

Statement of Engineering in Support of an Experimental License Application Phoenix, Arizona

Background

Clearwire Spectrum Holdings III, LLC, a wholly owned subsidiary of Clearwire Corporation ("Clearwire") is requesting Commission authority for an experimental license so that Clearwire can conduct a technology trial in the Phoenix, Arizona area. Clearwire is currently deploying Wimax technology in Phoenix. Clearwire intends on testing advanced 802.16(m) Wimax technology in this market. Clearwire is evaluating 802.16(m) and other "4G" technologies as a potential technology evolutionary strategy. Clearwire is planning to overlay 802.16(e) Wimax using 10 MHz channels, Frequency Division Duplexing ("FDD"), using 20 MHz channels, and Time Division Duplexing ("TDD") using 20 MHz channels. Many vendors will be evaluated; therefore Clearwire is requesting flexibility and is not specifying specific equipment manufacturers at this time. Clearwire is requesting authorization to use the channels specified below for its experiment. Please note that Clearwire has obtained licensee consent, in the form of letters included in this application for the spectrum for which it does not currently hold a license. For the other channels, they are currently licensed to affiliates, that like the applicant, are wholly-owned subsidiaries of Clearwire Corporation (designated with a ** below).

Licenses Intersecting Proposed Test

Licensee	Call Sign	Channels
Arizona State University	WND497	B1
Arizona State University	WND496	A1
Arizona State University	WHF226	A1234
Arizona State University	WLX815	B1234
Arizona State University	WNC664	B1234
North American Catholic Educational Programming Foundation	WHR919	C1234
Instructional Telecommunications Foundation	WLX816	D1234
Valley Lutheran High School	WND498	G12
Hispanic Information and Telecommunications Network	WND499	G34
Hispanic Information and Telecommunications Network	WNC558	G34
TDI Acquisition Sub, LLC**	WHT685	E1234
G&S TV, LLC**	WHT686	F1234
Alda Gold II, LLC**	WHK556	H1
Alda Gold II, LLC**	WHJ902	H2

Alda Gold II, LLC**	WNTL436	H3
Alda Gold II, LLC**	WPF47	BRS1
ATL MDS, LLC**	WHB522	BRS2

Trial Location

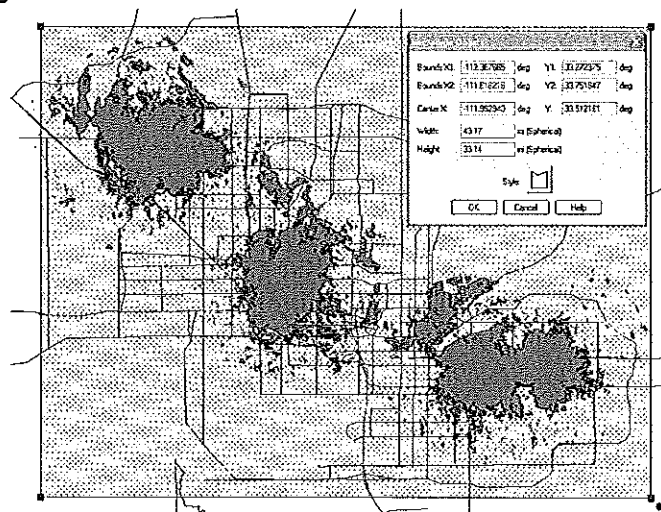
Clearwire will deploy 20-40 802.16(m) sites distributed within the follow polygon which is bound by the following coordinate pairs:

Southwest corner Latitude: 33.272375

Southwest corner Longitude: -112.367665

Northeast corner Latitude: 33.751947

Northeast corner Longitude: -111.618216



Phoenix Trial Area

Equipment Parameters

Base Stations will have the following typical configurations.

Polarization	Various
Height above ground level	Not to exceed 300 FT (91M)
Equipment Manufacturer	Huawei
Equipment Model Number	DBS 3900
Emission Designator	20M0D7W

Directional Antennas

For each of its sites, Clearwire proposes to use antennas with the following parameters:

- i. Width of beam in degrees at the half power point: 90 degrees
- ii. Orientation in horizontal plane 0-120-240 degrees
- iii. Orientation in vertical plane: -2 degrees

Antenna Heights Above Ground

Clearwire will not be extending the height of any existing structure and each structure on which Clearwire will be locating has already been coordinated with the Federal Aviation Administration.

Test Plan

To verify the maturity and availability of vendor system for commercial deployment, Clearwire and vendor will validate the vendor network at mutually agreed upon test facility. The test cases described in this document will evaluate following major categories:

1. End-to-end System Performance

- Evaluate end to end single-user and multi-user throughput for both DL and UL, under various channel conditions and cell loading, with full buffer traffic.
- Evaluate end to end user plane round trip time (RTT) with Ping service under various channel conditions, path loss and cell loading.
- Evaluate control plane delay time, taking into account of Idle-to-active state transition time.
- Verify typical user experience for applications such as HD video streaming and HTTP web-browsing.

2. Mobility Management

- Test handover under various cell loading, mobile speeds. Handover success rate, packet loss rate and interruption time will be recorded.
- Test cell-reselection for mobile in idle-state.

3. MIMO

- Evaluate and compare the throughput and coverage of various DL MIMO modes, e.g. adaptive MIMO, spatial multiplexing MIMO, transmit diversity MIMO, etc.
- Test the impact of CQI reporting interval on the performance of close-loop MIMO.

4. Multi-user Scheduler and QoS

- Evaluate multi-user performance with vendor proprietary scheduler, e.g. enhanced proportional fairness, maximum capacity and round robin scheduler.
- Verify QoS support under various user profile configuration and channel conditions.
- Verify the differentiation between GBR and non-GBR users.
- Verify the differentiation among users with different priorities.

5. Base Station RF Characteristics

- Evaluate base station transmit and receive RF characteristics relevant to co-existence with Wimax 802.16(e) Network,
- Characterize cell coverage by varying interfering cell loads.

6. VoIP

- Verify voice quality can be guaranteed in different SINR, speed and loading scenarios
- Demonstrate the maximum number of VoIP calls/cells/Mhz.
- Verify VoIP quality maintained during high-speed HO
- Verify that VoIP calls can fallback to CDMA network when the mobile is out of hotspot.

7. Self Optimization Network (SON)

- Verify the functionality of base station automatic deployment. Vendor system shall support automatic search, addition and configuration of new base station.
- Verify automatic neighboring cell reporting, self-configuration and X2 link establishment based on mobile measurements for supporting automatic neighboring cell relationship configuration.

8. Vendor Specific Features Test

- Intelligent Admission, Congestion and Load Management
- Multicarrier Network
- Fault management
- Reliability and Product Quality Stress Test

As detailed product descriptions will become available, additional test cases designed for vendor product specific features and functionality will be added.