



## Staff Report to the Zoning Administrator

Application Number: **131224**

**Applicant:** AT&T Chris Coones  
Forza Telecom  
**Owner:** City of Santa Cruz  
**APN:** 062-081-16

**Agenda Date:** 8/15/2014  
**Agenda Item #:** 8  
**Time:** After 9:00 a.m.

**Project Description:** Proposal to construct a new 109 foot tall "monopine" wireless communication facility at a City of Santa Cruz water tank facility located in the RA zone district. Requires a Commercial Development Permit and Variance to exceed the allowed height of 78 feet for wireless antennas located in the RA zone district.

**Location:** Property located at the end of El Refugio Way approximately 1,000 feet east from the intersection with Empire Grade.

**Supervisory District:** 3rd District (District Supervisor: Coonerty)

**Permits Required:** Commercial Development Permit, Variance

### Staff Recommendation:

- Determination that the proposal is exempt from further Environmental Review under the California Environmental Quality Act.
- Denial of the request for a Variance to exceed the allowed height of 78 feet for a wireless communication tower in the RA zone district.
- Approval of Application 131224, based on the attached findings and conditions.

### Exhibits

- |   |   |
|---|---|
| A. Categorical Exemption (CEQA determination) | F. General Plan Maps                        |
| B. Findings                                   | F. Alternatives Analysis & Propagation Maps |
| C. Conditions                                 | G. Radio Frequency (RF) Evaluation          |
| D. Project plans                              | H. Comments & Correspondence                |
| E. Assessor's, Location, Zoning and           |   |

### Parcel Information

Parcel Size: .93 Acres (40,554.4 square feet)  
Existing Land Use - Parcel: Municipal water tank  
Existing Land Use - Surrounding: Residential

Project Access:	El Refugio (private right of way)
Planning Area:	Bonny Doon
Land Use Designation:	R-R (Rural Residential)
Zone District:	RA (Residential Agriculture)
Coastal Zone:	<input type="checkbox"/> Inside <input checked="" type="checkbox"/> Outside
Appealable to Calif. Coastal Comm.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

### Environmental Information

Geologic Hazards:	Not mapped/no physical evidence on site
Soils:	Reviewed with Building Permit
Fire Hazard:	State Response Area
Slopes:	Less than 5%
Env. Sen. Habitat:	Not mapped
Grading:	No grading proposed
Tree Removal:	No trees proposed to be removed
Scenic:	Not a mapped resource
Drainage:	Reviewed with building Permit
Archeology:	Mapped archeological though no physical evidence on site

### Services Information

Urban/Rural Services Line:	<input type="checkbox"/> Inside <input checked="" type="checkbox"/> Outside
Water Supply:	City of Santa Cruz Water
Sewage Disposal:	No waste disposal improvements on site
Fire District:	County Fire Protection
Drainage District:	Outside flood control district

### History

The existing 2,000,000 gallon water tank has been operated by the City of Santa Cruz Municipal Water District since it was installed under Use Permit 1947-U in March of 1964. No other improvements existing on site.

### Project Setting

The subject property is located at the end of a dead end road (El Refugio Way) in the Cave Gulch area which consists mainly of residential properties developed at a rural density. The site is gently sloped and is surrounded on all sides by dense vegetation consisting of mature trees and thick brush. Though the site is mapped as an Archaeological Resource, an Archaeological Survey was conducted and reviewed by staff (REV131119) which revealed no significant resources on site.

### Zoning & General Plan Consistency

The subject property is a parcel of approximately 40,500 square feet in size, located in the RA (Residential Agriculture) zone district, a designation which restricts wireless antennas. The proposed wireless antenna is a permitted use within the zone district and the zoning is consistent with the site's

General Plan designation (R-R) Rural Residential. The subject parcel is located outside the coastal zone.

### **Variance**

This is a proposal to construct a wireless antenna in excess of the allowed 78 foot height (109 feet) as allowed in the RA zone district. The variance to the maximum allowed height for wireless antennas is based on the surrounding mature vegetation and surrounding topography. The proposed antenna and the desire to install a single antenna which is capable of providing service to the greater Bonny Doon and Cave Gulch areas is not supported by the attached variance findings. A reduced height of 78 feet is recommended based on the project location within a restricted zone district and the substantial improvement to existing levels of wireless coverage resulting from construction of a 78 foot high tower. Further, it appears that most, if not all, increased "in-building" service area provided by a 109 foot tower would be on either UCSC or State Parks land and not private land where houses might be built and service needed.

### **Design Review**

The proposed camouflage of the wireless antenna complies with the requirements of the County Design Review Ordinance, in that the proposed project will incorporate simulated tree branches to reduce the visual impact of the proposed development on surrounding land uses and to blend with the natural landscape.

### **Environmental Review**

The proposed development qualifies for a Class 3 Categorical Exemption under the California Environmental Quality Act (CEQA) and is not subject to further environmental review.

### **Conclusion**

As conditioned, the project as proposed to be 109 foot tall is not consistent with all applicable codes and policies of the Zoning Ordinance and General Plan/LCP. However, at the standard maximum allowed height of 78 feet, the project is consistent. Please see Exhibit "B" ("Findings") for a complete listing of findings and evidence related to the above discussion.

### **Staff Recommendation**

- Determination that the proposal is exempt from further environmental review under the California Environmental Quality Act.
- **DENIAL** of the request for a Variance to exceed the allowed height of 78 feet for a wireless communication tower.
- **APPROVAL** of Application Number **131224**, based on the attached findings and conditions.

**Supplementary reports and information referred to in this report are on file and available for viewing at the Santa Cruz County Planning Department, and are hereby made a part of the administrative record for the proposed project.**

**The County Code and General Plan, as well as hearing agendas and additional information are available online at: [www.co.santa-cruz.ca.us](http://www.co.santa-cruz.ca.us)**

Report Prepared By: Nathan MacBeth  
Santa Cruz County Planning Department  
701 Ocean Street, 4th Floor  
Santa Cruz CA 95060  
Phone Number: (831) 454-3118  
E-mail: [nathan.macbeth@co.santa-cruz.ca.us](mailto:nathan.macbeth@co.santa-cruz.ca.us)



# CALIFORNIA ENVIRONMENTAL QUALITY ACT

## NOTICE OF EXEMPTION

The Santa Cruz County Planning Department has reviewed the project described below and has determined that it is exempt from the provisions of CEQA as specified in Sections 15061 - 15332 of CEQA for the reason(s) which have been specified in this document.

Application Number: 131224  
Assessor Parcel Number: 062-081-16  
Project Location: no situs

**Project Description: Construction of a commercial wireless antenna.**

**Person or Agency Proposing Project: AT&T c/o Forza Telecom attn Chris Coones**

**Contact Phone Number: (925) 202-3333**

- A. ☐ The proposed activity is not a project under CEQA Guidelines Section 15378.  
B. ☐ The proposed activity is not subject to CEQA as specified under CEQA Guidelines Section 15060 (c).  
C. ☐ **Ministerial Project** involving only the use of fixed standards or objective measurements without personal judgment.  
D. ☐ **Statutory Exemption** other than a Ministerial Project (CEQA Guidelines Section 15260 to 15285).  
E. ☒ **Categorical Exemption**

Specify type: Class 3 - New Construction or Conversion of Small Structures (Section 15303)

**F. Reasons why the project is exempt:**

Construction of a wireless antenna that meet all county ordinances in an area allowing wireless facilities.

In addition, none of the conditions described in Section 15300.2 apply to this project.

\_\_\_\_\_  
Nathan MacBeth, Project Planner

Date: \_\_\_\_\_

## Wireless Communication Facility Use Permit Findings

1. The development of the proposed wireless communications facility as conditioned will not significantly affect any designated visual resources, environmentally sensitive habitat resources (as defined in the Santa Cruz County General Plan/LCP Sections 5.1, 5.10, and 8.6.6.), and/or other significant County resources, including agricultural, open space, and community character resources; or there are no other environmentally equivalent and/or superior and technically feasible alternatives to the proposed wireless communications facility as conditioned (including alternative locations and/or designs) with less visual and/or other resource impacts and the proposed facility has been modified by condition and/or project design to minimize and mitigate its visual and other resource impacts.

The proposed wireless communication facility will be located at the end of a dead end right of way (El Refugio) and is approximately 1,000 feet from the closest public road. The subject parcel is developed with an existing City of Santa Cruz water tank and is surrounded by an eight foot high chain link fence and dense vegetation consisting of mature trees. The subject property is relatively flat and will not require much site preparation (i.e. grading) to construction the proposed tower. No existing vegetation will be removed as a result of the project and the site is not mapped as a sensitive habitat. Though the site is mapped as an Archaeological Resource, an Archaeological Report was submitted and reviewed by County Environmental Staff and it was concluded that potential subsurface deposits were extremely unlikely.

The location of the proposed non-co-located facility is within a restricted zoned district (RA), therefore requiring an Alternatives Analysis (Exhibit F). This analysis examined the feasibility of a series of alternate locations for a similarly designed antenna. The alternate locations included the University of California Santa Cruz (UCSC) and nearby land zoned for timber production. It was concluded through the review of the alternatives analysis that the proposed location (El Refugio) is environmentally superior and has less visual impact than the alternate sites while providing the desired cellular coverage along Empire Grade.

The Alternatives Analysis further examined the feasibility of microcells rather than the proposed tower. It was concluded that the use of microcells would not meet the coverage objective for this project in that microcells would not reach the entire coverage area nor solve the capacity issues.

As proposed, the tower would be situated within the required setback for restricted zone districts, which is 300 feet or 5 times the height of the pole (whichever is more). Based on the proposed camouflage for the tower and existing screening, a reduction to the required 500 foot setback to 40 feet from adjacent residential properties is acceptable with respect to visual impacts. Though a tower of 109 feet in height is proposed, the findings for a Variance to allow for the increase in height of the tower cannot be made, therefore, a reduction in the height of the proposed tower is recommended (78 feet). This recommendation will further reduce the visual impact of the wireless tower at this location.

Because the location of the subject parcel is at the end of a private right of way and is surrounded by large trees found in the project area, the proposed wireless facility will be mostly screened from public view. Additionally, the location of the proposed antenna is relatively flat therefore not requiring much site preparation. The proposed development will be located behind an existing chain link fence within an area maintained by Santa Cruz City Water Department staff.

No public primary or secondary schools exist in the area however the Waldorff School (Private primary school) is located approximately 1,000 feet to the south west of the subject parcel. Visual simulations (Exhibit F) indicate the visual impact from the proposed tower will be negligible and further reduced by the recommended reduction in height to 78 feet.

Therefore this finding can be made.

2. The site is adequate for the development of the proposed wireless communications facility and, for sites located in one of the prohibited and/or restricted areas set forth in Sections 13.10.661(B) and 13.10.661 (C), that the applicant has demonstrated that there are not environmentally equivalent or superior and technically feasible: (1) alternative sites outside the prohibited and restricted areas; and/or (2) alternative designs for the proposed facility as conditioned.

The project is located within the RA (Residential Agriculture) zone district which is a restricted zone district. The applicant has demonstrated through submittal of an Alternatives Analysis (Exhibit F) that no environmentally equivalent or superior and technically feasible sites exist.

Though parcels in the vicinity are appropriately zoned for wireless facilities, the adjacent parcel zoned A (Agriculture) consists of open space which is relatively pristine and contains a variety of hiking trails and would require construction of an access road to service the new facility. The lands to the west zoned TP (Timber Production) are owned by California State Parks and though the parcel has the appropriate zoning, wireless facilities would not be permitted on land owned by the State.

Additional locations at the UCSC were evaluated but neither site provides the desired level of coverage along Empire Grade nor would these sites be environmentally superior with respect to visual impacts as shown in Exhibit F.

3. The subject property upon which the wireless communications facility is to be built is in compliance with all rules and regulations pertaining to zoning uses, subdivisions and any other applicable provisions of this title (County Code 13.10.660) and that all zoning violation abatement costs, if any, have been paid.

This finding can be made, in that the existing water tank on the subject property is in compliance with the requirements of the zone district and General Plan designation in which it is located.

No zoning violation abatement fees are applicable to the subject property.

4. The proposed wireless communication facility as conditioned will not create a hazard for aircraft in flight.

This finding can be made, in that the proposed wireless communications facility would be located on a wireless communications "monopine" tower, which would be approximately 109 feet in height. Both the proposed height (109 feet) and the height as conditioned (78 feet) are too low to interfere with an aircraft in flight.

5. The proposed wireless communication facility as conditioned is in compliance with all FCC and California PUC standards and requirements.

This finding can be made, in that the maximum ambient RF levels at ground level due to the proposed wireless communications facility's operation are calculated to be 5.3 percent of the most restrictive applicable limit. These levels comply with FCC and California PUC standards and requirements.

6. For wireless communication facilities in the coastal zone, the proposed wireless communication facility as conditioned is consistent with the all applicable requirements of the Local Coastal Program.

The proposed project site is not located within the coastal zone.

### **Variance Findings**

1. That because of special circumstances applicable to the property, including size, shape, topography, location, and surrounding existing structures, the strict application of the Zoning Ordinance deprives such property of privileges enjoyed by other property in the vicinity and under identical zoning classification.

It has been demonstrated through submission of an Alternatives Analysis (Exhibit F) that the subject property is the only suitable location for the proposed facility that is both technically feasible and environmentally superior.

A Variance is being requested on the basis of the location of the subject property, surrounding dense vegetation and the surrounding terrain. As proposed, a 109 foot high tower will provide the desired level of coverage for the Bonny Doon and Cave Gulch areas along Empire Grade.

Propagation maps have been provided for existing coverage in the area which depicts very limited service. Additional propagation maps have been submitted showing expected levels of coverage for both a 78 foot high tower and a 109 foot tower. Based on those maps, a substantial gap in coverage will be reduced in either case. Based on the information available, the maximum allowed height of 78 feet for a wireless tower would substantially improve wireless coverage within the desired coverage area and not deprive this property privileges enjoyed by other properties in the vicinity with identical zoning classifications. It appears that most, if not all, increased "in-building" service area provided by the 109 foot tower would be on either UCSC or State Parks land and not private land where houses might be built and service needed.

Therefore this finding cannot be made.

2. That the granting of the variance will be in harmony with the general intent and purpose of zoning objectives and will not be materially detrimental to public health, safety, or welfare or injurious to property or improvements in the vicinity.

This finding cannot be made, in that the proposed wireless communication tower of 109 feet in height is not in harmony with the intent and purpose of the zoning objectives. As proposed, the tower would exceed the allowed height limit for wireless communication facilities by approximately 30 feet. Though it has been demonstrated that the proposed location is one of few technically feasible and environmentally superior with respect to visual impacts, the County Code encourages reduced heights

of WCF where possible. Additionally, the subject parcel is located within a restricted zone district which discourages non-co-located wireless facilities while establishing an increased setback from adjacent land zoned residential to alleviate visual impacts. As proposed, the tower camouflaging would help the tower to blend in with the surrounding vegetation however the increased height of 30 feet will be visually obtrusive to the neighboring residential properties since the tower already is within the required setback.

3. That the granting of such variances shall not constitute a grant of special privileges inconsistent with the limitations upon other properties in the vicinity and zone in which such is situated.

This finding cannot be made, in that the proposal to construct a tower of 109 feet in height will provide expanded cellular coverage to the Bonny Doon and Cave Gulch areas, however, construction of a tower that meets the allowed height for the zone district (78 feet) is otherwise feasible and will significantly increase existing levels of wireless coverage as shown in Exhibit F. The desire to provide cellular coverage beyond that of the capabilities of a 78 foot height tower would be a granting of special privileges. Therefore, it is recommended that the height of the proposed tower be limited to 78 feet.

### **Development Permit Findings**

1. That the proposed location of the project and the conditions under which it would be operated or maintained will not be detrimental to the health, safety, or welfare of persons residing or working in the neighborhood or the general public, and will not result in inefficient or wasteful use of energy, and will not be materially injurious to properties or improvements in the vicinity.

This finding can be made, in that the project is located in an area designated for commercial uses and is not encumbered by physical constraints to development. Construction will comply with prevailing building technology, the California Building Code, and the County Building ordinance to insure the optimum in safety and the conservation of energy and resources. The proposed wireless antenna will not deprive adjacent properties or the neighborhood of light, air, or open space, in that the structure meets all current setbacks that ensure access to these amenities. The subject parcel is heavily wooded and the design of the proposed wireless antenna is to be camouflaged to reduce visual impacts on surrounding properties and complies with all FCC and California PUC standards and requirements.

2. That the proposed location of the project and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the purpose of the zone district in which the site is located.

This finding can be made, in that the proposed location of the wireless antenna and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the purpose of the RA (Residential Agriculture) zone district as the primary use of the property will be one wireless antenna (with sufficient camouflage and screening) that meets all current site standards for the zone district and an existing municipal water tank. Additionally, the project is consistent with county regulations in that the proposed site is the only technically feasible and environmentally superior location for the proposed tower.

3. That the proposed use is consistent with all elements of the County General Plan and with any



specific plan which has been adopted for the area.

The proposed commercial use is consistent with the use and density requirements specified for the Rural Residential (R-R) land use designation in the County General Plan by maintaining the rural character of the subject property by maintaining existing screening and camouflaging the proposed wireless tower.

With sufficient camouflage, the proposed wireless antenna will ensure compatibility of the proposed commercial use with the existing uses in the vicinity as specified in General Plan Policy 8.5.2 (Commercial Compatibility with Other Uses).

As recommended, a height of 78 feet for the proposed wireless antenna will be properly proportioned to the parcel size and the character of the neighborhood as specified in General Plan Policy 8.6.1 (Maintaining a Relationship Between Structure and Parcel Sizes), in that the proposed wireless antenna will comply with the site standards for the RA zone district (including setbacks, lot coverage, floor area ratio, height, and number of stories) and will result in a structure consistent with a design that could be approved on any similarly sized lot in the vicinity.

A specific plan has not been adopted for this portion of the County.

Therefore this finding can be made.

4. That the proposed use will not overload utilities and will not generate more than the acceptable level of traffic on the streets in the vicinity.

This finding can be made, in that the proposed wireless antenna is to be constructed on an existing developed lot. The existing level of traffic is not expected to increase since the proposed development will be "un-manned". The periodic maintenance of the proposed wireless facility is not expected to adversely impact existing roads or intersections in the surrounding area.

5. That the proposed project will complement and harmonize with the existing and proposed land uses in the vicinity and will be compatible with the physical design aspects, land use intensities, and dwelling unit densities of the neighborhood.

This finding can be made, in that the proposed "mono pine" wireless tower is located in a rural residential neighborhood with areas containing dense vegetation. The proposed design of the wireless antenna will be of appropriate color and size in order to achieve an unobtrusive design consistent with the surrounding vegetation and maintain the character of the rural community.

6. The proposed development project is consistent with the Design Standards and Guidelines (sections 13.11.070 through 13.11.076), and any other applicable requirements of this chapter.

This finding can be made, in that the proposed wireless antenna will be of an appropriate scale and type of design that is consistent with the aesthetic qualities of the surrounding properties and will not reduce or visually impact available open space in the surrounding area as the proposed tower will be situated behind a locked gate amidst dense vegetation.

## Conditions of Approval

Exhibit D: Project Plans; 6 sheets prepared by Borges Architectural Group, dated 7/9/13

- I. This permit authorizes the construction of a 78 foot high wireless antenna "monopine". This approval does not confer legal status on any existing structure(s) or existing use(s) on the subject property that are not specifically authorized by this permit. Prior to exercising any rights granted by this permit including, without limitation, any construction or site disturbance, the applicant/owner shall:
  - A. Sign, date, and return to the Planning Department one copy of the approval to indicate acceptance and agreement with the conditions thereof.
  - B. Obtain a Building Permit from the Santa Cruz County Building Official.
    1. Any outstanding balance due to the Planning Department must be paid prior to making a Building Permit application. Applications for Building Permits will not be accepted or processed while there is an outstanding balance due.
  - C. Obtain a Grading Permit from the Santa Cruz County Building Official.
  - D. Submit proof that these conditions have been recorded in the official records of the County of Santa Cruz (Office of the County Recorder) within 30 days from the effective date of this permit.
  - E. To ensure that the storage of hazardous materials on the site do not result in adverse environmental impacts, the applicant shall submit a Hazardous Materials Management Plan for review and approval by the County Department of Environmental Health Services.
  - F. The applicant shall obtain approval from the California Public Utilities Commission and the Federal Communications Commission to install and operate this facility.
- II. Prior to issuance of a Building Permit the applicant/owner shall:
  - A. Submit final *revised* architectural plans for review and approval by the Planning Department. The final plans shall be in substantial compliance with the plans marked Exhibit "D" on file with the Planning Department. Any changes from the approved Exhibit "D" for this development permit on the plans submitted for the Building Permit must be clearly called out and labeled by standard architectural methods to indicate such changes. Any changes that are not properly called out and labeled will not be authorized by any Building Permit that is issued for the proposed development. The final plans shall include the following additional information:
    1. Identify color and finish of exterior materials for Planning Department approval. All colors and materials must be non-reflective and blend with the existing infrastructure and/ or provide camouflage. All color boards must be no larger than 8.5"w x 11"h x 1/16"

2. One elevation shall indicate materials and colors as they were approved by this Discretionary Application. If specific materials and colors have not been approved with this Discretionary Application.
  3. All antennas and telecommunications equipment shall be located behind the screening fence and be no higher in elevation than the top of the screening fence.
  4. Grading, drainage, and erosion control plans.
  5. All new electric and telecommunications lines shall be placed underground.
  6. The building plans must include revised elevations and cross-sections and the topography of the project site which clearly depict the total height of the proposed structure. Maximum height is 78 feet.
  7. A lighting plan. All lighting must be manual and must not be visible from neighboring properties.
  8. Details showing compliance with fire department requirements. If the proposed structure(s) are located within the State Responsibility Area (SRA) the requirements of the Wildland-Urban Interface code (WUI), California Building Code Chapter 7A, shall apply.
- B. To guarantee that the camouflaged tower remains in good visual condition and to ensure the continued provision of mitigation of the visual impact of the wireless communications facility, the applicant shall submit a maintenance program prior to building permit issuance which includes the following:
1. A signed contract for maintenance with the company that provides the exterior finish and camouflage materials, for annual visual inspection and follow up repair, painting, and resurfacing as necessary.
- C. Submit four copies of the approved Discretionary Permit with the Conditions of Approval attached. The Conditions of Approval shall be recorded prior to submittal, if applicable.
- D. Meet all requirements of and pay drainage fees to the County Department of Public Works, Stormwater Management. Drainage fees will be assessed on the net increase in impervious area.
- E. Obtain an Environmental Health Clearance for this project from the County Department of Environmental Health Services.
- F. Meet all requirements and pay any applicable plan check fee of the Fire Protection District.



- G. Submit 3 copies of a soils report prepared and stamped by a licensed Geotechnical Engineer.
  - H. Submit proof of approval from the Federal Aviation Administration (FAA) for the proposed tower. Any modifications to the tower required by the FAA, such as required lights or painting, may require an amendment to this permit.
  - I. Submit a written statement signed by an authorized representative of the school district in which the project is located confirming payment in full of all applicable developer fees and other requirements lawfully imposed by the school district.
- III. All construction shall be performed according to the approved plans for the Building Permit. Prior to final building inspection, the applicant/owner must meet the following conditions:
- A. All site improvements shown on the final approved Building Permit plans shall be installed.
  - B. Construction hours: Monday through Friday 8am – 5 PM unless prior approval to work outside of these hours is granted by Planning Staff.
  - C. All inspections required by the building permit shall be completed to the satisfaction of the County Building Official.
  - D. The project must comply with all recommendations of the approved soils reports.
  - E. Pursuant to Sections 16.40.040 and 16.42.080 of the County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this development, any artifact or other evidence of an historic archaeological resource or a Native American cultural site is discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the Sheriff-Coroner if the discovery contains human remains, or the Planning Director if the discovery contains no human remains. The procedures established in Sections 16.40.040 and 16.42.080, shall be observed.
- IV. Operational Conditions
- A. In the event that future County inspections of the subject property disclose noncompliance with any Conditions of this approval or any violation of the County Code, the owner shall pay to the County the full cost of such County inspections, including any follow-up inspections and/or necessary enforcement actions, up to and including permit revocation.
  - B. The wireless communication facility may not be connected to a power source or operated until a final inspection and clearance from the Santa Cruz County Planning Department has been received.
  - C. The use of temporary generators to power the wireless communication facility is not allowed.

- D. All noise generated from the approved use shall be contained on the property.
- E. The exterior finish and materials of the wireless communication facility must be maintained on an annual basis to continue to blend with the existing utilities infrastructure. Additional paint and/or replacement materials shall be installed as necessary to blend the wireless communication facility with the existing utilities infrastructure.
- F. The existing vegetative screening of the project site and facilities must be maintained throughout the duration of the approved use. Tree removals or excessive pruning which reduce the visual screening of the project site are not allowed. If visual screening is reduced due to natural causes, replacement trees will be required which provide adequate visual screening of the project site and facilities.
- G. The operator of the wireless communication facility must submit within 90 days of commencement of normal operations (or within 90 days of any major modification of power output of the facility) a written report to the Santa Cruz County Planning Department documenting the measurements and findings with respect to compliance with the established Federal Communications Commission (FCC) Non-Ionizing Electromagnetic Radiation (NEIR) exposure standard. The wireless communication facility must remain in continued compliance with the NEIR standard established by the FCC at all times. Failure to submit required reports or to remain in continued compliance with the NEIR standard established by the FCC will be a violation of the terms of this permit.
- H. If, in the future, the pole based utilities are relocated underground at this location, the operator of the wireless communication facility must abandon the facility and be responsible for the removal of all permanent structures and the restoration of the site as needed to re-establish the area consistent with the character of the surrounding natural landscape.
- I. If, as a result of future scientific studies and alterations of industry-wide standards resulting from those studies, substantial evidence is presented to Santa Cruz County that radio frequency transmissions may pose a hazard to human health and/or safety, the Santa Cruz County Planning Department shall set a public hearing and in its sole discretion, may revoke or modify the conditions of this permit.
- J. If future technological advances would allow for reduced visual impacts resulting from the proposed telecommunication facility, the operator of the wireless communication facility must make those modifications which would allow for reduced visual impact of the proposed facility as part of the normal replacement schedule. If, in the future, the facility is no longer needed, the operator of the wireless communication facility must abandon the facility and be responsible for the removal of all permanent structures and the restoration of the site as needed to re-establish the area consistent with the character of the surrounding natural landscape.
- K. Any modification in the type of equipment shall be reviewed and acted on by the

Planning Department staff. The County may deny the modification or amend the approved conditions at that time, or the Planning Director may refer it for public hearing before the Zoning Administrator.

- L. The access road shall be permanently maintained to allow access to emergency vehicles at all times. Any obstruction of the access road, as a result of neglect or lack of maintenance, will be in violation of the conditions of this permit.
- M. The equipment cabinet area must be locked at all times except when authorized personnel are present. The antennas must not be accessible to the public.
- N. All site, building, security and landscape lighting shall be directed onto the lease site and away from adjacent properties. Light sources shall not be visible from adjacent properties. Building and security lighting shall be integrated into the building design and shall be operated with a manual on/off switch. The site shall be unlit except when authorized personnel are present at night.
- O. Transfer of Ownership: In the event that the original permittee sells its interest in the permitted wireless communications facility, the succeeding carrier shall assume all responsibilities concerning the project and shall be held responsible to the County for maintaining consistency with all project conditions of approval, including proof of liability insurance. Within 30-days of a transfer of ownership, the succeeding carrier shall provide a new contact name to the Planning Department.
- V. As a condition of this development approval, the holder of this development approval ("Development Approval Holder"), is required to defend, indemnify, and hold harmless the COUNTY, its officers, employees, and agents, from and against any claim (including attorneys' fees), against the COUNTY, its officers, employees, and agents to attack, set aside, void, or annul this development approval of the COUNTY or any subsequent amendment of this development approval which is requested by the Development Approval Holder.
  - A. COUNTY shall promptly notify the Development Approval Holder of any claim, action, or proceeding against which the COUNTY seeks to be defended, indemnified, or held harmless. COUNTY shall cooperate fully in such defense. If COUNTY fails to notify the Development Approval Holder within sixty (60) days of any such claim, action, or proceeding, or fails to cooperate fully in the defense thereof, the Development Approval Holder shall not thereafter be responsible to defend, indemnify, or hold harmless the COUNTY if such failure to notify or cooperate was significantly prejudicial to the Development Approval Holder.
  - B. Nothing contained herein shall prohibit the COUNTY from participating in the defense of any claim, action, or proceeding if both of the following occur:
    - 1. COUNTY bears its own attorney's fees and costs; and
    - 2. COUNTY defends the action in good faith.
  - C. Settlement. The Development Approval Holder shall not be required to pay or perform

any settlement unless such Development Approval Holder has approved the settlement. When representing the County, the Development Approval Holder shall not enter into any stipulation or settlement modifying or affecting the interpretation or validity of any of the terms or conditions of the development approval without the prior written consent of the County.

- D. Successors Bound. "Development Approval Holder" shall include the applicant and the successor(s) in interest, transferee(s), and assign(s) of the applicant.

---

Minor variations to this permit which do not affect the overall concept or density may be approved by the Planning Director at the request of the applicant or staff in accordance with Chapter 18.10 of the County Code.

**Please note: This permit expires three years from the effective date listed below unless a building permit (or permits) is obtained for the primary structure described in the development permit (does not include demolition, temporary power pole or other site preparation permits, or accessory structures unless these are the primary subject of the development permit). Failure to exercise the building permit and to complete all of the construction under the building permit, resulting in the expiration of the building permit, will void the development permit, unless there are special circumstances as determined by the Planning Director.**

Approval Date: \_\_\_\_\_

Effective Date: \_\_\_\_\_

Expiration Date: \_\_\_\_\_

\_\_\_\_\_  
Wanda Williams  
Deputy Zoning Administrator

\_\_\_\_\_  
Nathan MacBeth  
Project Planner

---

Appeals: Any property owner, or other person aggrieved, or any other person whose interests are adversely affected by any act or determination of the Zoning Administrator, may appeal the act or determination to the Planning Commission in accordance with chapter 18.10 of the Santa Cruz County Code.





# REFUGIO

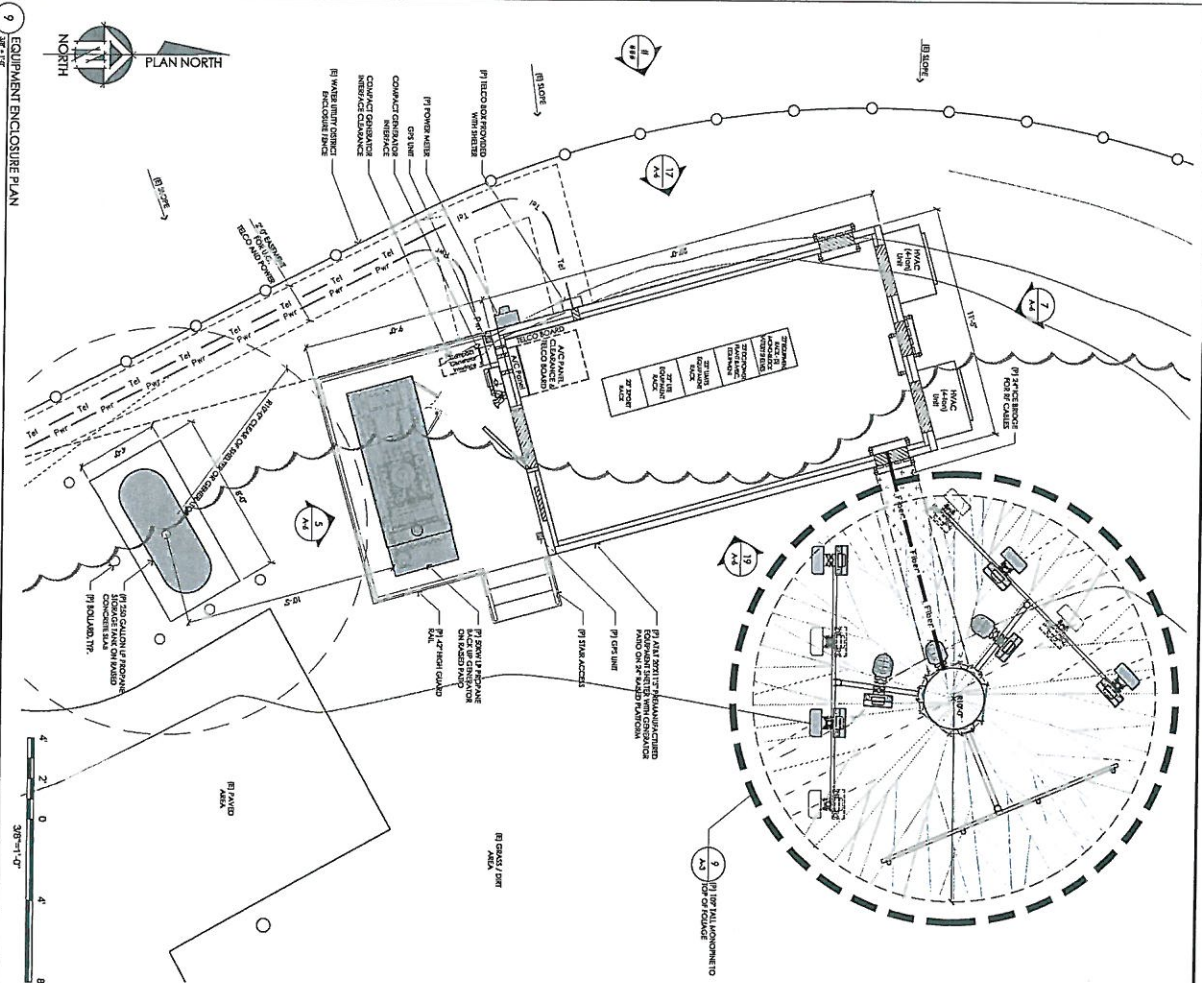
Project # 3701528769  
FA # 10151463

# EXTREME









SHEET NUMBER:  
**A-2**

EQUIPMENT SHELTER  
LAYOUT WITH  
GENERATOR PLAN

07/09/13  
100% ZD Submitta

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

License:

1	07/09/13	100% 2D SUBMITT
0	06/25/13	90% 2D SUBMITT


CHECKED BY:	A.O.L.

ALERT SITE NO:	CCU069
PROJECT NO:	12081-7

**Advertisement ID:**  
**Borge**  
1001 10th Street, Suite 100  
San Francisco, CA 94103  
Tel: 415.774.1000  
Fax: 415.774.1001  
www.borge.com

1041

Consultant:

---

Vendor:	
---------	--



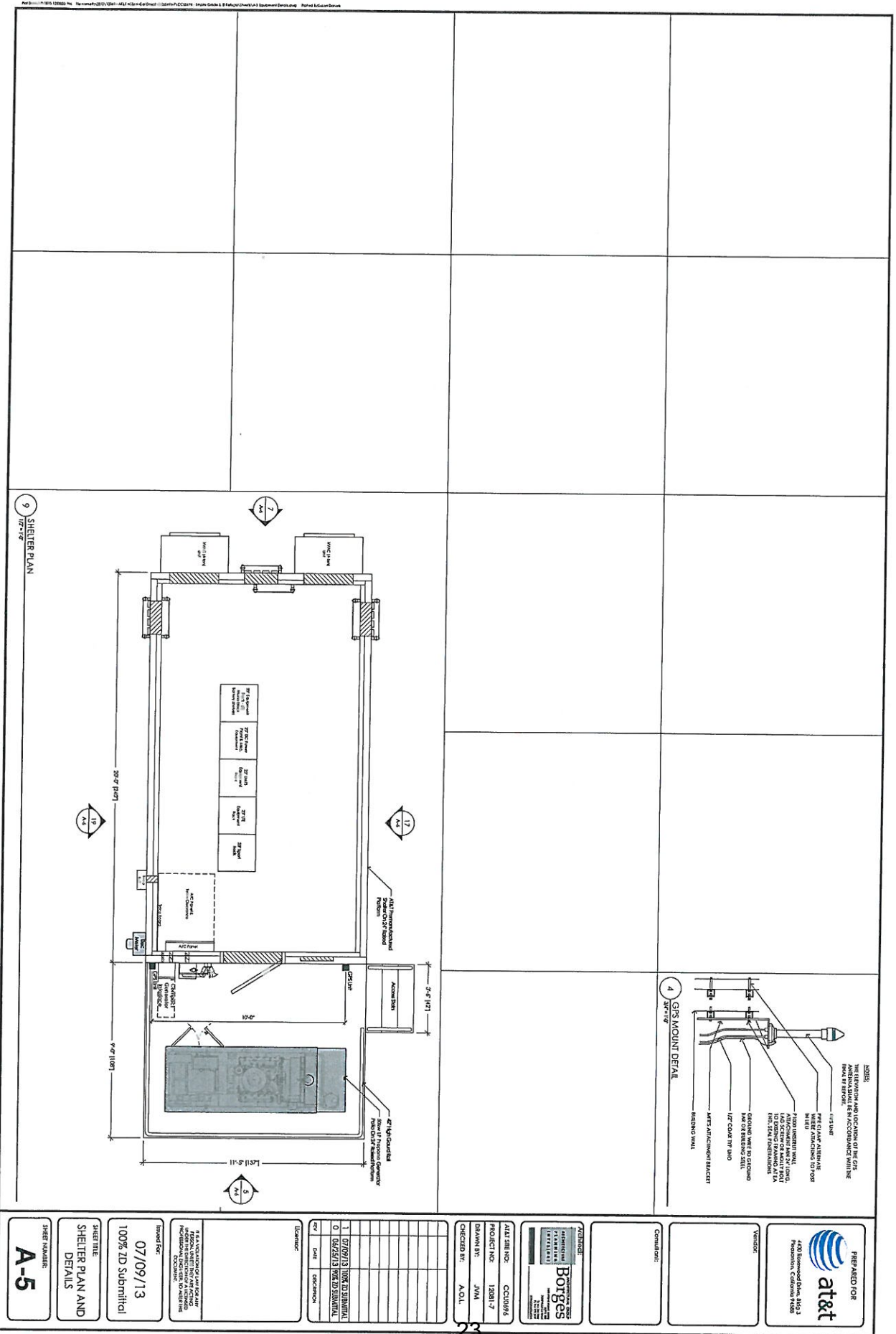
at&

PREPARED FOR









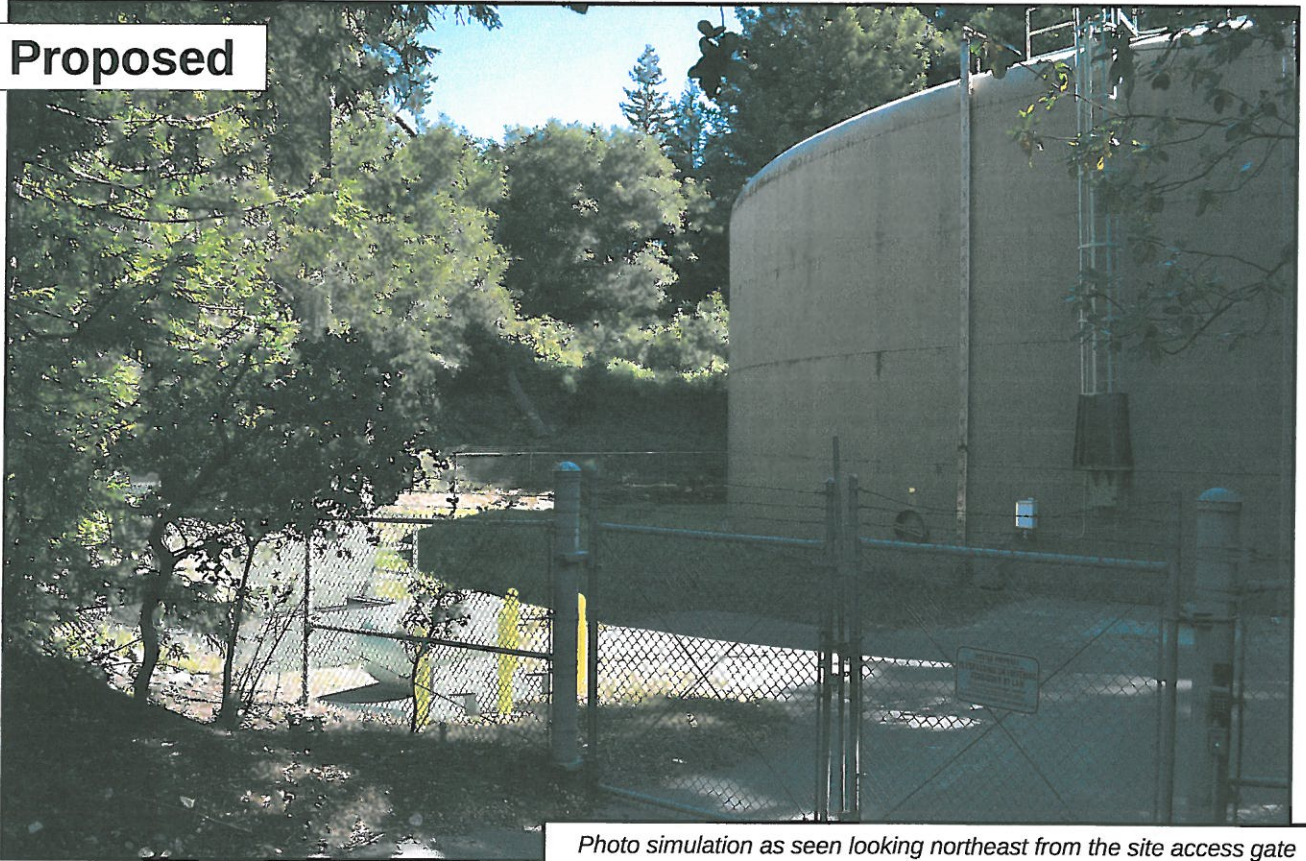




**Existing**



**Proposed**



*Photo simulation as seen looking northeast from the site access gate*

Prepared by: **WW** 07.24.2013  
WW Design & Consulting, Inc.  
1654 Candellero Court  
Walnut Creek, CA 94598  
info@photosims.com



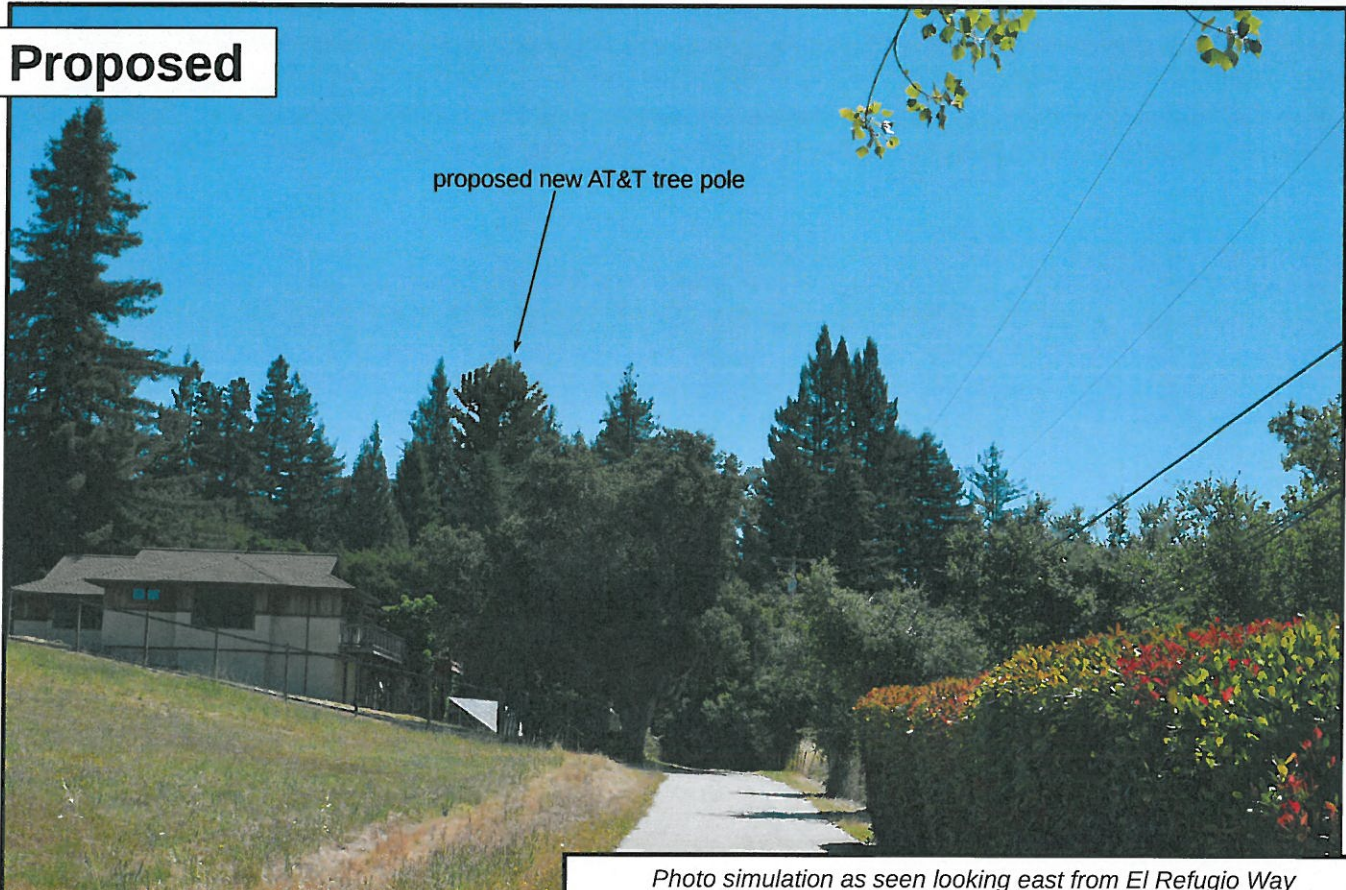
**CCU0696 Empire Grade & El Refugio**  
16 El Refugio Way, Santa Cruz, CA 95080



## Existing



## Proposed



*Photo simulation as seen looking east from El Refugio Way*



## Existing



## Proposed

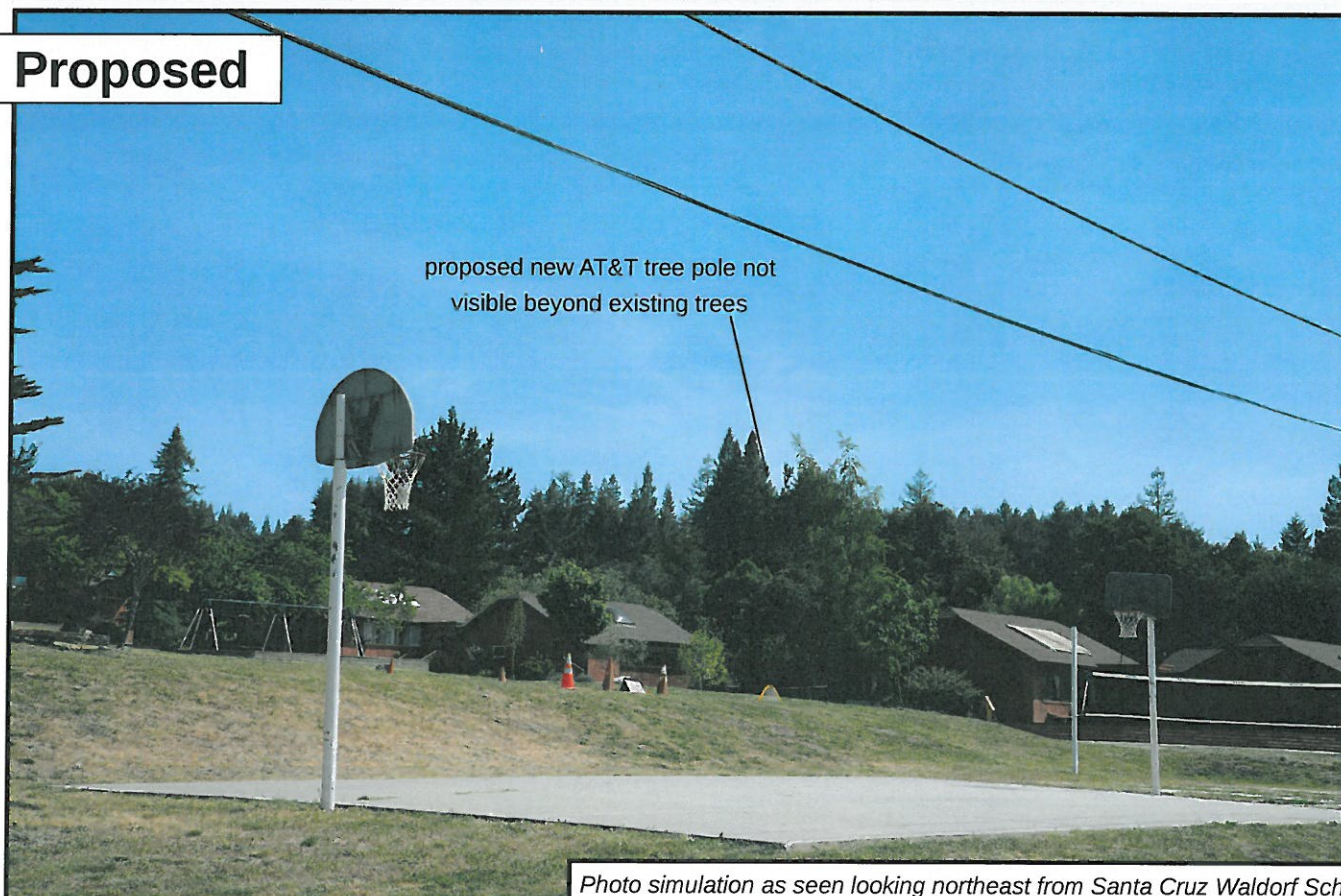
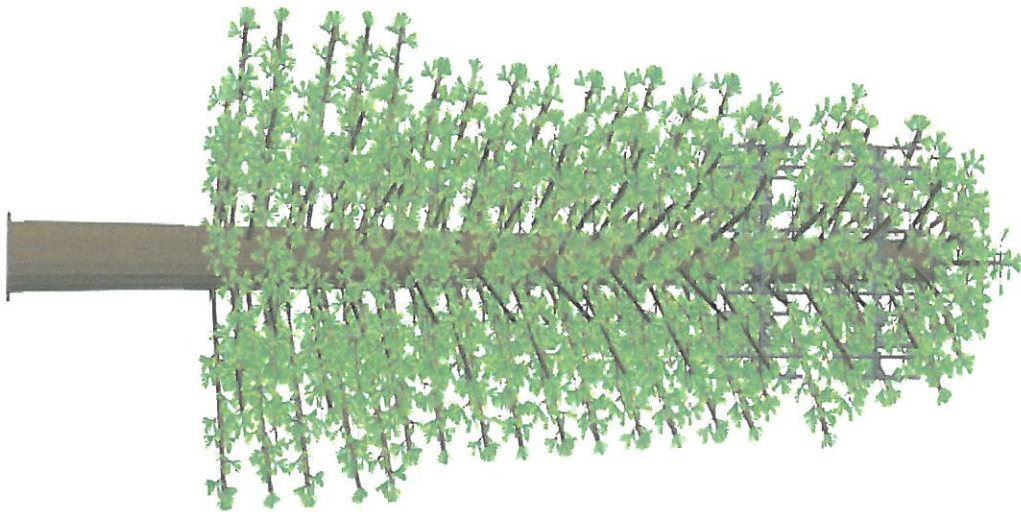


Photo simulation as seen looking northeast from Santa Cruz Waldorf School



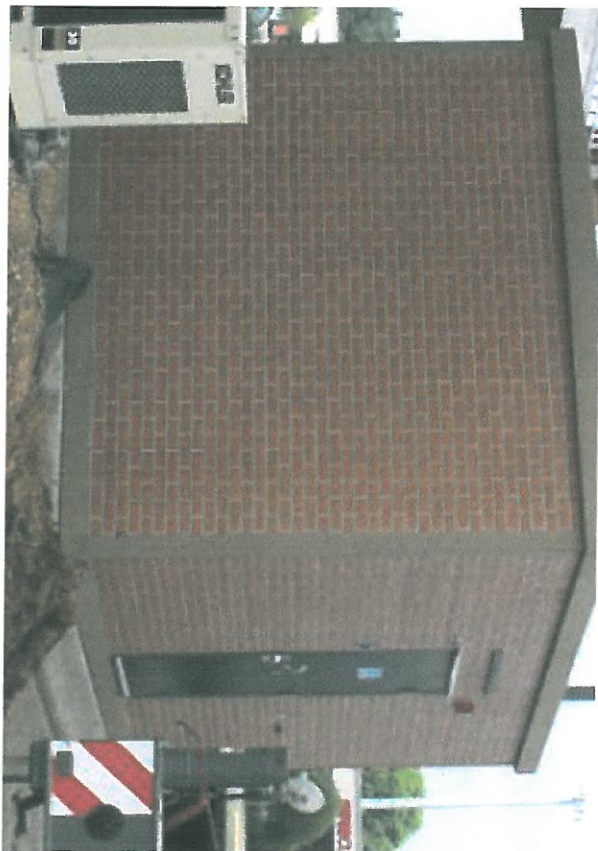
Monopine Example (Manufacturer: Steelhead)



Monopine Bark Example (Manufacturer: Steelhead)



Equipment Shelter Example (Manufacturer: Fibrebond)



AT&T Site #:	CCU0696
Jurisdiction:	County of Santa Cruz
APN:	062-081-16
Application:	131224

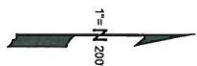


THE ASSESSOR MAKES NO GUARANTEE AS TO MAP ACCURACY NOR ASSUMES ANY LIABILITY FOR OTHER USES. NOT TO BE REPRODUCED. ALL RIGHTS RESERVED.  
© COPYRIGHT SANTA CRUZ COUNTY ASSESSOR 1999

Tax Area Code  
92-004

62-08

R/S MAP BOUNDRY OF  
LAZAROTTI & SMITH  
40MB89 7/13/1964

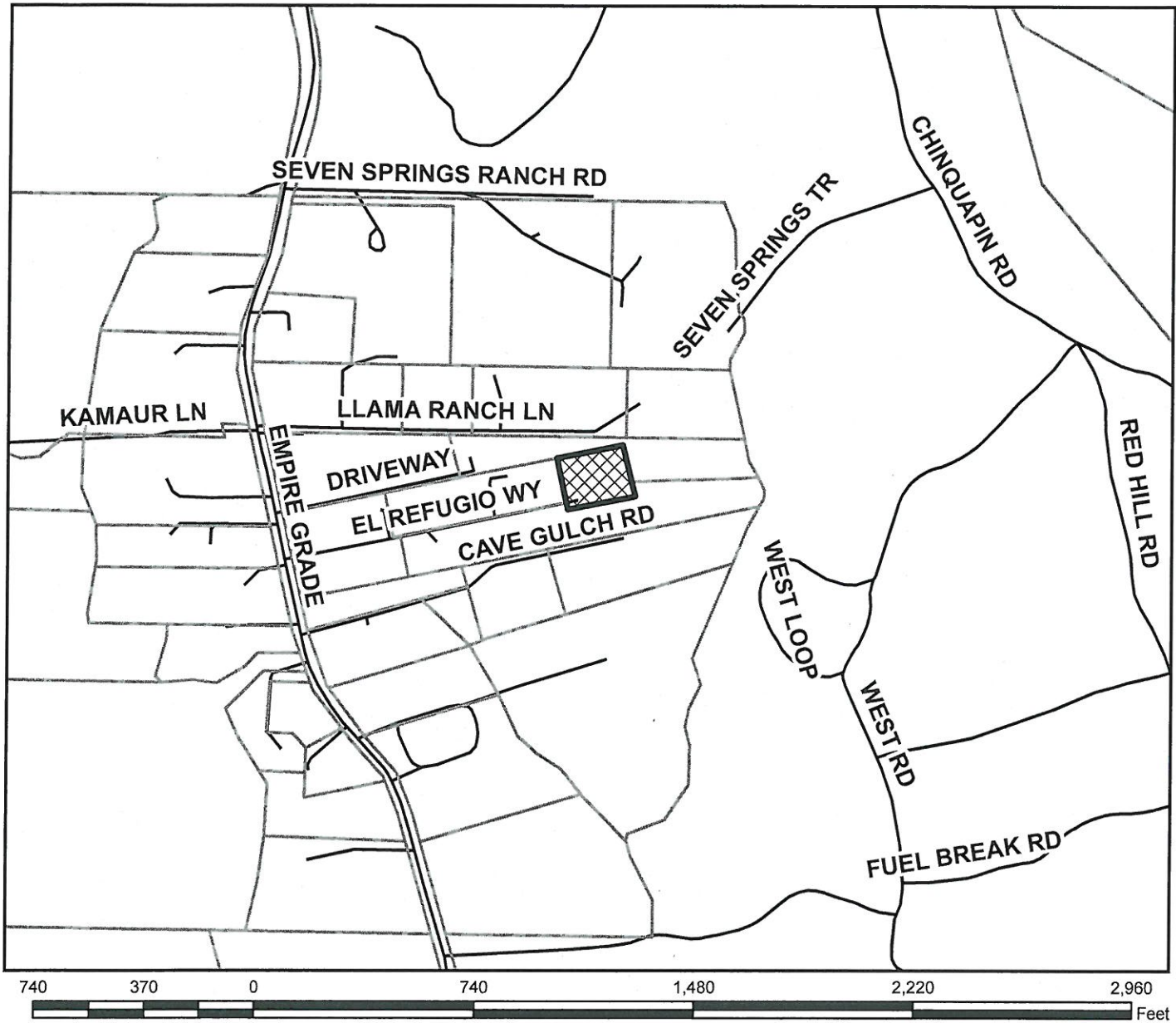


**Note - Assessor's Parcel & Block Numbers Shown in Circles.**




Assessor's Map No. 62-08  
County of Santa Cruz, Calif.  
March 1999

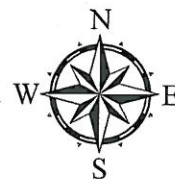


# Location Map



## LEGEND

-  APN: 062-081-16
-  Assessors Parcels
-  Streets

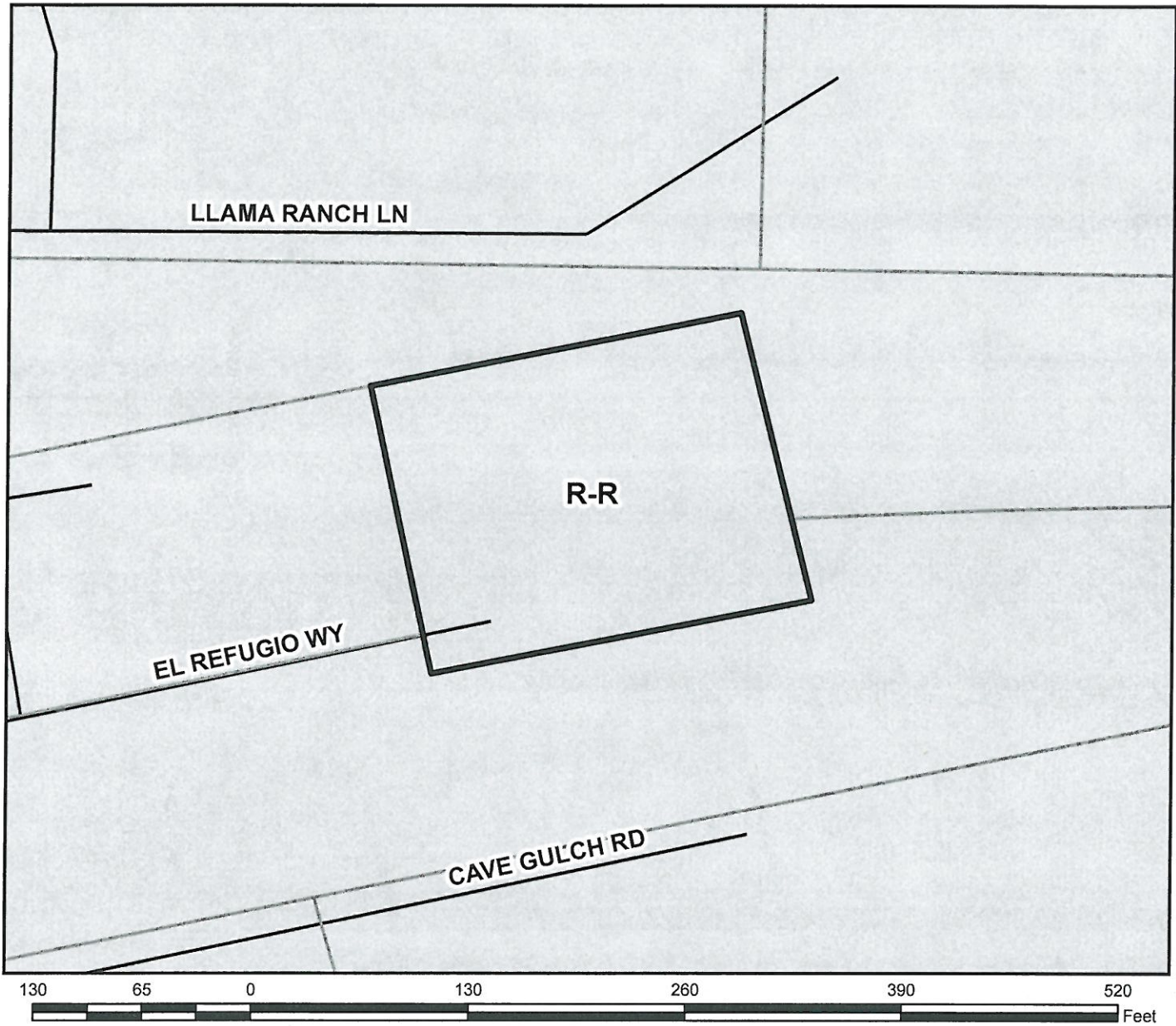


Map Created by  
County of Santa Cruz  
Planning Department  
August 2013

**EXHIBIT E**

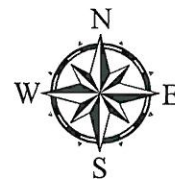


# General Plan Designation Map



## LEGEND

-  APN: 062-081-16
-  Assessors Parcels
-  Streets
-  Residential-Rural



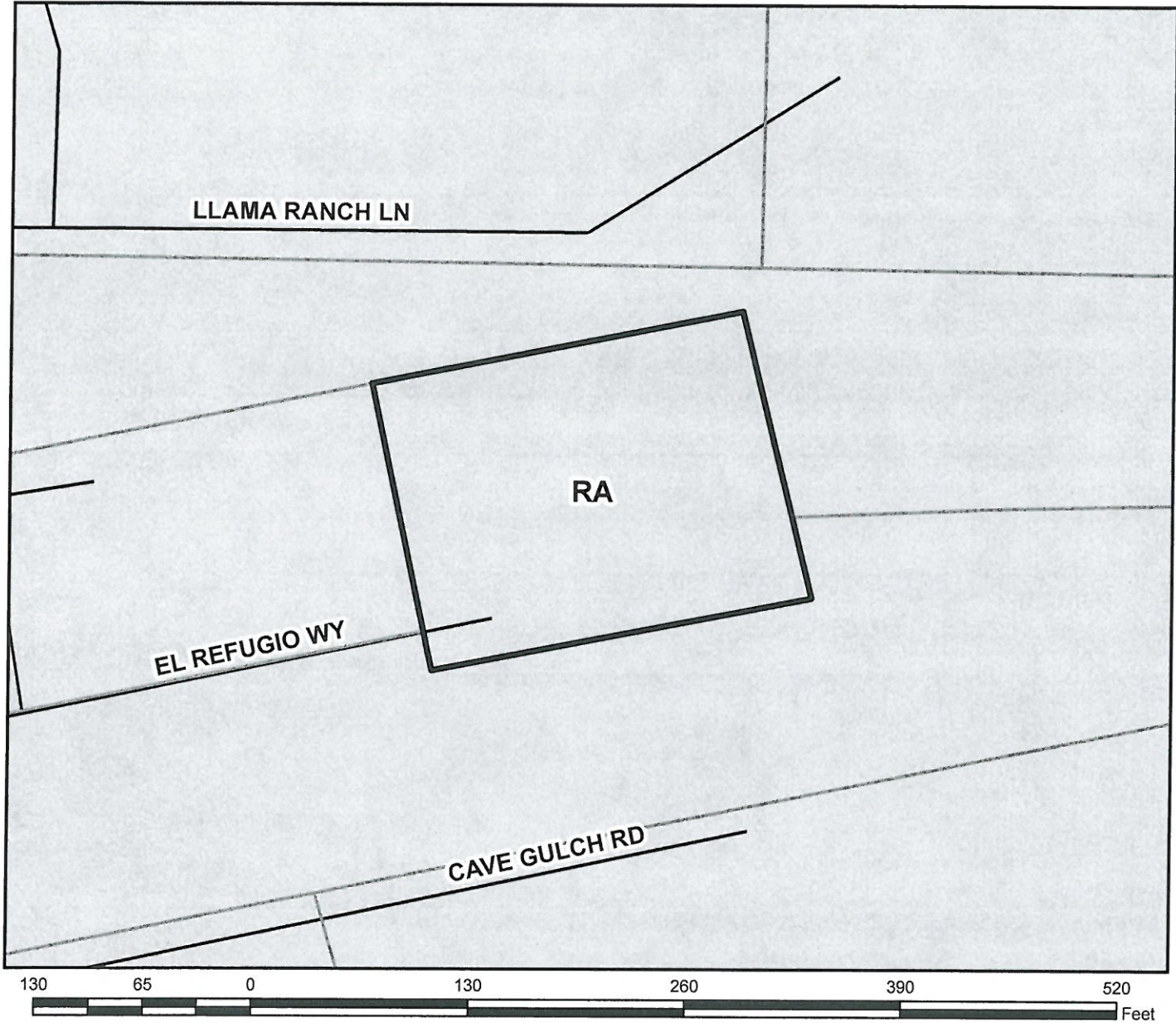
Map Created by  
County of Santa Cruz  
Planning Department  
August 2013

**EXHIBIT E**





# Zoning Map



## LEGEND

-  APN: 062-081-16
-  Assessors Parcels
-  Streets
-  AGRICULTURE RESIDENTIAL



Map Created by  
County of Santa Cruz  
Planning Department  
August 2013

**EXHIBIT E**



**Alternative Site Analysis\_AT&T Site CCU0696  
County of Santa Cruz\_Application 131224  
APN: 062-081-16**

**Project Description**

AT&T proposes to construct, operate and maintain an unmanned wireless telecommunications facility at 16 El Refugio way, Santa Cruz, California. The proposed site is intended to provide service in the area along Empire Grade Rd ( on the northbound and southbound direction from El Refugio Way). This includes indoor coverage in the residential community bounded by Seven Springs ranch Road, Empire Grade and the Santa Cruz Waldorf School Area.

In order to improve coverage in this area AT&T proposes to install 8 panel antennas on a new antenna facility designed to replicate a tree. See attached Photo simulation.

**Coverage Objective**

There are 2 coverage objectives for this site. 1: lack of Coverage and 2: Capacity. As can be seen from the enclosed coverage maps AT&T has poor in building coverage in the Empire Grade Rd area. Development of this site will help increase coverage as well fill the capacity gap.

**Alternative Locations**

We researched additional locations as an alternative to the proposed location. Mainly those locations were UC Santa Cruz Campus as well as State land located in TP zone. Due to terrain, large trees and the distance from the coverage objective, it was determined that those alternatives would not solve the coverage objective. Propagation maps are included to illustrate this point. No attempts were made to



secure leasing at these locations as AT&T RF Engineers determined that the sites would not meet the coverage objective and were rejected on that basis. There were no other leaseable areas that AT&T RF Engineers could determine would solve the coverage Gap. While microcells can be used in certain situations it was determined

that they would not be a viable option here. Due to the limited capacity and coverage of Microcells AT&T determined that a Macro site was optimal for this location. Several Microcells would be required to meet the coverage objective and still would not reach the entire objective area nor would it address the capacity issues as microcells are considerably lower capacity sites than Macro Solutions.

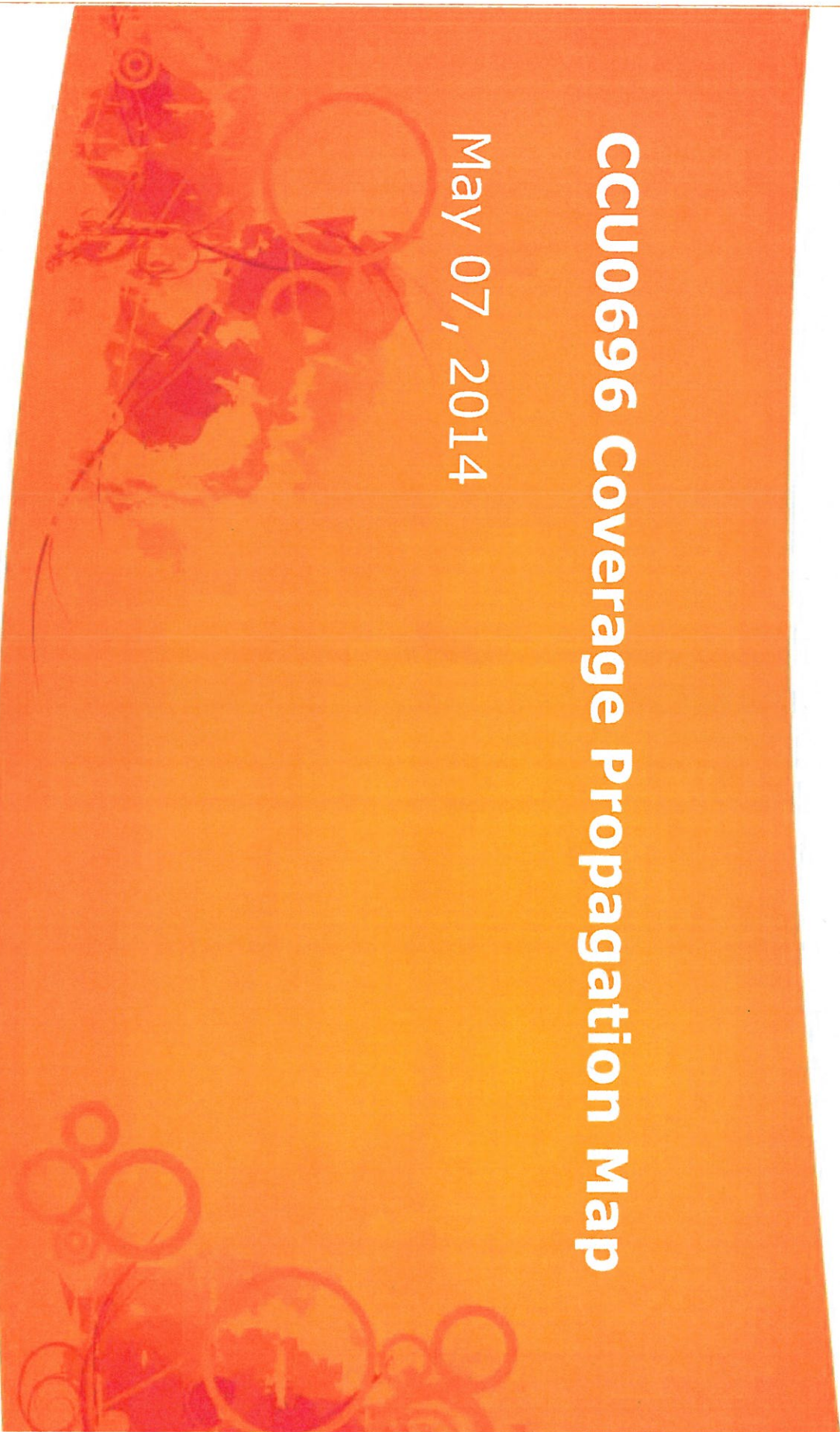
Potential designs were considered for the alternative locations and are included in this submission.

### **Conclusion**

AT&T strives to site facilities with other carriers and look for the best location that fits in the community. This needs to be balanced with the needs of the network objective. No co-location opportunities existed in the search area that would solve the coverage objective and previously mentioned alternative sites, were also found, to not solve the AT&T Network Objective. Attached coverage maps show the coverage at the proposed location and also point out the deficiencies with the alternative locations. All of these factors went into the decision to propose the current location.

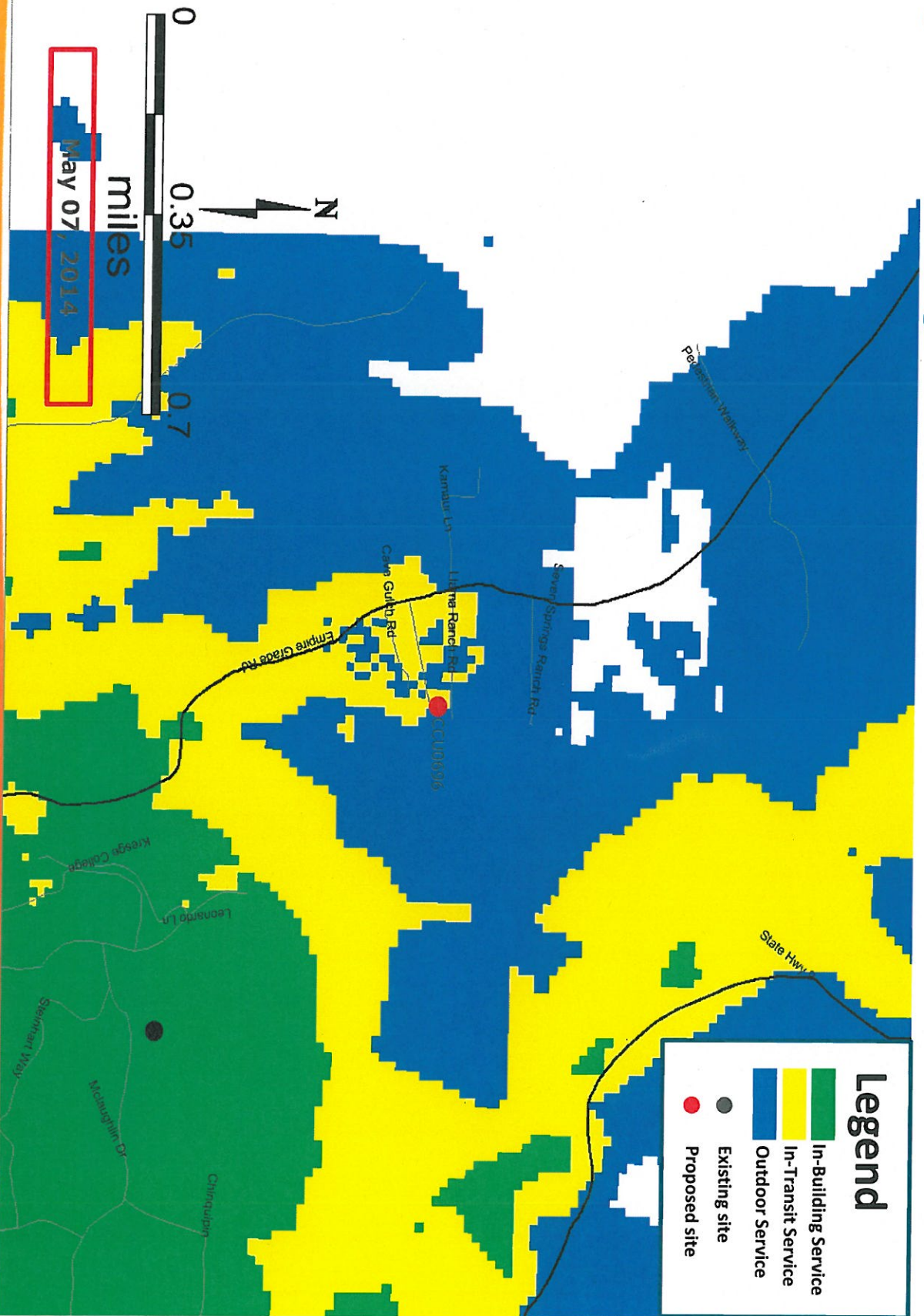
# **CCU0696 Coverage Propagation Map**

**May 07, 2014**



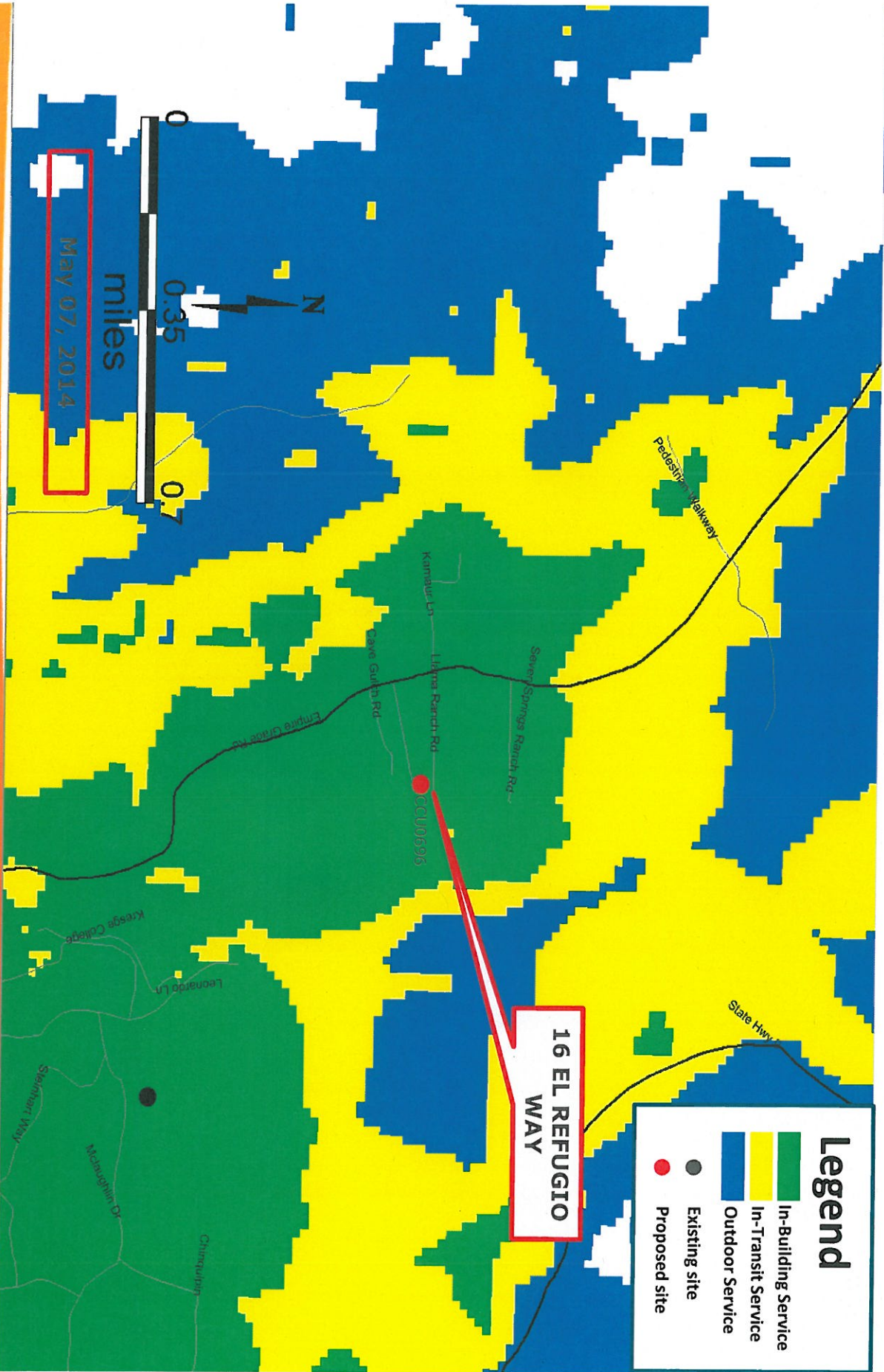


# Existing UMTS 850 Coverage



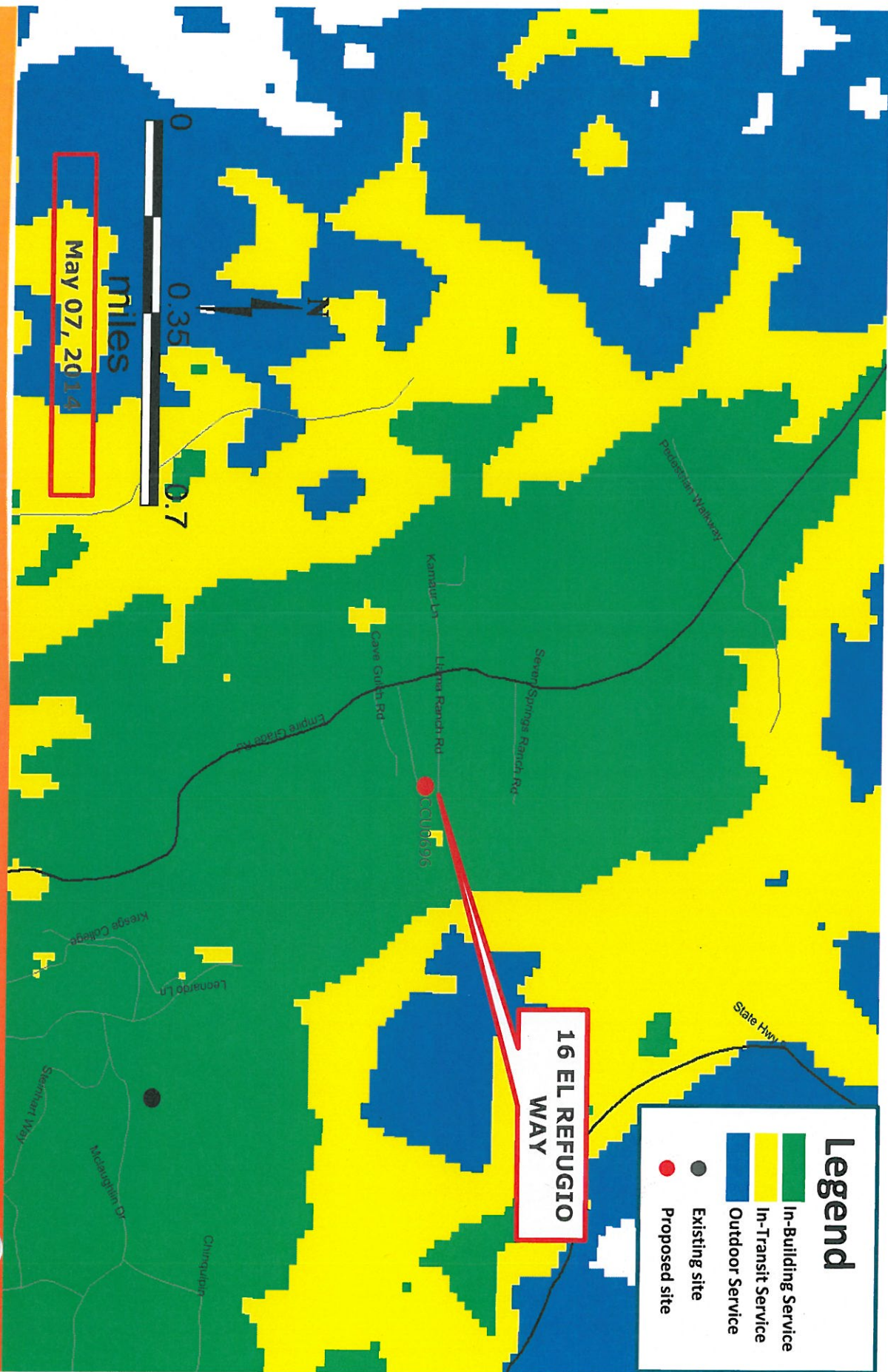


UMTS 850 Coverage - 16 EL REFUGIO WAY @ (RC = 74 ft.)



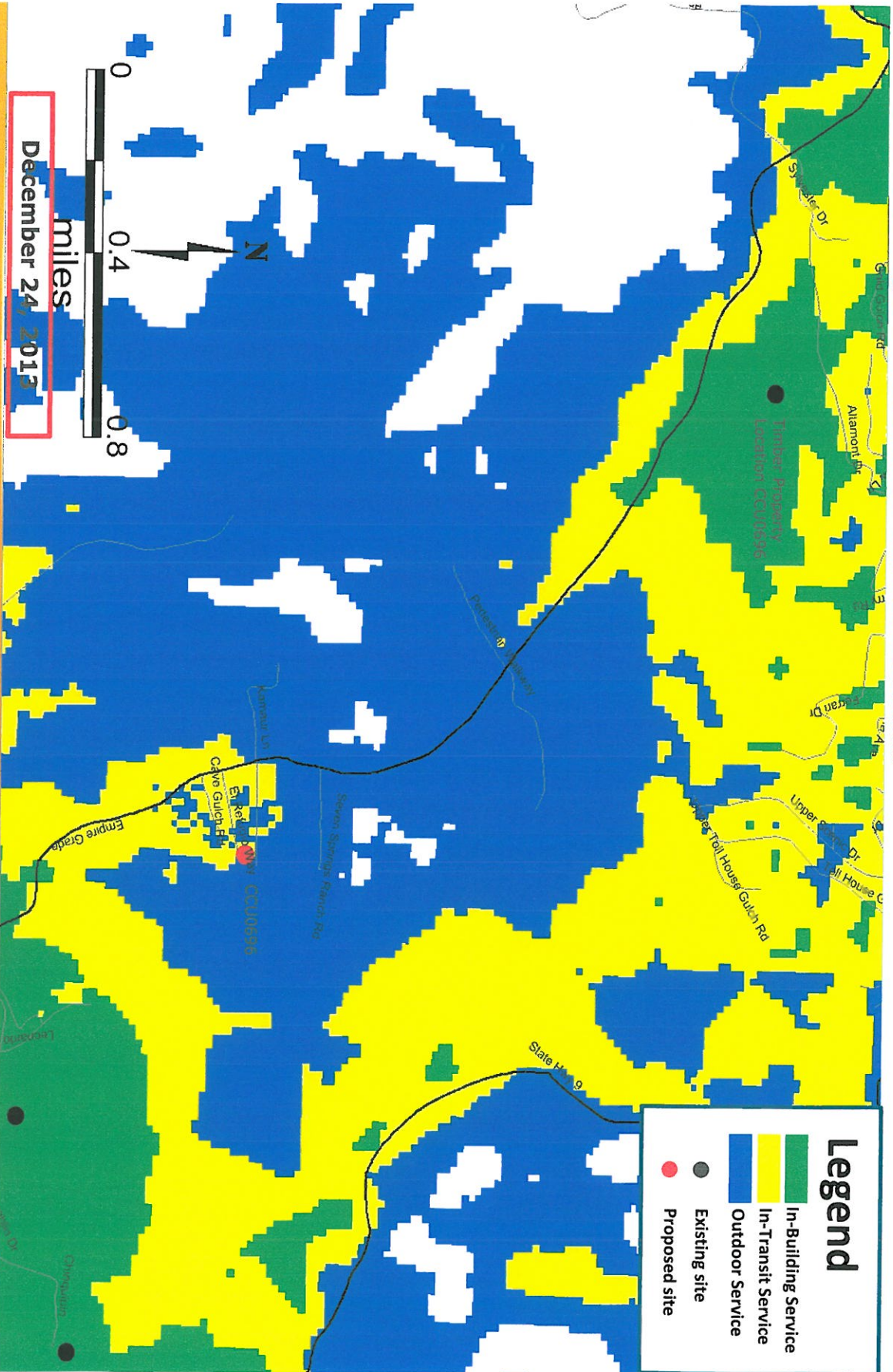


Proposed UMTS 850 Coverage - 16 EL REFUGIO WAY @ (RC = 100 ft.)



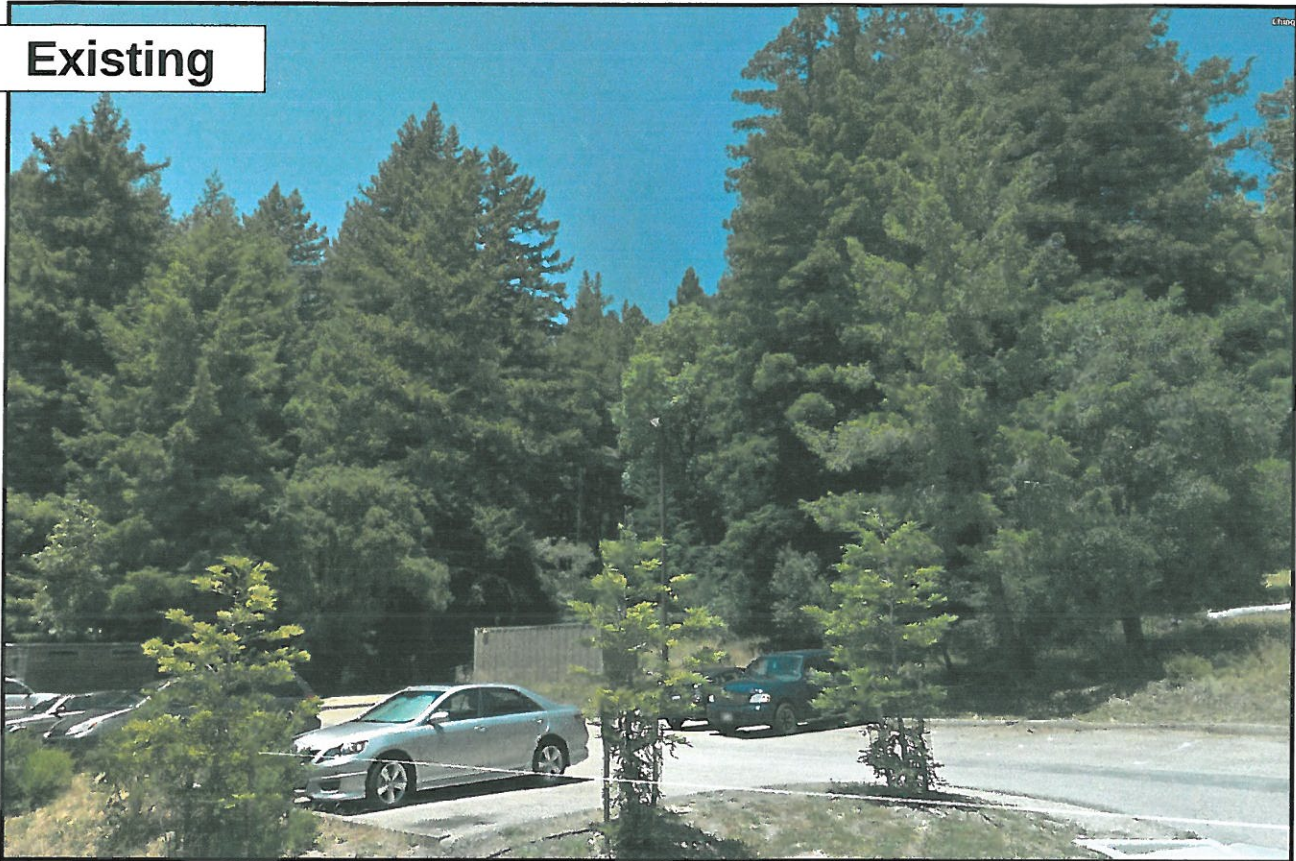


# UMTS 850 Coverage- AT CCU0696 Timber Location





Existing



Proposed



Photo simulation as seen looking north towards alternate location 1

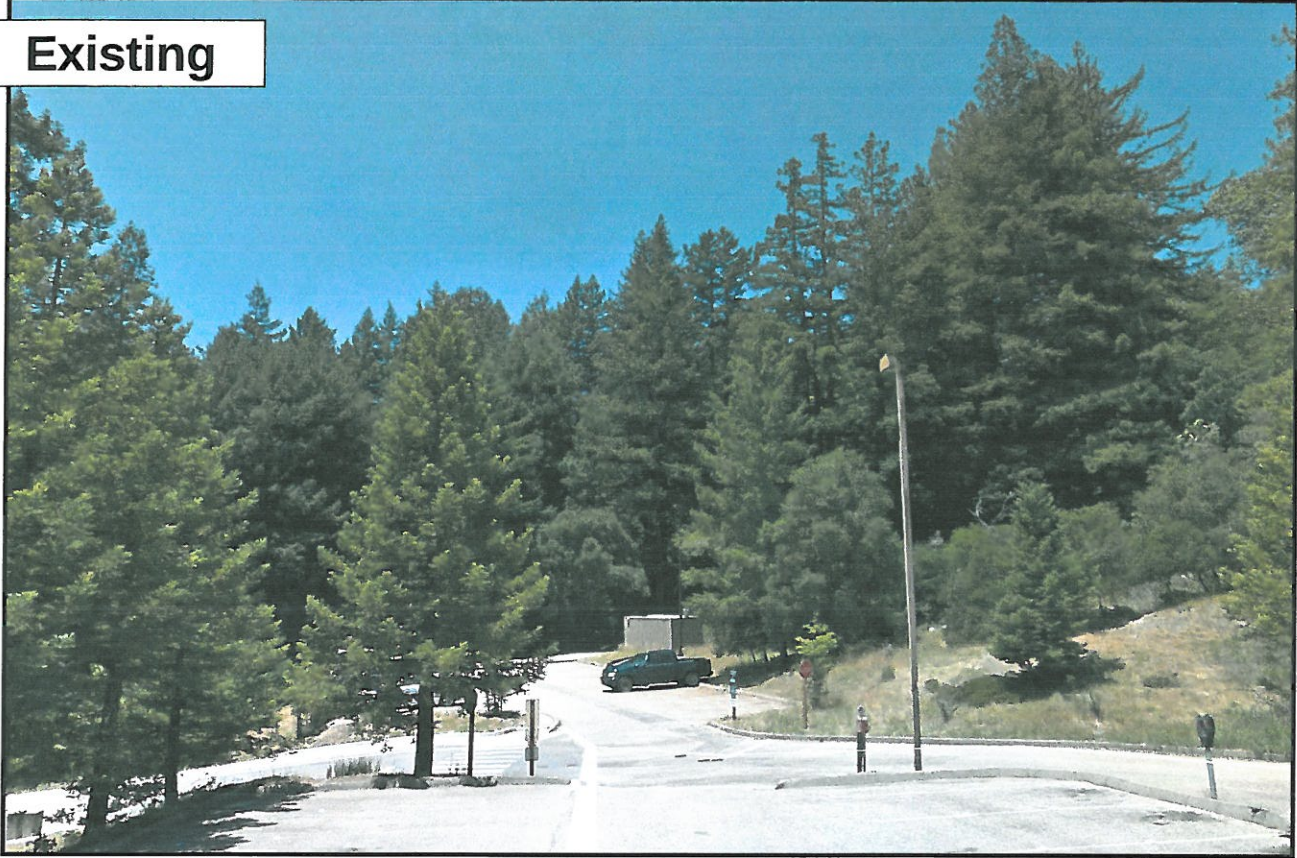
Prepared by: **WW** 01.10.2014  
WW Design & Consulting, Inc.  
1654 Candlere Court  
Walnut Creek, CA 94598  
info@photosims.com



CCU0696 Empire Grade & El Refugio  
+37°0'8.43", -122°3'20.42"



## Existing



## Proposed



*Photo simulation as seen looking west towards alternate location 1*

Prepared by: **WW** 01.10.2014  
WW Design & Consulting, Inc.  
1654 Candelero Court  
Walnut Creek, CA 94598  
info@photosims.com



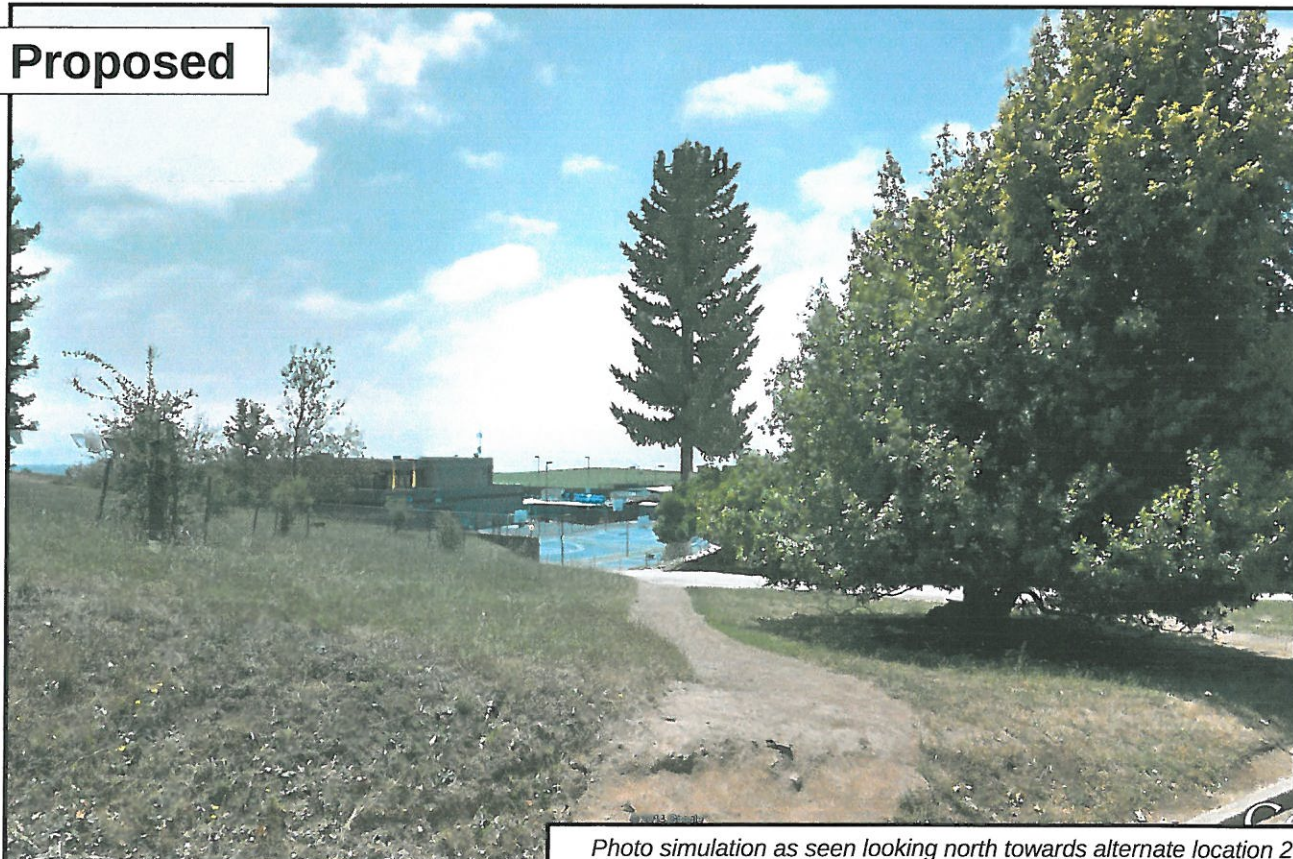
**CCU0696 Empire Grade & El Refugio**  
+37°0'8.43", -122°3'20.42"



**Existing**



**Proposed**



*Photo simulation as seen looking north towards alternate location 2*

Prepared by: **WW** 01.10.2014  
WW Design & Consulting, Inc.  
1654 Candelero Court  
Walnut Creek, CA 94598  
info@photosims.com



**CCU0696 Empire Grade & El Refugio**  
+36°59'42.73", -122°3'17.65"



**Existing**



**Proposed**



*Photo simulation as seen looking north towards alternate location 2*

Prepared by: **WW** 01.10.2014  
 WW Design & Consulting, Inc.  
 1654 Candellero Court  
 Walnut Creek, CA 94598  
 info@photosims.com



**CCU0696 Empire Grade & El Refugio**  
 +36°59'42.73", -122°3'17.65"



**AT&T Mobility • Proposed Base Station (Site No. CCU0696)  
16 El Refugio Way • Santa Cruz, California**

**Statement of Hammett & Edison, Inc., Consulting Engineers**

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of AT&T Mobility, a personal wireless telecommunications carrier, to evaluate the base station (Site No. CCU0696) proposed to be located at 16 El Refugio Way in Santa Cruz, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

**Executive Summary**

AT&T proposes to install directional panel antennas on a tall steel pole, configured to resemble a pine tree, to be located at 16 El Refugio Way in Santa Cruz. The proposed operation will comply with the FCC guidelines limiting public exposure to RF energy.

**Prevailing Exposure Standards**

The U.S. Congress requires that the Federal Communications Commission ("FCC") evaluate its actions for possible significant impact on the environment. A summary of the FCC's exposure limits is shown in Figure 1. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. The most restrictive FCC limit for exposures of unlimited duration to radio frequency energy for several personal wireless services are as follows:

Wireless Service	Frequency Band	Occupational Limit	Public Limit
Microwave (Point-to-Point)	5,000–80,000 MHz	5.00 mW/cm <sup>2</sup>	1.00 mW/cm <sup>2</sup>
BRS (Broadband Radio)	2,600	5.00	1.00
AWS (Advanced Wireless)	2,100	5.00	1.00
PCS (Personal Communication)	1,950	5.00	1.00
Cellular	870	2.90	0.58
SMR (Specialized Mobile Radio)	855	2.85	0.57
700 MHz	700	2.40	0.48
[most restrictive frequency range]	30–300	1.00	0.20

**General Facility Requirements**

Base stations typically consist of two distinct parts: the electronic transceivers (also called "radios" or "channels") that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The transceivers are often located at ground level and are connected to the antennas by coaxial cables. A small antenna for reception of GPS signals is also required, mounted with a clear view of the sky. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the antennas require line-of-sight paths for their signals to propagate well and so are installed at some

**AT&T Mobility • Proposed Base Station (Site No. CCU0696)  
16 El Refugio Way • Santa Cruz, California**

height above ground. The antennas are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. This means that it is generally not possible for exposure conditions to approach the maximum permissible exposure limits without being physically very near the antennas.

**Computer Modeling Method**

The FCC provides direction for determining compliance in its Office of Engineering and Technology Bulletin No. 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation," dated August 1997. Figure 2 attached describes the calculation methodologies, reflecting the facts that a directional antenna's radiation pattern is not fully formed at locations very close by (the "near-field" effect) and that at greater distances the power level from an energy source decreases with the square of the distance from it (the "inverse square law"). The conservative nature of this method for evaluating exposure conditions has been verified by numerous field tests.

**Site and Facility Description**

Based upon information provided by AT&T, including zoning drawings by Borges Architectural Group, Inc., dated June 6, 2013, it is proposed to install eight directional panel antennas – four Ericsson Model KRC 118 054/1, two Model SBNH-1D6565C, and two Andrew Model SBNHH-1D65C – on a new 100-foot steel pole, configured to resemble a pine tree, to be sited to the west of the municipal water tank located at 16 El Refugio Way in Santa Cruz. The antennas would be mounted with up to 12° downtilt at an effective height of about 86 feet above ground and would be oriented in identical groups of four toward 180°T and 315°T. The maximum effective radiated power in any direction would be 11,120 watts, representing simultaneous operation at 7,480 watts for PCS, 1,000 watts for cellular, and 2,640 watts for 700 MHz service. There are reported no other wireless telecommunications base stations at the site or nearby.

**Study Results**

For a person anywhere at ground, the maximum RF exposure level due to the proposed AT&T operation is calculated to be 0.027 mW/cm<sup>2</sup>, which is 4.1% of the applicable public exposure limit. The maximum calculated level at the second-floor elevation of any nearby residence\* is 5.3% of the public exposure limit. The maximum calculated level for a person on the nearby water tank is 2.9% of the public exposure limit. It should be noted that these results include several "worst-case" assumptions and therefore are expected to overstate actual power density levels from the proposed

---

\* Located at least 180 feet away, based on photographs from Google Maps.





**AT&T Mobility • Proposed Base Station (Site No. CCU0696)  
16 El Refugio Way • Santa Cruz, California**

operation. Figure 3 attached provides the specific data required under Santa Cruz County Code Section 13.10.659(g)(2)(ix), for reporting the analysis of RF exposure conditions.

**No Recommended Mitigation Measures**

Due to their mounting locations, the AT&T antennas would not be accessible to the general public, and so no mitigation measures are necessary to comply with the FCC public exposure guidelines. It is presumed that AT&T will, as an FCC licensee, take adequate steps to ensure that its employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antennas themselves.

**Conclusion**

Based on the information and analysis above, it is the undersigned's professional opinion that operation of the base station proposed by AT&T Mobility at 16 El Refugio Way in Santa Cruz, California, will comply with the prevailing standards for limiting public exposure to radio frequency energy and, therefore, will not for this reason cause a significant impact on the environment. The highest calculated level in publicly accessible areas is much less than the prevailing standards allow for exposures of unlimited duration. This finding is consistent with measurements of actual exposure conditions taken at other operating base stations.

**Authorship**

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration No. E-20309, which expires on March 31, 2015. This work has been carried out under her direction, and all statements are true and correct of her own knowledge except, where noted, when data has been supplied by others, which data she believes to be correct.



*Andrea L. Bright*  
Andrea L. Bright, P.E.  
707/996-5200

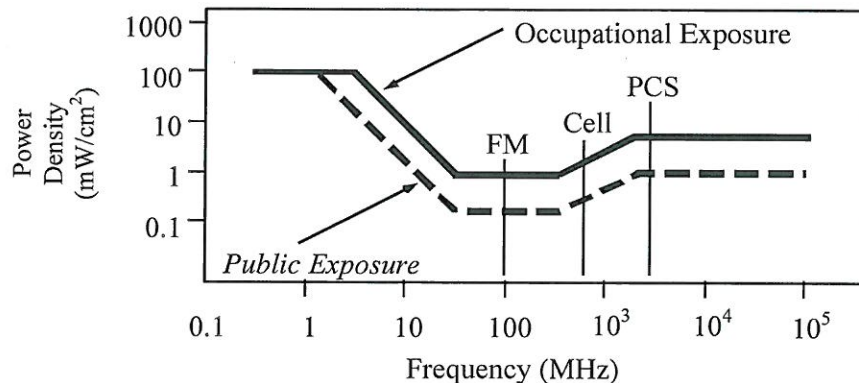
July 26, 2013

## FCC Radio Frequency Protection Guide

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The FCC adopted the limits from Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements ("NCRP"). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent standard, developed by the Institute of Electrical and Electronics Engineers and approved as American National Standard ANSI/IEEE C95.1-2006, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," includes similar limits. These limits apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

As shown in the table and chart below, separate limits apply for occupational and public exposure conditions, with the latter limits (in *italics* and/or dashed) up to five times more restrictive:

<u>Frequency</u>	<u>Electromagnetic Fields (f is frequency of emission in MHz)</u>					
Applicable Range (MHz)	Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm <sup>2</sup> )	
0.3 – 1.34	614	<i>614</i>	1.63	<i>1.63</i>	100	<i>100</i>
1.34 – 3.0	614	<i>823.8/f</i>	1.63	<i>2.19/f</i>	100	<i>180/f<sup>2</sup></i>
3.0 – 30	1842/f	<i>823.8/f</i>	4.89/f	<i>2.19/f</i>	900/f <sup>2</sup>	<i>180/f<sup>2</sup></i>
30 – 300	61.4	<i>27.5</i>	0.163	<i>0.0729</i>	1.0	<i>0.2</i>
300 – 1,500	3.54√f	<i>1.59√f</i>	√f/106	<i>√f/238</i>	f/300	<i>f/1500</i>
1,500 – 100,000	137	<i>61.4</i>	0.364	<i>0.163</i>	5.0	<i>1.0</i>



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has built those formulas into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radio sources. The program allows for the description of buildings and uneven terrain, if required to obtain more accurate projections.



**HAMMETT & EDISON, INC.**  
CONSULTING ENGINEERS  
SAN FRANCISCO

FCC Guidelines  
Figure 1



## RFR.CALC™ Calculation Methodology

### Assessment by Calculation of Compliance with FCC Exposure Guidelines

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The maximum permissible exposure limits adopted by the FCC (see Figure 1) apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits.

#### Near Field.

Prediction methods have been developed for the near field zone of panel (directional) and whip (omnidirectional) antennas, typical at wireless telecommunications base stations, as well as dish (aperture) antennas, typically used for microwave links. The antenna patterns are not fully formed in the near field at these antennas, and the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) gives suitable formulas for calculating power density within such zones.

For a panel or whip antenna, power density  $S = \frac{180}{\theta_{BW}} \times \frac{0.1 \times P_{net}}{\pi \times D \times h}$ , in mW/cm<sup>2</sup>,

and for an aperture antenna, maximum power density  $S_{max} = \frac{0.1 \times 16 \times \eta \times P_{net}}{\pi \times h^2}$ , in mW/cm<sup>2</sup>,

where  $\theta_{BW}$  = half-power beamwidth of the antenna, in degrees, and

$P_{net}$  = net power input to the antenna, in watts,

$D$  = distance from antenna, in meters,

$h$  = aperture height of the antenna, in meters, and

$\eta$  = aperture efficiency (unitless, typically 0.5-0.8).

The factor of 0.1 in the numerators converts to the desired units of power density.

#### Far Field.

OET-65 gives this formula for calculating power density in the far field of an individual RF source:

power density  $S = \frac{2.56 \times 1.64 \times 100 \times RFF^2 \times ERP}{4 \times \pi \times D^2}$ , in mW/cm<sup>2</sup>,

where ERP = total ERP (all polarizations), in kilowatts,

RFF = relative field factor at the direction to the actual point of calculation, and

$D$  = distance from the center of radiation to the point of calculation, in meters.

The factor of 2.56 accounts for the increase in power density due to ground reflection, assuming a reflection coefficient of 1.6 (1.6 x 1.6 = 2.56). The factor of 1.64 is the gain of a half-wave dipole relative to an isotropic radiator. The factor of 100 in the numerator converts to the desired units of power density. This formula has been built into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radiation sources. The program also allows for the description of uneven terrain in the vicinity, to obtain more accurate projections.



**HAMMETT & EDISON, INC.**  
CONSULTING ENGINEERS  
SAN FRANCISCO

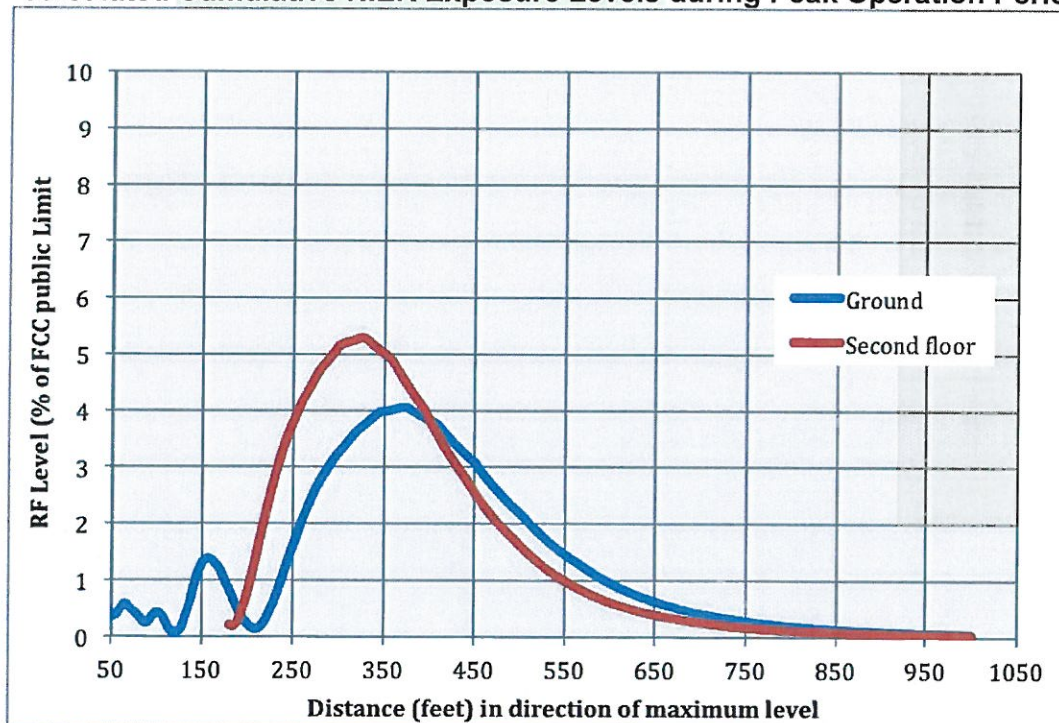
Methodology  
Figure 2

**AT&T Mobility • Proposed Base Station (Site No. CCU0696)  
16 El Refugio • Santa Cruz, California**

**Compliance with Santa Cruz County Submittal Guidelines**

Compliance with the FCC's non-ionizing electromagnetic radiation (NIE) standards or other applicable standards shall be demonstrated for any new wireless communication facility through submission, at the time of application for the necessary permit or entitlement, of NIE calculations specifying NIE levels in the area surrounding the proposed facility. Calculations shall be made of expected NIE exposure levels during peak operation periods at a range of distances from fifty (50) to one thousand (1,000) feet, taking into account cumulative NIE exposure levels from the proposed source in combination with all other existing NIE transmission sources within a one-mile radius. This should also include a plan to ensure that the public would be kept at a safe distance from any NIE transmission source associated with the proposed wireless communication facility, consistent with the NIE standards of the FCC, or any potential future superceding standards.

**Calculated Cumulative NIE Exposure Levels during Peak Operation Periods**



RF level (% limit)

Distance (feet)	50	100	200	300	500	750	1,000
ground	0.38%	0.44%	0.23%	3.3%	2.2%	0.28%	0.054%
second floor	N/A	N/A	0.80%	5.2%	1.6%	0.17%	0.034%

Calculated using formulas in FCC Office of Engineering Technology Bulletin No. 65 (1997), considering terrain variations within 1,000 feet of site.

**Maximum effective radiated power (peak operation)** - 11,120 watts

Effective AT&T antenna height above ground - 86 feet

Other sources nearby - None

Other sources within one mile - FM Translator K276BR, 103.1 MHz, 5 Watts effective radiated power, located about 1,000 feet to the northwest

**Plan for restricting public access** - Antennas are mounted on a tall pole



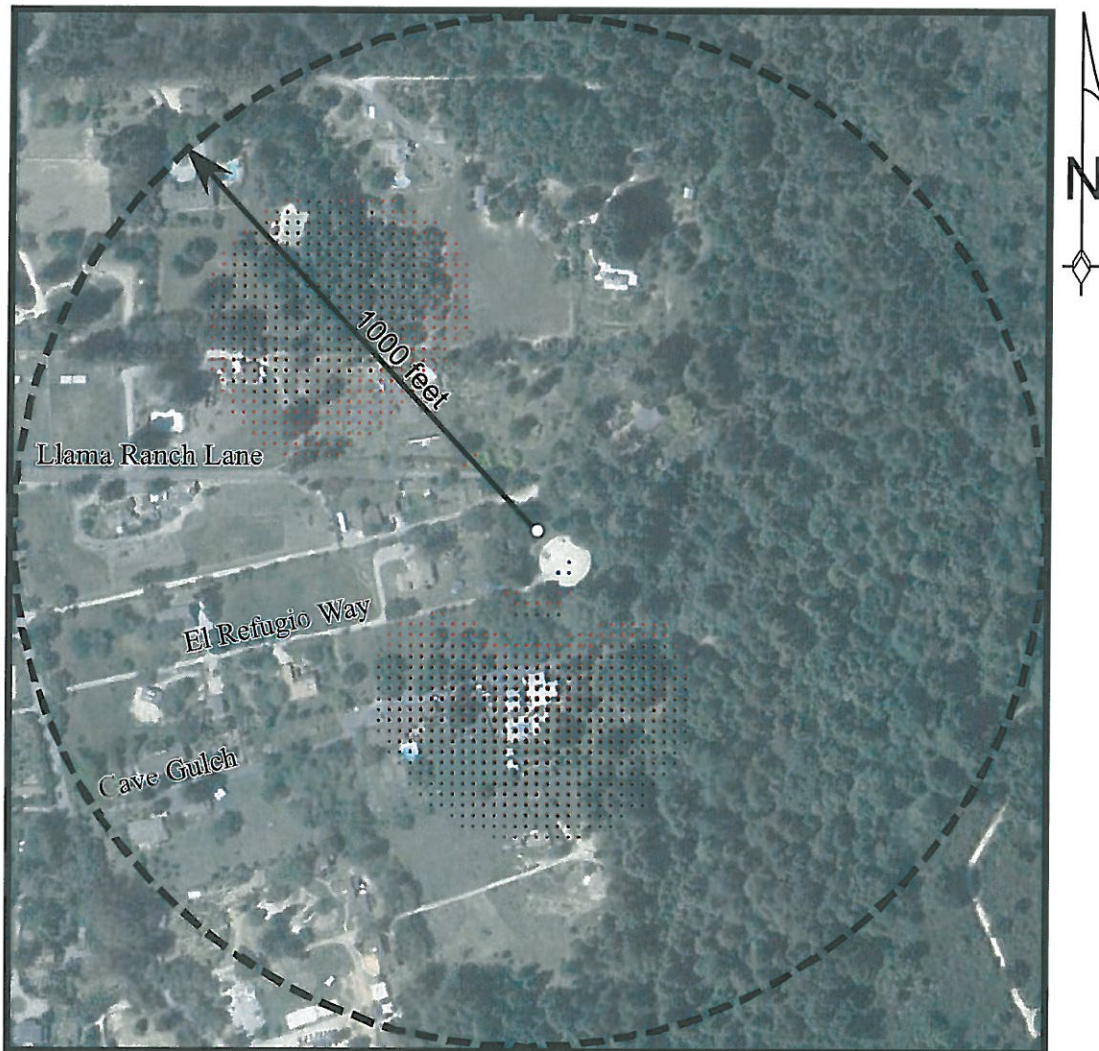
**HAMMETT & EDISON, INC.**  
CONSULTING ENGINEERS  
SAN FRANCISCO

D5UT  
Figure 3A






AT&T Mobility • Proposed Base Station (Site No. CCU0696) TEST 2  
16 El Refugio Way • Santa Cruz, California

Calculated NIER Exposure Levels  
Within 1,000 Feet of Proposed AT&T Site



Aerial photo from Google Maps

Legend	
blank	- less than 1% of FCC public limit ( <i>i.e.</i> , more than 100 times below)
	- 1% and above near ground level (highest level is 4.1%)
	- 1% and above at second-floor level (highest level is 5.3%)
	- 1% and above on the nearby water tank (highest level is 2.9%)

Calculated using formulas in FCC Office of Engineering Technology Bulletin No. 65 (1997), considering terrain variations within 1,000 feet of site. See text for further information.



## Nathan MacBeth

---

**From:** hollismd@aol.com  
**Sent:** Tuesday, May 27, 2014 8:59 PM  
**To:** coale@mlml.calstate.edu; joannereiter@gmail.com; Nathan MacBeth  
**Cc:** hilde@ucsc.edu; megafoca@ucsc.edu; dooner1@ix.netcom.com; mndiaz@ucsc.edu; speziabella@aol.com; betsyf@baymoon.com; feldman@biology.ucsc.edu; davidgarbacz@me.com; hugh@armory.com; wdgritton@mac.com; tgritton@mac.com; tlgrove@yahoo.com; matthewjames@got.net; clking@stanford.edu; leboeuf@ucsc.edu; Hal.Levin@buildingecology.com; meranna36@gmail.com; cmoore@pmc.ucsc.edu; muehleisen@gmail.com; neenan@cruzio.com; panofsky@cruzio.com; sheila.peck@envirocentives.com; suelloyd@cruzio.com; jschiesel@yahoo.com; nessmcleod@gmail.com; hschwartz@pmc.ucsc.edu; patshirley40@yahoo.com; don@bind.com; frankt@gopalace.com; garyt@gopalace.com; jwampler@cruzio.com; kdwing@gmail.com; slcoale@ucsc.edu  
**Subject:** Re: Response to Inquiry regarding the proposed Cell Tower on City Property

Dear Mr. MacBeth,

I am in favor of this tower. How do the members of our neighborhood give input to the county to support this variance?

What is called the "Cave Gulch Neighborhood Association" does not represent all the neighbors. This tower is advantageous to my family, which cannot receive Comcast connection, despite their original promise to do so. Mr. Coonerty worked desperately to alleviate that problem and was unsuccessful. We also have an extremely unreliable land line, especially during storms. The county needs to understand that some of us are so remote here that communication of all sorts is very difficult, if not impossible, in times of emergency.

ATT promised us cell phone coverage over ten years ago and we are glad that they are finally following up on their promise.

Thank you for your understanding in this matter.  
Hollis deLancey

-----Original Message-----

**From:** Kenneth Coale <coale@mlml.calstate.edu>  
**To:** joanne reiter <joannereiter@gmail.com>  
**Cc:** Kenneth Coale <coale@mlml.calstate.edu>; Hilde Schwartz <hilde@ucsc.edu>; megafoca megafoca <megafoca@ucsc.edu>; Dallas Belville <dooner1@ix.netcom.com>; Hollis Delancey <hollismd@aol.com>; May Diaz <mndiaz@ucsc.edu>; Bernadine & Don Dodson <speziabella@aol.com>; betsy f <betsyf@baymoon.com>; Jerry Feldman <feldman@biology.ucsc.edu>; david garbacz <davidgarbacz@me.com>; Hugh Gregg <hugh@armory.com>; Wendy Gritton <wdgritton@mac.com>; Terry Gritton <tgritton@mac.com>; Terry Grove <tlgrove@yahoo.com>; matthew james <matthewjames@got.net>; Christine King <clking@stanford.edu>; Burney Le Boeuf <leboeuf@ucsc.edu>; Hal Levin <Hal.Levin@buildingecology.com>; Anna Meredith <meranna36@gmail.com>; Casey Moore <cmoore@pmc.ucsc.edu>; Ralph Muehleisen <muehleisen@gmail.com>; Mark Neenan <neenan@cruzio.com>; Carol Panofsky <panofsky@cruzio.com>; Sheila Peck <sheila.peck@envirocentives.com>; Lloyd & Sue Robinson <suelloyd@cruzio.com>; john schiesel <jschiesel@yahoo.com>; Heide Schwartz <nessmcleod@gmail.com>; Hilde Schwartz <hschwartz@pmc.ucsc.edu>; Pat Shirley <patshirley40@yahoo.com>; Don Stevens <don@bind.com>; Frank Trowbridge <frankt@gopalace.com>; Gary Trowbridge <garyt@gopalace.com>; Joe Wampler <jwampler@cruzio.com>; Ken Wing <kdwing@gmail.com>; Susan Coale <slcoale@ucsc.edu>  
**Sent:** Tue, May 27, 2014 6:02 pm  
**Subject:** Response to Inquiry regarding the proposed Cell Tower on City Property

Cave Gulchers,  
Just heard back from Nathan.  
Not all the answers, but some more reports to come:

I would be happy to consolidate our concerns and direct them to the planner, but please feel free to contact Nathan yourselves if you so desire. If you do, it would be helpful to the process to copy others on your issues. This will help both



the Cave Gulch community and the Planning Department. I have heard from some concerned about the specific engineering, loop currents and their associated EMF, lack of other providers (other than AT&T), need for the full 100 feet, etc... I gotta say that with a 15 foot antenna above our house, we have better Ham radio coverage than most repeaters in Bonny Doon..... so the need for such a tall tower needs to be justified, in my opinion. Let me know if you have issues that you would like me to carry and I would be happy to do so as a neighborhood concern.  
Kenneth

From:

Nathan MacBeth

Nathan MacBeth <[Nathan.MacBeth@santacruzcounty.us](mailto:Nathan.MacBeth@santacruzcounty.us)>

Dr. Coale,

I appreciate your interest in this project. I have attempted to answer your questions below.  
Feel free to contact me if you need further clarification or have additional questions.

1. The request for a 100 foot tall antenna requires a Variance approval to exceed the 78 ft height maximum. This request is subject to approval by the Zoning Administrator (public hearing) and needs to meet a specific set of Findings related to property characteristics (slope, location, etc). As proposed, the antenna will be camouflaged to look like a tree in order to reduce visual impacts. Based on this information I have at this time, the cellular coverage for AT&T customers is likely to improve though this might be a more technical question for the applicant or better be answered by looking at the propagation maps that will be published as part of my staff report.
2. The applicant/primary carrier located on the antenna will be AT&T. The applicant hopes that the site will be of appropriate design to accommodate additional carriers in the future. Co-located wireless facilities are encouraged.
3. I have no knowledge of the site being used for anything other than the proposed single-carrier wireless facility.
4. Based on the information available at this time, it appears that cell coverage for residents along Empire Grade will improve dramatically in that there currently is none or very little. As previously noted, the applicant is shooting for an antenna design that would accommodate addition wireless carriers in the future therefore improving service for multiple cellular providers/subscribers. Visual simulations of the proposed design will be published as part of the staff report.
5. My understanding is that the intent of the proposed antenna is to improve cellular service to the residents of Bonny Doon and Empire corridor.

I will be certain to distribute a staff report to you when it becomes available as well as notice of when the public hearing is scheduled. Again, feel free to contact me with additional questions.  
Thank you,

Nathan MacBeth  
Development Review Planner  
County of Santa Cruz

-----Original Message-----

From: Kenneth Coale [<mailto:coale@mlml.calstate.edu>];  
Sent: Thursday, May 22, 2014 7:50 PM  
To: Nathan MacBeth  
Subject: Cell Tower at Refugio Lane, Lower Bonny Doon

Nathan,  
We live at 2309 and 2329 Empire Grade, across the street from the Cell Tower project. My wife and I are also co-coordinators of the Equine Evacuation Unit of Santa Cruz County which have over 230 volunteer members and 37 Ham radio operators in the Unit. We also have cell phones that don't work where we live. So, we have multiple interests in this project.

First, a 100 foot tower will blight the eastern skyline as viewed from our house.... do you need 100 feet rather than the

normal height allowed? What engineering studies have been done to recommend a tower much taller than the allowed height under the current code? What coverage areas would be expanded by this project? Many neighbors have this concern.

Second, a tower on public property should serve public interests... not just those of a single provider/developer. We are concerned that the developer may wish to limit other providers on this installation. What other providers will be allowed on this installation?

Third, we serve a public service capacity, not just in terms of Equine Evacuation, but also in terms of ARES (Amateur Radio Emergency Services), and are the current (reluctant) president of a neighborhood association in this area. What provisions are being considered for other public service repeaters on this installation? Can you give us some idea of the other tower uses including Cell, public service, amateur radio, GRS? Are there any FRS repeater options being considered? What public service capacities would be expanded by such an installation.

Fourth, how might our community benefit from such an installation? Specifically, can you describe the benefits to those of us who have been living here for a long time? Many of us will be sacrificing our skylines (and property values) to those who will benefit fiscally, from this installation. How are we to be compensated?

Fifth, what are the economic drivers of this project? Many of us are very weary of the UCSC development plans, especially in light of the current development plan and the water crisis that faces us now and into the future. Is this a project designed to serve the UCSC population? What are the real/honest motives for such a project?

We are very much looking forward to your responses.  
Please let us know how best to provide input into this development process.

Thanks for your consideration of these issues.

Dr. Kenneth Coale  
Moss Landing Marine Laboratories  
8272 Moss Landing Road  
Moss Landing, CA 95039  
(831) 771-4406  
[coale@mlml.calstate.edu](mailto:coale@mlml.calstate.edu)

On May 22, 2014, at 7:57 PM, Kenneth Coale wrote:

All,  
Many of us have seen the postings for the cell phone tower construction at the end of Refugio Lane, on the City Property where the water tank now sits. I have sent some questions to the planner associated with this project... just thought you should see what some of the issues may be.  
I am not pro or con... just want some more information.  
Kenneth

Nathan,  
We live at 2309 and 2329 Empire Grade, across the street from the Cell Tower project. My wife and I are also co-coordinators of the Equine Evacuation Unit of Santa Cruz County which have over 230 volunteer members and 37 Ham radio operators in the Unit. We also have cell phones that don't work where we live. So, we have multiple interests in this project.

First, a 100 foot tower will blight the eastern skyline as viewed from our house.... do you need 100 feet rather than the normal height allowed? What engineering studies have been done to recommend a tower much taller than the allowed height under the current code? What coverage areas would be expanded by this project? Many neighbors have this concern.

Second, a tower on public property should serve public interests... not just those of a single provider/developer. We are concerned that the developer may wish to limit other providers on this installation. What other providers will be allowed on



this installation?

Third, we serve a public service capacity, not just in terms of Equine Evacuation, but also in terms of ARES (Amateur Radio Emergency Services), and are the current (reluctant) president of a neighborhood association in this area. What provisions are being considered for other public service repeaters on this installation? Can you give us some idea of the other tower uses including Cell, public service, amateur radio, GRS? Are there any FRS repeater options being considered? What public service capacities would be expanded by such an installation.

Fourth, how might our community benefit from such an installation? Specifically, can you describe the benefits to those of us who have been living here for a long time? Many of us will be sacrificing our skylines (and property values) to those who will benefit fiscally, from this installation. How are we to be compensated?

Fifth, what are the economic drivers of this project? Many of us are very weary of the UCSC development plans, especially in light of the current development plan and the water crisis that faces us now and into the future. Is this a project designed to serve the UCSC population? What are the real/honest motives for such a project?

We are very much looking forward to your responses.  
Please let us know how best to provide input into this development process.

Thanks for your consideration of these issues.

Dr. Kenneth Coale  
Moss Landing Marine Laboratories  
8272 Moss Landing Road  
Moss Landing, CA 95039  
(831) 771-4406  
[coale@mlml.calstate.edu](mailto:coale@mlml.calstate.edu)

Dr. Kenneth Coale  
Moss Landing Marine Laboratories  
8272 Moss Landing Road  
Moss Landing, CA 95039  
(831) 771-4406  
[coale@mlml.calstate.edu](mailto:coale@mlml.calstate.edu)