

Before the
Federal Communications Commission
Washington DC 20554

In the Matters of

Robert Peterson, dba Wavebounce,
Request for Waiver of Sections 15.509 and
205 of the Commission's Rules

Geophysical Survey Systems, Inc.,
Request for Waiver of Section 15.509(d) of
the Commission's Rules

ET Docket No. 04-374

CONSOLIDATED REPLY TO OPPOSITIONS

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On July 6, 2004, Robert Peterson, dba Wavebounce, filed a request for waiver of Sections 15.509 and 205 of the Commission's Rules, relating to the emissions limits for certain categories of ground penetrating radar (GPR) devices. Geophysical Survey Systems, Inc. (GSSI) filed a similar request on October 13, 2004. The Commission consolidated the two requests into the same docket.¹

Along with several comments in support, the two requests drew nearly identical oppositions from Cingular Wireless, LLC. The waiver proponents respond to Cingular and the other commenters in this consolidated Reply.

A. Introduction

Both Wavebounce and GSSI request waivers applicable to non-contact horn-antenna GPRs. These are most often towed behind a vehicle to inspect transportation facilities such as

¹ *Office of Engineering and Technology Declares Wavebounce Request for a Waiver of Part 15 to Be a "Permit-but-Disclose" Proceeding for Ex Parte Purposes*, ET Docket No. 04-374, DA 04-3039 (released Sept. 22, 2004); *Office of Engineering and Technology Declares Geophysical Survey Systems, Inc. Request for a Waiver of Part 15 to Be a "Permit-but-Disclose" Proceeding for Ex Parte Purposes*, ET Docket No. 04-374, DA 04-3262 (released Oct. 15, 2004).

roadways, bridges, rail beds, and airport runways. Non-contact GPRs offer the only practical way to identify subsurface defects in such facilities before they cause accidents. These devices unquestionably save lives.

The emissions limits in Section 15.509(d) effectively restrict the towing speed of non-contact GPRs to far below the highway speed limit. Operation of a compliant device thus entails the safety hazards and added cost of operating slow-moving vehicles on a high-speed roadway and on facilities shared with aircraft and railroad trains.

The waiver requests propose compliance with the emissions limits of Section 15.209, subject to all other ultra-wideband (UWB) requirements, including Section 15.209(e) (narrowband emissions in the GPS bands).² The waivers will increase the working speed to highway speeds, so that towing vehicles can move with the traffic. This is far safer, less disruptive, and less expensive than low-speed operation, and will facilitate inspections of busy rail and airport facilities, while maintaining an adequate image resolution to locate small defects in critical surfaces.

The accompanying photographs show the need for waivers. The accident occurred in Maryland, in November 2003. A slow-moving, presumably compliant GPR was followed by an "attenuation truck" (Figure 1) carrying warning lights. We understand the driver of the first car was distracted by a cell-phone conversation when he ran into the attenuation truck. He in turn was rear-ended by the second car (Figure 2). A mother and child in the second car were hospitalized.

² We ask that the Commission not specify PRF, but rather allow manufacturers to optimize the balance between PRF and power-per-pulse within the overall emissions limits.



Figure 1



Figure 2

The waivers will bring important benefits to the American public, particularly protection of the lives and property of the people who travel over highways, bridges, tunnels, railroads, and airport runways. All such facilities are subject to hidden defects which, as a practical matter, only GPRs can identify before they become life-threatening hazards. Moreover, at a time when state and local governments are stretched to the utmost to fund public services, the present speed limitation on GPRs, and consequent need for extra vehicles and personnel, raises costs. This will result in highway and other infrastructure surveys being done far less frequently and less extensively, with the inevitable result of more accidents due to infrastructure failures. The need to operate at low speeds also exposes the public to accidents of the kind shown in the photographs above.

B. Most of the Filed Comments Support the Waivers.

Only one commenter opposes the waivers. By contrast, the Florida Department of Transportation registered its strong support, stressing that its current GPR system has been extended beyond its normal operating life and noting the lack of comparable replacements. FDOT point out that this has been a major concern with other state agencies as well.

One such agency, the Texas Department of Transportation, filed very strong supporting comments. With an enormous land area to cover, TexDOT is heavily reliant on GPRs to check its 180,000 miles of pavement. Similarly, the Texas Transportation Institute filed comments that estimate the state of Texas has saved millions of dollars by using GPRs to identify the optimal repair strategy for its highways. The Texas Transportation Institute has set certain standards for horn-antenna, non-ground-coupled GPRs to ensure the devices are able to provide reliable information to highway surveyors; but manufacturers have not been able to meet these criteria under the constraints imposed by the current emission standards. Dwayne Harris, a Ph.D. candidate in Civil Engineering at Purdue University with experience in using GPRs for research, confirms that the emissions levels requested in the waivers are necessary to provide the "critical combination of resolution and penetration" needed for many highway applications.

The American Association of State Highway and Transportation Officials (AASHTO) explains how twelve of its member departments use GPR, describing the equipment as "vital to the safe and efficient construction of the surface transportation system."³ AASHTO notes that GPR is an effective tool that minimizes DOTs' costs by allowing them to concentrate on localized areas for needed repair work.⁴

C. Cingular Does Not Allege Any Adverse Impact from the Waivers.

The opposition of Cingular, the sole opponent to the waivers, is puzzling. Cingular offers no justification for blocking the benefits of this technology. It does not suggest how the critical public safety functions of GPRs at highway speeds can be discharged without a waiver.

³ AASHTO at 1.

⁴ *Id.* at 2.

And Cingular does not mention any adverse impact to its own operations -- or to anyone else's, for that matter. Sprint, another major PCS carrier, conceded early in the ultra-wideband proceeding that GPRs do not pose any threat.⁵ Our customers' experience confirms Sprint was right. GPR operators routinely use cellular and PCS phones (and GPS units) in the course of mobile highway surveys, with no discernable interference.

Cingular's opposition to the waivers seems to rest solely on abstract principle: having made rules, says Cingular, the Commission must not deviate from them. But this view has two serious problems. First, the law says otherwise: the D.C. Circuit requires the Commission to consider a well-framed waiver request.⁶ Second, as we show here, a one-size-fits-all regime works poorly for GPR.

Unlike other categories of UWB, GPR is a mature technology (and much older than cell phones). The industry had accumulated thirty years of development and practical experience before the Commission adopted UWB rules. Those rules are now causing unexpected problems for these long-used and valuable devices.

At the time the rules were drafted, no one appreciated that the emissions limits would preclude safe highway surveys using non-contact horn-antenna GPRs. Since the rules were announced, both Wavebounce and GSSI have expended considerable time and money in efforts

⁵ "[S]o long as these [penetrating radar] are niche applications that are not mass marketed, Sprint does not necessarily oppose these applications." Sprint PCS Supplemental Comments in ET Docket No. 98-153 at 2 n. 3 (filed Oct. 6, 2000).

⁶ "The agency's discretion to proceed in difficult areas through general rules is intimately linked to the existence of a safety valve procedure for consideration of an application for exemption based on special circumstances." *WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969) (subsequent history omitted). Thus, said the court, "allegations such as those made by petitioners, stated with clarity and accompanied by supporting data . . . must be given a 'hard look.'" *Id.* (citation footnote omitted).

to engineer a GPR product that can meet the needs of the customer community while remaining within the parameters of the rules. Wavebounce has detailed some of its specific approaches, and its repeated findings that the nature of highway surveying and the composition of the materials to be surveyed demand a combination of power level and frequency band the rules do not permit.⁷ Only after two years of failed efforts did it seek a waiver. GSSI has manufactured compliant highway surveying devices, but they have met with a decided lack of acceptance in the marketplace. The devices fail to meet the specifications, for example, of the Texas DOT, and most independent GPR users have concluded that they cannot be operated at a high enough speed to permit surveys which are both accurate and safe.

In short, Cingular opposes the waivers not because it foresees any specific harm, but because it prefers uniform rules. The Commission was unaware in adopting those rules that it was effectively eliminating safe-speed highway surveys from the GPR portfolio. Given the critical public safety implications of these devices, a waiver is the proper course.

D. The Commission's Cautious Approach in Setting UWB Limits Leaves Room for Unique Applications.

The Commission has always acknowledged that its GPR emissions limits are conservative.⁸ The record of the original proceeding contained no data to support the low limits

⁷ Wavebounce waiver request at 5 (filed July 6, 2004).

⁸ "[GPRs] will have a low proliferation and would be used infrequently. Further, the primary energy from a GPR is directed into, and absorbed by, the ground. In addition, the energy radiated by the GPR is at a low elevation where it should attenuate rapidly." *Ultra-Transmission Systems*, 17 FCC Rcd. 7435 at para. 185 (2002) (First Report & Order). "Given the nature of their use, the quantities involved, and the low limits applicable to emissions from these devices, there is little chance that GPRs will cause harmful interference. . . . However, at the request of NTIA and based on our desire to proceed with an abundance of caution we are not changing the emission limits applicable to GPRs at this time." *Ultra-Wideband Transmission Systems*, 18 FCC Rcd 3857 at para. 35 (2003) (Memorandum Opinion and Order and Further

ultimately imposed. But the Commission reasoned that it was better to be safe than sorry. It planned to learn from experience and modify its regulatory treatment of GPRs as more information became available.⁹

Indeed, Cingular quotes the Commission as saying, "[W]e should be cautious until we have gained further experience with this technology."¹⁰ Alone among UWB devices, however, GPRs are the subject of thirty years' experience, including twelve years with non-contact products (now grandfathered) at the same levels requested in the waiver. This long-running field study confirms that these devices are not an interference threat. Neither the GPS community nor the air traffic community -- nor PCS providers such as Cingular -- have reported any ill effects from GPR use.

Cingular suggests that relief requires a change to the rules.¹¹ We agree that a rulemaking may be an appropriate long-term solution for GPRs generally. In the meantime, however, there is a pressing public-safety need for non-contact horn-antenna units capable of highway speeds. In view of both the urgency and the lack of harm to other spectrum users, prompt action on the waivers is appropriate.

Grant of the waivers fits within the Commission's overall approach to UWB. As grandfathered GPRs reach the end of their useful lives and the demand for public safety use of GPRs expands, it is appropriate for the Commission to take a small, cautious step

Notice of Proposed Rule Making).

⁹ First Report & Order at para. 21 ("Once additional experience has been gained with UWB operation, we may consider whether more flexible standards are appropriate.")

¹⁰ Cingular at 2, *quoting* First Report & Order at para. 21.

¹¹ Cingular at 5.

by waiving the emissions limits for a small subset of the GPR universe, in limited numbers, under the circumscribed operating conditions proposed in the waiver requests. The vast majority of UWB and GPR devices will continue to be restricted by the rules as adopted.

CONCLUSION

The proponents and their supporters have made a strong showing that grant of the waivers is in the public interest. The single opponent has not even alleged, much less established, any concrete harm. The Commission should grant the waivers promptly.

Respectfully submitted,

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