIFICATION

PREPARED FOR

Verizon Wireless

“POR HANCOCK”

PROPOSED PERSONAL WIRELESS FACILITY

2401 EAST HANCOCK STREET

CITY OF NEWBERG

WASHINGTON COUNTY, OREGON

AUGUST 2015

INTRODUCTION

Hatfield & Dawson Consulting Engineers has been retained to evaluate the proposed Verizon Wireless personal wireless telecommunications facility "POR HANCOCK" for compliance with current Federal Communications Commission (FCC) and local guidelines regarding public exposure to radio frequency (RF) electromagnetic fields (EMFs).

BACKGROUND

Construction information provided by Verizon representatives indicate that the proposed Verizon Wireless facility will have panel antennas installed atop a new monopole tower in the light industrial complex at 2401 East Hancock Street, Newberg, in Washington County, Oregon 97132.

All of the Verizon antennas will be mounted and centered approximately 70 feet above grade level. Thus all of the Verizon antennas will be mounted far from any habitable space and well above head height for persons at the project site, on adjacent properties, or within nearby buildings. The tower will be surrounded by a chain link fence topped with barbed wire. Thus it is unlikely that anyone other than authorized workers could approach near enough to any of the tower mounted antennas to cause that person's RF exposure to exceed FCC limits.

Personal wireless panel and microwave antennas are highly directional; these antennas project the majority of the transmitted RF energy horizontally and well above all nearby accessible areas. It is expected that RF exposure conditions will be well below FCC and local public exposure limits at the project site, and on adjacent properties, due to the contributions from all of the Verizon wireless operations at the site.

The operation of the Verizon facility will NOT create significant RF exposure conditions at any occupancy, habitable space or publicly accessible area. The project site is within a light industrial zone and there appears to be no habitable spaces within 65 feet of the project tower.

EMISSION CHARACTERISTICS

The Verizon facility may operate within the 700 MHz Upper Block “C” frequency band, the 800 MHz Cellular “B” frequency band, the 1.9 GHz Personal Communications Service (PCS) frequency bands, and the 2.1 GHz Advanced Wireless Service (AWS) frequency bands.

CALCULATION OF MAXIMUM EXPOSURE CONDITIONS

RF power densities and exposure conditions are computed in accordance with methods described in *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65, August 1997*.

OET Bulletin 65 describes the methods established by the FCC for predicting compliance with FCC-specified exposure limits. Personal wireless and microwave facilities are required to comply with the FCC “Rules & Regulations” **47 CFR §1.1310, Radiofrequency radiation exposure limits**.

The following formula has been used to calculate the power densities at specific locations:

$$S(\text{mW}/\text{cm}^2) = 0.36 \times \text{ERP (watts)} / (\text{Distance in feet})^2$$

This formula is derived from Equation 9 on page 21 of OET Bulletin 65. It includes the effect of reflections. The Effective Radiated Power (ERP) in a particular direction depends on the vertical and horizontal antenna patterns. A composite vertical antenna pattern is used to determine the predicted power density. This composite antenna pattern is a worst case envelope that encompasses the maximums of the downward lobes of the vertical patterns of the Verizon antennas.

It is expected that RF exposure conditions near ground level at the project site, within any nearby buildings, and on all adjacent properties, due to the contributions from all of the Verizon antennas on the tower, will be well below the FCC public exposure limit.

ANALYSIS OF PERSONAL WIRELESS OPERATIONS

The RF exposure analysis is based on information provided by Verizon representatives, and known characteristics of typical wireless facilities. The analysis provides a “worst case” model for calculating the maximum “uncontrolled” (i.e., general public) RF power density and exposure condition for a person standing at the nearest approach to any of the tower mounted antennas.

All of the Verizon personal wireless panel antennas will be mounted and centered at approximately the 70 foot level. A six foot tall person standing at ground level near the project tower would be about 64 feet from the center lines of any of the Verizon panel antennas.

CUMULATIVE RF EXPOSURE CONDITIONS DUE TO VERIZON OPERATIONS

The predicted maximum worst case cumulative Public RF exposure condition near the tower resulting from all proposed Verizon operations is less than 5% of the Public MPE limit. This maximum predicted cumulative Public exposure condition is less than **1/20th** of the 100% MPE limit.

Therefore the Verizon wireless operations at the project site will not have a significant environmental impact as defined by the FCC Public MPE limits. Furthermore, the Verizon facility will not cause any existing wireless facilities to exceed non-ionizing electromagnetic radiation (NIER) exposure standards.

The analysis presented in this report demonstrates compliance with NIER emissions standards as set forth by the Federal Communications Commission (FCC) particularly with respect to any habitable or occupied spaces on or near the project site, or in structures directly across from or adjacent to the antennas.

COMPLIANCE WITH FCC REGULATIONS AND GUIDELINES FOR RF EXPOSURE

The Verizon Wireless operations at the project site will not have a significant environmental impact as defined by the FCC Public MPE limits. The FCC has determined through calculations and technical analysis that personal wireless facilities and microwave facilities, such as those operated by Verizon, are highly unlikely to cause human RF exposures in excess of FCC guideline limits. In particular, personal wireless facilities with non-building-mounted antennas greater than 10 meters (about 33 feet) above ground level are considered to have such a low impact on overall exposure conditions that they are "categorically excluded" (i.e., exempt) from the requirement for routine environmental assessment regarding RF exposure hazards.

Thus according to FCC rules, the Verizon personal wireless facility, with all antennas centered at well above the 33 foot level, is exempt from further RF safety environmental assessment because it is presumed to be in compliance with the FCC RF exposure rules and guidelines. The Verizon facility is expected to be compliant with FCC rules regarding public RF exposure provided that direct access to the Verizon antennas is positively restricted.

COMPLIANCE WITH FCC REGULATIONS FOR RF EMISSIONS AND RF INTERFERENCE

It is expected that the RF interaction between all of the Verizon wireless operations at the project site will be low enough to preclude the likelihood of localized interference caused by the Verizon Wireless facility to the reception of any other communications signals. All of the Verizon antennas are sufficiently high enough, and far enough removed from all occupancies, that they are unlikely to cause interference with nearby consumer receivers or other consumer electronic devices.

Transmission equipment for the Verizon wireless facility is certified by the FCC under the equipment authorization procedures set forth in the FCC rules. This assures that the wireless facility will transmit within the desired base-station frequency bands at authorized power levels. The Verizon Wireless facility will operate in accordance with all FCC rules regarding power, signal bandwidth, interference mitigation, and good RF engineering practices. ***The Verizon facility will comply with all FCC standards for radio frequency emissions.***

CONCLUSIONS BASED ON CALCULATIONS AND REGULATIONS

The Verizon Wireless facility “POR HANCOCK” will be in compliance with current FCC and local rules regarding public exposure to radio frequency electromagnetic fields and radio frequency interference. This conclusion is based on information supplied by Verizon representatives, and estimates of future RF exposure conditions due to the Verizon facility.

The stated conclusions are based on FCC rules and recommendations, and the comparison of predicted RF conditions in specific areas with the corresponding safe exposure guidelines 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 and related issues.

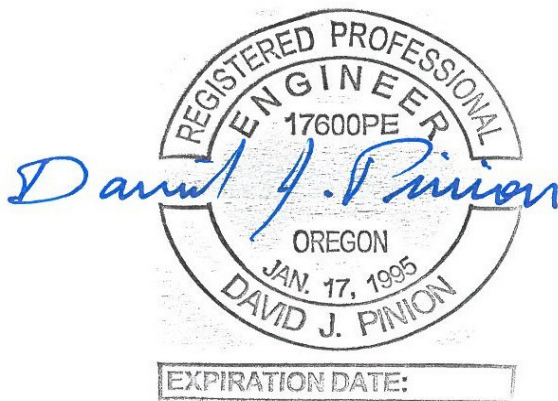
To ensure full compliance with current FCC rules regarding human exposure to radio frequency electromagnetic fields, the Verizon transmitters should be turned off whenever maintenance and repair personnel are required to work in the immediate vicinity of the Verizon antennas. This safety procedure should apply to all existing and future wireless transmission facilities at the project site.

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 Oregon, Washington, 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.

6 August 2015



David J. Pinion, P.E.

PE Expiration Date 12/31/2016

Hatfield & Dawson Consulting Engineers