

Exhibit 1: Experimental Description

This application requests authorization for an additional location in Boone, IA for the existing experimental license with call sign W12XTQ. It makes no other modifications, and the proposed technical characteristics of operations at this additional site are identical to those at the sites covered by the existing experimental license.

Microsoft Corporation has begun studying, under previously granted Special Temporary Authority (call sign WK9XBJ) the potential for unlicensed white-space spectrum to be used for wide-area, outdoor sensor networks. These sensors could be used in precision agriculture applications, such as monitoring soil moisture levels over a wide area, or other applications that take advantage of the unique propagation characteristics of white-spaces spectrum. Additional information regarding the use of white-spaces to increase agricultural productivity while reducing costs is available at Microsoft Research, Research Areas, FarmBeats: AT & IoT for Agriculture, <https://www.microsoft.com/en-us/research/project/farmbeats-iot-agriculture/>. Microsoft seeks to resume and extend this course of research pursuant to the experimental license requested herein.

Microsoft's experimental sensors may operate in narrower bands than conventional white-space devices, due to the necessity of improved frequency reuse, but lower bandwidth demands, of a sensor system consisting of a potentially large number of transmitters. In addition, for the purposes of these experiments, the sensors operating in white-spaces spectrum may not select frequencies according to the reported channel availability in the white-spaces database, necessitating an experimental license. In lieu of database control, Microsoft will coordinate with the Society of Broadcast

Engineers to ensure that its experimental operations do not cause harmful interference to incumbent licensees.

Through these experiments, Microsoft intends to:

- Evaluate the suitability of white-spaces spectrum for narrowband sensor operations.
- Evaluate the efficacy of such sensor systems for precision agriculture applications.
- Develop hardware and software for the operation of white-spaces sensors.

This research is likely to advance the state of the art in both white-spaces technologies, as applied to sensor systems, as well as the use of advanced sensor networks generally in precision agriculture applications to improve agricultural efficiency.