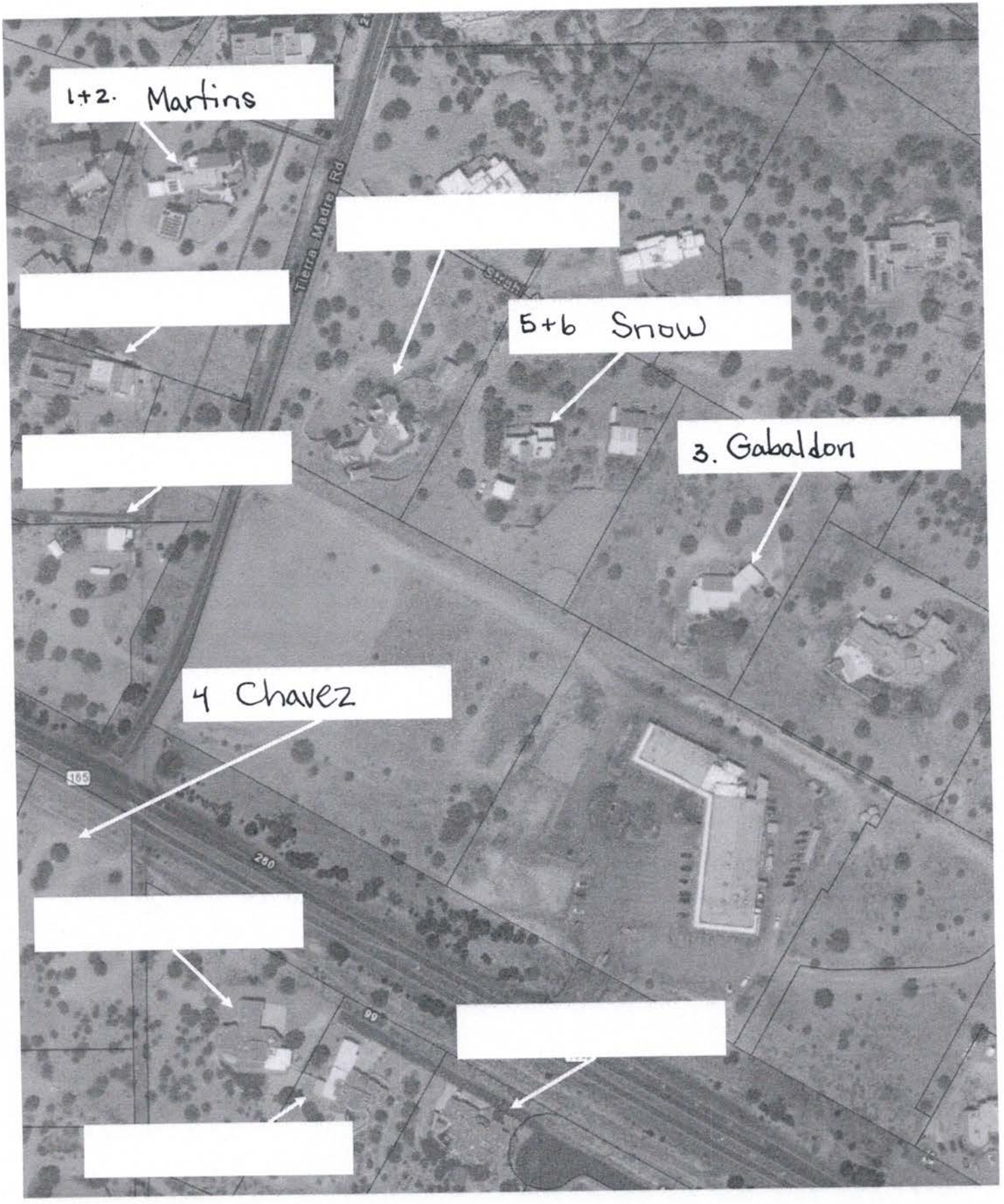
PETITION INVOKING 20% RULE (for appeals to the County Commission)

Site of Proposed Change: 221 165 HWY ST, PLACITAS, NM 87043 (Legal: S: 35 T: 13N R: 4E Subd: PLACITAS HOMESTEADS Lot: 5A-1A-W) **Case Number:**

Action Being Protested: Approval of the Macro Wireless Facilities Permit Application submitted by Pinnacle Consulting, LLC (Sun State Towers and Verizon Wireless).
Grant of a Conditional Use Permit for a Wireless Telecommunications Facility.

THIS SECTION FOR OFFICIAL USE

#	Name of Equitable Owner (Not Tenant) (Please Print)	Address of Parcel	Signature	Legal Description	UPC Code	Size of Property
1.	MICHAEL MARTINS	15 TIERRA MADRE RD				
2.	Silvia Martins	15 Tierra Madre Rd				
3.	Roberta & Paul Gabaldon	12 STRATHC AVE				
4.	[illegible]	212 NM-165				
5.	Christina Snow	6 Strahl AVE				
6.	[illegible]	6 Strahl AVE				
7. (Tenant)	RICHARD B GARY	1 TIERRA MADRE Rd				
8.						
9.						
10.						
11.						


1+2. Martins
Tierra Madre Rd
5+6 Snow
3. Gabaldon
4 Chavez
105
280
99

From: Brian Vogler
To: Planning and Zoning Main
Subject: Procedural Objection — Application CU-26-001 — Untimely Public Release of Application
Date: Monday, May 18, 2026 11:00:11 PM

Chairman Trujillo and Members of the Commission:

I object to the timing of the public release of Application CU-26-001. The Planning and Zoning Department posted the Application materials to its website on the eve of the May 19, 2026 hearing. The public had less than one day to review the Application before being asked to comment on it. I ask that this objection be entered on the record.

I further object that the agenda for consideration of the Application was not made available to the public and posted on the Planning and Zoning Department's website at least 72 hours prior to the meeting.

Respectfully,

Brian Vogler
32 Ridge Rd
Placitas, NM 87043

From: Claire Harwell
To: Planning and Zoning Main
Subject: CU26 001
Date: Monday, May 18, 2026 8:13:18 PM

VIA EMAIL TO: P&ZMain@SandovalCountynm.gov

Planning & Zoning Department
Attn: Doraida Arias, Interim Director
Sandoval County Administration Building
1500 Idalia Road, Building "D", 2nd Floor
Bernalillo, NM 87004

May 18, 2026

Dear Members of the Commission:

Please place this letter in the record for this case.

I object to approval of the proposed cell tower on the grounds that the application does not contain an Environmental Assessment as required by 1.1307 of the FCC rules found in Title 47 of the CFR. An environmental assessment is required if the proposed tower is likely to affect threatened or endangered species, or jeopardize the continued existence of those species. Placitas is home to state designated endangered and threatened raptors, federally endangered Southwestern Flycatcher, and the proposed threatened Monarch butterfly. Birds in particular are at risk for tower crashes as documented in many research studies. Federal Communication Commission (FCC). 2006. Notice of proposed rulemaking. In the matter of effects of communication towers on migratory birds. WT-Docket 03-187. FCC 06-164. Adopted November 3, 2006, Federal Communication Commission, Washington, D.C., USA. The flying creatures listed here are already fighting for survival. Please require the wireless telecommunications industry to comply with the federal requirements in order to protect these birds and butterflies.

I ask that the application be denied on the basis of its incompleteness as to the critical issue of environmental protection for the wildlife that is so strongly valued in this community. The entry to our community asks that our wildlife be respected. I ask the Commission to insure that SunState do so.

Respectfully,
Claire Harwell
Placitas resident

-------- Forwarded message --------
From: **Linda DeVlieg Killman** <linda@realestateinabq.com>
Date: Mon, May 18, 2026 at 12:39 PM
Subject: Placitas cell tower project
To: brian.vogler@gmail.com <brian.vogler@gmail.com>

Dear Mr. Vogler,

I am attaching my preliminary real estate marketability report regarding the proposed 75-foot cell tower in Sandoval County CU-26-001, along with my resume.

By way of background, I am a New Mexico real estate broker with extensive residential experience, including evaluating how buyers respond to location, views, neighborhood setting, external influences, and resale concerns. I am providing this report from the perspective of a real estate professional, not as an appraiser.

The scope of my review is limited to real estate marketability issues, including how the proposed tower may affect buyer perception, resale concern, overall desirability, neighborhood impression, and the market appeal of nearby residential properties in Placitas. My comments are based on my professional experience, preliminary research, MLS data review, and the specific community context of Placitas as a view-sensitive, semi-rural residential market.

I am not offering a formal appraisal opinion or assigning a specific dollar amount of property value impact. Rather, my report is intended to identify the real estate concerns that I believe should be considered when evaluating the proposed tower's potential effect on residential marketability.

Respectfully,

Linda DeVlieg Real Estate
Linda DeVlieg Killman, Qualifying Broker
6739 Academy NE Suite 104
Albuquerque, NM 87109
505-440-7200
www.RealEstateInABQ.com

"Helping you achieve your lifestyle goals with integrity, expertise, and a personal touch—making your vision of home a reality."

Linda DeVlieg Real Estate

6739 Academy NE Suite 104
Albuquerque, NM 87109
505-440-7200
linda@realestateinabq.com

May 18, 2026

Dear Mr. Vogler,

I am writing regarding the proposed 75-foot cell tower in Sandoval County CU-26-001 and its potential impact on residential marketability in Placitas.

I am providing this opinion from the perspective of a real estate professional, not as an appraiser. My comments are based on my experience as a residential real estate professional, my research, my review of local market data, and my understanding of how buyers evaluate homes in view-sensitive residential communities such as Placitas.

From a real estate standpoint, Placitas is not a generic residential market. Buyers in Placitas are often purchasing more than the house itself. They are purchasing views, open space, natural landscape, privacy, dark skies, rural character, and the overall sense of place. These features are part of what makes the Placitas residential market distinct.

A simple MLS search in the SWMLS system supports this point. In reviewing Placitas property listings over the past year, including active, pending, and sold properties, there were 155 total results. Of those, 126 listings used the word "views" in the public remarks. That means approximately 81% of Placitas listings referenced views in the public-facing marketing description.

By comparison, in a similar search of the Far Northeast Heights an MLS (mapped by road areas **east of Wyoming, south of Paseo del Norte/San Antonio, west of Tramway Blvd., and north of Montgomery**, an area of Albuquerque, there were 492 active, pending, and sold listings over the same general period, and only 119 used the word "views" in the public remarks. That is approximately 24%.

This is a significant marketability distinction. It indicates that views are not incidental in Placitas marketing; they are a recurring and material feature used to attract buyers.

For that reason, the proposed tower should not be viewed merely as a telecommunications facility. It should also be analyzed as a potential adverse visual condition in a view-sensitive residential market. A visible 75-foot tower will affect buyer perception, resale concern, overall desirability, and marketability, particularly for homes and neighborhoods where views and

natural setting are part of the value proposition. This value is essential in the Placitas real estate market.

The proposed location appears especially concerning because it is planned near the entryways to La Mesa, Homesteads, and Anasazi Trails, which are substantial residential neighborhoods in west Placitas. Entry experience matters in real estate. Buyers form impressions before they ever walk through the front door. A tower placed near the neighborhood gateway to the village will create an immediate visual objection or concern about the character of the area.

This concern is heightened by the fact that there is already a gravel pit at another entryway serving the area. From a buyer perception standpoint, repeated adverse visual conditions at neighborhood entry points will create a cumulative impression that affects desirability. In residential marketing, the approach to a neighborhood matters, especially in a community where buyers are seeking natural setting, views, and semi-rural character. To put it into perspective, when I am showing homes to a buyer client, there is always a concern about traffic noise, overhead power lines, air traffic, and light pollution, and a cell tower of this type and location would definitely be part of the conversation when a buyer is choosing a home in this area. Placitas is a destination choice to have views and a peaceful living environment. In real estate tradition, it's always 'location' that is the one thing that cannot be changed in a property's characteristics.

The proposed placement along NM 165 also places the tower near the Homesteads Village area, which functions as a community gathering place. This area includes restaurants, a coffee shop, outdoor seating, outdoor concerts, and the Placitas Outdoor Market. These are not merely commercial conveniences; they contribute to the identity and appeal of the community. A 75-foot tower in this location will affect the visual character of an area that is important to both residents and prospective buyers.

My experience as a real estate professional of 31 years, the custom of "location" also supports the broader real estate principle that views and visual settings matter. Research on residential amenities has found that views can contribute measurable value to residential property. NAR's research (The National Association of REALTORS) references on cell towers and power lines also recognize that visual impact, aesthetics, buyer concern, and marketability are legitimate real estate issues. Research on power lines and other external influences similarly supports the concept that proximity alone is not always the key factor; visibility, visual dominance, and buyer perception can be more important.

In my opinion, the strongest real estate concern is not whether every cell tower automatically reduces property value. The more appropriate question is whether this particular tower, in this particular location, within this particular view-sensitive residential community, will create buyer resistance, resale concern, reduced desirability, or a negative marketability effect.

Based on my preliminary review, I believe that is a legitimate concern and it will affect buyer perception and confidence in the area's marketability and lifestyle. The proposed tower has the potential to create an adverse visual influence in a market where views, rural character, natural landscape, and community setting are repeatedly emphasized in residential marketing.

Respectfully,

Linda DeVlieg Killman
Linda DeVlieg Real Estate

Preliminary research sources reviewed:

- National Association of REALTORS®, "Cell Phone Towers," Library & Archives / References.
- National Association of REALTORS®, "Field Guide to Effects of Power Lines on Property Values."

Benson, Hansen, Schwartz & Smersh, "Pricing Residential Amenities: The Value of a View," *Journal of Real Estate Finance and Economics*, 1998.

- Des Rosiers, "Power Lines, Visual Encumbrance and House Values," *Journal of Real Estate Research*, 2002.
- Filippova & Rehm, "The Impact of Proximity to Cell Phone Towers on Residential Property Values," *International Journal of Housing Markets and Analysis*, 2011.
- Placitas Area Plan, Sandoval County.
- SWMLS search

Linda DeVlieg Killman

Qualifying Broker | Real Estate Advisor | Former President, New Mexico Real Estate Commission

Linda DeVlieg Real Estate | 6739 Academy NE. Suite 104 | Albuquerque, NM 87109 | realestateinabq.com

PROFESSIONAL PROFILE

Experienced New Mexico Qualifying Broker, real estate advisor, consultant, and former President of the New Mexico Real Estate Commission. Licensed in New Mexico real estate since 1995, with deep experience in residential real estate, client representation, contract forms, MLS policy, broker standards, regulatory issues, expert witness consulting, and real estate technology. Known for practical judgment, professional leadership, market knowledge, and a client-centered approach to guiding buyers and sellers through complex real estate decisions.

CORE EXPERTISE

Residential Real Estate Brokerage | Seller & Buyer Representation | Qualifying Broker Responsibilities | Contract Forms & Disclosure Issues | MLS Policy & Governance | Regulatory Compliance | Expert Witness Consulting | Real Estate Technology | Client Education | Albuquerque Market Knowledge | Professional Standards | Website & Digital Marketing Strategy

PROFESSIONAL EXPERIENCE

Linda DeVlieg Real Estate — Albuquerque, New Mexico

Qualifying Broker / Real Estate Advisor

- Represent buyers and sellers in residential real estate transactions throughout Albuquerque and surrounding communities.
- Advise clients on pricing, market positioning, contract strategy, inspections, disclosures, negotiations, and closing coordination.
- Provide high-tech real estate services, data research, website development, and digital marketing strategies for real estate clients.
- Serve as a real estate consultant and expert witness in legal matters involving real estate issues.
- Develop client education resources and professional guidance designed to help consumers make informed real estate decisions.

LEADERSHIP & PROFESSIONAL SERVICE

President, New Mexico Real Estate Commission — Contributed leadership in broker regulation, professional standards, public protection, and real estate governance.

- Director, Southwest Multiple Listing Service, 2019–2020; member, NMAR Forms Committee.
- Former Agent Leadership Council Member, Keller Williams Albuquerque Market Center.
- Chair, Vice Chair, and Member, SWMLS Policy Committee; member, SWMLS Technology Committee, MLS Research Committee, Website Task Force, Areas Task Force, Square Footage Task Force, Vendor Committees, and Nominating Committees.
- Member, GAAR Mediation Committee and GAAR GAP Committee.

PUBLICATIONS

- Co-author, How to Make Your REALTOR® Get You the Best Deal, Albuquerque Edition.
- Co-author, Get the Best Deal When Selling Your Home, Albuquerque Edition.

EDUCATION

Arizona State University — Family Life Studies | **University of New Mexico** — Criminal Justice

PROFESSIONAL COMMITMENT

Committed to the REALTOR® Code of Ethics, consumer protection, property rights, professional standards, and informed client representation.

From: Jackie Shepherd
To: Planning and Zoning Main
Subject: Opposition to CU-26-001
Date: Monday, May 18, 2026 6:26:00 PM

Re: Application CU-26-001

Dear Commissioners,

My husband and I spent a year searching small communities between Albuquerque and Santa Fe before we found Placitas. We visited enough times to be certain. We bought our home on NM-165 and have been remodeling it room by room, landscaping around it, turning it into the place we meant to find. From our front courtyard and through our living room windows, the proposed tower site is visible. A 75-foot structure there becomes part of every morning we planned differently.

The site-selection record is where I keep getting stuck. The County's rules rank residential areas last — the lowest of six preferred location types. The applicant started at a County-owned property, which ranks near the top of that list, and when the lease there fell through, ended up at a vacant lot in a residential-zoned area without anything in the application showing what was considered in between. The rules say plainly that a failed lease negotiation is not a valid reason to skip the remaining priorities. The application also looks only at other carriers' towers — it says nothing about utility poles, building facades, streetlights, or any of the other existing infrastructure the County's rules expressly include under "other suitable structures" within four miles. The carrier with the strongest service in Placitas delivers it through small antennas on existing infrastructure, not through new macro towers. Verizon's application doesn't address why that path isn't the answer here.

There are also specific things missing from what was filed. The lot was zoned for a shopping center under a set of binding conditions the County adopted specifically for this parcel. The application treats the zoning as plain CD-WP and never connects the proposed design to those conditions. The application also doesn't include the FAA evaluation the rules require to establish whether any lighting is needed at this height — so what's actually planned for the tower itself remains unclear. And I haven't found a setback diagram showing the proposed tower meets the height-plus-ten-percent distance the rules require from each property line and right-of-way.

On property value: when we eventually sell, a visible 75-foot tower will matter to buyers. We chose this place deliberately. Had we known about this application, we would not have made that choice — and the next buyers will know, because the tower will be visible from the street.

I am asking the Commission to deny this application.

Sincerely,

Jaclyn Shepherd
289 State Highway 165
Placitas, NM

From: Liesel Anthony
To: Planning and Zoning Main
Subject: Opposition to CU-26-001
Date: Monday, May 18, 2026 5:48:42 PM

Re: Application CU-26-001

Dear Members of the Sandoval County Planning and Zoning Commission,

My husband and I chose Placitas with intention — not as a default or a compromise, but because of what this place actually is. We have lived here for a little over 2 years, and what we found here is exactly what we were looking for: open desert, quiet, and a landscape that hasn't been overbuilt. A 75-foot tower at the corner of Tierra Madre and NM-165, right next to Homestead Plaza, would be the tallest structure in the area by a wide margin. In a setting of single-story homes and unobstructed sky, that is not a small addition. It changes what this place looks like for everyone who lives here and everyone who drives in.

The thing I keep coming back to is what the application doesn't actually establish. The County zoned this parcel for a shopping center — that was the specific stated purpose when the Board created the special-use designation for these tracts. The application describes the zoning as plain CD-WP and never engages with what that designation means for this proposal. A 75-foot industrial monopole with a fenced equipment compound is not a shopping center, and the County's rules give the Commission the ability to deny a use that doesn't fit the stated purpose of a parcel's specific zoning. The applicant had the burden to explain why a tower belongs here under those terms. I don't see that explanation in the materials.

The application also has gaps I can't look past. The RF compliance report is internally labeled with a different site name from California and uses rooftop-analysis language that doesn't describe a ground-mounted pole in Placitas. An 8-foot fence around the base equipment is described as screening — and it may screen what's at ground level — but the 75-foot tower above it isn't screened from anything: not from NM-165, not from the homes on three sides. The application doesn't include the FAA evaluation the rules require to show whether any lighting would be needed at this height, so I don't know what's planned there. And I haven't found a site plan demonstrating that the tower's distance from each property line and right-of-way actually meets the County's setback standard. The County's own rules place the burden of proof on the applicant. These aren't details to iron out later — they're demonstrations the applicant should have included.

We came to Placitas because of what it is. The application as filed doesn't establish that this proposal belongs here. I am asking the Commission to listen to your constituents and deny it.

Sincerely,

Liesel Anthony
46 Placitas Trails Rd
Placitas, NM

May 18, 2026

Planning & Zoning Department
Attn: Interim Director Doraida Arias
Sandoval County Administration Building
1500 Idalia Road, Building “D” 2nd floor
Bernalillo NM, 87004

Re: Application CU-26-001

Dear Commissioners,

My husband and I moved to Placitas more than 25 years ago to leave behind city noise, bright lights, and crowded buildings. We chose this place deliberately. Every evening we sit on the deck and watch the sun drop behind the Jemez. A 75-foot tower would plant itself in that view permanently — visible from our bedroom, our deck, and our back yard — and there is no un-approving it once it is up.

Federal rules mean the County gets to review some future modifications to an approved tower, but routine additions — new carriers, equipment swaps, certain upgrades — happen on a fast track with no public hearing. Whatever conditions the Commission writes into this approval are the conditions that follow the tower for its lifetime. That makes this hearing the moment to be careful.

On how this site was selected: I am not satisfied with the record. The County's rules rank County-owned land well above residential areas in the preference order. The applicant tried the Fire Station, the lease talks did not come together, and the application settled on a vacant lot in a residential area — the last category on the County's list — without any documented look at what lay between those two points. The rules are explicit that a failed lease negotiation is not sufficient justification for skipping the rest of the list. The application also says nothing about small

cells — the small antennas on existing poles and building facades that already deliver the best service in Placitas without any new tower. The County's rules ask for an inventory of existing towers and other suitable structures within four miles. A slide deck is not that.

The application also lists "Offload surrounding sites in area" among the site's stated objectives. That is a benefit to Verizon's network, not to the people who live here. The visual cost lands in Placitas; the benefit goes to Verizon's towers elsewhere. That trade does not seem fair to ask of this community.

I also have not found the FAA evaluation in the materials that would establish whether any lighting is required at this height, which means I cannot tell what is actually planned for the tower at night.

For these reasons, I am asking the Commission to deny this application.

Sincerely,

_____

Lucinda V. Fairfield
4 Agua Sarca Road
Placitas, NM

From:	Claire Harwell
To:	Planning and Zoning Main
Cc:	Brian Vogler
Subject:	CU26-001 opposition
Date:	Monday, May 18, 2026 10:16:06 PM
Attachments:	20 percent rule petition.pdf

Claire Harwell, J.D.

P.O. Box 1341
Placitas, NM 87043
Phone: 617-447-3824
MClaireHarwell@gmail.com

VIA EMAIL TO: P&ZMain@SandovalCountynm.gov

Planning & Zoning Department
Attn: Doraida Arias, Interim Director
Sandoval County Administration Building
1500 Idalia Road, Building "D", 2nd Floor
Bernalillo, NM 87004

RE: CU26-001

May 18, 2026

Please place this letter and the attachments in the record.

The signatures on the attached document reflect opposition to the construction of the proposed cell tower by the neighbors surrounding the proposed cell tower described in the application in this case. NMSA § 3-21-6 (2025) requires a super majority of the commissioners to approve an application over the objection of 20% or more of neighbors on properties 100' feet from the site excluding rights of way. Additional signatures are being sought, but the requisite number of owners are represented on the petition at this time.

Sincerely,

M. Claire Harwell

From: Nancy Guist
To: Planning and Zoning Main
Subject: Opposition to CU-26-001
Date: Monday, May 18, 2026 8:56:32 PM

Re: Application CU-26-001

Dear Members of the Sandoval County Planning and Zoning Commission,

I have lived in Placitas for more than 25 years, and the things that drew me here — unobstructed desert views, genuinely dark nights, and the quiet rhythms of a small community — are not accidents of geography. They are what people here chose, deliberately, over and over again, when they had chances to choose otherwise. This application asks us to accept a 75-foot industrial monopole at the corner of Tierra Madre and NM-165, right next to Homestead Plaza, the gateway to Placitas. That structure would be the tallest thing for miles, visible to everyone driving into the community, and no amount of brown paint changes that.

On summer evenings, residents go to Homestead Plaza — to eat outside, to listen to music, to run into each other. The restaurant's outdoor patio would sit directly underneath this tower. The County's rules give it the authority to say no when a proposed use conflicts with the character of a neighborhood, and this is exactly that case: a 75-foot industrial structure with a mechanical equipment compound does not belong over the place where our community gathers.

The site-selection record gives me no confidence this location was chosen carefully. The County's rules set out a clear order of preferred site types, with residential areas listed last. The applicant started at the Fire Station — County-owned property, near the top of the list — and when the lease talks broke down, ended up at a vacant lot in a residential-zoned area without any evident walk-through of what lay between those two points. The rules are explicit that a failed lease negotiation is not good enough reason to skip the rest of the list. Beyond that, the rules ask for a real inventory of existing towers and other suitable structures within four miles — not just other carriers' towers, but anything that could host an antenna: utility poles, building facades, rooftops, streetlights. The technology that already delivers the best cellular service in Placitas is small antennas on existing infrastructure, not new towers. The application says nothing about any of that. What was filed is a slide deck.

One thing I noticed in the application's RF analysis: among the stated objectives for this site is "Offload surrounding sites in area." That is not a benefit to Placitas. It is a benefit to Verizon's network — moving traffic off towers that serve somewhere else. Whatever this tower costs our community in visual character, property values, and the feel of our gathering place, part of its stated purpose has nothing to do with us at all.

I am asking the Commission to deny this application.

Sincerely,

Nancy Guist
35 First Mesa Ct.
Placitas, NM

PART IV

Marginal Coverage Contribution of the Proposed Tower

Reconstruction by Per-Pixel Difference of the Applicant's Submitted RSRP Rasters

Conditional Use Permit CU-26-001 — Sandoval County, NM

Author: C. Edwin Garner, Ph.D., President, Mammoth Preclinical Consulting
Date: May 18, 2026
File: CU-26-001 — Proposed 75-ft monopole at 221 NM-165, Placitas NM 87043 (APN 102-307-302-8180)
Series: This document is Part IV of the integrated technical record. Part I (RF Propagation Foundations) establishes the propagation physics framework. Part II (Placitas Terrain Analysis) establishes the geometric line-of-sight viewshed and the four-class viewpoint geometry. Part III (Critique of Sponsor's RSRP Submission) identifies the qualitative deficiencies in the applicant's coverage exhibits. Part IV (this document) quantifies what the applicant's exhibits do not directly show: the marginal coverage contribution of the proposed tower in isolation, reconstructed by per-pixel categorical difference of the applicant's own submitted before/after RSRP rasters.

Key finding

The applicant's submitted RF Design Analysis presents two aggregate-network RSRP rasters — labeled "Current Coverage" and "Proposed Coverage" — that depict the sum of signal contributions from all towers in the analyzed network. The viewer is invited to infer the marginal value of the proposed tower from a visual side-by-side comparison. This Part IV reconstructs that marginal contribution explicitly by per-pixel categorical difference of the two rasters.

Of 325,918 classifiable map cells (~21.8 m / pixel; ~155 km² total map area):

- 79.5 % are unchanged between the current and proposed network.
- 17.6 % improve by at least one RSRP tier; the remaining 2.9 % register apparent degradations or noise at the classification boundary.
- Within 1 km of the proposed monopole, 95.4 % of cells improve; the improvement fraction falls to 16.1 % at 3 – 5 km and 12.5 % at 5 – 10 km.
- Only 3,312 cells (≈ 1.58 km²) jump three tiers ("None" to "Indoor"); these constitute the proposed tower's immediate signal footprint.
- 28,031 previously-uncovered cells (≈ 13.4 km²) gain at least one coverage tier; the remainder of the improvement consists of upgrades within the already-covered area.

The marginal contribution is geographically concentrated within the applicant's own drawn "coverage-objective" ellipse and falls off rapidly with distance and terrain shadowing. The corridors west of the tower — including the back-canyon residential neighborhoods served by NM-165 — receive limited and scattered improvement.

1. Background

The applicant (Pinnacle Consulting / Sun State Towers IV, LLC / Verizon Wireless) submitted two RSRP coverage exhibits in support of CU-26-001:

- "RSRP – Current Coverage" — a categorical map of aggregate network RSRP across the analyzed area with the proposed tower NOT included.
- "RSRP – Proposed Coverage" — the same map type WITH the proposed tower included, in addition to all existing towers.

Both rasters use the same three-color legend: green ≥ −85 dBm (Indoor), yellow ≥ −95 dBm (In-Vehicle), red/orange ≥ −101 dBm (Outdoor). Cells below −101 dBm appear as the un-tinted basemap (cream/tan) and represent "no usable coverage" under the applicant's own thresholds.

Because both rasters are aggregate-network renderings, the visual contribution of the proposed tower alone is not directly observable. The proper exhibit for that purpose would be an isolated single-tower RSRP raster — a calculation that the applicant's RF engineering tool produces routinely and that the applicant chose not to include in the application. In its absence, the closest reconstruction available is the per-pixel difference (proposed minus current) of the two submitted rasters, which is what this Part IV produces.

2. Methodology

2.1 Pixel classification

Both applicant rasters were digitized from the submitted PDF and cropped to the map interior. K-means clustering of map pixels recovered the canonical legend palette to within ±5 RGB units across both images:

- Indoor (≥ −85 dBm): RGB ≈ (134, 197, 100)
- In-vehicle (≥ −95 dBm): RGB ≈ (236, 237, 81)
- Outdoor (≥ −101 dBm): RGB ≈ (214, 142, 58)
- None (< −101 dBm; basemap shows through): RGB ≈ (238, 226, 181)

Each map pixel was classified by nearest-centroid match in RGB space. Pixels representing the red coverage-objective ellipse, the existing tower icons, road centerlines, frame borders, and tick-label text were excluded by a black/red mask. Approximately 2.5 % of pixels in each image were masked on this basis.

2.2 Geometric registration

Both rasters share the same labeled latitude/longitude extent (visible in the submitted PDF tick labels: −106.5833° to −106.4167° east; ~ 35.25° to ~ 35.33° north). The slightly differing PDF rasterization dimensions were normalized by bilinear resampling of the proposed-coverage map to the current-coverage map's pixel grid. Post-registration, the spatial scale is approximately 21.8 m per pixel (pixel area ≈ 476 m² ≈ 0.118 acres).

Registration quality was verified post-hoc by the fraction of unchanged pixels (79.5 %, consistent with the expectation that most of the map far from the proposed tower should be identical between the two scenarios) and by the geographic concentration of "improvement" pixels near the proposed tower location (46.5 % of all improvements fall within 150 px = 3.3 km of the tower).

2.3 Categorical difference and noise filtering

For each registered pixel pair, the categorical difference Δ = (proposed tier) − (current tier) was computed on the integer scale {0 = None, 1 = Outdoor, 2 = In-vehicle, 3 = Indoor}. Possible values of Δ therefore span [−3, +3].

To remove single-pixel classifier noise arising from anti-aliasing at color-tier boundaries, a 5 × 5 sign-agreement filter was applied: a pixel's sign-of-change is retained only if at least six of the 25 neighboring pixels share the same sign. This filter preserves contiguous patches of real coverage change (≥ ~1,000 m²) while suppressing isolated mis-classified pixels.

2.4 Limitations

- This is a categorical-tier difference, not a continuous dBm difference. A pixel that improves from −94 to −86 dBm (within the In-vehicle tier on both sides) registers as Δ = 0 here. The true continuous-dBm marginal contribution may be larger than the categorical difference indicates in some areas.
- Conversely, a pixel just below the −85 dBm Indoor threshold that crosses it because of the new tower will register a full one-tier improvement even though the underlying dB change is small.
- The difference is computed from the applicant's own modeled RSRP, not from independent measurements. It inherits any modeling assumptions, antenna pattern choices, terrain database, propagation model, and clutter assumptions used by the applicant's RF engineer.
- Apparent degradations (Δ < 0) are physically implausible from adding a new sector at a new location to an existing network. The 3.6 % of pixels with raw Δ < 0 (1.1 % after noise filtering) almost certainly represent classifier disagreement at color-boundary pixels rather than real coverage loss.

3. Results

3.1 Three-panel comparison (Figure 1)

Figure 1 presents the two applicant-submitted rasters side-by-side with the computed marginal-contribution panel on the right. The proposed tower location is marked with a star in all three panels; the applicant's drawn coverage-objective ellipse is preserved in red on the marginal panel for reference.

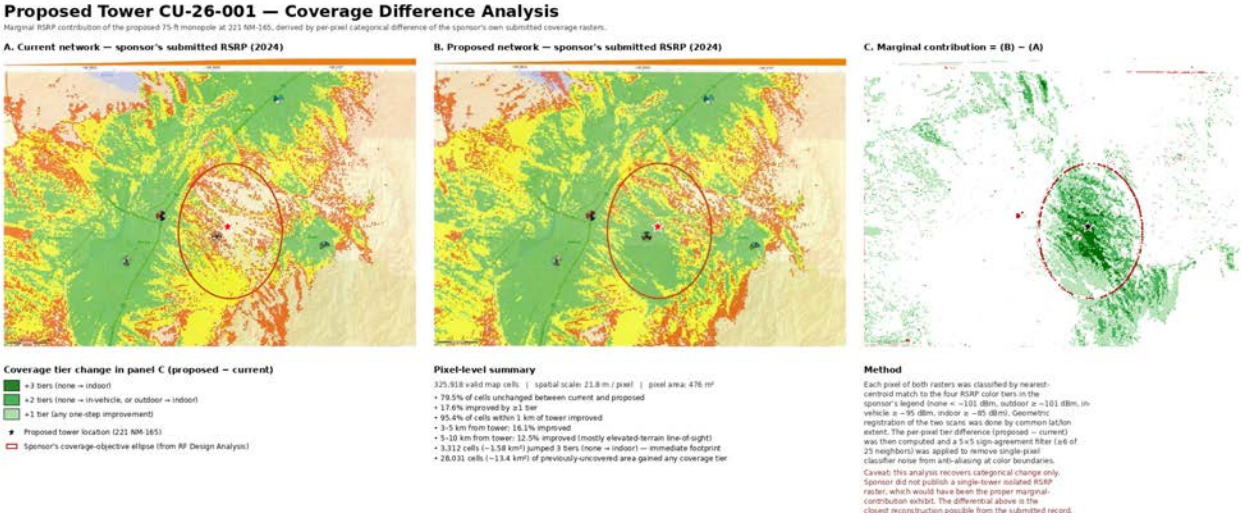


Figure 1. Three-panel comparison. Panel A: applicant-submitted "RSRP – Current Coverage." Panel B: applicant-submitted "RSRP – Proposed Coverage." Panel C: marginal contribution of the proposed tower, computed as the per-pixel categorical difference (B − A) after registration and noise filtering. Greens in Panel C denote coverage-tier improvements; the depth of green encodes the magnitude of the improvement (1, 2, or 3 tiers).

3.2 Marginal-contribution map (Figure 2)

Figure 2 magnifies the marginal-contribution panel and overlays it on a desaturated topographic backdrop so the geographic context (drainages, ridges, road network) remains visible.

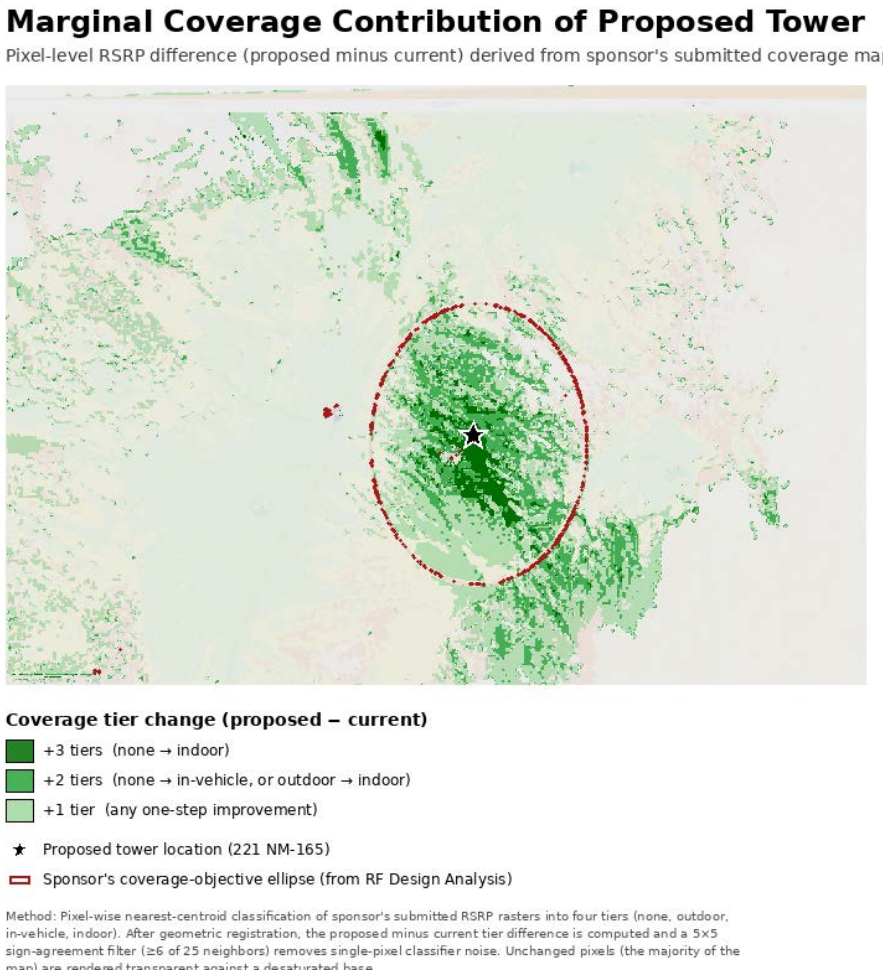


Figure 2. Marginal coverage contribution of the proposed 75-ft monopole. The strongest improvements (dark green, 3-tier jump) cluster immediately around the tower site. The improvement intensity attenuates rapidly with distance and is largely contained within the applicant's drawn coverage-objective ellipse. Western and southwestern corridors — including the back-canyon residential neighborhoods served by NM-165 west of the tower — receive scattered, weak improvement consistent with terrain shadowing.

3.3 Coverage-tier transition matrix

Table 1 reports the cell counts moving between each pair of coverage tiers. Diagonal entries (light grey) are pixels whose tier is unchanged between the current and proposed networks; off-diagonal entries above the diagonal (light green) are coverage improvements; off-diagonal entries below the diagonal (light red) are apparent degradations, which are dominated by classification noise.

Current → Proposed	None	Outdoor	In-vehicle	Indoor	Row total
None (< −101 dBm)	81,318	12,786	11,933	3,312	**109,349**
Outdoor (≥ −101 dBm)	1,972	24,653	18,525	4,057	**49,207**
In-vehicle (≥ −95 dBm)	1,344	3,575	70,531	14,376	**89,826**

Indoor (≥ −85 dBm)	368	106	4,483	72,579	**77,536**
Column total	**85,002**	**41,120**	**105,472**	**94,324**	**325,918**

Table 1. Coverage-tier transition matrix. Rows: current-network tier. Columns: proposed-network tier. Entries are pixel counts (n = 325,918 classifiable pixels; 1 pixel ≈ 476 m²).

Key observations from Table 1:

- 11,933 cells (≈ 5.68 km²) move from "None" directly to "In-vehicle."
- 3,312 cells (≈ 1.58 km²) move from "None" directly to "Indoor" — the immediate footprint of the new sector.
- 18,525 cells (≈ 8.82 km²) of previously-"Outdoor" coverage upgrade to "In-vehicle"; 4,057 (≈ 1.93 km²) upgrade two tiers to "Indoor."
- 14,376 cells (≈ 6.84 km²) of "In-vehicle" coverage upgrade to "Indoor."
- Degradation cells (below diagonal, light red) total approximately 11,800 cells (3.6 % of valid pixels), of which the noise-filtered residual is approximately 1.1 %. These are not real coverage losses; they are classifier artifacts at antialiased color boundaries between the two PDF rasterizations.

3.4 Distance falloff

Table 2 reports the improvement fraction in concentric rings around the proposed tower. The tower's signal contribution dominates within 1 km, attenuates sharply at 2 – 3 km (consistent with terrain shadowing into the back canyons), and contributes only a thin residual at 5 – 10 km associated with elevated terrain that retains direct line-of-sight to the tower.

Ring (km from tower)	Improved cells	% of cells in ring improved	Approx. improved area (km²)
0 – 1	6,211	95.4 %	2.95
1 – 2	13,191	67.9 %	6.28
2 – 3	8,330	26.0 %	3.96
3 – 5	16,350	16.1 %	7.78
5 – 10	20,906	12.5 %	9.94
> 10	1	< 0.1 %	<0.01

Table 2. Distance falloff of the marginal coverage contribution. Distances are radial from the proposed tower (35.30° N, −106.50° W approximately). Improved-area figures are based on a pixel area of ~476 m².

4. Discussion

4.1 What this analysis recovers

The difference map makes visible what the applicant's two aggregate rasters present only by implication: the geographic distribution of the proposed tower's marginal signal contribution. The result is consistent with the published propagation physics of a single 75-ft monopole sited at the proposed location:

- Strong, contiguous improvements within ~1 km of the tower, comprising essentially the full "Indoor" footprint.
- A line-of-sight-limited mid-range fringe of "In-vehicle" and "Outdoor" upgrades extending 1 – 3 km in directions of unobstructed terrain.
- Scattered, weak fringe improvements in the 3 – 10 km range, concentrated on elevated terrain retaining direct line-of-sight.
- Essentially no contribution beyond 10 km, consistent with free-space and obstructed-terrain path loss at the operating frequencies.

4.2 What this analysis does NOT support

The reconstructed marginal contribution is local. It does not extend across the entire map area suggested by the visual delta between the applicant's two aggregate rasters. The visual impression of "large improvement" in the side-by-side aggregate exhibits is amplified by:

- Inclusion of all towers in both rasters (so existing-network improvements unrelated to the proposed tower are present in both panels and visually persist).
- Selection of a coverage-objective ellipse that the new tower largely fills, drawn before the propagation result is shown — making the visual impression of "filling the gap" almost tautological.
- Absence of an isolated-tower RSRP raster, which would have shown the directional and distance-dependent fall-off explicitly.

4.3 Geographic distribution relative to residential population

The marginal-contribution map is presented here in geographic, not demographic, terms. A separate analysis would be required to weight the improved cells by residential parcel density. However, two qualitative observations are clear from Figure 2:

- The largest improvement intensities fall within the central portion of the applicant's drawn ellipse, an area of relatively low residential density between Placitas village to the west and the Las Huertas Canyon corridor to the east.
- The western and southwestern corridors — which contain a substantial portion of the residential housing along NM-165 and within the platted Placitas Homesteads, Ranchos de Placitas, and Sundance Mesa subdivisions — register weak and scattered marginal improvement, consistent with the terrain-shadowing geometry independently demonstrated in the Part II Terrain Analysis.

5. Conclusion

Pixel-wise differencing of the applicant's own submitted RSRP rasters recovers the marginal coverage contribution of the proposed monopole. That contribution is geographically concentrated, distance-attenuated, and terrain-shadowed in directions away from the central

coverage-objective ellipse. The aggregate-network framing of the applicant's submitted exhibits visually amplifies the apparent benefit relative to the isolated marginal contribution that an honest single-tower raster would have shown.

This Part IV does not, and need not, contest the existence of a coverage deficit in some portion of the analyzed area. It contests only the visual framing by which the applicant's submission invites the County to infer the proposed tower's geographic scope of benefit. The benefit is real but localized; alternative sites with comparable or superior coverage geometry (notably the Placitas Volunteer Fire Department site at 463 NM-165, identified by the applicant's own alternatives analysis as the first candidate) merit re-examination on the strength of the reconstructed marginal contribution rather than the aggregate-network rendering.

Appendix A — Reproducibility

All steps documented in Section 2 (image cropping, color palette discovery via k-means, nearest-centroid pixel classification, bilinear registration, per-pixel difference, 5×5 sign-agreement noise filter, and ring-distance binning) are deterministic given the two applicant-submitted PNG/PDF rasters. The analysis code, intermediate classifications, and the transition matrix are retained in the project archive and are available on request.

PART IV — SUPPLEMENT

Default Propagation-Model Assumptions and Their Inapplicability to the Placitas High-Desert Arroyo Environment

Conditional Use Permit CU-26-001 — Sandoval County, NM

Author: C. Edwin Garner, Ph.D., President, Mammoth Preclinical Consulting
Date: May 18, 2026
Companion to: Part IV — Marginal Coverage Contribution of the Proposed Tower (V1).
Subject: Technical critique of the implicit dependence in the applicant's submitted RSRP coverage maps on diffraction, reflection, and scattering propagation mechanisms whose standard model parameters are calibrated to urban and suburban environments and are not validly applicable to the Placitas high-desert arroyo terrain.

Key argument

Part IV established that the applicant's submitted RSRP rasters predict substantial coverage benefit at locations independently identified in the Part II Terrain Analysis as lying in deep geometric shadow of intervening ridges (Class C and Class D viewpoints). Pure line-of-sight propagation cannot reach those locations. The applicant's model can predict coverage there only by relying on non-line-of-sight propagation mechanisms — knife-edge or rounded-edge diffraction over the intervening ridge tops, specular and diffuse reflection from terrain and built surfaces, and multipath scattering from vegetation and buildings.

Each of those non-line-of-sight mechanisms is parameter-driven. Their predicted magnitudes depend on assumed clutter-class characteristics, diffraction-edge geometry, soil-conductivity values, vegetation density and species, and antenna heights and gains relative to a model receiver. The applicant's submitted documents do not identify the specific propagation-model package used, the clutter-classification scheme applied to the Placitas area, the diffraction algorithm, or any local calibration measurements supporting the model output. In the absence of that disclosure, the modeled coverage benefit into shadowed locations cannot be independently verified, and the standard-default parameter values from commercial RF-planning software are the only available basis on which to evaluate the prediction.

The standard defaults are calibrated to populated environments unlike Placitas, and they overstate the propagation benefit that diffraction, reflection, and scattering will deliver in high-desert arroyo terrain. The principal technical and physical bases for that conclusion are set out below.

1. Standard cellular propagation models and their environmental baselines

Modern cellular RF planning relies on a small number of widely-implemented propagation models. Each was empirically calibrated to a defined class of environment. The dominant models, and the environments to which their empirical foundations bind them, are as follows.

- Okumura–Hata family (Hata 1980; COST 231 1999): empirical model derived from extensive drive-test measurements by Okumura in and around Tokyo and Yokohama in the 1960s, parameterized by environment class ("large city," "medium-small city,"

"suburban," "open"). The "suburban" and "open" corrections to the urban baseline are themselves derived from Japanese urban-fringe data, not from arid open terrain.

- COST-231 Walfisch–Ikegami (Walfisch and Bertoni 1988; Ikegami et al. 1984): a deterministic urban model that explicitly assumes rows of buildings of approximately uniform height parallel to streets. It is not physically defined outside an urban grid.
- Standard Propagation Model (SPM), implemented in ATOLL (Forsk), Mentum Planet (Infovista), Asset (TEOCO), and other commercial planning tools used in carrier RF design: a multi-term log-distance model with adjustable K-coefficients, a diffraction term (typically Deygout 1966 multi-edge or Epstein–Peterson 1953), and a clutter-loss term keyed to a clutter-classification raster. Default K-coefficients and default clutter-loss values shipped with these tools are tuned to urban and suburban deployments where the model has been calibrated.
- ITU-R P.1812 (point-to-area terrestrial prediction) and ITU-R P.1546 (broadcast and mobile terrestrial services): standards-track models that include diffraction, troposcatter, and clutter loss with default "clutter category" values for water, open, suburban, urban, and dense-urban environments. The default clutter-loss values for "open" and "rural" environments are derived primarily from European and Japanese empirical data.
- Longley–Rice Irregular Terrain Model (Longley and Rice 1968; Hufford et al. 1982): the canonical model for irregular terrain. It uses defaults for ground conductivity, relative permittivity, climate region, and surface refractivity. Default values are for continental temperate climate and average ground; the model documentation explicitly warns that desert and arid-climate parameters differ from defaults.

None of these models was empirically calibrated on high-desert terrain with sharp arroyo geometry, sparse low vegetation, and predominantly rocky-sandy ground. The applicant's model output for the Placitas area is therefore an extrapolation from the environmental conditions under which the underlying empirical data was collected to an environment substantially different in clutter density, vegetation type, soil properties, and terrain edge geometry.

2. How the applicant's model implicitly depends on diffraction, reflection, and scattering

The four-tier coverage rendering in the applicant's RSRP maps shows modeled signal levels at receiver locations across the analyzed area. For receivers that are not in unobstructed line of sight to the proposed antenna — and a substantial fraction of Placitas residential parcels lie behind intervening ridges relative to the proposed 71-foot antenna centerline — predicted signal at the receiver can only arise from non-line-of-sight mechanisms. Three such mechanisms are universally included in commercial propagation models:

2.1 Diffraction

Electromagnetic energy bends around obstacle edges (knife-edge diffraction) or rounded ridges (Vogler or rounded-edge diffraction). Diffraction loss into a shadow region is a function of the Fresnel-zone clearance, the obstacle geometry, and the operating frequency. At the mid-band 5G frequencies used by Verizon (n77, approximately 3.7 GHz; band 66/AWS at approximately 1.7–2.1 GHz; band 13 at 700 MHz), diffraction loss is substantial and is frequency-dependent: a knife-edge with normalized obstruction parameter v = 1 produces approximately 14 dB of diffraction loss, and the loss increases with v approximately as 20·log(v) for moderate obstruction. Real desert arroyo walls approximate knife-edges far more closely than the rounded ridges assumed in the default rounded-edge diffraction formulations used in some commercial tools.

2.2 Reflection

Specular reflection from the ground and from built or natural vertical surfaces produces a delayed copy of the direct signal that may either add to or subtract from the direct path depending on phase. Reflection coefficients depend on the surface's electrical properties (relative permittivity, conductivity) and on the angle of incidence. Default soil parameters in commercial models typically correspond to moist temperate soil with relative permittivity in the range 15–25; dry rocky and sandy desert soils have relative permittivity in the range 3–7 and lower conductivity. The Fresnel reflection coefficient at grazing incidence is therefore smaller in desert ground than in default temperate soil, and the predicted reflection-aided signal at shadowed receivers is correspondingly overstated by a default-parameter model.

2.3 Scattering and clutter loss

Buildings, vegetation, and other discrete obstacles produce diffuse scattering that creates a rich multipath environment in dense urban and suburban areas. In the COST-231 Walfisch–Ikegami formulation and its successors, the "rooftop-to-street diffraction" term and the "multi-screen diffraction" term are explicit functions of inter-row building spacing and average building height. The standard SPM clutter-loss term subtracts a class-dependent value from predicted path loss for receivers located within a clutter cell of the specified class. The default clutter-loss values for "suburban residential" assume a continuous matrix of low-rise residential buildings on small lots, producing the multipath enhancement on which the model relies.

3. Why the standard defaults overstate propagation benefit in the Placitas arroyo environment

The Placitas built environment and natural terrain depart from the standard "suburban" or "rural" clutter-class defaults in five physically significant ways.

3.1 Building density is at least an order of magnitude lower than default "suburban"

The platted residential subdivisions of Placitas (Anasazi Trails, Placitas Homesteads, Sundance Mesa, La Mesa, Tierra Madre, Ranchos de Placitas Units IV–VII) are characterized by single-family homes on parcels typically 1.0 to 3.0 acres, with substantial undeveloped land between structures. The Hata "suburban" and SPM "residential suburban" clutter classes are calibrated on dwelling densities in the range of 8 to 20 units per acre, an order of magnitude or more denser than Placitas. Wherever the applicant's clutter database classifies a Placitas parcel as "suburban," the default scattering and multipath enhancement applied to that pixel substantially overstates the actual propagation benefit available from a sparse-built environment.

3.2 Vegetation is sparse, low, and unlike model-default canopy

ITU-R P.833 (vegetation attenuation) and the default vegetation classes in commercial planning tools are parameterized for deciduous and mixed-conifer canopies typical of temperate Europe and North America, with canopy heights commonly assumed in the 8–20 m range and continuous canopy cover. Placitas native vegetation is high-desert chaparral and piñon–juniper woodland: chamisa (Ericameria nauseosa) typically 0.5–1.5 m, four-wing saltbush 0.5–2 m, scattered one-seed juniper (Juniperus monosperma) and piñon pine (Pinus edulis) typically 3–6 m with discontinuous cover. The cover fraction across the residential portions of Placitas is well below the closed-canopy assumption embedded in default forest-vegetation clutter parameters. Standard models that include vegetation-aided scattering at their default values will overstate the corresponding contribution to shadowed-area coverage.

3.3 Soil is dry, rocky, and low-permittivity

Soils across the Placitas mesa surface and arroyo walls are derived from Tertiary Santa Fe Group alluvium and weathered Permian and Pennsylvanian sedimentary rock, with surface materials typically a mix of sand, gravel, and exposed bedrock. Volumetric soil moisture in the residential portions of Placitas is consistently low (annual precipitation approximately 10 in/yr; the area lies on the leeward side of the Sandia Mountains in a documented rain-shadow regime). The Fresnel ground-reflection coefficient at the operating frequencies, given relative permittivity in the 3 to 7 range for dry sandy soil and rock, is smaller in magnitude than the value computed using the standard default of approximately 15 for moist temperate soil. Ground-reflection-aided coverage prediction therefore overstates the realized field strength at shadowed receivers.

3.4 Arroyo geometry approximates knife-edge, not rounded ridge

The arroyos that incise the Placitas terrain (Las Huertas Creek, the unnamed tributaries flowing southwest from the eastern mesa rim, the wash separating Anasazi Trails from the proposed site) have walls cut by intermittent flow into steep, often near-vertical faces with sharp upper edges where the wall meets the mesa surface. The Vogler rounded-edge diffraction formulation, and the rounded-edge corrections in some implementations of the Deygout multi-edge cascade, assume a smooth radius of curvature on the order of meters to tens of meters at the obstacle peak. A sharp arroyo edge with curvature radius below the wavelength approximates a true

knife-edge, for which diffraction loss is larger than the rounded-edge value for the same obstruction parameter. Standard-default rounded-edge handling therefore understates the diffraction shadow into the canyon bottoms.

3.5 Atmospheric refractivity differs from standard-atmosphere defaults

Diffraction loss over a terrain edge depends on the effective Earth radius factor k, which is set by the vertical gradient of atmospheric refractivity. Standard models default to k = 4/3, corresponding to an annual-mean sea-level refractivity gradient of approximately −40 N-units/km. The Placitas mesa surface is at approximately 5,500 ft elevation in an arid continental climate; published refractivity climatologies (ITU-R P.453; Bean and Dutton 1968) document lower mean refractivity and a different annual cycle of refractivity gradient in elevated arid regions than in the temperate maritime regimes from which the standard default was derived. The effective k-factor over Placitas terrain is, on average, closer to 1.0 than to the standard 4/3 default, producing additional diffraction loss into shadowed valleys relative to the model default.

4. Specific evidentiary deficits in the applicant's submission

- The applicant's submitted RF Design Analysis does not identify the specific propagation-model software package (e.g., ATOLL, Mentum Planet, Asset, in-house tool) used to generate the RSRP rasters.
- The submission does not document the clutter-classification raster applied to the Placitas study area: which clutter class was assigned to which parcels, what the source dataset for that classification was, and when it was last updated.
- The submission does not identify the diffraction algorithm (single-edge knife, Deygout cascade, Epstein–Peterson, Bullington, Vogler rounded-edge) or the parameter values used.
- The submission does not present any drive-test calibration data, continuous-wave measurements, or other empirical validation that the propagation model has been tuned to Placitas-specific terrain and clutter conditions. The OpenSignal crowdsourced data shown on the applicant's slide 3 is not a calibration record; it is consumer-grade endpoint-reported signal data of unknown statistical reliability.
- The submission does not include the isolated single-tower RSRP raster that the planning tool produces routinely and that would directly display the proposed tower's marginal contribution. The aggregate-network framing critiqued in Part IV is consistent with — but does not by itself prove — over-reliance on default-parameter clutter and diffraction settings.

5. Implications for the Commission's evaluation

The marginal-contribution map in Part IV shows substantial modeled coverage benefit into locations Part II independently identified as geometric-shadow zones. The mechanism by which that benefit accrues in the applicant's model is non-line-of-sight propagation. The standard-default parameter values for diffraction, reflection, and scattering used in commercial RF-planning tools are calibrated to environmental conditions that depart from Placitas in every one of the five physical respects documented in Section 3 of this supplement. The proper inference from this fact pattern is not that the proposed tower will produce no coverage benefit in shadowed areas — diffraction and scattering are real propagation mechanisms — but that the

magnitude of the modeled coverage benefit in shadowed areas, as represented on the submitted RSRP rasters, is likely overstated relative to what residents will actually receive.

Two consequences follow for the Commission's deliberation.

- First, the applicant's coverage justification rests on a model prediction whose key parameters are undisclosed and whose default values are environmentally inappropriate. The Commission may reasonably require the applicant to disclose the propagation-model software and version, the clutter-classification scheme, the diffraction algorithm and parameters, and any Placitas-specific calibration data before treating the submitted RSRP rasters as a reliable basis for a coverage-need finding.
- Second, in the absence of model disclosure and calibration data, independent empirical measurement is the proper arbiter of coverage claims. A drive-test program covering the principal residential corridors of Placitas — NM-165 from the I-25 junction east through the village, the residential interior of Anasazi Trails, the platted streets of Placitas Homesteads, the access roads of Sundance Mesa and La Mesa, and the back-canyon residential streets — would produce the empirical signal-strength record against which the applicant's modeled coverage gap can be tested.

Summary

The applicant's submitted RSRP rasters depict modeled coverage benefit into geometric-shadow areas. That benefit, in any propagation model, can only arise from non-line-of-sight mechanisms — diffraction, reflection, and scattering. Those mechanisms are parameter-driven, the parameter defaults in commercial RF-planning tools are calibrated to populated environments, and the Placitas environment differs from those calibration environments in building density, vegetation type and cover, soil electrical properties, terrain-edge geometry, and atmospheric refractivity. Each of these five departures, in the direction documented, contributes to over-prediction of coverage into shadowed receiver locations. The applicant has not disclosed the model, its parameters, or any local calibration. The Commission should treat the modeled coverage benefit in geometrically-shadowed portions of the analyzed area as a model prediction of uncertain accuracy rather than as an established fact, and should consider requiring empirical drive-test verification of coverage claims that the proposed tower will materially serve back-canyon and ridge-shadowed residential areas.

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Proposed Placitas Cell Tower Adds Minimal Coverage for Verizon Customers

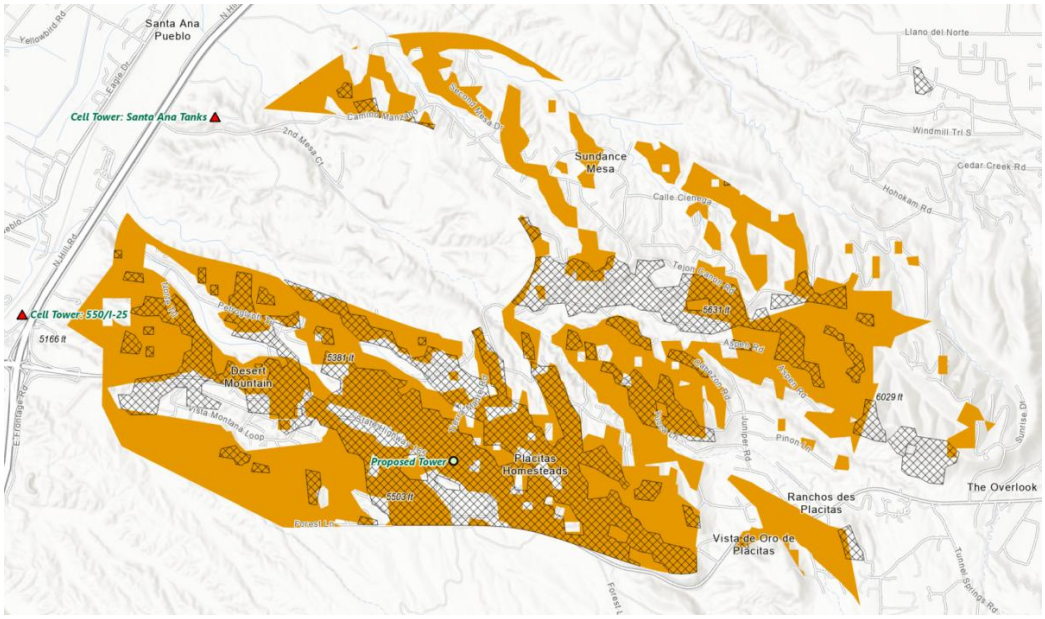
My name is John Branum. I'm a Civil Engineer and GIS Cartographer for the Bureau of Reclamation's Office in Albuquerque. I'm also a Verizon customer and Placitas resident, but the proposed tower would not fall into my viewshed.

In The Development Narrative Report, the applicant claims that this site is "for the purpose of expanding wireless coverage to the area identified as having high demand for Verizon Wireless Services ..." While coverage would be expanded, it would be by twenty percent, at most.

Ordinance 55, 9A clearly instructs the applicant to locate... in accordance with the following priorities: 1) ON EXISTING TOWERS; 2) COUNTY-OWNED PROPERTIES; 3) heavy industrial; 4) Commercial; 5) Agricultural; and finally, 6) residential areas.

Based on GIS line-of-sight (LoS) mapping using ArcGIS Pro 3.7 ("Viewshed" tool), the proposed location is not the best value for coverage expansion in western Placitas. It is 2nd in coverage area to the tower at the Santa Ana Tanks site (35°20'05.29"N 106°30'59.32"W) west of Placitas, east of I-25 – a location which would honor priority #1. Another site could be Fire Station #41 in Placitas, which would honor priorities #2 and #1. The applicant has not shown sufficient reason for declining these priority options.

In the LoS map below, orange depicts the areas of residential western Placitas covered by existing Verizon towers if the Santa Ana Tanks tower was added to the array. Gray hatching shows LoS coverage from the proposed tower. Without the addition of the Santa Ana Tanks tower, the proposed tower would add twenty percent coverage to Verizon's existing footprint in western Placitas. With the Santa Ana Tanks tower, the proposed tower only adds nine percent and still misses large neighborhoods.



The hill-and-canyon terrain of western Placitas clearly requires a Small Cell Tower array rather than a single large pole installation.

Thank you.

John Branum
johnrbranum@gmail.com
11 Tres Primas
Placitas, NM
87043

From:	C. Edwin Garner
To:	Planning and Zoning Main
Subject:	Re: Conditional Use Permit CU-26-001 — Proposed 75-ft Wireless Monopole at 221 NM-165, Placitas, NM 87043 (APN 102-307-302-8180) Submission of Part IV Supplement — Propagation Model Critique (V1)
Date:	Monday, May 18, 2026 4:33:53 PM
Attachments:	img-914296d7-a7bc-4884-a00c-231ac081a3d0 img-6b6426c0-abd3-4480-b8a1-e68663dff421 Part_IV_Marginal_Coverage_Contribution_V1.pdf Part_IV_Supplement_Propagation_Model_Critique_V1 (1).pdf
Importance:	High

May 18, 2026

Doraida Arias, Interim Director
Planning & Zoning Department
Sandoval County Administration Building
1500 Idalia Road, Building “D”, 2nd Floor
Bernalillo, NM 87004

Re: Conditional Use Permit CU-26-001 — Proposed 75-ft Wireless Monopole at 221 NM-165, Placitas, NM 87043 (APN 102-307-302-8180)
Submission of Part IV Supplement — Propagation Model Critique (V1)

Dear Director Arias:

Please see my submission of Part IV (Marginal Coverage Contribution of the Proposed Tower) and please find enclosed the companion technical document: Part IV — Supplement: Default Propagation-Model Assumptions and Their Inapplicability to the Placitas High-Desert Arroyo Environment (V1). This supplement is offered as a focused technical companion to Part IV and forms the fifth document in the integrated technical record submitted in opposition to CU-26-001 (Parts I, II, III, IV, and this Part IV Supplement).

Part IV demonstrates that while the applicant’s submitted RSRP coverage rasters suggest substantial coverage benefit at locations independently identified in the Part II Terrain Analysis as lying in deep geometric shadow of intervening ridges. This supplement addresses the only physical mechanisms by which a propagation model can predict signal into those shadowed locations — diffraction, reflection, and scattering — and documents why the standard default parameter values for those mechanisms in commercial RF-planning software are calibrated to populated environments unlike Placitas and therefore overstate the modeled coverage benefit in shadowed terrain (see Figure 1 and Figure 2, below)

Figure 1 presents the two sponsor-submitted rasters side-by-side with the computed marginal-contribution panel on the right. The proposed tower location is marked with a star in all three panels; the sponsor's drawn coverage-objective ellipse is preserved in red on the marginal panel for reference.

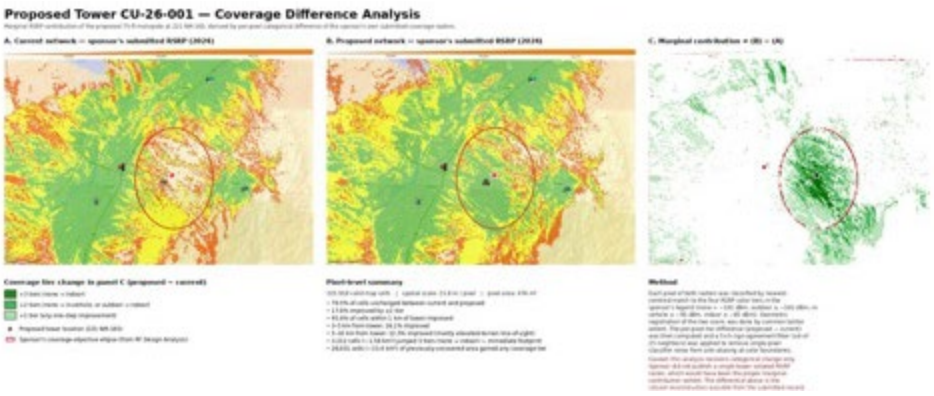


Figure 1. Three-panel comparison. Panel A: sponsor-submitted "RSRP – Current Coverage." Panel B: sponsor-submitted "RSRP – Proposed Coverage." Panel C: marginal contribution of the proposed tower, computed as the per-pixel categorical difference (B − A) after registration and noise filtering. Greens in Panel C denote coverage-tier improvements; the depth of green encodes the magnitude of the improvement (1, 2, or 3 tiers).

Marginal-contribution map (Figure 2)

Figure 2 magnifies the marginal-contribution panel and overlays it on a desaturated topographic backdrop so the geographic context (drainages, ridges, road network) remains visible.

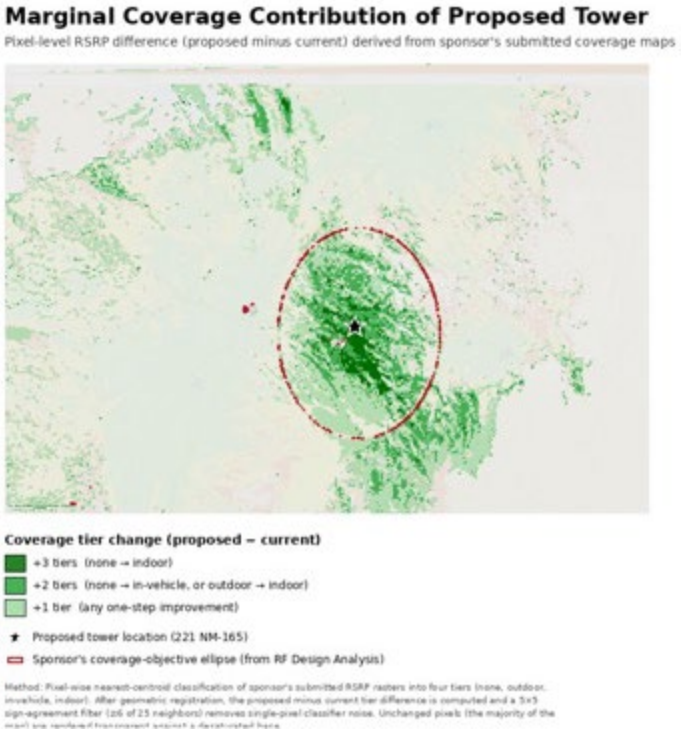


Figure 2. Marginal coverage contribution of the proposed 75-ft monopole. The strongest improvements (dark green, 3-tier jump) cluster immediately around the tower site. The improvement intensity attenuates rapidly with distance and is largely contained within the sponsor's drawn coverage-objective ellipse. Western and southwestern corridors — including the back-canyon residential neighborhoods served by NM-165 west of the tower — receive scattered, weak improvement consistent with terrain shadowing.

The supplement makes the following technical points, each grounded in peer-reviewed and standards-track sources (Hata 1980; Walfisch and Bertoni 1988; Deygout 1966; Vogler 1982; Longley and Rice 1968; ITU-R Recommendations P.526, P.833, P.1546, and

P.1812; Parsons 2000; Saunders and Aragón-Zavala 2007):

- The four dominant propagation models used in commercial RF planning — the Okumura–Hata family, COST-231 Walfisch–Ikegami, the Standard Propagation Model implemented in ATOLL and equivalent tools, and the Longley–Rice Irregular Terrain Model — were each empirically calibrated on populated environments. **None was calibrated on high-desert terrain with sharp arroyo geometry, sparse low-stature vegetation, and predominantly rocky-sandy ground.**
- The Placitas built and natural environment departs from the standard "suburban" or "rural" clutter-class defaults in five physically significant respects: (a) residential building density at least an order of magnitude lower than the default "suburban" calibration range of 8 to 20 units per acre; (b) sparse, low-stature high-desert vegetation rather than the continuous 8 to 20 m canopy assumed in default vegetation-clutter parameters; (c) dry, rocky, low-permittivity soil with Fresnel reflection coefficients smaller in magnitude than those produced by the default moist-temperate-soil parameter values; (d) sharp knife-edge arroyo geometry rather than the rounded ridges assumed by default rounded-edge diffraction implementations; and (e) elevated arid continental atmospheric refractivity producing an effective Earth-radius factor closer to 1.0 than to the standard 4/3 default. **Each of these five departures, in the direction documented, contributes to over-prediction of coverage benefit at shadowed receiver locations.**

- The applicant's submitted documents do not identify the specific propagation-model software package used, the clutter-classification scheme applied to the Placitas area, the diffraction algorithm and its parameters, or any drive-test calibration data supporting the model output for Placitas terrain. **The OpenSignal crowdsourced data shown on the applicant's slide 3 is not a calibration record.**

- **In the absence of model disclosure and local calibration data, the modeled coverage benefit into geometrically-shadowed portions of the analyzed area should be treated as a model prediction of uncertain accuracy rather than as an established fact. T**he Commission may reasonably require the applicant to disclose the propagation-model software and version, the clutter-classification scheme, the diffraction algorithm and parameters, and any Placitas-specific calibration data before treating the submitted RSRP rasters as a reliable basis for a coverage-need finding. In the alternative, empirical drive-test measurement along the principal residential corridors of Placitas would be the proper arbiter of the coverage claims.

Full methodology, parameter ranges, and references are documented across the seven pages of the enclosed supplement. I respectfully request that this Part IV Supplement be entered into the public record for CU-26-001 and made available to the Planning & Zoning Commission in advance of the May 19, 2026 public hearing. Please confirm receipt and inclusion in the record at your convenience.

Thank you for your attention to this matter.

Respectfully,

C. Edwin Garner, Ph.D.

46 Camino Barranca

Placitas, NM 87043

Enclosure: Part IV — Supplement: Default Propagation-Model Assumptions and Their Inapplicability to the Placitas High-Desert Arroyo Environment (V1), 7 pp.
cc: Sandoval County Planning & Zoning Commission, public record file CU-26-001

From: Steve Wall
To: Planning and Zoning Main
Subject: Opposition to CU-26-001
Date: Monday, May 18, 2026 6:49:58 PM

Re: Application CU-26-001

Dear Commissioners,

I have lived in Placitas for over 20 years, just north of the proposed tower location, and I moved here for exactly what a 75-foot industrial structure would take away: natural desert beauty and the mountain views that come with it. From my south-facing windows, I would see this tower every single day. That is not a minor inconvenience. It is a permanent alteration to the place I chose to live.

The site-selection record in this application gives me no confidence the applicant did the work the County's rules actually require. The County has a clear priority order for where towers should go, and residential areas sit at the very bottom of that list. The applicant started at the County Fire Station — a much higher priority — and when the lease talks did not come together, settled on a vacant lot in a residential area without anything in the materials showing what was weighed in between. The rules are clear that a failed lease negotiation is not a valid justification for skipping the remaining priorities. Beyond that, the County's rules require a genuine inventory of existing towers AND other suitable structures within four miles — utility poles, building facades, streetlights, anything that could host a small antenna. The carrier with the strongest coverage in Placitas delivers it through small antennas on existing infrastructure like those water tanks I can see to the east, not through new monopoles. Verizon's application is silent on why that path is not the answer here.

The application didn't seem all that clear. What about lighting on top at night, isn't it tall enough for evaluation of nighttime blinking lights? That would certainly make it worse.

The property I have spent more than twenty years building my life around will carry a visible 75-foot tower to every future buyer. Studies on this are not ambiguous: homes with direct exposure to towers like this lose value. That harm, combined with everything above, leaves me no reason to think this application belongs before the Commission in its current form.

Please deny this application.

Sincerely,

Stephen Wall
9 Calle del Arroyo
Placitas, NM