

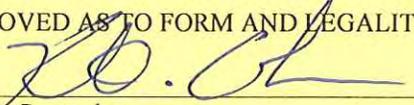


(DESCRIBE PROPERTY)

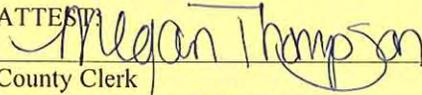
Property is located at 16423 Endicott Rd  
Applicant is Justin Anderson, SSC, Inc., an agent for Verizon Wireless  
Owners are Patrick Pierson & Brian Steele  
Current Zoning is AG, Agricultural District  
The property contains 115.39± acres

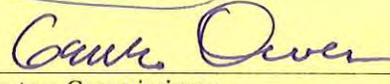
SEE ATTACHED LEGAL DESCRIPTION AND CONDITIONAL USE PERMIT.

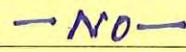
APPROVED AS TO FORM AND LEGALITY:

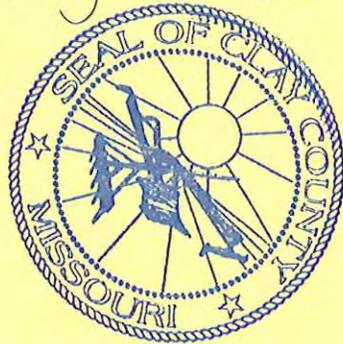
  
\_\_\_\_\_  
County Counselor

  
\_\_\_\_\_  
Presiding Commissioner

ATTEST:  
  
\_\_\_\_\_  
County Clerk

  
\_\_\_\_\_  
Western Commissioner

  
\_\_\_\_\_  
Eastern Commissioner



CLAY COUNTY PLANNING AND ZONING COMMISSION ("PZC")  
CONDITIONAL USE PERMIT



Date: September 15, 2014

Case: September 14-128CUP – Conditional Use Permit – Verizon/Endicott Rd Communications Tower

Applicant(s): Justin Anderson  
SSC, Inc., an agent for Verizon Wireless  
9900 W 109<sup>th</sup> St  
Suite 300  
Overland Park, KS 66210

Owner(s): Patrick Pierson & Brian Steele  
10186 Airfield Ln  
Richmond, MO 64085-2268

Work Session: Date Requested: 09/22/2014

Business Session: Date Requested: 09/29/2014

Past Commission Action: Angles Subdivision, AG to R-1, 1970.

### **Assessment**

Justin Anderson with Selective Site Consultants, Inc. (SSC), an agent for Verizon Wireless on behalf of the property owners Patrick Pierson and Brian Steele is requesting approval of a **Conditional Use Permit (CUP)** to erect a Commercial Telecommunications Facility specifically for wireless mobile and data services at approximately 16423 Endicott Rd. The property is approximately 115.39±acres in size and zoned Agricultural District (AG) and Rural Residential (R-1).

This request is to locate a 160-foot tall monopole style commercial communications tower ("cell tower") in order to provide mobile phone and data service to the surrounding area.

The application was filed on August 1, 2014, and a public hearing to consider approving the CUP was held before the Clay County Planning and Zoning Commission on September 9, 2014 to request the use of the commercial wireless communication tower/antenna.

### **Code Considerations**

The subject request for a Commercial Telecommunications Facility is handled under multiple portions of the 2011 Clay County Land Development Code ("LDC"). The use table inside **Section 151-6.1** includes a "Telecommunications Facility, Commercial" designation requiring approval of a Conditional Use Permit ("CUP") in the Agricultural ("AG"), Residential Rural (R-1), Residential Ranchette (R-5), Residential Urban (R-U), Commercial Services (C-3), Limited Industrial (I-1) and General Industrial (I-2) zoning districts. As such, the subject request must meet all of the approval criteria for a CUP in **Section 151-3.10 (A) (13)** detailed below:

- A) The proposed use complies with the intent of the Comprehensive Plan and general provisions of the Land Development Code, modified for the specific use request.
- B) The proposed use in its proposed location will not have a substantial adverse impact on the public health, safety or general welfare.
- C) The proposed use will not cause substantial injury to the value of other property in the vicinity.
- D) Adequate access routes will be provided and designed to prevent traffic hazards and to minimize traffic congestion in public streets.
- E) Adequate public safety, transportation and utility facilities/services will be available to service the subject property while maintaining adequate levels of service for existing development, and
- F) The proposed use is compatible with adjacent uses in terms of scale, site design, and operating characteristics (i.e., hours of operation, traffic generation, lighting, noise, odor, dust, and other external impacts).

Under Section 151-6.2 (G), the LDC provides specific use standards for commercial antennas/towers which apply to this request and are referenced below:

1) Federal Requirements

STAFF RESPONSE: *The applicant has received a notice of no hazard from FAA.*

2) Abandoned Towers – The LDC requires abandoned towers be removed at the owner's expense, and a bond or letter of credit be maintained for this purpose in the County Clerk's Office. The amount shall be equal to a demolition bid of the tower structure, updated every 5 years.

3) Inspection – The tower shall be inspected every 24 months by a registered structural engineer. A copy of the inspection report shall be provided to the County.

4) Accessory Equipment Storage – mobile equipment or equipment not used in direct support of a tower facility shall not be stored or parked on the site.

STAFF RESPONSE: *An accessory equipment/storage shelter building is proposed in conjunction with this tower request, but not intended to store any unrelated equipment.*

5) Fences – Towers shall be enclosed by security fencing not less than 6 feet in height with anti-climbing device, and have a locked gate. Security signs shall be posted on the fence.

STAFF RESPONSE: *supplied drawings show 6-foot tall chain-link fence around full perimeter of facility site. Monopole design is inherently anti-climbing.*

6) Design and Construction – The LDC requires a building permit be issued for construction of a tower, and plans and specifications be submitted from a registered professional engineer.

7) Lighting – If lighting is required, the County Commission may review the available lighting alternatives and approve the design that would cause the least disturbance to the surrounding views.

STAFF RESPONSE: *No additional lighting is required in relationship to this request.*

8) Landscaping – The tower compound shall be landscaped with a buffer of plant materials that effectively screens the compound from adjacent property.

STAFF RESPONSE: *The applicant has submitted site plan drawings that adequately show tower landscaping. See sheet "A10" of site plan drawings.*

9) Co-locations – The LDC requires tower installations above 120 feet in height provide a minimum capacity for three (3) total users that includes requesting provider.

STAFF RESPONSE: *The applicant has submitted site plan drawings that adequately show the subject request's ability to house up to three (3) users. See "Tower Elevation" depiction on sheet "A03-1" of site plan drawings.*

10) Separation from Existing Towers – A monopole tower such as this subject request must be at least 1,500 feet from any existing tower.

STAFF RESPONSE: *A proposed new monopole facility such as the subject request must be at least 1,500 feet from any existing tall structures. The proposed facility is approximately 6,000 feet (~ 1.29 miles) southeast of the existing PWSD # 8 water tower.*

11) Height and setback – No tower shall exceed 300 total feet above ground level, and must be setback a minimum distance equal to 100% of the height of the tower from all adjoining property lines.

STAFF RESPONSE: *This tower is proposed to be 160 feet in height and is set to be located approximately 200 feet from the east property line, thereby meeting this requirement.*

Section 151-5.5 of the LDC sets additional height hazard limitations for tall structures within the Airport Overlay Zoning District ("A-O"). The subject request falls approximately within the 1,200 feet above mean sea level (AMSL) max height level of the "Airport Conical Zones" (ACZ). This request as submitted reaches close to 1,113.85 AMSL (160' structure height + 953.85' ground elevation), thereby meeting or exceeding the additional standards set inside A-O.

**Outside Agency Review**

The Clay County Health Department has given preliminary and final approval. Platte-Clay Electric stated in an email dated 08/25/2014 that they have no objection to the subject request and that they have existing facilities to serve the proposed tower. Clay County Public Water Supply District #3 has not responded as of this writing. The Kearney Fire Protection District serves this property.

Clay County Highway Department has given approval, but noted that a driveway permit will need to be approved prior to a building permit being issued for the tower.

**Findings**

No opposition was received during Planning & Zoning Commission (PZC) meeting.

**PZC Recommendations**

Staff recommends the request for the **Conditional Use Permit** to erect a 160-foot tall monopole Commercial Telecommunications Facility be **approved with following conditions** as shown on Exhibit A:

**Exhibit A**

1. The CUP shall be based on a time frame of fifteen (15) years.
2. Written approval from FAA prior to issuance of building permit.
3. Clay County Highway Department driveway permit be approved prior to issuance of building permit.
4. Tower design shall be reviewed at the time a building permit is issued, and at minimum shall include the following elements:
  - a. Maximum height for this communications tower shall be 160 feet.
  - b. The monopole tower shall be set back a minimum distance of 160 feet from all adjoining property lines.
  - c. Construction plans and specification drawings be submitted from a registered professional engineer in the State of Missouri.
5. One (1) co-location shall be granted at no charge to the Clay County Sheriff Department and/or any other authorized public safety responder servicing the tower's coverage area.
6. Every twenty-four (24) months the tower must be inspected by a structural engineer registered in the State of Missouri who is regularly involved in maintenance, inspection and erection of communications towers.
7. If the tower is damaged or destroyed, the property owners will have 120 days to repair or dismantle the facility.
8. No hazardous materials may be stored on the property.

The PZC Commissioners' final vote was 4/0/0 recommending **approval** of the request **with conditions** for a Conditional Use Permit (CUP) for the use of a 160-foot commercial wireless communication tower at 16423 Endicott Rd.

**Action needed:** Approval of Resolution authorizing the Conditional Use Permit (CUP).

Chairman, Planning and Zoning Commission

ON FILE

Director of Planning and Zoning

Mark M. Jones

*Applicant/Property Information:*

Property is located at 16423 Endicott Rd  
Applicant is Justin Anderson, SSC, Inc., an agent for Verizon Wireless  
Owners are Patrick Pierson & Brian Steele  
Current Zoning is AG, Agricultural District  
The property contains 115.39± acres  
Application Submittal Date: 08/01/2014  
PZC Hearings: 09/09/2014

*Legal Description:*

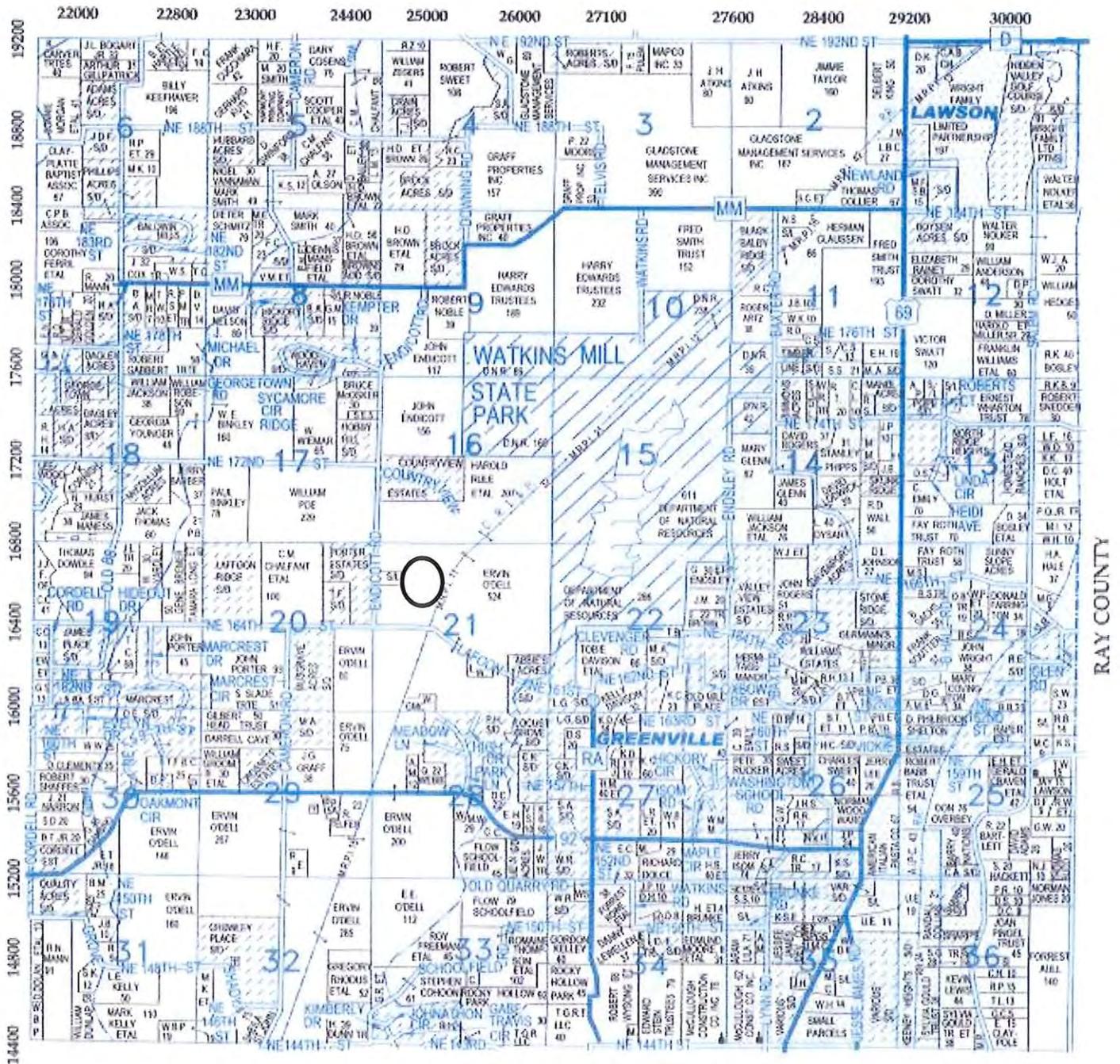
THAT PORTION OF THE NORTH HALF OF SECTION 21, TOWNSHIP 53 NORTH, RANGE 30 WEST, CLAY COUNTY, MISSOURI, WHICH LIES WEST OF THE WESTERLY RIGHT-OF-WAY LINE OF THE ST. PAUL AND KANSAS CITY SHORT LINE RAILROAD COMPANY/CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD AND NORTH OF COUNTY ROAD, SUBJECT TO ANY PART THEREOF IN ROAD RIGHT OF WAYS.

LESS AND EXCEPT THAT PART BOUNDED AS FOLLOWS: BEGINNING AT THE SOUTHWEST CORNER OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SAID SECTION; THENCE NORTH ALONG THE WEST LINE OF SAID QUARTER SECTION, A DISTANCE OF 80.5 FEET TO A POINT, THENCE EAST 80.5 FEET FROM AND PARALLEL WITH THE SOUTH LINE OF SAID QUARTER SECTION, A DISTANCE OF 660.0 FEET TO A POINT; THENCE SOUTH 660.0 FEET FROM AND PARALLEL WITH THE WEST LINE OF SAID SECTION, A DISTANCE OF 80.5 FEET TO THE SOUTH LINE OF SAID QUARTER SECTION; THENCE CONTINUING SOUTH AND PARALLEL WITH SAID WEST LINE, A DISTANCE OF 249.5 FEET TO A POINT, THENCE WEST 249.5 FEET FROM AND PARALLEL WITH SAID SOUTH QUARTER SECTION LINE, A DISTANCE OF 660.0 FEET TO A POINT IN THE WEST LINE OF SAID SECTION; THENCE NORTH ALONG THE WEST LINE OF SAID SECTION, 249.5 FEET TO THE POINT OF BEGINNING.

# Sept. 14-128CUP – Endicott Rd / Verizon Commercial Telecommunications Facility

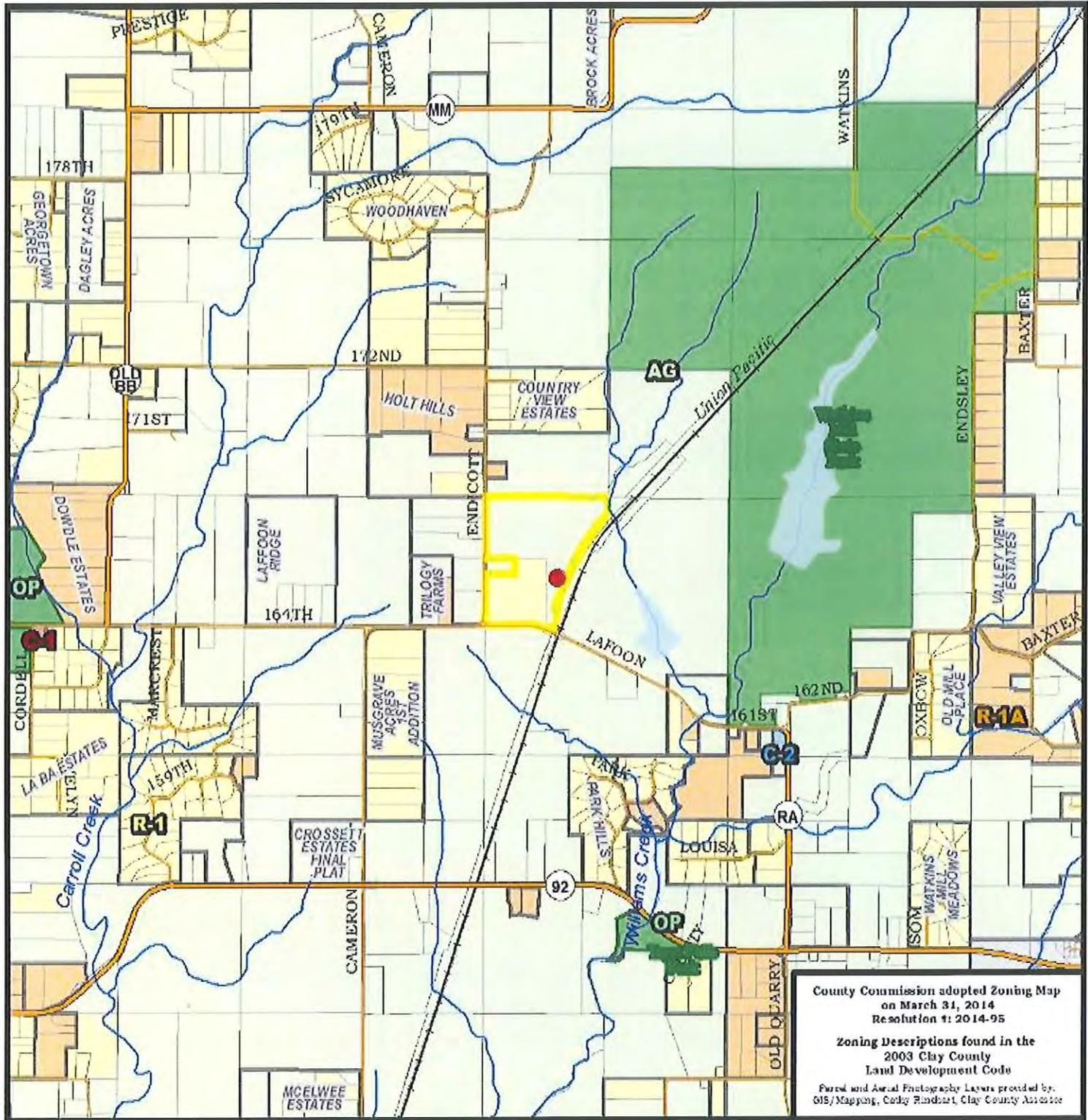
## Attachment A - Vicinity Map

### TOWNSHIP 53N • RANGE 30W



# Sept 14-128CUP – Endicott Rd Verizon Cell Tower

## Attachment B - Existing Conditions Map



County Commission adopted Zoning Map on March 31, 2014  
 Resolution #: 2014-95

Zoning Descriptions found in the 2003 Clay County Land Development Code

Aerial and Aerial Photography Layers provided by GIS/Mapping, Cedar Road, Clay County Assessor

**Planning & Zoning Department**



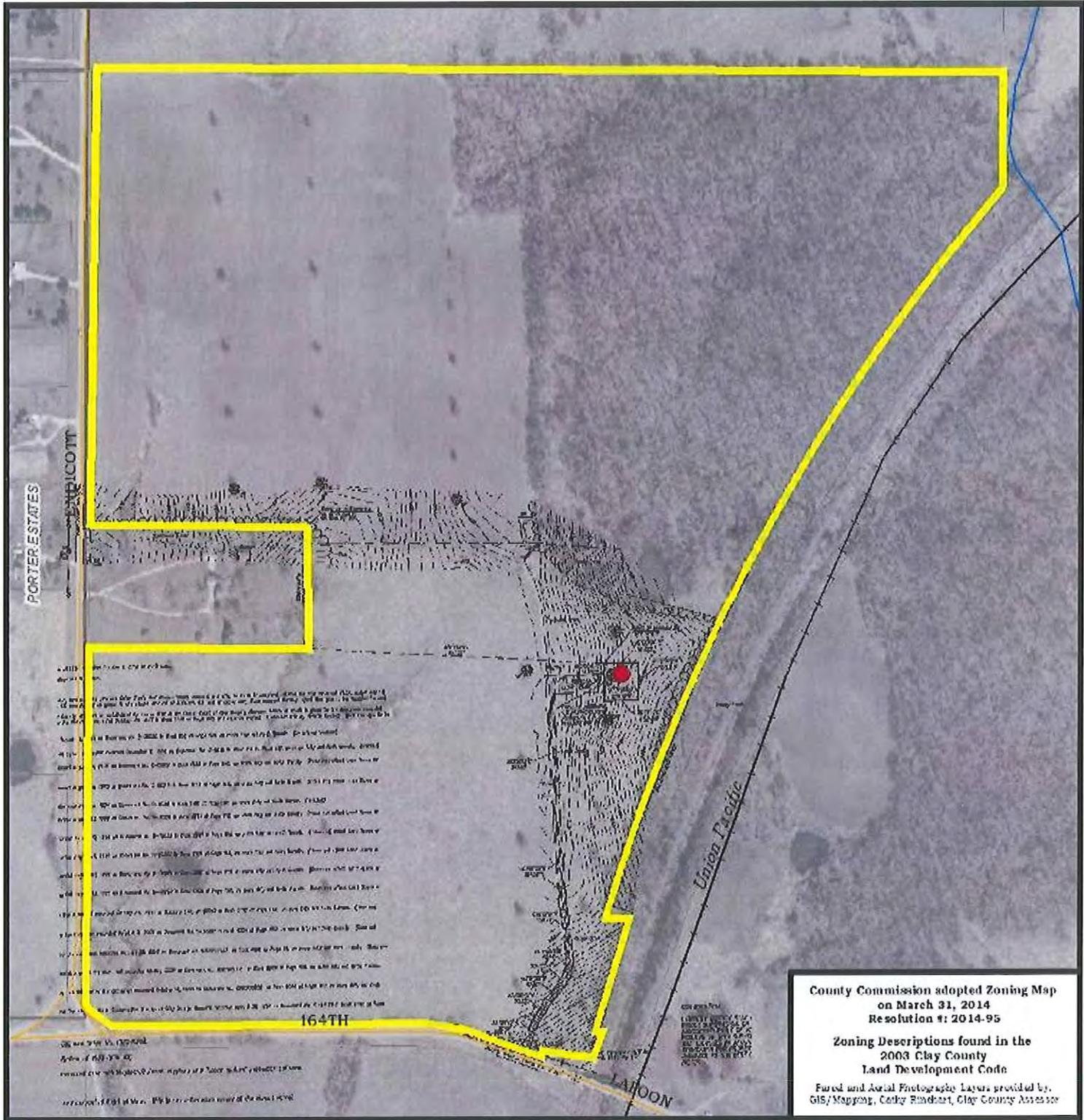
1 inch = 3,000 feet  
 1 inch = 0.57 miles

### LEGEND

- |                   |               |           |             |                |             |               |                            |                                     |                                |                   |
|-------------------|---------------|-----------|-------------|----------------|-------------|---------------|----------------------------|-------------------------------------|--------------------------------|-------------------|
| Property Line     | Streams (EPA) | Railroads | Interstates | State Highways | Local Roads | Highway Ramps | Subdivisions               | 2014 City Limits                    | Parks                          | County Boundaries |
| Overlay Districts | AG            | R-1       | R-1A/R-5    | R-1B/RU        | R-2         | OP            | CD (Conservation District) | POD (Preservation Overlay District) | PLD (Planned Unit Development) | C-1               |
|                   |               |           |             |                |             |               |                            |                                     |                                | C-2               |
|                   |               |           |             |                |             |               |                            |                                     |                                | C-3               |
|                   |               |           |             |                |             |               |                            |                                     |                                | M-1               |
|                   |               |           |             |                |             |               |                            |                                     |                                | M-2               |
|                   |               |           |             |                |             |               |                            |                                     |                                | OP                |

# Sept 14-128CUP – Endicott Rd Verizon Cell Tower

## Attachment C - Site Plan Map



Map Document: G:\GIS\Project\_Files\vacatnr MAP - 2 x 11" P.mxd  
3/8/2014 4:34:48 PM

**Planning & Zoning Department**



1 inch = 400 feet  
1 inch = 0.08 miles

### LEGEND

- Property Line
- Streams (EPA)
- Railroads
- Interstates
- State Highways
- Local Roads
- Highway Ramps
- Subdivisions
- 2014 City Limits
- Parks
- County Boundaries

### Overlay Districts

- CD (Conservation District)
- POD (Preservation Overlay District)
- PUD (Planned Unit Development)





**CLAY COUNTY PLANNING AND ZONING COMMISSION (“PZC”)  
CONDITIONAL USE PERMIT**

Date: March 9, 2015

Case: September 14-128CUP – Conditional Use Permit – Verizon/Endicott Rd Communications Tower

Applicant(s): Justin Anderson  
SSC, Inc., an agent for Verizon Wireless  
9900 W 109<sup>th</sup> St  
Suite 300  
Overland Park, KS 66210

Owner(s): Patrick Pierson & Brian Steele  
10186 Airfield Ln  
Richmond, MO 64085-2268

Work Session: Date Requested: 03/16/2015

Business Session: Date Requested: 03/23/2015

Past Commission Action: Angles Subdivision, AG to R-1, 1970.

***Assessment***

Justin Anderson with Selective Site Consultants, Inc. (SSC), an agent for Verizon Wireless on behalf of the property owners Patrick Pierson and Brian Steele is requesting approval of a **Conditional Use Permit (CUP)** to erect a Commercial Telecommunications Facility specifically for wireless mobile and data services at approximately 16423 Endicott Rd. The property is approximately 115.39+acres in size and zoned Agricultural District (AG) and Rural Residential (R-1).

This request is to locate a 160-foot tall monopole style commercial communications tower (“cell tower”) in order to provide mobile phone and data service to the surrounding area.

The application was filed on August 1, 2014, and a public hearing to consider approving the CUP was held before the Clay County Planning and Zoning Commission (PZC) on September 9, 2014 to request the use of the commercial wireless communication tower/antenna. The County Commission originally heard the request at September 22, 2014 combined business/work session. During the business/work session, the County Commission remanded the request back to the PZC so as to gather more information from all vested parties to the case.

The PZC heard the request at the December 2, 2014 meeting, where it was tabled to the February meeting to allow for more time to submit additional information from all vested parties. January 26, 2015 was the stated deadline by the PZC to submit all information to staff. The February PZC meeting was postponed to the March meeting due to lack of quorum. At the March 3, 2015 meeting, the PZC recommended approval of the request.

***Code Considerations***

The subject request for a Commercial Telecommunications Facility is handled under multiple portions of the 2011 Clay County Land Development Code (“LDC”). The use table inside **Section 151-6.1** includes a “Telecommunications Facility, Commercial” designation requiring approval of a Conditional Use Permit (“CUP”) in the Agricultural (“AG”), Residential Rural (R-1), Residential Ranchette (R-5), Residential Urban (R-U), Commercial Services (C-3), Limited Industrial (I-1) and General Industrial (I-2) zoning districts. As such, the subject request must meet all of the approval criteria for a CUP in **Section 151-3.10 (A) (13)** detailed below:

- A) The proposed use complies with the intent of the Comprehensive Plan and general provisions of the Land Development Code, modified for the specific use request.
- B) The proposed use in its proposed location will not have a substantial adverse impact on the public health, safety or general welfare.
- C) The proposed use will not cause substantial injury to the value of other property in the vicinity.

- D) Adequate access routes will be provided and designed to prevent traffic hazards and to minimize traffic congestion in public streets.
- E) Adequate public safety, transportation and utility facilities/services will be available to service the subject property while maintaining adequate levels of service for existing development, and
- F) The proposed use is compatible with adjacent uses in terms of scale, site design, and operating characteristics (i.e., hours of operation, traffic generation, lighting, noise, odor, dust, and other external impacts).

Under Section 151-6.2 (G), the LDC provides specific use standards for commercial antennas/towers which apply to this request and are referenced below:

1) Federal Requirements

STAFF RESPONSE: *The applicant has received a notice of no hazard from FAA.*

- 2) Abandoned Towers – The LDC requires abandoned towers be removed at the owner's expense, and a bond or letter of credit be maintained for this purpose in the County Clerk's Office. The amount shall be equal to a demolition bid of the tower structure, updated every 5 years.
- 3) Inspection – The tower shall be inspected every 24 months by a registered structural engineer. A copy of the inspection report shall be provided to the County.
- 4) Accessory Equipment Storage – mobile equipment or equipment not used in direct support of a tower facility shall not be stored or parked on the site.

STAFF RESPONSE: *An accessory equipment/storage shelter building is proposed in conjunction with this tower request, but not intended to store any unrelated equipment.*

- 5) Fences – Towers shall be enclosed by security fencing not less than 6 feet in height with anti-climbing device, and have a locked gate. Security signs shall be posted on the fence.

STAFF RESPONSE: *Applicant's supplied drawings show 6-foot tall chain-link fence around full perimeter of facility site. A monopole tower design is inherently anti-climbing.*

- 6) Design and Construction – The LDC requires a building permit be issued for construction of a tower, and plans and specifications be submitted from a registered professional engineer.
- 7) Lighting – If lighting is required, the County Commission may review the available lighting alternatives and approve the design that would cause the least disturbance to the surrounding views.

STAFF RESPONSE: *No additional lighting is required in relationship to this request.*

- 8) Landscaping – The tower compound shall be landscaped with a buffer of plant materials that effectively screens the compound from adjacent property.

STAFF RESPONSE: *The applicant has submitted site plan drawings that adequately show tower landscaping. See sheet "A10" of site plan drawings.*

- 9) Co-locations – The LDC requires tower installations above 120 feet in height provide a minimum capacity for three (3) total users that includes requesting provider.

STAFF RESPONSE: *The applicant has submitted site plan drawings that adequately show the subject request's ability to house up to three (3) users. See "Tower Elevation" depiction on sheet "A03-1" of site plan drawings.*

- 10) Separation from Existing Towers – A monopole tower such as this subject request must be at least 1,500 feet from any existing tower.

STAFF RESPONSE: *A proposed new monopole facility such as the subject request must be at least 1,500 feet from any existing tall structures. The proposed facility is approximately 6,000 feet (~ 1.29 miles) southeast of the existing PWSD # 8 water tower.*

- 11) Height and setback – No tower shall exceed 300 total feet above ground level, and must be setback a minimum distance equal to 100% of the height of the tower from all adjoining property lines.

STAFF RESPONSE: *This tower is proposed to be 160 feet in height and is set to be located approximately 200 feet from the east property line, thereby meeting this requirement.*

Section 151-5.5 of the LDC sets additional height hazard limitations for tall structures within the Airport Overlay Zoning District ("A-O"). The subject request falls approximately within the 1,200 feet above mean sea level (AMSL) max height level of the "Airport Conical Zones" (ACZ). This request as submitted reaches close to 1,113.85 AMSL (160' structure height + 953.85' ground elevation), thereby meeting or exceeding the additional standards set inside A-O.

### ***Outside Agency Review***

The Clay County Health Department has given preliminary and final approval. Platte-Clay Electric stated in an email dated 08/25/2014 that they have no objection to the subject request and that they have existing facilities to serve the proposed tower. Clay County Public Water Supply District #3 has not responded as of this writing. The Kearney Fire Protection District serves this property.

Clay County Highway Department has given approval, but noted that a driveway permit will need to be approved prior to a building permit being issued for the tower.

### ***Findings***

The PZC voted in favor of the request at the March 3, 2015 meeting solely based on the information they received from all vested parties. The applicant's (SSC, Inc.) information by way of their legal counsel, Curtis Holland, formed a substantial evidence base in their favor centering on two paired data analyses. The latter analysis (see Attachment "J") dated January 26, 2015 covered three case studies of local home sales data done by Integra Realty Resources that showed "no significant or measureable impact on the market value of residences" adjacent versus non-adjacent to a cell tower sites.

Lisa Malay, an adjacent property owner, submitted two (2) packets of information. Inside the latter included a study titled "The Impact of Cell Phone Towers on House Prices in Residential Neighborhoods" done in New Zealand by Dr. Sandy Bond, PhD (see Attachment "I").

### ***PZC Recommendations***

The PZC Commissioners' final vote was 5/0/0 to recommend **approval** of the **Conditional Use Permit** to erect a 160-foot tall monopole Commercial Telecommunications Facility at 16423 Endicott Rd **with following conditions** as shown on Exhibit A:

#### **Exhibit A**

1. The CUP shall be based on a time frame of fifteen (15) years.
2. Written approval from FAA prior to issuance of building permit.
3. Clay County Highway Department driveway permit be approved prior to issuance of building permit.
4. Tower design shall be reviewed at the time a building permit is issued, and at minimum shall include the following elements:
  - a. Maximum height for this communications tower shall be 160 feet.
  - b. The monopole tower shall be set back a minimum distance of 160 feet from all adjoining property lines.
  - c. Construction plans and specification drawings be submitted from a registered professional engineer in the State of Missouri.
5. One (1) co-location shall be granted at no charge to the Clay County Sheriff Department and/or any other authorized public safety responder servicing the tower's coverage area.
6. Every twenty-four (24) months the tower must be inspected by a structural engineer registered in the State of Missouri who is regularly involved in maintenance, inspection and erection of communications towers.
7. If the tower is damaged or destroyed, the property owners will have 120 days to repair or dismantle the facility.
8. No hazardous materials may be stored on the property.

**Action needed:** Approval of Resolution authorizing the Conditional Use Permit (CUP).

Vice-Chairman, Planning and Zoning Commission \_\_\_\_\_

Director of Planning and Zoning \_\_\_\_\_

**Applicant/Property Information:**

Property is located at 16423 Endicott Rd  
Applicant is Justin Anderson, SSC, Inc., an agent for Verizon Wireless  
Owners are Patrick Pierson & Brian Steele  
Current Zoning is AG, Agricultural District  
The property contains 115.39± acres  
Application Submittal Date: 08/01/2014  
PZC Hearings: 09/09/2014; 12/02/2014; 03/03/2015

**Legal Description for CUP:**

THAT PORTION OF THE NORTH HALF OF SECTION 21, TOWNSHIP 53 NORTH, RANGE 30 WEST, CLAY COUNTY, MISSOURI, WHICH LIES WEST OF THE WESTERLY RIGHT-OF-WAY LINE OF THE ST. PAUL AND KANSAS CITY SHORT LINE RAILROAD COMPANY/CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD AND NORTH OF COUNTY ROAD, SUBJECT TO ANY PART THEREOF IN ROAD RIGHT OF WAYS.

LESS AND EXCEPT THAT PART BOUNDED AS FOLLOWS: BEGINNING AT THE SOUTHWEST CORNER OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SAID SECTION; THENCE NORTH ALONG THE WEST LINE OF SAID QUARTER SECTION, A DISTANCE OF 80.5 FEET TO A POINT, THENCE EAST 80.5 FEET FROM AND PARALLEL WITH THE SOUTH LINE OF SAID QUARTER SECTION, A DISTANCE OF 660.0 FEET TO A POINT; THENCE SOUTH 660.0 FEET FROM AND PARALLEL WITH THE WEST LINE OF SAID SECTION, A DISTANCE OF 80.5 FEET TO THE SOUTH LINE OF SAID QUARTER SECTION; THENCE CONTINUING SOUTH AND PARALLEL WITH SAID WEST LINE, A DISTANCE OF 249.5 FEET TO A POINT, THENCE WEST 249.5 FEET FROM AND PARALLEL WITH SAID SOUTH QUARTER SECTION LINE, A DISTANCE OF 660.0 FEET TO A POINT IN THE WEST LINE OF SAID SECTION; THENCE NORTH ALONG THE WEST LINE OF SAID SECTION, 249.5 FEET TO THE PINT OF BEGINNING.

## **Sept. 14-128CUP – Endicott Rd Verizon Cell Tower**

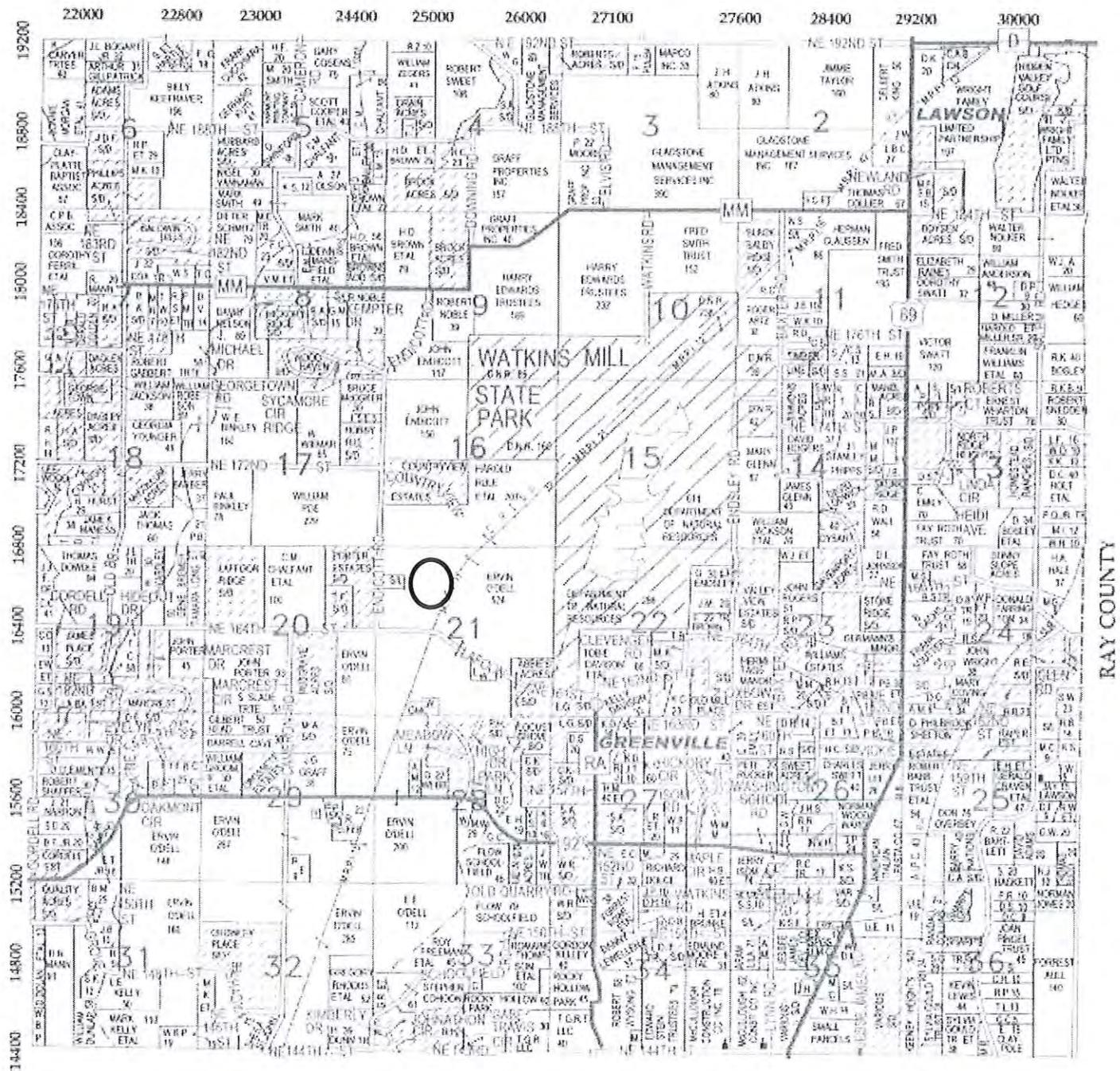
### **List of Attachments:**

- "A" – Vicinity Map
- "B" – Existing Conditions Map
- "C" – Site Plan Map
- "D" – Surrounding Property Map
- "E" – Applicant (SSC) Information *DURING* 12/02/2014 PZC
- "F" – Simmons Information *DURING* 12/02/2014 PZC
- "G" – Malay Information *DURING* 12/02/2014 PZC
- "H" – American Cancer Society "Cellular Phone Towers"
- "I" – Malay Information *AFTER* 12/02/2014 PZC
- "J" – Applicant (SSC) Information *AFTER* 12/02/2014 PZC

# Sept. 14-128CUP – Endicott Rd Verizon Cell Tower

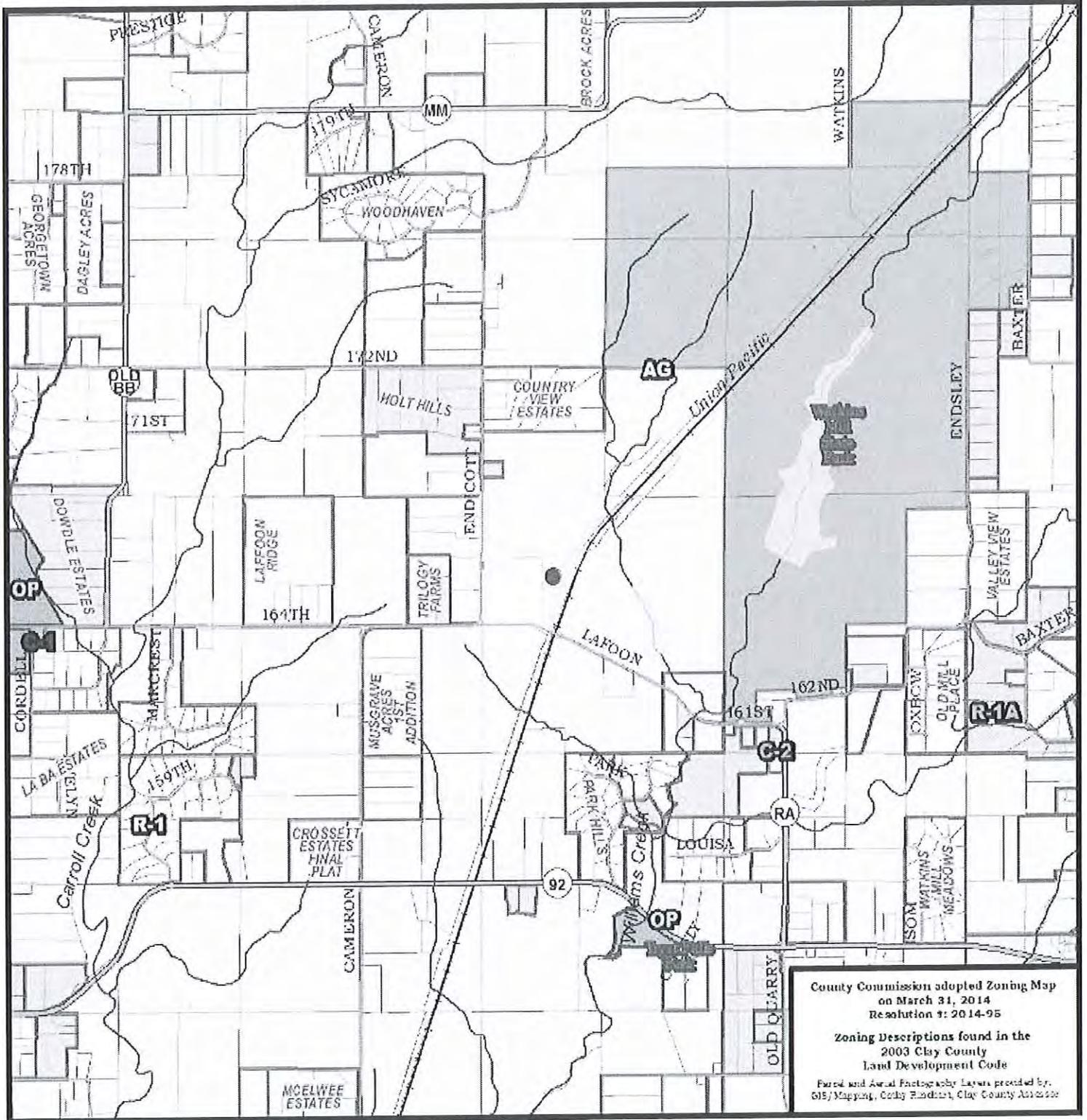
## Attachment A – Vicinity Map

### TOWNSHIP 53N • RANGE 30W



# Sept 14-128CUP - Endicott Rd Verizon Cell Tower

## Attachment B - Existing Conditions Map



County Commission adopted Zoning Map  
 on March 31, 2014  
 Resolution #: 2014-95

Zoning Descriptions found in the  
 2003 Clay County  
 Land Development Code

Parcel and Aerial Photography Layers provided by:  
 GIS/Mapping, Cindy Bandhart, Clay County Assessor

**Planning & Zoning Department**



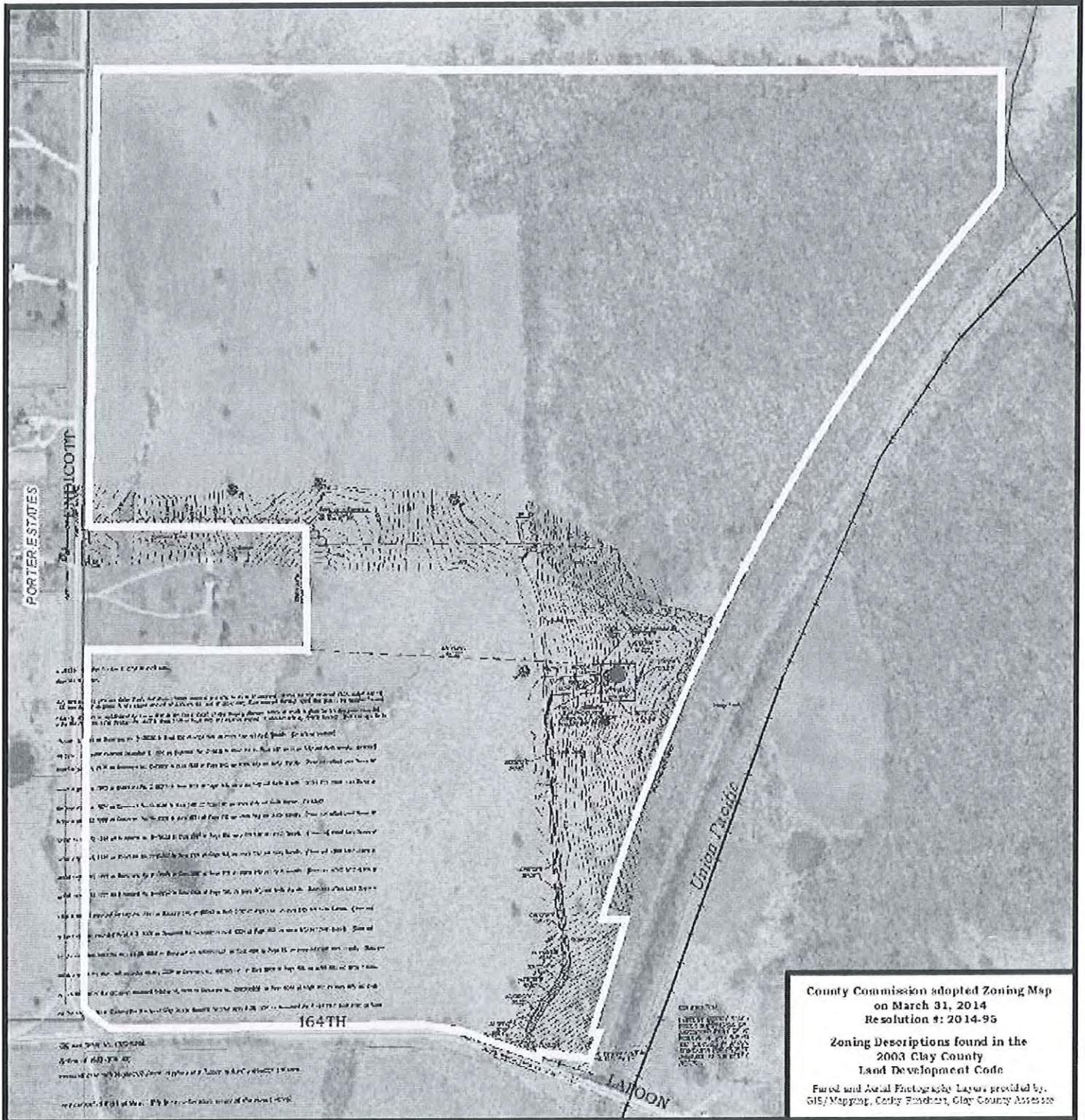
1 inch = 3,000 feet  
 1 inch = 0.57 miles

### LEGEND

- |               |                |                   |                                    |                  |
|---------------|----------------|-------------------|------------------------------------|------------------|
| Property Line | Roads          | Subdivisions      | Overlay Districts                  | Zoning Districts |
| Streams (EPA) | Interstates    | 2014 City Limits  | CD (Conservation District)         | AG               |
| Railroads     | State Highways | Parks             | PO (Preservation Overlay District) | R-1              |
| Highway Ramps | Local Roads    | County Boundaries | PUD (Planned Unit Development)     | R-1A/R-2         |
|               |                |                   |                                    | R-1B/RU          |
|               |                |                   |                                    | R-3              |
|               |                |                   |                                    | C-1              |
|               |                |                   |                                    | C-2              |
|               |                |                   |                                    | C-3              |
|               |                |                   |                                    | I-1              |
|               |                |                   |                                    | I-2              |
|               |                |                   |                                    | OP               |

# Sept 14-128CUP – Endicott Rd Verizon Cell Tower

## Attachment C - Site Plan Map



Planning & Zoning Department



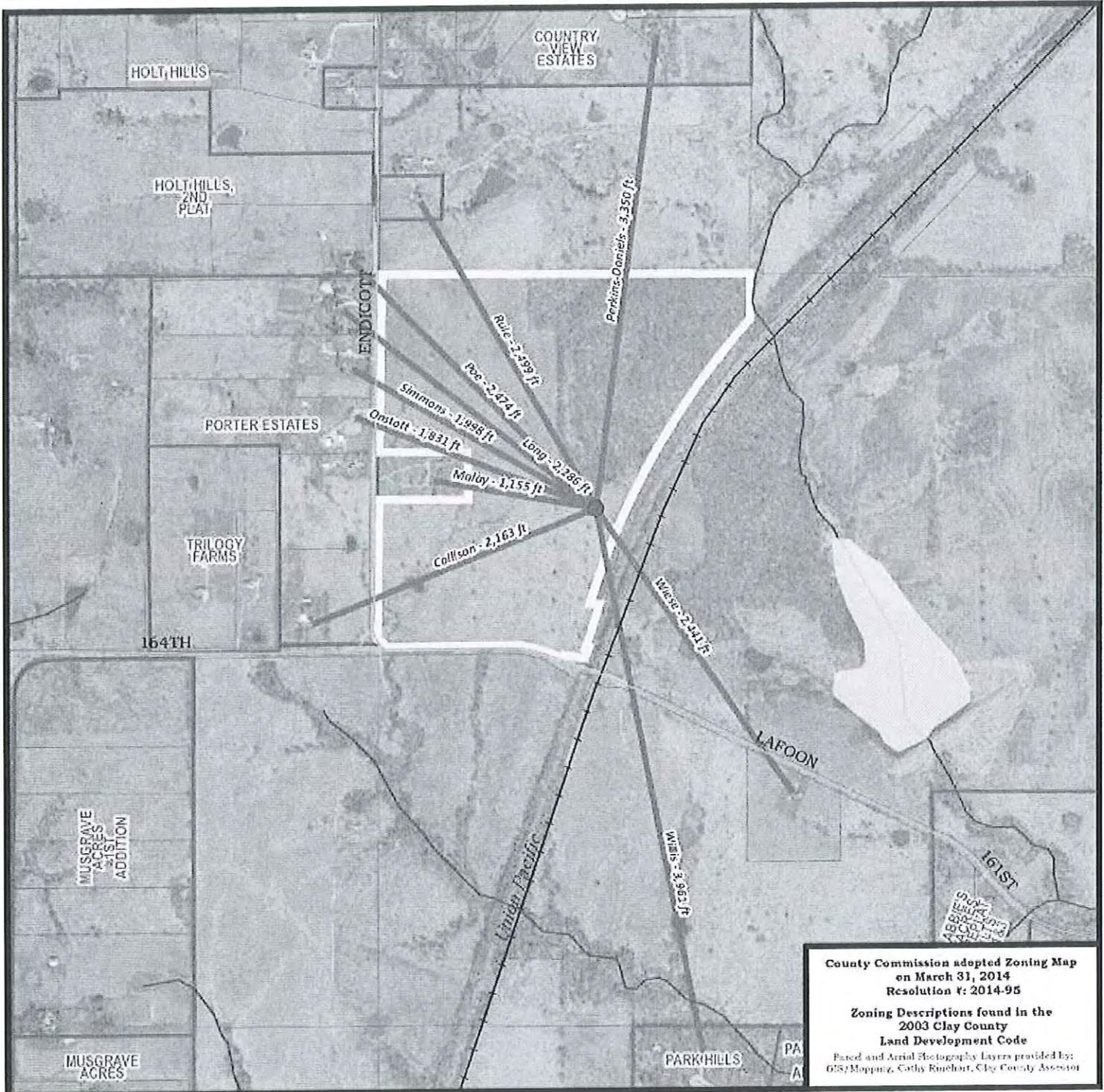
1 inch = 400 feet  
1 inch = 0.08 miles

### LEGEND

- |               |                |                   |                                     |
|---------------|----------------|-------------------|-------------------------------------|
| Property Line | Roads          | Subdivisions      | Overlay Districts                   |
| Streams (EPA) | Interstates    | 2014 City Limits  | CD (Conservation District)          |
| Railroads     | State Highways | Parks             | POD (Preservation Overlay District) |
|               | Local Roads    | County Boundaries | PUD (Planned Unit Development)      |
|               | Highway Ramps  |                   |                                     |

# Sep 14-128CUP – Endicott Rd Verizon Cell Tower

## Attachment D - Surrounding Property Map



County Commission adopted Zoning Map  
 on March 31, 2014  
 Resolution #: 2014-95

Zoning Descriptions found in the  
 2003 Clay County  
 Land Development Code

Base and Aerial Photography Layers provided by:  
 GIS Mapping, Cathy Ruchart, Clay County Assessor

**Planning & Zoning Department**

1 inch = 1,000 feet  
 1 inch = 0.19 miles

### LEGEND

- Proposed Tower Location
- Distance to Surrounding Properties
- Property Line
- Streams (EPA)
- Railroads
- Roads**
  - Interstates
  - State Highways
  - Local Roads
  - Highway Ramps
- Subdivisions
- City Limits
- Parks
- County Boundaries

**Sept. 14-128CUP – Endicott SSC/Verizon Tower**

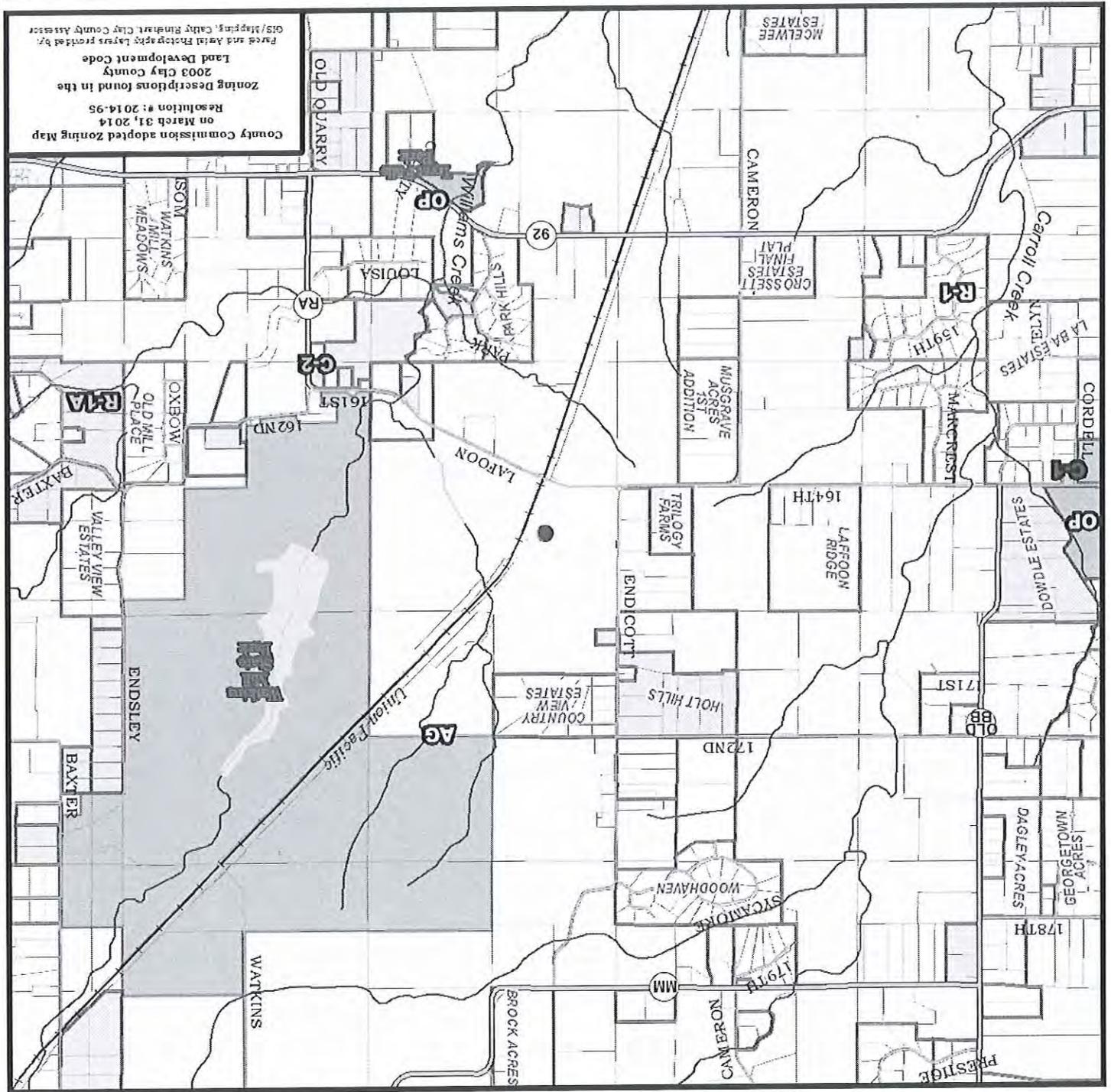
**List of Attachments**

- "A" – Vicinity Map
- "B" – Existing Conditions Map
- "C" – Site Plan Map
- "D" – Surrounding Property Map
- "E" – Applicant (SSC) Info. DURING 12/02/2014 PZC
- "F" – Simmons Info. DURING 12/02/2014 PZC
- "G" – Malay Info. DURING 12/02/2014 PZC
- "H" – American Cancer Society "Cellular Phone Towers"
- "I" – Malay Info. AFTER 12/02/2014 PZC
- "J" – Applicant (SSC) Info. AFTER 12/02/2014 PZC



# Sept 14-128CUP - Endicott Rd Verizon Cell Tower

## Attachment B - Existing Conditions Map



County Commission adopted Zoning Map on March 31, 2014  
 Resolution #: 2014-95  
 Zoning Descriptions found in the 2003 City County Land Development Code  
 Parcel and Aerial Photography Layers provided by GIS/Mapping, Cadiz/Rimhart, Clay County Assessor

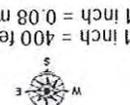
### LEGEND

	Zoning Districts		Property Line
	CD (Conservation District)		Streams (EPA)
	POD (Preservation Overlay District)		Railroads
	PUD (Planned Unit Development)		State Highways
	R-1		Interstates
	R-1A/R-5		Roads
	R-1B/R-3		Local Roads
	R-2		Highway Ramps
	R-3		County Boundaries
	C-1		Parks
	C-2		2014 City Limits
	C-3		Subdivisions
	C-1		

1 inch = 3,000 feet  
 1 inch = 0.57 miles

Planning & Zoning Department

**Planning & Zoning Department**

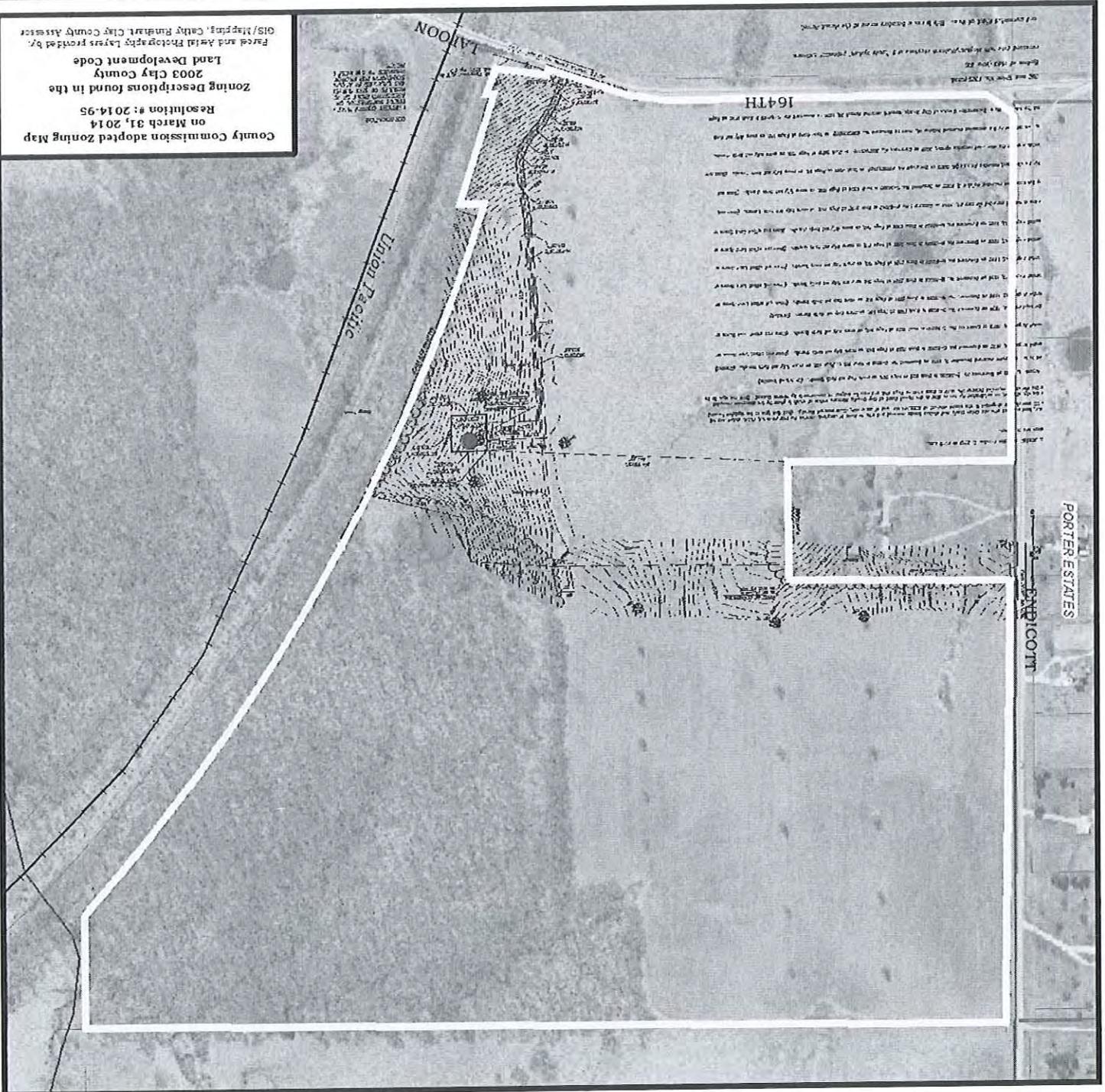


1 inch = 400 feet  
 1 inch = 0.08 miles

**LEGEND**

- Property Line
- Roads
- Interstates
- State Highways
- Local Roads
- Highway Ramps
- Streams (EPA)
- Railroads
- Subdivisions
- 2014 City Limits
- Parks
- County Boundaries
- Overlay Districts
  - CD (Conservation District)
  - POD (Preservation Overlay District)
  - PUD (Planned Unit Development)

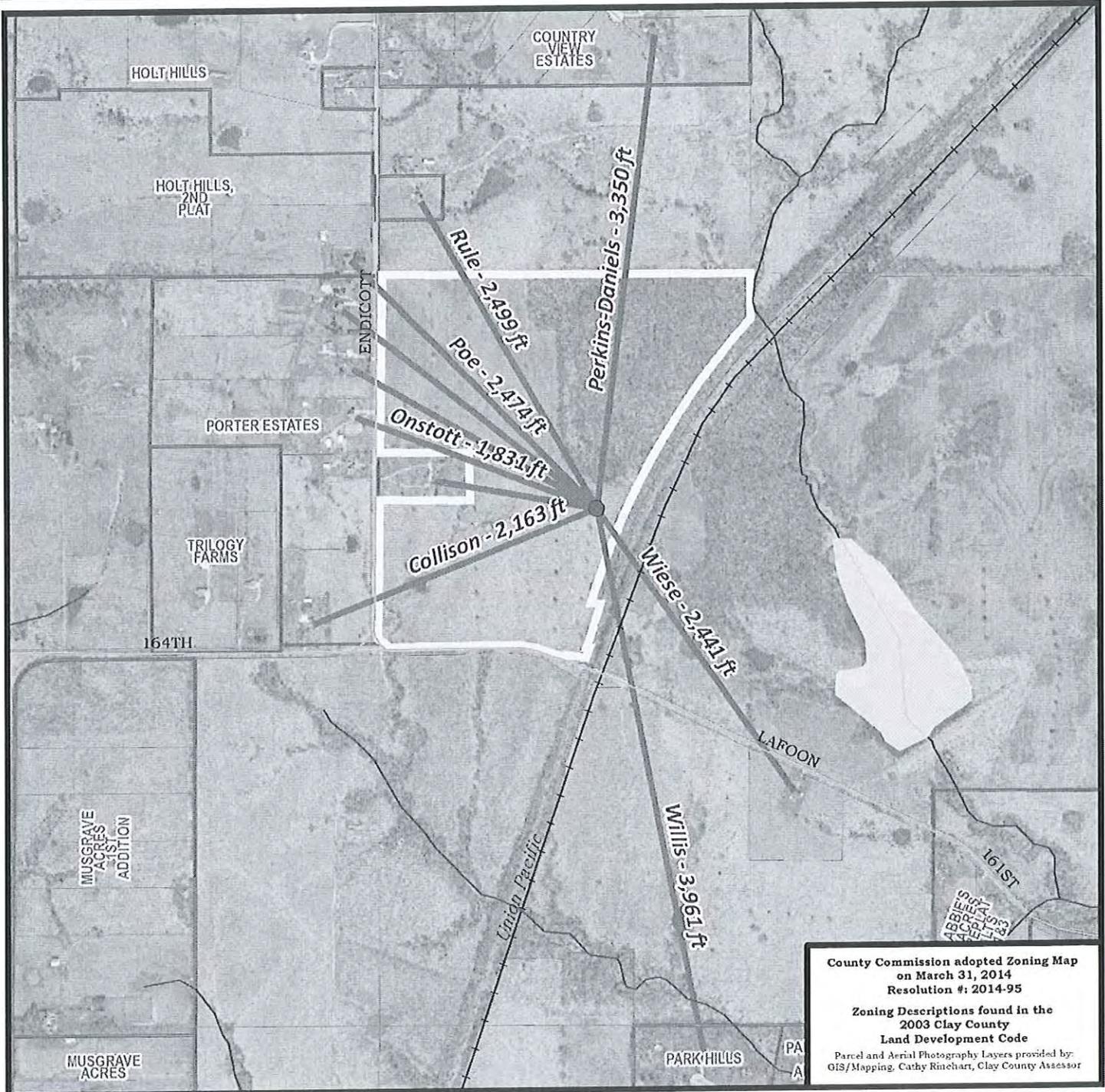
County Commission adopted Zoning Map  
 on March 31, 2014  
 Resolution #: 2014-95  
 Zoning Descriptions found in the  
 2003 Clay County  
 Land Development Code  
 Face and Aerial Photography Layers provided by  
 GIS Mapping, Cathy Finkhart, Clay County Assessor



**Sept 14-128CUP - Endicott Rd Verizon Cell Tower  
 Attachment C - Site Plan Map**

# Sep 14-128CUP – Endicott Rd Verizon Cell Tower

## Attachment D - Surrounding Property Map



County Commission adopted Zoning Map on March 31, 2014  
 Resolution #: 2014-95  
 Zoning Descriptions found in the 2003 Clay County Land Development Code  
 Parcel and Aerial Photography Layers provided by: GIS/Mapping, Cathy Rinehart, Clay County Assessor

Map Document: (G:\GIS\Project\_Files\Vacinity Map - 8 x 11 P.mxd)  
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**Planning & Zoning Department**

**LEGEND**

- Proposed Tower Location
- Distance to Surrounding Properties
- Property Line
- Streams (EPA)
- Railroads

**Roads**

- Interstates
- State Highways
- Local Roads
- Highway Ramps

**Subdivisions**

- 2014 City Limits
- Parks
- County Boundaries

Attachment E

May 6, 2008



RE: Proximity Analysis  
Integra Realty Resources – Kansas City File No: 119-2008-0160

Dear Mr. Adcock:

We have conducted paired sales analyses of single family residences and single family lots in Johnson County to determine the impact, if any; a cell tower site will have on sale prices due to proximity. This technique is defined by the *Appraisal of Real Estate* 12<sup>th</sup> Edition as a "quantitative technique used to identify and measure adjustments to sale prices or rents of comparable properties; to apply this technique, sales or rental data on nearly identical properties are analyzed to isolate a single characteristic's effect on the value or rent."

We present sales data of properties abutting and properties not abutting several cell tower sites. Case Study No. 1 is of properties near the cell tower at approximately 119<sup>th</sup> and South Sunset in Olathe. Case Study No. 2 is of condominiums developed near the Haven at the Wilderness at 159<sup>th</sup> and Roe in Leawood. Case Study No. 3 is of properties near the tower at 5950 Roe in Mission, KS. Case Study No. 4 is of properties near the cell tower location at 9617 Lee in Leawood, on the site of the Leawood Fire and Police Departments.

The purpose of this assignment is to identify what if any influence proximity to a cell tower has on the sales price of residential properties. All of the sales presented in these case studies occurred after the cell tower went online at the respective locations.

IRR.



May 6, 2008

Page 2

The economic analysis presented in the following seven paired sale case studies indicate that there is no significant or measurable impact on the market value of single family residential lots or single family residences as a result of proximity to the cell tower sites.

Regards,

A handwritten signature in black ink, appearing to read "K. Jagers".

Kenneth Jagers, MAI  
Managing Director  
Certified General Real Property Appraiser  
Kansas Certificate # G-969  
Phone: 913-748-4704  
E-mail: [kjagers@irr.com](mailto:kjagers@irr.com)

## CORPORATE PROFILE

Integra Realty Resources, Inc. (IRR) with corporate offices in New York, NY offers the broadest and most comprehensive valuation and counseling services in North America through 56 independently owned and operated offices located across the United States and Mexico. Each local office is operated by its principal who, on average, has 30 years of local service and is led by a Managing Director holding the MAI designation and having an average of 25 years of experience in commercial and investment property. Benefited by IRR's intellectual property, standardized reports, delivery systems and certain intellectual property, each office operates under the philosophy "Local Expertise...Nationally."

IRR offers a single point of contact to coordinate your assignments and communicate the unique nature of the real estate and/or your special requirements. Each local office is licensed to use IRR's MarketPoint and DataPoint products which provide the client with consistent applications of the most sophisticated valuation tools, access to a national database and delivery of a standardized report for ease of review and presentation.

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Updated 2-27-08

IRR.

## CASE STUDY 1

A Comparison of Residential Lot and Single Family Home Sales Analyzing the Impact of Cell Tower Site Proximity to 119<sup>th</sup> and South Sunset, Olathe, Kansas

### 119th and South Sunset Tower Location - Private commercial site

Sales Analysis		
Sale Identification	11881 Skyview	18613 W. 117th
Cell Tower Site Influence	Abutting	Non-abutting
Sale Date	August 1, 2004	December 1, 2003
Sale Price	\$228,000	\$205,000
Sale Price/SF	\$92.61	\$94.04
Financing	Conventional	Conventional
Total Living Area SF	2,462	2,180
Bedrooms / Full Baths / Half Baths	4 / 2 / 1	4 / 2 / 1
Age / Condition	1999	1997
Basement	Full Basement	Full Basement
HVAC / Mechanical	Central AC / Forced Air	Central AC / Forced Air
Attachments / Other	2 Car Garage	2 Car Garage
% Difference in Prices Per SF		-1.54%

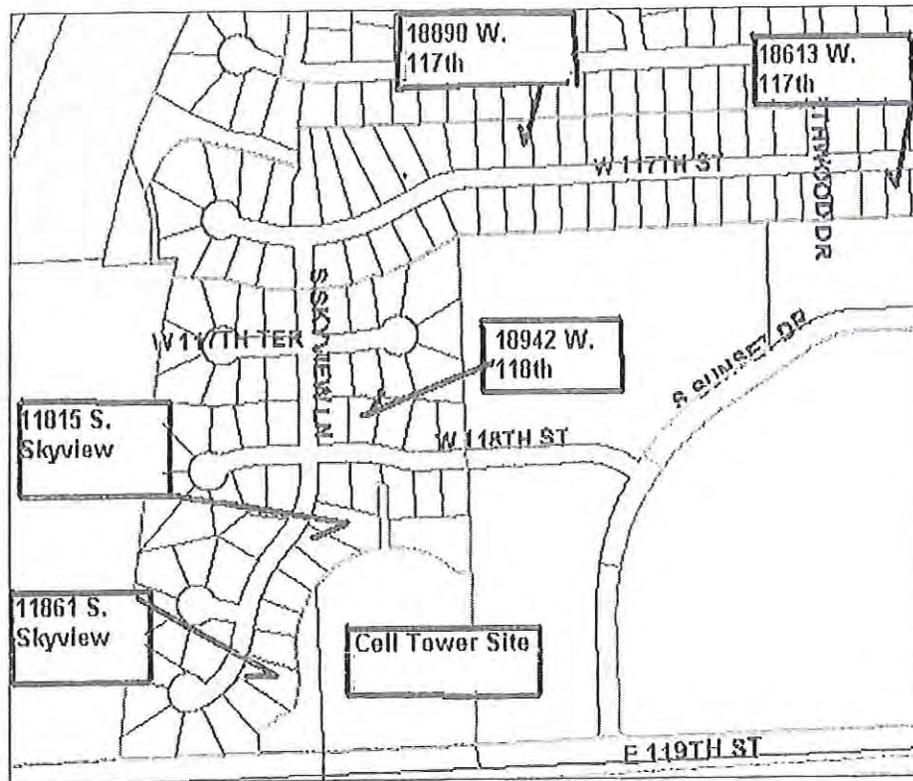
Sales Analysis		
Sale Identification	11881 Skyview	18890 W. 117th
Cell Tower Site Influence	Abutting	Non-abutting
Sale Date	August 1, 2004	September 5, 2005
Sale Price	\$228,000	\$227,000
Sale Price/SF	\$92.61	\$91.87
Financing	Conventional	Conventional
Total Living Area SF	2,462	2,471
Bedrooms / Full Baths / Half Baths	4 / 2 / 1	4 / 2 / 1
Age / Condition	1999	1995
Basement	Full Basement	Full Basement
HVAC / Mechanical	Central AC / Forced Air	Central AC / Forced Air
Attachments / Other	2 Car Garage	2 Car Garage
% Difference in Prices Per SF		0.80%

**119th and South Sunset  
Tower Location - Private commercial site**

**Sales Analysis**

Sale Identification	11815 S. Skyview	18942 W. 118th
Cell Tower Site Influence	Abutting	Non-abutting
Sale Date	August 3, 2007	May 25, 2007
Sale Price	\$235,151	\$242,000
Sale Price/SF	\$110.61	\$101.34
Financing	Conventional	Conventional
Total Living Area SF	2,126	2,388
Bedrooms / Full Baths / Half Baths	4 / 2 / 1	4 / 2 / 1
Age / Condition	1999	1999
Basement	Full Basement	Full Basement
HVAC / Mechanical	Central AC / Forced Air	Central AC / Forced Air
Attachments / Other	2 Car Garage	2 Car Garage
% Difference in Prices Per SF		8.38%

A plat map showing these paired sales is included on the following page. The sales selected for comparison are timely and similar in size, amenities, and age. In percentage terms and as a price per square foot of lot area, the difference is negligible and within the margin of price deviation that may be expected under normal market conditions within the same subdivision. Case Study No. 1 tells us that residences in the same subdivision, similar in nearly all respects except proximity to a cell tower site, will sell for the same price on a per square foot of living area basis. By analyzing the sales on a per square foot basis, the nominal disparity in size is neutralized and it is apparent that the presence of the cell tower site is not a negative influence on market value.



Shown on the following page are two single family lot sales in Northwood Trails subdivision, which is adjacent to the cell tower site, located at the northwest corner of 119<sup>th</sup> Street and South Sunset Drive in Olathe, Kansas. The 480 foot guyed cell tower went on air in 1990.

---

**Sales Analysis**


---

Sale Identification	Lot 79, Block 12, Northwood Trails	Lot 19, Block 14, Northwood Trails
Cell Tower Site Influence	Abutting	Not Abutting
Sale Date	December 21, 1999	May 11, 2000
Sale Price	\$32,000	\$28,950
Sale Price/SF	\$3.46	\$3.44
Lot Size SF	9,258	8,413
<b>% Difference in Prices Per SF</b>		<b>0.44%</b>

---

**Sales Analysis**


---

Sale Identification	Lot 87, Block 12, Northwood Trails	Lot 21, Block 14, Northwood Trails
Cell Tower Site Influence	Abutting	Not Abutting
Sale Date	February 21, 2000	December 10, 1999
Sale Price	\$32,000	\$26,950
Sale Price/SF	\$3.37	\$3.30
Lot Size SF	9,494	8,160
<b>% Difference in Prices Per SF</b>		<b>2.01%</b>

A map showing the locations of the properties in relation to the cell tower site is shown on the following page. The properties sold within six months of one another and are very similar. In percentage terms and as a price per square foot of lot area, the difference is negligible and within the margin of price deviation that may be expected under normal market conditions within the same subdivision. Case Study No. 1 tells us that lots in the same subdivision, similar in nearly all respects except proximity to a cell tower site, will sell for nearly the same price on a per square foot basis. By analyzing the sales on a per lot square foot basis, the nominal disparity in size is neutralized and the quality, size, or utility of improvements does not impact the conclusion. It is apparent that the presence of the cell tower site is not a negative influence on market value.



## CASE STUDY 2

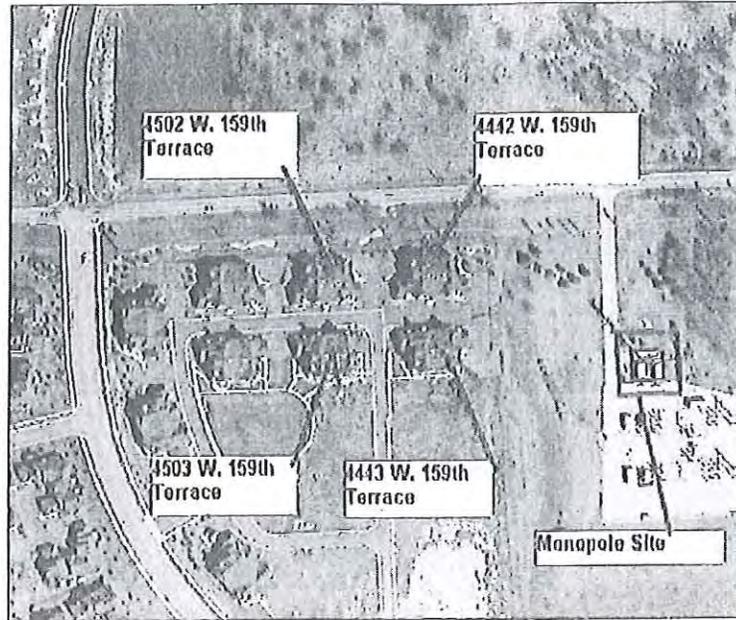
### A Comparison of Single Family Residential Sales Analyzing the Impact of Cell Tower Site Proximity to the Havens @ Wilderness Condominiums

Shown below is a pairing of four identical six unit condominium buildings. Two about the cell tower site and two do not. The unit floor plans in these four buildings are identical and the buildings were completed in 2005. The sale prices reflected below are of the first homeowner and the sales occurred September 2005 to July 2007. We compared only the identical unit sales in determining the average sales price.

**159th and Roe  
Tower Location - Adjacent Havens @ the Wilderness Condominiums**

Sales Analysis				
Sale Identification	4442 W. 169th Terrace	4443 W. 169th Terrace	4502 W. 169th Terrace	4503 W. 169th Terrace
Cell Tower Site Influence	Abutting	Abutting	Non-abutting	Non-abutting
Sale Date	2005 - 2007	2005 - 2007	2005-2007	2005-2007
Sale Price	\$911,774	\$902,428	\$915,503	\$893,304
Sale Price/SF	\$182,355	\$180,466	\$183,101	\$178,661
Financing	Conventional	Conventional	Conventional	Conventional
Units	6	6	6	6
Age / Condition	New	New	New	New
Basement	NA	NA	NA	NA
HVAC / Mechanical	Central AC / Forced Air			
% Difference average price abutting vs non-abutting			-0.93%	1.52%

An aerial showing the locations of the properties in relation to the cell tower site are shown on the following pages. In percentage terms and as a price per unit, the difference is negligible and within the margin of price deviation that may be expected under normal market conditions within the same subdivision. Case Study No. 2 tells us that condominium units in the same development, similar in nearly all respects except proximity to a cell tower site, will sell for nearly the same price on a per unit basis. By analyzing the sales on an average price per unit basis, the nominal disparity in size is neutralized and it is apparent that the presence of the cell tower site is not a negative influence on market value.



## CASE STUDY 3

### A Comparison of Single Family Residence Sales Analyzing the Impact of Cell Tower Site Proximity to 5950 Roe, Mission, KS

Shown below is one pairing of residences in this area. 4705 West 60<sup>th</sup> Street is a residence that is almost directly south of and facing the monopole site at the commercial property at 5950 Roe. We have paired this small two bedroom one bath residence that is influenced by the tower and sold in November 2003 with a similar property that sold approximately one year prior.

#### 5950 Roe Tower Location - Private commercial site

<b>Sales Analysis</b>		
Sale Identification	4705 W. 60th Street	4711 W. 60th Terrace
Cell Tower Site Influence	Faces Cell Tower	No influence
Sale Date	November 21, 2003	September 27, 2002
Sale Price	\$107,100	\$128,200
Sale Price/SF	\$85.41	\$87.93
Financing	Conventional	Conventional
Total Living Area SF	1,254	1,458
Bedrooms / Full Baths / Half Baths	2 / 1	2 / 1
Age / Condition	1954	1952
Basement	Crawl Space	Crawl Space
HVAC / Mechanical	Central AC / Forced Air	Central AC / Forced Air
Attachments / Other	1 car attached	1 car attached
% Difference In Prices Per SF		-2.95%

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LaSalle Bank  
Mission Bank  
Missouri Bank & Trust  
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Farm Credit Services  
FDIC  
FHLMC  
FNMA  
Franklin County Commissioners  
GSA  
Internal Revenue Service -  
Johnson County, Kansas  
Johnson County District Court  
Johnson County Parks &  
Recreation  
Johnson County Substance  
Abuse Services  
KCCID  
KC Port Authority  
K.C. Redevelopment Authority  
KCMO School District  
Kansas Dept. of Transportation  
Kansas Public Employees  
LCRA  
MHDC/State of Missouri  
Mosera  
PIEA  
RTC  
University of Missouri  
United States Postal Service  
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Blackwell Sanders, et al.  
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Enz & Jester, PC  
Foth & Orrick, LLP  
Humphrey, Farrington & McClain  
Husch & Eppenberger, LLC  
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Lewis, Rice & Fingersh LC  
Lowe, Farmer, Bacon & Roe  
McAnany, Van Cleave & Phillips, PA  
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McDowell, Rice, Smith &  
Buchanan, PC  
Niewald, Waldeck & Brown, PC  
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Wallace, Saunders, et al.  
White Goss Bowers et al  
Wyrsh, Hobbs & Mirakian, PC

## CORPORATE PROFILE

Integra Realty Resources, Inc. (IRR) with corporate offices in New York, NY offers the broadest and most comprehensive valuation and counseling services in North America through 56 independently owned and operated offices located across the United States and Mexico. Each local office is operated by its principal who, on average, has 30 years of local service and is led by a Managing Director holding the MAI designation and having an average of 25 years of experience in commercial and investment property. Benefited by IRR's intellectual property, standardized reports, delivery systems and certain intellectual property, each office operates under the philosophy "Local Expertise...Nationally."

IRR offers a single point of contact to coordinate your assignments and communicate the unique nature of the real estate and/or your special requirements. Each local office is licensed to use IRR's MarketPoint and DataPoint products which provide the client with consistent applications of the most sophisticated valuation tools, access to a national database and delivery of a standardized report for ease of review and presentation.

A listing of IRR's local offices and their Managing Directors follows:

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KANSAS CITY, MO/KS - Kenneth Jagers, MAI, MRICS  
LAS VEGAS, NV - Shelli L. Lowe, MAI  
LOS ANGELES, CA - John G. Ellis, MAI, CRE  
LOUISVILLE, KY - George M. Chapman, MAI, SRA, CRE  
MEMPHIS, TN - J. Walter Allen, MAI  
MIAMI, FL - Michael Y. Cannon, MAI, SRA, CRE  
MILWAUKEE, WI - Sean Reilly, MAI

MINNEAPOLIS, MN - Michael F. Amundson, MAI, CCIM  
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NAPLES, FL - Thomas Tippett, MAI  
NASHVILLE, TN - R. Paul Perutelli, MAI, SRA  
NEW YORK, NY - Raymond T. Cirz, MAI, CRE  
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Updated 2-27-08

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## CASE STUDY 4

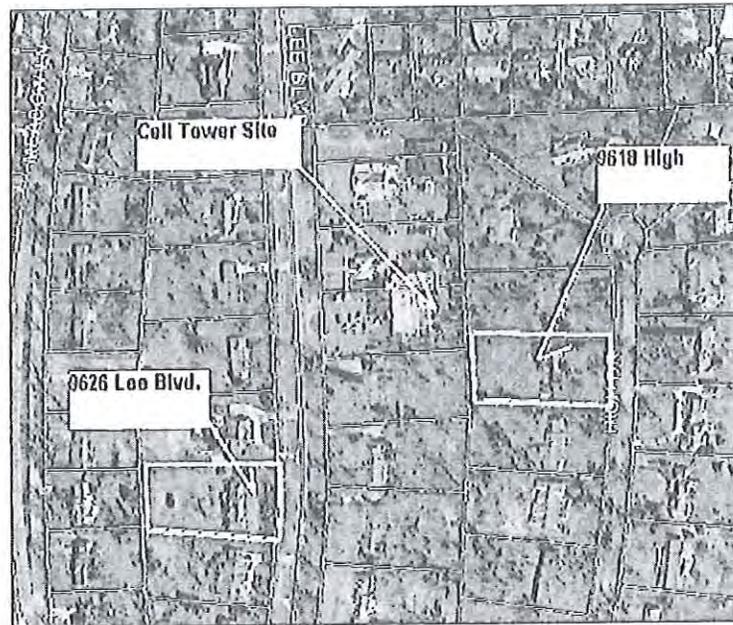
### A Comparison of Residential Lot Sales Analyzing the Impact of Cell Tower Site Proximity to 9617 Lee, Leawood, KS

Shown below is a pairing of residences in this area. 9618 High Street is a residence that abuts the Leawood Fire and Police Department site at 9617 Lee. The monopole site is immediately west of its rear yard fence. We have paired this four bedroom, two and one-half bath residence that is influenced by the tower, sold in August 2007, six months later.

#### 9617 Lee Tower Location - Leawood FD

<b>Sales Analysis</b>		
Sale Identification	9618 High	9626 Lee
Cell Tower Site Influence	Abutting	Not Abutting
Sale Date	August 24, 2007	March 20, 2008
Sale Price	\$351,000	\$370,000
Sale Price/SF	\$177.09	\$189.94
Financing	Conventional	Conventional
Total Living Area SF	1,982	1,948
Bedrooms / Full Baths / Half Baths	4 / 2 / 1	4 / 3
Age / Condition	1953	1955
Basement	Unfinished	Unfinished
HVAC / Mechanical	Central AC / Forced Air	Central AC / Forced Air
Attachments / Other	2 car garage	2 car garage
% Difference in Prices Per SF		-7.25%

A map showing the locations of the properties in relation to the cell tower site is shown below. The properties sold within six months of one another and are very similar. In percentage terms and as a price per square foot of lot area, the difference is negligible and within the margin of price deviation that may be expected under normal market conditions within the same subdivision. Case Study No. 4 tells us that single family residences in the same subdivision, similar in nearly all respects except proximity to a cell tower site, will sell for nearly the same price on a per square foot basis. By analyzing the sales on a per square foot basis, the nominal disparity in size is neutralized and it is apparent that the presence of the cell tower site is not a negative influence on market value.



## RECONCILIATION

The four case studies previously analyzed demonstrate that there is no meaningful disparity in value per square foot of single family residence or single family lot attributable to conditions created by being adjacent to a cell tower site. This includes detached residences as is the case in Nos. 1, 3 and 4, residential lots in 1, and attached residences (condominiums) as demonstrated in No. 2.

The similarity of the properties analyzed is best demonstrated in No. 1 because the homes are relatively new, and with uniformity in age and quality. The lot sales analysis is the best pure analysis because there are no improvements to influence the sales price. No. 2 is very well suited to this analysis as all of the units sold were new at the time of sale. Only sales to the first homeowners were considered. Each unit contributing to the average sales price per unit for the four buildings were identical floor plans. In pairing the sales of individual properties, and finding no difference in value, outside the price deviation under normal market conditions, between those abutting a cell tower site and those not abutting a cell tower site. We conclude that there is no evidence of any impact that a cell tower site will have on single family residential lots, single family residences, or condominiums due to proximity.

## CERTIFICATION

We certify that, to the best of our knowledge and belief:

1. The statements of fact contained in this report are true and correct.
2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and is my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
3. We have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved.
4. We have no bias with respect to the property that is the subject of this report or the parties involved with this assignment.
5. Our engagement in this assignment was not contingent upon developing or reporting predetermined results.
6. Our compensation for completing this assignment is not contingent upon a conclusion that favors the cause of the client or the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this case study.
7. Our analyses, opinions, and conclusions were developed, and this report has been prepared, in compliance with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, in conformity with the *Uniform Standards of Professional Appraisal Practice (USPAP)*.
8. On May 4, 2008, each of the properties described in this report were inspected from the street by Kenneth Jagers.
9. No one has provided significant real property assistance to the person(s) signing this certification.
10. We have not relied on unsupported conclusions relating to characteristics such as race, color, religion, national origin, gender, marital status, familial status, age, and receipt of public assistance income, handicap, or an unsupported conclusion that homogeneity of such characteristics is necessary in reaching the conclusion as stated herein.
11. We have experience in similar consulting assignments and are in compliance with the Competency Rule of USPAP.
12. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.

13. As of the date of this report, Kenneth Jagers, MAI, has completed the requirements of the continuing education program of the Appraisal Institute. Qualifications of the consultants are found in the following section.



Kenneth Jagers, MAI  
Managing Director  
Certified General Real Property Appraiser  
Kansas Certificate # G-969  
Phone: 913-748-4704  
E-mail: [kjagers@irr.com](mailto:kjagers@irr.com)

## QUALIFICATIONS OF CONSULTANTS

**PROFESSIONAL QUALIFICATIONS  
 KENNETH JAGGERS, MAI, MRICS**

<b>EXPERIENCE:</b>	<p>Mr. Jagers, Managing Director, has been with Integra Realty Resources - Kansas City, since May 1993. He started his career in commercial real estate in 1987 as an investment officer with a subsidiary of Metropolitan Life in Overland Park, Kansas then in the Washington D.C., and Boston, Massachusetts's offices. In 1991, Mr. Jagers joined BankBoston and served as a review and field appraiser for two years. Duties included quality control over two acquired banks in Maine and Vermont.</p> <p>Since that time he has completed appraisals on commercial properties of all types, primarily for institutional investors and for litigation. Unique properties include the 1,140,000 SF IRS Processing facilities and the 600,000 SF Overland Park Trade Center and exhibition hall. Mr. Jagers appraised Corporate Woods in Overland Park Kansas. The largest single investor owned real estate asset in the Kansas City area, it has 21 buildings totaling 2.2 million SF of Class A and B office space. He has also appraised the former headquarters of H&amp;R Block, the Sanofi Aventis (&gt;500,000 SF), and Town Pavilion (&gt;900,000 SF) offices in Kansas City and finally, Branson Landing a destination mixed use project with over 400,000 SF of lifestyle retail, marina, boutique hotel, and 170 condominium units. Mr. Jagers is a Director of IRR's Hospitality Specialty Practice Group. A recent assignment in this capacity was the Lodge of Four Seasons at Lake Ozark, MO with over 300 rooms, 146 proposed Condotel units, marina, and two golf courses.</p>
<b>LITIGATION EXPERIENCE:</b>	<p>Mr. Jagers has performed appraisal services and/or provided expert trial or deposition testimony in many legal proceedings, including the following: State of Kansas vs. Westgate, LC 04 C 214, State of Kansas v. Domino LC, and Northland LC, WD1 of Johnson County v. Highlands Group, Debra L. Miller v. Aida Oil Company etal, Moore v. United States No. 93-134 L, Illig v. United States 98-934L, City of Lenexa v. RREEF American REIT II Corp., VVV etal, Colliers v. City of Oak Grove, MO 03CV223403, Gailloyd Enterprises v Centertainment 98-CV-5115.</p>
<b>QUALIFIED BEFORE COURTS AND ADMINISTRATIVE BODIES</b>	<p>Circuit Court of Jackson County, Missouri          Kansas District Court, 7<sup>th</sup> Judicial District</p>
<b>EXPERIENCE WITH MUNICIPALITIES/ ADMINISTRATIVE BODIES:</b>	<p>Mr. Jagers has provided expert testimony to a number of taxing authorities, city councils, boards of planning and zoning, commissioners' hearings, and bodies providing public finance (TIF and Tax Abatement). His expertise is sought by the administrative bodies and by the private developers.</p>
<b>PROFESSIONAL ACTIVITIES:</b>	<p>Member of the Appraisal Institute, Secretary of the Kansas City Chapter          Member of The Royal Institution of Chartered Surveyors          Westwood City Planning Commission          Lecturer - UMKC Bloch School Lewis White Real Estate Center - Hospitality Feasibility          Lecturer - REATIC Forecast 2003-2008          Lecturer - Blue Springs EDC - Market Trends 2006-2008          Lecturer - Employee Relocation Council 2005 - The Housing Bubble</p>
<b>STATE LICENSES:</b>	<p>State of Iowa Certified General Real Property Appraiser (CG02446)          State of Kansas Certified General Real Property Appraiser (G-969)          State of Missouri Certified General Real Estate Appraiser (RA 003190)          State of Nebraska Certified General Real Estate Appraiser (CG970204)          State of Wyoming Certified Real Estate Appraiser (863)</p>
<b>EDUCATION:</b>	<p>Bachelor of Arts (1983) Chadron State College, Chadron, Nebraska          Economics and Marketing, Minor in Business Administration</p>
<b>APPRAISAL TRAINING:</b>	<p>Mr. Jagers has successfully completed numerous Appraisal Institute courses and attended seminars in keeping current, the educational and professional work product requirements of the Appraisal Institute and states in which he is licensed.</p> <p>Completed 3<sup>rd</sup> Party Multifamily Accelerated Processing (MAP), September 18, 2002.</p>

February 27, 2008



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AIMCO  
 Allen Bank & Trust  
 Allied Irish Bank  
 American Real Estate Group  
 Arbor National  
 Athena Corporation  
 Bank of America  
 Bank of Belton  
 Bank of Blue Valley  
 Bank of Boston  
 Bank of Jacomo  
 Bank Midwest  
 Bank of Odessa  
 Bank of Prairie Village  
 Bannister Bank  
 Bayview Financial  
 Beneficial Finance Co.  
 Brotherhood Bank & Trust  
 Capitol Federal  
 Capital City Bank  
 Central Bank of Kansas City  
 Chase Manhattan Bank  
 CIT Financial Savings  
 Citigroup  
 Citizens Bank & Trust  
 Clay County Savings & Loan  
 Collateral Mortgage  
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 Commerce Bank & Trust  
 Country Club Bank  
 Credit Union of America  
 CS First Boston  
 Douglas Bank  
 Enterprise Banking  
 Exchange National Bank  
 Farmers Exchange Bank  
 Federal Employee Credit Union  
 First Bank of Missouri  
 First National Bank  
 First National Bank of Chicago  
 First National Bank of Olathe  
 First Nationwide Bank  
 First State Bank  
 GMAC Commercial Mortgage  
 Gold Bank  
 Hillcrest Bank  
 Household Finance Corporation  
 Industrial State Bank  
 Interbay Funding  
 Intrust Bank  
 James B. Nutter Company  
 Johnson County Credit Union  
 KeyBank  
 Landmark Bank  
 LaSalle Bank  
 Mission Bank  
 Missouri Bank & Trust  
 North American Savings  
 Old Second National Bank  
 Peoples Bank  
 PNC Bank  
 Security Bank  
 Security Financial  
 UMB  
 US Bank  
 Valley View State Bank  
 Wachovia  
 Wells Fargo

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 Coldwell Banker Real Estate  
 Crown Realty, Inc.  
 Eugene D. Brown Realtors  
 Reece & Nichols  
 Prudential  
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 B.A. Karbank & Company  
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 CIII Holdings  
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 Highwoods Realty L.P.  
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 Management Associates  
 Maxicare  
 MC Real Estate  
 Simon & Co.  
 NOMURA  
 North Star Development  
 Price Brothers  
 Property Company of America  
 R.H. Sailors & Co.  
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 RED Development  
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 Trammell Crow  
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**CORPORATIONS**  
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 Lab One  
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 Menorah Medical Center  
 Merrill, Lynch, Pierce, Fenner & Smith, Inc.  
 Merrill Lynch Relocation  
 Michelin  
 North KC Memorial Hospital  
 Olathe Medical Center  
 Olathe School District  
 Price Waterhouse Coopers  
 Property Tax Representatives  
 Puritan Bennett Corporation  
 Research Medical Center  
 Saint Joseph Health Center  
 St. Luke's Hospital of KC  
 Shawnee Mission USD 512  
 Shearson, Lehman Brothers/  
 E.F. Hutton  
 Shell OPUS  
 Southwestern Bell Telephone  
 Sprint  
 Standard Havens, Inc.  
 Stern Brothers & Company  
 American Airlines  
 Trinity Lutheran Hospital  
 United Telecommunications, Inc.  
 Ullcorp  
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 New York Life  
 Northwestern Mutual Life  
 Prudential Financial  
 State Farm  
 STRS of Ohio  
 TIAA-CREF  
 Transamerica Life Insurance  
 Annuity Company  
 Travelers Insurance  
 Travelers Pension Fund  
 Union Labor Life Insurance  
 USF&G  
 Zurich of America Insurance Co.

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City of Blue Springs, Missouri  
 City of Branson, Missouri  
 City of DeSoto, Kansas  
 City of Fulton, Missouri  
 City of Gardner, Kansas  
 City of Gladstone, Missouri  
 City of Grandview, Missouri  
 City of Independence, Missouri  
 City of Kansas City, Kansas  
 City of Kansas City, Missouri  
 City of Leawood, Kansas  
 City of Lenexa, Kansas  
 City of Liberty, Missouri  
 City of Manhattan, Kansas  
 City of Merriam, Kansas  
 City of Olathe, Kansas  
 City of Overland Park, Kansas

City of Prairie Village, Kansas  
 City of Raytown, Missouri  
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 City of Springfield, Missouri  
 City of Topeka, Kansas  
 City of Westwood, Kansas  
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 CRIMI MAE  
 Department of HUD  
 Department of the Navy  
 Economic Development Corp.  
 Farm Credit Services  
 FDIC  
 FHLMC  
 FNMA  
 Franklin County Commissioners  
 GSA  
 Internal Revenue Service - Johnson County, Kansas  
 Johnson County District Court  
 Johnson County Parks & Recreation  
 Johnson County Substance Abuse Services  
 KCCID  
 KC Port Authority  
 K.C. Redevelopment Authority  
 KCMO School District  
 Kansas Dept. of Transportation  
 Kansas Public Employees  
 LCRA  
 MHDC/State of Missouri  
 Mosers  
 PIEA  
 RTC  
 University of Missouri  
 United States Postal Service  
 USDOT

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 Humphrey, Farrington & McClain  
 Husch & Eppenberger, LLC  
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 Kirkland & Woods, PC  
 Lathrop & Gage, LC  
 Lewis, Rice & Fingersh LC  
 Lovo, Farmer, Bacon & Roe  
 McAnany, Van Cleave & Phillips, PA  
 McCormick, Adam & Long  
 McDowell, Rice, Smllh & Buchanan, PC  
 Niewald, Waldeck & Brown, PC  
 Norton, Hubbard, Ruzicka & Kremer, PC  
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 Sonnenschein, Nath & Rosenthal, LLP  
 Spencer Fane, Britt & Browne, LLP  
 Silnson, Morrison, Hecker, LLP  
 Wallace, Saunders, et al.  
 White Goss Bowers et al  
 Wyrsh, Hobbs & Mirakian, PC

State of Kansas

Real Estate Appraisal Board

This is to certify that

Kenneth Jagers

has complied with the provisions of the Kansas State Constitution and Licensed Real Property Appraisers Act  
to transact business as a

Certified General Real Property Appraiser

in the State of Kansas

License No.: G-969

Effective Date: July 1, 2007

Expiration Date: June 30, 2008

Gregg L. Leal  
Chairman





Case Number September14-128CUP  
 Case Type Conditional Use Permit  
 Project Name Endicott Rd / Verizon  
 Commercial Telecommunications Facility

Attachment G -

Malay Information

Residents Request to Deny CUP

December 2, 2014

The residents represented request the Planning & Zoning committee re-evaluate the allowance of a Conditional Use Permit for the placement of a 160' Cell Tower with a minimum of 3 carriers (cell service providers) located at the Endicott location because it does not comply with the following:

As stated in the P&Z staff report dated 9/2/2014, and previously submitted to this committee, the subject request must meet all of the approval criteria for a CUP in Section 151-3.10 (A) (13) of the LDC detailed below. We submit that it falls critically short in at least 4 areas.

**A) The proposed use complies with the intent of the Comprehensive Plan and general provisions of the Land Development Code, modified for the specific use request.**

Resident's response: The comprehensive plan quote "fosters quality growth, conservation, and preservation of natural resources and development throughout the County and its unincorporated planning area. In the plan we are designated as a 'green tier' area, *"these areas may be appropriate for large-lot subdivisions served by permitted septic systems and other low density residential development depending on environmental considerations."*

Low density residential and agricultural. A cell tower of this stature, by its nature, indicates an anticipation of development of a much more densely populated area than what is intended for our area by the County's master plan. This tower is seems more appropriate for the business/ incorporated areas.

**B) The proposed use in its proposed location will not have a substantial adverse impact on the public health, safety or general welfare.**

**Residents:** In 2013 The International Agency for Research on Cancer (IARC) has classified RF fields as a Class 2B carcinogen "possibly carcinogenic to humans." This is the same classification as lead, welding fumes and DDT.

A study conducted by the Institute of Pharmacology, Toxicology and Pharmacy of the Veterinary School of Hanover (Germany) found that dairy cows were affected by their proximity to cell phone tower sites. The cows had reduced milk production and increased behavioral abnormalities. When the cows were removed from the area, the strange behavior subsided after five days. Upon returning to the antenna site, the symptoms returned.

Another study, this one from Israel's Tel Aviv University, examined 622 people living near a cell-phone transmitter station for 3-7 years who were patients in one clinic in Netanya and compared them against 1,222 control patients from a nearby clinic. Participants were very closely matched in environment, workplace and occupational characteristics. The people in the first group live within a half circle of 350m (1148 feet) radius from the transmitter, which came into service in July 1996.

The results were startling. Out of the 622 exposed patients, 8 cases of different kinds of cancer were diagnosed in a period of just one year (July 1997 to June 1998): 3 cases of breast cancer, one of ovarian cancer, lung cancer, Hodgkin's disease (cancer of the lymphatic system), osteoid osteoma (bone tumor) and kidney cancer. This compares with 2 per 1 222 in the matched controls of the nearby clinic. The relative risk of cancer was 4.15 for those living near the cell-phone transmitter compared with the entire population of Israel.

Women were more susceptible. As seven out of eight cancer cases were women, the relative cancer rates for females were 10.5 for those living near the transmitter station and 0.6 for the controls relative for the whole town of Netanya. One year after the close of the study, 8 new cases of cancer were diagnosed in the microwave exposed area and two in the control area.

The real question is not whether the radio-frequency emissions of cell-phone towers are safe, but what the safe radiation levels are.

**C) The proposed use will not cause substantial injury to the value of other property in the vicinity.**

Response: There is documented research and evidence supporting the fact that property values will be impacted negatively for owners adjacent to a tower site anywhere from a minimum of 15% up to 20%. Much of this is due to the public's perception of the negative health effects of proximity to a cell tower, regardless of whether the adverse effects are documented or not. Perception is reality. If the adjacent home is worth \$225,000 and annual property values increase at projected 2% annually, it will take the owner 7 to 9 to recover the negative financial impact of the tower.

Even the ease of selling what is now a home with a beautiful setting will be much more difficult when similar homes are located along Endicott with beautiful settings and no cell tower in back.

(See excerpts from published reports attached).

D) Adequate access routes will be provided and designed to prevent traffic hazards and to minimize traffic congestion in public streets.

E) Adequate public safety, transportation and utility facilities/services will be available to service the subject property while maintaining adequate levels of service for existing development, and

**F) The proposed use is compatible with adjacent uses in terms of scale, site design, and operating characteristics (i.e., hours of operation, traffic generation, lighting, noise, odor, dust, and other external impacts).**

Response: This tower would be 4 times the height of the 40' trees next to it. There is not another tower or structure of this size within 5 miles of this location. The tower has nothing in common in purpose, scale or design with the agricultural and rural residential surroundings where it would be erected.

Also, we ask that you consider the Land Evaluation and Site Assessment (LESA) System which provides a rational process for assisting Clay County elected and appointed officials in making farmland conversion decisions. It calculates multiple factors when a change to another land use is proposed in the regulatory jurisdiction of Clay County—all of the unincorporated portions of the County as stated below.

2. Public Policy Considerations. These factors can include:

- Land area zoned for agricultural uses within one mile of the site;
- Land area zoned for agricultural use adjacent to the site;
- Availability of development clusters at the site – to preserve land and open space;
- Environmental considerations (flood hazards, wetlands, aquifer recharge area, wild life habitat and unique community values);

Response: Those unique community values include our desire to live in a rural area with wide open spaces and unobstructed views. We pay more in travel and services to live in this area because of these values. If we were interested in the latest technology and fastest service we would live in a Google Fiber neighborhood where we could get cable tv and have pizza delivered.

- Creation of open space; and
- Protection of vistas in view sheds and view corridors.

We suggest you drive Endicott Road from Jesse James Road to MM once and deny that it is a 'view corridor' with amazing 'vistas.' We are asking you to help us protect this area from the blight that this tower would cause.

Report prepared by Lisa Malay  
16521 Endicott Rd.  
Kearney, MO 64060  
816-401-1514

## Property Value Impact With Close Proximity to Cell Tower

The National Institute for Science, Law and Public Policy's survey "Neighborhood Cell Towers & Antennas—Do They Impact a Property's Desirability?" completed June, 2014 in US & abroad shows an overwhelming majority of the 1000 respondents (94%) reported that cell towers and antennas in a neighborhood or on a building would impact interest in a property and the price they would be willing to pay for it. And 79% said under no circumstances would they ever purchase or rent a property within a few blocks of a cell tower or antenna.

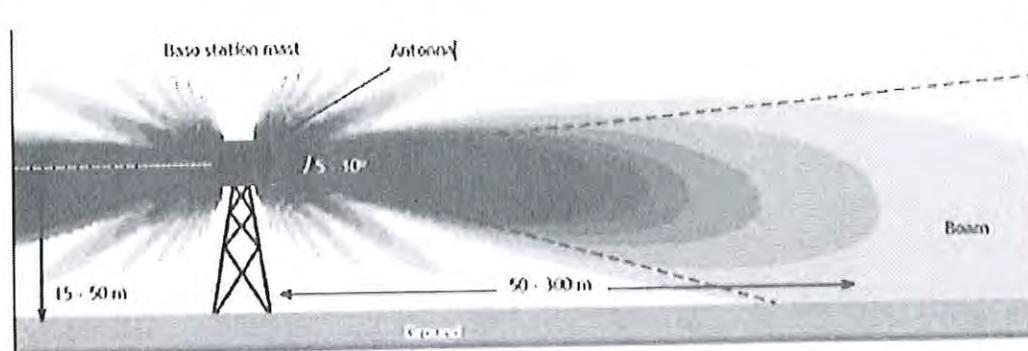
- 94% said a nearby cell tower or group of antennas would negatively impact interest in a property or the price they would be willing to pay for it.
- 79% said under no circumstances would they ever purchase or rent a property within a few blocks of a cell tower or antennas.
- 89% said they were generally concerned about the increasing number of cell towers and antennas in their residential neighborhood.

A widely respected study on this subject by Sandy Bond, PhD of the New Zealand Property Institute, and Past President of the Pacific Rim Real Estate Society (PRRES), The Impact of Cell Phone Towers on House Prices in Residential Neighborhoods, was published in *The Appraisal Journal* of the Appraisal Institute in 2006. The Appraisal Institute is the largest global professional organization for appraisers with 91 chapters. The study indicated that homebuyers would pay from 10%–19% less to over 20% less for a property if it were in close proximity to a cell phone base station. The 'opinion' survey results were then confirmed by a market sales analysis. The results of the sales analysis showed prices of properties were reduced by around 21% after a cell phone base station was built in the neighborhood."

*The Appraisal Journal* study added,

"Even buyers who believe that there are no adverse health effects from cell phone base stations, knowing that other potential buyers might think the reverse, will probably seek a price discount for a property located near a cell phone base station."

## Radiation Pattern of a Cell Tower Antenna



Propagation of "main beam" from antenna mounted on a tower or roof top

People living within 50 to 300 meter radius are in the high radiation zone (dark blue) and are more prone to ill-effects of electromagnetic radiation.

Reference - Mobile Telecommunications and health research programme (MTHR) Report 2007 - Pg 50 - [http://www.mthr.org.uk/documents/MTHR\\_report\\_2007.pdf](http://www.mthr.org.uk/documents/MTHR_report_2007.pdf)

300 Meters = 984 feet

Tower located 1100 feet or 335 meters directly behind home at 16521 Endicott Road.

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Attachment H

## Cellular Phone Towers

Cellular (cell) phones first became widely available in the United States in the 1990s, but since then their use has increased dramatically. The widespread use of cell phones has led to cell phone towers being placed in many communities. These towers, also called *base stations*, have electronic equipment and antennas that receive and transmit radiofrequency (RF) signals.

### How do cellular phone towers work?

Cell phone base stations may be free-standing towers or mounted on existing structures, such as trees, water tanks, or tall buildings. The antennas need to be high enough so they can adequately cover the area. Base stations are usually from 50-200 feet high.

Cell phones communicate with nearby cell towers mainly through radiofrequency (RF) waves, a form of energy in the electromagnetic spectrum between FM radio waves and microwaves. Like FM radio waves, microwaves, visible light, and heat, they are forms of non-ionizing radiation. This means they cannot cause cancer by directly damaging DNA. RF waves are different from stronger types of radiation such as x-rays, gamma rays, and ultraviolet (UV) light, which can break the chemical bonds in DNA.

At very high levels, RF waves can heat up body tissues. (This is the basis for how microwave ovens work.) But the levels of energy used by cell phones and towers are much lower.

When a person makes a cell phone call, a signal is sent from the phone's antenna to the nearest base station antenna. The base station responds to this signal by assigning it an available radiofrequency channel. RF waves transfer the voice information to the base station. The voice signals are then sent to a switching center, which transfers the call to its destination. Voice signals are then relayed back and forth during the call.

### How are people exposed to the energy from cellular phone towers?

As people use cell phones to make calls, signals are transmitted back and forth to the base station. The RF waves produced at the base station are given off into the environment, where people can be exposed to them.

The energy from a cellular phone tower antenna, like that of other telecommunication antennas, is directed toward the horizon (parallel to the ground), with some downward scatter. Base station antennas use higher power levels than other types of land-mobile antennas, but much lower levels than those from radio and television broadcast stations. The amount of energy decreases rapidly with increasing distance from the antenna. As a result, the level of exposure to radio waves at ground level is very low compared to the level close to the antenna.

Public exposure to radio waves from cell phone tower antennas is slight for several reasons. The power levels are relatively low, the antennas are mounted high above ground level, and the signals are transmitted intermittently, rather than constantly.

At ground level near typical cellular base stations, the amount of RF energy is thousands of times less than the limits for safe exposure set by the US Federal Communication Commission (FCC) and other regulatory authorities. It is very unlikely that a person could be exposed to RF levels in excess of these limits just by being near a cell phone tower.

When a cellular antenna is mounted on a roof, it is possible that a person on the roof could be exposed to RF levels greater than those typically encountered on the ground. But even then, exposure levels approaching or exceeding the FCC safety guidelines are only likely to be found very close to and directly in front of the antennas. If this is the case, access to these areas should be limited.

The level of RF energy inside buildings where a base station is mounted is typically much lower than the level outside, depending on the construction materials of the building. Wood or cement block reduces the exposure level of RF radiation by a factor of about 10. The energy level *behind* an antenna is hundreds to thousands of times lower than in front. Therefore, if an antenna is mounted on the side of a building, the exposure level in the room directly behind the wall is typically well below the recommended exposure limits.

## Do cellular phone towers cause cancer?

Some people have expressed concern that living, working, or going to school near a cell phone tower might increase the risk of cancer or other health problems. At this time, there is very little evidence to support this idea. In theory, there are some important points that would argue against cellular phone towers being able to cause cancer.

First, the energy level of radiofrequency (RF) waves is relatively low, especially when compared with the types of radiation that are known to increase cancer risk, such as gamma rays, x-rays, and ultraviolet (UV) light. The energy of RF waves given off by cell phone towers is not enough to break chemical bonds in DNA molecules, which is how these stronger forms of radiation may lead to cancer.

A second issue has to do with wavelength. RF waves have long wavelengths, which can only be concentrated to about an inch or two in size. This makes it unlikely that the energy from RF waves could be concentrated enough to affect individual cells in the body.

Third, even if RF waves were somehow able to affect cells in the body at higher doses, the level of RF waves present at ground level is very low – well below the recommended limits. Levels of energy from RF waves near cell phone towers are not significantly different from the background levels of RF radiation in urban areas from other sources, such as radio and television broadcast stations.

For these reasons, most scientists agree that cell phone antennas or towers are unlikely to cause cancer.

### Studies in people

Very few human studies have focused specifically on cellular phone towers and cancer risk.

In one large study, British researchers compared a group of more than 1,000 families of young children with cancer against a similar group of families of children without cancer. They found no link between a mother's exposure to the towers during pregnancy (based on the distance from the home to the nearest tower and on the amount of energy given off by nearby towers) and the risk of early childhood cancer.

In another study, researchers compared a group of more than 2,600 children with cancer to a group of similar children without cancer. They found that those who lived in a town that could have exposed them to higher than average RF radiation from cellular phone towers in the previous 5 years had a slightly higher risk of cancer, although not of any certain type of cancer (like leukemia or brain tumors). This study estimated the children's possible exposure based on the number of towers in their town and how strong the signals were from the towers. It did not look at actual exposure of any individual child based on how far their home or school was from a tower.

One study looked for signs of DNA and cell damage in blood cells as a possible indicator of cancer-causing potential. They found that the damage was no worse in people who lived near a cell phone tower as compared with those didn't.

The amount of exposure from living near a cell phone tower is typically many times lower than the exposure from using a cell phone. About 30 studies have looked at possible links between cell phone use and tumors in people. Most studies to date have not found a link between cell phone use and the development of tumors, although these studies have had some important limitations. This is an area of active research. For more information, see the document, *Cellular Phones*.

### Studies done in the lab

Laboratory studies have looked at whether the types of RF waves used in cell phone communication can cause DNA damage. Most of these studies have supported the idea that the RF waves given off by cell phones and towers don't have enough energy to damage DNA directly.

Some scientists have reported that the RF waves may produce other effects in human cells (in lab dishes) that might possibly help tumors grow. However, these studies have not been verified, and these effects weren't seen in a study that looked at the blood cells from people living near a cellular phone tower.

Several studies in rats and mice have looked at whether RF energy might promote the development of tumors caused by other known carcinogens (cancer-causing agents). These studies did not find evidence of tumor promotion. Research in this area continues.

### What expert agencies say

#### About cell phone towers

The 3 expert agencies that usually classify cancer-causing exposures (carcinogens) – the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), and the US Environmental Protection Agency (EPA) – have not classified cell phone towers as to their cancer-causing potential.

The **US Federal Communications Commission (FCC)** has said this about cell phone towers near homes or schools:

“Radiofrequency emissions from antennas used for cellular and PCS [personal communications service] transmissions result in exposure levels on the ground that are typically thousands of times below safety limits. These safety limits were adopted by the FCC based on the recommendations of expert organizations and endorsed by agencies of the Federal Government responsible for health and safety. Therefore, there is no reason to believe that such towers could constitute a potential health hazard to nearby residents or students.”

## About RF radiation

Some of the agencies that classify cancer-causing exposures have, however, made statements about radiofrequency radiation.

The **International Agency for Research on Cancer (IARC)** has classified RF fields as “possibly carcinogenic to humans,” based on limited evidence of a possible increase in risk for brain tumors among cell phone users, and inadequate evidence for other types of cancer. (For more information on the IARC classification system, see our document, *Known and Probable Human Carcinogens*.) IARC also noted that exposure to the brain from RF fields from cell phone base stations (mounted on roofs or towers) is less than 1/100<sup>th</sup> the exposure to the brain from mobile devices such as cell phones.

The **Environmental Protection Agency (EPA)** states:

“Exposure to radio frequency (RF) radiation has climbed rapidly with the advent of cell phones and other wireless technologies. Studies of the link between exposure to RF and to electric and magnetic frequency (EMF) radiation have found RF and EMF to be ‘potential carcinogens,’ but the data linking RF and EMF to cancer is not conclusive. World wide, health physicists (scientists who study the biological effects of radiation) continue to study the issue.”

## Do cellular phone towers cause any other health problems?

High levels of RF waves can cause a warming of body tissues, but the energy levels on the ground near a cell phone tower are far below the levels needed to cause this effect. So far, there is no evidence in published scientific reports that cell phone towers cause any other health problems.

## Can I limit my exposure?

Cell phone towers are not known to cause any health effects. But if you are concerned about possible exposure from a cell phone tower near your home or office, you can ask a government agency or private firm to measure the RF field strength near the tower (where a person could be exposed) to ensure that it is within the acceptable range.

## What should I do if I’ve been exposed to cellular phone towers?

There is no test to measure whether you have been exposed to RF radiation from cellular phone towers. But as noted above, most researchers and regulatory authorities do not believe that cell phone towers pose health risks under ordinary conditions. If you have additional health concerns, you might want to talk with your doctor.

## Additional resources

### More information from your American Cancer Society

The following related information may also be helpful to you. These materials may be viewed on our Web site or ordered from our toll-free number, at 1-800-227-2345.

Cellular Phones

Does This Cause Cancer?

Known and Probable Human Carcinogens

Microwaves□Radio Waves□and Other Types of Radiofrequency Radiation

## National organizations and Web sites\*

In addition to the American Cancer Society, other sources of information and support include:

### Environmental Protection Agency

Home page: [www.epa.gov](http://www.epa.gov)

Understanding radiation: [www.epa.gov/radiation/understanding-radiation-overview.html](http://www.epa.gov/radiation/understanding-radiation-overview.html)

### Federal Communications Commission

RF Safety Program, Office of Engineering and Technology

Web site: [www.fcc.gov/oet/rfsafety](http://www.fcc.gov/oet/rfsafety)

### Food and Drug Administration

Home page: [www.fda.gov](http://www.fda.gov)

Radiation-emitting products: Cell phones: [www.fda.gov/Radiation-](http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/HomeBusinessandEntertainment/CellPhones/default.htm)

[EmittingProducts/RadiationEmittingProductsandProcedures/HomeBusinessandEntertainment/CellPhones/default.htm](http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/HomeBusinessandEntertainment/CellPhones/default.htm)

### National Cancer Institute

Toll-free number: 1-800-422-6237 (1-800-4-CANCER)

Home page: [www.cancer.gov](http://www.cancer.gov)

Cellular telephone use and cancer risk: [www.cancer.gov/cancertopics/factsheet/Risk/cellphones](http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones)

### National Institute of Environmental Health Sciences

Home page: [www.niehs.nih.gov](http://www.niehs.nih.gov)

Electric and magnetic fields: [www.niehs.nih.gov/health/topics/agents/emf/index.cfm](http://www.niehs.nih.gov/health/topics/agents/emf/index.cfm)

### World Health Organization

Electromagnetic fields and public health: base stations and wireless technologies

Web site: [www.who.int/mediacentre/factsheets/fs304/en/index.html](http://www.who.int/mediacentre/factsheets/fs304/en/index.html)

*\* Inclusion on this list does not imply endorsement by the American Cancer Society*

No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at 1-800-227-2345 or visit [www.cancer.org](http://www.cancer.org).

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IRPA, 1988, International Radiation Protection Association. Guidelines on limits of exposure to radio frequency electromagnetic fields. IEEE United States Activities, COMAR, Washington, DC.

Li CY, Liu CC, Chang YH, Chou LP, Ko MC. A population-based case-control study of radiofrequency exposure in relation to childhood neoplasm. *Sci Total Environ*. 2012 Oct 1;435-436:472-478.

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Wolf R, Wolf D. Increased incidence of cancer near a cell-phone transmitter station. *Int J Cancer Prevention* 2004;1:123-128.

Yildirim MS, Yildirim A, Zamani AG, Okudan N. Effect of mobile phone station on micronucleus frequency and chromosomal aberrations in human blood cells. *Genet Couns*. 2010;21(2):243-51.

Last Medical Review: 01/31/2013

Last Revised: 01/31/2013

Monday January 26, 2015

**Sept 14-128CUP - 16423 Endicott Road  
Attachment I**

Matt:

The information I'm delivering today includes:

The original book and reports that I quoted in my original document submitted December 2<sup>nd</sup>, 2014.

A petition that neighbors in the area of the proposed cell tower have signed and included a map with plats marked in red indicating signatures on the petition and those who attended last P&Z meeting and said they were not in favor of the tower.

A map which shows the existing towers above 100' within a radius of approximately 4 miles of the proposed site. Excluding a tower owned by John Hill Transportation that also houses a City of Lawson antennae, there is no precedence for a 160' tower outside existing major highways and commercial areas.

An elevation map showing that the tower will be visible above the tree line from the lake at Watkins Mill State Park. Currently there are now visible power lines or towers visible above the tree line that would obstruct the view.

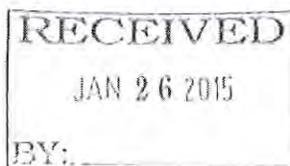
Other documentation that residents wanted included for the committee to review in making their recommendation.

If at all possible I would like to have the book returned since it was an \$80 investment.

Thank you for helping to walk me through this process. It is very gratifying to have our voices heard.

Sincerely,

Lisa Malay





# The Impact of Cell Phone Towers on House Prices in Residential Neighborhoods

by Sandy Bond, PhD, and Ko-hang Hong

## abstract

This article examines whether proximity to cellular phone towers has an impact on residential property values and the extent of any impact. First, a survey approach is used to examine how residents perceive living near cellular phone base stations (CPBSs) and how residents evaluate the impacts of CPBSs. Next, a market study attempts to confirm the perceived value impacts reported in the survey by analyzing actual property sales data. A multiple regression analysis in a hedonic pricing framework is used to measure the price impact of proximity to CPBSs. Both the survey and market sales analysis find that CPBSs have a negative impact on the prices of houses in the study areas.

The introduction of cellular phone systems and the rapid increase in the number of users of cellular phones have increased exposure to electromagnetic fields (EMFs). Health consequences of long-term use of cellular phones are not known in detail, but available data indicates that development of nonspecific health symptoms is possible.<sup>1</sup> Conversely, it appears health effects from cellular phone equipment (antennas and base stations) pose few, if any, known health hazards.<sup>2</sup>

A concern associated with cellular phone usage is the siting of cellular phone transmitting antennas (CPTAs) and cellular phone base stations (CPBSs). In New Zealand, CPBS sites are increasingly in demand as the major cellular phone companies there, Telecom and Vodafone, upgrade and extend their network coverage. This demand could provide the owner of a well-located property a yearly income for the siting of a CPBS.<sup>3</sup> However, new technology that represents potential hazards to human health and safety may cause property values to diminish due to public perceptions of hazards. Media attention to the potential health hazards of CPBSs has spread concerns among the public, resulting in increased resistance to CPBS sites.

Some studies suggest a positive correlation between long-term exposure to the electromagnetic fields and certain types of cancer,<sup>4</sup> yet other studies report inconclusive results on health effects.<sup>5</sup> Notwithstanding the research results, media reports indicate that the extent of opposition from some property owners

1. Stanley Szponof and Elizabeth Solerzwick, "Cellular Phone Systems and Human Health: Problems with Risk Perception and Consumer Action," *Environmental Management and Health* 11, no. 4 (2000): 357-368.
2. Jerry R. Burton, "Cellular Phones, Are They Safe?," *Professional Safety* 44, no. 12 (Dec., 1999): 20-23.
3. R. Williams, "Phone Zero - Renting Roof Space to Ma Bell," *The Property Business* 12 (April 2000): 6-7.
4. C. M. Rouse et al., "Effects of Electromagnetic Field Emitted by Cellular Phones on the EEG During a Memory Task," *Neuroreport* 11, no. 4 (2000): 763-765.
5. Independent Expert Group on Mobile Phones, *Mobile Phones and Health Report to the United Kingdom Government*, 2000, <http://www.cis.gov.org.uk/>.

affected by the siting of CPBSs remains strong.<sup>6</sup> However, the extent to which such attitudes are reflected in lower property values for homes located near CPBSs is not known.

Understanding the impact of CPBSs on property values is important to telecommunications companies both for planning the siting of CPBSs and for determining likely opposition from property owners. Similarly, property appraisers need to understand the valuation implications of CPBSs when valuing CPBS-affected property. The owners of affected property also want to understand the magnitude of any effects, particularly if compensation claims or an award for damages are to be made based on any negative effects on value.

The research here uses a case study approach to determine residents' perceptions towards living near CPBSs in Christchurch, New Zealand, and to quantify these effects in monetary terms according to an increasing or decreasing percentage of property value. The case study uses both an opinion survey and an econometric analysis of sales transaction data. A comparison of the results can be used to help appraisers value affected property as well as to resolve compensation issues and damage claims in a quantitative way. Further, the results provide a potential source of information for government agencies in assessing the necessity for increased information pertaining to CPBSs.

The following provides a brief review of the cellular phone technology and relevant literature. Then, the next section describes the research procedure used, including descriptions of the case study and control areas. The results are then discussed, and the final section provides a summary and conclusion.

### Cellular Telephone Technology<sup>7</sup>

Cellular (mobile) telephones are sophisticated two-way radios that use ultrahigh frequency (UHF) radio waves to communicate information. The information is passed between a mobile phone and a network of low-powered transceivers, called mobile phone sites or cell sites. As mobile sites are very low powered they serve only a limited geographic area (or "cell"), varying from a few hundred meters to several kilometers; they can handle only a limited number of calls at one time. When a mobile phone

user on the move leaves one cell and enters another, the next site automatically takes over the call, allowing contact to be maintained.

When a mobile phone call is initiated, the phone connects to the network by using radio signals to communicate with the nearest mobile phone site. The mobile phone sites in a network are interlinked by cable or microwave beam, enabling phone calls to be passed from one cell to another automatically. A mobile phone site is typically made up of a mast with antennas connected to equipment stored in a cabinet. Power is fed into the cabinet by underground cable. The antennas are designed to transmit most of the signal away horizontally, or just below horizontal, rather than at steep angles to the ground.

Mobile phone sites can only accommodate a limited number of calls at any one time. When this limit is reached, the mobile phone signal is transferred to the next nearest site. If this site is full or is too far away, the call will fail.

Cell site capacity is a major issue for telecommunication companies. As the number of people using mobile phones grows, more and more cell sites are required to meet customer demand for reliable coverage. At the end of March 2002, Telecom had more than 1.5 million mobile phone customers and more than 750 mobile phone sites throughout New Zealand. Vodafone had over 1.1 million mobile phone customers.<sup>8</sup> In areas, such as Auckland (the largest city in New Zealand, with close to a third of the NZ population), where almost complete coverage has been achieved, the main issue is ensuring that there is the capacity to handle the ever-increasing number of mobile phones and calls.

### Locating Cellular Phone Sites

For cellular phone service providers, the main goals when locating cell sites are (1) finding a site that provides the best possible coverage in the area without causing interference with other cells, and (2) finding a site that causes the least amount of environmental impact on the surrounding area. Service providers usually attempt to locate cell sites on existing structures such as buildings, where antennas can be mounted on the roof to minimize the environmental impact. If this is not possible, a mast will need to be erected to support the antennas for the new cell site.

6. S. Iles, "Cell Phone Antenna Wines Landscapes," *Environ. Impact Review*, November 8, 2002, 4.

7. The information in this section was sourced from Telecom, <http://www.telecom.co.nz>, New Zealand Ministry for the Environment, <http://www.mfe.govt.nz>, and New Zealand Ministry of Health, <http://www.moh.govt.nz>.

8. Vodafone, "Cell Sites and the Environment," [http://www.vodafone.co.nz/about/vodafone\\_cellsites.pdf](http://www.vodafone.co.nz/about/vodafone_cellsites.pdf) (accessed December 19, 2002) and "Mobile Phones and Health," [http://www.vodafone.co.nz/about/vodafone\\_health\\_and\\_safety.pdf](http://www.vodafone.co.nz/about/vodafone_health_and_safety.pdf) (accessed December 19, 2002); and Telecom, "Mobile Phone Sites and Safety," [http://www.telecom.co.nz/econ/04\\_PBS/27116\\_1536\\_03.html](http://www.telecom.co.nz/econ/04_PBS/27116_1536_03.html) (accessed December 19, 2002).



dio signal. However, reported scientific evidence challenges this view and shows that cell phone radiation causes various effects, such as altered brain activity, memory loss, and fatigue.<sup>16</sup>

According to Cherry, there is also strong evidence to conclude that cell sites are risk factors for certain types of cancer, heart disease, neurological symptoms and other effects.<sup>17</sup> The main concerns related to EMF emissions from CPBSs are linked to the fact that radio frequency fields penetrate exposed tissues.

Public concern regarding both cell phones and CPBSs in many countries has led to establishment of independent expert groups to carry out detailed reviews of the research literature. Research on the health effects of exposures to RF are reviewed by, for instance, the NZ Radiation Laboratory, the World Health Organization, the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the Royal Society of Canada, and the UK Independent Expert Group on Mobile Phones. The reviews conclude that there are no clearly established health effects for low levels of exposure. Such exposures typically occur in publicly accessible areas around radio frequency transmitters. However, there are questions over the delayed effects of exposure.

While present medical and epidemiological studies reveal weak association between health effects and low level exposures of RF/MW fields, controversy remains among scientists, producers, and the general public. Negative media attention has fuelled the perception of uncertainty over the health effects from cell phone systems. Further scientific or technological information is needed to allay fears of the public about cell phone systems.

**Radio Frequency Radiation Exposure Standards: International Standards.** The reviews of research on the health effects of exposures to RF have helped establish exposure standards that limit RF exposures to a safe level. Most standards—including those set by the ICNIRP, the American National Standards Institute (ANSI), and New Zealand—are based on the most adverse potential effects.

The 1998 ICNIRP guidelines have been accepted by the world's scientific and health communities; these guidelines are both consistent with other stated standards and published by a highly respected and independent scientific organization. The ICNIRP is responsible for providing guidance and advice on the health hazards of nonionizing radiation for the World Health Organization (WHO) and the International Labour Office.<sup>18</sup>

**The New Zealand Standard.** In New Zealand, when a mobile phone site is being planned, radio frequency engineers calculate the level of electromagnetic energy (EME) that will be emitted by the site. The level of EME is predicted by taking into account factors such as power output, cable loss, antenna gain, path loss, and height and distance from the antenna. These calculations allow engineers to determine the maximum possible emissions in a worst case scenario, i.e., as if the site was operated at maximum power all the time. The aim is to ensure that EME levels are below international and NZ standards in areas where the general public has unrestricted access.

All mobile phone sites in New Zealand must comply in all respects with the NZ standard for radio frequency exposures.<sup>19</sup> This standard is the same as used in most European countries, and is more stringent than that used in the United States, Canada, and Japan. Some local communities in New Zealand have even lower exposure-level standards; however, in reality mobile phone sites only operate at a fraction of the level set by the NZ standard. The National Radiation Laboratory has measured exposures around many operating cell sites, and maximum exposures in publicly accessible areas around the great majority of sites are less than 1% of the exposure limit of the NZ standard. Exposures are rarely more than a few percent of the limit, and none have been above 10%.

#### Court Decisions

Two court cases in New Zealand have alleged adverse effects due to CPBSs: *McIntyre v. Christchurch City*

16. R. Mann and J. Roschke, "Effects of Pulsed High Frequency Electromagnetic Fields on Human Sleep," *Neuropsychobiology* 33, no. 1 (1990): 41–47; R. Mann et al.; Alexander Baskley et al., "Pulsed High Frequency Electromagnetic Field Effects on Human Sleep and Sleep Architecture/epileptiform," *Neurosci Lett* 275, no. 3 (1999): 207–210; L. Reber et al., "Effects of Mobile GSM Radiofrequency Exposure on the Auditory Brainstem Response (ABR)," *Neurobiology* 7, no. 1 (1999): 29–31; B. Heckberg, "Preliminary Report, Symptoms Associated with Mobile Phone Use," *Urban Med* 48, no. 6 (Sept. 1998): 357–369, and others, as reported in Red Cherry, *Health Effects Associated with Mobile Phone Stations in Communities: The Need for Health Studies*, Environmental Management and Design Division, Lincoln University (June 7, 2000), <http://pages.hawaii.hawaii.edu/~redcherry/ourcases/stations.htm>.

17. Cherry for the Environment and Ministry of the Sea.

18. *NZS 2722:1 (1998)*, "Radiofrequency Fields, Part I: Maximum Exposure Levels—300 to 300 GHz." This standard was based largely on the 1998 ICNIRP recommendations for maximum human exposure levels to radio frequency. The standard also includes a requirement for minimum radio frequency assessment. See National Radiation Laboratory, *Cell Sites* (March 2001), 7, available at <http://www.rad.npl.govt.nz/CellSiteTech1.pdf>.

*Council*<sup>20</sup> and *Shirley Primary School v. Telecom Mobile Communications Ltd.*<sup>21</sup> Very few cell site cases have actually proceeded to Environment Court hearings. In these two cases the plaintiffs claimed that there was a risk of adverse health effects from radio frequency radiation emitted from cell phone base stations and that the CPBSs had adverse visual effects.

In *McIntyre*, Bell South applied for resource consent to erect a CPBS. The activity was a noncomplying activity under the Transitional District Plan. Residents objected to the application. Their objections were related to the harmful health effects from radio frequency radiation. In particular, they argued it would be an error of law to decide, based on the present state of scientific knowledge, that there are no harmful health effects from low level radio frequency exposure. It was also argued that the Resource Management Act contains a precautionary policy and also requires a consent authority to consider potential effects of low probability but high impact in reviewing an application.

The Planning Tribunal considered residents' objections and heard experts' opinions as to the potential health effects, and granted the consent, subject to conditions. It was found that there would be no adverse health effects from low levels of radiation from the proposed transmitter, not even effects of low probability but high potential impact.

In *Shirley Primary School*, Telecom applied to the Christchurch City Council for resource consent to establish, operate, and maintain a CPBS on land adjacent to the Shirley Primary School. This activity was a noncomplying activity under the Transitional District Plan. Again, the city council granted the consent subject to conditions. However, the school appealed the decision, alleging the following four adverse effects:

- Risk of adverse health effects from the radio frequency radiation emitted from the cell site
- Adverse psychological effects on pupils and teachers because of the perceived health risks.
- Adverse visual effects
- Reduced financial viability of the school if pupils withdraw because of the perceived adverse health effects

The court concluded that the risk of the children or teachers at the school developing leukemia or other cancers from radio frequency radiation emitted by

the cell site is extremely low, and the risk to the pupils of developing sleep disorders or learning disabilities because of exposure to radio frequency radiation is higher, but still very small. Accordingly, the Telecom proposal was allowed to proceed.

In summary, the Environmental Court ruled that there are no established adverse health effects from the emission of radio waves from CPBSs and no epidemiological evidence to show this. The court was persuaded by the ICNIRP guidelines that risk of health effects from low level exposure is very low and that the cell phone frequency imposed by the NZ standard is safe, being almost two and one half times lower than that of the ICNIRP.

The court did concede that while there are no proven health effects, there was evidence of property values being affected by both of the health allegations. The court suggested that such a reduction in property values should not be counted as a separate adverse effect from, for example, adverse visual or amenities effects. That is, a reduction in property values is not an environmental effect in itself; it is merely evidence, in monetary terms, of the other adverse effects noted.

In a third case, *Goldfinch v. Auckland City Council*,<sup>22</sup> the Planning Tribunal considered evidence on potential losses in value of the properties of objectors to a proposal for the siting of a CPBS. The court concluded that the valuer's monetary assessments support and reflect the adverse effects of the CPBS. Further, it concluded that the effects are more than just minor as the CPBS stood upon the immediately neighboring property.

## Literature Review

While experimental and epidemiological studies have focused on the adverse health effects of radiation from the use of cell phones and CPBSs, few studies have been conducted to ascertain the impact of CPBSs on property values. Further, little evidence of property value effects has been provided by the courts. Thus, the extent to which opposition from property owners affected by the siting of CPBSs is reflected in lower property values is not well known in New Zealand.

Two studies have been conducted to ascertain the adverse health and visual effects of CPBSs on property values. Telecom commissioned Knight Frank (NZ) Ltd to undertake a study in Auckland in 1998/

20. NZRMA 289 (1995).

21. NZRMA 69 (1999).

22. NZRMA 97 (1999).

99 and commissioned Teller Young (Cauterbury) Ltd to undertake a similar study in Christchurch in 2001. Although the studies show that there is not a statistically significant effect on property prices where CPBSs are present,<sup>23</sup> the research in both cases involves only limited sales data analysis. Further, no surveys of residents' perceptions were undertaken, and the studies did not examine media attention to the sites and the impact this may have on saleability of properties in close proximity to CPBSs. Finally, as the sponsoring party to the research was a telecommunication company it is questionable whether the results are completely free from bias. Hence, the present study aims to help fill the research void on this contentious topic in an objective way.

CPBSs are very similar structures to high-voltage overhead transmission lines (HVOTLs); therefore it is worthwhile to review the body of literature on the property values effects of HVOTLs. The only recently published study in New Zealand on HVOTLs effects is by Bond and Hopkins.<sup>24</sup> Their research consists of both a regression analysis of residential property transaction data and an opinion survey to determine the attitudes and reactions of property owners in the study area toward living close to HVOTLs and pylons.

The results of the sales analysis indicate that having a pylon close to a particular property is statistically significant and has a negative effect of 20% at 10–15 meters from the pylon, decreasing to 5% at 50 meters. This effect diminishes to a negligible amount after 100 meters. However, the presence of a transmission line in the case study area has a minimal effect and is not a statistically significant factor in the sale prices.

The attitudinal study results indicate that nearly two-thirds of the respondents have negative feelings about the HVOTLs. Proximity to HVOTLs determines the degree of negativity; respondents living closer to the HVOTLs expressed more negative feelings towards them than those living farther away. It appears, however, from a comparison of the results, that the negative feelings expressed are often not reflected in the prices paid for such properties.

There have been a number of HVOTLs studies carried out in the United States and Canada. A major review and analysis of the literature by Kroll and Priestley indicates that in about half the studies, HVOTLs have not affected property values and in the rest of the studies there is a loss in property value between 2%–10%.<sup>25</sup> Kroll and Priestley are generally critical of most valuer type studies because of the small number of properties included and the failure to use econometric techniques such as multiple regression analysis. They identify the Colwell study as one of the more careful and systematic analyses of residential impacts.<sup>26</sup> That study, carried out in Illinois, finds that the strongest effect of HVOTLs is within the first 15 meters, but the effect dissipates quickly with distance, disappearing beyond 60 meters.

A Canadian study by Des Rosiers, using a sample of 507 single-family house sales, finds that severe visual encumbrance due to a direct view of either a pylon or lines exerts a significant, negative impact on property values; however location adjacent to a transmission corridor may increase value.<sup>27</sup> This was particularly evident where the transmission corridor was on a well wooded, 90 meter right of way. The proximity advantages include enlarged visual field and increased privacy. The decrease in value from the visual impact of the HVOTLs and pylons (on average between 5% and 10% of mean house value) tends to be cancelled out by the increase in value from proximity to the easement.

A study by Wolverton and Bottemiller<sup>28</sup> uses a paired sale analysis of home sales in 1989–1992 to ascertain any difference in sale price between properties abutting rights-of-way of transmission lines (subjects) in Portland, Oregon; Vancouver, Washington; and Seattle, Washington; and those located in the same cities but not abutting transmission line rights of way (comparisons). Subjects sold during the study period were selected first; then a matching comparison was selected that was as similar to the subject as possible. The study results did not support a finding of a price effect from abutting an HVTL right of way. In their conclusion, the authors

23. Mark Danks is Teller Young research valuer, personal communication with Bond, 2002. The results of these studies have not been made publicly known. The study by Wright Group of Auckland was conducted by Robert Abrecht.

24. S. G. Bond and J. Hopkins, "The Impact of Transmission Lines on Residential Property Values: Results of a Case Study in a Suburb of Wellington, New Zealand," *Ecological Property Research Journal*, no. 2 (2000): 52–60.

25. G. Kroll and L. Priestley, "The Effects of Overhead Transmission Lines on Property Values: A Review and Analysis of the Literature," *Tolson Electric Institute* (July 1992).

26. Peter L. Colwell, "Pylon Lines and Land Value," *Journal of Real Estate Research* 5, no. 3 (Spring 1993): 111–124.

27. François Des Rosiers, "Pylon Lines, Visual Encumbrance and House Values: A Microspatial Approach to Impact Measurement," *Journal of Real Estate Research* 23, no. 3 (2002): 275–301.

28. Mark J. Wolverton and Steven G. Bottemiller, "Further Analysis of Home Sales in an Electric Line Corridor on Residential Property Values," *Real Appraisal Journal* (July 1993): 247–252.

warn that the results cannot and should not be generalized outside of the data. They explain that

limits on generalizations are a universal problem for real property sale data because analysis is constrained to properties that sell and sold properties are never a randomly drawn representative sample. Hence, generalizations must rely on the weight of evidence from numerous studies, samples, and locations.<sup>29</sup>

Thus, despite the varying results reported in the literature on property value effects from HVOTLs, each study adds to the growing body of evidence and knowledge on this (and similar) valuation issue(s). The study reported here is one such study.

### Opinion Survey Research Objectives and Methodology

Research by Abelson;<sup>30</sup> Chalmers and Roehr;<sup>31</sup> Kinnard, Geckler and Dickey;<sup>32</sup> Bond;<sup>33</sup> and Flynn et al.,<sup>34</sup> recommend the use of market sales analysis in tandem with opinion survey studies to measure the impact of environmental hazards on residential property values. The use of more than one approach provides the opportunity to compare the results from each and to derive a more informed conclusion than obtained from relying solely on one approach. Thus, the methods selected for this study include a public opinion survey and a hedonic house price approach (as proposed by Freeman<sup>35</sup> and Rosen<sup>36</sup>). A comparison of the results from both of these techniques will reveal the extent to which the market reacts to cell phone towers.

### Public Opinion Survey

An opinion survey was conducted to investigate the current perceptions of residents towards living near CPBSs and how this proximity might affect property values. Case study areas in the city of Christchurch were selected for this study. The study included residents in ten suburbs: five case study areas (within 300 meters of a cell phone tower) and five control areas (over 1 kilometer from the cell phone tower). The five case study suburbs were

matched with five control suburbs that had similar living environments (in socioeconomic terms) except for the presence of a CPBS.

The number of respondents to be surveyed (800) and the nature of the data to be gathered (perceptions/personal feelings towards CPBSs) governed the choice of a self-administered questionnaire as the most appropriate collection technique. Questionnaires were mailed to residents living in the case study and control areas.

A self-administered survey helps to avoid interviewer bias and to increase the chances of an honest reply where the respondent is not influenced by the presence of an interviewer. Also, mail surveys provide the time for respondents to reflect on the questions and answer these at their leisure, without feeling pressured by the time constraints of an interview. In this way, there is a better chance of a thoughtful and accurate reply.

The greatest limitation of mail surveys is that a low response rate is typical. Various techniques were used to help overcome this limitation, including careful questionnaire design; inclusion of a free post return envelope; an accompanying letter ensuring anonymity; and reminder letters. An overall response rate of 40% was achieved for this study.

The questionnaire contained 43 individual response items. The first question acted as an identifier to determine whether the respondent was a homeowner or tenant. While responses from both groups were of interest, the former was of greater importance, as they are the group of purchasers/sellers that primarily influence the value of property. However, it was considered relevant to survey both groups as both are affected by proximity to a CPBS to much the same extent from an occupiers' perspective, i.e., they both may perceive risks associated with a CPBS. It was hypothesized that tenants, being less permanent residents, would perceive the effects in a similar way, but to a much lesser degree.

Other survey questions related to overall neighborhood environmental desirability; the timing of

29. *Ibid.*, 252.

30. R.W. Abelson, "Property Prices and Amenity Values," *Journal of Environmental Economics and Management* 6 (1979): 11-28.

31. James A. Chalmers and Scott Roehr, "Issues in the Valuation of Contaminated Property," *The Appraisal Journal* (January 1993): 20-41.

32. W. H. Brund, M. B. Goldberg, and S. A. Dickey, "Fear (Is a Measure of Damages) Study: Our Two Case Studies - Comparisons of Actual Market Behavior with Opinion Survey Research." Paper presented at the Tenth Annual American Real Estate Society Conference, Santa Barbara, California, April 1993.

33. S. G. Bond, "Do Market Perceptions Affect Market Prices? A Case of a Remediated Contaminated Site," in *Local State Valuation Issues*, ed. R. Wang and M. E. Webster, 205-374 (Boston: Allyn & Bacon Publishers, 2002).

34. James Flynn et al., "Survey Approach for Demonstrating Stigma Effects on Property Value Estimation," *The Appraisal Journal* (Winter 2003): 35-45.

35. A. Myrdal, *Democracy, The Benefits of Environmental Improvement: Theory and Practice* (Baltimore: Johns Hopkins Press, 1979).

36. Sherman Rosen, "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," *Journal of Political Economy* 82, no. 1 (Jan/Feb 1974): 34-55.

the CPBS's construction and its proximity in relation to the respondent's home; the importance placed on the CPBS as a factor in relocation decisions and on the price/rent the respondent was prepared to pay for the house; how a CPBS might affect the price the respondent would be willing to pay for the property; and the degree of concern regarding the effects of CPBSs on health, stigma, aesthetics, and property values. The surveys were coded to identify the property address of the respondent. This enabled each respondent's property to be located on a map and to show this in relation to the cell site.

Eighty questionnaires<sup>37</sup> were distributed to each of the ten suburbs (five case study and five control areas) in Christchurch. Respondents were instructed to complete the survey and return it in the free post, self-addressed envelope provided. The initial response rate was 51%. A month later, a further 575 questionnaires with reminder letters were sent out to residents who had not yet responded. A total response rate of 46% was achieved. Response rates from each suburb ranged from 55% (Linwood) to 61% (Bishopdale).

The questionnaire responses were coded and entered into a computerized database.<sup>38</sup> The analysis of responses included the calculation of means and percentage of responses to each question to allow for an overview of the response patterns in each area.

#### Case Study and Control Areas

The suburbs of Beekham, Papanui, Upper Riccarton, Bishopdale, and St Albans were selected for the case study because there is at least one CPBS within each of these communities. Census data, providing demographic and socioeconomic characteristics of geographic areas, was used to select the control suburbs of Spreydon, Linwood, Bromley, Avonhead, and Ham.<sup>39</sup> The control areas are located further away (over 1 kilometer) from the CPBS in their matched case study area. As well as matching demographic and socioeconomic characteristics, each suburb was selected based on its similarity to its matched case study area in terms of living environment and housing stock, distance to the central

business district, and geographic size; the only dissimilarity is that there are no CPBSs in the control areas. (See Appendix I for a location map.)

Demographic statistics show that Bromley and Ham comprise a younger population (median age about 35), with Bishopdale and Upper Riccarton having an older population (median age about 40). The ethnic breakdown of each suburb indicates that Papanui and Spreydon have the highest proportion of Europeans (about 90%), Bromley has the highest proportion of both Maoris and Pacific Islanders (15.9% and 8.5% respectively), while Ham, Avonhead, and Upper Riccarton have the highest proportion of Asians (16.1% to 18.5%).<sup>40</sup>

Median household and median family incomes (MHI and MFI) are highest in Ham and Avonhead (MHI: \$51,751NZ, \$55,405NZ; MFI: \$51,550NZ, \$65,801NZ, respectively) and lowest in Linwood and Beekham (MHI: \$22,275NZ, \$26,598NZ; MFI: \$29,675NZ, \$35,847NZ respectively).<sup>41</sup> Residents of St Albans West have the highest levels of education (21.7% have a degree or a higher degree) followed by Upper Riccarton (18.7%), Ham (16.7%), and Avonhead (16.2%). These same suburbs have the highest proportion of professionals by occupational class (20.5% to 27.3%). Residents of Bromley have the lowest education (40% have no qualification) and the lowest proportion of professionals (5.5%).<sup>42</sup>

In summary, the socioeconomic data shows that Ham is the more superior suburb, followed by Avonhead, Upper Riccarton, St Albans West, and Papanui. The lower socioeconomic areas are, in decreasing order, Spreydon, Bishopdale, Bromley, Beekham, and Linwood.

#### Survey Results

A summary of the main findings from the survey is presented in Appendix II, and the survey results are discussed in the following.

#### Response Rates

Of the 800 questionnaires mailed to homeowners and tenants in the case study and control areas (400 to each group), 50% from the case study area and 41%

37. Approved by the University of Auckland Human Subjects Ethics Committee (reference 2002/149).

38. The computer program SPSS was selected as the appropriate analytical tool for processing the data.

39. The census is conducted in New Zealand every five years, and the data used to define the control areas is from the latest census conducted in 2001. See Christchurch City Area Profile, 2001 at <http://www.ccc.govt.nz/Content/ChristchurchCityAreaProfile.stm>.

40. Christchurch City Area Profile statistics.

41. SHZ = 50.04%, med. \$34,254NZ = \$22,989NZ.

42. The median house price for Christchurch city in August 2003 was \$489,000NZ/\$120,000US (New Zealand national median house price at the time was \$216,000NZ/\$140,000US), (<http://www.renz.co.nz/Info/HousingStats/Sample-PDF5.pdf> accessed March 17, 2004). Median house prices in each individual suburb could not be obtained as the regional data from the Real Estate Institute of NZ (REINZ) captures more than one suburb in each location grouping.

from the control area were completed and returned. Over three-quarters (78.5%) of the case study respondents were homeowners compared to 94% in the control area.

#### Desirability of the Suburb as a Place to Live

More than half (58.7%) the case study respondents have lived in their suburb for more than five years (compared to 65% in the control group) and a quarter (25%) have lived in their suburb between 1 and 4 years (compared to 28% in the control group).

Around two-thirds (65% of the case study respondents and 68% of the control group respondents) rated their neighborhoods as either above average or superior as a place to live when compared with other similar named suburbs. The reasons given for this include close proximity to amenities (shops, library, medical facilities, public transport, and recreational facilities) and good schools.

Reasons given for rating the case study neighborhoods inferior to other similar neighborhoods include lower house prices, older homes, more student housing and lower-income residents. The reasons given by the control group respondents for an inferior rating include distance from the central business district (Aynhoead); smell from the sewerage oxidation ponds and composting ponds (Bromley); and lower socioeconomic area and noise from the airport (Lidwood).

#### Feelings About a CPBS as an Element of the Neighborhood

In the case study areas, a CPBS had already been constructed when only 59% of the respondents bought their houses or began renting in the neighborhood. Some responded that they were not notified that the CPBS was to be built, that they had no opportunity to object to it, and that they felt they should have been consulted about its construction. For the respondents who said that proximity to the tower was of concern to them, the most common reasons given for this were the impact of the CPBS on health, aesthetics, and property values. Nearly three-quarters (74%) of the respondents said they would have gone ahead with the purchase or rental of their property anyway if they had known that the CPBS was to be constructed.

In the control areas nearly three-quarters (72%) of the respondents indicated they would be opposed to construction of a CPBS nearby. The location of a CPBS would be taken into account by 85% of respondents if they were to consider moving. As with the case study respondents, the control group respondents who were concerned about proximity to a

CPBS were most often concerned about the effects of CPBSs on health, aesthetics, and property values.

#### Impact on Decision to Purchase or Rent

In the case study areas, the tower was visible from the houses of 46% of the respondents, yet two-thirds (66%) of these said it was barely noticeable, and one-quarter said it mildly obstructed their view. When asked in what way the CPBS impacts the enjoyment of living in their home, 57% responded that its impact was related to health concerns, 24% said it impacted neighborhood aesthetics, 20% said it impacted property value, and 12% said it impacted the view from their property.

When asked about the impact that the CPBS had on the price/rent they were prepared to pay for their property, over half the case study respondents (53.1%) said that the tower was not constructed at the time of purchase/rental, and 51.4% of the respondents said the proximity to the CPBS did not affect the price they were prepared to pay for the property. Nearly 3% said they were prepared to pay a little less, 2% said they were prepared to pay a little more. For the control group respondents, 45% of the respondents would pay substantially less for a property if a CPBS were located nearby, over one-third (38%) were prepared to pay just a little less for such a property, and 17% responded that a CPBS would not influence the price they would pay.

Only 10% of the case study respondents gave an indication of the impact that the CPBS had on the price/rent they were prepared to pay for the property; one-third of these felt it would decrease price/rent by 1% to 9%. For the control group, over one-third (38%) of the respondents felt that a CPBS would decrease price/rent by more than 20%, and a similar number (36%) said they would be prepared to pay 10% to 19% less for property located near a CPBS. The responses are outlined in Table 1.

**Table 1** Impact of a CPBS on Purchase/Rental Price Decision

Price/Rent Effect	Percent of Case Study Respondents (Control Group Responses)
20% more	5% (3%)
10–19% more	10% (2%)
1–9% more	14% (2%)
1–9% less	33% (19%)
10–19% less	24% (36%)
20% or greater reduction in price/rent	14% (38%)

Interestingly, it would seem that those living farther away from the CPBSs (the control group) are far more concerned about proximity to CPBSs than those living near CPBSs (the case study group); they indicated that a CPBS would have a greater price/rent effect. The possible explanations for this are discussed in the survey results section.

#### Concerns About Proximity to the CPBS

Most case study respondents were not worried about the effects of proximity to a CPBS related to health (30%), stigma (55%), future property value (61%), or aesthetics (63%). About one quarter to one third of these respondents were somewhat worried about the impact of proximity to a CPBS on health (58%), stigma (54%), future property value (25%), or aesthetics (25%). From the list of issues, respondents were most worried about future property value, but only 13.5% of the respondents responded this way.

Here again, control group respondents were much more concerned about the effects of proximity to a CPBS than their case study counterparts. Of the possible concerns about CPBSs on which respondents were asked to comment, control group respondents were most worried about the negative effects on future property values and aesthetics. Nearly half the respondents were worried a lot about these issues. Similar responses were recorded for the possibility of harmful health effects in the future from CPBSs (12% were worried a lot about this) and stigma associated with houses near CPBSs (54% were worried a lot). The responses regarding concerns about living near a CPBS are shown in Table 2.

In both the case study and control areas, the issue of greatest concern for respondents was the impact of proximity to CPBSs on future property values. The main concerns related to CPBSs were the unknown potential health effects, the possible socioeconomic implications of the siting of CPBSs, and how CPBSs affect property values. There also were concerns that the city council was not notifying the public about the possible construction of CPBSs.

#### Discussion of the Survey Results

The results were mixed, with responses from residents ranging from having no concerns to being very concerned about proximity to a CPBS. In general, those people living in areas farther from CPBSs were much more concerned about issues related to proximity to CPBSs than residents who lived near CPBSs.

Over 40% of the control group respondents were worried a lot about future health risks, aesthetics, and future property values compared with the case study areas, where only 13% of the respondents were worried a lot about these issues. However, in both the case study and control areas, the impact of proximity to CPBSs on future property values is the issue of greatest concern for respondents. If purchasing or renting a property near a CPBS, over a third (38%) of the control group respondents said a CPBS would reduce the price of their property by more than 20%. The perceptions of the case study respondents were again less negative, with a third saying they would reduce the price by only 1%–9%, and 24% saying they would reduce the price by 10%–19%.

The lack of concern shown by the case study respondents may be due to the CPBSs being either not visible or only barely visible from their homes. The CPBSs may be far enough away from respondents' properties (as was indicated by many respondents, particularly in St Albans West, Upper Riccarton, and Bishopdale) or hidden by trees and consequently not perceived as affecting the properties. The results may have been quite different had the CPBS being more visually prominent.

Alternatively, the apparent lower sensitivity to CPBSs of case study residents compared to the control group residents may be due to cognitive dissonance reduction. In this case, respondents may be unwilling to admit, due to the large amounts of money already paid, that they may have made a poor purchase or rental decision in buying or renting property located near a CPBS. Similarly, the homeowners may be unwilling to admit there are concerns about CPBSs when the CPBSs were built

**Table 2** Concerns about Living Near a CPBS\*

Concern	Does not worry me	Worries me somewhat	Worries me a lot
Possibility of harmful health effects	50% (20%)	38% (38%)	12% (42%)
Stigma effect	55% (21%)	34% (45%)	12% (34%)
Effect on future property values	61% (15%)	25% (37%)	13% (47%)
Aesthetics	63% (18%)	25% (37%)	11% (45%)

\* Percent of case study respondents (left) and control group respondents (right). All figures are rounded.

the distance from the hazard.<sup>16</sup> However, there are no known published studies that use hedonic housing models to measure the impact of proximity to a CPBS on residential property values. As in the previous residential house price studies, the standard hedonic methodology was used here to quantify the impact of a CPBS on sale prices of homes located near a CPBS. The results from this study in tandem with the opinion survey results will help test the hypothesis that proximity to a CPBS has a negative impact on property value and will reveal the extent to which the market reacts to CPBSs.

**Model Specification**

A hedonic price model is constructed by treating the price of a property as a function of its utility-bearing attributes. Independent variables used in the model to account for the property attributes are limited to those available in the data set and known, based on other well-tested models reported in the literature and from valuation theory, to be related to property price. The basic model used to analyze the impact on sale price of a house located near a CPBS, is as follows:

$$P_i^t = f(X_{1i}^t, X_{2i}^t, \dots, X_{ni}^t) \quad \text{where:}$$

$P_i^t$  = property price at the  $i$ th location  
 $X_1, \dots, X_n$  = individual characteristics of each house, floor area, sale date, construction materials, house condition, CPBS construction date, etc.)

The more recent hedonic pricing studies that demonstrate the effects of proximity to an environmental hazard use different functional forms to represent the relationship between price and various property characteristics.<sup>17</sup> In hedonic housing models the linear and log-linear models are most popular. The linear model implies constant partial effects between house prices and housing characteristics, while the log-linear model allows for nonlinear price effects and is shown in the following equation:

after they had purchased their homes, because to do so might have a negative impact on property values. Regardless of the reasons for the difference in responses from the case study and control groups, the overall results show that residents perceive CPBSs negatively. In both the case study and control areas, the impact of proximity to CPBSs on future property values was the issue of great concern for respondents. Overall, respondents felt that proximity to a CPBS would reduce value by from 10% to over 20%. The second part of the study outlined below, involving an econometric analysis of Christchurch property sales transaction data, helps to confirm these results.

Respondents' comments added at the end of the survey indicate that residents have ongoing concerns about CPBSs. Although some people accepted the need for CPBSs, they said that they did not want them built in their back yard, or they preferred that they be disguised to blend better with their environment.

**Market Study Research Objectives and Methodology**

A market study was undertaken to test the hypothesis that in suburbs where there is a CPBS it will be possible to observe discounts to the selling price of homes located near these structures. Such discounts would be observed where buyers of proximate homes view the CPBSs in negative terms due to a perceived risk of adverse effects on health, aesthetics, and property value.

The literature dealing specifically with the measurement of the impact of environmental hazards on residential sale prices (including proximity to transmission lines, landfill sites, and ground water contamination) indicates the popularity of hedonic pricing models, as introduced by Court<sup>18</sup> and later (refinements) and further developed by Freeman<sup>19</sup> and Rosner.<sup>20</sup> The more recent studies, including those by Portzous,<sup>21</sup> Simons and Semeritz,<sup>22</sup> and Reichert,<sup>23</sup> focus on proximity to an environmental hazard and demonstrate that this reduces residential house prices by varying amounts depending on

13. A. Court, "Hedonic Prices, Property with Amenity Attributes, in *The Theory of Statistical Economics* (New York: Ronald Press, 1939), 41-49.  
 14. M. Freeman, *Real Estate Prices and Quality Changes* (Cambridge, Mass.: Harvard University Press, 1971), 45, footnote 1.  
 15. Freeman.  
 16. Freeman.  
 17. A. M. L. Brown, "Generalizing Constant and Proportional Property Values," *The Journal of Real Estate Research* 1997, 271-283.  
 18. Brown and Arthur Corbett, "Equity Losses and Private Homeowners with Leasing Obligations," *The Journal of Real Estate Research* 1997, 295-304.  
 19. M. L. Brown, "Impact of a New Water Treatment Plant on Property Values," *The Journal of Real Estate Research* 1997, 281-292.  
 20. M. L. Brown, "A Note on the Estimation of Hedonic Models with Proportional and Constant Price Changes: This Was Likely Due to the Random Nature of the Estimation Where the Proportionality Was not Used for Pricing Purposes."  
 21. See for example, E. Portzous et al., "The Property Values Received from Environmental Impacts," *Land Economics* 1992, 101-2 (May 1992); 111-125 (August, 1992); and "The Impacts of Environmental Impacts on Property Values," *Land Economics* 1992, 101-2 (May 1992).

$$\ln P_i = b_0 + b_1 \times X_{i1} + b_2 \times X_{i2} + b_3 \times X_{i3} + \dots + b_n \times X_{in+1} + a_0 \times D_0 + \dots + a_m \times D_m + e_i$$

where:

$\ln P_i$  = the natural logarithm of sale price

$b_0$  = the intercept

$b_1 \dots b_n; a_0 \dots a_m$  = the model parameters to be estimated, i.e., the implicit unit prices for increments in the property characteristics

$X_1 \dots X_n$  = the continuous characteristics, such as land area

$D_0 \dots D_m$  = the categorical (dummy) variables, such as whether the sale occurred before (0) or after (1) the CPBS was built

Sometimes the natural logarithm of land area and floor area is also used. The parameters are estimated by regressing property sales on the property characteristics and are interpreted as the households' implicit valuations of different property attributes. The null hypothesis states that the effect of being located near a CPBS does not explain any variation in property sale prices.

### The Data

Part of the process for selecting appropriate case study areas was identifying areas where there had been a sufficient number of property sales to provide statistically reliable and valid results. Sales were required for the period before and after the CPBS had been built in order to study the impact of the CPBS on the surrounding properties' sale prices.

Further, due to the multitude of factors that combine to determine a neighborhood's character, such as proximity to the central business district, standard of schooling, recreational facilities provided, standard of housing, proximity to amenities, and the difficulty in allowing for these separately, sales located in areas with comparable neighborhood characteristics were preferred.

Four of the suburbs in the survey case study met the criteria for the market study: St Albans, Beckenham, Papanui, and Bishopdale. No sales data was available for Upper Riccarton after the CPBS was built in this suburb, hence this suburb was not included in the market analysis study. As each CPBS was built at a different date, the sales from each suburb were sepa-

rately analyzed. The uniformity of locational and neighborhood characteristics in each of these suburbs allows the analysis to be simplified and to focus on the properties' physical attributes. The relative homogeneity of housing, locational, and neighborhood attributes was verified through field inspections.

The dependent variable is the property sale price. The data set includes 4283 property sales that occurred between 1986 and 2002 (approximately 1000 sales per suburb).<sup>52</sup>

The independent data set was limited to those variables that correspond to property attributes known and suspected to influence price. These variables are floor area (m<sup>2</sup>); land area (ha); age of the house (the year the house was built); tower (a dummy variable indicating whether the sale occurred before or after the CPBS was built); sale date (month and year); time of sale based on the number of quarters before or after the CPBS was built (to help control for movements in house prices over time); category of residential property (stand alone dwelling, dwelling converted into flats, ownership unit, etc); quality of the principal structure (as assessed by an appraiser); and roof and wall materials. The number of bedrooms was not available in the data set, but would not have been included as an independent variable since the number of bedrooms is highly correlated with floor area.

Since the GIS coordinates of properties for the initial analysis were not available, street name was included as an independent variable instead. To a limited extent, street name helped to control for the proximity effects of a CPBS. It was suspected that houses on a street close to a CPBS may, on average, sell for less than houses on a street farther away from the CPBS.

While views, particularly water views, have been shown in previous empirical studies to be an important attribute affecting sale price, in the present study the flat contour of the landscape where the homes are located, together with the suburban nature of the environment surrounding these, precluded any significant views. Thus, views were not included in the analysis. Further, due to the large number of sales included in the analysis, inspections of each individual property were not made to determine the view, if any, of a CPBS from each house. It was felt that it is not merely the view that may impact on price, but also proximity to a CPBS due to the potential effect this may have on health, cell phone coverage, and neighborhood aes-

52. The data source obtained from Housing Systems Ltd, a data distribution and systems development company. Housing is the major supplier of property market sales information to New Zealand's valuation profession. It is jointly owned by the NZ Institute of Valuers (NZIV) and PE Investments, a consortium of 20 shareholders from within the property industry.

thetics. Hence, view of a CPBS was not included as an independent variable. The variable descriptions are listed in Table 3. Variable codes are shown in Appendix III and basic descriptive statistics for selected quantitative variables are shown in Appendix IV.

**Table 3 Variable Descriptions**

Variable*	Definition
SLNETX	Sale price of the house (NZ\$)
SITSTX	Street name
CATGYX2	Category of dwelling: D, E, etc. <sup>†</sup>
CATGYX4	Quality of the structure: A, B, C <sup>†</sup>
TIMESOLD.Q	Using the time the cell phone tower was built as a baseline quarter, the number of quarters before (-) and after (+) it was built
AGE	Year the house was built
LANDAX	Land area (ha)
MATFAX	Total floor area (m <sup>2</sup> )
WALLCNX	Wall construction: W, B, C, etc. <sup>†</sup>
ROOFCNX	Roof construction: W, B, C, etc. <sup>†</sup>
TOWER	An indicator variable: 0 if before the cell phone tower was built, or 1 after it was built

\* Sale price is the dependent variable.

† See Appendix III for explanation of variable codes.

### Market Study Results

An econometric analysis of Christchurch property transaction data helped to confirm the opinion survey results. In the analysis of selected suburbs, the sales data from sales that occurred before a CPBS was built was compared to sales data from after a CPBS was built to determine any variance in price, after accounting for all the relevant independent variables.

### Empirical Results

The model of choice is one that best represents the relationships between the variables and has a small variance and unbiased parameters. Various models were tested and the results are described in the next section. The following statistics were used to help select the most appropriate model: the adjusted coefficient of determination (adjusted  $R^2$ ); the standard error of the regression equation; the AIC<sup>53</sup> and BIC<sup>54</sup> statistics; and  $t$ -test of significance of the coefficients and  $F^2$ -statistic.

### Significance of Variables and the Equation: St Albans

As hedonic prices can vary significantly across different functional forms, various commonly used functional forms were examined to determine the model specification that best describes the relationship between price and the independent variables. Also, to test the belief that the relationship between *Price* and *Land Area* is not a linear function of *Price*, the variable *LANDAX* (land area) was transformed to reflect the correct relationship. Several transformations were tested including: linear of *SLNETX* (sale price) and log of *LANDAX*; log of *SLNETX* and linear of *LANDAX*; and log of *SLNETX* and log of *LANDAX*. All dummy variables remained in their linear form in each model.

It was found that the best result was obtained from using the log of *SLNETX* and log of *LANDAX*, and the linear form of all the dummy variables. Taking the log of an independent variable implies diminishing marginal benefits. For example, an extra 50 square meters of land area on a 550-square-meter site would be worth less than the previous 50 square meters. The log-log model shows the percent change in price for a one-percent change in the independent variable, while all other independent variables are held constant (as explained in Hill, Griffiths, and Judge).<sup>55</sup>

In the semilogarithmic equation the interpretation of the dummy variable coefficients involves the use of the formula:  $100(e^{b_n} - 1)$ , where  $b_n$  is the dummy variable coefficient.<sup>56</sup> This formula derives the percentage effect on price of the presence of the factor represented by the dummy variable and is advocated over the alternative, and commonly misused, formula of  $100 \cdot (b_n)$ . The resulting model included all the available variables as follows:

$$\begin{aligned} \log(SLNETX) = & \alpha + \beta_1 \times TOWER + \beta_2 \times SITSTX \\ & + \beta_3 \times CATGYX2 + \beta_4 \times CATGYX4 \\ & + \beta_5 \times TIMESOLD \times Q + \beta_6 \times AGE \\ & + \beta_7 \times \log(LANDAX) \\ & + \beta_8 \times MATFAX \\ & + \beta_9 \times WALLCNX \\ & + \beta_{10} \times ROOFCNX \end{aligned}$$

53. AIC is the Akaike Information Criterion, and is a "goodness of fit" measure involving the standard error of the regression adjusted by a penalty factor. The model selected is the one that minimizes this criterion (Microsoft SPSSPC Online Guide, 1997).

54. The BIC is the Bayesian Information Criterion. Like the AIC, BIC takes into account both how well the model fits the observed data, and the number of parameters used in the model. The model selected is the one that adequately describes the series and has the minimum SBC. The SBC is based on Bayesian (maximum-likelihood) considerations. (Microsoft SPSSPC Online Guide, 1997).

55. R. Carter Hill, William E. Griffiths, and George G. Judge, *Undergraduate Econometrics* (New York: John Wiley & Sons, 1997).

56. See Robert Halvorsen and Raymond Palmquist, "The Interpretation of Dummy Variables in Semi-Logarithmic Equations," *American Economic Review* 70, no. 3 (1980): 474-475.

From the regression output, the variables *ROOFCNX* and *WALLCNX* were found to be insignificant so these were removed from the model and the regression was rerun. The table in Appendix V summarizes these results. The *F*-statistic (123) shows that the estimated relationship in the model is statistically significant at the 95% confidence level and that at least one of the coefficients of the independent variables within the model is not zero.

Table 4 summarizes the model selection test statistics. Based on the AIC and BIC, the regression that excludes the variables *ROOFCNX* and *WALLCNX* is superior to the regression that includes them (AIC and BIC are minimized). For this reason, the model excluding these variables was selected for analysis, and it is discussed next.

**Table 4 Test Statistics — St Albans**

	Adjusted <i>R</i> <sup>2</sup>	AIC	BIC
Full Model	0.82	-118.38	36.55
Sub Model	0.82	-121.64	5.95

Tests for normality, heteroskedasticity, and multicollinearity generally indicated that the model was adequately specified and that the data were not severely ill conditioned (heteroskedasticity and multicollinearity were diminished when the data were transformed).

The coefficient of determination (*R*<sup>2</sup>) indicates that approximately 82% of the variation in sale price is explained by the variation in the independent variable set. All variable coefficients had the expected signs,<sup>57</sup> except for *TOWER*, which was positive. The positive coefficient for *TOWER* shows that, when all the other variables are held constant, after the installation of a CPBS in St Albans, the price of a house would increase by  $e^{0.1155} \approx 1.12$  (12%). A possible explanation is that cell phone technology was quite new at the time (1994), and as there had been little in the media about possible adverse health effects from CPBSs, people may have perceived it as a benefit as they were likely to get better cell phone coverage.

The most significant variables were *TIMESOLD.Q* (the quarter in which the sale occurred before or after the CPBS was built),  $\log(LANDAX)$  (log of land area), and *MATEAX* (total floor area) and all have a positive influence on

price. The positive *TIMESOLD.Q* indicates that the market was increasing over time since the CPBS was built (1994), but only to a limited extent (1.38%). The positive log of land area and total floor area shows that prices increase with increasing size.

The regression coefficient on  $\log(LANDAX)$  is 0.3285, which indicates that, on average, a 10% increase in *LANDAX* will generate a 3.285% increase in price. The positive coefficient for *MATEAX* indicates that, when all the other variables are held constant, for each additional m<sup>2</sup> the price would increase by  $e^{0.0022314} \approx 1.0022314$  (0.22% increase).

#### Significance of Variables and the Equation: Papanui

The same functional form used for St Albans was used for Papanui. From the regression output, the variable *CATGYA2* was found to be insignificant so it was removed from the model and the regression was rerun; Appendix VI summarizes the results. The *F*-statistic (152) shows that the estimated relationship in the model is statistically significant at the 95% confidence level and that at least one of the coefficients of the independent variables within the model is not zero.

Table 5 summarizes the model selection test statistics. Based on the AIC and BIC, the regression that excludes the variable *CATGYA2* is superior to the regression that includes it (AIC and BIC are minimized). For this reason, the model excluding this variable was selected for analysis, and is discussed next.

**Table 5 Test Statistics — Papanui**

	Adjusted <i>R</i> <sup>2</sup>	AIC	BIC
Full Model	0.87	-509.91	-371.99
Sub Model	0.87	-510.57	-381.56

The coefficient of determination (*R*<sup>2</sup>) indicates that approximately 87% of the variation in sale price is explained by the variation in the independent variable set. This would be considered high in comparison with the amount of explanation obtained in similar hedonic house studies reported in the literature.<sup>58</sup> All variable coefficients had the expected signs.

The most significant variables were *TIMESOLD.Q*, *MATEAX* (total floor area), and *TOWER*. The former two have a positive influence on price. The positive *TIMESOLD.Q* indicates that the

57. Note that the variable *AGE* is positive as this variable indicates the year the house was built; therefore, the higher the year, the younger the home. Newer houses have less wear and tear than older homes and sell, on average, for more than older homes.

58. For example, Reichert obtained an adjusted *R*<sup>2</sup> of 84%; Simons and Scmentelli, 78%; Abelson, 68%; Dotzour, 56%–61%.

market was increasing over time since the CPBS was built (2000), but only by 1.4% per quarter. The positive coefficient for *MATEIX* indicates that, when all the other variables are held constant, the price would increase by  $e^{0.0012576} = 1.00127$  (0.43%), with increasing size. The negative coefficient for *TOWER* shows that, when all the other variables are held constant, after the installation of a CPBS in Papanui, the price of a house would decrease by  $e^{-0.2319} = 0.79$  (21% decrease).

#### Significance of Variables and the Equation: Beckenham

The same functional form used for Papanui and St Albans was used for Beckenham. From the regression output, the variable *ROOFCNX* was found to be insignificant so it was removed from the model and the regression was rerun; Appendix VII summarizes these results. The *F*-statistic (214) shows that the estimated relationship in the model is statistically significant at the 95% confidence level and that at least one of the coefficients of the independent variables within the model is not zero.

Table 6 summarizes the model selection test statistics. Based on the AIC and BIC, the regression that excludes the variable *ROOFCNX* is superior to the regression that includes it (AIC and BIC are minimized). For this reason, the model excluding this variable was selected for analysis.

**Table 6 Test Statistics — Beckenham**

	Adjusted $R^2$	AIC	BIC
Full Model	0.89	-819.00	-641.39
Sub Model	0.89	-818.66	-650.66

The coefficient of determination ( $R^2$ ) indicates that approximately 89% of the variation in sale price is explained by the variation in the independent variable set. Again, as with the model for Papanui this amount of explanation would be considered high.

The most significant variables were *TIMESOLD.Q*, *MATEIX*, and *TOWER*. The former two have a positive influence on price. The positive *TIMESOLD.Q* indicates that the market was increasing over time since the CPBS was built in 2000, but only by 1.91% per quarter. The positive coefficient for *MATEIX* indicates that, when all the other variables are held constant, the price would increase by  $e^{0.0012034} = 1.00121$  (0.42%), with increasing size. The negative coefficient for *TOWER* shows that, when all the other variables are held constant, after the installation of a

CPBS in Beckenham, the price of a house would decrease by  $e^{-0.23019} = 0.793$  (20.7% decrease).

#### Significance of Variables and the Equation: Bishopdale

The same functional form used for the other three suburbs was used for Bishopdale. From the regression output, the variables *ROOFCNX* and *CATGYX* were found to be insignificant so these were removed from the model and the regression was rerun; Appendix VIII summarizes these results. The *F*-statistic (122) shows that the estimated relationship in the model is statistically significant at the 95% confidence level and that at least one of the coefficients of the independent variables within the model is not zero.

**Table 7 Test Statistics — Bishopdale**

	Adjusted $R^2$	AIC	BIC
Full Model	0.79	-927.48	-775.71
Sub Model	0.79	-929.32	-796.52

Table 7 summarizes the model selection test statistics. Based on the AIC and BIC, the regression that excludes the variable *ROOFCNX* and *CATGYX* is superior to the regression that includes it (AIC and BIC are minimized). For this reason, the model excluding these variables was selected for analysis.

Again, the most significant variables were *TIMESOLD.Q* and *MATEIX*; the variable of interest, *TOWER*, was not a significant variable in the model so it is not discussed further. The former two variables have a positive influence on price. The positive *TIMESOLD.Q* indicates that the market was increasing over time since the CPBS was built in 1994, but only at 0.98% per quarter. The positive coefficient for *MATEIX* indicates that, when all the other variables are held constant, the price would increase by  $e^{0.0039955} = 1.004$  (0.40%), with increasing size.

#### Summary of Results

The above analysis shows that the most significant variables and their impact on price were similar between suburbs. This indicates the relative stability of the coefficients between each model. Interestingly, the impact of *TOWER* on price (a decrease of between 20.7% and 21%) was very similar in the two suburbs where the towers were built in the year 2000. This may be due to the much greater media publicity given to CPBSs after the two legal cases in Christchurch (*McIntyre* and *Shirley Primary School*

in 1996 and 1999, respectively). The two suburbs where *TOFFER* was either insignificant or increased prices by around 12%, were suburbs where towers had been built in 1994, prior to the media publicity.

### Limitations of the Research

The main limitation affecting this survey was in the selection of the case study areas. Specifically, the areas selected had CPBSs that were not highly visible to residents. If more-visible CPBSs had been selected, the results may have been quite different. Thus, caution must be used in making generalizations from this study or applying the results directly to other similar studies or valuation assignments. Factors that could affect results are the distance of homes from the CPBS, the style and appearance of the CPBS, how visible the CPBS is to residents, the type of home (single family, multifamily, rental, etc.), and the socioeconomic make-up of the resident population.

To help address the proximity factor, a study is in progress examining the role of distance to the CPBSs and price effects; that study uses GIS analysis to determine the impact this has on residential property prices. It is expected that this will provide a more precise estimation of the impact of a CPBS on price.

It must be kept in mind that these results are the product of only one case study carried out in a specific area (Christchurch) at a specific time (2003). The above results indicate that value effects from CPBSs may vary over time as market participants' perceptions change. Perceptions toward CPBSs can change either positively or negatively over time. For example, as the World Health Organization's ten-year study of the health effects from CPBSs is completed and becomes available, consumers' attitudes may become more positive or negative depending on the outcome of that study. Consequently, studies of the price effects of CPBSs need to be conducted over time.

### Areas for Further Study

This research has focused on residents' perceptions of negative effects from proximity to CPBSs and how these impact property values, rather than the scientific or technological estimates of these risks. The technologists' objective view of risk is that risk is measurable solely in terms of probabilities and severity of consequences, whereas the public, while taking experts' assessments into account, view risk more subjectively, based on other factors. Further, the results of scientific studies about the health effects of radio frequency and microwave radiation

from CPBSs are not consistent. Residents' perceptions and assessments of risk vary according to a wide range of psychological, social, institutional, and cultural processes, and this may explain why their assessments differ from those of the experts.

Given the public concerns about the potential risks arising from being located nearby a CPBS, it is important for future studies to focus more attention on the kinds of risks the public associates with CPBSs and the level of risk perceived. How far away from the CPBS do people feel they have to be to be safe? What CPBS design, size, and surrounding landscape would help CPBSs to be more publicly acceptable? What social, economic, educational, and other demographic variables influence how people perceive the risks from CPBSs? Do residents that are heavy users of cell phones have a different perception of CPBSs than residents who make little use of this technology? Are these perceived risks reflected in property values and to what extent? Do these perceived risks vary over time and to what degree?

Answers to these questions, if shared among researchers and made public, could lead to the development of a global database to assist appraisers in determining the perceived level of risk associated with CPBSs and other similar structures.<sup>59</sup> Knowledge of the extent that these risks are incorporated into property prices and how they vary over time will lead to more accurate value assessments of properties in close proximity to CPBSs and other similar structures.

### Summary and Conclusions

Focusing on four case study neighborhoods in Christchurch, New Zealand, this article presents the results from both an opinion survey and market sales analysis undertaken in 2003 to determine residents' perceptions towards living near a CPBS and how this may impact property prices. From the results, it appears that people who live close to CPBSs perceive the sites less negatively than those who live farther away.

The issue of greatest concern for survey respondents in both the case study and control areas is the impact of proximity to CPBSs on future property values. Overall, respondents would pay from 10%-19% less to over 20% less for a property if it were in close proximity to a CPBS.

The opinion survey results were generally confirmed by the market sales analysis using a hedonic house price approach. The results of the sales analysis show prices of properties were reduced by around 21% after a CPBS was built in the neighborhood. How-

59. For example, high-voltage overhead transmission lines.

ever, this result varies between neighborhoods, with a positive impact on price being recorded in one neighborhood, possibly due to the CPBS being built in that suburb before any adverse media publicity about CPBSs appeared in the local Christchurch press.

Research to date reports no clearly established health effects from radio frequency emissions of CPBSs operated at or below the current safety standards, yet recent media reports indicate that people still perceive that CPBSs have harmful effects. Thus, whether or not CPBSs are proven to be free from health risks is only relevant to the extent that buyers of properties near CPBSs perceive this to be true. Even buyers who believe that there are no adverse health effects from CPBSs, knowing that other potential buyers might think the reverse, will probably seek a price discount for a property located near a CPBS.

The comments of survey participants indicate the ongoing concerns that residents have about CPBSs. There is the need to increase the public's understanding of how radio frequency transmitting facilities operate and the strict exposure-limit standards imposed on the telecommunication industry. As more information is discovered that refutes concerns regarding adverse health effects from CPBSs, and as information about the NZ safety standards are made more publicly available, the perception of risk may gradually change, eliminating the discounts for neighboring properties.

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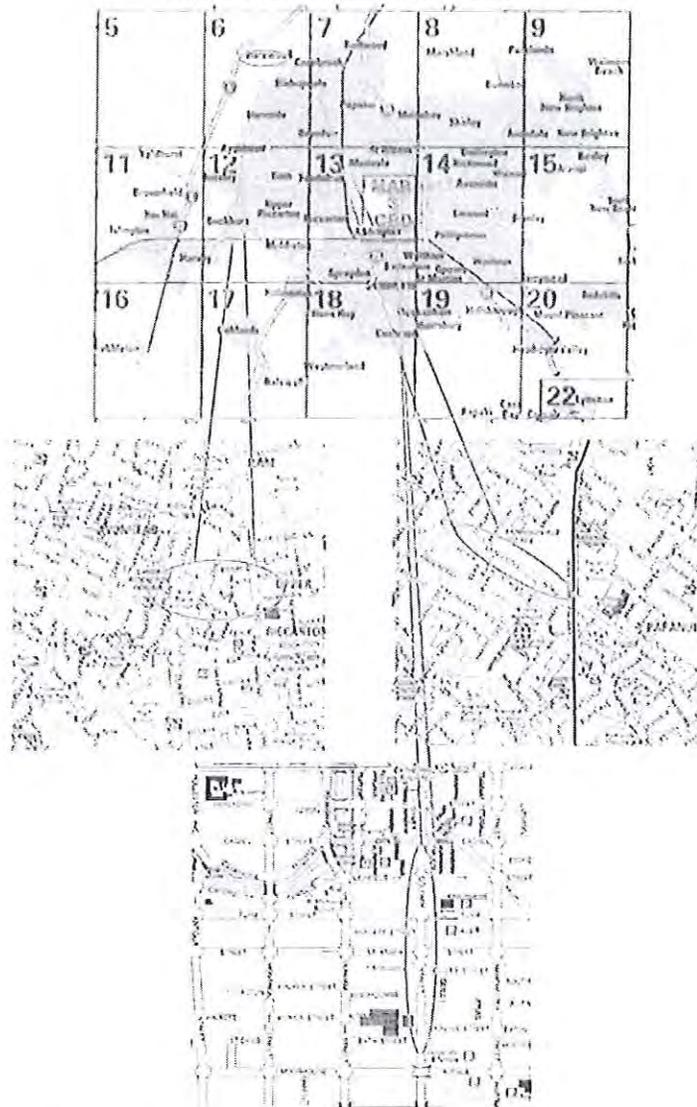
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### Appendix I Location Map



Areas circled in white at the top are without a cell phone tower, while areas circled in the bottom three maps have a cell phone tower.  
Source: <http://www.ccc.govt.nz/maps/Wises/>

## Appendix II Summary of the Survey Results

Variable	Response	Valid Percent (%)	
		Case Study	Control
Occupancy	Homeowner	78.5	94.2
	Tenant	21.5	5.8
How long have you lived there?	Less than 6 months	8.0	2.6
	6 months-1 year	8.6	4.5
	1-4 years	25.1	27.7
	More than 5 years	58.3	65.2
How would you rate the desirability of your neighborhood?	Superior	27.4	30.9
	Above Average	37.4	36.8
	Average	28.5	27.0
	Below Average	5.6	4.6
	Inferior	1.1	0.7
Would you be opposed to construction of a cell phone tower nearby?	Yes		72.1
	No		27.9
When you purchased/began renting was the cell phone tower already constructed?	Yes	39.3	
	No	60.7	
Was the proximity of the cell phone tower a concern to you?	Yes	20.0	
	No	80.0	
Would you have gone ahead with rental/purchase if you had known a cell phone site was to be constructed?	Yes	73.9	
	No	26.1	
Is location of a cell phone tower a factor you would consider when moving?	Yes		83.4
	No		16.6
Is the cell phone tower visible from your house?	Yes	45.7	
	No	54.3	
If yes, how much does it impact on your view?	Very obstructive	9.6	
	Mildly obstructive	24.5	
	Barely noticeable	66.0	
In what way does it impact on the enjoyment of living in your house?	Views	11.8	
	Aesthetics	20.6	
	Health concerns	36.8	
	Change in property value	19.9	
	Other	11.0	
Effect a nearby cell phone tower would have on the price/rent you would pay for the property	Tower wasn't constructed	53.1	
	Pay substantially more	0.0	0.0
	Pay a little more	2.3	0.0
	Pay a little less	2.8	37.6
	Pay substantially less	0.6	45.4
	Not influence price	51.4	17.0
% Effect a nearby cell phone tower would have on the price/rent you would pay for the property	20% higher or more	5	3.2
	10-19% more	10	1.6
	1-9% more	14	2.4
	1-9% less	33	19.2
	10-19% less	24	36.0
	20% or a greater reduction	14	37.6
Concern about the possibility of harmful health effects in the future	Does not worry me	50.3	19.9
	Worries me somewhat	38.0	38.4
	Worries me a lot	11.7	41.7
Concern about the stigma associated with houses near the cell phone sites	Does not worry me	54.6	20.8
	Worries me somewhat	33.9	45.0
	Worries me a lot	11.5	34.2
Concern about the affect on your properties value in the future	Does not worry me	61.3	15.4
	Worries me somewhat	25.4	37.2
	Worries me a lot	13.3	47.4
Concern about the aesthetic problems caused by the tower	Does not worry me	63.3	18.2
	Worries me somewhat	25.4	37.0
	Worries me a lot	11.3	44.8

## Appendix III Variable Codes

### Category of Dwelling

Code	Definition
D	Dwelling houses are of a fully detached or semi-detached style situated on their own clearly defined piece of land.
E	Converted dwelling houses that are now used as rental flat.
F	Ownership home units which may be single storey or multi-storey and which do not have the appearance of dwelling houses.
H	Home and income. The dwelling is the predominant use, and there is an additional unit of use attached to or associated with the dwelling house that can be used to produce income.
R	Rental flats that have been purpose built.

### Quality of the Principal Structure

Code	Definition
A	Superior design and quality of fixtures and fittings is first class.
B	The design is typical of its era and the quality of the fixtures and fittings is average to good.
C	The design is below the level generally expected for the era, or the level of fixtures and fittings is barely adequate and possibly of below average quality.

### Building Materials: Walls and Roof

Code	Definition
W	Wood
B	Brick
C	Concrete
S	Stone
R	Roughcast
F	Fibrolite
M	Malthoid
P	Plastic
I	Iron
A	Aluminium
G	Glass
T	Tiles
X	*

## Appendix IV Descriptive Statistics

Variable	Mean	Std. dev.	Median	Minimum	Maximum	Range
<b>St Albans:</b>						
Sale Price (\$)	221,957	110,761	200,000	42,000	839,000	797,000
Land Area (ha)	0.0658	0.0331	0.0579	0.0261*	0.3794	0.3533
Floor Area (m <sup>2</sup> )	161	70.40	150	50	450	400
<b>Beckenham:</b>						
Sale Price (\$)	116,012	50,037	111,000	21,500	385,000	363,500
Land Area (ha)	0.0601	0.0234	0.0553	0.0164*	0.2140	0.1976
Floor Area (m <sup>2</sup> )	115	32.50	110	40	340	300
<b>Papanui:</b>						
Sale Price (\$)	127,661	51,114	119,000	43,000	375,000	332,000
Land Area (ha)	0.0685	0.0289	0.0675	0.0310	0.3169	0.2859
Floor Area (m <sup>2</sup> )	122	34.60	110	56	290	234
<b>Bishopdale:</b>						
Sale Price (\$)	136,786	41,390	134,500	56,000	342,000	286,000
Land Area (ha)	0.0679	0.0163	0.0653	0.0400	0.2028	0.1628
Floor Area (m <sup>2</sup> )	125	31.20	118	64	290	226

\* These small land areas are related to apartments or units in a block of apartments/units that have the land area apportioned on a pro rata basis.

### Appendix V Regression Model: St Albans

log(SLNCTX) = TOWER + CATGYX2 + CATGYX4 + TIMESOLD.Q + AGE + log(LANDAX) + MATFAX + SITSTX

Residuals:	Min	1Q	Median	3Q	Max
	0.72855	-0.15032	0.01593	0.14263	0.72047
Coefficients:	Estimate	Std. Error	t-value	Pr(>  t )	
(Intercept)	9.1781868	0.6769096	13.559	< 2e-16 ***	
TOWER	0.1133186	0.0318188	3.561	0.000395 ***	
CATGYX2D	0.1846417	0.0702520	2.628	0.008776 **	
CATGYX2O	0.0334663	0.1008594	0.332	0.740134	
CATGYX4B	-0.1551409	0.0245485	-6.320	4.75e-10 ***	
CATGYX4C	-0.1483169	0.0722959	-2.052	0.040600 *	
TIMESOLD.Q	0.0136663	0.0008208	16.650	< 2e-16 ***	
AGE	0.0016408	0.0003521	4.660	3.81e-06 ***	
log(LANDAX)	0.3285367	0.0283610	11.584	< 2e-16 ***	
MATFAX	0.0022314	0.0001962	11.373	< 2e-16 ***	
SITSTXAKMANS RD	0.4029259	0.0533671	7.550	1.41e-13 ***	
SITSTXBEVERLEY ST	0.2330787	0.0803137	2.902	0.003827 **	
SITSTXBRISTOL ST	0.1706840	0.0521716	3.272	0.001124 **	
SITSTXBROWNS RD	0.2492536	0.0720854	3.458	0.000579 ***	
SITSTXCOX ST	0.3055798	0.0581672	5.253	2.00e-07 ***	
SITSTXGORDON AVE	0.0823422	0.0679833	1.211	0.226236	
SITSTXKNOWLES ST	0.1690979	0.0558911	3.025	0.002576 **	
SITSTXMANSFIELD AVE	0.2954242	0.0652983	4.524	7.16e-06 ***	
SITSTXMCDUGALL AVE	0.3303105	0.0623720	5.296	1.60e-07 ***	
SITSTXMURRAY PL	0.3613773	0.0629166	5.744	1.40e-08 ***	
SITSTXOFFICE RD	0.3681146	0.0543368	6.775	2.71e-11 ***	
SITSTXOther	0.0618491	0.0736629	0.840	0.401416	
SITSTXPAPANUI RD	0.1940369	0.0560474	3.462	0.000570 ***	
SITSTXRANFURLY ST	0.1701716	0.0617504	2.756	0.006012 **	
SITSTXST ALBANS ST	0.1458665	0.0571172	2.554	0.010873 *	
SITSTXWEBB ST	0.1895432	0.0725061	2.614	0.009143 **	
SITSTXWESTON RD	0.2084419	0.0527555	3.951	8.60e-05 ***	

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
 Residual standard error: 0.2175 on 677 degrees of freedom  
 Multiple R-Squared: 0.8253, Adjusted R-squared: 0.8186  
 F-statistic: 123 on 26 and 677 DF, p-value: < 2.2e-16

### Appendix VI Regression Model: Papanui

ln(formula = log(SLNCTX) ~ TOWER + SITSTX + TIMESOLD.Q + AGE + log(LANDAX) + MATFAX + WALLCNX + ROOFCNX + CATGYX4, data = Papanui.final)

Residuals:	Min	1Q	Median	3Q	Max
	0.484987	-0.098006	0.003859	0.106253	0.563126
Coefficients:	Estimate	Std. Error	t-value	Pr(>  t )	
(Intercept)	5.9482310	0.6998186	8.500	< 2e-16 ***	
TOWER	-0.2339640	0.0240908	-9.712	< 2e-16 ***	
SITSTXHOANI ST	-0.1966982	0.0265429	-7.411	4.26e-13 ***	
SITSTXLANGDONS RD	-0.1192547	0.0281242	-4.240	2.58e-05 ***	
SITSTXLEANDER ST	0.0305555	0.0449437	0.680	0.496853	
SITSTXMATSONS AVE	0.0949636	0.0292461	3.247	0.001231 **	
SITSTXMORELAND AVE	-0.0892332	0.0397622	-2.244	0.025183 *	
SITSTXMORRISON AVE	-0.1984492	0.0289772	-6.848	1.84e-11 ***	
SITSTXOther	-0.1543194	0.0337436	-4.573	5.83e-06 ***	
SITSTXSAILS ST	-0.0761412	0.0433455	-1.757	0.079490 .	
SITSTXSAWTELL PL	0.1840793	0.0393904	4.673	3.66e-06 ***	
SITSTXSAWYERS ARMS RD	0.0872393	0.0201388	4.332	1.73e-05 ***	
SITSTXST JAMES AVE	0.2497688	0.0289940	8.615	< 2e-16 ***	
TIMESOLD.Q	0.0138914	0.0004137	33.575	< 2e-16 ***	
AGE	0.0029307	0.0003512	8.345	4.85e-16 ***	
log(LANDAX)	0.0904764	0.0270812	3.341	0.000886 ***	
MATFAX	0.0042576	0.0002410	17.664	< 2e-16 ***	
WALLCNX	0.0054100	0.0200666	0.270	0.787558	
WALLCNXF	-0.0980851	0.0464442	-2.112	0.035106 *	
WALLCNXO	-0.1158407	0.0468334	-2.473	0.013655 **	
WALLCNXR	-0.0670051	0.0244382	-2.742	0.006291 **	
WALLCNXW	-0.0679166	0.0192628	-3.526	0.000454 ***	
WALLCNX	-0.0571365	0.0358369	-1.594	0.111381	
ROOFCNXI	0.1502973	0.1139845	1.319	0.187810	
ROOFCNXO	0.0870092	0.1164152	0.747	0.455111	
ROOFCNXT	0.0954874	0.1138505	0.839	0.401965	
CATGYX4B	-0.0623758	0.0343487	-1.816	0.069872 .	
CATGYX4C	-0.3669901	0.0905659	-4.052	5.74e-05 ***	

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
 Residual standard error: 0.1579 on 604 degrees of freedom  
 Multiple R-Squared: 0.8718, Adjusted R-squared: 0.8661  
 F-statistic: 152.2 on 27 and 604 DF, p-value: < 2.2e-16

### Appendix VII Regression Model: Beckenham

ln(formula = log(SLNETX) ~ TOWER + SITSTX + CATGYX4 + TIMESOLDQ + AGE + log(LANDAX) + MATFAX + WALLCNX + CATGYX2, data = Beckenham.final)

Residuals:	Min	1Q	Median	3Q	Max
	0.64490	-0.09026	0.01142	0.10112	0.40993
Coefficients:	Estimate	Std. Error	t-value	Pr(> t )	
(Intercept)	9.2062865	0.4725194	19.483	< 2e-16 ***	
TOWER1	-0.2301918	0.0182774	-12.594	< 2e-16 ***	
SITSTXBECKENHAM ST	0.1648069	0.0515406	3.198	0.001436 **	
SITSTXDOON ST	-0.0616738	0.0484966	-1.272	0.203817	
SITSTXBRADFORD AVE	0.0923843	0.0491942	1.867	0.062300 .	
SITSTXCOLUMBO ST	0.0623765	0.0467234	1.335	0.182223	
SITSTXDEVON ST	-0.0959430	0.0457562	-2.097	0.036299 *	
SITSTXDUNN ST	-0.0207886	0.0427676	-0.486	0.627031	
SITSTXFISHER AVE	0.2271245	0.0100288	5.674	1.90e-08 ***	
SITSTXLONGFELLOW ST	-0.0186953	0.0451597	-0.414	0.678990	
SITSTXOTHER	-0.0222126	0.0467607	-0.475	0.634888	
SITSTXPERCIVAL ST	-0.0347190	0.0517740	-0.671	0.502663	
SITSTXROXBURGH ST	0.1029109	0.0466753	2.205	0.027729 *	
SITSTXSOMERFIELD ST	0.0186495	0.0428968	0.435	0.663851	
SITSTXSOUTHAMPTON ST	-0.0243265	0.0402926	-0.604	0.546171	
SITSTXSOUTHEY ST	-0.0324513	0.0429880	-0.755	0.450520	
SITSTXSTRICKLAND ST	0.0819418	0.0407196	2.012	0.044494 *	
SITSTXTENNYSON ST	0.1165007	0.0393410	2.961	0.003147 **	
SITSTXWEMPLEY ST	0.0648226	0.0458033	1.415	0.157359	
CATGYX4B	0.0275481	0.0373405	0.738	0.460864	
CATGYX4C	-0.1168640	0.0469787	-2.488	0.013049 *	
TIMESOLD.Q	0.0189904	0.0003396	55.928	< 2e-16 ***	
AGE	0.0010988	0.0002426	4.530	6.74e-06 ***	
log(LANDAX)	0.1546535	0.0195655	7.904	8.19e-15 ***	
MATFAX	0.0042054	0.0002138	19.674	< 2e-16 ***	
WALLCNXC	-0.0208433	0.0378338	-0.551	0.581833	
WALLCNXF	-0.1171637	0.0394091	-2.973	0.003031 **	
WALLCNXO	-0.0445073	0.0399745	-1.113	0.265849	
WALLCNXR	-0.1119164	0.0235736	-4.748	2.41e-06 ***	
WALLCNXW	-0.0629968	0.0222366	-2.833	0.004718 **	
WALLCNXX	-0.0992564	0.0398493	-2.491	0.012933 *	
CATGYX2D	0.1445276	0.0399650	3.616	0.000316 ***	
CATGYX2F	0.3069113	0.0744524	4.122	4.11e-05 ***	
CATGYX2R	0.2927391	0.1222453	2.395	0.016847 *	

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
 Residual standard error: 0.1515 on 864 degrees of freedom  
 Multiple R Squared: 0.8911, Adjusted R squared: 0.8869  
 F-statistic: 214.2 on 33 and 864 DF, pvalue: < 2.2e-16

### Appendix VIII Regression Model: Bishopdale

ln(formula = log(SLNETX) ~ TOWER + TIMESOLD.Q + AGE + log(LANDAX) + MATFAX + WALLCNX + SITSTX, data = Bishopdale.final)

Residuals:	Min	1Q	Median	3Q	Max
	-0.53633	-0.08893	0.01446	0.08850	0.49048
Coefficients:	Estimate	Std. Error	t-value	Pr(> t )	
(Intercept)	9.0005033	0.6988891	12.878	< 2e-16 ***	
TOWER	0.0262575	0.0182796	1.436	0.151259	
TIMESOLD.Q	0.0097887	0.0004834	20.261	< 2e-16 ***	
AGE	0.0013236	0.0003598	3.679	0.000249 ***	
log(LANDAX)	0.1357753	0.0333622	4.070	5.16e-05 ***	
MATFAX	0.0039665	0.0001855	21.389	< 2e-16 ***	
WALLCNXC	-0.0169935	0.0108641	-1.564	0.118160	
WALLCNXO	0.0785660	0.0336688	2.333	0.019863 *	
WALLCNXR	-0.0693225	0.0300511	-2.307	0.021313 *	
WALLCNXW	-0.0815023	0.0230110	-3.542	0.000420 ***	
SITSTXCARDOME ST	0.0610536	0.0314227	1.943	0.052360 .	
SITSTXCHEDWORTH AVE	0.0330487	0.0317738	1.040	0.298589	
SITSTXCLOILDA PL	0.2252988	0.0420078	5.363	1.06e-07 ***	
SITSTXCOLESBURY ST	0.0528749	0.0302668	1.747	0.081018 .	
SITSTXCOTSWOLD AVE	0.0604953	0.0286474	2.112	0.035012 *	
SITSTXCASTLING ST	0.0551537	0.0319833	1.724	0.085003 .	
SITSTXFARRINGTON AVE	-0.0001768	0.0238544	-0.007	0.994087	
SITSTXHAREWOOD RD	0.0204412	0.0252674	0.809	0.418753	
SITSTXHIGHTSD RD	0.0391760	0.0253953	1.543	0.123302	
SITSTXKILBURN ST	-0.0176756	0.0366951	-0.482	0.630155	
SITSTXKINGROVE ST	-0.0052772	0.0375965	-0.140	0.888406	
SITSTXLEACROFT ST	0.1058243	0.0333633	3.172	0.001571 **	
SITSTXMURMONT ST	0.1825316	0.0365287	4.997	7.12e-07 ***	
SITSTXNEWMARK ST	-0.0342136	0.0272490	-1.256	0.209621	
SITSTXOTHER	0.0525437	0.0253634	2.072	0.038612 *	
SITSTXRALEIGH ST	0.0470151	0.0314032	1.497	0.134740	
SITSTXTACKHOUSE AVE	0.0235719	0.0278844	-0.845	0.398165	

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
 Residual standard error: 0.137 on 821 degrees of freedom  
 Multiple R Squared: 0.7946, Adjusted R squared: 0.7881  
 F-statistic: 122.1 on 26 and 821 DF, pvalue: < 2.2e-16



The Clay County residents listed below request the Clay County Planning & Zoning Committee and further the Clay County Commissioners deny the request for a Conditional Use Permit for the placement of a 160' Cell Tower with a minimum of 3 carriers to be located in the area of 164th Street and Endicott Road in Kearney, Missouri because it does not meet all of the approval criteria for a CUP as listed in Section 151-3.10(A)(13) of the Land Development Code, specifically:

Will cause substantial injury to the value of other property in the vicinity;

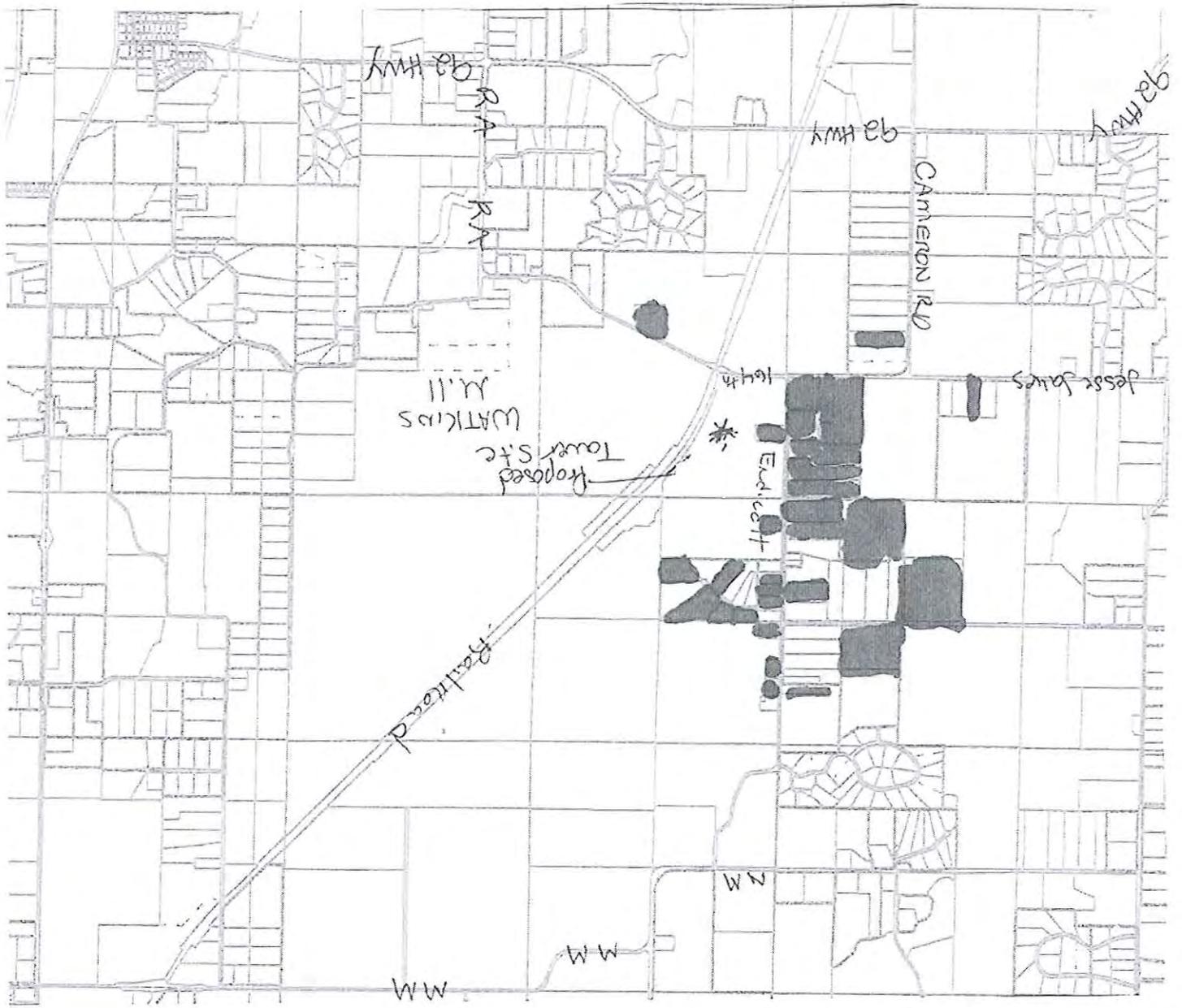
Will have a substantial impact on the health, safety or general welfare of residents in the area;

Is incompatible with adjacent land in terms of scale, design and external impacts;

Does not comply with the intent of the Comprehensive Plan and general provisions of the Land Development Code, modified for the specific use request.

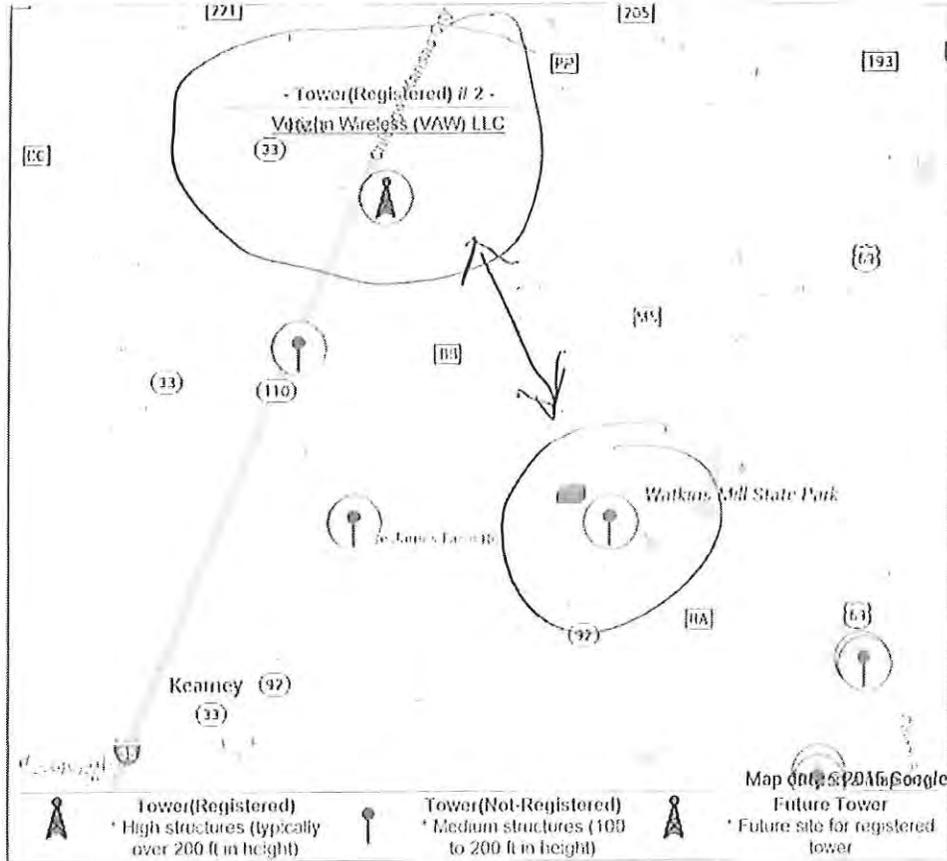
LAST NAME	FIRST NAME	ADDRESS	CITY	STATE	ZIP	PHONE	SIGNATURE
21	Simmons	16700 Endicott Rd	Kearney	MO	64060	638-4433	Denise Simmons
22	Hornack	15289 Cameron Rd	Kearney	MO	64060	517-850-2205	[Signature]
23	[Signature]	16506 Endicott Rd	Kearney	MO	64060	516-682-7888	[Signature]
24	Whitaker	17005 Endicott Rd	Kearney	MO	64060	516-682-7888	[Signature]
25	Moore	24416 Country View	Kearney	MO	64060	516-682-7888	[Signature]
26	[Signature]	17311 Endicott Rd	Kearney	MO	64060	628-1245	[Signature]
27	[Signature]	17311 Endicott Rd	Kearney	MO	64060	628-3423	[Signature]
28	Rutze	17208 Endicott Rd	Kearney	MO	64060	585-6266	[Signature]
29	Rutze	17308 Endicott Rd	Kearney	MO	64060	674-1667	[Signature]
30	Wingfield	17222 Endicott Rd	Kearney	MO	64060	628-3713	[Signature]
31	Rutson	24200 N.E. 172nd	Kearney	MO	64060	624-1600	[Signature]
32	Wilson	17016 Endicott Rd	Kearney	MO	64060	516-518-0535	[Signature]
33	[Signature]	17007 Endicott Rd	Kearney	MO	64060	516-392-6281	[Signature]
34	[Signature]	17116 Endicott Rd	Kearney	MO	64060	516-392-6281	[Signature]
35	[Signature]	24018 N.E. 162nd St	Kearney	MO	64060	628-3475	[Signature]
36	Webbing	16506 Endicott Rd	Kearney	MO	64060	817-7801	[Signature]
38							
39							
40							







Tower Structures - (16700 Endicott Rd, Kearney, MO 64060)



**Alert!** 14 Towers (3 Registered, 11 Not Registered) found within 4.00 miles of 16700 Endicott Rd, Kearney, MO 64060.

**Info!** The NEAREST Tower is .36 miles away and is owned by Verizon Wireless.

**Ok!** No Applications for Future Towers detected as of 01/16/15.

Tower Type	ID Num	Site Owner	Height	Dist
Registered	(1)	Union Pacific Railroad	68 feet	3.09 miles
	(2)	Verizon Wireless (vzw) Llc	230 feet	3.87 miles
	(3)	City Of Excelsior Springs Missouri	138 feet	3.91 miles
Not Registered	(1)	Verizon Wireless	160 feet	.36 miles
	(2)	NW Electric Power Cooperative Inc	130 feet	2.86 miles
	(3)	Nextel West Corp	225 feet	3.77 miles
	(4)	Excelsior Springs, City Of	225 feet	3.82 miles
	(5)	Burns & McDonnell	34 feet	3.83 miles
	(6)	Sage Aviation	26 feet	3.83 miles
	(7)	Cofular One	160 feet	3.85 miles
	(8)	Green Quarries, Inc.	95 feet	3.89 miles
	(9)	Unsite Inc	305 feet	3.90 miles

	(10)	<u>Cellular One Of Kansas City</u>	155 feet	3.93 miles
	(11)	<u>Union Electric Company</u>	199 feet	3.97 miles
Future	(No Towers Detected)			

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## The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer

Horst Eger, Klaus Uwe Hagen, Birgitt Lucas, Peter Vogel, Helmut Voit

Published in *Umwelt-Medizin-Gesellschaft* 17,4 2004, as:

'Einfluss der räumlichen Nähe von Mobilfunksendeanlagen auf die Krebsinzidenz'

### Summary

Following the call by Wolfram König, President of the Bundesamt für Strahlenschutz (Federal Agency for radiation protection), to all doctors of medicine to collaborate actively in the assessment of the risk posed by cellular radiation, the aim of our study was to examine whether people living close to cellular transmitter antennas were exposed to a heightened risk of taking ill with malignant tumors.

The basis of the data used for the survey were PC files of the case histories of patients between the years 1994 and 2004. While adhering to data protection, the personal data of almost 1,000 patients were evaluated for this study, which was completed without any external financial support. It is intended to continue the project in the form of a register.

The result of the study shows that the proportion of newly developing cancer cases was significantly higher among those patients who had lived during the past ten years at a distance of up to 400 metres from the cellular transmitter site, which has been in operation since 1993, compared to those patients living further away, and that the patients fell ill on average 8 years earlier.

In the years 1999-2004, ie after five years' operation of the transmitting installation, the relative risk of getting cancer had trebled for the residents of the area in the proximity of the installation compared to the inhabitants of Naila outside the area.

Key words: cellular radiation, cellular transmitter antennas, malignant tumours

The rapid increase in the use of mobile telephony in the last few years has led to an increasing number of cell phone transmission masts being positioned in or near to residential areas. With this in mind, the president of the German governmental department for protection against electromagnetic radiation (Bundesamtes für Strahlenschutz) Wolfram König, has challenged all doctors to actively help in the work to estimate the risks from such cell phone masts. The goal of this investigation was therefore to prove whether or not people living near to cell phone masts have a higher risk of developing cancerous tumours.

The basic data was taken from the medical records held by the local medical authority (Krankenkasse) for the years 1994 to 2004. This material is stored on computer. In this voluntary study the records of roughly 1,000 patients from Naila (Oberfranken) were used, respecting the associated data protection laws. The results from this study show a significantly increased likelihood of developing cancer for the patients that have lived within 400 metres of the cell phone transmission mast (active since 1993) over the last ten years, in comparison to those patients that live further away. In addition, the patients that live within 400 metres tend to develop the cancers at a younger age. For the years 1999 to 2004 (ie after

five or more years of living with the cell phone transmission mast), the risk of developing cancer for those living within 400 metres of the mast in comparison to those living outside this area, was three times as high.

### Introduction

A series of studies available before this investigation provided strong evidence of health risks and increased cancer risk associated with physical proximity to radio transmission masts. Halder *et al.* reported in 1993 in the Moosbrunn study frequent psychovegetative symptoms below the current safety limit for electromagnetic waves (1). In 1995, Abelin *et al.* in the Swiss-Schwarzenburg study found dose dependent sleep problems (5:1) and depression (4:1) at a shortwave transmitter station that has been in operation since 1939 (2).

In many studies an increased risk of developing leukaemia has been found; in children near transmitter antennas for Radio and Television in Hawaii (3); increased cancer cases and general mortality in the area of Radio and Television transmitter antennas in Australia (4); and in England, 9 times more leukaemia cases were diagnosed in people who live in a nearby

area to the Sutton Coldfield transmitter antennas (5). In a second study, concentrating on 20 transmitter antennas in England, a significant increased leukaemia risk was found (6). The Cherry study (7) indicates an association between an increase in cancer and living in proximity to a transmitter station. According to a study of the transmitter station of Radio Vatican, there were 2.2 times more leukaemia cases in children within a radius of 6 km, and adult mortality from leukaemia also increased (8).

In 1997 Goldsmith published the Lillienfeld-study that indicated 4 times more cancer cases in the staff of the American Embassy in Moscow following microwave radiation during the cold war. The dose was low and below the German limit (9).

The three studies of symptoms indicated a significant correlation between illness and physical proximity to radio transmission masts. A study by Santini *et al.* in France resulted in an association between irritability, depression, dizziness (within 100m) and tiredness within 300m of a cell phone transmitter station (10).

In Austria there was an association between field strength and cardiovascular symptoms (11) and in Spain a study indicates an association between radiation, headache, nausea, loss of appetite, unwellness, sleep disturbance, depression, lack of concentration and dizziness (12).

The human body physically absorbs microwaves. This leads to rotation of dipole molecules and to inversion transitions (13), causing a warming effect. The fact that the human body transmits microwave radiation at a very low intensity means that since every transmitter represents a receiver and transmitter at the same time, we know the human body also acts as a receiver.

In Germany, the maximum safe limit for high frequency microwave radiation is based on purely thermal effects. These limits are one thousand billion times higher than the natural radiation in these frequencies that reaches us from the sun.

The following study examines whether there is also an increased cancer risk close to cellular transmitter antennas in the frequency range 900 to 1800 MHz. Prior to this study there were no published results for long-term exposure (10 years) for this frequency range and its associated effects to be revealed. So far, no follow-up monitoring of the state of health of such a residential population has been systematically undertaken.

## Materials and Methods

### Study area

In June 1993, cellular transmitter antennas were permitted by the Federal Postal Administration in the Southern German city of Naila and became operational in September 1993.

The GSM transmitter antenna has a power of 15 dBW per channel in the 935MHz frequency range. The total

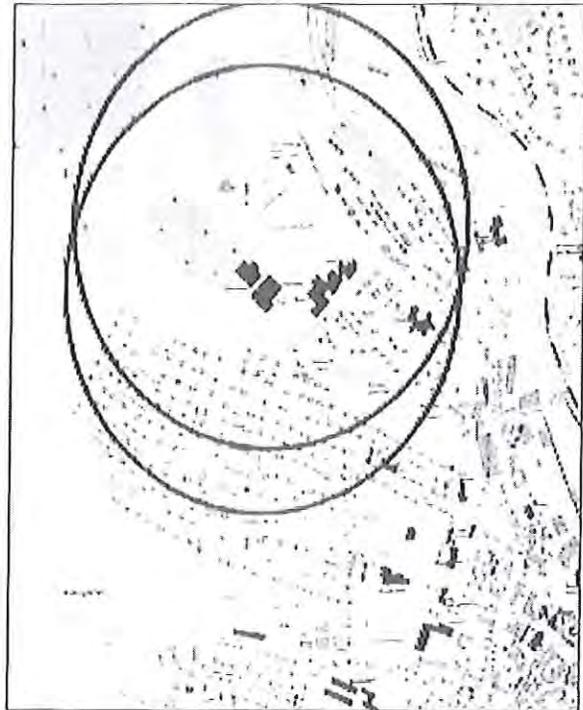


Fig. 1: Schematic plan of the antenna sites

transmission time for the study period is ca. 90,000 hours. In December 1997 there followed an additional installation from another company. The details are found in an unpublished report, appendix page 1-3 (14).

To compare results an 'inner' and 'outer' area were defined. The inner area covered the land that was within a distance of 400 metres from the cellular transmitter site. The outer area covered the land beyond 400 metres. The average distance of roads surveyed in the inner area (nearer than 400m) was 266m and in the outer area (further than 400m) 1,026m. Fig. 1 shows the position of the cellular transmitter sites (560m) are the highest point of the landscape, which falls away to 525m at a distance of 450m. From the height and tilt angle of the transmitter it is possible to calculate the distance where the transmitter's beam of greatest intensity strikes the ground (see Fig. 2).

The highest radiation values are in areas of the main

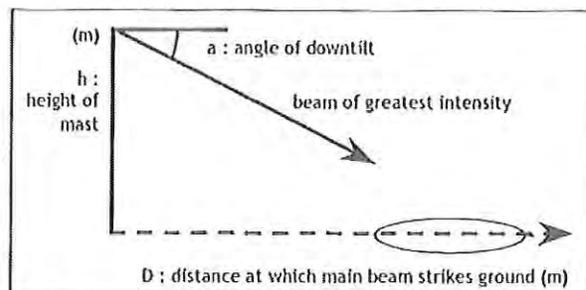


Fig. 2: From the mast height  $h$  and the downtilt angle  $a$ , the distance  $D$  at which the main beam reaches ground is given by  $D = \tan(90-a) \times h$

beam where it hits the ground and from the expected associated local reflection; from this point the intensity of radiation falls off with the square of the distance from the transmitter.

In Naila the main beam hits the ground at 350m with a beam angle of 6 degrees (15). In the inner area, additional emissions are caused by the secondary lobes of the transmitter; this means in comparison that from purely mathematical calculations the outer area has significantly reduced radiation intensity.

The calculations from computer simulations and the measurements from the Bavaria agency for the environmental protection, both found that the intensity of radiation was a factor of 100 higher in the inner area as compared to the outer area. The measurements of all transmitter stations show that the intensity of radiation from the cell phone transmitter station in Naila in the inner area was higher than the other measurement shown in the previous studies of electromagnetic fields from radio, television or radar (14).

The study StSch 4314 from the ECOLOG Institute indicates an association between a vertical and horizontal distance from the transmitter station and expected radiation intensity on the local people (16). The reason for setting a distance of 400m for the differentiation point is partly due to physical considerations, and partly due to the study of Santini *et al.* who chose 300m (10).

#### Data Gathering

Similar residential streets in the inner area and outer areas were selected at random. The large old people's home in the inner area was excluded from the study because of the age of the inhabitants. Data gathering covered nearly 90% of the local residents, because all four GPs in Naila took part in this study over 10 years. Every team researched the names of the patients from the selected streets that had been ill with tumours since 1994. The condition was that all patients had been living during the entire observation time of 10 years at the same address.

The data from patients was handled according to data protection in an anonymous way. The data was evaluated for gender, age, tumour type and start of illness. All cases in the study were based on concrete results from tissue analysis. The selection of patents for the study was always done in exactly the same way. Self-selection was not allowed. Also the subjective opinion of patients that the radio mast detrimentally affected their health has not affected this study. Since patients with cancer do not keep this secret from GPs, it was possible to gain a complete data set.

#### Population study

In the areas where data was collected 1,045 residents were registered in 31.12.2003. The registration statistics for Naila at the beginning of the study (1.1.1994) show the number of old people in the inner and outer areas, as shown in Table 1. The average age at the beginning

	female	male	total
Inner area	41.48	38.70	40.21
Outer area	41.93	38.12	40.20
Naila total	43.55	39.13	41.45

Table 1 : Overview of average ages at the beginning of the study in 1994

1994	inner 22.4%	outer 2.8%	Naila total 24.8%
2004	inner 26.3%	outer 26.7%	

Table 2 : Proportion of patients aged over 60

of the study (1.1.1994) in both the inner and outer areas was 40.2 years. In the study period between 1994-2004, 34 new cases of cancer were documented out of 967 patients (Table 3). The study covered nearly 90% of local residents.

The average age of the residents in Naila is one year more than that of the study due to the effects of the old people's home. From the 9,472 residents who are registered in Naila, 4,979 (52.6%) are women and 4,493 (47.4%) are men. According to the register office, in 1.1.1994 in the outer area, the percentage was 45.4% male and 54.5% female, and in the inner area 45.3% male and 54.6% female. The number of people who are over 60 years old is shown in Table 2.

The social differences in Naila are small. Big social differences like in the USA do not exist here. There is also no ethnic diversity. In 1994 in Naila the percentage of foreigners was 4%. Naila has no heavy industry, and in the inner area there are neither high voltage cable nor electric trains.

#### Results

Results are first shown for the entire 10 year period from 1994 until 2004. Secondly, the last five-year period 1999 to 2004 is considered separately.

#### Period 1994 to 2004

As a null hypothesis it was checked to see if the physical distance from the mobile transmission mast had no effect on the number cancer cases in the selected population, *ie* that for both the group nearer than 400 metres and the group further than 400 metres the chance of developing cancer was the same. The relative frequencies of cancer in the form of a matrix are shown in Table 3. The statistical test method used on this data was the chi-squared test with Yates's correction. Using this method we obtained the value of 6.27, which is over the critical value of 3.84 for a

Period	Inner area	Outer area	total
1994-2004			
new cases of cancers	18	16	34
with no new cancer	302	631	933
total	320	647	967

Table 3 : numbers of patients with and without cancers, 1994-2004

statistical significance of 0.05).

This means the null hypothesis that both groups within the 400-metre radius of the mast and beyond the 400 metre radius, have the same chance of developing cancer, can be rejected with a 95% level of confidence. With a statistical significance of 0.05, an even more significant difference was observed in the rate of new cancer cases between the two groups.

Calculating over the entire study period of 1994 until 2004, based on the incidence matrix (Table 3) we arrive at a relative risk factor of 2.27 (quotient of proportion for each group, eg 18/320 in the strongly exposed inner area, against 16/647 in the lower exposed comparison group). If expressed as an odds ratio, the relationship of the chance of getting cancer between strongly exposed and the less exposed is 2.35.

The following results show clearly that inhabitants who live close to transmitter antennas compared to inhabitants who live outside the 400m zone, double their risk of developing cancer. In addition, the average age of developing cancer was 64.1 years in the inner area whereas in the outer area the average age was 72.6 years, a difference of 8.5 years. That means during the 10 year study that in the inner area (within 400 metres of the radio mast) tumours appear at a younger age.

In Germany the average age of developing cancer is approximately 66.5 years, among men it is approximately 66 and among women, 67 (18).

Over the years of the study the time trend for new cancer cases shows a high annual constant value (Table 4). It should be noted that the number of people in the inner area is only half that of the outer area, and therefore the absolute numbers of cases is smaller.

Table 7 shows the types of tumour that have developed in the cases of the inner area.

#### Period 1994 to 1999

No. of cases of tumours per year of study	Inner area: of the 320 people		outer area: of the 647 people	
	total cases	per 1,000	total cases	per 1,000
1994	—	—	I	1.5
1995	—	—	—	—
1996	II	6.3	I	1.5
1997	I	3.1	III	4.6
1998	II	6.3	III	4.6
1999	II	6.3	I	1.5
2000	IIII	15.6	I	1.5
2001	II	6.3	II	3.1
2002	II	6.3	II	3.1
2003-3/2004	II	6.3	II	3.1

Table 4 : Summary of the total tumours occurring per year (no. and per thousand)

Period	Inner area	Outer area	total
1994-1999			
new cases of cancers	5	8	13
with no new cancer	315	639	954
total	320	647	967

Table 5 : numbers of patients with and without cancers, 1994-1999

For the first five years of the radio transmission mast operation (1994-1998) there was no significant increased risk of getting cancer within the inner area as compared to the outer area (Table 5).

#### Period 1999 to 2004

Under the biologically plausible assumption that cancer caused by detrimental external factors will require a time of several years before it will be diagnosed, we now concentrate on the last five years of the study between 1999 and 2004. At the start of this period the transmitter had been in operation for 5 years. The results for this period are shown in Table 6. The chi-squared test result for this data (with Yates's correction) is 6.77 and is over the critical value of 6.67 (statistical significance 0.01). This means, with 99% level of confidence, that there is a statistically proven difference between development of cancer between the inner group and outer group. The relative risk of 3.29 revealed that there was 3 times more risk of developing cancer in the inner area than the outer area during this time period.

Period	Inner area	Outer area	total
1999-2004			
new cases of cancers	13	8	31
with no new cancer	307	639	946
total	320	647	967

Table 6 : numbers of patients with and without cancers, 1999-2004

The odds-ratio 3.38 (VI 95% 1.39-8.25, 99% 1.05-10.91) allows us with 99% confidence to say that the difference observed here is not due to some random statistical effect.

#### Discussion

Exactly the same system was used to gather data in the inner area and outer areas. The medical chip card, which has been in use for 10 years, enables the data to be processed easily. The four participating GPs examined the illness of 90% of Naila's inhabitants over the last 10 years. The basic data for this study were based on direct examination results of patients extracted from the medical chip cards, which record also the diagnosis and treatment. The study population is (in regards to age, sex and cancer risk) comparable, and therefore statistically neutral. The study deals only with people who have been living permanently at the same address for the entire study period and therefore

Type of tumour (organ)	no. of tumours found	total expected	incidence per 100,000	ratio inner: outer
breast	8	5.6	112	5:3
ovary	1	1.1	23	0:1
prostate	5	4.6	101	2:3
pancreas	m 3	0.6	14	2:1
	f 2	0.9	18	1:1
bowel	m 4	3.7	81	2:2
	f 0	4.0	81	0:0
skin melanoma	m 1	0.6	13	1:0
	f 0	0.7	14	0:0
lung	m 3	3.6	79	2:1
	f 0	1.2	24	0:0
kidney	m 2	1.0	22	1:1
	f 1	0.7	15	1:0
stomach	m 1	1.2	27	0:1
	f 1	1.1	23	0:1
bladder	m 1	2.0	44	0:1
	f 0	0.8	16	0:0
blood	m 0	0.6	14	0:0
	f 1	0.7	15	1:0

Table 7 : Summary of tumours occurring in Naila, compared with incidence expected from the Saarland cancer register

have the same duration of exposure regardless of whether they are in the inner area or outer area.

The result of the study shows that the proportion of newly developing cancer cases was significantly higher ( $p < 0.05$ ) among those patients who had lived during the past ten years within a distance of 400 metres from the cellular transmitter site, which has been in operation since 1993, in comparison to people who live further away. Compared to those patients living further away, the patients developed cancer on average 8.5 years earlier. This means the doubled risk of cancer in the inner area cannot be explained by an average age difference between the two groups. That the transmitter has the effect that speeds up the clinical manifestations of the illness and general development of the cancer cannot be ruled out.

In the years 1999-2004, ie after five years and more of transmitter operation, the relative risk of getting cancer had trebled for the residents of the area in the proximity of the mast compared to the inhabitants of Naila in the outer area ( $p > 0.01$ ). The division into inner area and outer area groups was clearly defined at the beginning of the study by the distance to the cell phone transmission mast. According to physical considerations people living close to cellular transmitter antennas were exposed to heightened transmitted radiation intensity.

Both calculated and empirical measurements revealed that the intensity of radiation is 100 times higher in the inner area compared to the outer area. According to the research StSch 4314 the horizontal and vertical position in regards to the transmitter antenna is the most important criterion in defining the radiation intensity area on inhabitants (16).

The layered epidemiological assessment method used in this study is also used in assessment of possible chemical environmental effects. In this case the layering is performed in regards to the distance from the cell phone transmitter station. Using this method it has been shown that there is a significant difference in probability of developing new cancers depending on the exposure intensity.

The number of patients examined was high enough according to statistical rules that the effects of other factors (such as use of DECT phones) should be normalised across the inner area and outer area groups. From experience the disruption caused by a statistical confounding factor is in the range between 20% and 30%. Such a factor could therefore in no way explain the 300% increase in new cancer cases. If structural factors such as smoking or excessive alcohol consumption are unevenly distributed between the different groups this should be visible from the specific type of cancers to have developed (ie lung, pharyngeal or oesophageal). In the study inner area there were two lung cancers (one smoker, one non-smoker), and one in the outer area (a smoker), but no oesophageal cancers. This rate of lung cancer is twice what is statistically to be expected and cannot be explained by a confounding factor alone. None of the patients who developed cancer was from a family with such a genetic propensity.

Through the many years experience of the GPs involved in this study, the social structures in Naila are well known. Through this experience we can say there was no significant social difference in the examined groups that might explain the increased risk of cancer.

The type and number of the diagnosed cancers are shown in Table 7. In the inner area the number of cancers associated with blood formation and tumour-controlling endocrine systems (pancreas), were more frequent than in the outer area (77% inner area and 69% outer area).

From Table 7, the relative risk of getting breast cancer is significantly increased to 3.4. The average age of patients that developed breast cancer in the inner area was 50.8 years. In comparison, in the outer area the average age was 69.9 years, approximately 20 years less. In Germany the average age for developing breast cancer is about 63 years. The incidence of breast cancer has increased from 80 per 100,000 in the year 1970 to 112 per 100,000 in the year 2000. A possible question for future research is whether breast cancer can be used as a 'marker cancer' for areas where there is high contamination from electromagnetic radiation. The report of Tynes *et al.* described an increased risk of breast cancer in Norwegian female radio and telegraph operators (20).

To further validate the results the data gathered were compared with the Saarland cancer register (21). In this register all newly developed cancers cases since 1970 are recorded for each Bundesland. These data are accessible via the Internet. Patients that suffer two separate tumours were registered twice, which increases the overall incidence up to 10%. In this

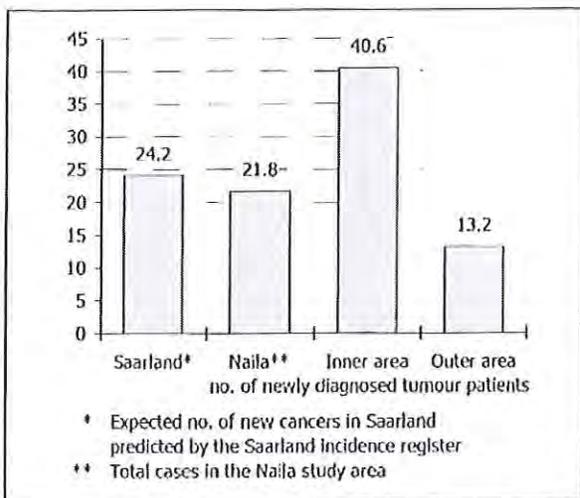


Fig. 3 : Number of new cancer cases 1999 to 2004, adjusted for age and gender, calculated for the 5,000 patient years

register there is no location-specific information, for instance proximity to cell phone transmission masts. The data in the cancer register therefore reflect no real control group but rather the effect of the average radiation on the total population.

From the Saarland cancer register for the year 2000 the incidence of new cancer cases was 498 per 100,000 for men and 462 per 100,000 for women. When adjusted for age and sex one would expect a rate of between 480 and 500 per 100,000 in Naila. For the years 1999 to 2004 there were 21 new cases of cancer among 967 patients. The expected number was 24 cases per 1,000 patients.

The results of the study are shown graphically in Fig. 3. The bars of the chart represent the number of new cancer cases per 1,000 patients in the separate areas, over the five years (bars 2 to 4). The first bar represents the expected number from the Saarland cancer register.

In spite of a possible underestimation, the number of newly developed cancer cases in the inner area is more than the expected number taken from the cancer register, which represents the total population being irradiated. The group who had lived during the past five years within a distance of 400 m from the cellular transmitter have a two times higher risk of developing cancer than that of the average population. The relative risk of getting cancer in the inner area compared with the Saarland cancer register is 1.7 (see to Table 7).

### Conclusion

The result of this retrospective study in Naila shows that the risk of newly developing cancer was three times higher among those patients who had lived during past ten years (1994-2004), within a distance of 400m from the cellular transmitter, in comparison to those who had lived further away.

Cross-sectional studies can be used to provide the decisive empirical information to identify real problems. In the 1960s just three observations of birth deformities were enough to uncover what is today an academically indisputable Thalidomide problem.

This study, which was completed without any external financial support is a pilot project. Measurements of individual exposure as well as the focused search for further side effects would provide a useful extension to this work, however such research would need the appropriate financial support.

The concept of this study is simple and can be used everywhere, where there it a long-term electromagnetic radiation from a transmitting station.

The results presented are a first concrete epidemiological sign of a temporal and spatial connection between exposure to GSM base station radiation and cancer disease.

These results are, according to the literature relating to high frequency electromagnetic fields, not only plausible and possible, but also likely.

From both an ethical and legal standpoint it is necessary to immediately start to monitor the health of the residents living in areas of high radio frequency emissions from mobile telephone base stations with epidemiological studies. This is necessary because this study has shown that it is no longer safely possible to assume that there is no causal link between radio frequency transmissions and increased cancer rates.

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### Footnotes

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#### Kontakt:

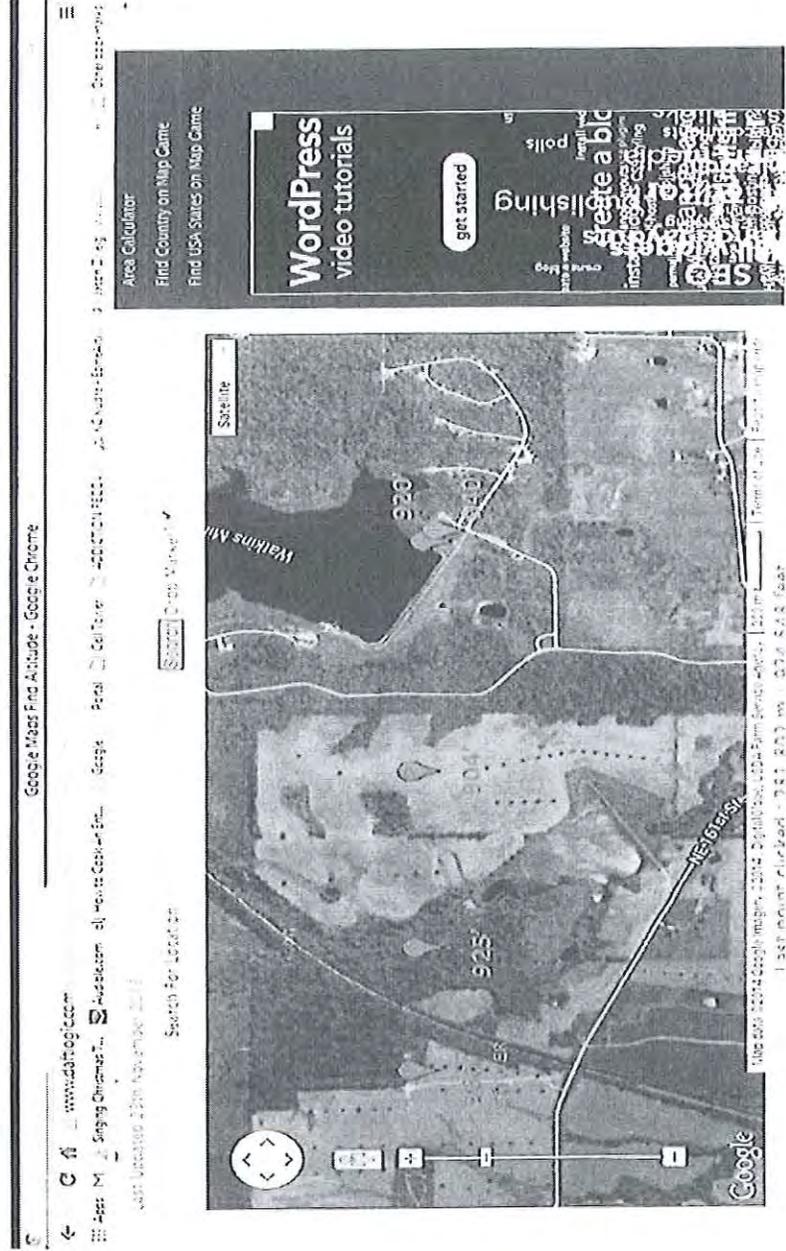
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### Sight Line of proposed 160' Cell Tower from Watkins Mill

Ground elevation numbers shown were obtained from Google maps and are consistent with elevations submitted by CCS, Inc., the company representing Verizon Wireless in this zoning request.

1. Marker Elevation at parking lot/east end of dam 940'
2. Marker Elevation at west facing bench/ east end of dam 920'
3. Marker at proposed Tower location 960'
4. Marker on east side of railroad 925'
5. Marker on west end of park 904'

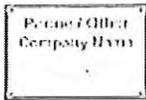


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Data Logic > Sandbox > Google Maps Find Altitude

## Google Maps Find Altitude

Last Updated 23th November 2013

Search For Location :

Search Drop Marker?



Clear Map

[Map Height : - - ]

Output latitude,longitude?    Output in meters?    Output in feet?

number, feet  
0,931.180  
1,917.154  
2,960.523  
3,926.491  
4,885.948



```

geocoder = new google.maps.Geocoder();
}

function foundsingle(first)
{
var latlng = new google.maps.LatLng (parseFloat(first.lat),parseFloat(first.lng));

var obj=new Object();
obj.latlng=latlng;

getElevation(obj);
}

function getElevation(event)
{
var locations = [];

// Retrieve the clicked location and push it on the array
var clickedLocation = event.latLng;
locations.push(clickedLocation);

// Create a LocationElevationRequest object using the array's one value
var positionalRequest = {'locations': locations};

// Initiate the location request
elevator.getElevationForLocations(positionalRequest, function(results, status)
{
if (status == google.maps.ElevationStatus.OK)
{
// Retrieve the first result
if (results[0])
{
// Open an info window indicating the elevation at the clicked position
outputDiv.innerHTML= "Last point clicked : " + results[0].elevation.toFixed(3) + " m / " +
(results[0].elevation*3.2808399).toFixed(3) + " feet";
var marker=placeMarker(clickedLocation,results[0].elevation.toFixed(3) + " m / " +
(results[0].elevation*3.2808399).toFixed(3) + " feet");
marker.setMap(map);
routeMarkers.push(marker);

output_lat.push(event.latLng.lat());
output_lng.push(event.latLng.lng());
output_f.push((results[0].elevation*3.2808399).toFixed(3));
output_m.push(results[0].elevation.toFixed(3));

fn_makecsv();
}
else
{
outputDiv.innerHTML="No results found";
}
}
else
{
outputDiv.innerHTML="Elevation service failed due to: " + status;
}
});
}

function placeMarker(location,text)

```

```

{
var image = new google.maps.MarkerImage('http://www.daftlogic.com/images/gmmarkersv3/stripes.png',
// This marker is 20 pixels wide by 32 pixels tall.
new google.maps.Size(20, 34),
// The origin for this image is 0,0.
new google.maps.Point(0,0),
// The anchor for this image is the base of the flagpole at 0,32.
new google.maps.Point(9, 33));
var shadow = new google.maps.MarkerImage('http://www.daftlogic.com/images/gmmarkersv3/shadow.png',
// The shadow image is larger in the horizontal dimension
// while the position and offset are the same as for the main image.
new google.maps.Size(28, 22),
new google.maps.Point(0,0),
new google.maps.Point(1, 22));

var marker = new google.maps.Marker({position:location,map:map,shadow:shadow,icon:image,title:text});

return marker;
}

function clearmap()
{
if (routeMarkers)
{
for (i in routeMarkers)
{
routeMarkers[i].setMap(null);
}
}
routeMarkers=new Array(0);
clearsearchresults();
document.getElementById("queryInput").value="";
outputDiv.innerHTML="";

output_lat =new Array(0);
output_lng =new Array(0);
output_f =new Array(0);
output_m =new Array(0);

document.getElementById("ta_csvoutput").style.visibility="hidden";
document.getElementById("ta_csvoutput").value="";
}

function fn_makecsv()
{
var int=0;
document.getElementById("ta_csvoutput").style.visibility="visible";
document.getElementById("ta_csvoutput").value="";

output="number";
if (document.getElementById("cb_output_latlng").checked)
{
output+="latitude,longitude";
}
if (document.getElementById("cb_output_meters").checked)
{
output+="meters";
}
if (document.getElementById("cb_output_feet").checked)
{

```

```
output+=" ,feet";
}
output+="\n";
```

```
for (i in routeMarkers)
{
output+=int;
if (document.getElementById("cb_output_latlng").checked)
{
output+=","+output_lat[int]+" "+output_lng[int];
}
if (document.getElementById("cb_output_meters").checked)
{
output+=","+output_m[int];
}
if (document.getElementById("cb_output_feet").checked)
{
output+=","+output_f[int];
}
output+="\n";
int=int+1;
}
document.getElementById("ta_csvoutput").value=output;
}
```

```
function submitenter(myfield,e)
{
var keycode;
if (window.event) keycode = window.event.keyCode;
else if (e) keycode = e.which;
else return true;

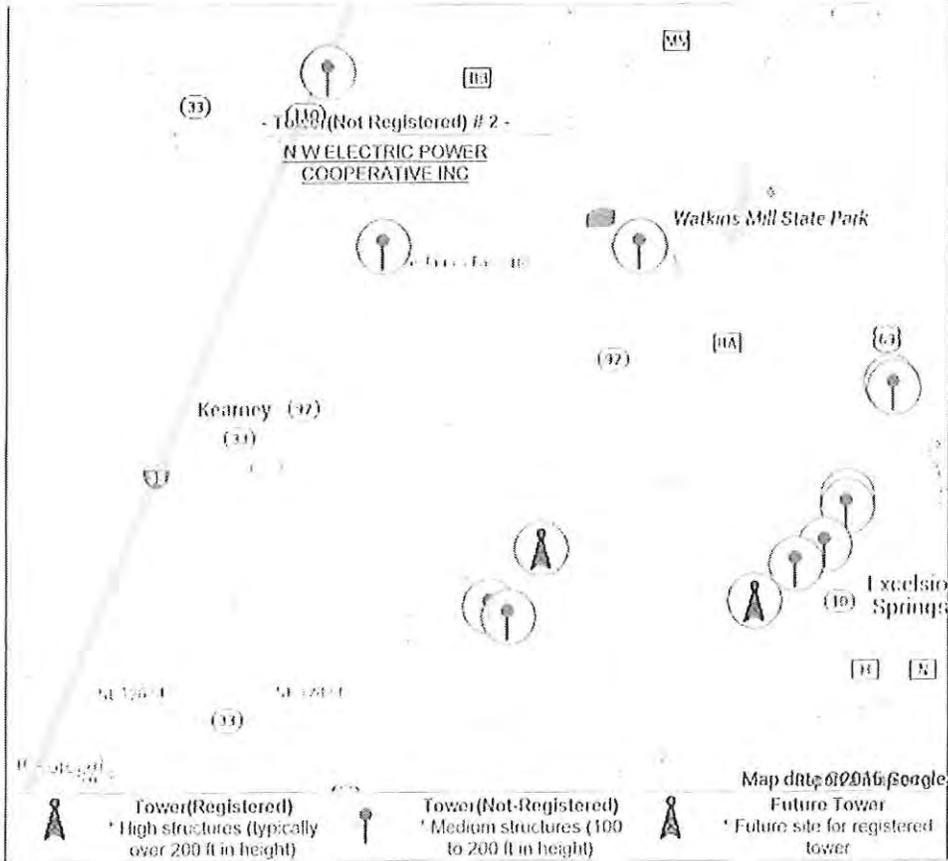
if (keycode == 13)
{
fn_quickfind2(document.getElementById('goto').value);
document.getElementById("goto").focus();
document.getElementById("goto").select();
return false;
}
else
{
return true;
}
}
```

```
/**
*****Quick Find Option*****
***/
```

```
function fn_quickfind2(address)
{
document.getElementById("btn_go").value="Searching...";
geocoder.geocode( { 'address': address}, function(results, status)
{
if (status == google.maps.GeocoderStatus.OK)
{
var image = new google.maps.MarkerImage('http://www.dafllogic.com/images/gmmarkersv3/stripes.png',
// This marker is 20 pixels wide by 32 pixels tall.
new google.maps.Size(20, 34),
// The origin for this image is 0,0.
```



• Tower Structures - (16700 Endicott Rd, Kearney, MO 64060)



Tower Search Report

- Alert!** 14 Towers (3 Registered, 11 Not Registered) found within 4.00 miles of 16700 Endicott Rd, Kearney, MO 64060.
- Info!** The NEAREST Tower is .36 miles away and is owned by Verizon Wireless.
- Ok!** No Applications for Future Towers detected as of 01/16/15.

Tower Type	ID Num	Site Owner	Height	Dist
	(1)	Union Pacific Railroad	68 feet	3.09 miles
	(2)	Verizon Wireless (vaw) Llc	230 feet	3.87 miles
	(3)	City Of Excelsior Springs Missouri	138 feet	3.91 miles
	(1)	Verizon Wireless	160 feet	.36 miles
	(2)	N W Electric Power Cooperative Inc	130 feet	2.86 miles
	(3)	Nextel West Corp	225 feet	3.77 miles
	(4)	Excelsior Springs, City Of	225 feet	3.82 miles
	(5)	Burns & McDonnell	34 feet	3.83 miles
	(6)	Sage Aviation	26 feet	3.83 miles
	(7)	Cellular One	160 feet	3.85 miles
	(8)	Green Quarries, Inc	95 feet	3.89 miles
	(9)	Unisite Inc	305 feet	3.90 miles

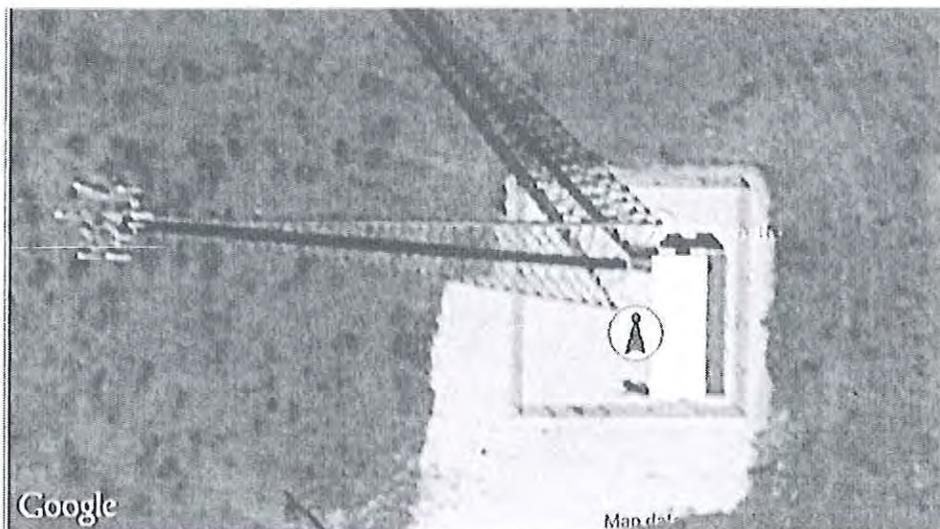
	(10)	Cellular One Of Kansas City	155 feet	3.93 miles
	(11)	Union Electric Company	199 feet	3.97 miles
Future	(No Towers Detected)			

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## Wilson Cell Phone Booster

Buy Wilson Boosters for Home, Cars & Buildings. Low Prices. Free Ship!

 Registered Tower Detail - Tower (2)



• Ownership Info

Rep	Company: Verizon Wireless Contact: Steve L Regitz Phone: (770)797-1070 Email: <a href="mailto:Network.Regulatory@VerizonWireless.com">Network.Regulatory@VerizonWireless.com</a>	Attn: Network Regulatory Address: 1120 Sanctuary Pkwy, #150 GASA5REG Alpharetta, GA, 30009
Owner	Company: Verizon Wireless (VAW) LLC Contact: Not Recorded Phone: (770)797-1070 Email: <a href="mailto:Network.Regulatory@VerizonWireless.com">Network.Regulatory@VerizonWireless.com</a>	Attn: Network Regulatory Address: 1120 Sanctuary Pkwy, #150 GASA5REG Alpharetta, GA, 30009

• Tower Characteristics

Registration #:	1257839	Ground Elev:	949.2 feet
Latitude:	39.4414	Height Of Structure:	220.2 feet
Longitude:	-94.3257	Overall Height:	1179.2 feet
Structure Type:	Tower	Structure Address:	19413 Scott Rd, Holt, MO
Status:	Constructed		
Date Constructed:	08/10/2007		

• History

Purpose	Status	Date	Addtl Info
New Reg	Granted	04/04/2007	...
Constructed	Granted	08/13/2007	...
Adm Update	Granted	08/07/2013	...

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Integra Realty Resources  
Kansas City

Appraisal of Real Property

KCYC Cameron Road Site No. 274049  
Proximity Analysis  
16423 Endicott Rd.  
Kearney, Clay County, Missouri 64060

Prepared For:  
Polisnell PC

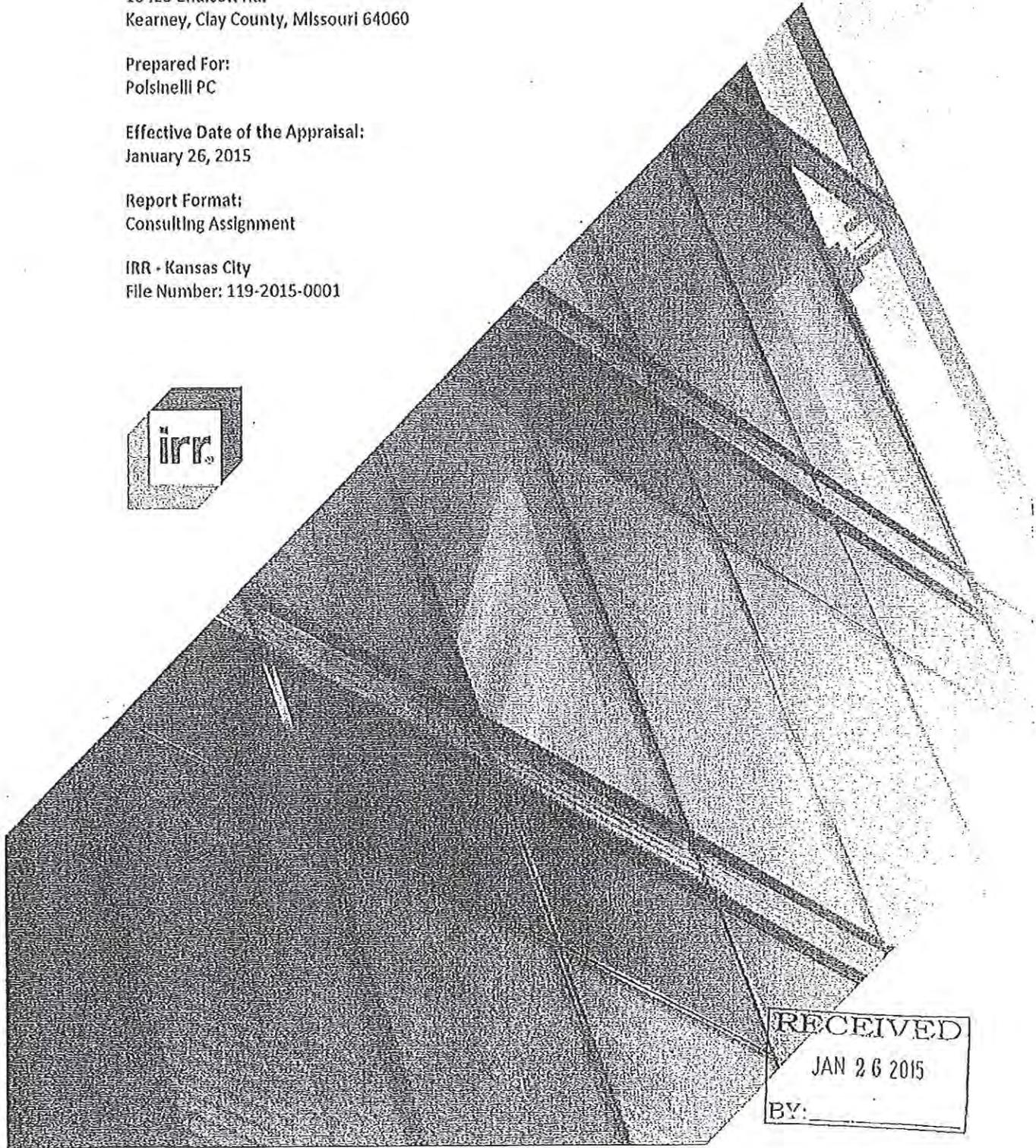
Effective Date of the Appraisal:  
January 26, 2015

Report Format:  
Consulting Assignment

IRR - Kansas City  
File Number: 119-2015-0001



**Sept 14-128 CUP -  
16423 Endicott Road  
Attachment J**



RECEIVED  
JAN 26 2015  
BY:

Integra Realty Resources  
Kansas City

1901 West 47th Place  
Suite 300  
Westwood, KS 66205-1834

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F 913.236.4307  
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January 26, 2015

Curtis Holland  
Polsinelli PC  
6201 College Blvd, Suite 500  
Overland Park, KS 66211

**SUBJECT:** Market Value Appraisal  
KCYC Cameron Road Site No. 274049  
16423 Endicott Rd.  
Kearney, Clay County, Missouri 64060  
IRR - Kansas City File No. 119-2015-0001

Dear Mr. Holland:

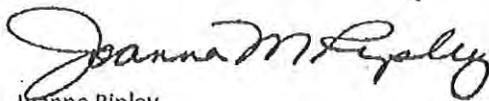
We have conducted paired data analyses of single family residences in Clay and Platte County to determine the impact, if any; a cell tower site will have on sale prices due to proximity. This technique is defined by The Dictionary of Real Estate Appraisal 5th Edition as a "quantitative technique used to identify and measure adjustments to sale prices or rents of comparable properties; to apply this technique, sales or rental data on nearly identical properties are analyzed to isolate a single characteristic's effect on the value or rent."

We present sales data of properties abutting and properties not abutting several cell tower sites. Case Study No. 1 is residential properties in Riss Lake in Parkville, Missouri. Case Study No. 2 is rural residential properties in Cass County, Missouri and Case Study No. 3 of a rural residential property abutting a cell tower on 112<sup>th</sup> Street in Kansas City, Missouri. As Clay, Cass, and Platte Counties are not required to disclose sales, information is limited to what is presented in the local multiple listing service.

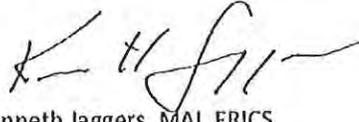
The purpose of this assignment is to identify what, if any, influence proximity to a cell tower has on the sales price of residential properties. All of the sales presented in these case studies occurred after the cell towers were constructed at the respective locations.

Curtis Holland  
Polsinelli PC  
January 26, 2015  
Page 2

The economic analysis presented in the following paired sale case studies indicate there is no significant or measurable impact on the market value of residences as a result of proximity to cell tower sites. From this we also found no impact on the marketing period for the properties abutting cell tower sites.



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## General Information

### Identification of the Project

A cell tower is proposed at 16423 Endicott Road in Kearney, Clay County, Missouri. The tower is to have an overall structure height of 160 feet, or 48.8 meters. The tower will be a 150 foot monopole with no guy wires. A Verizon Wireless shelter that is approximately 293 square feet is also proposed for the site. These improvements would be within a proposed lease boundary of 100 feet by 100 feet that is estimated to be approximately 150 to the west of the rail road right-of-way. The nearest residential vertical improvements are approximately 840 feet from the planned area. The plans for this project and the legal description are within the addenda of this report. The proposed lease was not made available to us at this time. This area is rural with mostly agricultural and rural residential uses. Maps and aerials of the surrounding area follow this section.

### Current Ownership

The fee owner of the site on which the cell tower is to be located is Patrick Pierson and Brian Steele. They each own 50% each as tenants in common. The current owners, Pierson and Steele, are to be the leaseholders to the proposed Verizon cell tower.

### Intended Use and User

The intended use of the report is for public hearing in January and February. The client and intended user is Polsinelli PC. Integra Realty Resources – Kansas City is not responsible for unauthorized use of this report.

### Prior Services

We have not performed any services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.

### Scope of Work

The scope of work for a paired data analysis to determine if there is proximity damage demonstrated in the market does not necessarily require an inspection of the site on which the cell tower is to be completed. As we have described, the nearest single family residences are approximately 840 feet from the cell tower which is 150 feet tall. What we report based upon our findings is if there is a proximity damage demonstrated in the market and if there is, to what extent any damage could be anticipated for the land owners abutting the proposed cell tower at the above location.

We use market transactions in developing our findings. We looked at cellreception.com web site and identified all of the cell towers located in the Kansas City MSA. From that population of cell towers, we identified those that were similar to or taller than the proposed cell tower at 16423 Endicott. We then narrowed the comparable sites to include only those where single family residences abutted the property with the cell tower but were not affected by any other dramatic locational characteristics such as properties along the rail road or major highway or residences abutting heavy commercial or

Industrial use. This narrowed the potential sites dramatically. Lastly we looked for sales of single family properties that were abutting the site on which a comparable cell tower was located. Where an abutting sale was identified, we then looked for specifically comparable properties from within the same area or subdivision. Once we identified one or more non-abutting sale for comparison, we completed the paired data analysis. Since there is no disclosure in Platte, Clay, Cass or Ray counties, and there is no disclosure at the time of sale enforced in Jackson County, we had a difficult time identifying information to use from these sources. Non-abutting sales were selected based on date of sale, location, physically characteristics of the land and residential improvements.

Having gathered the data we then paired the non-abutting sale transaction to the abutting sale transaction. Just as if we were appraising the properties for financing or acquisition or disposition, we compared abutting to non-abutting and adjusted for the modest remaining differences. These adjustments, typical of single family residential appraisal, were for finished basement or building size, room county, etc. We present our findings in three case studies.

Our market data research included information from county and public records that included deeds and leases for properties where cell towers located. We also searched for sales available from the Heartland Multiple Listing Service as well as deeds from public records to show the transfer of properties within our area. This area included Clay, Platte, Ray, Cass, and Jackson Counties within Missouri. From these records we chose sales that were the most relevant information for this analysis and made adjustments where appropriate.

### Land Description and Analysis

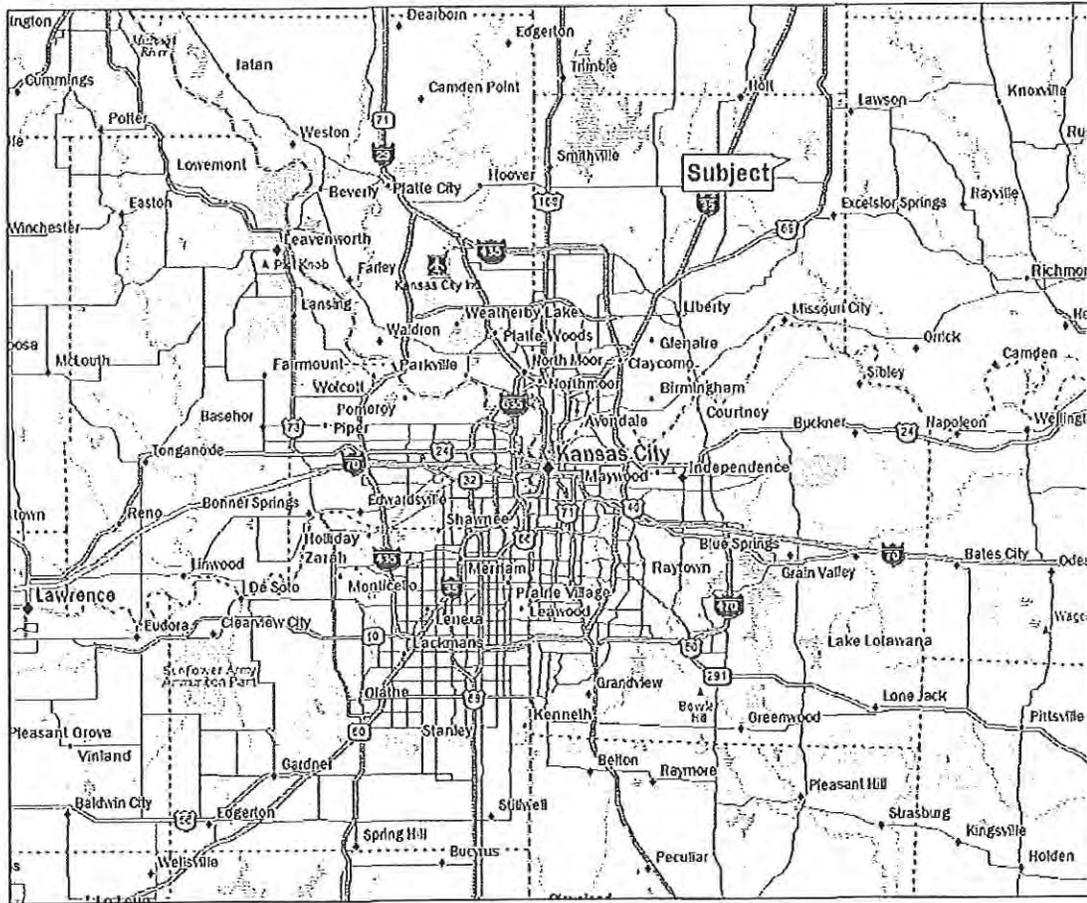
The site with the proposed tower is approximately 115.39 acres, or 5,026,388 square feet. This property is located at the northeast corner of Endicott Road and NE 164<sup>th</sup> Street. Rail road tracks border the entire eastern boundary of the parcel. As stated previously the area is used for agricultural and rural residential uses. According to Clay County Planning and Zoning the subject is zoned AG, agricultural and R-1, residential rural. These improvements would be within a proposed lease boundary of 100 feet by 100 feet that is estimated to be approximately 150 to the west of the rail road right-of-way. The nearest residential vertical improvements are approximately 840 feet from the planned area.

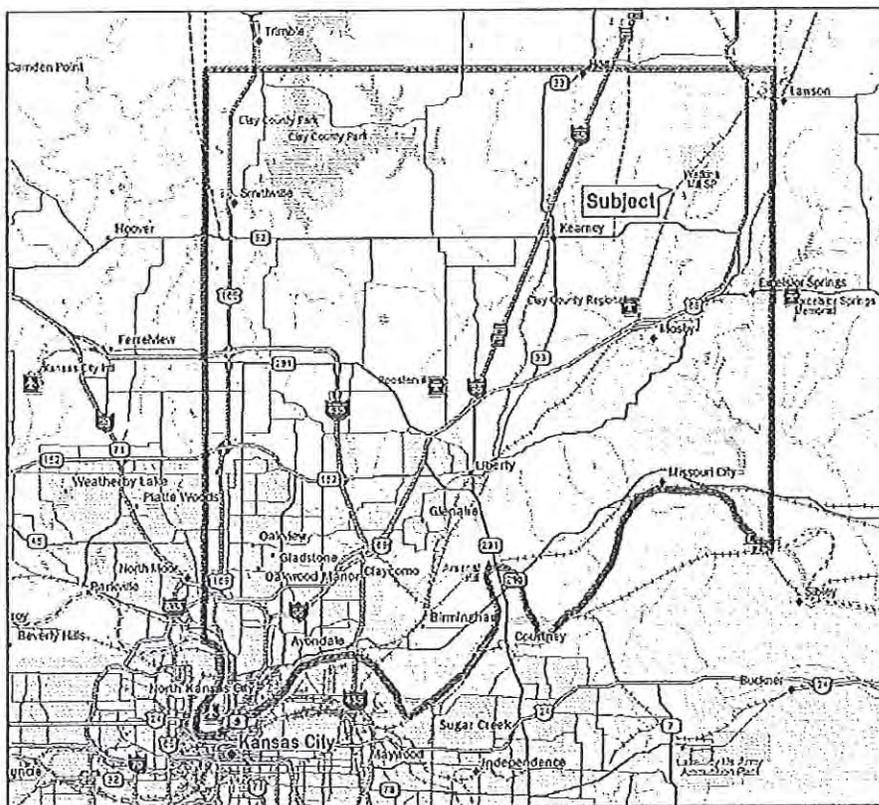
Aerial and Site Plan

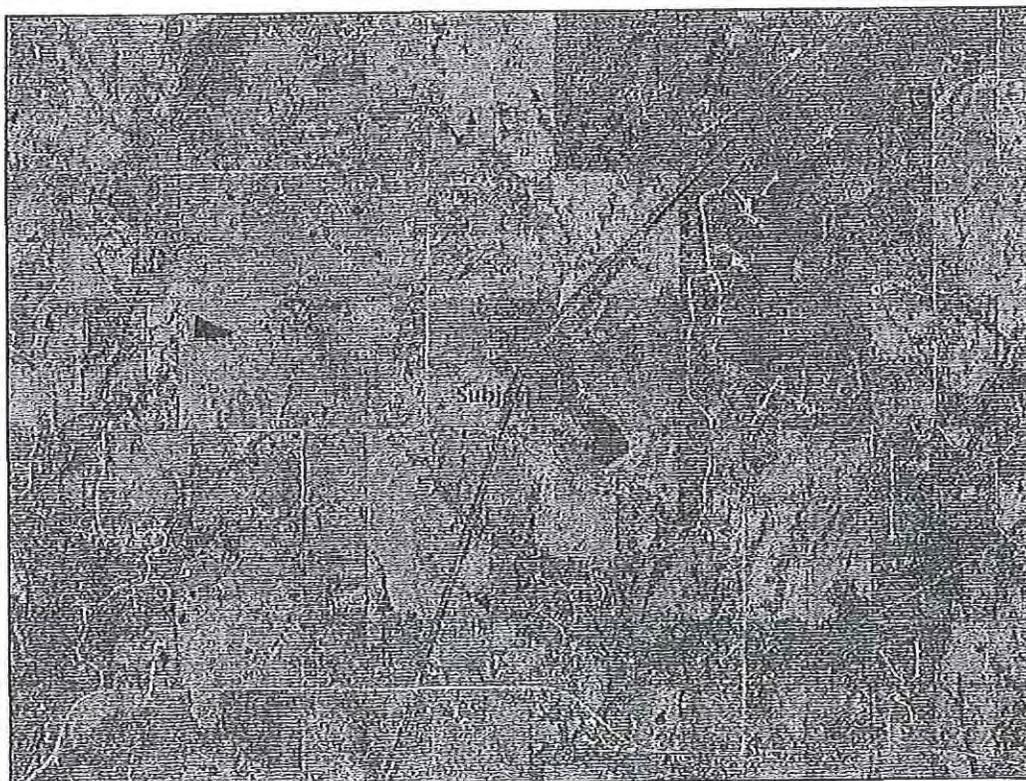
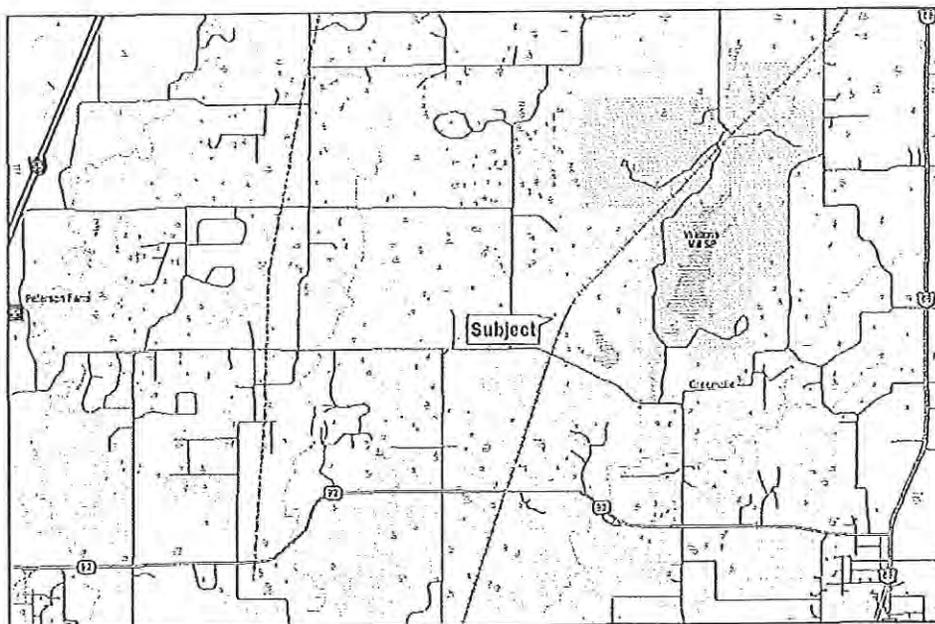




### Surrounding Area Maps







## CASE STUDY 1

Case Study No. 1 is a comparison of residential properties in Riss Lake in Parkville, Platte County, Missouri abutting a cell phone tower. The Riss Lake area was planned to have and has heavily wooded areas as well as a 134 acre lake. The subdivision is upscale with custom homes and amenities. This area is to be somewhat secluded but is accessible to the Kansas City MSA. This cell tower is described as 67.6 meters, or 225 feet in height and owned by Platte County, Missouri.

### Riss Lake

#### Tower Location - Park College Property

Sales Analysis		
Sale Identification	8021 NW Lakeview	5736 Splnnaker Pointe
Cell Tower Site Influence	Abutting	Not Abutting
Sale Date	September 24, 2012	May 4, 2012
Sale Price	\$334,000	\$330,000
Days on Market	87 Days	69 Days
Financing	Conventional	Conventional
Site	0.66 Acres	0.37 Acres
Total Living Area SF	3,646	2,797
Adjustment		\$20,000
Bedrooms / Full Baths / Half Baths	4 / 3 / 1	4 / 3 / 1
Age / Condition	1991	1994
Basement	Full Finished	Full Finished
Garage	3 Car Attached	3 Car Attached
HVAC / Mechanical	Central AC / Forced Air	Central AC / Forced Air
Style	1.5 Story	1.5 Story
Adjusted Sales Price		\$350,000
% Difference in Prices		-4.79%



It is noted that the abutting sale is slightly larger than the non-abutting sales, however as they have similar utility being a 1.5 story homes with four bedrooms, three and a half baths, and three car garages. We look to the overall sale price of the properties as it includes all attributes of the properties and not purely above grade living area. In terms of percentage between the sale prices of the comparables above, the difference of -4.79% is minimal as they sold within a similar time frame under similar market conditions. A map and aerials of the sales are included below.

### Sales Analysis

Sale Identification	8021 NW Lakeview	6229 North Lake Drive
Cell Tower Site Influence	Abutting	Not Abutting
Sale Date	September 24, 2012	February 28, 2013
Sale Price	\$334,000	\$335,000
Days of Market	87 Days	19 Days
Financing	Conventional	Conventional
Site	0.66 Acres	0.46 Acres
Total Living Area SF	3,646	3,319
Bedrooms / Full Baths / Half Baths	4 / 3 / 1	4 / 3 / 1
Age / Condition	1991	1998
Basement	Full Finished	Full Unfinished -\$15,000
Garage	3 Car Attached	3 Car Attached
HVAC / Mechanical	Central AC / Forced Air	Central AC / Forced Air
Style	1.5 Story	1.5 Story
Adjusted Sales Price		\$320,000
% Difference in Prices		4.19%

It is noted that the abutting sale is slightly larger than the non-abutting sales, however as they have similar utility being a 1.5 story homes with four bedrooms, three and a half baths, and three car garages. We look to the overall sale price of the properties as it includes all attributes of the properties and not purely above grade living area. In terms of percentage between the sale prices of the comparables above, the difference of 4.19% is minimal as they sold within a similar time frame under similar market conditions. A map and aerials of the sales are included below.

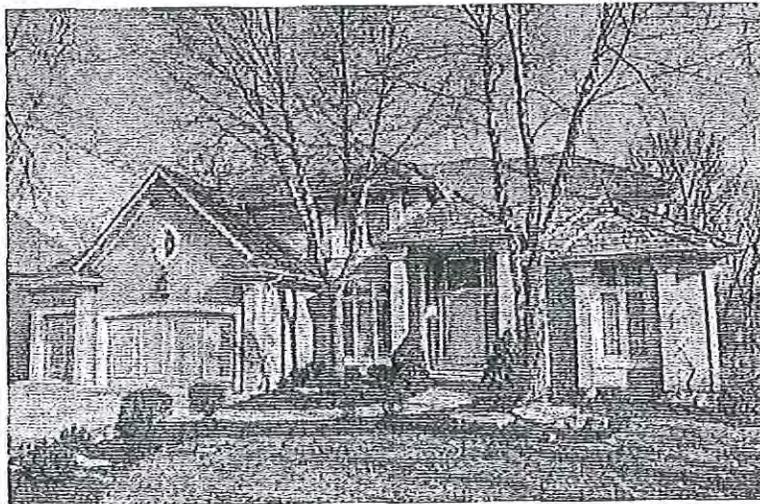
8021 Lakeview – Abutting Cell Tower to the south of the subject

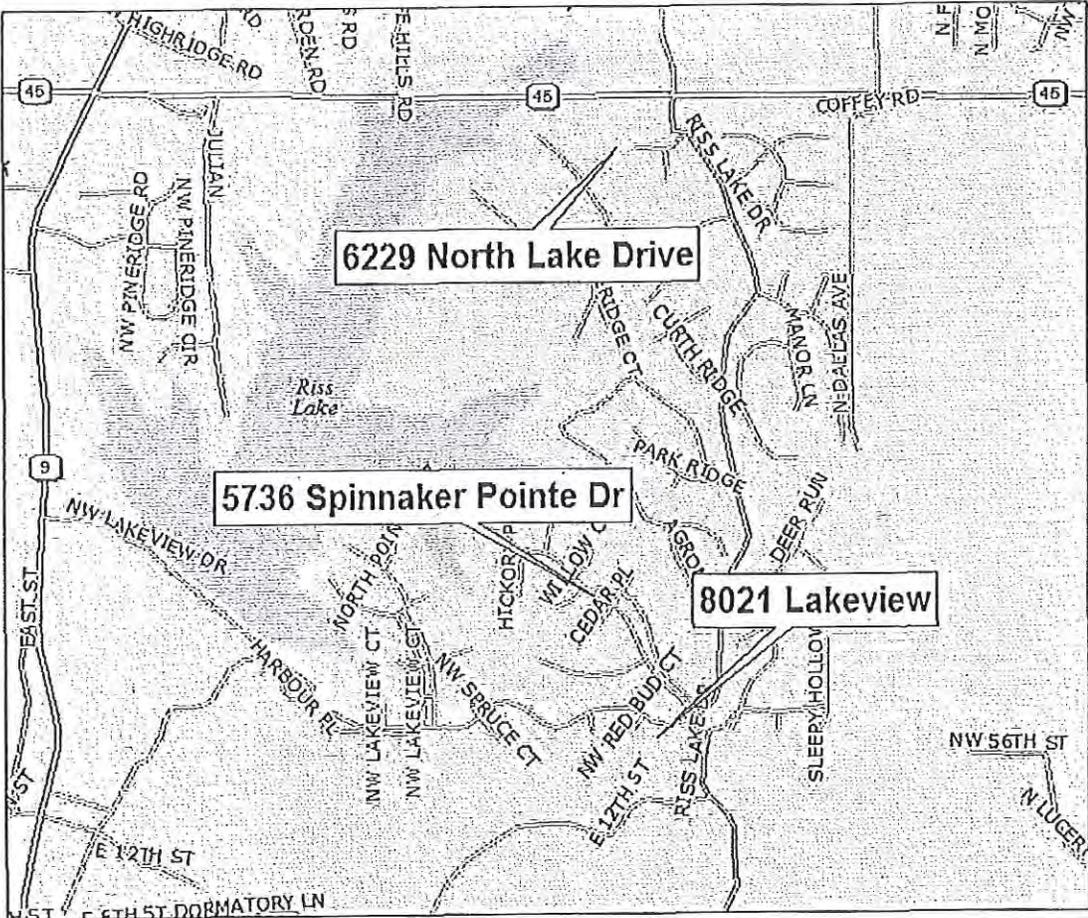


5736 Splinnaker Pointe



6229 North Lake Drive





## CASE STUDY 2

Case Study No. 2 is a comparison of rural residential properties in Cass County, Missouri abutting a cell phone tower. This cell tower is described as 256 meters, or 840 feet in height and is owned by Patriot Communications Services, Inc. There were limited sales similar to the property abutting the cell tower as such we look to similar properties that are currently listed near the subject.

### Route J

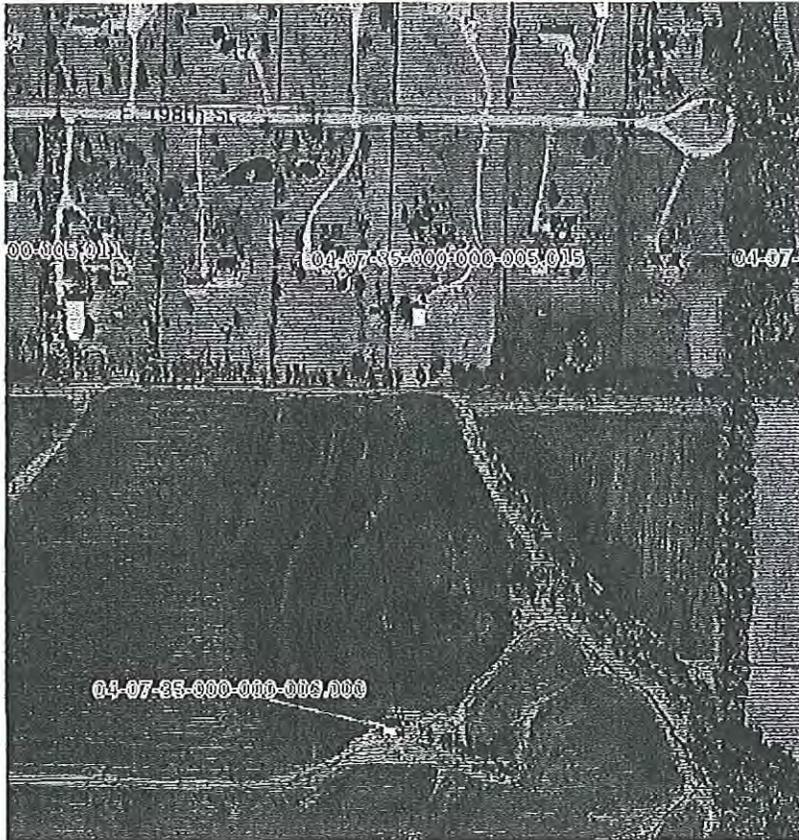
Tower Location - Route J, Peculiar, MO

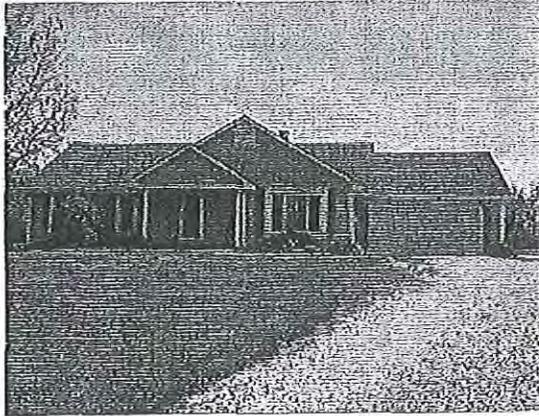
#### Sales Analysis

	13903 E 198th St, Peculiar	1407 N Jeter Rd, Raymore
Cell Tower Site Influence	Abutting	Non-abutting
Sale Date	September 12, 2012	January 14, 2013
Sale Price	\$222,000	\$227,000
Difference in Concessions		\$1,400
Financing	Conventional	Conventional
Site	4.28 Acres	3.02 Acres \$5,000
Total Living Area SF	2,180	2,065
Bedrooms / Full Baths / Half Baths	3 / 2 / 1	3 / 2 / 0
Age / Condition	1989	1985
Basement	Full Unfinished	Full Finished -\$10,000
Adjustment		
HVAC / Mechanical	Central AC / Forced Air	Central AC / Forced Air
Garage	2 Car Attached	2 Car Attached
Other	Outbuilding	Outbuilding
Adjusted Sale Price		\$223,400
% Difference in Prices		-0.63%

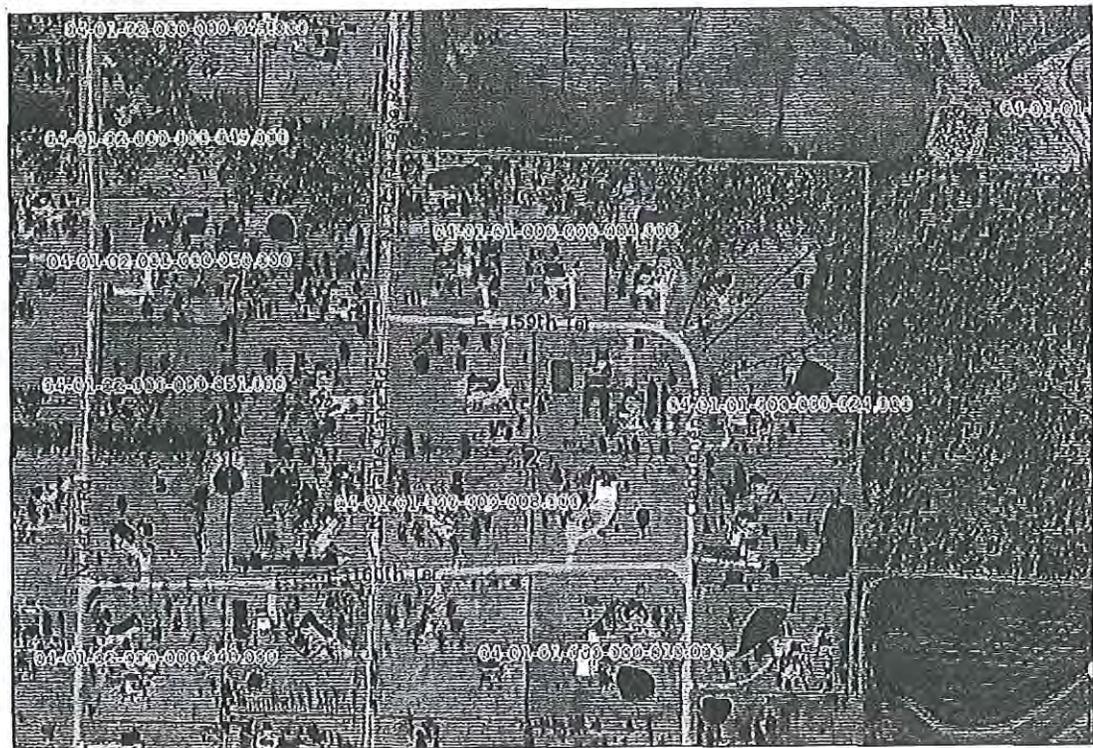
It is noted that the abutting sale is slightly larger than the non-abutting sales, however as they have similar utility being a ranch style homes with three bedrooms, full basements on acreage. We look to the overall sale price of the properties as it includes all attributes of the properties and not purely above grade living area. In terms of percentage between the sale prices of the comparables above, the difference of -0.63% is minimal as they sold within a similar time frame under similar market conditions. A map and aerials of the sale and listing are included below.

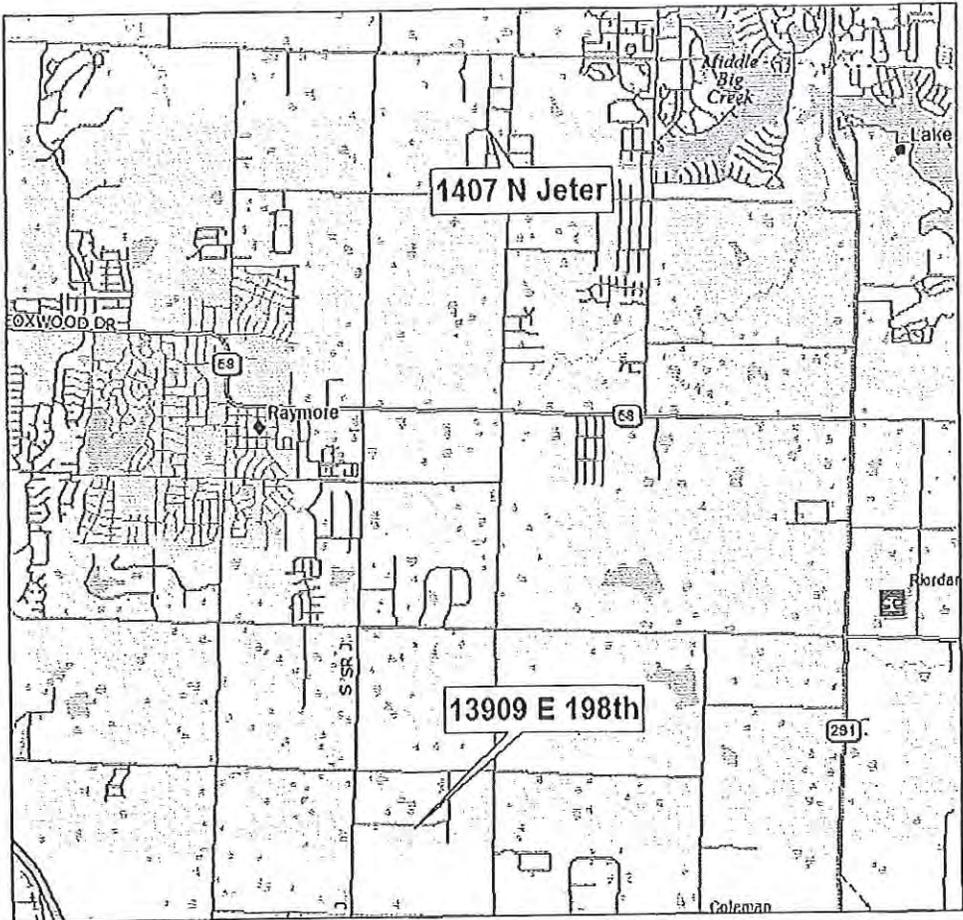
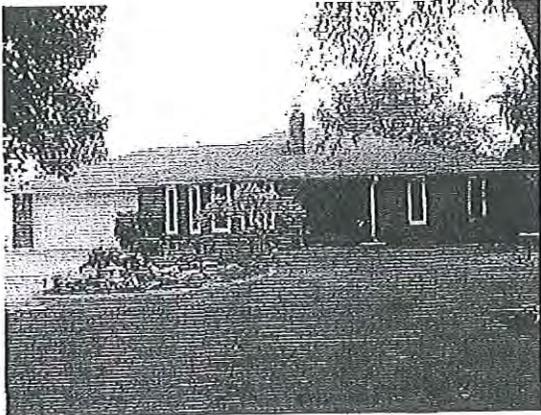
### 13903 E 198<sup>th</sup> Street – Abutting Cell Tower to the south of the subject





1407 N Jeter





## CASE STUDY 3

Case Study No. 3 is a comparison of rural residences in Clay County, Missouri abutting a cell phone tower. This cell tower at this location is described to be 47.2 meters, or 155 feet in height and is owned by Sba Monarch Towers II, LLC. As these properties are considered rural it is reasonable to have significant distance between the comparable properties.

### 112th Street Location

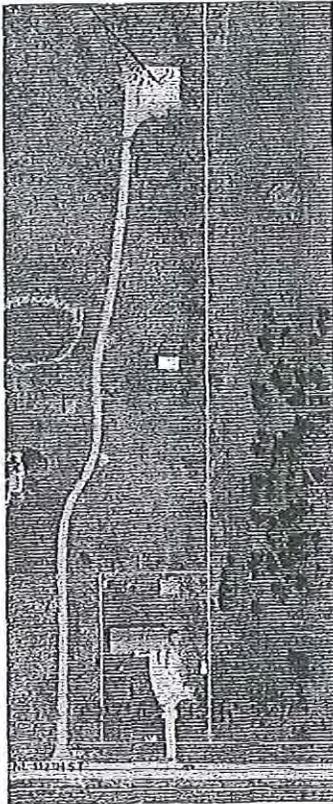
Tower Location - 9202 NE 112th Street, Kansas City, Missouri

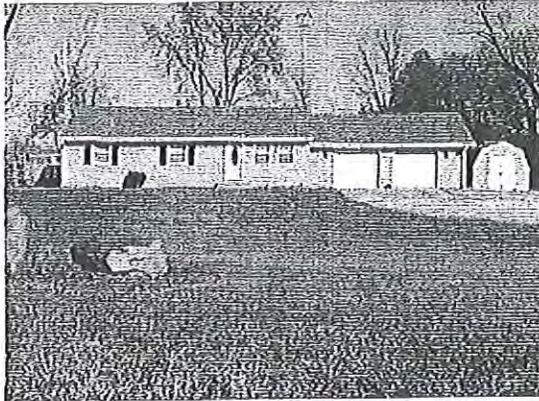
#### Sales Analysis

Sale Identification	9250 NE 112th Street	9230 NW View Crest Drive
Cell Tower Site Influence	Abutting	Non-abutting
Sale Date	January 8, 2015	November 7, 2014
Sale Price	\$137,000	\$133,500
Days on Market	14 Days	52 Days
Financing	VA	VA
Total Living Area SF	1,144	1,456
Bedrooms / Full Baths / Half Baths	3 / 2 / 0	3 / 2 / 0
Age / Condition	1962	1950
Basement	Full Basement	Crawl Space \$5,000
HVAC / Mechanical	Central AC / Forced Air	Central AC / Forced Air
Garage	2 Car Attached	2 Car Attached
Lot Size	0.69 Acres	0.58 Acres
Style	Ranch	Ranch
Adjusted Sales Price		\$138,500
% Difference in Prices		-1.09%

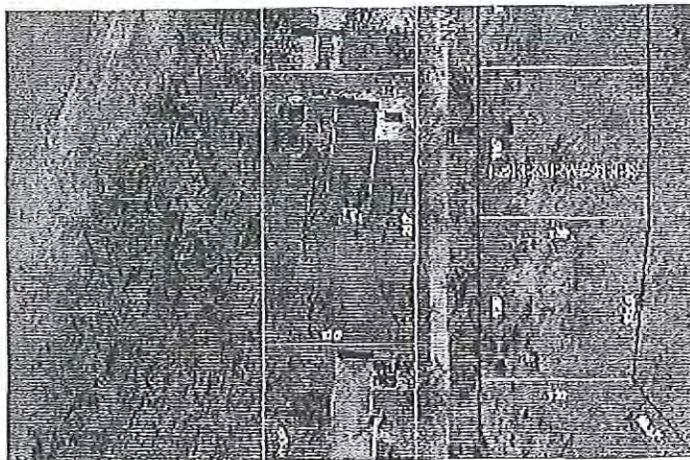
It is noted that the non-abutting sale is slightly larger than the abutting sale, however as they have similar utility being updated ranch style home with three bedrooms, two baths, and two car garage. The only difference is the lack of basement area. We look to the overall sale price of the properties as it includes all attributes of the properties and not purely above grade living area. In terms of percentage between the sale prices of the comparables above, the difference of -1.09% is minimal as they sold within a similar time frame under similar market conditions. A map and aerials of the sales are included below.

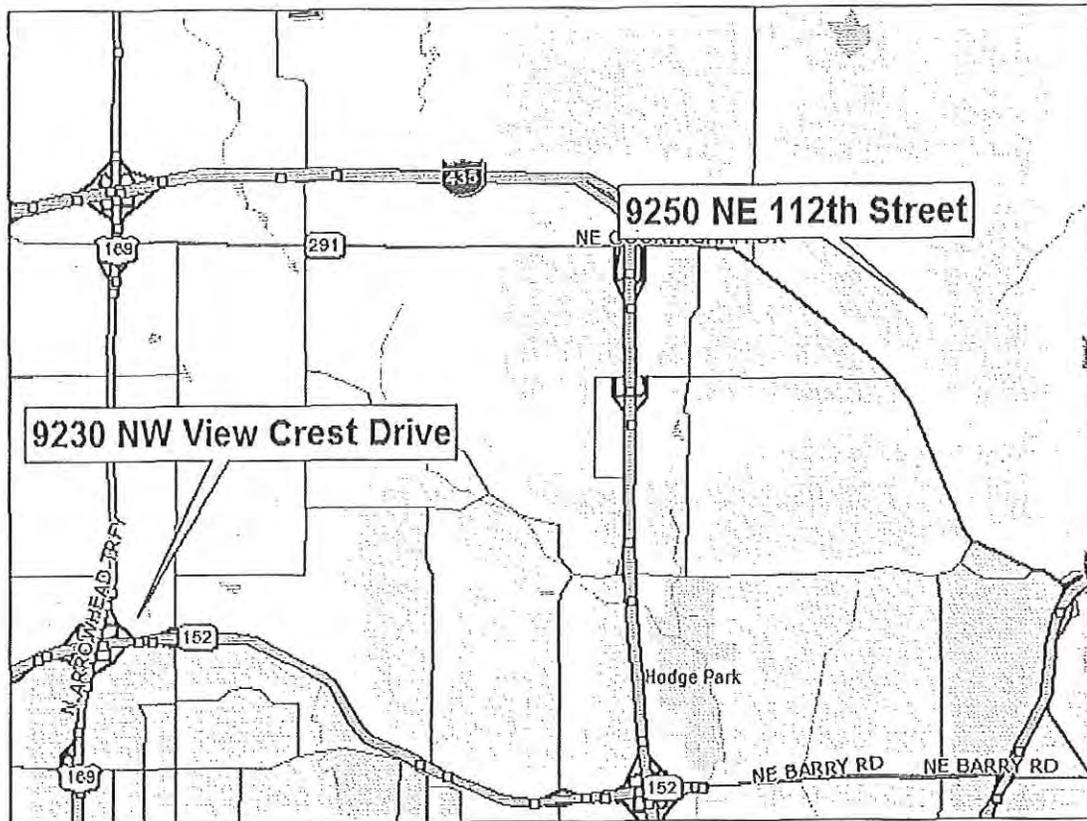
**9250 NE 112<sup>th</sup> Street – Abutting Cell Tower to the north of the subject**





9230 NW View Crest





### Conclusion

From the economic analysis presented in the paired sale case studies there is no indicated significant or measurable impact on the market value of residences as a result of proximity to cell tower sites. From the above analysis we see an overall sale price difference of approximately +2.55% to -2.25% before adjustments and 4.19% to -4.79% after adjustments reflecting the influence of abutting cell towers. The ranges before and after adjustment area are both minimal. This range appears to be typical of the real estate market as the purchase of a residence tends to be a personal and emotional experience and not attributed to outside factors as the abutting cell towers. We use the overall sale price for comparison as it takes all the attributes of the property into account. As for the marketing period for the properties we saw a range of days on market of 10 to 185 days, or approximately two weeks to six months. The time frames of the sales are appropriate for a relatively balanced real estate market. We found no impact on the marketing period for the properties abutting cell tower sites as the longest marketing period was for a property not abutting a cell tower.

## Certification

We certify that, to the best of our knowledge and belief:

1. The statements of fact contained in this report are true and correct.
2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, opinions, and conclusions.
3. We have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved.
4. We have not performed any services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
5. We have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
6. Our engagement in this assignment was not contingent upon developing or reporting predetermined results.
7. Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
8. Our analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice as well as applicable state appraisal regulations.
9. The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute.
10. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
11. Joanna Ripley made a personal inspection of the property that is the subject of this report. Kenneth Jagers, MAI, FRICS, has not personally inspected the subject.
12. No one provided significant real property appraisal assistance to the person(s) signing this certification.
13. We have experience in appraising properties similar to the subject and are in compliance with the Competency Rule of USPAP.



14. As of the date of this report, Kenneth Jagers, MAI, FRICS, has completed the continuing education program for Designated Members of the Appraisal Institute.



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Certified General Real Estate Appraiser  
Missouri Certificate # 2012014696  
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E-mail: jriley@irr.com



Kenneth Jagers, MAI, FRICS  
Senior Managing Director  
Certified General Real Estate Appraiser  
Missouri Certificate # G-969  
Phone: 913-748-4704  
E-mail: kjagers@irr.com

## Assumptions and Limiting Conditions

This appraisal and any other work product related to this engagement are limited by the following standard assumptions, except as otherwise noted in the report:

1. The title is marketable and free and clear of all liens, encumbrances, encroachments, easements and restrictions. The property is under responsible ownership and competent management and is available for its highest and best use.
2. There are no existing judgments or pending or threatened litigation that could affect the value of the property.
3. There are no hidden or undisclosed conditions of the land or of the improvements that would render the property more or less valuable. Furthermore, there is no asbestos in the property.
4. The revenue stamps placed on any deed referenced herein to indicate the sale price are in correct relation to the actual dollar amount of the transaction.
5. The property is in compliance with all applicable building, environmental, zoning, and other federal, state and local laws, regulations and codes.
6. The information furnished by others is believed to be reliable, but no warranty is given for its accuracy.

This appraisal and any other work product related to this engagement are subject to the following limiting conditions, except as otherwise noted in the report:

1. An appraisal is inherently subjective and represents our opinion as to the value of the property appraised.
2. The conclusions stated in our appraisal apply only as of the effective date of the appraisal, and no representation is made as to the effect of subsequent events.
3. No changes in any federal, state or local laws, regulations or codes (including, without limitation, the Internal Revenue Code) are anticipated.
4. No environmental impact studies were either requested or made in conjunction with this appraisal, and we reserve the right to revise or rescind any of the value opinions based upon any subsequent environmental impact studies. If any environmental impact statement is required by law, the appraisal assumes that such statement will be favorable and will be approved by the appropriate regulatory bodies.
5. Unless otherwise agreed to in writing, we are not required to give testimony, respond to any subpoena or attend any court, governmental or other hearing with reference to the property without compensation relative to such additional employment.
6. We have made no survey of the property and assume no responsibility in connection with such matters. Any sketch or survey of the property included in this report is for illustrative purposes only and should not be considered to be scaled accurately for size. The appraisal

- covers the property as described in this report, and the areas and dimensions set forth are assumed to be correct.
7. No opinion is expressed as to the value of subsurface oil, gas or mineral rights, if any, and we have assumed that the property is not subject to surface entry for the exploration or removal of such materials, unless otherwise noted in our appraisal.
  8. We accept no responsibility for considerations requiring expertise in other fields. Such considerations include, but are not limited to, legal descriptions and other legal matters such as legal title, geologic considerations such as soils and seismic stability; and civil, mechanical, electrical, structural and other engineering and environmental matters. Such considerations may also include determinations of compliance with zoning and other federal, state, and local laws, regulations and codes.
  9. The distribution of the total valuation in the report between land and improvements applies only under the reported highest and best use of the property. The allocations of value for land and improvements must not be used in conjunction with any other appraisal and are invalid if so used. The appraisal report shall be considered only in its entirety. No part of the appraisal report shall be utilized separately or out of context.
  10. Neither all nor any part of the contents of this report (especially any conclusions as to value, the identity of the appraisers, or any reference to the Appraisal Institute) shall be disseminated through advertising media, public relations media, news media or any other means of communication (including without limitation prospectuses, private offering memoranda and other offering material provided to prospective investors) without the prior written consent of the persons signing the report.
  11. Information, estimates and opinions contained in the report and obtained from third-party sources are assumed to be reliable and have not been independently verified.
  12. Any income and expense estimates contained in the appraisal report are used only for the purpose of estimating value and do not constitute predictions of future operating results.
  13. If the property is subject to one or more leases, any estimate of residual value contained in the appraisal may be particularly affected by significant changes in the condition of the economy, of the real estate industry, or of the appraised property at the time these leases expire or otherwise terminate.
  14. Unless otherwise stated in the report, no consideration has been given to personal property located on the premises or to the cost of moving or relocating such personal property; only the real property has been considered.
  15. The current purchasing power of the dollar is the basis for the values stated in the appraisal; we have assumed that no extreme fluctuations in economic cycles will occur.
  16. The values found herein is subject to these and to any other assumptions or conditions set forth in the body of this report but which may have been omitted from this list of Assumptions and Limiting Conditions.
  17. The analyses contained in the report necessarily incorporate numerous estimates and assumptions regarding property performance, general and local business and economic

conditions, the absence of material changes in the competitive environment and other matters. Some estimates or assumptions, however, inevitably will not materialize, and unanticipated events and circumstances may occur; therefore, actual results achieved during the period covered by our analysis will vary from our estimates, and the variations may be material.

18. The Americans with Disabilities Act (ADA) became effective January 26, 1992. We have not made a specific survey or analysis of the property to determine whether the physical aspects of the improvements meet the ADA accessibility guidelines. We claim no expertise in ADA issues, and render no opinion regarding compliance of the subject with ADA regulations. Inasmuch as compliance matches each owner's financial ability with the cost to cure the non-conforming physical characteristics of a property, a specific study of both the owner's financial ability and the cost to cure any deficiencies would be needed for the Department of Justice to determine compliance.
19. The appraisal report is prepared for the exclusive benefit of the Client, its subsidiaries and/or affiliates. It may not be used or relied upon by any other party. All parties who use or rely upon any information in the report without our written consent do so at their own risk.
20. No studies have been provided to us indicating the presence or absence of hazardous materials on the subject property or in the improvements, and our valuation is predicated upon the assumption that the subject property is free and clear of any environmental hazards including, without limitation, hazardous wastes, toxic substances and mold. No representations or warranties are made regarding the environmental condition of the subject property. Integra Realty Resources – Kansas City, Integra Realty Resources, Inc., Integra Strategic Ventures, Inc. and/or any of their respective officers, owners, managers, directors, agents, subcontractors or employees (the "Integra Parties"), shall not be responsible for any such environmental conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because we are not experts in the field of environmental conditions, the appraisal report cannot be considered as an environmental assessment of the subject property.
21. The persons signing the report may have reviewed available flood maps and may have noted in the appraisal report whether the subject property is located in an identified Special Flood Hazard Area. We are not qualified to detect such areas and therefore do not guarantee such determinations. The presence of flood plain areas and/or wetlands may affect the value of the property, and the value conclusion is predicated on the assumption that wetlands are non-existent or minimal.
22. Integra Realty Resources – Kansas City is not a building or environmental inspector. Integra Kansas City does not guarantee that the subject property is free of defects or environmental problems. Mold may be present in the subject property and a professional inspection is recommended.
23. The appraisal report and value conclusions for an appraisal assume the satisfactory completion of construction, repairs or alterations in a workmanlike manner.
24. It is expressly acknowledged that in any action which may be brought against any of the Integra Parties, arising out of, relating to, or in any way pertaining to this engagement, the

appraisal reports, and/or any other related work product, the Integra Parties shall not be responsible or liable for any incidental or consequential damages or losses, unless the appraisal was fraudulent or prepared with intentional misconduct. It is further acknowledged that the collective liability of the Integra Parties in any such action shall not exceed the fees paid for the preparation of the appraisal report unless the appraisal was fraudulent or prepared with intentional misconduct. Finally, it is acknowledged that the fees charged herein are in reliance upon the foregoing limitations of liability.

25. Integra Realty Resources – Kansas City, an independently owned and operated company, has prepared the appraisal for the specific intended use stated elsewhere in the report. The use of the appraisal report by anyone other than the Client is prohibited except as otherwise provided. Accordingly, the appraisal report is addressed to and shall be solely for the Client's use and benefit unless we provide our prior written consent. We expressly reserve the unrestricted right to withhold our consent to your disclosure of the appraisal report or any other work product related to the engagement (or any part thereof including, without limitation, conclusions of value and our identity), to any third parties. Stated again for clarification, unless our prior written consent is obtained, no third party may rely on the appraisal report (even if their reliance was foreseeable).
26. The conclusions of this report are estimates based on known current trends and reasonably foreseeable future occurrences. These estimates are based partly on property information, data obtained in public records, interviews, existing trends, buyer-seller decision criteria in the current market, and research conducted by third parties, and such data are not always completely reliable. The Integra Parties are not responsible for these and other future occurrences that could not have reasonably been foreseen on the effective date of this assignment. Furthermore, it is inevitable that some assumptions will not materialize and that unanticipated events may occur that will likely affect actual performance. While we are of the opinion that our findings are reasonable based on current market conditions, we do not represent that these estimates will actually be achieved, as they are subject to considerable risk and uncertainty. Moreover, we assume competent and effective management and marketing for the duration of the projected holding period of this property.

Addenda

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Addenda



## Joanna Ripley

### Experience

Joanna M. Ripley joined Integra Realty Resources in July of 2008. She has experience in the valuation analysis of various types of residential and commercial real estate including vacant land, industrial, multi-family, retail, and mixed use properties. She is also experienced in eminent domain valuation, having worked for the City of Lenexa, Kansas, and City of Lee's Summit, Missouri. Valuation assignments have been prepared on partially completed, renovated and existing structures. These assignments have been performed on behalf of institutional investors and lenders, commercial banks, and other clients.

### Licenses

Iowa, Certified General Real Property Appraiser, CG03199, Expires June 2015  
Kansas, Certified General Real Property Appraiser, G-2869, Expires June 2015  
Missouri, State Certified General Real Estate Appraiser, 2012014696, Expires June 2016

### Education

Iowa State University  
• B.S. in Housing and the Near Environment, May 1997

Relevant coursework completed: Statistics, Community Regional Planning, Business Law, Housing Finance, and Economics.

Ms. Ripley has successfully completed the following industry courses:

- Appraisal Principles
- Appraisal Procedures
- National Uniform Standards of Professional Appraisal Practice (USPAP)
- Market Analysis and Highest and Best Use
- Real Estate Appraisal Methods
- Principles of Capitalization
- Residential Valuation of High End Properties

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*State of Missouri*

*Department of Insurance, Financial Institutions and Professional Registration  
Division of Professional Registration  
Real Estate Appraisers Commission*  
**State Certified General Real Estate Appraiser**

VALID THROUGH JUNE 30, 2016  
ORIGINAL CERTIFICATE/LICENSE NO. 2012014696

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RAYMORE MO 64083  
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*Vanessa Beauchamps*  
EXECUTIVE DIRECTOR

*Janet A. Parker*  
DIVISION DIRECTOR

# Kenneth Jagers, MAI, FRICS

## Experience

Mr. Jagers, Senior Managing Director, has been with Integra Realty Resources – Kansas City, since May 1993. He started his career in commercial real estate in 1987 as an Investment officer with a subsidiary of Metropolitan Life in Overland Park, Kansas then in the Washington D.C., and Boston, Massachusetts's offices. In 1991, Mr. Jagers joined BankBoston and supervised field and review appraiser for two years. Duties included quality control over acquired banks in Maine and Vermont.

Since that time and while at Integra he has completed appraisals on commercial properties of all types, primarily for institutional investors and for litigation. Unique properties include the 1,140,000 SF IRS Processing Facility and the 600,000 SF Overland Park Trade Center exhibition hall. He has appraised the Corporate Woods Business Park in Overland Park, Kansas, which is the largest single investor owned real estate asset in the Kansas City area. It has 21 buildings totaling 2.2 million SF of Class A and Class B office space. He also has appraised the former headquarters of H&R Block, the Sanofi-Aventis Pharmaceuticals office and manufacturing facility (>500,000 SF), the Town Pavilion office tower (>900,000 SF), and finally, Branson Landing – a destination mixed-use project with over 400,000 SF of lifestyle retail, marina, boutique hotel, and 170 condominium units.

Mr. Jagers also serves as Director for our St. Louis office. Significant appraisal assignments include the Bank of America Plaza office tower – 30 stories with >850,000 SF; One AT&T Center office tower – 42 stories with nearly 1.5 million SF; Blu City Spaces, a 13-story 144-unit high rise condominium; and Gateway Tower office highrise.

Portfolios managed include >800 office and retail properties for an investment bank, 34 apartment properties for a pension advisor, 19 office and flex industrial properties for a pension advisor, as well as numerous multiple property projects for eminent domain.

Mr. Jagers is a director of IRR's Hospitality Specialty Practice Group. A recent assignment in this capacity was the Lodge of Four Seasons at Lake Ozark, MO with over 300 rooms, 146 proposed Condotel units, marina, and two golf courses. He also serves as Director of our Chicago office.

## Professional Activities & Affiliations

Westwood City Planning Commission

Lecturer: UMKC Block School Lewis White Real Estate Center 2008-2010

Lecturer: Blue Springs EDC - Market Trends 2006-2014

Lecturer: Real Estate Trends and Investment Criteria Annual Economic Forecasting Seminar 2003-2010

Appraisal Institute, Member (MAI) President - Kansas City Chapter Appraisal Institute 2010

Royal Institute of Chartered Surveyors, Fellow (FRICS) Fellow of the Royal Institution of Chartered Surveyors

## Licenses

Arkansas, Certified General Real Estate Appraiser, CG 3889, Expires June 2015

Illinois, Certified General Real Estate Appraiser, 553.002180, Expires September 2015

Kansas, Certified General Real Property Appraiser, G-969, Expires June 2015

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## Kenneth Jagers, MAI, FRICS

### Licenses (Cont'd)

Missouri, Certified General Real Estate Appraiser, RA 003190, Expires June 2016  
Nebraska, Certified General Real Estate Appraiser, CG970204, Expires December 2016

### Education

Bachelor of Arts (1983) Chadron State College, Chadron, Nebraska  
Economics and Marketing, Minor In Business Administration

Mr. Jagers has successfully completed numerous Appraisal Institute courses and attended seminars in keeping current, the educational and professional work product requirements of the Appraisal Institute and states in which he is licensed.

Completed 3rd Party Multifamily Accelerated Processing (MAP), September 18, 2002.  
IRR Certified Reviewer Seminar

### Qualified Before Courts & Administrative Bodies

Circuit Court of Jackson County, Missouri  
Kansas District Court, 7th Judicial District  
State Tax Commission of Missouri

#### Litigation experience:

Mr. Jagers has performed appraisal services and/or provided expert trial or deposition testimony in many legal proceedings, including the following: State of Kansas vs. Westgate, LC 04 C 214, State of Kansas v. Domino LC, and Northland LC, WD1 of Johnson County v. Highlands Group, Debra L. Miller v. Aida Oil Company et al, Moore v. United States No. 93-134 L, Illig v. United States 98-934L, City of Lenexa v. RREEF American REIT II Corp., VVV et al, Colliers v. City of Oak Grove, MO 03CV223403, Gailloyd Enterprises v. Centertainment 98-CV-5115.

#### Experience with Municipalities/Administrative Bodies:

Mr. Jagers has provided expert testimony to a number of taxing authorities, city councils, boards of planning and zoning, commissioners' hearings, and bodies providing public finance. His expertise is sought by the administrative bodies and by the private developers.

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State of Missouri

Department of Insurance, Financial Institutions and Professional Registration  
Division of Professional Registration  
Real Estate Appraisers Commission  
State Certified General Real Estate Appraiser

VALID THROUGH JUNE 30, 2018  
ORIGINAL CERTIFICATE/LICENSE NO. RA003190

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EXECUTIVE DIRECTOR

*Janet A. Parker*

DIVISION DIRECTOR

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KHRC  
LCRA  
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Welsenfels  
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Wyrsh, Hobbs & Miraklan, PC

May 26, 2012

# Integra Realty Resources, Inc.

## Corporate Profile

Integra Realty Resources, Inc. offers the most comprehensive property valuation and counseling coverage in the United States with 62 independently owned and operated offices in 34 states and the Caribbean. Integra was created for the purpose of combining the intimate knowledge of well-established local firms with the powerful resources and capabilities of a national company. Integra offers integrated technology, national data and information systems, as well as standardized valuation models and report formats for ease of client review and analysis. Integra's local offices have an average of 25 years of service in the local market, and all but one are headed by a Senior Managing Director who is an MAI member of the Appraisal Institute.

A listing of IRR's local offices and their Senior Managing Directors follows:

ATLANTA, GA - Sherry L. Watkins, MAI, FRICS  
AUSTIN, TX - Randy A. Williams, MAI, SR/WA, FRICS  
BALTIMORE, MD - G. Edward Kerr, MAI, MRICS  
BIRMINGHAM, AL - Rusty Rich, MAI, MRICS  
BOISE, ID - Bradford T. Knipe, MAI, ARA, CCIM, CRE, FRICS  
BOSTON, MA - David L. Cary, Jr., MAI, MRICS  
CHARLESTON, SC - Cleveland "Bud" Wright, Jr., MAI  
CHARLOTTE, NC - Fitzhugh L. Stout, MAI, CRE, FRICS  
CHICAGO, IL - Eric L. Enloe, MAI, FRICS  
CINCINNATI, OH - Gary S. Wright, MAI, FRICS, SRA  
CLEVELAND, OH - Douglas P. Sloan, MAI  
COLUMBIA, SC - Michael B. Dodds, MAI, CCIM  
COLUMBUS, OH - Bruce A. Daubner, MAI, FRICS  
DALLAS, TX - Mark R. Lamb, MAI, CPA, FRICS  
DAYTON, OH - Gary S. Wright, MAI, FRICS, SRA  
DENVER, CO - Brad A. Welman, MAI, FRICS  
DETROIT, MI - Anthony Sanna, MAI, CRE, FRICS  
FORT WORTH, TX - Gregory B. Cook, SR/WA  
GREENSBORO, NC - Nancy Tritt, MAI, SRA, FRICS  
GREENVILLE, SC - Michael B. Dodds, MAI, CCIM  
HARTFORD, CT - Mark F. Bates, MAI, CRE, FRICS  
HOUSTON, TX - David R. Dominy, MAI, CRE, FRICS  
INDIANAPOLIS, IN - Michael C. Lady, MAI, SRA, CCIM, FRICS  
JACKSON, MS - J. Walter Allen, MAI, FRICS  
JACKSONVILLE, FL - Robert Crenshaw, MAI, FRICS  
KANSAS CITY, MO/KS - Kenneth Jagers, MAI, FRICS  
LAS VEGAS, NV - Charles E. Jack IV, MAI  
LOS ANGELES, CA - John G. Ellis, MAI, CRE, FRICS  
LOS ANGELES, CA - Matthew J. Swanson, MAI  
LOUISVILLE, KY - Stacey Nicholas, MAI, MRICS  
MEMPHIS, TN - J. Walter Allen, MAI, FRICS  
MIAMI/PALM BEACH, FL - Scott M. Powell, MAI, FRICS

MIAMI/PALM BEACH, FL - Anthony M. Graziano, MAI, CRE, FRICS  
MINNEAPOLIS, MN - Michael F. Amundson, MAI, CCIM, FRICS  
NAPLES, FL - Carlton J. Lloyd, MAI, FRICS  
NASHVILLE, TN - R. Paul Perutelli, MAI, SRA, FRICS  
NEW JERSEY COASTAL - Halvor J. Egeland, MAI  
NEW JERSEY NORTHERN - Barry J. Krauser, MAI, CRE, FRICS  
NEW YORK, NY - Raymond T. Cirz, MAI, CRE, FRICS  
ORANGE COUNTY, CA - Larry D. Webb, MAI, FRICS  
ORLANDO, FL - Christopher Storkey, MAI, MRICS  
PHILADELPHIA, PA - Joseph D. Pasquarello, MAI, CRE, FRICS  
PHOENIX, AZ - Walter 'Tres' Winius III, MAI, FRICS  
PITTSBURGH, PA - Paul D. Griffith, MAI, CRE, FRICS  
PORTLAND, OR - Brian A. Glanville, MAI, CRE, FRICS  
PROVIDENCE, RI - Gerard H. McDonough, MAI, FRICS  
RALEIGH, NC - Chris R. Morris, MAI, FRICS  
RICHMOND, VA - Kenneth L. Brown, MAI, CCIM, FRICS  
SACRAMENTO, CA - Scott Beebe, MAI, FRICS  
ST. LOUIS, MO - P. Ryan McDonald, MAI, FRICS  
SALT LAKE CITY, UT - Darrin W. Liddell, MAI, CCIM, FRICS  
SAN ANTONIO, TX - Martyn C. Glen, MAI, CRE, FRICS  
SAN DIEGO, CA - Jeff A. Greenwald, MAI, SRA, FRICS  
SAN FRANCISCO, CA - Jan Kleczewski, MAI, FRICS  
SARASOTA, FL - Carlton J. Lloyd, MAI, FRICS  
SAVANNAH, GA - J. Carl Schultz, Jr., MAI, FRICS, CRE, SRA  
SEATTLE, WA - Allen N. Safer, MAI, MRICS  
SYRACUSE, NY - William J. Kimball, MAI, FRICS  
TAMPA, FL - Bradford L. Johnson, MAI, MRICS  
TULSA, OK - Robert E. Gray, MAI, FRICS  
WASHINGTON, DC - Patrick C. Kerr, MAI, SRA, FRICS  
WILMINGTON, DE - Douglas L. Nickel, MAI, FRICS  
CARIBBEAN/CAYMAN ISLANDS - James Andrews, MAI, FRICS

### Corporate Office

1133 Avenue of the Americas, 27th Floor, New York, New York 10036  
Telephone: (212) 255-7858; Fax: (646) 424-1869; E-mail [info@irr.com](mailto:info@irr.com)  
Website: [www.irr.com](http://www.irr.com)



Addenda

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### Comparison of Report Formats

Reporting Options in 2014-2015 Edition of USPAP	Integra Reporting Formats Effective January 1, 2014	Corresponding Reporting Options in 2012-2013 Edition of USPAP
Appraisal Report	Appraisal Report – Comprehensive Format	Self-Contained Appraisal Report
	Appraisal Report – Standard Format	Summary Appraisal Report
	Appraisal Report – Concise Summary Format	Minimum Requirements of Summary Appraisal Report
Restricted Appraisal Report	Restricted Appraisal Report	Restricted Use Appraisal Report



### **USPAP Reporting Options**

The 2014-2015 edition of USPAP requires that all written appraisal reports be prepared under one of the following options: Appraisal Report or Restricted Appraisal Report.

An Appraisal Report summarizes the information analyzed, the appraisal methods employed, and the reasoning that supports the analyses, opinions, and conclusions. The requirements for an Appraisal Report are set forth in Standards Rule 2-2 (a) of USPAP.

A Restricted Appraisal Report states the appraisal methods employed and the conclusions reached but is not required to include the data and reasoning that supports the analyses, opinions, and conclusions. Because the supporting information may not be included, the use of the report is restricted to the client, and further, the appraiser must maintain a work file that contains sufficient information for the appraiser to produce an Appraisal Report if required. The requirements for a Restricted Appraisal Report are set forth in Standards Rule 2-2 (b).

### **Integra Reporting Formats under the Appraisal Report Option**

USPAP gives appraisers the flexibility to vary the level of information in an Appraisal Report depending on the intended use and intended users of the appraisal. Accordingly, Integra Realty Resources has established internal standards for three alternative reporting formats that differ in depth and detail yet comply with the USPAP requirements for an Appraisal Report. The three Integra formats are:

- Appraisal Report – Comprehensive Format
- Appraisal Report – Standard Format
- Appraisal Report – Concise Summary Format

An Appraisal Report – Comprehensive Format has the greatest depth and detail of the three report types. It describes and explains the information analyzed, the appraisal methods employed, and the reasoning that supports the analyses, opinions, and conclusions. This format meets or exceeds the former Self-Contained Appraisal Report requirements that were contained in the 2012-2013 edition of USPAP.

An Appraisal Report – Standard Format has a moderate level of detail. It summarizes the information analyzed, the appraisal methods employed, and the reasoning that supports the analyses, opinions, and conclusions. This format meets or exceeds the former Summary Appraisal Report requirements that were contained in the 2012-2013 edition of USPAP.

An Appraisal Report - Concise Summary Format has less depth and detail than the Appraisal Report – Standard Format. It briefly summarizes the data, reasoning, and analyses used in the appraisal process while additional supporting documentation is retained in the work file. This format meets the minimum requirements of the former Summary Appraisal Report that were contained in the 2012-2013 edition of USPAP.

On occasion, clients will request, and Integra will agree to provide, a report that is labelled a Self-Contained Appraisal Report. Other than the label, there is no difference between a Self-Contained Appraisal Report and an Appraisal Report - Comprehensive Format. Both types of reports meet or

## Addenda

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exceed the former Self-Contained Appraisal Report requirements set forth in the 2012-2013 edition of USPAP.

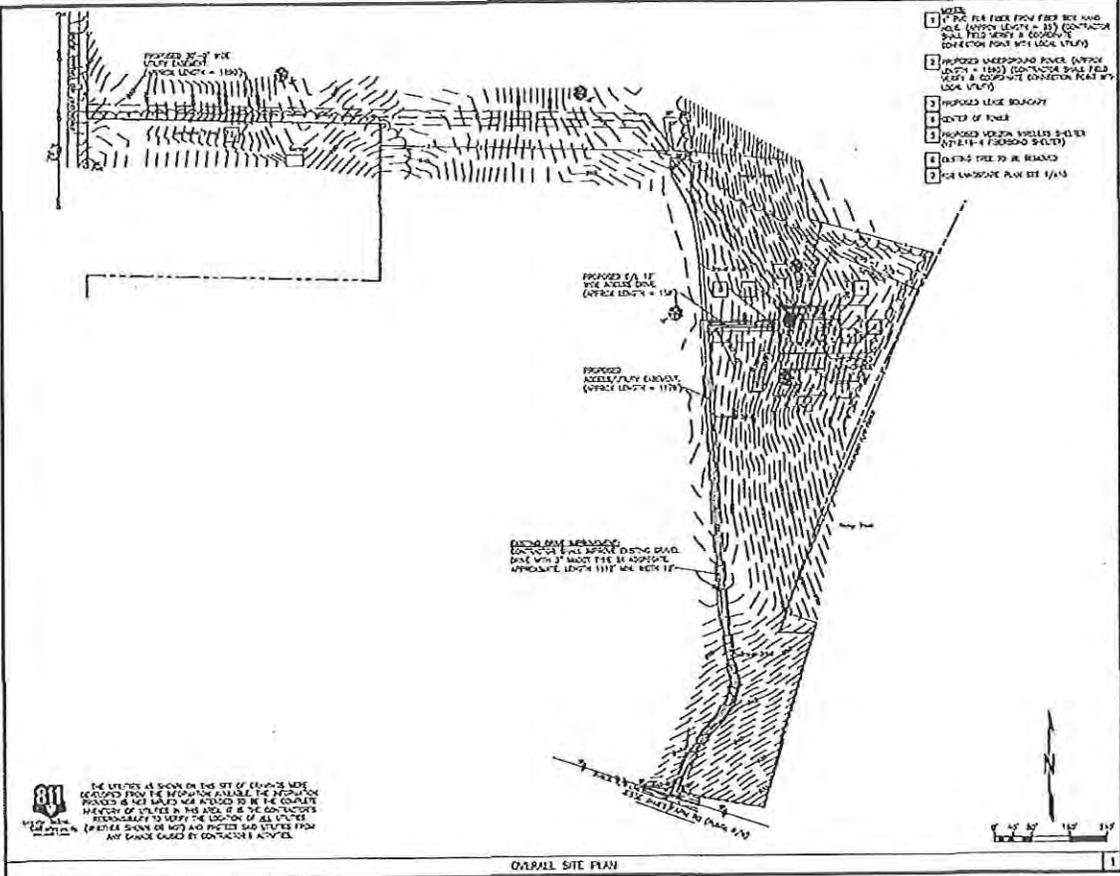
### **Integra Reporting Format under Restricted Appraisal Report Option**

Integra provides a Restricted Appraisal Report format under the USPAP Restricted Appraisal Report option. This format meets the requirements of the former Restricted Use Appraisal Report that were contained in the 2012-2013 edition of USPAP.









1. NOTES FOR FIELD FROM FIELD BOOK AND SOIL (OFFICE LENGTH = 35) (CONTRACTOR SHALL FIELD VERIFY & CORRECT) (CONTRACTOR SHALL VERIFY LOCAL UTILITY)
2. PROPOSED WEEPDOWN ROVER (OFFICE LENGTH = 1160) (CONTRACTOR SHALL FIELD VERIFY & CORRECTIVE CONNECTION PLAN BY LOCAL UTILITY)
3. PROPOSED LEASE BOUNDARY
4. CENTER OF ROAD
5. PROPOSED METEORIC METEOR SHEDDER (OFFICE LENGTH = 1160) (CONTRACTOR SHALL FIELD VERIFY & CORRECTIVE CONNECTION PLAN BY LOCAL UTILITY)
6. EXISTING TREE TO BE REMOVED
7. FOR LANDSCAPE PLAN SEE 1/11/13

THE UTILITIES SHOWN ON THIS SET OF DRAWINGS WERE OBTAINED FROM THE INFORMATION AVAILABLE. THE PRESENCE OR ABSENCE OF UTILITIES IN THIS AREA IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF ALL UTILITIES (PUBIC OR PRIVATE) AND PROTECT THEM FROM ANY DAMAGE CAUSED BY CONTRACTOR'S ACTIVITIES.

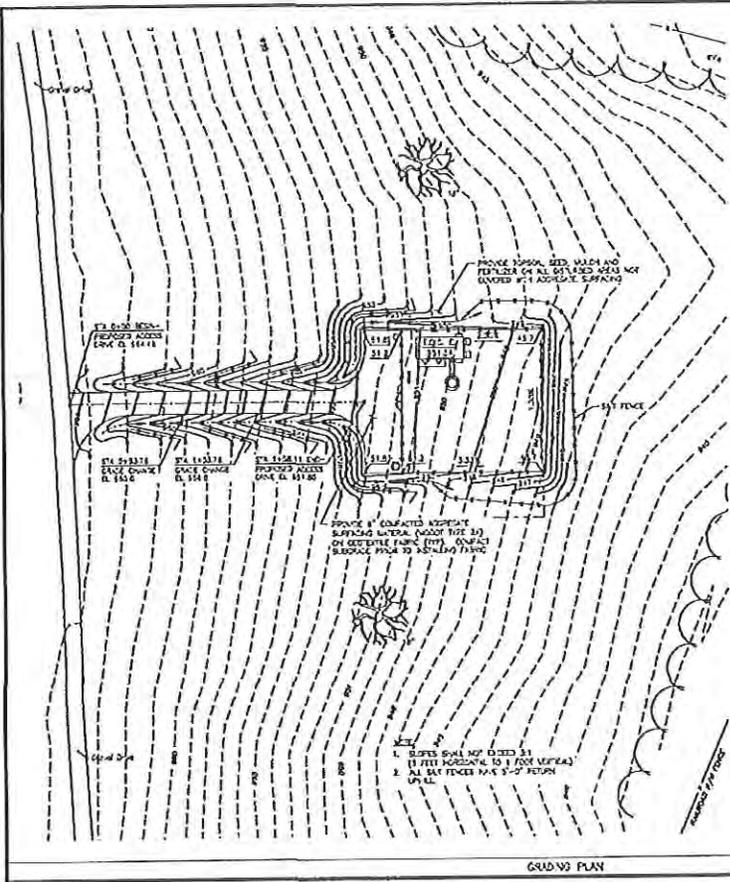
OVERALL SITE PLAN

<p>16411 ENDICOTT ROAD KEARNEY, MISSOURI 65203</p>	
<p>274079</p>	
<p>16411 ENDICOTT ROAD KEARNEY, MISSOURI 65203</p>	
<p>OVERALL SITE PLAN</p>	
<p>DATE</p>	<p>1/11/13</p>
<p>SCALE</p>	<p>A01</p>







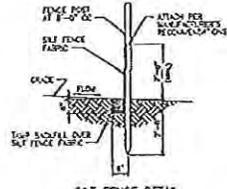
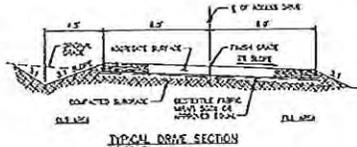


**GRADING NOTES:**

1. STRIP THE GROUND OF ALL VEGETATION AND DEBRIS.
2. PROOF ROLL WITH LOADED TRUCKS TO CERTIFY SAT FENCE.
3. REMOVE SOFT SPOT WATER AND CONTACT TO 511 AT STRUCTURE, SEE ELEVATION.
4. INSTALL GEOTEXTILE FABRIC ON PREPARED SURFACE.
5. PAUSE AND COMPACT BY APPROPRIATE SURFACING.
6. SEE SPECIFICATIONS DRAWINGS FOR REQUIREMENTS OF BATTLE WATER.
7. MAINTAIN REASONABLE DUST CONTROL VEHICLES DURING CONSTRUCTION.
8. EXPOSE DRIVE LENGTH SHALL BE POSITIVE GRADING DURING AND AT COMPLETION OF CONSTRUCTION.
9. CONTRACTOR SHALL OBTAIN ALL SITE SPECIFIC SCALE DRAWINGS AND FOLLOW ALL REQUIREMENTS FOR A DISTANCE BETWEEN EXISTING DRIVE AND SAT FENCE. THE DISTANCE FROM DRIVE SHALL BE 50 FEET TO 100 FEET OF DISTANCE.

**SATURATION NOTES:**

1. SATURATION DETAIL DEVICES TO BE IN PLACE UNTIL ADEQUATE VEGETATION GROWTH INDICATES NO FURTHER DRAINAGE.
2. SATURATION FENCE SHALL BE INSPECTED PERIODICALLY FOR DAMAGE AND FOR THE AMOUNT OF SEEDING WHICH HAS ACCUMULATED. REMOVE OF SEEDING WILL BE REQUIRED WHEN IT REACHES 1/2 FENCE HEIGHT.
3. ADJUSTMENT OF GEOTEXTILE FABRIC TO BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. SAT FENCING TO BE USED AT ALL ANGLES OF ELEVATION.



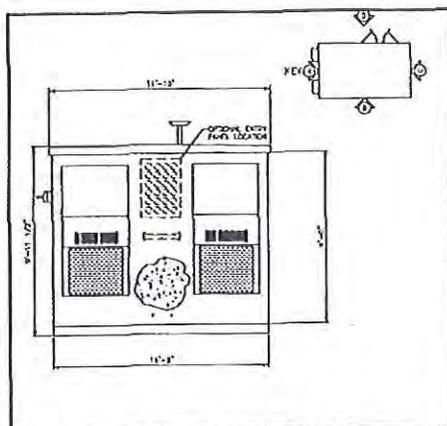
<p>ENGINEERING FENCE</p> <p>1000 S. 10th St. Suite 100 Tulsa, OK 74106 Tel: 918.438.1234</p>	
<p>PROJECT NO. 274079</p>	
<p>CLIENT: ECVC CAMERON ROAD</p>	
<p>DATE: 08/20/2024</p>	
<p>PROJECT LOCATION: 16433 ENTACOTT ROAD, REARNEY, OKLAHOMA 73069</p>	
<p>PROJECT TYPE: GRADING PLAN</p>	
<p>SCALE: 1\"/&gt; </p>	

GRADING PLAN

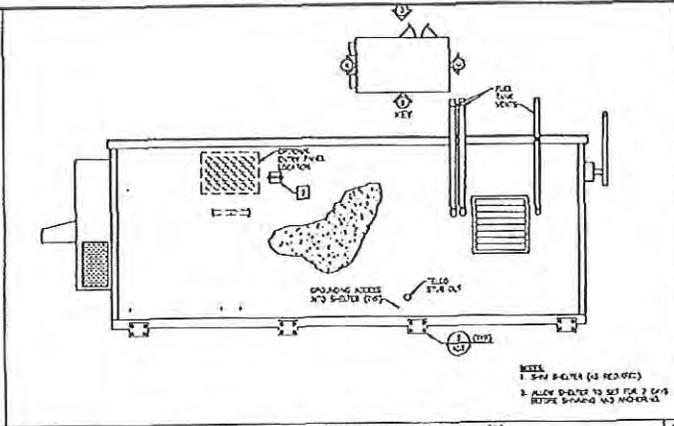
A04



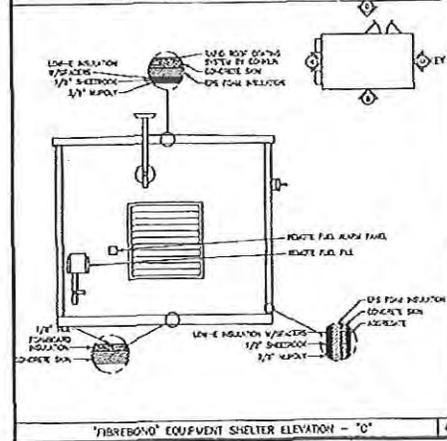




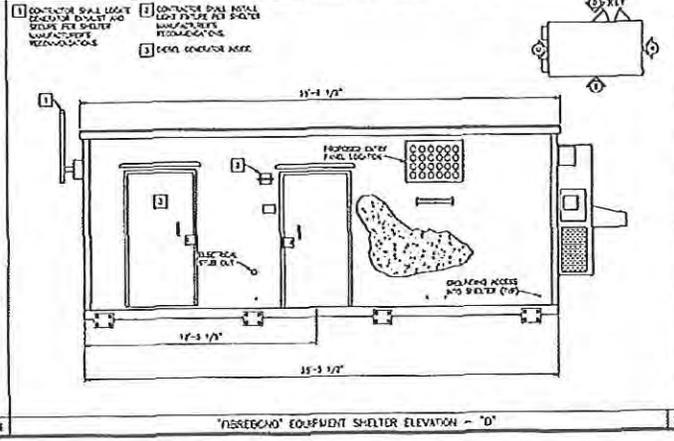
'FIBREBOX' EQUIPMENT SHELTER ELEVATION - "A"



'FIBREBOX' EQUIPMENT SHELTER ELEVATIONS - "B"



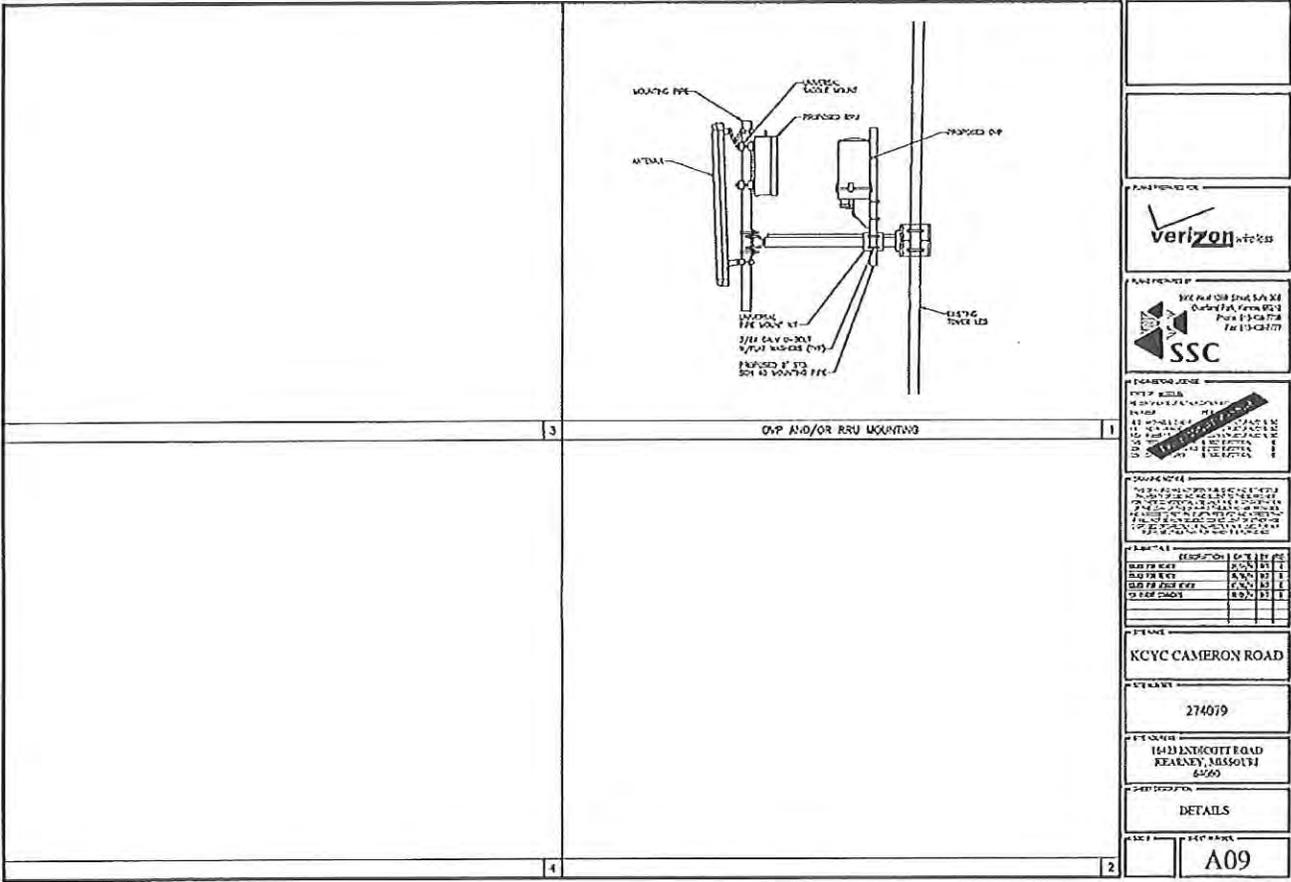
'FIBREBOX' EQUIPMENT SHELTER ELEVATION - "C"



'FIBREBOX' EQUIPMENT SHELTER ELEVATION - "D"

VERIZON  
 SSS  
 PROJECT NO. 10423 ENSCOTT ROAD  
 KEARNEY, MISSOURI 64506  
 SHEET NO. A07





3

OMP AND/OR RSU MOUNTING



REVISIONS

NO.	DESCRIPTION	DATE	BY	APP.
1	ISSUED FOR CONSTRUCTION	10/15/11	...	...
2	...	...	...	...
3	...	...	...	...
4	...	...	...	...

REVISIONS

NO.	DESCRIPTION	DATE	BY	APP.
1	ISSUED FOR CONSTRUCTION	10/15/11	...	...
2	...	...	...	...
3	...	...	...	...
4	...	...	...	...

PROJECT NAME

KCYC CAMERON ROAD

PROJECT NO.

274079

PROJECT ADDRESS

1412 HASTINGS ROAD  
KEARNEY, MISSOURI  
65660

PROJECT DESCRIPTION

DETAILS

SCALE

DATE

A09

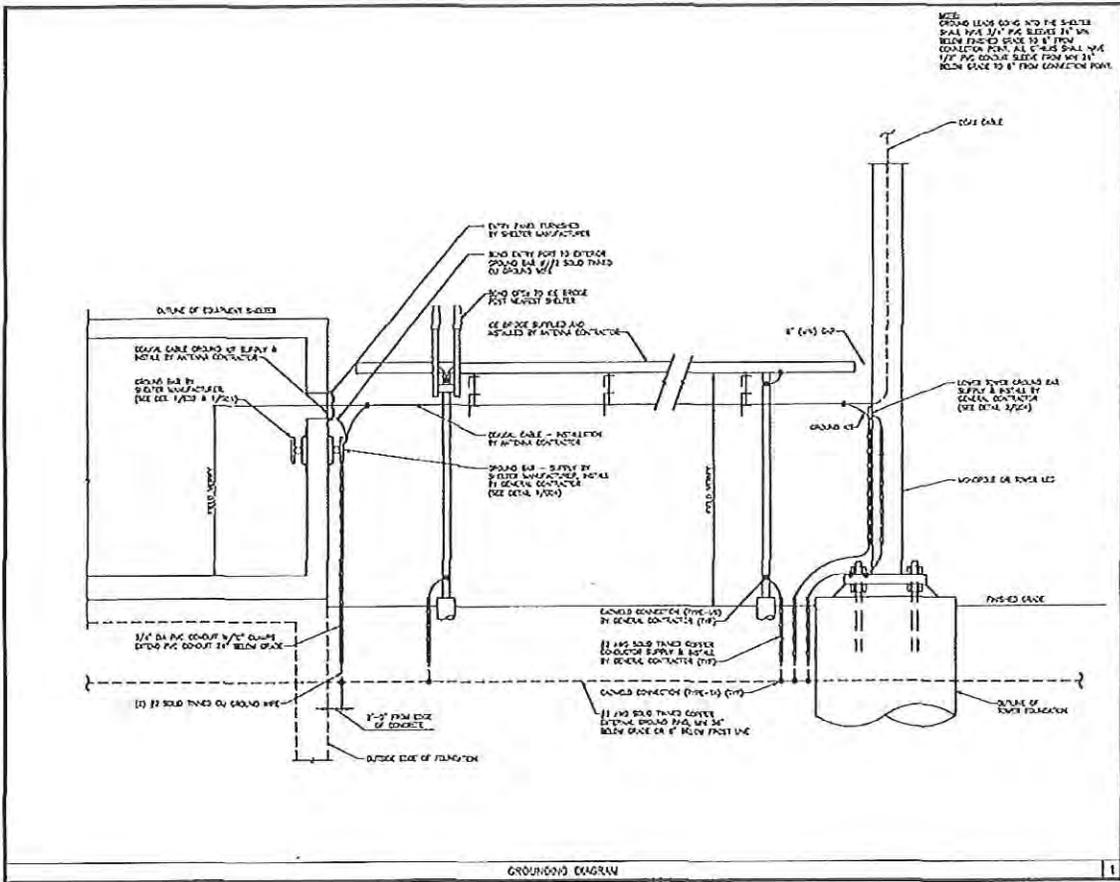












VERIZON WIRELESS

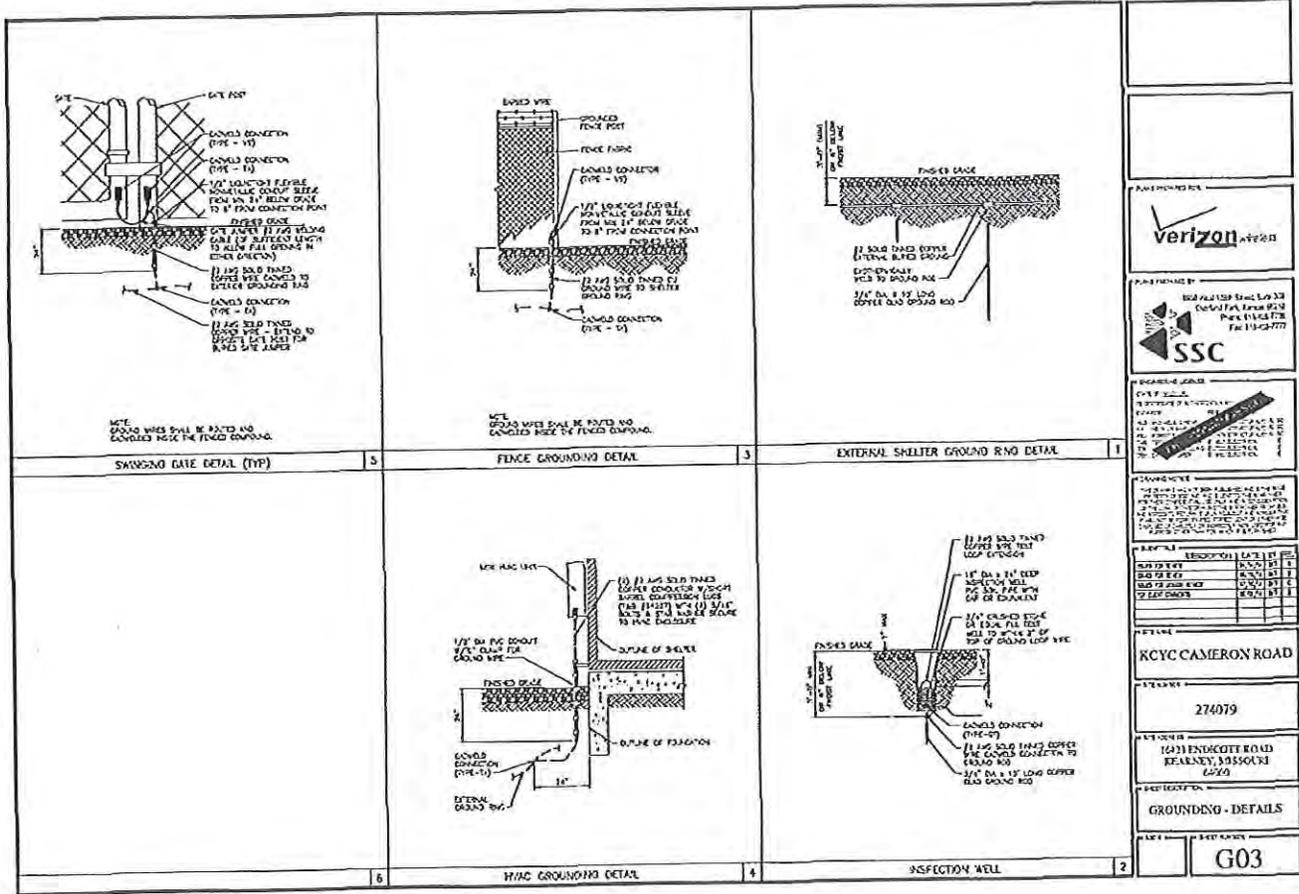
SSC

PROVIDING SERVICE

16433 ENLACUTY ROAD  
 KEARNEY, MISSOURI  
 64550

GROUNDING - DETAILS

G02



APPROVED BY:

APPROVED BY:

100 W. US 90, Suite 100  
 Oakdale, CA 95361  
 Phone: (916) 838-7777  
 Fax: (916) 838-7777

REVISIONS:

NO.	DESCRIPTION	DATE	BY	CHKD
1	ISSUED FOR CONSTRUCTION	08/20/13	SSC	SSC
2	REVISION	08/20/13	SSC	SSC
3	REVISION	08/20/13	SSC	SSC
4	REVISION	08/20/13	SSC	SSC
5	REVISION	08/20/13	SSC	SSC

PROJECT:

KCYC CAMERON ROAD

ADDRESS:

274079

CLIENT:

10433 ENDICOTT ROAD  
 KEENEY, MASSACHUSETTS  
 01503

PROJECT NO.:

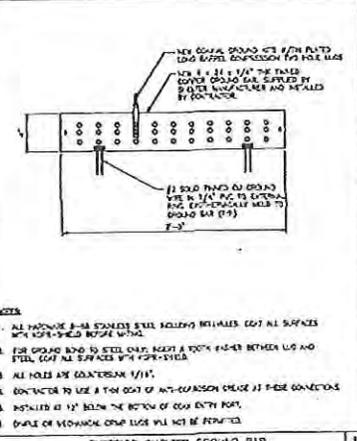
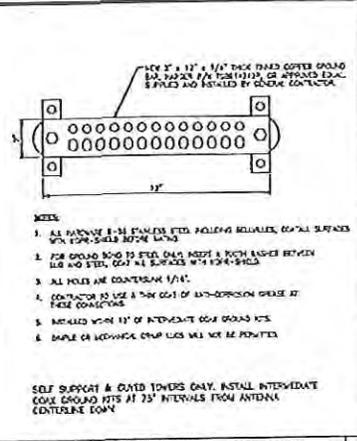
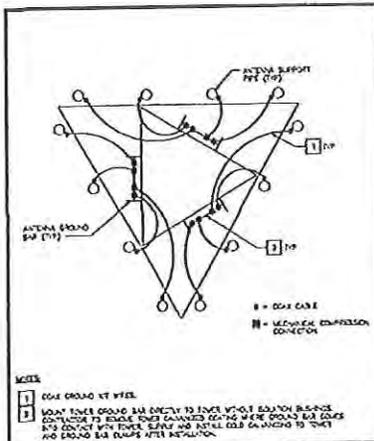
GROUNDING - DETAILS

DATE:

08/20/13

SCALE:

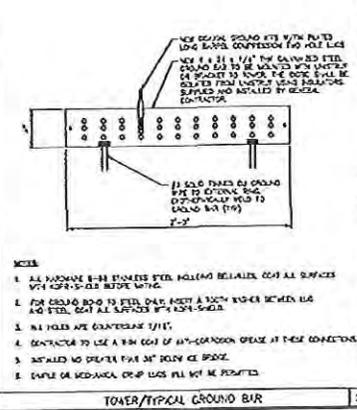
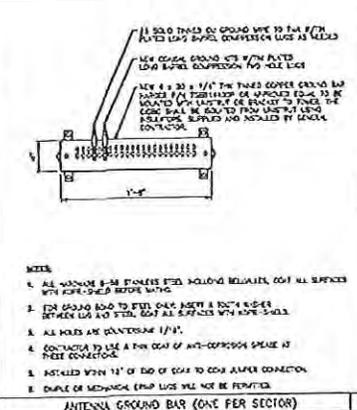
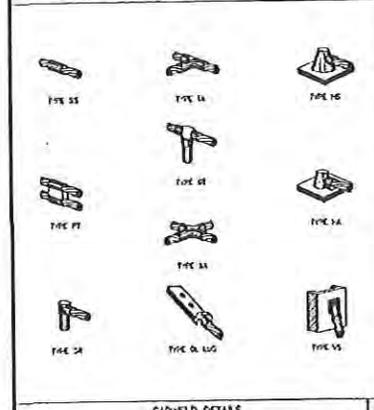
G03



ANTENNA GROUNDING PLAN 5

INTERMEDIATE COAX GROUND KIT - GROUND BAR 3

EXTERIOR SHELTER GROUND BAR 1



WELDED DETAILS 6

ANTENNA GROUND BAR (ONE PER SECTOR) 4

TOWER/TYPICAL GROUND BAR 2

VERIZON

SSC

16433 INTCOTT ROAD  
KEANSBY, MISSOURI  
64662

274079

GROUNDING - DETAILS

G04









<p><b>COMMUNICATIONS ANTENNA SPECIFICATION</b></p> <p><b>GENERAL:</b></p> <p><b>1.1. WORK REQUIRED</b></p> <p>A. ANTENNA AND COAXIAL CABLES ARE PROVIDED BY OWNER UNDER SEPARATE CONTRACT. THE CONTRACTOR SHALL VERIFY ANTENNA INSTALLATION CONTRACTOR IS COMPLYING WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS AND SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL AND PROPERTY FROM HAZARDOUS CONDITIONS TO ANTENNA CABLES.</p> <p>B. ANTENNA INSTALLATION AS REQUIRED ON DRUMS AND OTHER INSTALLATIONS.</p> <p>C. ANTENNA CABLES SHALL BE INSTALLED AS REQUIRED ON DRUMS.</p> <p>D. ANTENNA CABLES SHALL BE INSTALLED AS REQUIRED ON DRUMS.</p> <p>E. THE CONTRACTOR SHALL REMOVE PROBLEMS DURING INSTALLATION (FOR) THAT RESULT IN THE CONTRACTOR HAVING TO REWORK WHEN ONE WEEK OF DELAY.</p> <p>F. ANTENNA CABLES AND TERMINATORS BETWEEN ANTENNA AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. VERIFY ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. REMOVE ALL COAXIAL CABLE FROM THE SITE IN CASES OF BOTH RIGHT LOCATION UNLESS OTHERWISE SPECIFIED.</p> <p>G. ANTENNA AND COAXIAL CABLE ENDING</p> <p>1. ALL COAXIAL CABLE ENDING CONDITIONS ARE TO BE NOTICE BRAND WITH ANOTHER CONTRACTOR/SUB CONTRACTOR'S SITE OF EQUIPMENT.</p> <p>2. ALL COAXIAL CABLE ENDING SITE ARE TO BE INSTALLED ON STUDY'S END OF COAXIAL CABLE (NOT WITHIN RANGE)</p> <p><b>1.2. RELATED WORK</b></p> <p>A. FINISH THE FOLLOWING WORK IS SPECIFIED UNDER CONSTRUCTION AGREEMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO AND</p> <p>1. FINISH OF CONCRETE AND CURB WALLS</p> <p>2. SEAL AND CURE ALL CONCRETE</p> <p>3. FINISH</p> <p>4. CURB AND FINISH</p> <p><b>1.3. PERFORMANCE OF RELATED WORK</b></p> <p>A. FINISH ALL RELATED EQUIPMENT UNDER SUCH WORK, IS AVAILABLE, NOTABLE IN CONFORMANCE WITH ALL STANDARDS AS SET FORTH.</p> <p>B. ANTENNA ANTENNA CABLES AND ENDING SYSTEMS IN ACCORDANCE WITH CONSTRUCTION AND INSTALLATION IN ORDER AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL, FEDERAL AND ANY OTHER CODES, WITHIN APPLICABLE STATE SPECIFIC REGULATIONS OF WORKING REGULATIONS IS NOT LIMITED TO THE FOLLOWING:</p> <p>1. FCC - FEDERAL COMMUNICATIONS COMMISSION - FCC REGULATIONS STANDARDS FOR ANTENNA POWER AND ANTENNA SUPPORTING STRUCTURES</p> <p>2. FCC - FEDERAL COMMUNICATIONS COMMISSION REGULATIONS STANDARDS FOR ANTENNA SUPPORTING STRUCTURES</p> <p>3. FCC - FEDERAL COMMUNICATIONS COMMISSION REGULATIONS STANDARDS FOR ANTENNA SUPPORTING STRUCTURES</p> <p>4. IEEE - NATIONAL INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL STEEL USING STEEL JOISTS</p> <p>5. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>6. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>7. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>8. ALL AS BUILT THE PLAN RULES AND THE CODE RULES ARE APPLICABLE AND IN THE CASE OF CONFLICT, SUPersedes ANY OTHER STANDARD OR SPECIFICATION.</p> <p>9. USE APPROPRIATE WORK AREA, WITHIN SITE.</p>	<p><b>1.4. RELATED WORK</b></p> <p>A. FINISH THE FOLLOWING WORK IS SPECIFIED UNDER CONSTRUCTION AGREEMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO AND</p> <p>1. FINISH OF CONCRETE AND CURB WALLS</p> <p>2. SEAL AND CURE ALL CONCRETE</p> <p>3. FINISH</p> <p>4. CURB AND FINISH</p> <p><b>1.5. PERFORMANCE OF RELATED WORK</b></p> <p>A. FINISH ALL RELATED EQUIPMENT UNDER SUCH WORK, IS AVAILABLE, NOTABLE IN CONFORMANCE WITH ALL STANDARDS AS SET FORTH.</p> <p>B. ANTENNA ANTENNA CABLES AND ENDING SYSTEMS IN ACCORDANCE WITH CONSTRUCTION AND INSTALLATION IN ORDER AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL, FEDERAL AND ANY OTHER CODES, WITHIN APPLICABLE STATE SPECIFIC REGULATIONS OF WORKING REGULATIONS IS NOT LIMITED TO THE FOLLOWING:</p> <p>1. FCC - FEDERAL COMMUNICATIONS COMMISSION - FCC REGULATIONS STANDARDS FOR ANTENNA POWER AND ANTENNA SUPPORTING STRUCTURES</p> <p>2. FCC - FEDERAL COMMUNICATIONS COMMISSION REGULATIONS STANDARDS FOR ANTENNA SUPPORTING STRUCTURES</p> <p>3. FCC - FEDERAL COMMUNICATIONS COMMISSION REGULATIONS STANDARDS FOR ANTENNA SUPPORTING STRUCTURES</p> <p>4. IEEE - NATIONAL INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL STEEL USING STEEL JOISTS</p> <p>5. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>6. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>7. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>8. ALL AS BUILT THE PLAN RULES AND THE CODE RULES ARE APPLICABLE AND IN THE CASE OF CONFLICT, SUPersedes ANY OTHER STANDARD OR SPECIFICATION.</p> <p>9. USE APPROPRIATE WORK AREA, WITHIN SITE.</p>	<p><b>1.6. RELATED WORK</b></p> <p>A. FINISH THE FOLLOWING WORK IS SPECIFIED UNDER CONSTRUCTION AGREEMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO AND</p> <p>1. FINISH OF CONCRETE AND CURB WALLS</p> <p>2. SEAL AND CURE ALL CONCRETE</p> <p>3. FINISH</p> <p>4. CURB AND FINISH</p> <p><b>1.7. PERFORMANCE OF RELATED WORK</b></p> <p>A. FINISH ALL RELATED EQUIPMENT UNDER SUCH WORK, IS AVAILABLE, NOTABLE IN CONFORMANCE WITH ALL STANDARDS AS SET FORTH.</p> <p>B. ANTENNA ANTENNA CABLES AND ENDING SYSTEMS IN ACCORDANCE WITH CONSTRUCTION AND INSTALLATION IN ORDER AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL, FEDERAL AND ANY OTHER CODES, WITHIN APPLICABLE STATE SPECIFIC REGULATIONS OF WORKING REGULATIONS IS NOT LIMITED TO THE FOLLOWING:</p> <p>1. FCC - FEDERAL COMMUNICATIONS COMMISSION - FCC REGULATIONS STANDARDS FOR ANTENNA POWER AND ANTENNA SUPPORTING STRUCTURES</p> <p>2. FCC - FEDERAL COMMUNICATIONS COMMISSION REGULATIONS STANDARDS FOR ANTENNA SUPPORTING STRUCTURES</p> <p>3. FCC - FEDERAL COMMUNICATIONS COMMISSION REGULATIONS STANDARDS FOR ANTENNA SUPPORTING STRUCTURES</p> <p>4. IEEE - NATIONAL INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL STEEL USING STEEL JOISTS</p> <p>5. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>6. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>7. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>8. ALL AS BUILT THE PLAN RULES AND THE CODE RULES ARE APPLICABLE AND IN THE CASE OF CONFLICT, SUPersedes ANY OTHER STANDARD OR SPECIFICATION.</p> <p>9. USE APPROPRIATE WORK AREA, WITHIN SITE.</p>	<p><b>1.8. RELATED WORK</b></p> <p>A. FINISH THE FOLLOWING WORK IS SPECIFIED UNDER CONSTRUCTION AGREEMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO AND</p> <p>1. FINISH OF CONCRETE AND CURB WALLS</p> <p>2. SEAL AND CURE ALL CONCRETE</p> <p>3. FINISH</p> <p>4. CURB AND FINISH</p> <p><b>1.9. PERFORMANCE OF RELATED WORK</b></p> <p>A. FINISH ALL RELATED EQUIPMENT UNDER SUCH WORK, IS AVAILABLE, NOTABLE IN CONFORMANCE WITH ALL STANDARDS AS SET FORTH.</p> <p>B. ANTENNA ANTENNA CABLES AND ENDING SYSTEMS IN ACCORDANCE WITH CONSTRUCTION AND INSTALLATION IN ORDER AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL, FEDERAL AND ANY OTHER CODES, WITHIN APPLICABLE STATE SPECIFIC REGULATIONS OF WORKING REGULATIONS IS NOT LIMITED TO THE FOLLOWING:</p> <p>1. FCC - FEDERAL COMMUNICATIONS COMMISSION - FCC REGULATIONS STANDARDS FOR ANTENNA POWER AND ANTENNA SUPPORTING STRUCTURES</p> <p>2. FCC - FEDERAL COMMUNICATIONS COMMISSION REGULATIONS STANDARDS FOR ANTENNA SUPPORTING STRUCTURES</p> <p>3. FCC - FEDERAL COMMUNICATIONS COMMISSION REGULATIONS STANDARDS FOR ANTENNA SUPPORTING STRUCTURES</p> <p>4. IEEE - NATIONAL INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL STEEL USING STEEL JOISTS</p> <p>5. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>6. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>7. IEEE - NATIONAL ELECTRICAL CODE FOR POWER DISTRIBUTION</p> <p>8. ALL AS BUILT THE PLAN RULES AND THE CODE RULES ARE APPLICABLE AND IN THE CASE OF CONFLICT, SUPersedes ANY OTHER STANDARD OR SPECIFICATION.</p> <p>9. USE APPROPRIATE WORK AREA, WITHIN SITE.</p>
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**VERIZON**

**SSC**

**274079**

**14433 ENKSCOTT ROAD**  
**KEASLEY, MISSOURI**  
**65050**

**SPECIFICATIONS (4 OF 8)**

**SP4**







**PART 3 DESCRIPTION**

**11. CONDUIT**

- 1. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- 2. EQUIPMENT SHALL BE PROTECTIVELY COVERED AND PROTECTED AGAINST DIRT OR WATER AND MOISTURE DAMAGE OR WEATHERING. ALL JUNCTIONS SHALL BE PROTECTIVELY COVERED.

**12. WIRING AND TERMINALS**

- 1. ALL WIRING FOR THE INSTALLATION OF WIRING AND EQUIPMENT TERMINALS FOR THE ELECTRICAL SYSTEM SHALL BE DONE BY EXTENDED MEANS OF THE PROPER PULLS.
- 2. ALL ELECTRICAL TERMINAL POINTS SHALL BE IDENTIFIED, LABELED AND SET TO THE CONTRACTOR AS REQUIRED TO PROVIDE THE INTENDED PERFORMANCE.
- 3. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL PROTECT ALL EXPOSED EQUIPMENT, PROVIDE ALL LABELS AND WIRING IDENTIFICATION OR CAPS AND MAKE THE INSTALLATION PROTECTIVE AND READY FOR OPERATION.

**13. CONNECTIONS**

- 1. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL WIRING WITH THE CONTRACTOR'S EQUIPMENT INSTALLATION SCHEDULE TO PREVENT UNDERCUTTING EQUIPMENT IN THE FIELD WORK.

**14. GENERAL**

- 1. ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS SPECIFIED AND NOT EXPOSED TO DAMAGE OF LESS THAN 3/4" NOMINAL SIZE SHALL BE USED.
- 2. PROVIDE AND LABEL FOR ALL EXPOSED EQUIPMENT CONDUIT.
- 3. PROVIDE SCHEDULE 40 PVC OR FOR CONDUIT BENDS ONLY, 1" MINIMUM. UNLESS NOTED OTHERWISE, ALL 90 DEGREE BENDS TO AVOID CONDUIT SHALL BE FOR MINIMUM BENDS. BENDS SHALL BE 90 DEGREE TO TOP OF CONDUIT, UNLESS NOTED OTHERWISE.
- 4. USE GUARANTEED PERMANENT STEEL CONDUIT WHERE CONDUIT CONNECTION IS NOT DESIRABLE FOR REASONS OF EQUIPMENT MAINTENANCE, SAFETY OR FOR USE OF MAINTENANCE. USE UNDRIPPED PVC CONDUIT WHERE PERMANENT CONDUIT FOR OUTDOOR APPLICATIONS.
- 5. INSTALL GUARANTEED PERMANENT STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORTS TO AVOID THE EXPANSION AND CONTRACTION.
- 6. A RUN OF CONDUIT BETWEEN BOXES OR FITTINGS SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR 90-DEGREE BENDS. EXCESS BENDS SHALL BE INSTALLED AS PERMITTED BY THE MANUFACTURER. THE NUMBER OF BENDS SHALL BE NOTED IN THE NOTES FOR EACH OF THE CORRESPONDING TRADE DRAWING.
- 7. WHERE CONDUIT HAS TO BE RUN IN THE FIELD IT SHALL BE CUT SQUARE WITH A PIPE CUTTER LEAVING TWO ENDS.
- 8. ALL CONDUIT SHALL BE SECURED AGAINST BEING PULLED AS APPROPRIATE WITH WIRE TIES OR CONDUIT BUNDLES. CONDUIT SHALL BE INSTALLED IN A MANNER TO AVOID ALL EXCESSIVE AND EXCESSIVE BENDING, UP, AND DOWN.
- 9. INSTALL PULL STRINGS IN ALL EXPOSED CONDUIT. PULL STRINGS SHALL BE INSTALLED IN ALL EXPOSED CONDUIT.
- 10. PROVIDE WEATHERED GROUNDING BUSBARS FOR ALL CONDUIT SYSTEMS AND EQUIPMENT CONNECTIONS AS PERMITTED FOR FUTURE USE BY OTHERS.
- 11. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUIT DURING CONSTRUCTION THROUGHOUT THE WORK. IN THE EVENT OF DAMAGE TO CONDUIT, THE CONTRACTOR SHALL REPAIR OR REPLACE THE CONDUIT AND EQUIPMENT TERMINALS AND EQUIPMENT CONNECTIONS AS PERMITTED.
- 12. INSTALL A CHANGE RECEIPTABLE DATE TO MARK ALL UNDERGROUND CONDUIT AND PIPES.
- 13. CONDUIT SHALL BE INSTALLED IN SUCH A MANNER AS TO BE PROTECTIVE AGAINST COLLISION OF TRAFFIC OR EQUIPMENT.

**15. WIRE AND CABLE**

- 1. ALL POWER WIRING SHALL BE COLOR CODED AS FOLLOWS:
 

DESCRIPTION	120/240V	208/240V	480/277V
PHASE 1	BLACK	BLACK	BROWN
PHASE 2	RED	RED	ORANGE
PHASE 3	BLUE	BLUE	YELLOW
NEUTRAL	WHITE	WHITE	GRAY
GROUND	GREEN	GREEN	GREEN
- 2. WIRING SHALL BE MADE AGAINST OUTSIDE SURFACE OF BOXES OR TERMINALS UNLESS OTHERWISE SPECIFIED.
- 3. PULLING WIRING SHALL BE ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS. ALL WIRING SHALL BE MADE IN SUCH A MANNER AS TO BE PROTECTIVE AGAINST COLLISION OF TRAFFIC OR EQUIPMENT.

- 4. CABLES SHALL BE MADE AGAINST WITHOUT INTERFERENCE AND BE OF SUFFICIENT LENGTH TO BE MADE AGAINST WITHOUT INTERFERENCE. ALL WIRING SHALL BE MADE IN SUCH A MANNER AS TO BE PROTECTIVE AGAINST COLLISION OF TRAFFIC OR EQUIPMENT.

**16. CONNECTIONS**

- 1. INSTALL GUARANTEED PERMANENT STEEL AND PULSED CONDUIT TO WIRING SYSTEM AND GROUND AS PERMITTED.
- 2. GROUNDING
- 1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT SHALL NOT BE EXPOSED TO WEATHERING UNLESS OTHERWISE SPECIFIED IN THE MANUFACTURER'S INSTRUCTIONS.
- 2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEMS ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS. PROVIDE GROUNDING BUSBARS, BONDING JUNCTIONS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- 3. ROUTE GROUNDING CONDUCTORS AND CONDUCTORS TO GROUND IN THE MOST DIRECT AND UNOBSTRUCTED PATH POSSIBLE TO MINIMIZE THROUGH SPACE LOSS.
- 4. TIGHTEN GROUNDING AND BONDING CONNECTIONS, INCLUDING BOLTS AND NUTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TABLES. TIGHTENING TORQUES ARE NOT PERMITTED FOR THE CONNECTIONS TO CONDUIT WITH TIGHTENING TORQUE VALUES SPECIFIED IN THE USA TO AVOID OVER-TIGHTENING AND DAMAGE TO CONDUIT.
- 5. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE IN THE EXTERIOR AND PROTECTIVE AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- 6. ALL GROUND CONNECTIONS SHALL BE PROTECTED FOR DAMAGE. EXPOSED GROUNDING CONNECTIONS SHALL BE COVERED BY THE CONTRACTOR. PROTECTIVE COVERINGS SHALL BE INSTALLED BY THE CONTRACTOR.
- 7. APPLY CORROSION-RESISTANT FINISH TO FIELD CONNECTIONS AND POINTS WHERE FIELD WIRING PENETRATES CONDUIT. USE THE CORROSION-RESISTANT FINISH OR APPROVED EQUAL.
- 8. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL EXPOSED AND BURIED CONDUITS.
- 9. BOND ALL INSULATED GROUNDING BUSBARS WITH A BOLT (1/2" DIA) AND GROUNDING CONDUCTOR TO A GROUND BUS OR GROUNDING LUG IN ENCLOSURE.
- 10. EXPOSED BONDING GROUNDING CONDUCTORS SHALL BE INSTALLED IN A MANNER TO AVOID COLLISION WITH OTHER EQUIPMENT.
- 11. ALL GROUNDING CONDUCTORS EXPOSED IN OR PROTECTIVE CONDUIT SHALL BE INSTALLED IN THE CONDUIT.
- 12. INSTALL ELECTRICAL GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. BONDING SHALL BE MADE TO THE MANUFACTURER'S INSTRUCTIONS. BONDING SHALL BE MADE TO THE MANUFACTURER'S INSTRUCTIONS.
- 13. EXPOSED GROUNDING CONDUCTORS SHALL BE INSTALLED IN THE CONDUIT.
- 14. GROUNDING CONDUCTORS TO EQUIPMENT SHALL BE:
  - 1) BUNDLED TO EQUIPMENT WITH STAINLESS STEEL BOLTS AND LOCK WASHERS.
  - 2) ALL EQUIPMENT TO BE GROUNDING SHALL BE FREE OF PAINT OR ANY OTHER MATERIALS EXCEPT AS NOTED IN THE NOTES OF DRAWING.

**17. ACCEPTANCE TESTING**

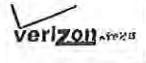
- 1. PROVIDE WEATHERED AND EQUIPMENT WIRING AND BONDING TESTS AND SUBMIT TEST REPORTS UPON COMPLETION OF FIELD.
- 2. WHEN ELECTRICAL WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE WORKMANSHIP SHALL BE REWORKED FROM THE POINT AND REWORKED WITH FIELD EQUIPMENT WITH THE SPECIFIED REQUIREMENTS. REWORK SHALL BE MADE AT THE POINT OF WORK.

**18. TEST PROCEDURES**

- 1. ALL TESTS SHALL HAVE THEIR INSULATION TESTED WITH INSTALLATION. ALL WIRING CONNECTIONS TO BE TESTED. THE INSULATION SHALL NOT BE TESTED UNTIL THE WIRING IS COMPLETE. ALL WIRING SHALL BE TESTED WITH THE WIRING SYSTEM COMPLETE.
- 2. TESTS TO DETERMINE CAPACITY, TEST WIRING LEAKAGE FOR ELECTRICAL CONTAMINATION AND PROTECTIVE BONDING.
- 3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE AND NEUTRAL. RECORD A RECORD OF VOLTAGE AND RECORD VOLTAGES.
- 4. RECORD GROUNDING TEST TO MEASURE GROUNDING RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 81-1999 "FIELD-APPLIED" METHOD. MEASURE RESISTANCE TO GROUND USING THE IEEE STANDARD 81-1999 METHOD. MEASURE RESISTANCE TO GROUND USING THE IEEE STANDARD 81-1999 METHOD.

**END OF SECTION**

**END OF SPECIFICATION**





274079

10441 INDEPENDENT ROAD  
KEARNEY, MISSOURI 64502

SPECIFICATIONS (8 OF 8)

SP8

Clay County, Missouri

Recorded in Clay County, Missouri  
Date and Time: 07/18/2013 at 02:50:38 PM

Instrument Number: 2013027691

Book: 7146 Page: 64

Unofficial Document

Instrument Type: M/D  
Page Count: 4  
Recording Fee: \$33.00 S



Electronically Recorded

Jay Lawson, Recorder

Above Area Reserved for Recorder of Deeds  
**Special Warranty Deed**

This Indenture is made effective at July 18, 2013, by and between:

1. O'Dell Real Estate Limited Partnership, a Missouri limited partnership ("Grantor") whose address is P.O. Box 418050, Kansas City, MO 64141, and
2. Patrick Pierson and Brian Steele ("Grantee"), each as 50% tenants in common, and not as joint tenants with right of survivorship, whose address is 10186 Airfield Ln., Richmond, MO 64085.

Legal Description: Page(s) 4.

**Witnesseth:**

**Grantor**, in consideration of the sum of Ten Dollars (\$10.00) and other valuable consideration paid to Grantor by Grantee (the receipt and sufficiency of which consideration being hereby acknowledged by Grantor), does by these presents **bargain and sell, convey and confirm** to said Grantee, and said Grantee's heirs, successors and assigns, the following described lots, tracts and parcels of land lying, being and situated in the County of Clay, State of Missouri, described in Exhibit A attached here.

**Grantor** states that the sole incumbent general partners of O'Dell Real Estate Limited Partnership are Mark D. O'Dell and Kimi D. Nelson, and that all limited partners of O'Dell Real Estate Limited Partnership have approved the conveyance hereby made.

**To have and to hold** the premises aforesaid with all and singular, the rights, privileges, appurtenances and immunities thereto belonging or in any way appertaining unto said Grantee (with each Grantee holding an undivided 50% interest in the whole of the premises, as tenants in common and not as joint tenants with right of survivorship) and unto said Grantee's heirs, successors and assigns forever, the said Grantor hereby covenanting and warranting only that Grantor shall and will Warrant and Defend the title to the aforesaid premises unto Grantee and to Grantee's heirs, successors and assigns forever, against the lawful claims of all persons claiming by, through or under Grantor (but not any predecessors in interest or title of Grantor), provided

# Clay County, Missouri

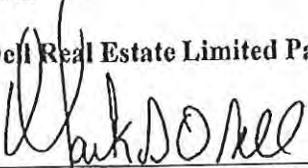
however, the aforesaid limited and special warranty is subject to the following exception(s) and exclusions with respect to the foregoing premises, to wit:

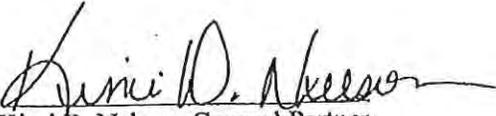
## Unofficial Document

1. Easements (including declarations of easements), rights of way (including easements and grants for railroads and roads), recorded agreements, reservations and restrictions of record;
2. burial grounds and cemeteries, if any;
3. general and special real estate taxes and assessments for the tax year in which Closing occurs (subject to proration as provided herein);
4. assessments and fees payable to any water/water supply, sewer, road, levee or other district which is organized as a political subdivision in the State of Missouri;
5. visible and apparent (but unrecorded) easements, overlaps, encroachments and boundary line disputes which would be revealed had Buyer secured an accurate ALTA/ACSM survey with respect to the Premises;
6. the effect of any condemnation proceedings pertaining to all or any part of the Premises;
7. zoning laws and land use regulations and ordinances;
8. leases and tenancies;
9. building lines, setbacks, restrictions and easements as shown on any recorded plat embracing all or any part of the Premises;
10. roads, roadways and streets (whether dedicated or actually used by members of the public).

In Witness Whereof, Grantors have hereunto set their hands the day and year first above written.

O'Dell Real Estate Limited Partnership

By:   
Mark D. O'Dell, General Partner

By:   
Kimi D. Nelson, General Partner

# Clay County, Missouri

Missouri Acknowledgement-Limited Partnership

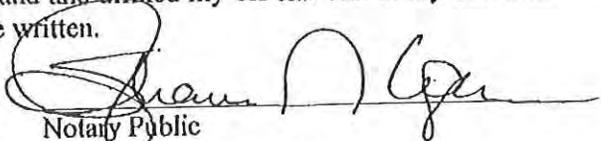
State of Missouri  
County of Clay

## Unofficial Document

Effective at July 18, 2013, before me, the undersigned, a Notary Public, personally appeared Mark D. O'Dell and Kimi D. Nelson, as the sole incumbent general partner(s) of O'Dell Real Estate Limited Partnership, a Missouri Limited Partnership, to me known to be the person(s) described in and who executed the foregoing instrument in behalf of said limited partnership and acknowledged to me that the instrument was executed for the purposes therein stated as the free act and deed of said limited partnership.

In Witness Whereof, I have hereunto set my hand and affixed my official seal at my office in said county and state, the day and year last above written.

My Commission Expires:

  
Notary Public

4-4-15



SHARON N. COPE  
My Commission Expires  
April 4, 2015  
Ray County  
Commission #11456020

# Clay County, Missouri

Exhibit A

## Unofficial Document

That portion of the North Half of Section 21, Township 53 North, Range 30 West, Clay County, Missouri, which lies west of the westerly right of way line of the St. Paul and Kansas City Short Line Railroad Company/ Chicago, Rock Island and Pacific Railroad and north of County Road.

Except that part bounded as follows: Beginning at the Southwest corner of the Northwest Quarter of the Northwest Quarter of said Section; thence North along the West line of said Quarter Section, a distance of 80.5 feet to a point; thence East 80.5 feet from and parallel with the South line of said Quarter Section, a distance of 660.0 feet to a point; thence South 660.0 feet from and parallel with the West line of said Section, a distance of 80.5 feet to the South line of said Quarter Section; thence continuing South and parallel with said West line, a distance of 249.5 feet to a point; thence West 249.5 feet and parallel with said South Quarter Section line, a distance of 660.0 feet to a point in the West line of said Section; thence North along the West line of said Section, 249.5 feet to the point of beginning.

Also Except that part conveyed to the St. Paul and Kansas City Short Line Railroad Company by the Deed recorded in Book 274 at Page 431.

Also Except that part conveyed to the St. Paul and Kansas City Short Line Railroad Company by the Deed recorded in Book 277 at Page 145.

End of Exhibit A

Integra Realty Resources  
Kansas City

1901 West 47th Place  
Suite 300  
Westwood, KS 66205

T 913.236.4700  
F 913.236.4307  
info@irr.com  
www.irr.com



December 31, 2014

*Via Email: [cholland@polsinelli.com](mailto:cholland@polsinelli.com)*

Curtis M. Holland  
Polsinelli PC  
6201 College Blvd., Suite 500  
Overland Park, KS 66211

**SUBJECT:** Proposal/Authorization for Consulting Services  
KCYC Cameron Road Site No. 274049  
16432 Endicott Road (the "Subject Property")  
Unincorporated Clay County, MO 64060

Dear Mr. Holland:

Integra Realty Resources – Kansas City ("Integra – Kansas City"), appreciates the opportunity to provide this proposal for consulting services to Polsinelli Law Firm (the "Client") for the above-captioned property.

It is our mutual understanding that the purpose of these reports is to provide a proximity studies for the subject property. The intended use of the reports is for public hearings in January and February. The reports will be prepared in conformance with and subject to, the Standards of Professional Practice and Code of Ethics of the Appraisal Institute and the *Uniform Standards of Professional Appraisal Practice* (USPAP) developed by the Appraisal Standards Board of the Appraisal Foundation.

Our fee for this assignment will be hourly up to \$6,000 for the consulting reports and hourly for any public hearings or review of other expert reports. We will provide three (3) copies of the report; however, additional copies of the reports are available at an additional cost. The current minimum cost for each additional copy is \$100 per copy. The reports will be completed and delivered to you no later than January 19, 2015. We will begin work upon our receipt of this fully executed engagement letter and the information requested in ATTACHMENT II.

Curtis M. Holland  
Polsinelli PC  
December 31, 2014  
Page 2 of 9

Additional fees will be charged on an hourly basis for any work which exceeds the scope of this proposal, including reviewing other expert reports, additional research and conference calls, public hearings, or meetings with any party which exceed the time allotted for an assignment of this nature.

The terms of ATTACHMENT I which apply to this engagement are hereby incorporated by reference.

In order to complete this assignment in the designated time, we will require as much of the available information as possible, as identified in ATTACHMENT II, within five business days after the execution of this engagement letter. Any delays in the receipt of this information or in the access to the property will automatically extend the final delivery date of the reports as proposed. Furthermore, the reports and conclusions therein will be predicated upon the accuracy and completeness of the information provided by the Client and set forth in Attachment II. In the absence of some of this information, the consultants will attempt to obtain this information from other sources and/or may require the use of Extraordinary Limiting Conditions and Assumptions within the report.

The reports will be limited by our standard Assumptions and Limiting Conditions and any Extraordinary Assumptions and Limiting Conditions, which become apparent or necessary during the course of the assignment. A copy of the standard Assumptions and Limiting Conditions is set forth in ATTACHMENT III.

The purpose of the reports is to provide a proximity studies for the subject property on behalf of the Client as well as the permitting authorities of Clay County, Missouri and Douglas County, Kansas as the intended user of the reports. Without first obtaining our prior written consent, the use of the reports by anyone other than the Client or named intended users is prohibited. Accordingly, the reports will be addressed to and shall be solely for the Client's use and named intended users benefit unless we provide our prior written consent. We expressly reserve the unrestricted right to withhold our consent to your disclosure of the reports (or any part thereof including, without limitation, conclusions of value and our identity), to any third parties. Stated again for clarification, unless our prior written consent is obtained, no third party may rely on the reports (even if their reliance was foreseeable).

In the event the Client provides a copy of these reports to, or permits reliance thereon by, any person or entity not authorized by Integra – Kansas City, the Client agrees to indemnify and hold harmless Integra – Kansas City, its affiliates and its shareholders, directors, officers and employees, from and against all damages, expenses, claims and costs, including attorneys' fees, incurred in investigating and defending any claim arising from or in any way connected to the use of, or reliance upon, the review by any such unauthorized person or entity.

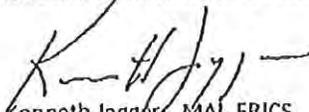
If the reports are referred to or included in any offering material or prospectus, it shall be deemed referred to or included for informational purposes only and Integra – Kansas City, its employees and the consultants have no liability to such recipients. Integra – Kansas City disclaims any and all liability to any party other than the Client which retained Integra – Kansas City to prepare the report.

Curtis M. Holland  
Polsinelli PC  
December 31, 2014  
Page 3 of 9

If this proposal is acceptable, please authorize us to proceed by executing this letter agreement where noted below, initial all attachments where indicated in the lower right-hand corner, and returning one copy to the undersigned. Thank you for considering us for this assignment and we look forward to working with you. Please call if you wish to discuss this proposal or the assignment any further.

Sincerely,

INTEGRA REALTY RESOURCES – KANSAS CITY



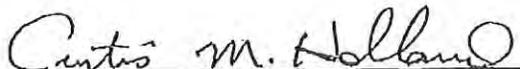
Kenneth Jagers, MAI, FRICS  
Senior Managing Director

Attachments

KJ:aed

AGREED & ACCEPTED THIS 31<sup>st</sup> DAY OF December, 2014.

BY: Polsinelli PC

  
AUTHORIZED SIGNATURE

Curtis M. Holland  
NAME (PRINT)

**ATTACHMENT I**

**ADDITIONAL TERMS**

This assignment is subject to the following terms:

1. **Completion Date Estimate:** Integra – Kansas City agrees to use reasonable commercial efforts to complete these reports as per the attached letter agreement. Said completion date is an estimate and does not take into consideration pre-trial or court time as well as delays beyond the control of Integra – Kansas City such as illness, lack of specific necessary data and/or Acts of God.
2. **Database/Marketing:** Both parties acknowledge that real estate consulting requires current and historical market data to competently analyze the Subject Property. Accordingly, the Client agrees that: (I) the data collected by Integra – Kansas City in this assignment will remain the property of Integra – Kansas City; and (II) with respect to any data provided by the Client, Integra – Kansas City and its partner companies may utilize, sell and include such data (either in the aggregate or individually), in their marketing materials, the Integra database and derivative products, including the identity of the Client and the Subject Property. The Client agrees that all data already in the public domain may be utilized on an unrestricted basis.
3. **Litigation:** In the event Integra – Kansas City is called upon to provide testimony or receives a subpoena concerning any suit or proceeding or otherwise become involved in any litigation relating to this engagement or assignment, in which Integra – Kansas City is not a party, Integra – Kansas City will make every reasonable effort to assist the Client and give such testimony. The Client agrees to compensate Integra – Kansas City at its then current rates, on an hourly basis, plus reimbursement for all expenses incurred as a result of said litigation. In addition to the foregoing, the following terms are applicable:

- (a) Review and trial preparation (if applicable) in-office, will be billed at standard hourly rates; outside office rates may apply to conferences, depositions and testimony. Our current in-office rates are as follows:

Kenneth Jagers, MAI; FRICS	\$350 per hour
Directors or Principals (Other MAIs, CPAs, CREs, and Real Estate Brokers)	\$175-\$250 per hour
Senior Analyst	\$150-\$250 per hour
Analyst	\$100-\$175 per hour

- (b) All reports for which testimony is required must be disclosed prior to reports authorization.
- (c) All fees for reports, conferences and depositions must be paid prior to hearings and trial.
- (d) Scheduling of casework and appearances will be made with due consideration for the time of all persons involved. Every effort to comply with reasonable requests for appearances will be made. Once an appointment, deposition or appearance is scheduled, that time is set aside. Therefore, if the appearance is canceled, or the reserved time is abandoned for whatever reason, the following cancellation charges will apply:
  1. More than one week No Charge
  2. 48 Hours prior \$250.00
  3. Less than 48 Hours prior \$600.00
  4. A Stand-by Charge of \$250.00 per day
- (e) Due to the difficulty associated with accurately forecasting the number of hours which may be required with the research, hearing and/or trial preparation, deposition time, client/expert conferences, etc., we will maintain contemporaneous time and expense records and will provide you invoices on a 30 day billing cycle. The Client agrees to pay Integra – Kansas City at the time the invoice is submitted and acknowledges payment to Integra – Kansas City is not contingent upon any set outcome, result or award to the Client.

4. **Limitations of Liability:** It is expressly agreed that in any action which may be brought against Integra – Kansas City, Integra Realty Resources, Inc. or their respective officers, owners, managers, directors, agents, subcontractors or employees (the “Integra Parties”), arising out of, relating to, or in any way pertaining to this engagement, the report, or any estimates or information contained therein, the Integra Parties shall not be responsible or liable for an incidental or consequential damages or losses, unless the reports was fraudulent or prepared with gross negligence. It is further agreed that the collective liability of the Integra Parties in any such action shall not exceed the fees paid for the preparation of the reports unless the reports was fraudulent or prepared with gross negligence. Finally, it is agreed that the fees charged herein are in reliance upon the foregoing limitations of liability.

In the event the Client provides our work or permits reliance thereon by, any person or entity not authorized by Integra – Kansas City in writing to use or rely thereon, Client hereby agrees to indemnify and hold Integra – Kansas City, its affiliates and the respective shareholders, directors, officers and employees, harmless from and against all damages, expenses, claims and costs, including attorneys’ fees, incurred in investigating and defending any claim arising from or in any way connected to the use of, or reliance upon our work by any such unauthorized person or entity.

You acknowledge that any opinions and conclusions expressed by professionals employed by Integra – Kansas City during this assignment are representations made as them as employees and not as individuals. Our responsibility is limited to you as Client, and use of our product by third parties shall be solely at the risk of you and/or third parties.

5. **Late Fees; Etc.:** Unless arrangements are made otherwise, a late charge of 15% per annum, commencing thirty (30) days after the receipt of invoice will be charged on any balance not paid; however, in no event shall this delinquency rate of interest exceed the maximum rate permitted by law. We shall also be entitled to recover our costs (including attorneys’ fees), associated with collecting any amounts owed or otherwise incurred in connection with this engagement. Upon default, we shall be permitted to file a lien against the Subject Property for any amounts owed pursuant to this engagement.
6. **Cancellation:** In the event the assignment is canceled prior to completion, an invoice will be prepared reflecting the percentage of work completed as of that date plus \$350 for file setup and soft costs. Any credits to the Client will be promptly refunded or any remaining balances to Integra – Kansas City will be indicated on the invoice.
7. **Responding to Review:** We agree to respond to your review of our reports within five (5) business days of your communication to us. Correspondingly, you will have twenty-one (21) days from receipt of our reports to communicate your review. We reserve the right to bill you for responding to your review beyond this time period.
8. **Special Experts:** Any out-of-pocket expenses incurred during this assignment will be billed at cost and included on the invoice. Should the Client request the assistance of Integra – Kansas City in hiring a special expert to contribute to this assignment (including but not limited to, a surveyor, environmental consultant, land planner, architect, engineer, business, personal property, machinery and equipment appraiser, among others), the Client agrees to perform their own due diligence to qualify said special expert. The Client agrees and acknowledges it is solely responsible in paying for the services of said special expert. Furthermore, the Client acknowledges that Integra – Kansas City is not responsible for the actions and findings of the special expert and agrees to hold Integra – Kansas City harmless from any and all damages that may arise out of the Client’s reliance on the special expert.
9. **Duration of Quote:** This proposal and fees quoted are valid for a period of fourteen (14) calendar days from the date hereof. If not retained by the Client, the fact that we made the foregoing proposal of professional services will not preclude us from performing professional services for another client on the property.
10. **Marketpoint/Template:** The Client acknowledges that IRR-Marketpoint, our templates and DataPoint software is proprietary and confidential. Accordingly, the Client agrees not to use such software or make such software available for the use of any third party.
11. **Arbitration:** The parties agree that any dispute relating to this letter agreement or the reports shall be submitted to, and resolved exclusively pursuant to arbitration in accordance with the commercial arbitration rules of the American Arbitration Association. Such arbitration shall take place in Johnson County and shall be subject to the substantive laws of the state of Kansas. Decisions pursuant to such arbitration shall be final, conclusive and binding on the parties. Upon the conclusion of the arbitration, the parties may apply to any appropriate court to enforce the decision of such arbitration.

Curtis M. Holland  
Polsinelli PC  
December 31, 2014  
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**ATTACHMENT II**  
**PROPERTY INFORMATION REQUEST**

**PROPERTY AND OTHER DATA**

- Location of other Verizon cell towers in rural Clay and Platte and Ray counties in Missouri and Douglas, Wyandotte, and Johnson counties in Kansas.
- Tower height, foundation depth and size, guy wire locations.

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Initials

### ATTACHMENT III

#### ASSUMPTIONS & LIMITING CONDITIONS

These reports are subject to the following limiting conditions, except as otherwise noted in the report.

1. A consulting assignment is inherently subjective and represents our opinion as to the value of the property analyzed.
2. The conclusions stated in our reports apply only as of the effective date of the report, and no representation is made as to the effect of subsequent events.
3. No changes in any federal, state or local laws, regulations or codes (including, without limitation, the Internal Revenue Code) are anticipated.
4. No environmental impact studies were either requested or made in conjunction with this assignment, and we reserve the right to revise or rescind any of the opinions based upon any subsequent environmental impact studies. If any environmental impact statement is required by law, the reports assume that such statement will be favorable and will be approved by the appropriate regulatory bodies.
5. Unless otherwise agreed to in writing, we are not required to give testimony, respond to any subpoena or attend any court, governmental or other hearing with reference to the property without compensation relative to such additional employment.
6. We have made no survey of the property and assume no responsibility in connection with such matters. Any sketch or survey of the property included in these reports are for illustrative purposes only and should not be considered to be scaled accurately for size. The appraisal covers the property as described in this report, and the areas and dimensions set forth are assumed to be correct.
7. No opinion is expressed as to the analysis of subsurface oil, gas or mineral rights, if any, and we have assumed that the property is not subject to surface entry for the exploration or removal of such materials, unless otherwise noted in our report.
8. We accept no responsibility for considerations requiring expertise in other fields. Such considerations include, but are not limited to, legal descriptions and other legal matters such as legal title, geologic considerations, such as soils and seismic stability, and civil, mechanical, electrical, structural and other engineering and environmental matters.
9. Neither all nor any part of the contents of these reports shall be disseminated through advertising media, public relations media, news media or any other means of communication (including without limitation prospectuses, private offering memoranda and other offering material provided to prospective investors) without the prior written consent of the person signing the report.
10. Information, estimates and opinions contained in the report, obtained from third-party sources are assumed to be reliable and have not been independently verified.
11. Any income and expense estimates contained in the reports do not constitute predictions of future operating results.
12. No consideration has been given to personal property located on the premises or to the cost of moving or relocating such personal property; only the real property has been considered.
13. The opinions found herein is subject to these and to any other assumptions or conditions set forth in the body of these reports but which may have been omitted from this list of Assumptions and Limiting Conditions.
14. The analyses contained in the reports necessarily incorporate numerous estimates and assumptions regarding property performance, general and local business and economic conditions, the absence of material changes in the competitive environment and other matters. Some estimates or assumptions, however, inevitably will not materialize, and unanticipated events and circumstances may occur; therefore, actual results achieved during the period covered by our analysis will vary from our estimates, and the variations may be material.

15. The *Americans with Disabilities Act (ADA)* became effective January 26, 1992. We have not made a specific survey or analysis of any property to determine whether the physical aspects of the Improvements meet the *ADA* accessibility guidelines. In as much as compliance matches each owner's financial ability with the cost to cure the non-conforming physical characteristics of a property, we cannot comment on compliance to *ADA*. Given that compliance can change with each owner's financial ability to cure non-accessibility, the value of the subject does not consider possible non-compliance. A specific study of both the owner's financial ability and the cost to cure any deficiencies would be needed for the Department of Justice to determine compliance.
16. The reports are prepared for the exclusive benefit of the Client, its subsidiaries and/or affiliates. It may not be used or relied upon by any other party. All parties who use or rely upon any information in the reports without our written consent do so at their own risk.
17. No studies have been provided to us indicating the presence or absence of hazardous materials on the Subject Property or in the improvements, and our valuation is predicated upon the assumption that the Subject Property is free and clear of any environmental hazards including, without limitation, hazardous wastes, toxic substances and mold. No representations or warranties are made regarding the environmental condition of the Subject Property and the person signing the reports shall not be responsible for any such environmental conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because we are not experts in the field of environmental conditions, the appraisal reports cannot be considered as an environmental assessment of the Subject Property.
18. The person signing the reports may have reviewed available flood maps and may have noted in the appraisal reports whether the Subject Property is located in an Identified Special Flood Hazard Area. We are not qualified to detect such areas and therefore do not guarantee such determinations. The presence of flood plain areas and/or wetlands may affect the value of the property, and our conclusion is predicated on the assumption that wetlands are non-existent or minimal.
19. Integra is not a building or environmental inspector. Integra does not guarantee that the Subject Property is free of defects or environmental problems. Mold may be present in the Subject Property and a professional inspection is recommended.
20. It is expressly acknowledged that in any action which may be brought against Integra – Kansas City, Integra Realty Resources, Inc., or their respective officers, owners, managers, directors, agents, subcontractors or employees (the "Integra Parties"), arising out of, relating to, or in any way pertaining to this engagement, the appraisal report, or any estimates or information contained therein, the Integra Parties shall not be responsible or liable for an incidental or consequential damages or losses, unless the reports were fraudulent or prepared with gross negligence. It is further acknowledged that the collective liability of the Integra Parties in any such action shall not exceed the fees paid for the preparation of the reports unless the analysis was fraudulent or prepared with gross negligence. Finally, it is acknowledged that the fees charged herein are in reliance upon the foregoing limitations of liability.
21. Integra – Kansas City, an independently owned and operated company shall prepare the consulting reports for the specific purpose so stated elsewhere in this proposal. The intended use of the reports is stated in the General Information section of the report. The use of the reports by anyone other than the Client is prohibited except as otherwise provided. Accordingly, the reports will be addressed to and shall be solely for the Client's use and benefit unless we provide our prior written consent. We expressly reserve the unrestricted right to withhold our consent to your disclosure of the reports (or any part thereof including, without limitation, conclusions of value and our identity), to any third parties. Stated again for clarification, unless our prior written consent is obtained, no third party may rely on the reports (even if their reliance was foreseeable).
22. The conclusions of these reports are estimates based on known current trends and reasonably foreseeable future occurrences. These estimates are based partly on property information, data obtained in public record, interviews, existing trends, buyer-seller decision criteria in the current market, and research conducted by third parties, and such data are not always completely reliable. The Integra Parties and the undersigned are not responsible for these and other future occurrences that could not have reasonably been foreseen on the effective date of this assignment. Furthermore, it is inevitable that some assumptions will not materialize and that unanticipated events may occur that will likely affect actual performance. While we are of the opinion that our findings are reasonable

based on current market conditions, we do not represent that these estimates will actually be achieved, as they are subject to considerable risk and uncertainty. Moreover, we assume competent and effective management and marketing for the duration of the projected holding period of this property.

23. All conclusions prospective to the current date and presented in these reports are estimates and forecasts which are prospective in nature and are subject to considerable risk and uncertainty. In addition to the contingencies noted in the preceding paragraph, several events may occur that could substantially alter the outcome of our estimates such as, but not limited to changes in the economy, interest rates, and capitalization rates, behavior of consumers, investors and lenders, fire and other physical destruction, changes in title or conveyances of easements and deed restrictions, etc. It is assumed that conditions reasonably foreseeable at the present time are consistent or similar with the future.

As will be determined during the course of the assignment, additional extraordinary or hypothetical conditions may be required in order to complete the assignment. The reports shall also be subject to those assumptions.

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