



Staff Report to the Zoning Administrator

Application Number: **04-0019**

Applicant: Nextel of California
Owner: Pacific Gas & Electric Company
APN: 026-281-05

Agenda Date: October 1, 2004
Agenda Item #: 7
Time: After 11:00 am

Project Description: Proposal to co-locate wireless communication antennas on an existing approximately 90 foot tall monopole by mounting three panel antennas and constructing a 11.5 by 20 foot equipment shelter within an existing fenced PG&E maintenance yard.

Location: Project located on the west side of 7th Avenue immediately north of the SP railroad tracks about 150 north of Eaton Street (615 7th Avenue).

Supervisorial District: 3rd District (District Supervisor: Mardi Wormhoudt)

Permits Required: Amendment to Commercial Development Permits 76-193-PD, 84-688-MV, and 03-0141, and a Coastal Development Permit

Staff Recommendation:

- Approval of Application 04-0019, based on the attached findings and conditions.
- Certification that the proposal is exempt from further Environmental Review under the California Environmental Quality Act.

Exhibits

- | | |
|---|---|
| A. Project plans | G. Visual Simulations |
| B. Findings | H. Design Review comments |
| C. Conditions | I. Applicant submitted Project Synopsis and Statement of Operations |
| D. Categorical Exemption (CEQA determination) | J. Radio Frequency (RF) report |
| E. Assessor's parcel map | |
| F. Zoning, General Plan, and Location map | |

Parcel Information

Parcel Size: 7.8 acres
Existing Land Use - Parcel: Public Utility and Urban Open Space (portion)

Existing Land Use - Surrounding: Visitor Accommodations, Commercial, and Residential
Project Access: 7'' Avenue gated entrance
Planning **Area:** Live *Oak*
Land Use Designation: P (Public Facility)
Zone District: PF (Public and Community Facilities)
Coastal Zone: Inside Outside
Appealable to Calif. Coastal Comm. Yes No

Environmental Information

Geologic Hazards: NIA
Soils: N/A
Fire ~~Hazard~~: Not a mapped constraint
Slopes: Level site, previously developed
Env. Sen. Habitat: NIA
Grading: No grading proposed
Tree Removal: No trees proposed to be removed
Scenic: Not a mapped resource
Drainage: Existing drainage adequate
Traffic: N/A
Roads: Existing roads adequate
Parks: N/A
Archeology: Mapped on portion; previously developed site

Services Information

Urban/Rural Services Line: Inside Outside
Water Supply: City of Santa Cruz
Sewage Disposal: County of Santa Cruz Sanitation District
Fire District: Central Fire Protection District
Drainage District: Zone 5

History

The site is currently developed with an existing PG&E Service Center which contains office buildings, employee and service truck parking, a fuel station, and an existing 90.5 foot tall monopole communications antenna. A master plan for the parking layout and site design was approved under Permit 76-193-PD and modified under Permit 84-688-MV. Commercial and Coastal Development Permit 03-0141 approved 6 panel antennas on the existing monopole and an adjacent ancillary equipment shelter for Verizon Wireless.

Analysis and Discussion

The subject property is an approximately 7.8 acre lot, located in the PF (Public and Community Facilities) zone district, a designation which allows public facilities and appurtenant uses and structures. The proposed co-located wireless communication facility on an existing monopole is

an allowed use within the zone district per County Code Section 13.10.661, and is consistent with the site's (P) Public Facility General Plan designation.

The existing monopole is approximately 75 feet in height with a 15 foot communications antenna. The pole is a maximum of 12 inches in diameter at its base and 2 inches in diameter at the top. The 3 new antennas are proposed to be flush mounted approximately 43 feet above ground level with a slight 2 to 4 degree down-tilt. Commercial Development Permit 03-0141 approved co-located Verizon flat panel antennas at a height of 67 feet.

The 11.5 by 20 foot ancillary equipment shelter is proposed 146 feet away from the pole adjacent to the approved Verizon equipment lease area. The 11 foot tall shelter will be located in a 21 by 30 foot leased area within the existing PG&E compound. A small amount of private parking will be removed by the equipment cabinet, however ample public and private parking exists on the 7.8 acre site.

To minimize visibility, the proposed antennas will be painted a light, non-reflective color to match the exterior of the existing tower and the proposed equipment shelter will be painted a neutral color to blend with the existing adjacent PG&E office buildings and Verizon equipment shelter. Landscaping along the 7" Avenue frontage, required as a condition of approval of Commercial Development Permit 03-0141, will provide additional screening of the equipment areas.

The antennas and equipment cabinet are proposed in a location of the PG&E site that is surrounded by a six foot fence and locked gates. Only authorized personnel may access the area. Periodic monitoring will be performed by Nextel employees and contractors through permission of the property owner.

Local Coastal Program Consistency

The proposed wireless communication antennas on an existing monopole is in conformance with the County's certified Local Coastal Program, in that the structure is sited and designed to be visually compatible, in scale with, and integrated with the character of the existing development. Developed parcels in the area contain a variety of one and two-story commercial and residential structures. The submitted proposal is designed to be consistent with the existing development on the subject site.

The project site is not located between the shoreline and the first public road and is not identified as a priority acquisition site in the County's Local Coastal Program. Consequently, the proposed project will not interfere with public access to the beach, ocean, or other nearby body of water.

Alternative Site Analysis

An alternative site analysis is not required for the proposed project, since the use of the proposed site which is already developed for Public Facility use and has an existing telecommunication tower, would significantly reduce environmental impacts. The creation of an additional site in the immediate area would require the erection of an additional tower and would create unnecessary, additional visual impacts to the surrounding area.

Visual Analysis

The proposed wireless communication antennas on an existing monopole complies with the requirements of the County Design Review Ordinance, in that the proposed project will incorporate design features such as flush mounting to the pole and light colors that will blend with the existing pole to reduce the visual impact of the proposed development on surrounding land uses and the natural landscape.

The project site and existing monopole are not visible from the Highway One scenic corridor but can be seen from immediately adjacent properties. Consistent with recommendations from the County's Urban Designer, the submitted visual simulations show the proposed antennas and equipment cabinet painted to match the existing development. Landscaping required as a condition of approval of Commercial Development Permit 03-0141 will provide additional screening of the project site.

Radio Frequency Emissions

A Radio Frequency (RF) report has been prepared for this project. The combined wireless communications facilities on the project site, including the existing and proposed facilities, will not exceed 1.8% of the allowed Federal Communications Commission (FCC) maximum public exposure levels. These levels are considered a worst case scenario that would be experienced within 1,000 feet of the PG&E site at a height corresponding to a second floor. The *calculated* level at any ground level location is 1.1% of the public exposure limit, with the Nextel antennas contributing a maximum of 0.86%.

Conclusion

As proposed and conditioned, the project is consistent with all applicable codes and policies of the Zoning Ordinance and General Plan/LCP. Please see Exhibit "B" ("Findings") for a complete listing of findings and evidence related to the above discussion.

Staff Recommendation

- **APPROVAL** of Application Number **04-0019**, based on the attached findings and conditions.
- Certification that the proposal is exempt from further Environmental Review under the California Environmental Quality Act.

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.

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The County Code and General Plan, as well as hearing agendas and additional information are available online at: www.co.santa-cruz.ca.us

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Coastal Development Permit Findings

1. That the project is a use allowed in one of the basic zone districts, other than the Special Use (SU) district, listed in section 13.10.170(d) as consistent with the General Plan and Local Coastal Program LUP designation.

This finding can be made, in that the property is zoned PF (Public and Community Facilities), a designation which allows wireless communications facilities. The proposed co-located wireless communication antennas and ancillary equipment shelter is an allowed use within the zone district, and is consistent with the site's (P) Public Facility General Plan designation.

2. That the project does not conflict with any existing easement or development restrictions such as public access, utility, or open space easements.

This finding can be made, in that the proposal does not conflict with any existing easement or development restriction such as public access, utility, or open space easements in that no such easements or restrictions are known to encumber the project site. The project site is located within an existing fenced PG&E facility.

3. That the project is consistent with the design criteria and special use standards and conditions of this chapter pursuant to section 13.20.130 et seq.

This finding can be made, in that the new antennas and ancillary equipment shelter are designed to minimize visual impacts by using light, non-reflective, natural colors that are complementary to the existing monopole and office buildings on site. Conditions of approval for Commercial Development Permit 03-0141 require additional landscaping along the 7th Avenue frontage which further reduce visual impacts to the area. The project site is not located on a prominent ridge, beach, or bluff top and is not visible from the beach.

4. That the project conforms with the public access, recreation, and visitor-serving policies, standards and maps of the General Plan and Local Coastal Program land use plan, specifically Chapter 2: figure 2.5 and Chapter 7, and, as to any development between and nearest public road and the sea or the shoreline of any body of water located within the coastal zone, such development is in conformity with the public access and public recreation policies of Chapter 3 of the Coastal Act commencing with section 30200.

This finding can be made, in that the project site is not located between the shoreline and the first public road. Consequently, the wireless communication antennas will not interfere with public access to the beach, ocean, or any nearby body of water. Further, the project site is not identified as a priority acquisition site in the County Local Coastal Program.

5. That the proposed development is in conformity with the certified local coastal program.

This finding can be made, in that the structure is sited and designed to be visually compatible, in scale with, and integrated with the character of the surrounding neighborhood. Additionally, wireless communication facilities are allowed uses in the PF (Public and Community Facilities)

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zone district of the area, as well as the Local Coastal Program and General Plan land use designation. Developed parcels in the area contain single and multi-family dwellings and commercial buildings. Size and architectural styles vary widely in the area, and the design submitted is not inconsistent with the existing range.

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.

The location of the proposed wireless communications facility 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, in that the maximum ambient radio frequency (RF) electromagnetic field strength levels at ground level due to the simultaneous operation of all proposed co-located wireless communications facilities are calculated to be **1.1%of** the FCC public exposure limit. The contribution of the Nextel antennas represents a maximum of 0.86% of the applicable public limit

The proposed project will not result in inefficient or wasteful use of energy, in that the most recent and efficient technology available to provide wireless communication services are required as a condition of this permit. Upgrades to more efficient and effective technologies will be required to occur **as** new technologies are developed.

The project will not be materially injurious to properties or improvements in the vicinity in that the project will be located within an existing facility and camouflaged from view, resulting in minimal visual impact.

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 co-located wireless communication facility and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the purpose of the PF (Public and Community Facilities) zone district in that the primary use of the property will continue to be a public utility service center that meets all current site standards for the zone district.

The proposed co-located wireless communication facility is an allowed use within the zone district. The proposed project is consistent with the Wireless Communication Facilities ordinance in that the proposed antennas will be co-located on an existing telecommunications antenna and will be painted to match the pole. The proposed, developed site **is** the environmentally superior site, with no further alternative site analysis required.

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.

This finding can be made, in that the proposed wireless communication facility is located in the Public and Community Facilities (PF) zone district which implements the Public Facility (P)

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General Plan land use designation. The existing and proposed uses, as designed and conditioned, are compatible with the zone district and General Plan designation.

The proposed co-located wireless communication facility, as conditioned, will not adversely impact the light, solar opportunities, air, and/or open space available to other structures or properties, and meets all current site and development standards for the zone district. The project is consistent with General Plan Objective **8.5.1** (Commercial and Industrial Design), in that co-located antennas concentrate commercial uses thereby minimizing impacts on residential areas and scenic viewsheds.

The subject property is not located within the Highway One scenic comdor nor is it visible from any local beaches. The proposed antenna additions, while visible from adjacent properties, are designed to be visually compatible with existing development. The proposed facility will be located on an existing utility pole and painted to match the existing light color, which will result in negligible visual impact to the adjacent properties.

The proposed project complies with General Plan Policy **5.10.3** (Protection of Public Vistas), in that the project, by co-locating on an existing utility pole, will result in minimal disruption of landform and aesthetic character. Conditions of approval for Commercial Development Permit **03-0141** require additional landscaping along the 7th Avenue frontage which further reduces visual impacts to the area.

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

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 communication facility will not require the use of public services such as water or sewer, but will require electric power and telephone connections, which are already available on site. The facility will require inspection by maintenance personnel at least once per month and this level of traffic will not adversely impact existing roads and 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.

The proposed co-location on the existing utility pole will complement and harmonize with the existing and proposed land uses in the vicinity and will be compatible with the physical design aspects and land use intensities of the neighborhood, in that the proposed antennas will be located on an existing structure and will be painted to appear as part of the existing development. This proposed design will adequately mitigate any potential visual impacts to the surrounding neighborhood.

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

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requirements of this chapter.

This finding can be made, in that the proposed wireless communication facility will be located on an existing telecommunications monopole and will be camouflaged to reduce potential visual impacts to the surrounding neighborhood. Conditions of approval for Commercial Development Permit 03-0141 require additional landscaping along the 7th Avenue frontage which further reduces visual impacts to the area.

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.

This finding can be made, in that the proposed project is not visible from any designated scenic road. While the proposed antennas and ancillary equipment cabinet will be visible from adjacent properties, the project is designed and conditioned to mitigate potential significant visual impacts. The proposed facility will be located on an existing telecommunications site and is designed to appear as part of the existing development. The proposed painting scheme, matching the new equipment shelter to the existing office building and the new antennas to the existing utility pole, will result in minimal impact to the surrounding properties. Conditions of approval for Commercial Development Permit 03-0141 require additional landscaping along the 7th Avenue frontage which further reduces visual impacts to the area.

The proposed project complies with General Plan Policy **5.10.3** (Protection of Public Vistas), in that the project, by co-locating on an existing utility pole, will result in minimal disruption of landform and aesthetic character. While the western edge of the **7.8** acre parcel does have a General Plan designation of Urban Open Space (O-U), the existing utility pole and proposed co-located antennas are located well away from this area.

No formal alternative site analysis has been required for this project. The proposed project site is the environmentally superior site, in that the creation of an additional wireless communications facility near the subject property would require the erection of an additional tower and may cause greater impacts to the surrounding residential and commercial neighborhood.

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.

As discussed in Wireless Communication Finding #1, the finding that the proposed project site is the environmentally superior site can be made, in that additional infrastructure or utility poles and the associated site disturbance are not required for this co-located project. In addition, the project avoids the erection of a new monopole that would be visible to adjacent properties, therefore proposing the least visually intrusive alternative and minimizing adverse visual impacts.

The presence of existing telecommunication development on the project site, with the associated utilities infrastructure, camouflaging landscaping, and restricted access, result in the determination that the currently proposed project site is the environmentally superior site for this project, and requires no further alternative site analysis.

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 and that all zoning violation abatement costs, if any, have been paid.

This finding can be made, in that the proposed location of the co-located wireless communication facility and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the purpose of the PF (Public and Community Facilities) zone district in that the primary use of the property will continue to be a public utility service center that meets all current site standards for the zone district.

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 will be located on an existing **90** foot tall utility pole, which is 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 existing wireless communications facilities and the proposed operation are calculated to be 1.1% of the most restrictive applicable limit.

The applicant is required to obtain all necessary approvals from the California Public Utilities Commission and the Federal Communications Commission prior to construction.

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.

This finding can be made, in that the proposed wireless communication facility is designed and located in a manner that will minimize potential impacts to scenic and biotic resources, and that the construction of the proposed facility will not impede access to the beach or other recreational resources.

Conditions of Approval

Exhibit A: Project Plans drawn by MSA Architecture & Planning, 11 sheets, dated December 11, 2003.

- I. This permit authorizes the construction of 3 wireless communication antennas at a height of 43 feet on an existing 90 foot monopole, and an ancillary equipment cabinet 11.5 by 20 feet in size. This permit amends and incorporates all of the findings and conditions of Commercial Development Permits 76-193-PD, 84-688-MV, and 03-0141. Any findings or conditions contained in this permit that are in conflict with prior permits will be superseded by the conditions contained within 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.
 - C. 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 of the approval date on this permit.
- II. Applicant shall obtain approval from the California Public Utilities Commission and the Federal Communications Commission.
- III. Prior to issuance of a Building Permit the applicant/owner shall:
 - A. Submit Final Architectural Plans for review and approval by the Planning Department. The final plans shall be in substantial compliance with the plans marked Exhibit "A" on file with the Planning Department. The final plans shall include the following additional information:
 1. Identify finish of exterior materials and colors of the equipment shelter and antennas for Planning Department approval. Exterior materials of the equipment shelter shall be non-reflective earth tone colors that blend with the existing office buildings. Exterior materials of the antennas shall be non-reflective light colors that blend with the existing utility pole. Any color boards must be in 8.5" x 11" format.
 2. Indicate on the building plans that any proposed lighting shall have a manual on/off switch and that no continuous lighting will be used.
 3. Provide fencing and warning sign details. Include sign location, fence location, height, and materials for review and approval by the County.

- B. Meet all requirements of and pay Zone 5 drainage fees to the County Department of Public Works, Drainage. Drainage fees will be assessed on the net increase in impervious area. Clearly label all new proposed impervious surfaces.
 - C. Meet all requirements and pay any applicable plan check fee of the Central Fire Protection District.
 - D. 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.
- IV. 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. All inspections required by the building permit shall be completed to the satisfaction of the County Building Official.
 - C. Pursuant to Sections 16.40.040 and 16.42.100 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 16.42.100, shall be observed.
- V. 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 applicant shall agree in writing that where future technological advances would allow for reduced visual impacts resulting from the proposed telecommunication facility, the applicant agrees to *make* those modifications which would allow for reduced visual impact as part of the normal replacement schedule. If, in the future, the facility is no longer needed, the applicant agrees to abandon the facility and be responsible for the removal of all permanent structures and the restoration of the site as needed to reestablish the area consistent with the character of the surrounding landscaping.

- C. Any modification in the type of equipment shall be reviewed by Planning Department staff. The County may deny or modify conditions at this time, or the Planning Director may refer it for public hearing before the Zoning Administrator.
 - D. Outdoor noise producing construction activities shall only take place on non-holiday weekdays between the hours of 8 a.m. and 6 p.m.
 - E. All noise created by the new development shall be contained on the property. A maximum exterior noise level at the property line is 60 dB L_{dn} (day/night average noise level).
 - F. The applicant shall meet all requirements of County Code **13.10.664** pertaining to initial post-construction non-ionizing electromagnetic radiation (NIER) monitoring requirements. A report documenting the measurements and findings with respect to compliance with the established FCC NIER exposure standard shall be submitted to the Planning Director within ninety (90) days of commencement of operation.
 - G. The antennas and ancillary equipment cabinet must be repainted and resurfaced as necessary to ensure the continued mitigation of the visual impact of the facility.
 - H. All exterior lighting shall be manually operated and used only during night maintenance checks or in emergencies. The lighting shall be directed onto the lease site and away from adjacent properties. Building and security lighting shall be integrated into the building design.
- VI. 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 two years from the effective date unless you obtain the required permits and commence construction.

Approval Date: _____

Effective Date: _____

Expiration Date: _____

Don Bussey
Deputy Zoning Administrator

Karen McConaghy
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.

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: 04-0019
Assessor Parcel Number: 026-281-05
Project Location: 615 7th Avenue

Project Description: Proposal to co-locate wireless communication antennas on an existing monopole

Person or Agency Proposing Project: Nextel of California

Contact Phone Number: (925) 250-1498

- 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).

Specify type:

- E. **Categorical Exemption**

Specify type: Class 3. New Construction of Small Structures (Section 15303)

F. Reasons why the project is exempt:

Construction of an accessory structure

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

Karen McConaghy, Project Planner

Date: _____

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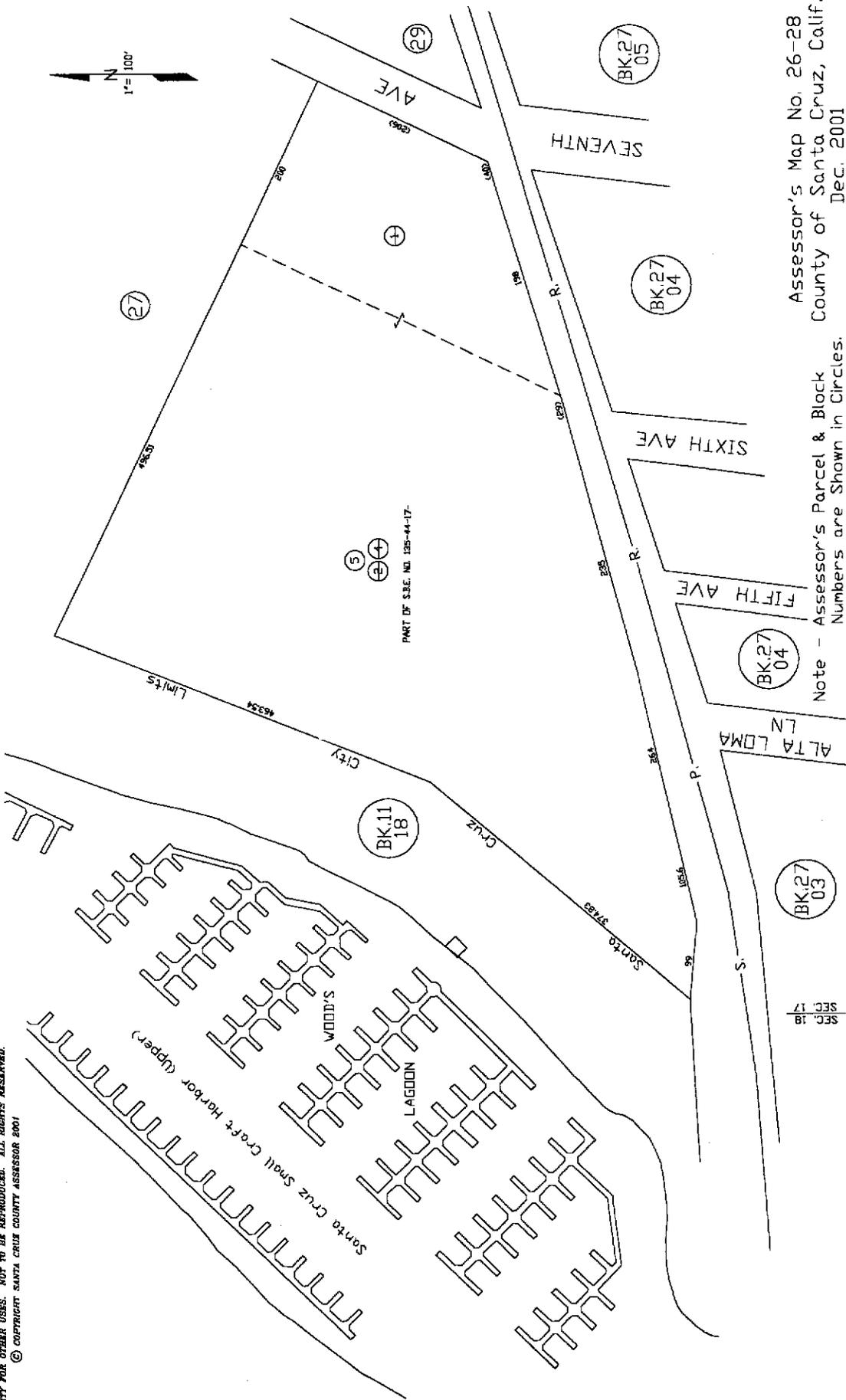
Tax Area Code
82-040

POR. OF SEC. 17 & 18, T.11S., R.1W., M.D.B. & M.

FOR TAX PURPOSES ONLY

THE ASSessor MAKES NO GUARANTEE AS TO MAP ACCURACY NOR ASSUMES ANY LIABILITY FOR OTHER USES. NOT TO BE REPRODUCED. ALL RIGHTS RESERVED.

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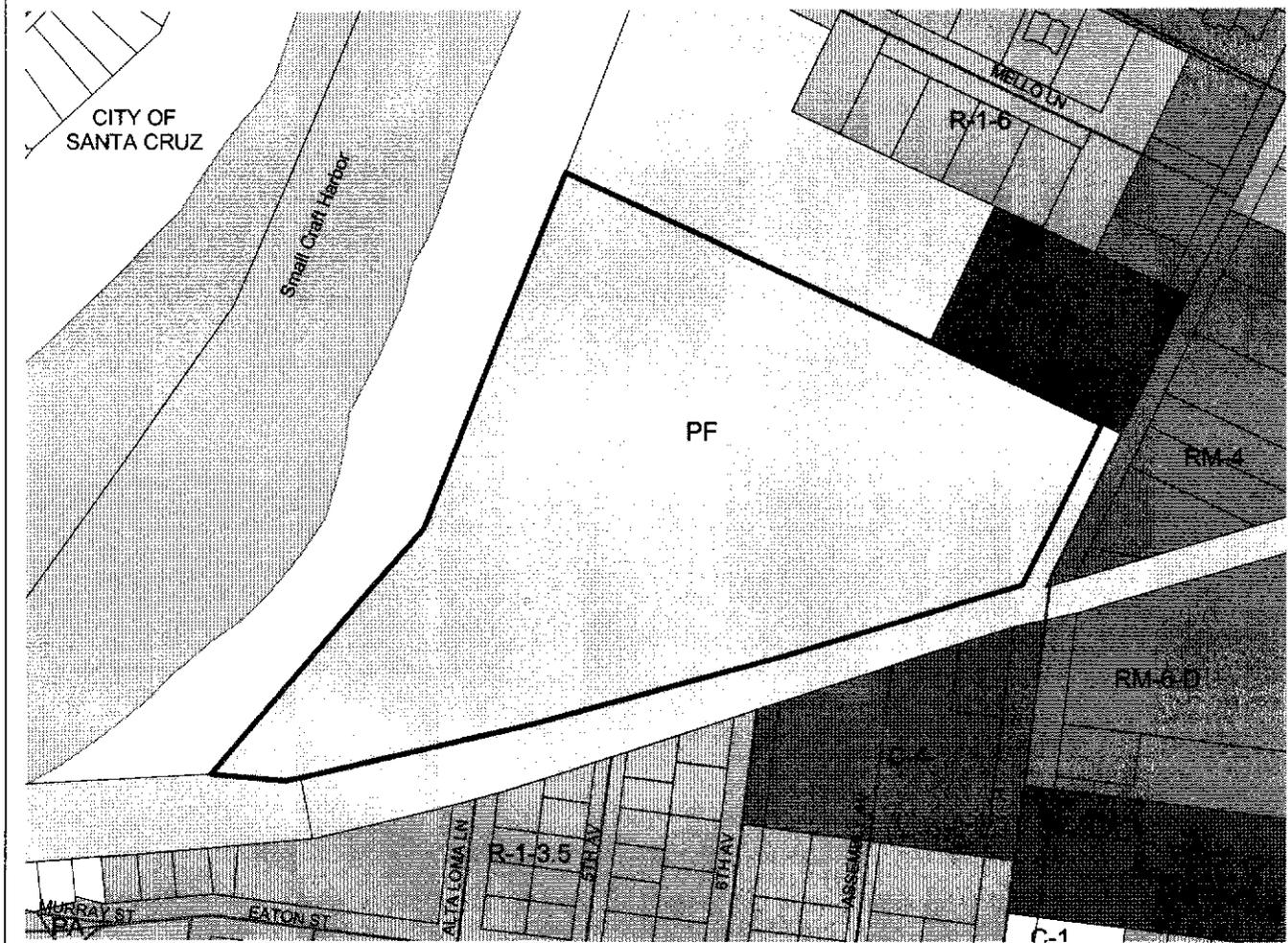


SEC 18
SEC 17

Assessor's Map No. 26-28
County of Santa Cruz, Calif.
Dec. 2001

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

Zoning Map



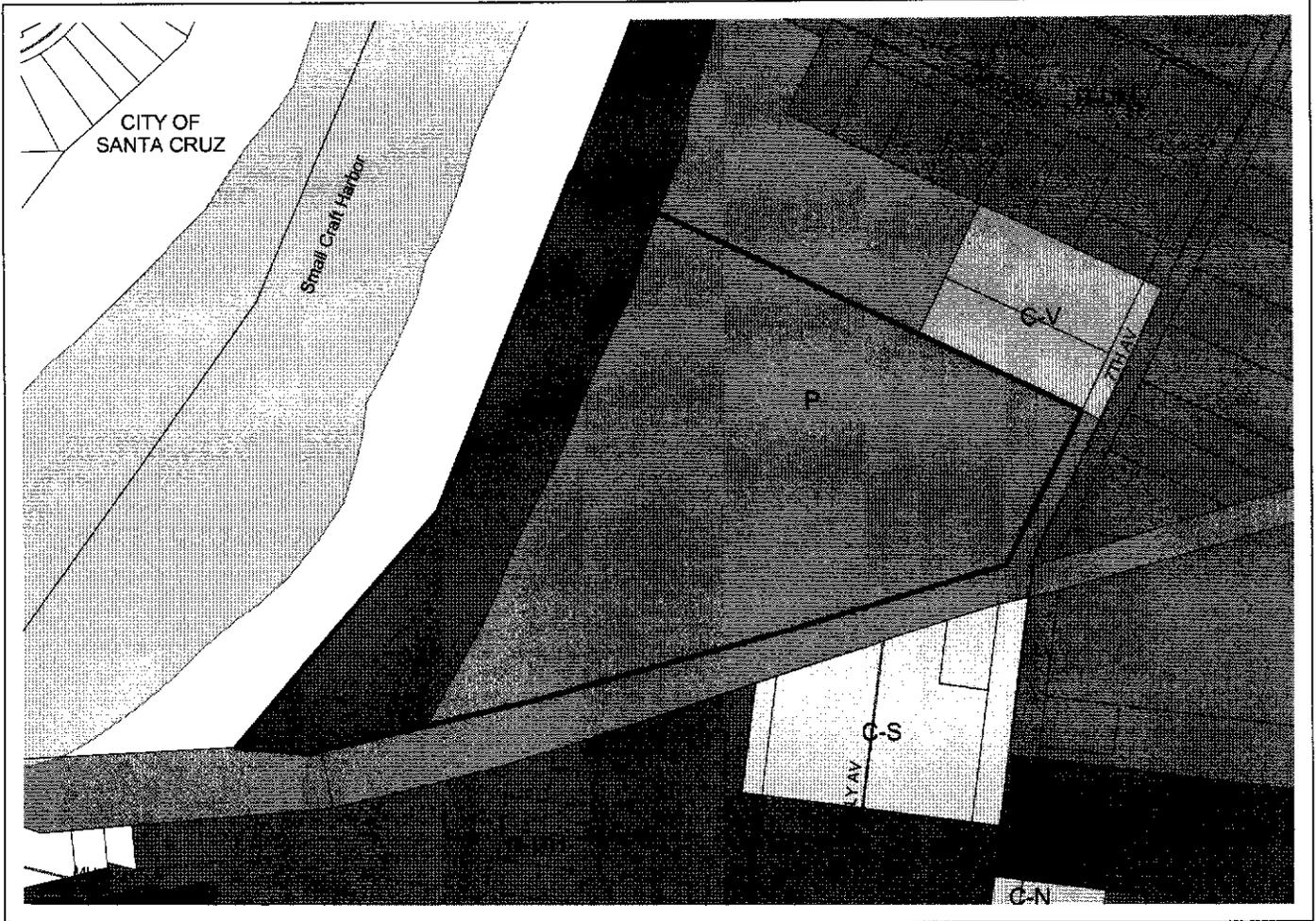
Legend

	APN 026-281-05
	Streets
	Lakes
	C-1
	PF
	PA
	R-1-X
	RM
	PR
	VA



Map created by Santa Cruz County
Planning Department:
January 2004

General Plan Map



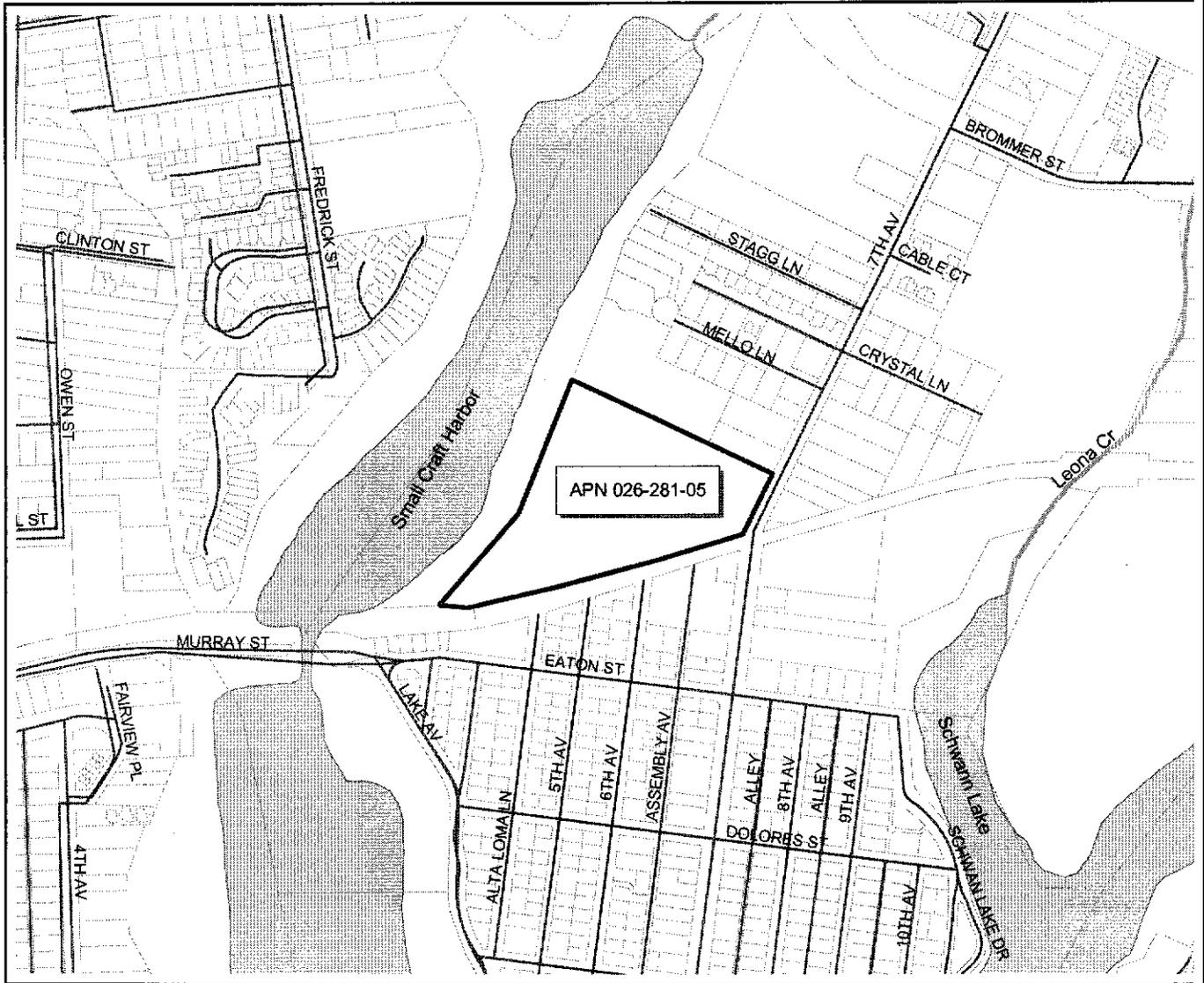
Legend

	Lake
	Service Commercial
	Neighborhood Commercial
	Visitor Accommodations
	Public Facilities
	Residential - Urban Medium Density
	Residential - Urban High Density
	Urban Open Space
	Parks and Recreation



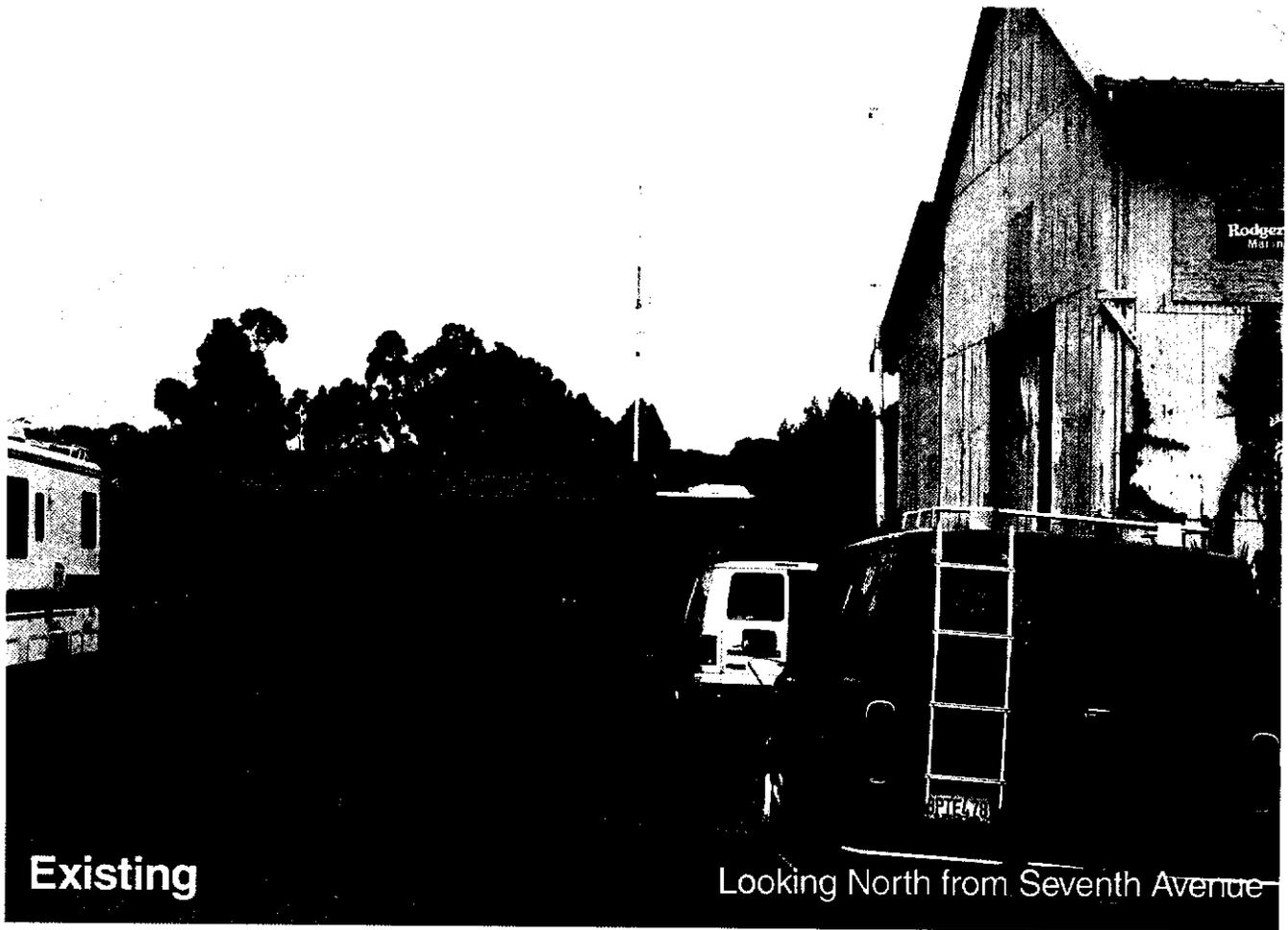
Map created by Santa Cruz County
Planning Department:
January 2004

Location Map



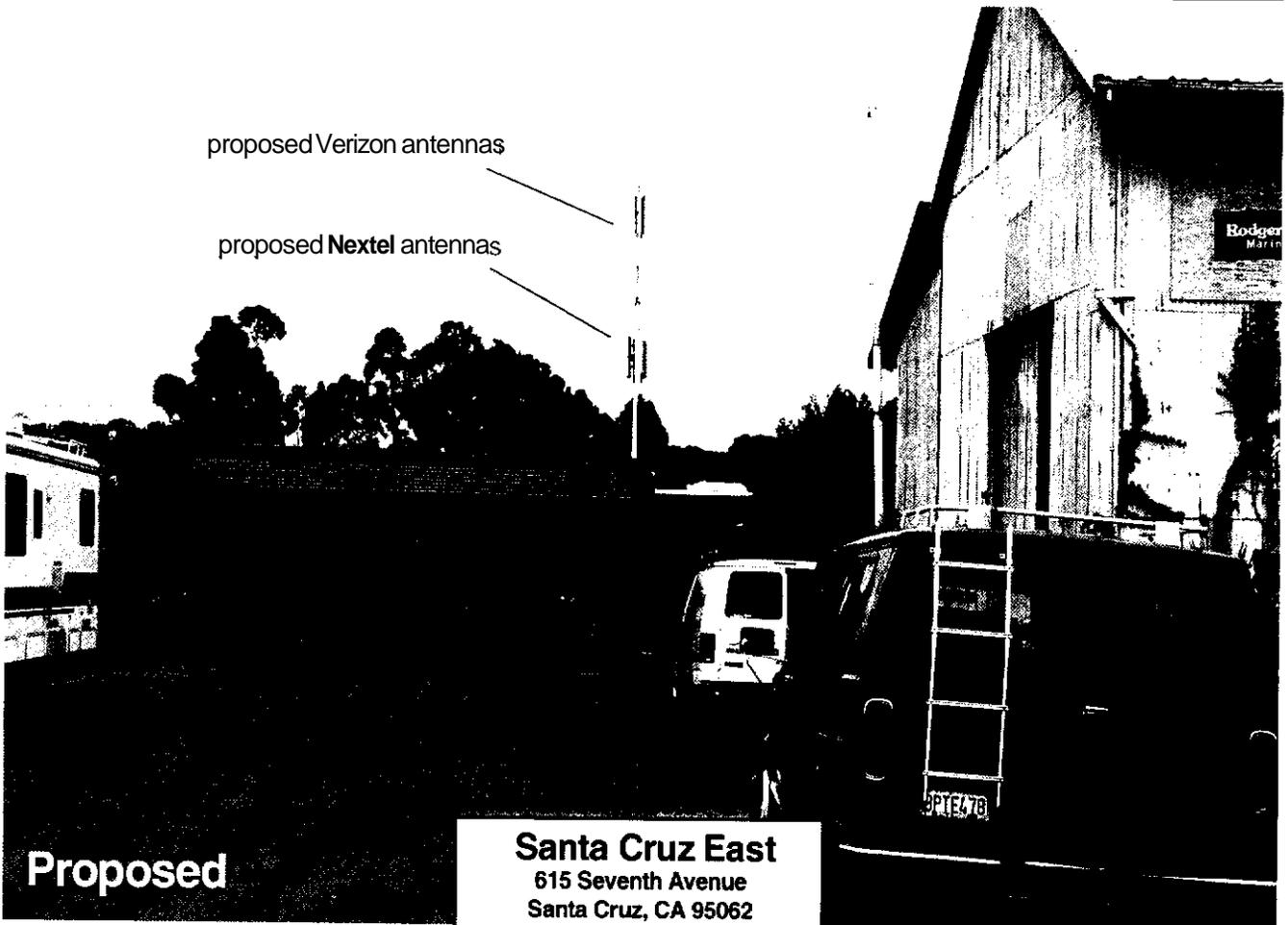
Map created by Santa Cruz County
Planning Department:
January 2004





Existing

Looking North from Seventh Avenue



proposed Verizon antennas

proposed Nextel antennas

Proposed

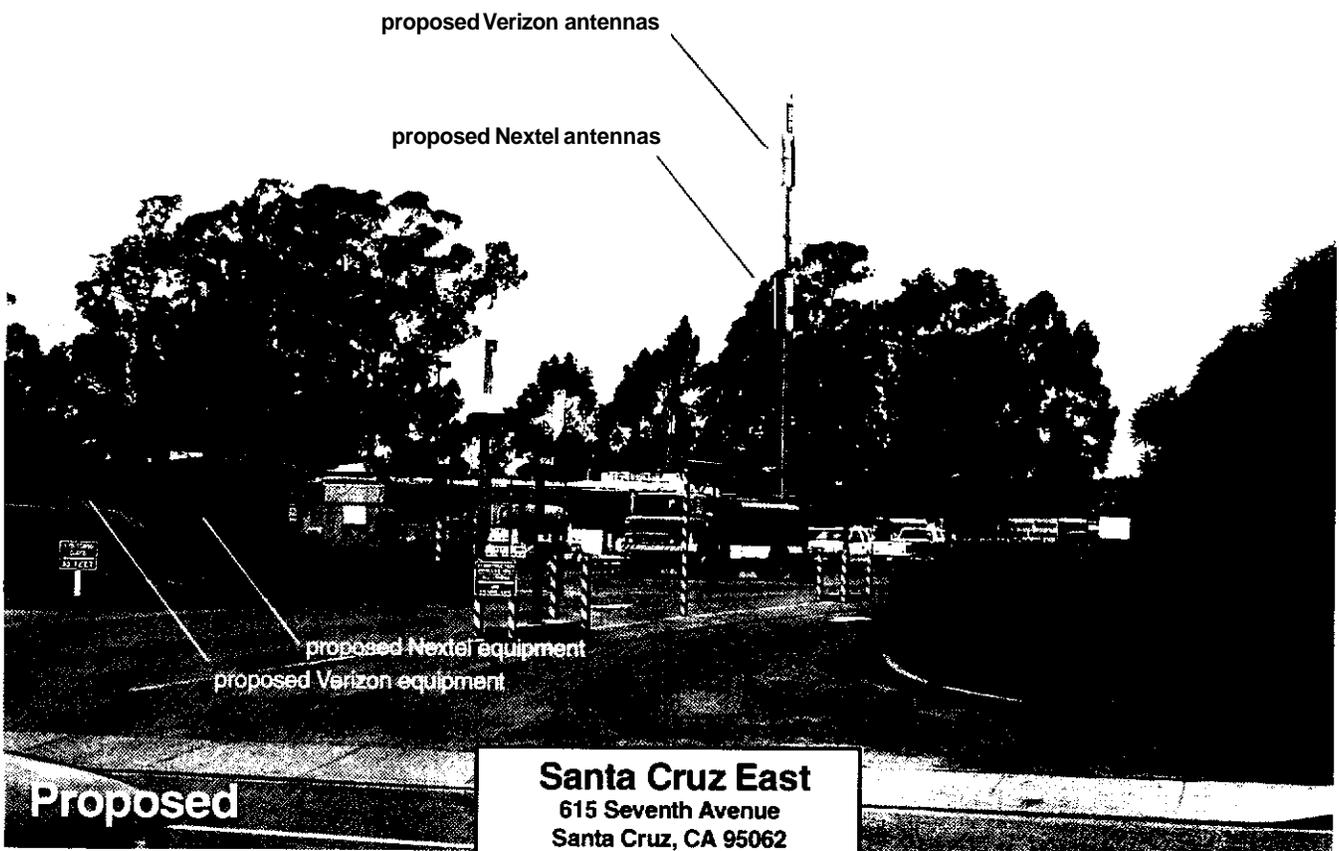
Santa Cruz East
615 Seventh Avenue
Santa Cruz, CA 95062
site # CA-2339 C

NEXTEL 1/14/04

Photosimulation by Applied Imagination 510 914-0500

VIEW 1

22



Santa Cruz East
 615 Seventh Avenue
 Santa Cruz, CA 95062
 site # CA-2339 C

NEXTEL 1/14/04

Photosimulation by Applied Imagination 510 914-0500

View 2

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INTEROFFICE MEMO

APPLICATION NO: 04-0019

Date: February 4, 2004

To: David Heinlein, Project Planner

From: Larry Kasparowitz, Urban Designer

Re: Design Review for co-locating cellular antennae and equipment enclosure at 615 7th Avenue, Santa Cruz (PG&E / owner, Nextel of California / applicant)

COMPLETENESS ISSUES

GENERAL PLAN / ZONING CODE ISSUES

Design Review Authority

13.20.130 The Coastal Zone Design Criteria are applicable to any development requiring a Coastal Zone Approval.

Design Review Standards

13.20.130 Design criteria for coastal zone developments

Evaluation Criteria	Meets criteria In code (✓)	Does not meet criteria (✓)	Urban Designer's Evaluation
Visual Compatibility			
All new development shall be sited, designed and landscaped to be visually compatible and integrated with the character of surrounding neighborhoods or areas	✓		<i>See comments below.</i>
Minimum Site Disturbance			
Grading, earth moving, and removal of major vegetation shall be minimized.			N/A
Developers shall be encouraged to maintain all mature trees over 6 inches in diameter except where circumstances require their removal, such as obstruction of the building site, dead or diseased trees, or nuisance species.			N/A
Special landscape features (rock outcroppings, prominent natural			N/A

landforms, tree groupings) shall be retained.			
ridgeline Development			
Structures located near ridges shall be sited and designed not to project above the ridgeline or tree canopy at the ridgeline			NIA
Land divisions which would create parcels whose only building site would be exposed on a ridgetop shall not be permitted			NIA
Landscaping			
New or replacement vegetation shall be compatible with surrounding vegetation and shall be suitable to the climate, soil, and ecological characteristics of the area			NIA
Development shall be located, if possible, on parts of the site not visible or least visible from the public view.			NIA
Development shall not block views of the shoreline from scenic road turnouts, rest stops or vista points			NIA
designed to fit the physical setting carefully so that its presence is subordinate to the natural character of the site, maintaining the natural features (streams, major drainage, mature trees, dominant vegetative communities)			NIA
Screening and landscaping suitable to the site shall be used to soften the visual impact of development in the viewshed			NIA
Building design			
Structures shall be designed to fit the topography of the site with minimal cutting, grading, or filling for construction			N/A
Pitched, rather than flat roofs, which are surfaced with non-reflective materials except for solar energy devices shall be encouraged			NIA

Natural materials and colors which blend with the vegetative cover of the			N/A
repeat or harmonize with those in the cluster			
Large agricultural structures			
The visual impact of large agricultural structures shall be minimized by locating the structure within or near an existing group of buildings			N/A
The visual impact of large agricultural structures shall be minimized by using materials and colors which blend with the building cluster or the natural vegetative cover of the site (except for greenhouses).			N/A
The visual impact of large agricultural structures shall be minimized by using landscaping to screen or soften the appearance of the structure			N/A
Restoration			
Feasible elimination or mitigation of unsightly, visually disruptive or degrading elements such as junk heaps, unnatural obstructions, grading scars, or structures incompatible with the area shall be included in site development			N/A
The requirement for restoration of visually blighted areas shall be in scale with the size of the proposed project			N/A
Signs			
Materials, scale, location and orientation of signs shall harmonize with surrounding elements			N/A
Directly lighted, brightly colored, rotating, reflective, blinking, flashing or moving signs are prohibited			N/A
illumination of signs shall be permitted only for state and county directional and informational signs, except in designated commercial and visitor serving zone districts			N/A

<p>In the Highway 1 viewshed, except within the Davenport commercial area, only CALTRANS standard signs and public parks, or parking lot identification signs, shall be permitted to be visible from the highway. These signs shall be of natural unobtrusive materials and colors</p>			<p>NIA</p>
<p>(e.g., decks, patios, structures, trees, shrubs, etc.) in rural areas shall be set back from the bluff edge a sufficient distance to be out of sight from the shoreline, or if infeasible, not visually intrusive</p>			<p>NIA</p>
<p>No new permanent structures on open beaches shall be allowed, except where permitted pursuant to Chapter 16.10 (Geologic Hazards) or Chapter 16.20 (Grading Regulations)</p>			<p>NIA</p>
<p>The design of permitted structures shall minimize visual intrusion, and shall incorporate materials and finishes which harmonize with the character of the area. Natural materials are preferred</p>			<p>NIA</p>

Design Review Authority

13.11.040 Projects requiring design review

- (e) All commercial remodels or new commercial construction.

Evaluation Criteria	Meets criteria In code (✓)	Does not meet criteria (✓)	Urban Designer's Evaluation
Location and type of access to the site			N/A
Building siting in terms of its location and orientation			N/A
Building bulk, massing and scale			N/A
Parking location and layout			N/A
Relationship to natural site features and environmental influences			N/A
Landscaping			N/A
Streetscape relationship			N/A
Street design and transit facilities			N/A
Relationship to existing structures	✓		<i>See comments below.</i>
Views			
Protection of public viewshed			N/A
Minimize impact on private views	✓		
Noise			
Reasonable protection for adjacent properties			N/A

13.11.074 Access, circulation and parking.

All site, building, security and landscape lighting shall be directed onto the site and away from adjacent properties.			<i>Suggest as Condition of Approval</i>
Area lighting shall be high-pressure sodium vapor, metal halide, fluorescent, or equivalent energy-efficient fixtures.			<i>Suggest as Condition of Approval</i>
All lighted parking and circulation areas shall utilize low-rise light standards or light fixtures attached to the building.			<i>Suggest as Condition of Approval</i>

Light standards to a maximum height of 15 feet are allowed.			
Building and security lighting shall be integrated into the building design.			<i>Suggest as Condition of Approval</i>
Light sources shall not be visible from adjacent properties.			<i>Suggest as Condition of Approval</i>

URBAN DESIGNERS COMMENTS:

- *Equipment cabinet shall match the colors of the existing PG and E building and/or the adjacent Verizon cabinet*

Project Synopsis

Nature of Request

Nextel Communications (“Nextel”) **seeks** approval of a Conditional Use Permit, and all related permits to allow the co-location of a communication facility on an existing parcel, developed with a “monopole”. Pacific Gas and Electric Company (“PG&E”), 77 Beale Street Rm. 1302, San Francisco Ca. 94583, owns the existing facility. The proposed plan calls for (3) new antennas, 3 sectors, one antenna per sector. The existing tower is 74’ – 11” above ground level. The antennas are to be mounted below the existing configuration, at an operating center of 43’-7” above ground level. The antennas are to be mounted flush to the pole, with minimal protrusion ~~from~~ the pole and slight (2 to 4 degrees) down-tilt. The ancillary equipment shelter will be placed approximately 146’ away from the tower, within the existing compound. The shelter will require a new concrete slab, approximately 11.5’ x 20’, within the 21’x30’ lease area. The base station is intended to provide improved coverage for the east side of Santa Cruz. The geographic location of this facility in relation to existing Nextel sites in the City of Santa Cruz, and the availability of ground space for the ancillary equipment, make this location the ideal point for Nextel to complete the current gap in coverage between Ocean Avenue and East Santa Cruz. This facility is being proposed in strict accordance with Nextel’s FCC license requirements.

Property Description

The subject property is located at 615 Seventh Avenue, Santa Cruz. The Assessor’s Parcel # is 026-281-05. The property owner is PG&E. The existing facilities are located at the southeastern end of the property. The property is a Public Facility zone, and has neighboring residential structures within 500 feet of the proposed communication facility. The proposed site has no public access, situated with locked gates and through- building authorized access. The existing tower is located on the eastern side of the property, and is currently used for PG&E fleet communications antennas. The parcel is appropriately zoned for commercial telecommunications use, per the current Santa Cruz County Wireless Telecommunications Ordinance part 1310.661 et al.

Project Description

Nextel Communications proposes to provide service for the area around this parcel by installing (3) new antennas to an existing monopole. The flat panel antennas will be mounted below the existing antennas, at an operating center height of 43.6’ above ground level. The existing pole stands at 74’-11” in height. The equipment shelter is to be placed within the existing compound, behind a locked gate and fence. The entire equipment area is not within any public access, and will not be expanded to include the Nextel equipment. No on-site generator will be proposed with this facility. Access to the project site will be gained through permission of the property owner, and will only be gained by authorized Nextel employees and contractors for periodic monitoring. There are no hazardous materials used in conjunction with this facility. This facility is part of a three- site network proposal for the south end of Santa Cruz County.

Statement of Operations

The proposed Nextel facility requires only electrical and telephone services, which are available at the site. No nuisances will be created by the proposed installation, and the facility will not endanger public safety or health. The expanded service will benefit the public. Cellular technology does not interfere with any other forms of electronic communication, public or private. Construction of the facility may be done with minimal impact to the surrounding area, and the entire complex is securely self-contained. On site parking will not be affected, as the existing area is not currently used at all. No grading or drainage patterns will be affected by the layout of the facility. Upon completion of the project, periodic maintenance will occur, but the site is to operate as an unmanned facility. The site is self-monitoring, and connects directly to central office computers, which alert personnel to any equipment malfunction or security breach. Each carrier's equipment is individually metered, and may be accessed for emergency power shut-off by authorization of Nextel and PG&E. Emergency power loss is backed up by means of gel-cased 12 volt battery racks. No hazardous materials are produced in conjunction with the use of the facility, no on site water or facilities will be required in this proposal.

Zoning Analysis

Pursuant to The County of Santa Cruz Wireless Telecommunication Services (WTS) guidelines, the proposed use is permitted in this Zoning District, subject to approval of a Conditional Use Permit. The proposal is consistent with the County design, siting, and review guidelines for commercial antenna installation (Santa Cruz County Wireless Communications Facilities Ordinance part 1310.661). The project calls for co-location with existing facilities, and is architecturally integrated into the existing conditions. The proposal is put forth in the least obtrusive manner possible, and is separated from areas of public access. This proposal adheres to all of the design guidelines outlined in the current County Zoning Ordinance.

Alternative Site Analysis

The area surrounding the subject parcel does contain another wireless facility within 2,000 feet. The "Park Place" commercial office complex at 200 7th Avenue does house a wireless communications facility. The structure of the roof at this location would require a great deal of structural retrofit to house the Nextel equipment shelter, and architectural integration of the antennas would mean added mass to the existing building. There was no available ground or office space to lease for the ancillary equipment.



200 Seventh Avenue Santa Cruz Ca. 95062

Candidate Selection

The PG&E site was selected for very specific reasons: 1) The view of the intended coverage area, 2) The existing utilities and appropriate zoning, and co-location is encouraged by the jurisdiction, and 3) the design of the proposed facility integrates with the current standards set forth by the County of Santa Cruz, as well as the existing conditions.. In addition to this, the existing layout facilitates construction in a non-invasive manner.

Our goal in determining this site as one for our proposal is based on minimizing impacts, visual and others, and to adhere as closely as possible to the zoning standards set forth by the jurisdiction regarding cellular base stations.

No other reasonable candidates exist within the area, and to create a new facility on another parcel would mean closer encroachment to residential areas, greater visual impacts to the community, and a more intrusive construction process. The commercial zoning and favorable location of this facility make it the ideal candidate for Nextel to provide improved service to this area.

Compliance with Federal Regulations

Nextel Communications' installations comply fully with all Federal Communications Commission (FCC) guidelines, governing construction requirements, technical standards, interference protection, power level and radio frequency regulations. Additionally, Nextel will comply with all Federal Aviation Administration (FAA) standards on cellular base station operations. Nextel's facilities are proposed and built in strict accordance with all Federal (NEPA), State (CEQA), and local environmental regulations.

Amendment

The applicant agrees to notify within 30 days, any change of information required and submitted as part of this ordinance.

Technical Review

An independent technical expert, at the direction of the County of Santa Cruz and notification by, may review any technical materials submitted with this application.

**Nextel SMK • Proposed Base Station (Site No. CA-2339C)
615 7th Street • Santa Cruz, California**

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of Nextel SMK, a wireless telecommunications carrier, to evaluate the base station (Site No. CA-2339C) proposed to be located at 615 7th Street in Santa Cruz, California, for compliance with appropriate guidelines limiting human exposure to radio frequency (“RF”) electromagnetic fields.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission (“FCC”) evaluate its actions for possible significant impact on the environment. In Docket 93-62, effective October 15, 1997, the FCC adopted the human exposure limits for field strength and power density recommended in 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 Institute of Electrical and Electronics Engineers (“IEEE”) Standard C95.1-1999, “Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,” includes nearly identical exposure limits. 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 thresholds for exposures of unlimited duration to radio frequency energy for several personal wireless services are as follows:

<u>Personal Wireless Service</u>	<u>Approx. Frequency</u>	<u>Occupational Limit</u>	<u>Public Limit</u>
Personal Communication (“PCS”)	1,950 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Cellular Telephone	870	2.90	0.58
Specialized Mobile Radio	855	2.85	0.57
[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 “cabinets”) 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 about 1 inch thick. 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 height above ground. The antennas are designed to concentrate their energy toward the



**NextelSMR • Proposed Base Station (Site No. CA-2339C)
615 7th Street • Santa Cruz, California**

horizon, with very little *energy* wasted toward the sky or the ground. Along with the low power of such facilities, 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 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 Nextel, including design drawings by MSA Architecture and Planning, Inc., dated August 14, 2003, it is proposed to mount three EMS directional panel antennas on a new 75-foot steel pole to replace an existing pole located in the PG&E Maintenance Yard at 615 7th Avenue in Santa Cruz. The antennas would be mounted with 3° downtilt at an effective height of about 43¹/₂ feet above ground, with one Model FR9013-00DAL2 antenna oriented toward 10°T and two Model FR6514-00DAL2 antennas oriented toward 120°T and 255°T. The maximum effective radiated power in any direction would be 1,000 watts, representing ten channels operating simultaneously at 100 watts each.

Proposed to be located or relocated on the same pole are antennas for use by Verizon Wireless, another wireless telecommunications carrier. Verizon reports that it will be using six Allen Telecom Model DB894H65E-SX directional antennas mounted at effective heights of about 71 and 76 feet above ground. Those antennas would be oriented in pairs, one antenna above another, toward 40°T, 160°T, and 280°T, and would operate with a maximum effective radiated power in any direction of 2,400 watts. PG&E also proposes to locate an antenna on the tower, assumed for the purposes of this study to be an Allen Telecom Model ASP-680 omnidirectional "whip" antenna, operating with a ~~maximum~~ effective radiated power of 200 watts and mounted on top of the tower, at an effective height of about 82¹/₂ feet above ground.

Study Results

The maximum ambient RF level within 1,000 feet at any ground level location outside the PG&E property, due to the proposed Nextel operation by itself, is calculated to be 0.0049 mW/cm², which is



**Nextel SMR • Proposed Base Station (Site No. CA-2339C)
615 7th Street • Santa Cruz, California**

0.86% of the applicable public limit. The maximum calculated cumulative level at any ground level location outside the PG&E property within 1,000 feet for the simultaneous operation of all carriers is 1.1% of the public exposure limit; the maximum calculated level at a height corresponding to a second floor is 1.8% of the public limit. It should be noted that these results include several "worst-case" assumptions and therefore are expected to overstate actual power density levels. 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

Since they are to be mounted on a PG&E pole, the Nextel antennas are not accessible to the *general* public, and so no mitigation measures are necessary to comply with the FCC public exposure guidelines. It is presumed that PG&E already takes adequate precautions to ensure that there is no unauthorized access to its pole. To prevent exposures in excess of the occupational limit by authorized PG&E workers, it is expected that they will adhere to appropriate safety protocols adopted by that company.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the base station proposed by Nextel SMR at 615 7th Street 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 Nos. E-13026 and M-20676, which expire on June 30, 2005. This work has been carried out by him or under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

December 12, 2003



William F. Hammett
William F. Hammett, P.E.



HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

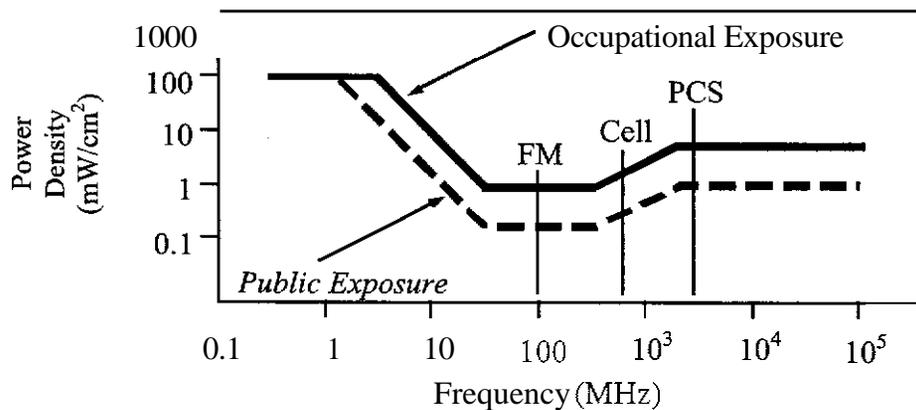
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Page 3 of 3

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, which are nearly identical to the more recent Institute of Electrical and Electronics Engineers Standard C95.1-1999, “Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.” 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:

Frequency Applicable Range (MHz)	Electromagnetic Fields (f is frequency of emission in MHz)					
	Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm ²)	
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/f²</i>
3.0– 30	18421f	<i>823.8/f</i>	4.89/ f	<i>2.19/f</i>	900/ f ²	<i>180/f²</i>
30– 300	61.4	<i>27.5</i>	0.163	<i>0.0729</i>	1.0	0.2
300– 1,500	3.54√f	<i>1.59√f</i>	√f/106	<i>√f/238</i>	0300	<i>f/1500</i>
1,500– 100,000	137	<i>61.4</i>	0.364	<i>0.163</i>	5.0	1.0



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.

RFR.CALC™ Calculation Methodology Assessment by Calculation of Compliance with Human Exposure Limitations

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, which are nearly identical to the more recent Institute of Electrical and Electronics Engineers Standard C95.1-1999, “Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.” 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. 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. The near field zone is the distance from an antenna before which the manufacturer’s published, far field antenna patterns have formed; the near field is assumed to be in effect for increasing distance, D until results coincide with far-field predictions. The FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) gives this formula for calculating power density in the near field zone about an individual RF source:

$$\text{power density } S = \frac{180}{\theta_{BW}} \times \frac{0.1 \times P_{net}}{\pi \times D \times h}, \text{ in mW/cm}^2,$$

where θ_{BW} = half-power beamwidth of antenna, in degrees, and

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

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

λ = wavelength of the transmitted signal, in meters

The factor of 0.1 in the numerator converts to the desired units of power density.* This formula has been built into a proprietary program that calculates the distances to the FCC public and occupational limits.

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

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

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

RFF = relative field factor in 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 ($1.6 \times 1.6 = 2.56$). 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.

These formulas have 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 at the site, to obtain more accurate projections.

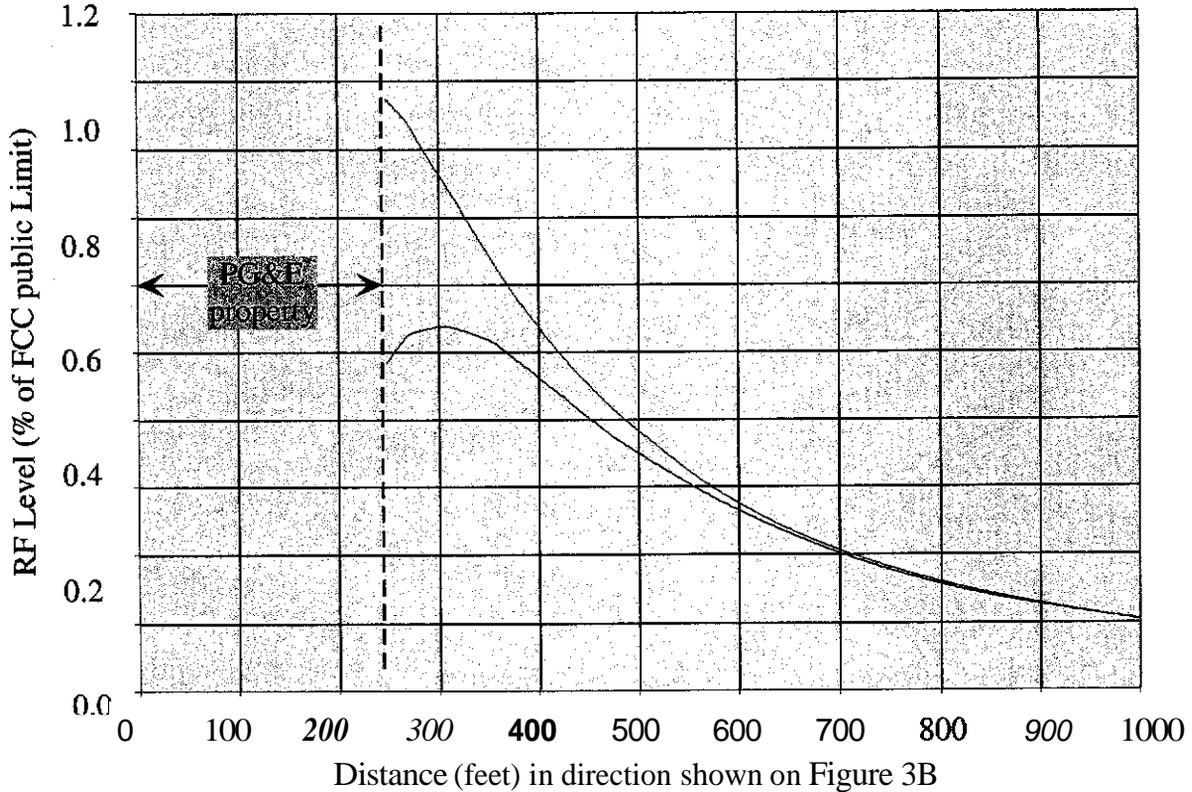
* The far-field azimuth patterns included to account for exposures at locations behind the antenna

**Nextel SMR • Proposed Base Station (Site No. CA-2339C)
615 7th Street • Santa Cruz, California**

Compliance with Santa Cruz County Code §13.10.659(g)(2)(ix)

"Compliance with the FCC's non-ionizing electromagnetic radiation (NIER) 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 NIER calculations specifying NIER levels in the area surrounding the proposed facility. Calculations shall be made of expected NIER exposure levels during peak operation periods at a range of distances from fifty (50) to one thousand (1,000) feet, taking into account cumulative NIER exposure levels from the proposed source in combination with all other existing NIER 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 NIER transmission source associated with the proposed wireless communication facility, consistent with the NIER standards of the FCC, or any potential future superceding standards"

Calculated Cumulative NIER Exposure Levels during Peak Operation Periods



RF level (% limit)

Distance (feet)	250	300	400	500	600	750	1,000
ground	0.97%	1.1%	0.92%	0.69%	0.53%	0.35%	0.21%
secondfloor	1.8%	1.5%	1.1%	0.76%	0.55%	0.36%	0.21%

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) - 1,000 watts

Effective Nextel antenna height above ground - 43 1/2 feet

Other sources nearby - Verizon Wireless and PG&E omnidirectional antenna

Other sources within one mile - No AM, FM, or TV broadcast stations

No two-way stations close enough to affect compliance

Plan for restricting public access - Antennas are mounted on tall pole within fenced enclosure

Nextel SM. · Proposed Base Station (Site No. A-2339C)
615 7th Street • Santa Cruz, California

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

For Simultaneous Operation of
Nextel SMR, Verizon Wireless, and PG&E Antennas



Aerial photo from Mapquest.

Legend

- blank - less than 1% of FCC public limit (*i.e.*, more than 100 times below)
-  - 1% and above near ground level (highest level is 1.1%)
-  - 1% and above at 2nd floor level (highest level is 1.8%)

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.