

DOCKET NO. 160 - An application of the
 Department of Public Safety, Division
 of State Police for a Certificate of
 Environmental Compatibility and Public
 Need for the construction, operation,
 and maintenance of a telecommunications
 facility located approximately 6,180
 feet northwest from the intersection of
 Stone Ranch Road and Boston Post Road
 (U.S. 1) on Pump House Hill Road in
 East Lyme, Connecticut.

: Connecticut

: Siting

: Council

: September 29, 1993

FILE
COPYFINDINGS OF FACTIntroduction

1. On May 4, 1993, the Connecticut Department of Public Safety, Division of State Police (CSP), pursuant to sections 16-50g to 16-50z of the Connecticut General Statutes (CGS), applied to the Connecticut Siting Council (Council) for a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction, operation, and maintenance of a telecommunications tower, associated equipment, and equipment building in the Town of East Lyme, Connecticut. (CSP I, pp. 2-6 and 5-1; Council Hearing Notice)
2. The proposed site is located within the Stone Ranch Military Reservation (Stone Ranch) and situated between the Troop E district service area centered in Montville and the Troop F district service area centered in Westbrook. (CSP I, p. 2-7, 2-8, and 2-13; Tab 13A and 13D)
3. Pursuant to CGS section 16-50m, the Council, after giving due notice thereof, held a public hearing for the proposed facility on July 20, 1993, beginning at 3:00 P.M. and reconvening at 7:00 P.M. for public comment in the Activity Center in the East Lyme Library and Community Center, 42 Society Road, East Lyme, Connecticut. (Council Hearing Notice; Transcript, p. 1)
4. The Council and its staff inspected the proposed site on July 20, 1993. (Council Hearing Notice)

Existing CSP Telecommunications System

5. The CSP currently use a low-band, voice-only, two-way radio system that was originally placed in service in the 1940s to serve 290 personnel. Although the CSP force has grown to over 1,000 personnel, the basic architecture of the existing radio system has not correspondingly changed. (CSP I, pp. 2-1, 2-9, 5-2, 8-2, 8-3, and 9-3)
6. Problems and design faults of the existing low-band, two-way radio system which provides field communications to State

Police personnel are as follows:

- o channel capacity varies from radio to radio;
- o co-channel and skip interference;
- o lack of frequency availability;
- o areas of poor or no communication;
- o voice encryption and mobile data terminals are not available; and
- o physical plant is old and cannot support microwave equipment.

(CSP I, pp. 2-2, 2-3, 2-9, 9-3, and 9-4)

7. Point-to-point communications to link troop barracks and base stations are provided by leased telephone landlines, which are usually an above-ground, pole-to-pole design, subject to storm damage and human accidents. Specific problems with the existing wireline network includes:

- o lack of capacity for system growth;
- o inability for high speed transfer of digital data;
- o inherent noise levels and circuit failures; and
- o incompatibility with computer controlled technologies of a modern 800 MHz radio system.

(CSP I, pp. 9-1 and 9-2)

8. There is no way to modify the current radio system to meet present or future demands. (CSP I, pp. 9-3 and 9-5)

Proposed CSP Telecommunications System

9. The CSP is proposing to replace the current wireline, point-to-point, communication service, and low-band radio system with a digital microwave, point-to-point, backbone network supporting and controlling an 800 megaHertz (MHz) trunked radio system. This digital microwave network would connect all CSP barracks and base stations providing for point-to-point data transfer, radio control, computer connection, and emergency telephone circuits in the event the conventional telephone network becomes overloaded or inoperative. (CSP I, pp. 2-10, 5-2, and Tab 14)
10. The Federal Communications Commission (FCC) has issued a portion of the 800 MHz frequencies to public safety organizations nationwide. The CSP belong to the Tri-State and New England Committees for Spectrum Utilization which are submitting applications for the necessary FCC licenses. (CSP I, pp. 2-12, 11-3, and 12-11)
11. The digital microwave system would enable all base stations, (i.e. two-way radio antenna sites), to act as

a single base station, otherwise known as SIMULCAST. The 800 MHz trunked radio system would have the ability to assign available channels on a demand basis. Both systems would improve the CSP's ability to use available channels in the most efficient manner possible. (CSP I, p. 12-12)

12. The proposed microwave and 800 MHz radio systems would provide for system growth, security, voice encryption, mobile data terminals, computer-aided dispatch, and communications statewide with state and local agencies. The system, named the Connecticut Telecommunications System (CTS), is designed to use digital electronics and redundant processors to provide uninterrupted operation and additional channel capacity, and to eliminate sources of system interference including atmospheric interference. (CSP I, p. 2-11 and Tab 10)
13. The Bell System Standard design objective for microwave system outages due to propagation failures is one hour per year. For the CTS, the average reliability design for each microwave path would be ten times more stringent than the Bell System Standard for microwave services; thus, the average outage time of each path should not exceed 5.5 minutes per year (99.999 percent reliability). The proposed 800 MHz two-way radio has been designed to provide radio coverage to 95 percent of an area 95 percent of the time for mobile units, and 90 percent coverage 90 percent of the time for portable units. (CSP I, pp. 12-8, 12-9, 12-14, and 12-15; Transcript p. 27))
14. The CSP have engaged in tower sharing agreements whenever possible; however, no existing towers within the Troop E jurisdictional area met site search criteria for dual microwave and 800 MHz communication needs without the need for modifying an existing tower. (CSP I, p. 5-3, and Tab 15)
15. The microwave backbone system at the proposed site would become operational by the end of 1994. The 800 MHz two-way radio system is expected to be operating by 1996. (CSP I, Tab Q)

System Alternatives

16. The CSP considered the following alternatives to its proposed digital microwave network.

<u>Alternative</u>	<u>Reason for Rejection</u>
Copper Wire Landlines	<ul style="list-style-type: none">o would not support the number of channels or transmission speeds required for digital data transmissiono would not support SIMULCASTo would be susceptible to landline related outages
Satellites	<ul style="list-style-type: none">o would be cost-prohibitiveo frequency spectrum not yet designated for satellite mobile radioo are not yet in operation for public safety mobile radio needs
Fiber Optics	<ul style="list-style-type: none">o would increase installation costso would be susceptible to landline related outages
Private Leased Network	<ul style="list-style-type: none">o would increase the statewide system cost by 10 percento would cause loss of budgetary and managerial control
Analog Microwave	<ul style="list-style-type: none">o would not provide high transmission speedo would not allow for system expansiono would not provide intelligent networking available with digital microwave technology

(CSP I, pp. 11-1 and 11-2)

Proposed Stone Ranch Site

17. The proposed tower site would be on a 60-foot by 100-foot parcel, approximately 6,180 feet northwest from the intersection of Stone Ranch Road and Boston Post Road (U.S. Route 1) on Pump House Hill Road in East Lyme, Connecticut. Stone Ranch is owned by the State of Connecticut and consists of open space and a military institution. (CSP I, Tab 13B, Tab 13D, and Tab 14; CSP V, Q. 1)
18. The proposed site is generally level within a mature forest canopy reaching heights of 80 to 90 feet above ground level with a mostly open understory. Some tree clearing and minimal grading of the site would be

necessary. An existing unimproved dirt road would serve the proposed site except for a short accessway from the existing road that would be improved and covered with gravel. (CSP I, Tab 13C, 13H, and Tab 14; Transcript p. 23)

19. The proposed site is 298 feet above mean sea level and is zoned rural (RU-80). The nearest residence is approximately 2,800 feet south of the proposed site. (CSP I, Tab 13B, 13D, and Tab 14; CSP V, Qs. 1 and 8)
20. A new 140-foot, three-legged, lattice tower, equipment building, and security fence would be constructed at the proposed site. The tower would be approximately 27 feet at the base tapering to approximately ten feet at the top. The tower and tower foundations would be designed in accordance with the methods defined in American National Standards Institute (ANSI) and Electronic Industries Standard 222-E, to withstand an ice load of 1/2 inch solid radial ice and a simultaneous wind load of 90 miles-per-hour. The fall zone of the proposed tower would be solely on State of Connecticut property with the proposed equipment building being the only structure within the fall zone. (CSP I pp. 12-3 and 12-4; Tab 13H and 13E)
21. The proposed facility is required for receiving and transmitting microwave signals with a Vinegar Hill facility in Ledyard, 11.7 miles northeast of East Lyme, and the Troop F facility in Westbrook, 9.6 miles southwest of East Lyme, and to provide 800 MHz radio coverage to the following towns or portions thereof: East Lyme, Waterford, New London, Groton, Montville, Salem, Lyme, Deep River, Essex, and Old Saybrook. (CSP I, p. 2-7 and Tab 13C; CSP V, Attachment D)
22. The proposed 140-foot tower height is needed to maintain microwave transmission paths. Topography, tree height, and foliage are the limiting factors for establishing antenna heights. (CSP I, Tab 13C; Transcript pp. 23 and 30)
23. Nine antennas would be mounted between the 110-foot and 140-foot levels with some antennas rising 14 feet above the top of the proposed tower. The CSP would own eight antennas and the remaining sole antenna would belong to the Connecticut National Guard (CNG). The CNG would use the proposed antenna to enhance its existing radio system, use the tower for training, and use the State Police facility to access the CTS for statewide communications capability for its contingency plan. (CSP I, Tab 13H, 13J, and Tab 14; and CSP V, Q.14; Transcript pp. 33 and 34)

24. An 18-foot by 41-foot equipment building would be constructed adjacent to the tower to house radio equipment and an emergency generator. The proposed site would be surrounded by an eight-foot high, chain-link fence topped with security wire. A variety of remote alarms installed at the site would indicate the opening of shelter doors, smoke and high temperatures within the shelter, and propane leaks to a central dispatch facility. (CSP I, pp. 12-3 to 12-5, and Tab 14)
25. An electric utility line terminates at a pump house on Stone Ranch. The CSP would extend telephone lines overhead to the pump house and place underground conduits, containing electric and telephone utility services, approximately 500 feet north to the proposed site. (CSP I, p. 12-2, Tab 13D, and Tab 14 Exhibit A; Transcript pp. 19 and 20)
26. A propane-fueled, 49 kilowatt emergency generator and a bank of batteries would provide power in the event of an electrical outage. A fuel tank, sized for a minimum of three days of operation at full load would be buried on site. This generator would run once a week for 15 to 20 minutes for preventive maintenance. (CSP I, p. 12-3, Tab 13D, and Tab 14; CSP IV, Attachment E)
27. Unattenuated noise from an on-site, emergency, propane-fueled generator would be approximately 90 decibels (dBA). These noise levels would be attenuated since the emergency generators would be housed inside an equipment shelter. Noise created as a result of, or relating to, an emergency is exempt from State noise regulations. (CSP I, Tab 13T and Tab 14; CSP IV, Q. 21; Transcript p. 29; Regulations of Connecticut State Agencies, Title 22a Environmental Protection section 22a-69-1 through 22a-69-7.4, Control of Noise)
28. The proposed CSP facility would not generate solid waste or toxic substances. Air emissions from the running of the emergency generator would not have a significant effect on air quality in the region. (CSP I, Tab 14)
29. The proposed facility would not affect historic, architectural, or archeological resources of the surrounding area. (CSP I, Tab 14; CSP IV, Q. 7)
30. No wetlands, watercourses, or aquifer areas are on or near the proposed Stone Ranch site. (CSP I, Tab 14)
31. No federal or Connecticut endangered and threatened species or species of special concern to Connecticut occur at the proposed site. (CSP I, Tab 14; CSP IV, Q. 7)

32. The CSP have complied with the Connecticut Environmental Policy Act by preparing environmental impact study for the proposed site. (CSP I, p. 2-12)
33. Prior to construction at the proposed site, erosion and sedimentation controls would be installed and maintained. (CSP I, Tab 14)
34. Disturbed areas that lie within the proposed fence of the site would be covered with crushed stone. All other disturbed areas would be loamed and seeded to prevent erosion. (CSP I, Tab 14)
35. The calculated, worst-case electromagnetic radio frequency power densities at the base of the proposed telecommunications facility, assuming all channels operating simultaneously at maximum allowable power, would be 0.3291 percent of the maximum permissible limits as prescribed by ANSI standard C95.1-1982, which was adopted by the State of Connecticut under CGS section 22a-162 as the State standard. The maximum power densities would be 1.5875 percent of the Institute of Electrical and Electronic Engineers C95.1-1991 standard for the maximum permissible exposure for an uncontrolled environment. (CSP I, Tabs 13N and 13Q; CSP V, Q. 14)
36. A self-supporting, lattice tower was selected over a guyed-lattice tower because it would require less maintenance, require less land thereby saving aquisition costs, is less vulnerable to damage, and is less likely to shift or twist under high wind conditions. Also, a self-supporting, lattice tower was selected over a self-supporting, monopole tower because it has more attachment points and expansion capability that is not readily allowed by monopoles and is two to three times less costly than a monopole with equivalent strength and rigidity. (CSP I, pp. 12-2 to 12-7)
37. A landing strip for aircraft within Stone Ranch is approximately 2,053 feet southeast of the proposed facility. The proposed 140-foot tower has been identified as a hazard to air navigation by the Federal Aviation Administration (FAA) and would require obstruction marking and lighting. A white strobe would be used during the day and a red lamp at night to identify the tower for aircraft. (CSP I, Tab 5 and Tab 13L, Tab 14, p. 12; Transcript pp. 34-36)
38. The CSP explored the use of the Southern New England Telephone Cellular Scott Road site located approximately 1.25 miles northeast of the proposed Stone Ranch site.

This tower site was rejected for the following reasons:

- o privatized development of the Scott Road site could jeopardize State bond funding;
- o management and control of the telecommunications tower could be lost;
- o the CNG could not use this site for low-band communications, training, or emergency purposes; and
- o the property owner, Heritage Development Group, Inc., has restricted further development on their property.

(CSP I, Tab 13R and Tab 15; CSP V, Qs. 14, 17, and 18; Transcript p. 32)

39. The CSP explored three sites within Stone Ranch of which two were rejected for the following reasons:

- o the sites were in areas the CNG deemed more useful for training exercises;
- o possible impediment of aircraft flight patterns of the nearby landing strip;
- o increased visibility to the community; and
- o increased distance to power sources.

(CSP I, Tab 14; CSP V, Q. 17; and Transcript pp. 17 and 18)

40. The estimated costs for developing the proposed facility are itemized as follows:

Radio Equipment	\$657,500
Tower and Antennas	161,400
Power systems	34,900
Site, Road, Shelter	177,000
Miscellaneous	<u>48,300</u>
	Total

\$1,079,100

(CSP IV, Q. 15; Transcript pp. 22 and 23)