



City of Vacaville
Department of Public Works
Engineering Services

MEMO #E18-04

February 1, 2018

Updated: February 5, 2018

TO: Albert Enault, Associate Planner

FROM: Adam Brown, Associate Civil Engineer *AB*

SUBJECT: DRAKE'S PEAK RADIO TOWER – UPDATED PROJECT DESCRIPTION
APN 0129-040-020, -030

PURPOSE

The City has identified a need for upgrading public safety communication infrastructure within the City. The City's emergency communication system currently utilizes two towers: one (1) at Butcher Hill and one (1) at Fire Station #73, both of which are outdated and in need of upgrades. Preliminary investigations have shown that developing the Drake's Point site will allow the City to improve coverage in areas of town that are currently inadequately served by the existing tower at Fire Station 73, due to the low elevation at that location. It will also provide the added benefit of opening up potential opportunities for better interoperability with surrounding agencies, especially the City of Dixon, the greater Solano County, and other agencies to the east towards Sacramento.

As requested by the City Council, no new permanent access roads would be allowed; the Project contractor would need to establish temporary access for the Project and restore the temporary access areas to pre-Project conditions. The Project will benefit the community because the new radio tower will better improve public safety communication infrastructure.

PROJECT DESCRIPTION

The Drake's Point Radio Tower Project ("Project") consists of installing a new radio tower and equipment building on top of Drake's Point (aka Rocky Hill or Drake's Peak) in the Glen Eagle Open Space. The site contains an existing 37-foot tall wooden pole with two airport navigation lights on top. Both lights are currently not in operation and are in need of replacement. The existing pole is owned and maintained by the Nut Tree Airport. The Project would involve the following components:

- Replace the existing wooden pole with a new 40-foot tall monopole that would hold four (4) 14-foot tall send/receive antennas and two (2) four-foot diameter microwave dishes.
- Construct a new 160 sq. ft. equipment building (approximately 12'8" by 12'8").
- Upgrade the existing electrical service currently provided along Vine Street.
- Replace conduit or overhead lines, as necessary, to provide power to the Project.

The Project would be located on a 21.36-acre parcel in the Glen Eagle Open Space, which is north of I-80 and Downtown Vacaville, between Vine Street and Woodcrest Drive in Vacaville, California. The Project area proposed for development is approximately 0.8 acres. The total combined height of the radio tower and antennas would be approximately 50 feet.

The equipment building would be constructed approximately 50 feet away from the proposed monopole to the southeast in order to be partially obscured by natural rock outcrops and existing vegetation so that visual impacts on surrounding residential areas would be reduced. The equipment building would be constructed atop a concrete foundation approximately 17 feet by 18 feet in size, and would be constructed of masonry block with a standing seam metal roof. The equipment building would enclose telecommunications equipment; heating, ventilating, and air conditioning (HVAC) units; backup batteries; and the upgrade of the existing electrical service and conductor located in the western portion of the Project area. The enclosure would contain two backup batteries that are anticipated to be either lead acid or lithium ion and will be powered by a rooftop solar system in the event of a power outage. The batteries total 4,000 ampere-hour (Ah) (or approximately 2.5 days of backup energy; maximum of four days of backup energy depending on system usage). The backup battery system would be strapped against the inside wall to prevent damage or movement during earthquakes.

Finally, the current overhead powerline supplying power to the existing airplane navigation beacons at the top of the hill will need to be replaced in order to supply the radio tower with sufficient electricity. The current wooden poles supporting the powerline would still be used with the new powerline; however, the existing pole on the top of the hill would be replaced with a new pole of similar height that would be relocated closer to the edge of the top of the hill. This pole would serve as a location to transition overhead wires to underground conduit. The radio tower would be placed approximately in the same location as the last current existing pole and the airplane navigation beacons would be placed atop the new radio tower.

ALTERNATE LOCATION ANALYSIS

As noted above, the main purpose for this Project is to replace outdated equipment, increase emergency service radio coverage in areas underserved (Browns Valley, Markham, and Cheyenne), and increase connectivity with other emergency systems with Fairfield-Suisun and Solano County. Prior to selecting Drake's Point as the Project site, the Vacaville Police Department investigated alternate sites and solutions that could be used to achieve the Project objective, as required by Section 14.09.125.070.A (Telecommunication Facilities – Location Criteria) of the Land Use and Development Code ("Code"). The following options were considered unfeasible as noted below:

- OPTION A: Increase the height of an existing 60 feet tower located at Fire Station #73 to a new height of 100 feet tall. This option was determined unfeasible because: (1) the option is a short-term solution for a long-term service goal; (2) the existing facility only provides 20-25% coverage for Vacaville, and the new improvements would produce less than ideal results; and (3) the increased height would produce a significant visual impact to surrounding land uses.
- OPTION B: Add additional antennas to the existing tower located Fire Station #73. This option was determined unfeasible because: (1) the option is a short-term solution for a long-term service goal; and (2) the option would not create coverage for those areas currently underserved (Browns Valley, Markham, and Cheyenne) due to topographical issues.
- OPTION C: Establish new sites on Mount Vaca and Mix Canyon ridgelines. This option was determined unfeasible because existing topographical challenges would interfere with radio coverage in Vacaville, which does not meet long-term service goals.
- OPTION D: Establish new antennas on the Browns Valley Reservoir. This option was determined unfeasible because it was costlier and deferred the eventual expenses that would be incurred once the City upgrades communication systems to the newest technology.

Based on our assessment, there are no other existing towers within the one (1) mile radius for which the City could establish a co-location agreement to use.

PERFERRED OPTION

Drake's Point was determined to be the most suitable and beneficial location for achieving the coverage and service goals for the Project. The Project was chosen for the following reasons:

- A. Coverage – The new facility would increase coverage to existing areas that have limited or no coverage for emergency services due to existing topography, such as Browns Valley, Markham, and Cheyenne areas.
- B. Co-location – The new facility would be jointly used by the Nut Tree Airport as a navigation beacon for airport activities. As previously mentioned, there is an existing pole with two (2) lights on it that is owned and operated by the Nut Tree Airport. Prior to learning about this Project, the Airport was already planning on replacing the pole with a new pole and a new set of lights. Using this location for our new telecommunications tower will essentially be “co-locating” the City's new equipment with the Airport's aerial obstruction light.
- C. Visibility – Due to existing topography and vegetation, the new facility would be substantially screened from surrounding properties and public view and would not result in any adverse visual impacts. Surrounding vegetation and topography would help ensure the facility does not silhouette against the sky above the ridgeline.
- D. Ownership – The new facility would be located on City-owned property, which is preferred pursuant to Section 14.09.125.070.B.4 (Telecommunication Facilities – Major Facilities) of the Code.
- E. Joint System – The new facility would: (1) improve the joint radio system between Fairfield and Vacaville; (2) provide Vacaville with greater range in coverage; and (3) enable full interoperable communications between Fairfield, Vacaville and Suisun City, covering over half of the entire terrain in Solano County for emergency services.
- F. Replacement – The new facility would allow the City to discontinue operation of the site at Fire Station #73, and would require less dependence on the site at Butcher Hill Road.
- G. Criteria – The Project site is the only location within a one mile radius that provides: (1) the topographic elevation required to provide the radio coverage necessary for proper emergency services operations; (2) reasonable existing access for construction and maintenance; and (3) an existing power source with existing easement/access rights.

SECURITY

The Project will implement the following security measures:

- 1. Anti-climbing pegs on the tower (cut-sheets were provided with the 35% submittal)
- 2. Security camera(s)
- 3. Door lock(s)
- 4. Building security alarm