PETITION NUMBER:	0810-SE-02
SUBJECT SITE ADDRESS:	4909 Sheridan Road
APPELLANT:	New Cingular Wireless PCS, LLC. AT&T Mobility
REQUEST:	The Appellant is requesting a Special Exception to the Westfield-Washington Zoning Ordinance (WC 16.04.125, B1) to allow a wireless communication tower and facility in the AG-SF1 District.
CURRENT ZONING:	AG-SF1
CURRENT LAND USE:	Commercial
APPROXIMATE ACREAGE:	3.46
RELATED CASES:	0607-SE-001 (Special Exception to allow cell tower; Withdrawn)
EXHIBITS:	1. Staff Report, 03/10/09
	2. Aerial Location Map, 10/14/08
	3. Property Card, 10/14/08
	4. Appellant's Application and Plans, 9/16/08
	5. Hamilton County Surveyor's Office Letter, 9/25/08
	6. Email from Hamilton County Surveyor's Office, 10/03/08
	7. Westfield/Washington Township; Westfield Fire Department Commitment Form, 10/14/08
	8. Westfield Public Works Letter, 09/19/08
	9. Site photos and cell tower exhibits, 10/31/08
	10. Appellant's updated plans, 10/3/08
	11. City of Westfield Wireless Communication Service Facilities Ordinance
	12. Appellant submitted aerial photos and points of discussion for the December BZA meeting, 11/26/08
	13. Appellant submitted updated exhibits and information
	14. Staff supplied photos
STAFF REVIEWER:	JCM

PROCEDURAL

This item requires a public hearing.

PETITION HISTORY

The March 10, 2009 Board of Zoning Appeals meeting represents the second hearing of this petition before the Board. The case was originally scheduled for October, but was continued by the petitioner to have time to resolve issues and offer new information. The case was continued at the January meeting, to give the appellant additional time to offer new information and seek approval from the Hamilton County Drainage Board. Prior to this hearing, a similar case was filed in July of 2006. It was later withdrawn at the October 2006 BZA meeting.

The Westfield Technical Advisory Committee reviewed this petition at their September 23, 2008 meeting. The items discussed at that meeting can be found under the Technical Advisory Committee section of this report.

PROPERTY HISTORY

An aerial from 1974 shows a mobile home on property. Aerial photos from 1985 show the outside storage of boats and the construction of two additional structures measuring approximately 10,550 sq. ft. total on the property. In 1988, the mobile home was removed and a residential structure was constructed on the subject property (permit # 87-IP-128). An aerial from 2004 shows the addition of a gravel driveway for access to the additional structures. The site is located in the northeast section of Washington Township which is predominately agricultural and single family residential, with some business operations on State Road 38. The site is currently used as a residence and the accessory buildings are used as retail and repair facilities for boats and other aquatic equipment.

There are no previous special exceptions, subdivision plats, development plan, site plan, or rezoning cases for the subject property.

TECHNICAL ADVISORY COMMITTEE

Staff sends variances of use, special exceptions, and other complex BZA cases to the Technical Advisory Committee for review and feedback, at the Director's discretion. The input from the agencies assists with staff's analysis and review.

Comments from the September 23, 2008 TAC meeting are as follows:

- Westfield Public Works Department provided a comment letter discussing infrastructure requirements, performance bonds, utility connection fees, IDEM notification and showing and labeling items in the right-of-way on submitted plans.
- Westfield Fire Department requested a written commitment from the owner of the property stating that boats and other items will not be stored in the access drive. WFD also informed the petitioner that a 20-foot access drive would be required. WFD also requested an information sheet listing all chemicals, including batteries that would be stored on-site.
- Hamilton County Surveyor's Office informed the applicant that the location of the tower and structure was likely in a regulated drain easement. HCSO requested additional information to verify. HCSO also informed the petitioner of erosion control requirements during construction.
- Citizens Gas of Westfield informed the applicant that they serve the site.
- Duke Energy informed the applicant that an underground transformer is nearby.
- INDOT asked about traffic generation and had no further comment.

ANALYSIS

"Radio, facsimile, TV and microwave towers" are listed as a Special Exception in the AG-SF1 district. The towers are listed as a Special Exception due to concerns of decreasing surrounding property value, visual obstruction, public safety and the placement of the towers in the community. The appellant is requesting a Special Exception to construct a 150-foot cell tower with an 11-foot 5 inches by 20-foot equipment building. Submitted plans indicate an area for future expansion onto

the building to the west and a chain link fence to be installed around the cell tower equipment building with landscape screening on the east, north and west sides of the equipment building. The property has an existing gravel drive to access the structures onsite. Submitted plans show extending the gravel drive to the south and widening the drive to 20-feet for access to the proposed equipment building. Westfield Fire Department requested a 20-foot wide access drive turnaround for fire safety equipment access and maneuverability. Parking for the maintenance of the facility is not mentioned on the submitted plans.

The Hamilton County Surveyor's Office identified that the proposed equipment building falls within the Cox Regulated Drain Watershed. The appellant submitted plans on October 3rd indicating the location of the 75-foot Beals and Cox Regulated Drain easement and the proximity of the proposed project to the existing easement. The submitted plans confirm that the proposed building would encroach into the drainage easement. The Hamilton County Surveyor's Office has sent an email stating that the Hamilton County Surveyor's Office will give positive recommendation for a non-enforcement permit (encroachment permit) for the cell tower equipment building to the Drainage Board. The petitioner has not received approval from the Hamilton County Drainage Board to obtain a non enforcement permit.

The final decision on whether or not the encroachment into the drainage easement will be permitted is made by the Drainage Board. At the last BZA meeting, the BZA agreed that the appellant has until April 15th to get approval from the Drainage Board. Failure to gain approval from the Drainage Board the BZA would immediately render any special exceptions void.

Plans submitted by the appellant illustrate the effort to co-locate on an existing structure. Co-location could be obtained on the nearby Westfield water tower. An option to consider would be to install the needed equipment on the pole section of the existing water tower (Exhibit 14). The current mounting system on top of the water tower would not structurally hold any new equipment without covering an access hatch for the water tower. However, mounting to the pole section of the water tower has not been commented on as an option for co-location. Information about co-locating on the nearby T-Mobile antenna was submitted and showed an improvement in the signal along State Road 38. Due to the improvement in the coverage by locating on the T-Mobile tower, the option of co-locating on the T-Mobile tower remains.

The proposed tower reaches 150 feet plus an 8 foot lightening rod. It is surrounded by a commercial nursery to the south, the office for the nursery to the east, residential homes to the west and State Road 38 to the north. The fall zone for the tower should be considered for the health, safety and wellness of the surrounding neighbors, nearby workers and travelers utilizing State Road 38. The fall zone illustrated in Exhibit 13 shows that if the tower were to fall, it could strike the nearby commercial business. This places the employees and any patrons to the retail business at risk.

Concerns about the structure attracting lightening to the area were brought up at the November BZA meeting. The appellant submitted information concerning structures like the proposed tower and if the structure would or would not attract lightening to the area. Submitted materials indicate

that the proposed tower would not attract additional lightening to the area.

The wireless communications service facilities (WC 16.04.125 Section 2: Development Standards) of the City of Westfield zoning ordinance mention that "all utility buildings and structures accessory to the antenna support must be architecturally designed to blend into the surrounding area." No options were submitted on blending the tower and buildings into the surroundings. Dillion Park, for example in Noblesville has camouflaged a cell tower into a large flag pole and located that structure into the center of the park (Exhibit 14).

The plans submitted have not met all the requirements of the City of Westfield Zoning Ordinance WC 16.04.125. Sections that the applicant needs to address are section WC 16.04.125 Procedural Standards. The submitted plans need to explore options listed in the City of Westfield Zoning Ordinance section WC 16.04.125 Development Standards A and Development standards E and F as found in exhibit 11. Plans also show that the equipment building will be encroaching on the rear yard setback. The setback for the property is incorrect and should read 30-foot setback. Updated plans need to be submitted to ensure that the equipment building is not located in the rear yard.

The Land Use Concept Map in the Westfield-Washington Township Comprehensive Plan recommends that this area be developed in a manner consistent with the "New Suburban" recommendations (p. 23). Cell Towers are not mentioned in the "New Suburban" section of the current Comprehensive Plan.

CRITERIA FOR SPECIAL EXCEPTION REQUEST

A Board of Zoning Appeals shall approve or deny special exceptions from the terms of the zoning ordinance. The Board may impose reasonable conditions as a part of its approval. A special exception may be approved under IC 36-7-4-918.4 only upon a determination in writing that:

1. The establishment, maintenance, or operation of the special exception will not be detrimental to or endanger the public health, safety, morals, or general welfare:

Finding: Granting a special exception for a cell tower would be injurious to the public health, safety, morals, and general welfare of the community. Encroachment into the adjacent regulated drain has not been approved from the Hamilton County Surveyor's Office. Drainage Board approval to locate the proposed tower and accessory structure has not been granted. Staff concerns about the fall zone of the proposed cell tower and the relationship to a nearby boat repair building have not been addressed.

2. The special exception will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property value within the neighborhood:

Finding: The special exception will not be injurious to the use and enjoyment of other property in the immediate vicinity or diminish and impair property value. The appellant has submitted material that demonstrates that cell towers do not reduce or impair the development of property.

3. The establishment of the special exception will not impede the normal and orderly development and improvement of surrounding property for uses permitted in the district:

Finding: The appellant has submitted material that demonstrates that cell towers do not reduce or impair the normal and orderly development of property.

4. Adequate utilities, streets, drainage, and other necessary facilities have been or are being provided:

Finding: Adequate utilities, streets, drainage and other necessary facilities are required. The appellant has agreed to provide a 20-foot wide access drive turnaround as requested by the Westfield Fire Department. Parking for the facility is not illustrated on the submitted plans.

5. Adequate measures have been or will be taken to provide ingress and egress designed to minimize traffic congestion:

Finding: Adequate measures have been taken to provide ingress and egress for acceptable traffic.

6. The special exception will be located in a district where such use is permitted and that all other requirements set forth, applicable to such special exception, will be met:

Finding: The site is zoned AG-SF1, which by Special Exception does allow for "Radio, facsimile, TV and microwave towers". The appellant has not met all the requirements or explored all the options set forth in the Wireless Communications Service Facilities section of the City of Westfield zoning ordinance.

RECOMMENDATION
Deny this request based on the findings 1, 4 and 6 of this report.

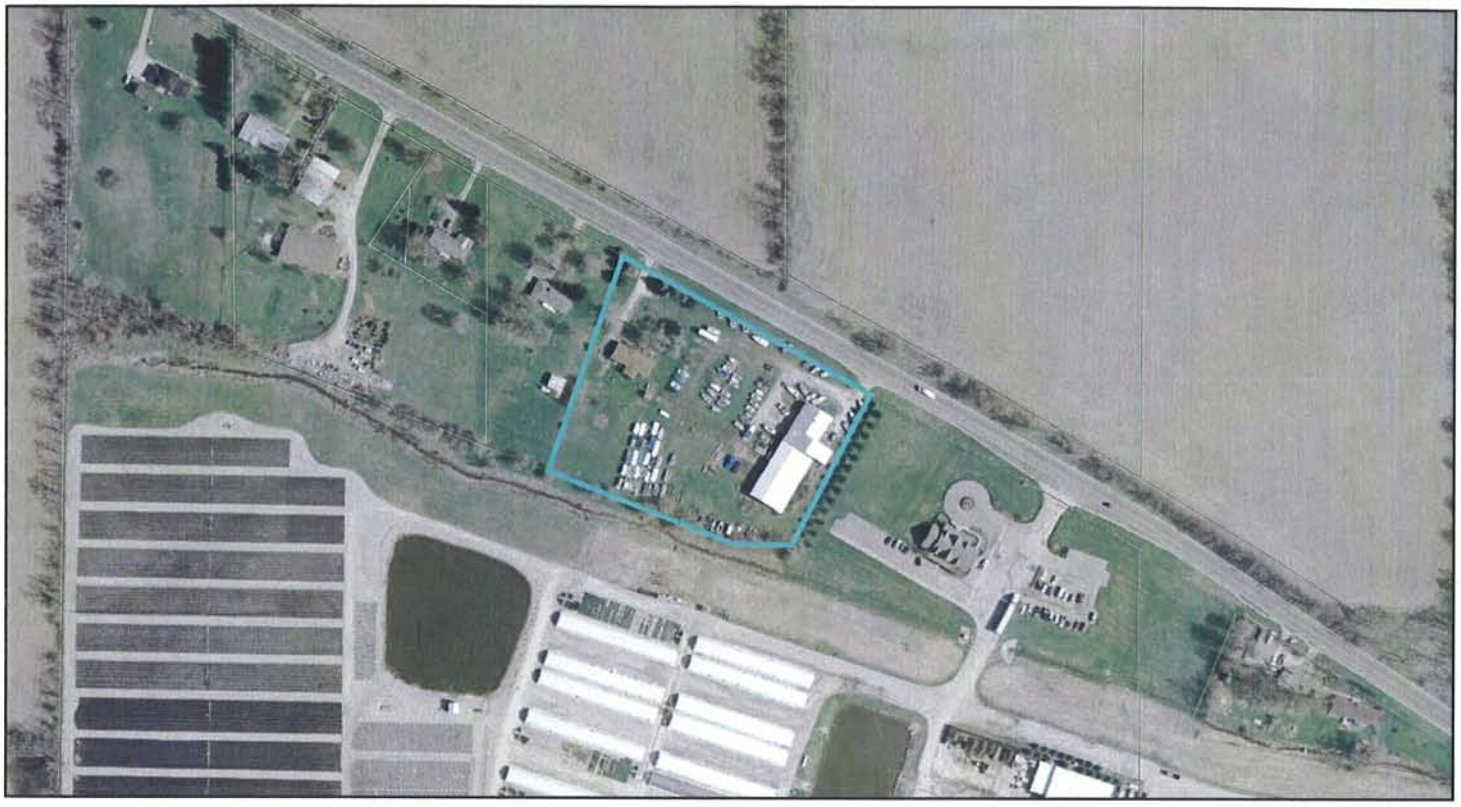
****
JCM

0810-SE-02
08-06-20-00-00-008.000
4909 Sheridan Road
Exhibit 2

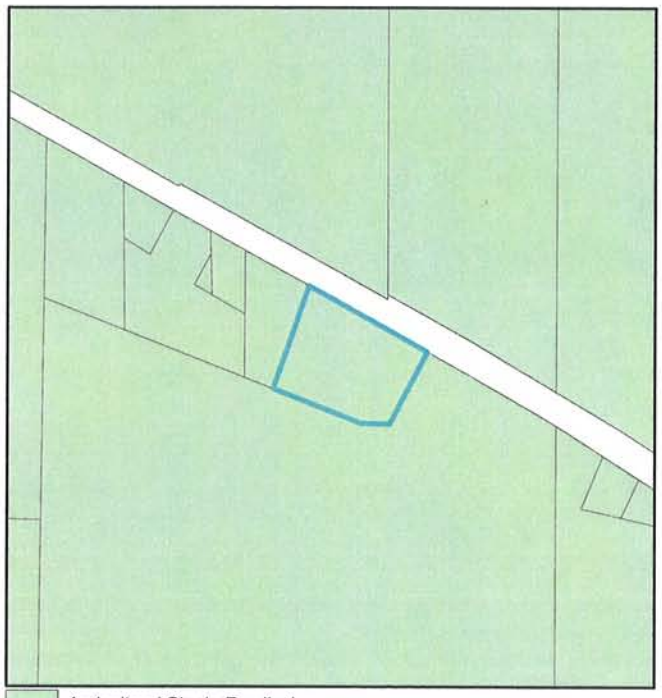
N
W E
S
Not To Scale

Aerial Location Map

Site

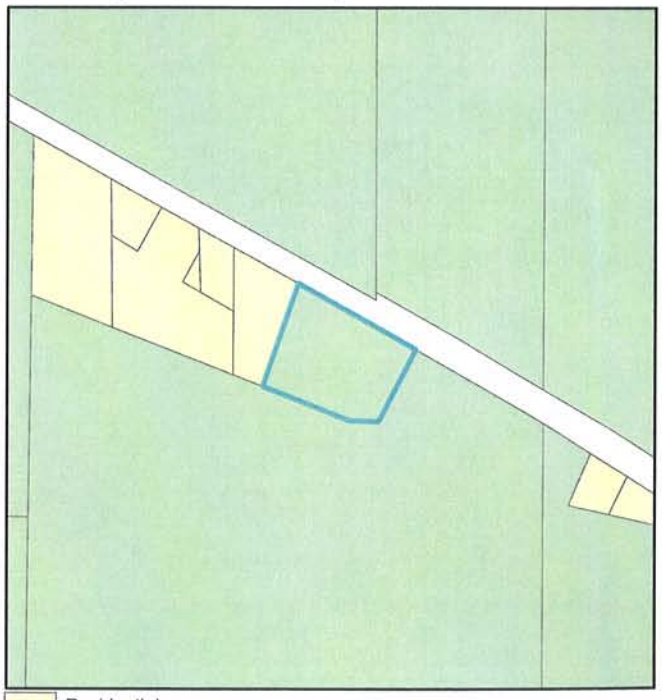


Zoning Map



Agricultural Single Family 1

Existing Land Use Map



Residential

Agriculture

L:\West_GIS\Planning\Petitions\BZA\0810-SE-02.mxd (October 7, 2008)

EXHIBIT 3

co.HAMILTON.in.us
Official government site of Hamilton County, Indiana

Online Services

Property Card Report

1. report type: Reset
2. property search: new search
3. view reports: general parcel info. | spring tax statement | tax payments | property card | fall tax statement

Disclaimer:
This program allows you to view and print certain public records. **Each report reflects information as of a specific date**; so the information provided by different reports may not match. All information has been derived from public records that are constantly undergoing change and is not warranted for content or accuracy. It may not reflect the current information pertaining to the property of interest.

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Any, and all information contained on this web site report is the result of assessment data extracted on the most recent taxable year - **March 1, 2007**. Improvement characteristics may differ from those used to determine the total assessed value listed.

Summary Information - Parcel Number: 08-06-20-00-00-008.000

Property Data	
Parcel Location	5005 SHERIDAN RD,NOBLESVILLE
Taxing Unit	Washington
Legal Description	273-90 AUD 1/14/
Section/Township/Range	S20 T19 R04
Subdivision Name	NULL
Lot and Block	Lot Block
Acres	3.465
Effective Frontage	
Effective Depth	
Property Class	Commercial Other structure
Exterior Features and Out Buildings	
1 Small Shop, 1 Lean-To, 1 No structure, 1 Barn, 1 Barn, 1 Mobile Home, 1 Utility Shed, 2 Open Frame Porch,	

Property Owner as of April 30, 2007	
Campbell, Charles P	
Most Recent Valuation as of March 1, 2007	
Assessed Value: Land	109300
Assessed Value: Improvements	145500
Total Assessed Value:	254800

Building 1, Card ID R02

Physical Characteristics	
Story Height	1.0
Attic	none
Basement	none
Crawl	none
Year Built	1988
Floor Construction	
Floor Finish	
Exterior Cover	
Interior Finish	

Accomodations	
Finished Rooms	0
Bedrooms	0
Heating and Air Conditioning	
Primary Heat	YES
Air Conditioning	YES
Plumbing	
Full Baths	1
Partial Baths	0
Fireplace	
Fireplace Stacks	NO
Basement Rec Room	
Rec Room Type	
Rec Room Square Footage	0
Area/Square Footage (based on exterior eave to eave area)	

Building Level	Base Area	Approx. Finished Area
Garage		
Garage Type		
Garage Square Footage	0	

This application is developed and maintained by the Information System Services Department. If you have any questions or comments, please contact the Webmaster.
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EXHIBIT 4

TOWN OF WESTFIELD, INDIANA

RECEIVED
SEP 16 2008
DEVELOPMENT

Petition Number: 08 10 SE 02
Date of Filing: 9-16-08

Application for SPECIAL EXCEPTION
Westfield – Washington Township
Board of Zoning Appeals (BZA)

This application must be completed and filed with the Community Services Department of the Town of Westfield, Indiana in accordance with the meeting schedule.

1. Applicant's Name: New Cingular Wireless PCS, LLC. AT&T Mobility
   Attn.: Jeffery W. Kellerman
   Address: 900 E. 96th Street Suite 500
   Indianapolis, Indiana 46280
   Telephone Number: _____

2. Landowner's Name: Charles P. Campbell, AMF Powerboats, Inc.
   Address: 4909 Sheridan Road (State Road 38)
   Noblesville, Indiana 46062
   Telephone Number: _____

3. *Representative: Jason Riggs, Fortune Wireless, Inc.
   *Address: 6402 Corporate Drive
   Indianapolis, Indiana 46278
   *Telephone Number: _____

*If the applicant is not presenting a petition, please provide contact information for the party representing the applicant.

4. Common description of property (address, location, etc.)
   4909 Sheridan Road (State Road 38), Hamilton County, Westfield Township, AMF Powerboat Storage and Repair; property on all 4 sides are zoned as AG-SF1 (Agricultural – Single Family); Elevation: 895'

5. Legal description of property (list below or attach)
   See attached Exhibit A

6. Complete description of the nature of the special exception applied for:

   Wireless Communications Zoning Ordinance 16.04.125 B 1 Wireless Communications Service Facilities and pursuant Westfield Zoning Ordinance 16.04.030 (B)(2) requiring a Special Exception for communication towers in districts zoned as AG-SF1 (Agricultural – Single Family), 150' Monopole, plus additional 10' Lightning rod; 11'-5"X 20' "unstaffed" communication equipment building; Elevation AGL – 1045' [*see attached* more detailed description of nature of the special exception]

7. **ALL SITE PLANS SHALL BE LEGIBLE AND DRAWN TO SCALE.** Site plans must accompany this application and must depict at a minimum:

a. Lot(s) shape and dimensions;

b. Location and dimensions of existing and proposed structures;

c. Location and dimensions of existing and proposed points of ingress and egress; and

d. All topographic and natural features and/or other unusual characteristics associated with the property.

8. The Applicant must address the following criteria and establish at the public hearing that each of the following is true in order to obtain a favorable determination from the BZA.

No special exception shall be granted unless the BZA finds all of the following to be true:

a. The establishment, maintenance, or operation of the special exception will not be detrimental to or endanger the public health, safety, morals, or general welfare:

Because the proposed construction of a wireless communications monopole antenna structure to a height of 150' (plus additional 10' lighting rod) and 11'5" X 20' "unstaffed", automated equipment building will not create air, water, or noise pollution, unsanitary conditions, surface drainage problems, environmental nuisances, threats to morality or public safety, or other objectionable characteristics offensive to the community. No local water areas are located in the site area pursuant to WC 160.04.125 2 D. The proposed wireless communication facility will permit reliable wireless telecommunication service, which can be used in emergencies, including the use of E-911.

b. The special exception will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property value within the neighborhood:

Because the surrounding site area, as well as the site itself, is zoned as AG-SF1. This zone is described as Agricultural – Single Family, meaning large-lot single homes. The proposed site is the least objectionable site available which still meets system engineering requirements. The site has been placed in such a way that it is more than the called for setbacks away from any surrounding properties. Only a visual impact will be assessed with construction of the wireless communications tower and building. This tower will be used for the sole purpose of providing greater wireless coverage and service to ifs consumers in the surrounding area. Also the proposed tower will comply with ANSI structural standards, which will make the tower structurally stable. The proposed wireless communication facility will permit reliable wireless telecommunication service, which can be used in emergencies, including the use of E-911. The proposed site will not create air, water, or noise pollution, unsanitary conditions, surface drainage problems, environmental nuisances, threats to morality or public safety, or other objectionable characteristics offensive to the community.

c. The establishment of the special exception will not impede the normal and orderly development and improvement of surrounding property for uses permitted in the district:

Because this wireless communications facility will provide a valuable resource to the community. It will be placed on a site location within required setbacks limits to allow for normal development and improvement of the surrounding area under the current ordinance.

d. Adequate utilities, streets, drainage, and other necessary facilities have been or are being provided:

Both electric and telecommunications are adequate at the site area as both utilities are currently located on the property. Water/sewage will not need to be used for the proposed use. Site does not need daily manned service.

e. Adequate measures have been or will be taken to provide ingress and egress designed to minimize traffic congestion:

The entrance to AMF Powerboats, Inc. will be used as an existing access (12' X 200') to the site with provided consent of owner. Site will only need to be accessed from time to time for periodic maintenance and emergency purposes once site is constructed.

f. The special exception will be located in a district where such use is permitted and that all other requirements set forth, applicable to such special exception, will be met:

The current AG-SF1 zoning classification permits special exception for wireless communication facilities such as proposed.

The Applicant hereby certifies that the information contained in and accompanying this application is true and correct.

Applicant

SUBSCRIBED AND SWORN TO ME THIS 16th DAY OF September, 2008.

Lena Diana Long
Notary Public

LENA DIANA LONG
NOTARY PUBLIC
SEAL
STATE OF INDIANA
MY COMMISSION EXPIRES April 07, 2016

My commission expires: April 7, 2016

EXHIBIT A

Part of the Northwest Quarter of Section 20, Township 19 North, Range 4 East in Hamilton County, Indiana, more particularly described as follows:

Commencing at the Southeast corner of the Northwest Quarter of Section 20, Township 19 North, Range 4 East; thence Westerly on and along the South line thereof 1080.6 feet; thence Northerly on a forward deflection angle of 89 degrees 21 minutes right (89 degrees 18 minutes measured) 1583.4 feet over found iron pipes to the centerline of State Road 38 as now located; thence Southeasterly on and along said centerline on a forward deflection angle of 118 degrees 54 minutes right (118 degrees 36 minutes measured) 264 feet to the Beginning point of this description; thence Southeasterly on and along a continuation of the last described course and said centerline 460.5 feet (481.1 feet measured); thence Southwesterly on a forward deflection angle of 91 degrees 47 minutes right (88 degrees 02 minutes measured) on and along an existing fence line 312.2 feet; thence Westerly on a forward deflection angle of 55 degrees 28 minutes right (61 degrees 01 minutes measured) 102.0 feet (103.2 feet measured) to an existing corner post; thence Northwesterly on a forward deflection angle of 24 degrees 48 minutes right (23 degrees 22 minutes measured) 330.5 feet; thence Northeasterly on a forward deflection angle of 87 degrees 09 minutes right 415.65 feet to the beginning point; containing 3.91 acres, more or less.

Except:

A part of the Northwest Quarter of Section 20, Township 19 North, Range 4 East, Hamilton County, Indiana, and being that part of the Grantor's land lying within the right of way lines described as follows:

Commencing at the Southeast corner of said Quarter Section; thence Westerly 1080.6 feet along the South line of said Quarter Section; thence Northerly on a forward deflection angle of 89 degrees 21 minutes right (89 degrees 18 minutes measured) 1583.4 feet to the center line of State Road 38; thence Southeasterly on and along said center line on a forward deflection angle of 118 degrees 54 minutes right (118 degrees 36 minutes measured) 264 feet to the point of Beginning of this description (angles and distances quoted from Instrument No. 9031113); thence South 61 degrees 15 minutes 33 seconds East 479.26 feet (481.1 feet by Instrument No. 9031113) along the center line of said State Road 38 to the Northeast corner of the Grantor's land; thence South 26 degrees 48 minutes 41 seconds West 40.14 feet along the Eastern line of the Grantor's land to the Southwestern boundary of said State Road 38; thence North 61 degrees 11 minutes 21 seconds West 473.33 feet along the boundary of said State Road 38 to the Western line of the Grantor's land; thence North 18 degrees 18 minutes 39 seconds East 40.20 feet along said Western line to the point of beginning and containing 0.435 acres, more or less, inclusive of the presently existing right of way which contains 0.435 acres, more or less. The portion of the above described real estate, which is not already embraced within

present existing right of way, contains 0.000 acres, more or less. All bearings in this description which are not quoted from previous instruments are based on the bearing system for State Highway Project STP-5229(008).

For information purposes Only:

Common Address:	5005 Sheridan Road a/k/a 4909 Sheridan Road, Noblesville, Indiana 46062
Tax Parcel Number:	08-06-20-00-00-008.000
TSLLC File #:	05100212

4909 Sheridan Road, Noblesville, IN 46062

DETAILED DESCRIPTION OF THE PROPOSED SPECIAL EXCEPTION VARIANCE

New Cingular Wireless PCS, LLC, Petitioner, is a public utility licensed by the Federal Communications Commission (FCC), and certified by the Indiana Utility Regulatory Commission (IURC) pursuant to Indiana Code § 8-1-2-88, to provide commercial mobile radio communication public utility (cellular) service in the Noblesville and Westfield, Indiana community. As a public utility, Petitioner is required by law to provide adequate and reliable cellular mobile radio telecommunications service to the public which, in turn, requires the construction and operation of communications transmitting and receiving antennas throughout its service area at locations dictated by customer use and cellular system engineering requirements. By this petition, Petitioner proposes to build a 150' "monopole" self-supporting cellular telephone, (plus additional 10' lightning rod), and install and maintain an adjacent fully automated 11'-5" X 20' "unstaffed" prefabricated communications equipment building on a 25' x 70' site.

A special exception is necessary as site location is currently zoned as AG-SF1 (Agricultural – Single Family) and appropriate to allow Petitioner to build the proposed wireless communications antenna for the sole purpose of bringing service of wireless communications consistent with the intent and purpose of the Wireless Communications Zoning Ordinance of Westfield, Indiana rules, WC §16.04.125 (B)(1) and WC §16.04.030 (B)(2) regarding AG-SF1 zones. Zone AG-SF1 is described as an Agricultural land use area with large-lot single family homes This site location meets required 40' from property line on all sides by Westfield Wireless Communication Ordinance, WC 16.04.125 §2 (B) and meets the standard development requirements under the Westfield Zoning Ordinance for AG-SF1 zones WC §16.04.030 (B)(4-6). Currently, the site is occupied by a commercial enterprise (boat repair) as a legally existing, nonconforming use (grandfather).

Due to site zoned as AG-SF1 a special exception variance is required for construction of a wireless communications antenna at 4909 Sheridan Road (State Road 38), Noblesville, Indiana 46062. Petitioner seeks to build a wireless telecommunications tower and adjacent equipment building. The proposal will not change the general characteristics of this site or surrounding sites.

188220

WESTFIELD / WASHINGTON TOWNSHIP
BOARD OF ZONING APPEALS

CONSENT FORM

The undersigned, Charles P. Campbell, being the owner of the property commonly known as 4909 Sheridan Road (State Road 38), Noblesville, Indiana 46062 herby authorizes New Cingular Wireless PCS, LLC/AT&T Mobility and Jason Riggs, Fortune Wireless to file a land development petitions necessary for the aforementioned address.

This consent shall remain in effect until revoked by a written statement filed with the Westfield / Washington Township Board of Zoning Appeals.

Chas. P. Campbell

Charles P. Campbell
Property Owner

Jason Riggs

Witness

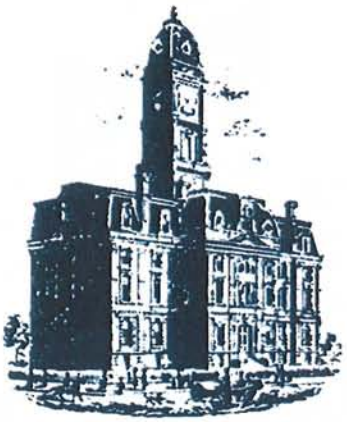
9\15\08

Date

9/15/08

Date

EXHIBIT 5



SURVEYOR'S OFFICE

Hamilton County

Kenton C. Ward, CFM
Surveyor of Hamilton County
Phone (317) 776-8495
Fax (317) 776-9628

Suite 188
One Hamilton County Square
Noblesville, Indiana 46060-2230

September 25, 2008

Fortune Wireless, Inc.
ATTN: Jason Riggs
6402 Corporate Drive
Indianapolis, IN. 46278
VIA E-MAIL: jriggs@ffi.net

RE: 4909 Sheridan Road – Proposed Wireless Communications Tower

Dear Mr. Riggs:

We have reviewed the BZA variance request submitted to the Hamilton County Surveyor's Office on September 18, 2008, for this project and have the following comments:

1. The proposed project falls in the unincorporated area and MS4 jurisdiction of Hamilton County.

2. The proposed project DOES NOT fall in a Westfield Wellhead Protection Zone.

3. The proposed project falls in the Beals and Cox Regulated Drain Watershed.

4. Hamilton County Surveyor's Office can not determine if the proposed location for the wireless communications tower falls in the Beals and Cox Regulated Drain easement based on the provided information. Please provide a stamped survey of the site that shows the statutory 75 foot easement from the top of bank of the Beals and Cox Regulated Drain and the relationship of this project to that existing easement. Until this is provided, Hamilton County Surveyor's Office can not provide any type of recommendation to the City of Westfield Community Development Department or allow the tower to be placed in our easement.

5. If your leased area and tower are found to be in the Beals and Cox Regulated Drain easement and you wish to move forward with this proposed plan, please contact me immediately be begin the non-enforcement (encroachment) permit process. This would fall under Indiana Code 36-9-27-33 and will require written consent of the Hamilton County Drainage Board.

6. Please note that further comments may be necessary at a later date.

Should you have any questions, I can be reached at 317-776-8495.

Sincerely,

Greg Hoyes

Greg Hoyes, AC, CFM
Plan Reviewer

CC: Donna Luley – Westfield Public Works
Al Salzman – City of Westfield
Kevin Todd – City of Westfield
Sandy Landrum - INDOT
Dave Lucas – HCHD

Exhibit C

Kevin M. Todd, AICP

From: Greg Hoyes [grh@co.hamilton.in.us]
Sent: Monday, October 06, 2008 1:30 PM
To: Jason Riggs
Cc: Jeremy Miller; Kevin M. Todd, AICP
Subject: Re: Fw: IN0318

Jason

I talked to the County Surveyor this morning and our office will give a positive recommendation to a non-enforcement permit (encroachment) for the cell tower. Here is a link to the permit you will need to file: http://www.co.hamilton.in.us/upload/contents/308/nonenftract.pdf. We will grant an encroachment for approximately 30 feet into the easement, so the information for the middle of the page is "The Board.....distance of 45 feet from the north side of the top of bank....." Also, under other conditions, put "For encroachment of wireless communications tower and all accessories including utilities, foundation, equipment buildings, fencing, and landscaping" or something similar. We will not allow landscaping on the south side of the fence (increased encroachment) but the other three sides are fine. An authorized representative of your company will need to sign as the applicant, and the PROPERTY OWNER will need to sign as the co-applicant, as this is binding upon the parcel. The fee will need to be submitted along with the request and the will be passed along to our Permits Inspector for presentation to the Drainage Board. This does not guarantee approval, as the final decision is made by the Drainage Board. If you have this submitted to me in proper form by 10-20-08, it will be presented at the Drainage Board meeting on 10-27-08. If you have any questions, please let me know.

Greg Hoyes
HCSO Plan Reviewer

>>> "Jason Riggs" <jason.riggs@pdhinc.com> 12:58 PM Friday, October 03,
>>> 2008 >>>
Greg,

Please find attached the revised drawings and survey. It looks like we are within the 75' drainage easement. I would like to know what the next step in the process would be to get an encroachment permit.

Please let me know at your earliest convenience.

Thanks,

Jason Riggs
317-281-9451

----- Original Message -----
From: Jason Riggs
To: ktodd@westfield.in.gov <ktodd@westfield.in.gov>
Sent: Fri Oct 03 10:52:58 2008
Subject: FW: IN0318

Here are the drawings, I will be dropping them off today along with the LO signed commitment that the Fire Chief requested.

Thanks,

Jason Riggs
Project Manager
Site Development Services
Fortune Wireless, Inc.
A Subsidiary of Fortune Industries, Inc.
6402 Corporate Drive
Indianapolis, IN 46278
Cell: 317-281-9451
Fax: 317-471-1234
Email: jriggs@ffi.net

-----Original Message-----
From: Vikki Malbone [mailto:vmalbone@gpdgroup.com]
Sent: Friday, October 03, 2008 10:45 AM
To: Jason Riggs
Cc: Traci Preble; Lee Barker

EXHIBIT 7

WESTFIELD / WASHINGTON TOWNSHIP
WESTFIELD FIRE DEPARTMENT

COMMITMENT FORM

I, Charles P. Campbell, being the owner of the property commonly known as 4909 Sheridan Road (State Road 38), Noblesville, Indiana 46062 herby commit to keep the 20' access to the Wireless Communication facility clear at all times including after business hours.

Chas. P. Campbell

Charles P. Campbell
Property Owner

Jason Riggs

Witness

10\3\08

Date

10-3-08

Date

EXHIBIT 8

WESTFIELD PUBLIC WORKS

BOARD OF PUBLIC WORKS
J. ANDREW COOK, MAYOR
JOHN B. HART, BOARD MEMBER
MARK HEIRBRANDT, BOARD MEMBER

CHIEF ADMINISTRATIVE OFFICER
BRUCE A. HAUK

DIRECTOR OF PUBLIC WORKS
KURT J. WANNINGER

September 19, 2008

GPD Associates.
Attn: Mr. David Granger, P.E.
8275 Allison Pointe Trail, Ste 220
Indianapolis, IN 46250

RE: AT & T 4904 Sheridan Road Rezone Review

Dear Mr. Granger:

The Westfield Public Works Department has reviewed the proposed rezone plans for the above project and offers the following comments:

1. Please recognize that all infrastructures shall be installed in accordance with the Town of Westfield's Utility and Infrastructure Construction Standards, which can be found on our website at www.westfield.in.gov under Development/Construction.

2. 110% performance bonds for all public infrastructures will be required before any construction commences. All easements shall be recorded before approval of construction plans.

3. The estimated water and sanitary availability/connection fees will be calculated according to the Project Information Sheet. This does not include fire or irrigation fees.

4. It is the developer's responsibility to notify IDEM if there are any wetlands on the project site.

5. Please show all telephone poles, pedestal/utility boxes and trees or other obstructions that are located in the right of way. Right of way width will match the current thoroughfare plan which is 75' ½ right of way and should be dedicated to the City.

These review comments, submitted plans, and TAC meeting do not constitute approval for construction by the Westfield Public Works Department.

I thank you in advance for your cooperation and efforts to move this development along successfully. If you should have any questions or concerns regarding my comments or the above information, please call me at the below listed number.

Sincerely,

Donna Luley
Plan Review Coordinator
Development/Construction
dluley@westfield.in.gov

Exhibit 9

Tower
N Raceway Rd
W 52nd St
© 2008 Tele Atlas
Google
Pointer 39°50'43.63" N 86°19'42.51" W elev 863 ft
Streaming 100%
Eye alt 2257 ft

155' from house
Tower
Plum Creek Blvd
Prelude Ln
Hazel Dell Pkwy
Opus Dr
Stanwich Pl
Honors Dr
Cerromar Ct
Sandalwood
E 126th St
Autumn Gate Way
Pebble Allaseam Dr
© 2008 Tele Atlas
Google
Pointer 39°58'20.01" N 86°04'07.58" W elev 751 ft
Streaming 100%
Eye alt 2891 ft

Coventry Cr
Brooks St
Scotland St
Mimosa Dr
Colonial Cr
Potters Pike
Noblet Cr
Woodacre Blvd S Dr
Amber Ln
Windward Dr
Keevers Dr
2 towers that were built on a old farm prior to the home additions going up.
Independence Ave
N Raceway Rd
W 52nd St
Armstead Ave
Nassau St
Eaglemeadow Dr
© 2008 Tele Atlas
Google
Pointer 39°50'46.19" N 86°19'45.51" W elev 863 ft
Streaming 100%
Eye alt 6347 ft

Monticello Square Ln
Jamestown Square
Raceway Rd
Independence Ave
147' from house
Tower
© 2008 Tele Atlas
Google
Pointer 39°50'54.31" N 86°19'46.68" W elev 860 ft
Streaming 100%
Eye alt 2257 ft

Fortune Wireless, Inc.
A Subsidiary of
Fortune Industries, Inc.

AT&T Mobility Presentation Booklet

Site #: IN0318
Site Name: SR 38 & Hinkle Rd
Presented To: Town of Westfield, IN
Presented By: Jason Riggs/Fortune Wireless

RECEIVED
SEP 16 2008

TABLE OF CONTENTS

1. Application for Special Exception.

2. Street Map & Topo Map showing proposed site location.

3. FEMA Map showing proposed site location.

4. Tax Map showing proposed site location.

5. Zoning Map showing proposed site location.

6. Aerial Maps (3) Proposed Site, Parcel of Proposed Site, & Aerial Site Sketch (Not to Scale).

7. Directional Photos of the proposed site.

8. Existing structures synopsis & photos.

   I. T-Mobile

   II. Westfield Water Tower

   III. Electrical Towers.

9. RF Propagation Maps.

10. Site Plan.

Petition Number: _____
Date of Filing: _____

Application for SPECIAL EXCEPTION
Westfield – Washington Township
Board of Zoning Appeals (BZA)

This application must be completed and filed with the Community Services Department of the Town of Westfield, Indiana in accordance with the meeting schedule.

1. Applicant's Name: New Cingular Wireless PCS, LLC. AT&T Mobility
   Attn.: Jeffery W. Kellerman
   Address: 900 E. 96th Street Suite 500
   Indianapolis, Indiana 46280
   Telephone Number: (317) 581-2507

2. Landowner's Name: Charles P. Campbell, AMF Powerboats, Inc.
   Address: 4909 Sheridan Road (State Road 38)
   Noblesville, Indiana 46062
   Telephone Number: (317) 877-0802

3. *Representative: Jason Riggs, Fortune Wireless, Inc.
   *Address: 6402 Corporate Drive
   Indianapolis, Indiana 46278
   *Telephone Number: (317) 281-9451

*If the applicant is not presenting a petition, please provide contact information for the party representing the applicant.

4. Common description of property (address, location, etc.)
   4909 Sheridan Road (State Road 38), Hamilton County, Westfield Township, AMF Powerboat Storage and Repair; property on all 4 sides are zoned as AG-SF1 (Agricultural – Single Family); Elevation: 895'

5. Legal description of property (list below or attach)
   See attached Exhibit A

6. Complete description of the nature of the special exception applied for:

   Wireless Communications Zoning Ordinance 16.04.125 B 1 Wireless Communications Service Facilities and pursuant Westfield Zoning Ordinance 16.04.030 (B)(2) requiring a Special Exception for communication towers in districts zoned as AG-SF1 (Agricultural – Single Family), 150' Monopole, plus additional 10' Lightning rod; 11'-5"X 20' "unstaffed" communication equipment building; Elevation AGL – 1045' [*see attached* more detailed description of nature of the special exception]

7. **ALL SITE PLANS SHALL BE LEGIBLE AND DRAWN TO SCALE.** Site plans must accompany this application and must depict at a minimum:

a. Lot(s) shape and dimensions;

b. Location and dimensions of existing and proposed structures;

c. Location and dimensions of existing and proposed points of ingress and egress; and

d. All topographic and natural features and/or other unusual characteristics associated with the property.

8. The Applicant must address the following criteria and establish at the public hearing that each of the following is true in order to obtain a favorable determination from the BZA.

No special exception shall be granted unless the BZA finds all of the following to be true:

a. The establishment, maintenance, or operation of the special exception will not be detrimental to or endanger the public health, safety, morals, or general welfare:

Because the proposed construction of a wireless communications monopole antenna structure to a height of 150' (plus additional 10' lighting rod) and 11'5" X 20' "unstaffed", automated equipment building will not create air, water, or noise pollution, unsanitary conditions, surface drainage problems, environmental nuisances, threats to morality or public safety, or other objectionable characteristics offensive to the community. No local water areas are located in the site area pursuant to WC 160.04.125 2 D. The proposed wireless communication facility will permit reliable wireless telecommunication service, which can be used in emergencies, including the use of E-911.

b. The special exception will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property value within the neighborhood:

Because the surrounding site area, as well as the site itself, is zoned as AG-SF1. This zone is described as Agricultural – Single Family, meaning large-lot single homes. The proposed site is the least objectionable site available which still meets system engineering requirements. The site has been placed in such a way that it is more than the called for setbacks away from any surrounding properties. Only a visual impact will be assessed with construction of the wireless communications tower and building. This tower will be used for the sole purpose of providing greater wireless coverage and service to ifs consumers in the surrounding area. Also the proposed tower will comply with ANSI structural standards, which will make the tower structurally stable. The proposed wireless communication facility will permit reliable wireless telecommunication service, which can be used in emergencies, including the use of E-911. The proposed site will not create air, water, or noise pollution, unsanitary conditions, surface drainage problems, environmental nuisances, threats to morality or public safety, or other objectionable characteristics offensive to the community.

c. The establishment of the special exception will not impede the normal and orderly development and improvement of surrounding property for uses permitted in the district:

Because this wireless communications facility will provide a valuable resource to the community. It will be placed on a site location within required setbacks limits to allow for normal development and improvement of the surrounding area under the current ordinance.

d. Adequate utilities, streets, drainage, and other necessary facilities have been or are being provided:

Both electric and telecommunications are adequate at the site area as both utilities are currently located on the property. Water/sewage will not need to be used for the proposed use. Site does not need daily manned service.

e. Adequate measures have been or will be taken to provide ingress and egress designed to minimize traffic congestion:

The entrance to AMF Powerboats, Inc. will be used as an existing access (12' X 200') to the site with provided consent of owner. Site will only need to be accessed from time to time for periodic maintenance and emergency purposes once site is constructed.

f. The special exception will be located in a district where such use is permitted and that all other requirements set forth, applicable to such special exception, will be met:

The current AG-SF1 zoning classification permits special exception for wireless communication facilities such as proposed.

The Applicant hereby certifies that the information contained in and accompanying this application is true and correct.

Applicant

SUBSCRIBED AND SWORN TO ME THIS 16th DAY OF September, 2008.

Lena Diana Long
Notary Public

LENA DIANA LONG
NOTARY PUBLIC
SEAL
STATE OF INDIANA
MY COMMISSION EXPIRES April 07, 2016

My commission expires: April 7, 2016

EXHIBIT A

Part of the Northwest Quarter of Section 20, Township 19 North, Range 4 East in Hamilton County, Indiana, more particularly described as follows:

Commencing at the Southeast corner of the Northwest Quarter of Section 20, Township 19 North, Range 4 East; thence Westerly on and along the South line thereof 1080.6 feet; thence Northerly on a forward deflection angle of 89 degrees 21 minutes right (89 degrees 18 minutes measured) 1583.4 feet over found iron pipes to the centerline of State Road 38 as now located; thence Southeasterly on and along said centerline on a forward deflection angle of 118 degrees 54 minutes right (118 degrees 36 minutes measured) 264 feet to the Beginning point of this description; thence Southeasterly on and along a continuation of the last described course and said centerline 460.5 feet (481.1 feet measured); thence Southwesterly on a forward deflection angle of 91 degrees 47 minutes right (88 degrees 02 minutes measured) on and along an existing fence line 312.2 feet; thence Westerly on a forward deflection angle of 55 degrees 28 minutes right (61 degrees 01 minutes measured) 102.0 feet (103.2 feet measured) to an existing corner post; thence Northwesterly on a forward deflection angle of 24 degrees 48 minutes right (23 degrees 22 minutes measured) 330.5 feet; thence Northeasterly on a forward deflection angle of 87 degrees 09 minutes right 415.65 feet to the beginning point; containing 3.91 acres, more or less.

Except:

A part of the Northwest Quarter of Section 20, Township 19 North, Range 4 East, Hamilton County, Indiana, and being that part of the Grantor's land lying within the right of way lines described as follows:

Commencing at the Southeast corner of said Quarter Section; thence Westerly 1080.6 feet along the South line of said Quarter Section; thence Northerly on a forward deflection angle of 89 degrees 21 minutes right (89 degrees 18 minutes measured) 1583.4 feet to the center line of State Road 38; thence Southeasterly on and along said center line on a forward deflection angle of 118 degrees 54 minutes right (118 degrees 36 minutes measured) 264 feet to the point of Beginning of this description (angles and distances quoted from Instrument No. 9031113); thence South 61 degrees 15 minutes 33 seconds East 479.26 feet (481.1 feet by Instrument No. 9031113) along the center line of said State Road 38 to the Northeast corner of the Grantor's land; thence South 26 degrees 48 minutes 41 seconds West 40.14 feet along the Eastern line of the Grantor's land to the Southwestern boundary of said State Road 38; thence North 61 degrees 11 minutes 21 seconds West 473.33 feet along the boundary of said State Road 38 to the Western line of the Grantor's land; thence North 18 degrees 18 minutes 39 seconds East 40.20 feet along said Western line to the point of beginning and containing 0.435 acres, more or less, inclusive of the presently existing right of way which contains 0.435 acres, more or less. The portion of the above described real estate, which is not already embraced within

present existing right of way, contains 0.000 acres, more or less. All bearings in this description which are not quoted from previous instruments are based on the bearing system for State Highway Project STP-5229(008).

For information purposes Only:

Common Address:	5005 Sheridan Road a/k/a 4909 Sheridan Road, Noblesville, Indiana 46062
Tax Parcel Number:	08-06-20-00-00-008.000
TSLLC File #:	05100212

4909 Sheridan Road, Noblesville, IN 46062

DETAILED DESCRIPTION OF THE PROPOSED SPECIAL EXCEPTION VARIANCE

New Cingular Wireless PCS, LLC, Petitioner, is a public utility licensed by the Federal Communications Commission (FCC), and certified by the Indiana Utility Regulatory Commission (IURC) pursuant to Indiana Code § 8-1-2-88, to provide commercial mobile radio communication public utility (cellular) service in the Noblesville and Westfield, Indiana community. As a public utility, Petitioner is required by law to provide adequate and reliable cellular mobile radio telecommunications service to the public which, in turn, requires the construction and operation of communications transmitting and receiving antennas throughout its service area at locations dictated by customer use and cellular system engineering requirements. By this petition, Petitioner proposes to build a 150' "monopole" self-supporting cellular telephone, (plus additional 10' lightning rod), and install and maintain an adjacent fully automated 11'-5" X 20' "unstaffed" prefabricated communications equipment building on a 25' x 70' site.

A special exception is necessary as site location is currently zoned as AG-SF1 (Agricultural – Single Family) and appropriate to allow Petitioner to build the proposed wireless communications antenna for the sole purpose of bringing service of wireless communications consistent with the intent and purpose of the Wireless Communications Zoning Ordinance of Westfield, Indiana rules, WC §16.04.125 (B)(1) and WC §16.04.030 (B)(2) regarding AG-SF1 zones. Zone AG-SF1 is described as an Agricultural land use area with large-lot single family homes This site location meets required 40' from property line on all sides by Westfield Wireless Communication Ordinance, WC 16.04.125 §2 (B) and meets the standard development requirements under the Westfield Zoning Ordinance for AG-SF1 zones WC §16.04.030 (B)(4-6). Currently, the site is occupied by a commercial enterprise (boat repair) as a legally existing, nonconforming use (grandfather).

Due to site zoned as AG-SF1 a special exception variance is required for construction of a wireless communications antenna at 4909 Sheridan Road (State Road 38), Noblesville, Indiana 46062. Petitioner seeks to build a wireless telecommunications tower and adjacent equipment building. The proposal will not change the general characteristics of this site or surrounding sites.

WESTFIELD / WASHINGTON TOWNSHIP
BOARD OF ZONING APPEALS

CONSENT FORM

The undersigned, Charles P. Campbell, being the owner of the property commonly known as 4909 Sheridan Road (State Road 38), Noblesville, Indiana 46062 herby authorizes New Cingular Wireless PCS, LLC/AT&T Mobility and Jason Riggs, Fortune Wireless to file a land development petitions necessary for the aforementioned address.

This consent shall remain in effect until revoked by a written statement filed with the Westfield / Washington Township Board of Zoning Appeals.

Chas. P. Campbell

Charles P. Campbell
Property Owner

Jason Riggs

Witness

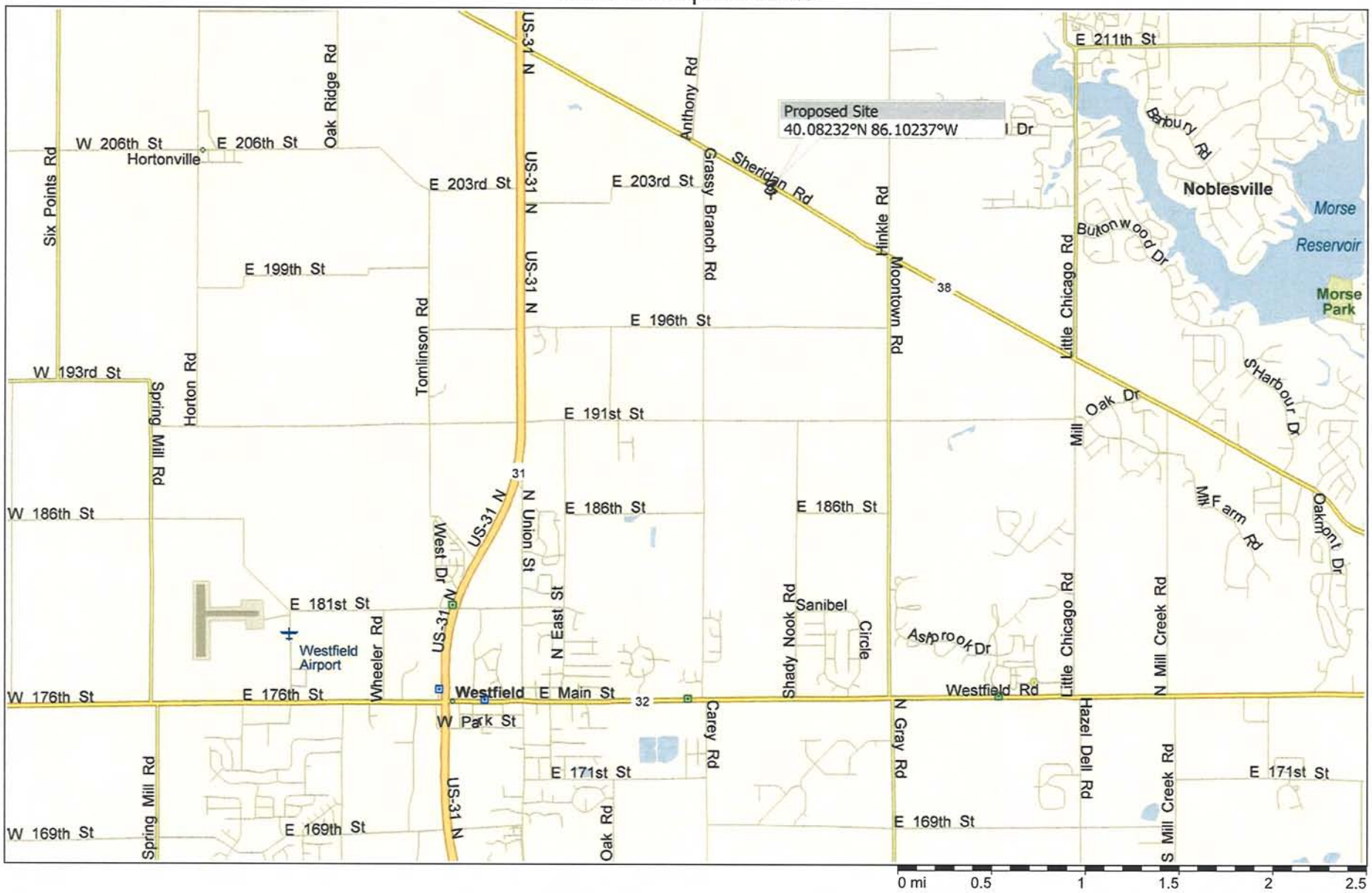
9\15\08

Date

9/15/08

Date

IN0318 Proposed Site



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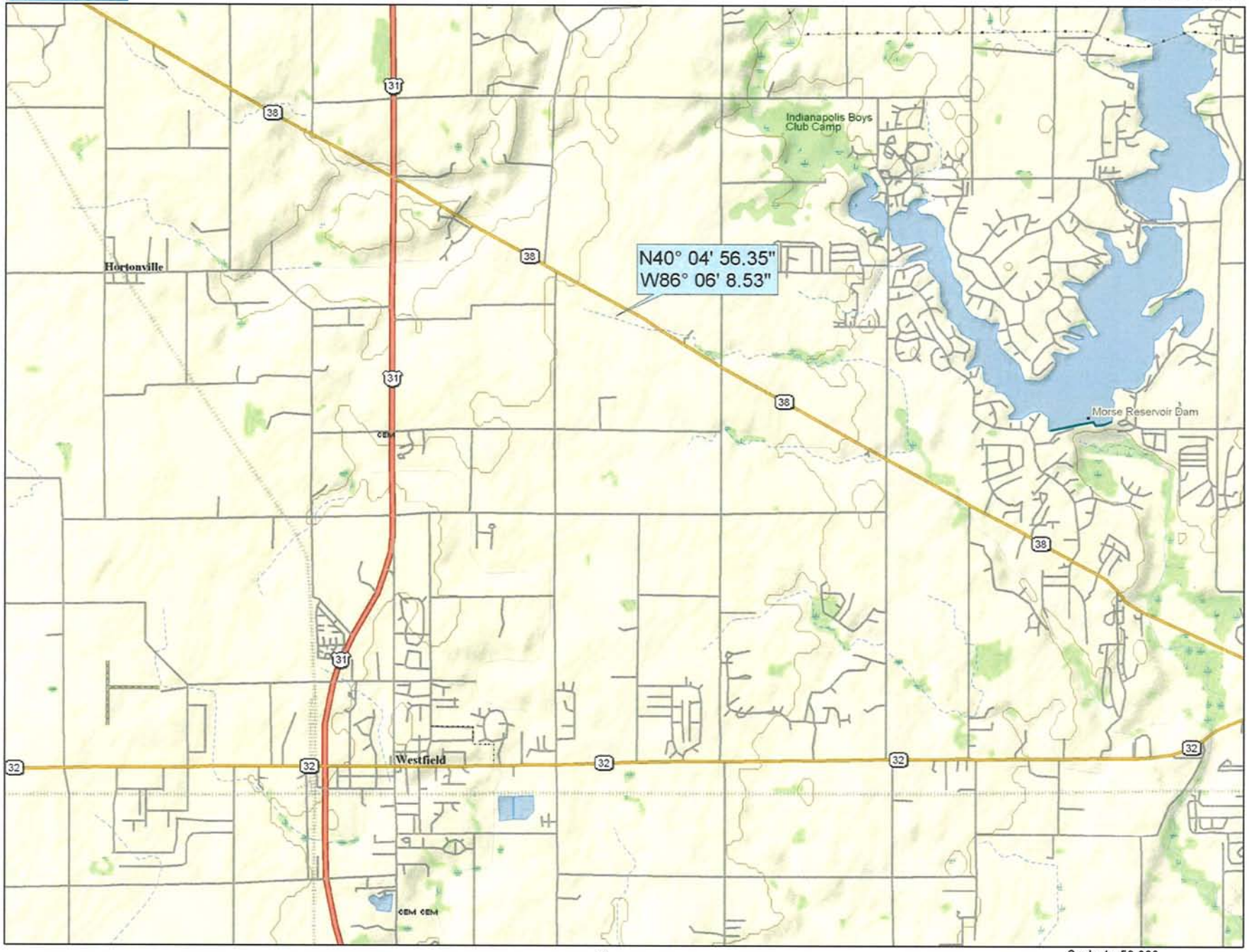
DELORME

Topo USA® 5.0



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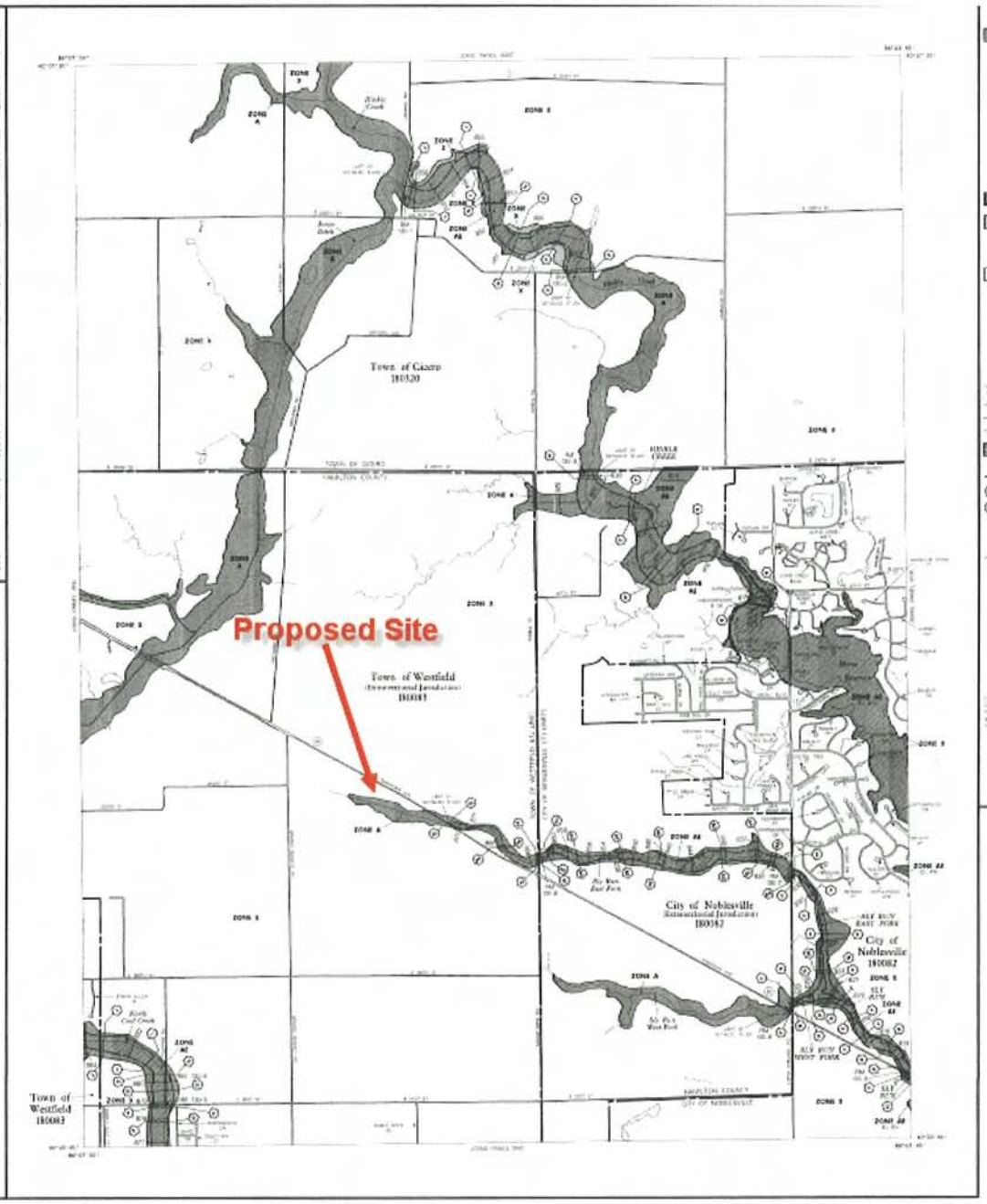
www.delorme.com

TN
MN (4.2°W)

Scale 1 : 50,000
1" = 4,166.7 ft
Data Zoom 12-0

NOTES TO USERS



LEGEND

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

HAMILTON COUNTY, INDIANA AND INCORPORATED AREAS

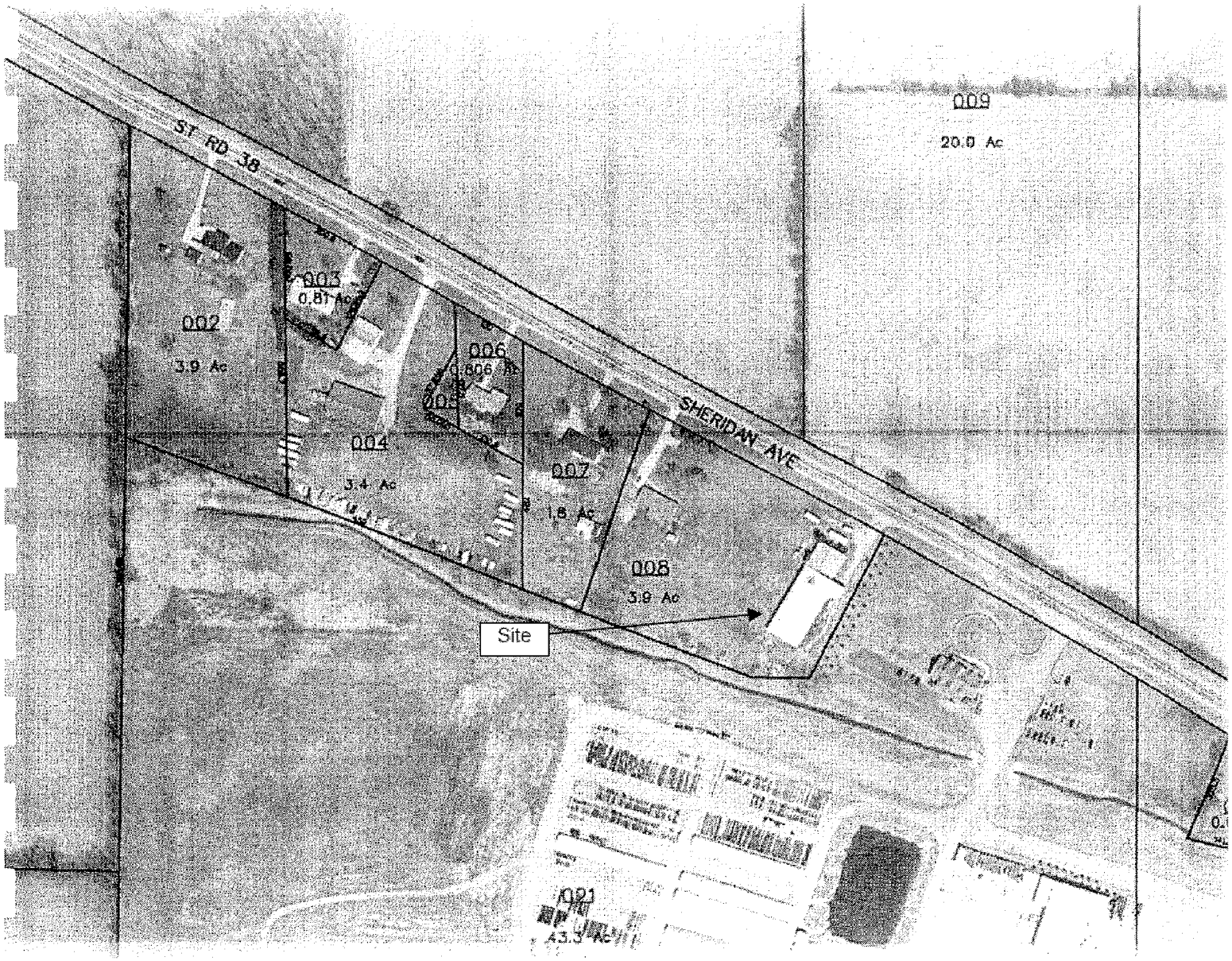
PANEL 150 OF 350

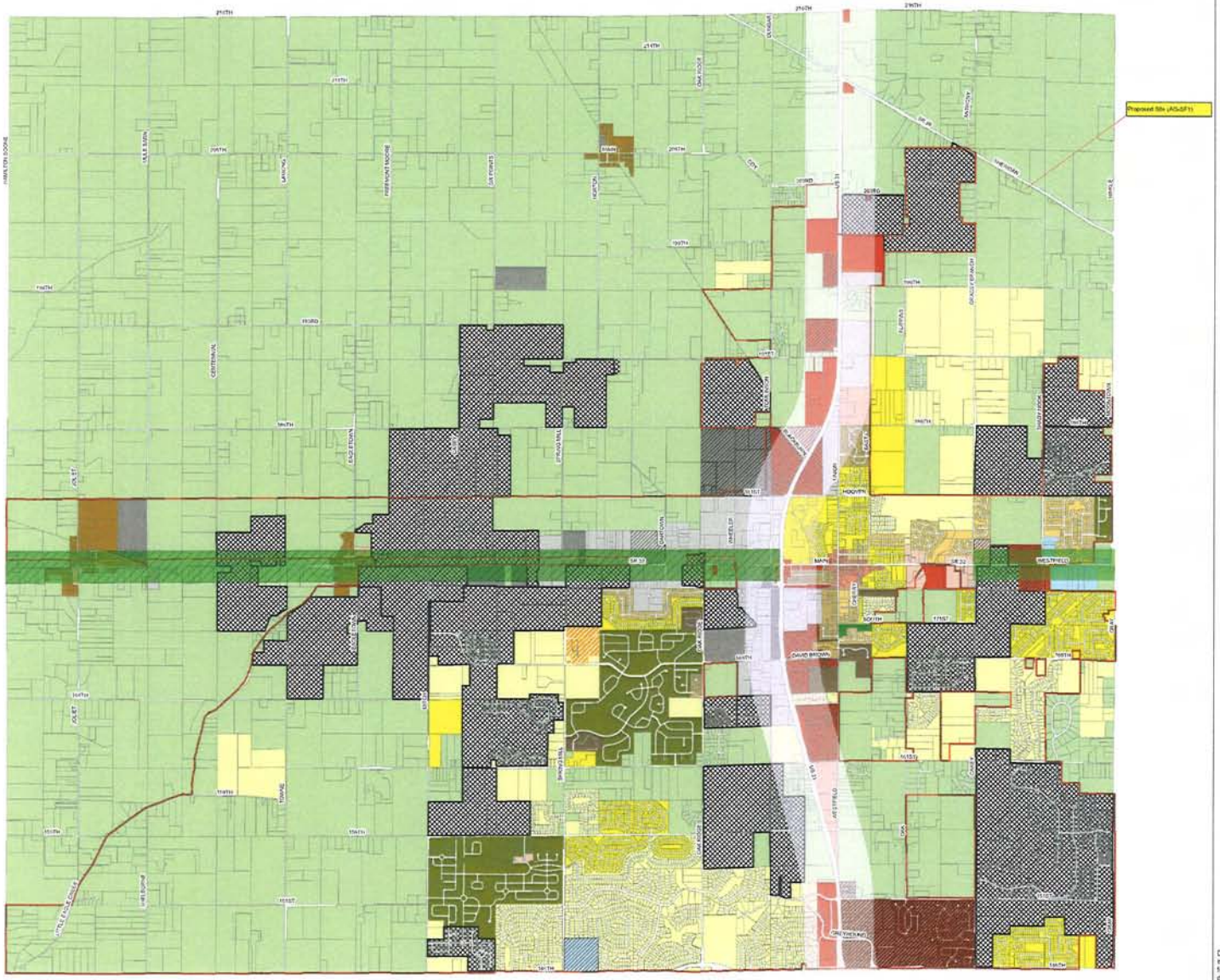
MAP NUMBER 18057C0150F

EFFECTIVE DATE: FEBRUARY 19, 2003

Federal Emergency Management Agency

TAX PARCEL MAP





City of Westfield and Washington Township Zoning Map

March 2008

Legend

City Limits

Overlay Districts

- SR32 Overlay
- SR32 Landscape Overlay
- US31 Overlay

Zoning Districts

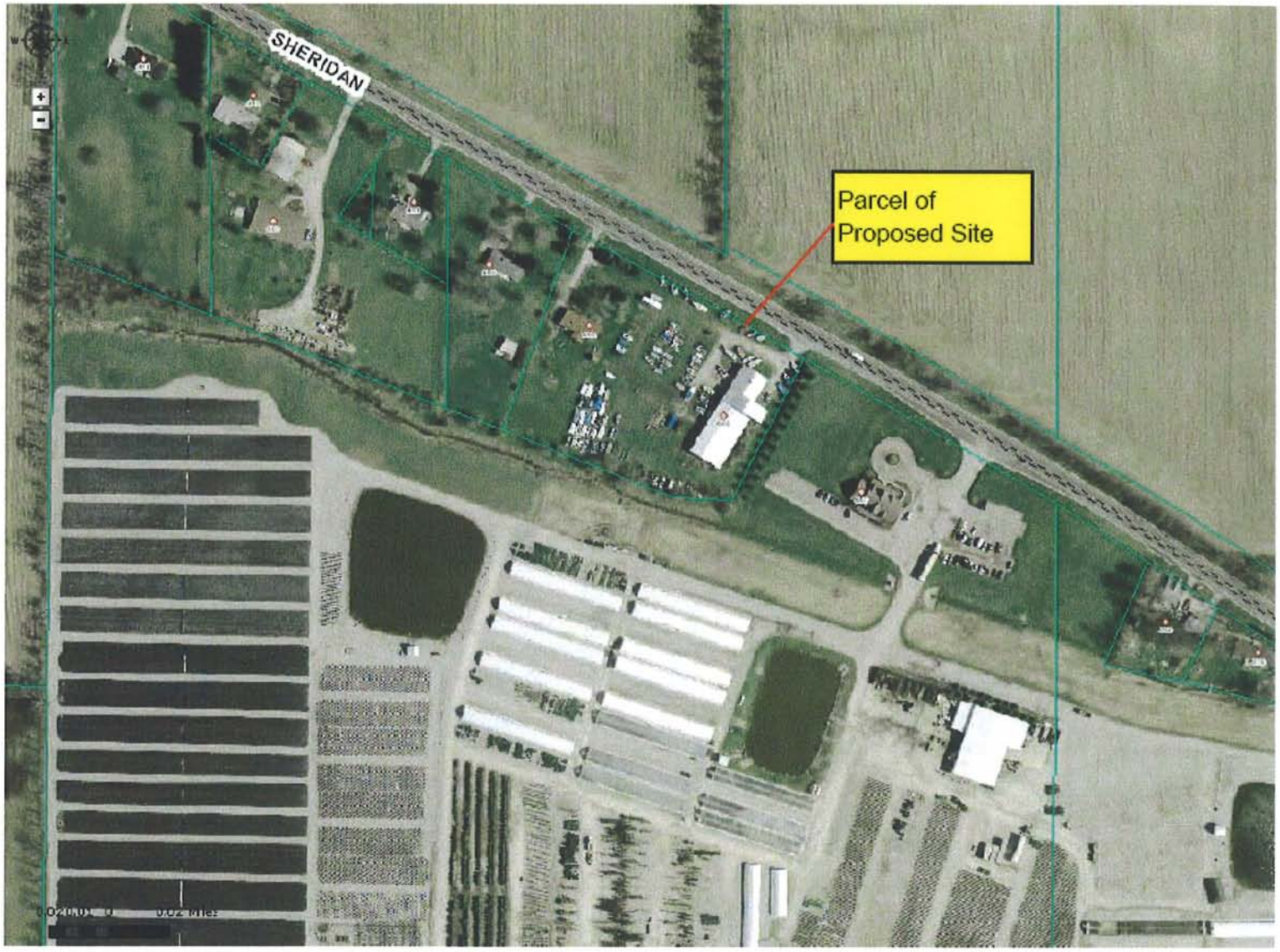
- AG-SF1 (Agriculture-Single Family 1)
- AG-SF1I (Agriculture-Single Family 1 In-town)
- SF-2 (Single Family-2)
- SF-3 (Single Family-3)
- SF-3 Cluster (Single Family-3 Cluster)
- SF-4 (Single Family-4)
- SF-4 Pre-1994 (Single Family 4 Pre-1994)
- SF-5 (Single Family-5)
- SF-A (Single Family-Attached)
- MF-1 (Multiple Family-1)
- MF-2 (Multiple Family-2)
- GO (General Office)
- GO-PD (General Office-Planned Development)
- LB (Local Business)
- LB-H (Local Business-Historical)
- LB-PD (Local Business-Planned Development)
- GB (General Business)
- GB-PD (General Business-Planned Development)
- SB-PD (Special Business-Planned Development)
- EI (Enclosed Industrial)
- EI-PD (Enclosed Industrial-Planned Development)
- OI (Open Industrial)
- OI-PD (Open Industrial-Planned Development)
- PUD (Planned Unit Development)

Map Is Not To Scale

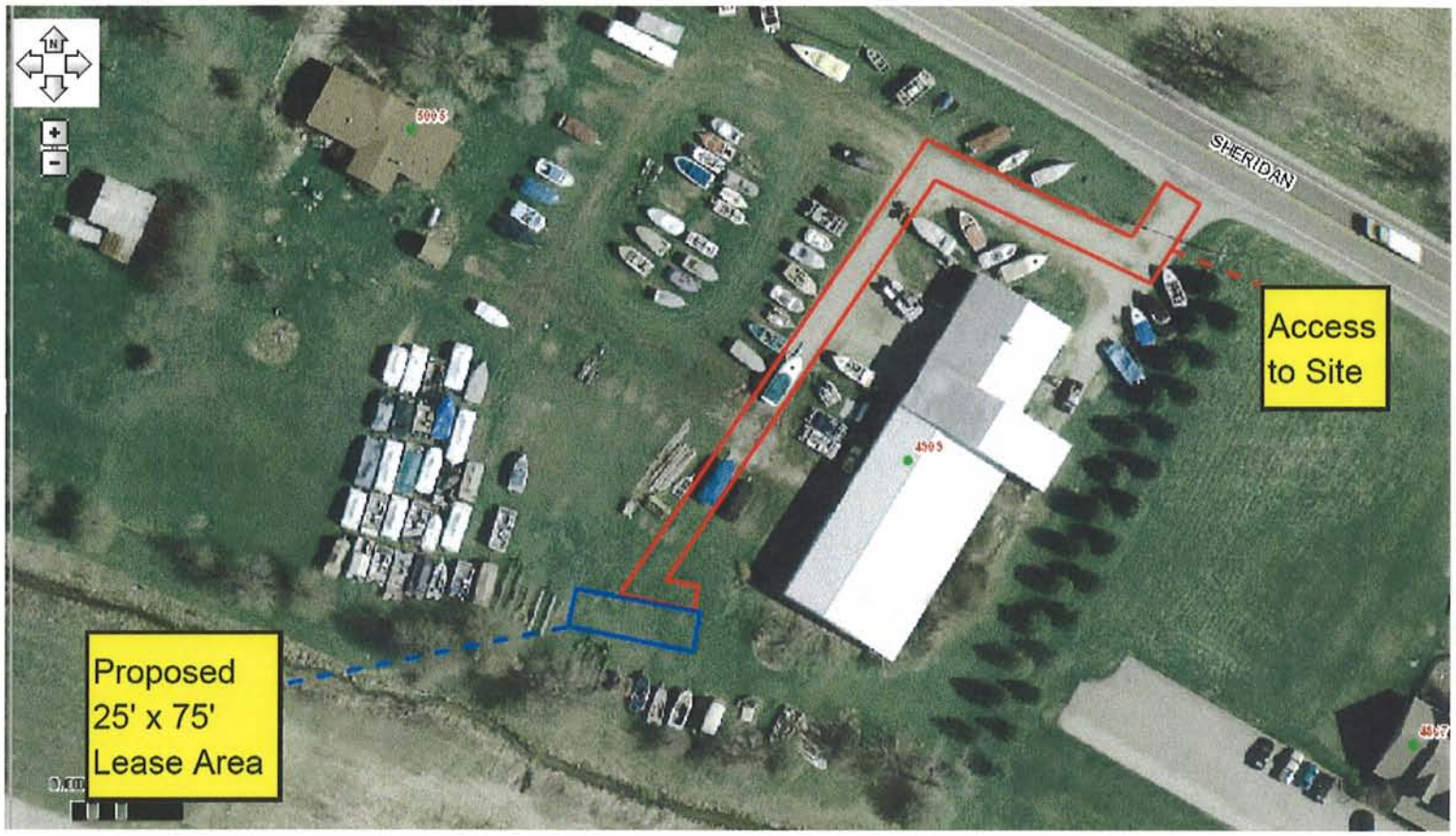
DISCLAIMER: The City of Westfield, Indiana has created this map in an attempt to increase the availability of public information and enhance public knowledge. The City is continually collecting, maintaining and updating data. Information for the map themes was obtained from existing, and many times historical documentation. Because of this, the information displayed on this map is not guaranteed to be completely accurate or all inclusive. The City of Westfield retains the right to change the content of this map without prior notice. The City of Westfield assumes no liability for any actions or occurrences that may result from persons viewing the information contained on this map. This map is not meant to take the place of any existing guidelines, rules, regulations or legal procedures. No information displayed on this map should be used in place of legal documentation. Field investigations are still necessary for locating underground facilities, and contact with appropriate departmental staff is still required for determining location-based feasibilities.

L:\West_GIS\Planning\Zoning\Zoning 2008\Zoning 031708.mxd (March 17, 2008)

Proposed Site
38
Grassy Branch Rd
© 2008 Tele Atlas
Google
Pointer 40°04'52.19" N 86°06'03.42" W elev 879 ft
Streaming 100%
Eye alt 5252 ft


SHERIDAN
Parcel of
Proposed Site

AERIAL SITE SKETCH



Overlaid lines on aerial are "Not to Scale" and shall not be represented in that manner. This is merely for the visual assistance of the approximate locations described in the above comments.

Looking South at Ingress

Looking South at Ingress
(Continuing to Proposed Site)

Looking North at Egress

Looking Northeast at Egress
(Continued to SR38)

Looking South Into Site

Looking Southeast Into Site

Looking East Into Site

Looking West Into Site
(From the Entrance of Brehob Nursery)

Looking North From Site

Looking South From Site

Looking East From Site

Looking West From Site

Existing Structures
T-Mobile monopole (approximately 185'), Westfield Utilities water tower (approximately 150'), Dual Line utility concrete monopole (approximately 90'), Dual line lattice transmission tower (approximately 130').

T-Mobile (Tab 1)

This structure has an available centerline that is approximately 175'. This site is too close to an existing site (IN0150), which would cause major overlapping in service and would not improve coverage on or around State Road 38 to US Highway 31 (as seen in section 9 page 3).

Westfield Utilities (Tab 2)

This water tower has existing antennas located at the top as seen in the following Tab 2. Before additional antennas could be placed on this tower, structural issues and designs would need to be considered. Additionally, the water tower would still leave coverage gaps on State Road 38 and poor coverage to the north of State Road 38. This site would also cause some overlapping in service with another site (as seen in section 9 page 4).

Utility Structures (Tab 3)

There are two utility structures close to this area. The closest structure to the proposed site is a Dual Line concrete monopole and is similar in nature to the desired site structure. This structure was considered as a possibility, but since it is a Dual Line (as seen in the following Tab 3), it is not acceptable for antenna placement as the power company would have to shut off the power to one side of the line resulting in an extended

power outage for numerous homeowners. The same situation also applies for the Dual Line lattice transmission tower that can also be seen in the following Tab 3.

Site Acquisition responsibilities for searching an area.

We are issued a search area to try and locate an Antenna System. The first step is to drive the area to determine if there are any **"Existing Structures"** in that area, which could be utilized as a possible collocation. If there are existing sites outside the search area, they are included in our original summary to the RF Engineer for review to determine if they could be acceptable locations. If they can not meet the coverage objectives, then we proceed with a raw land build.

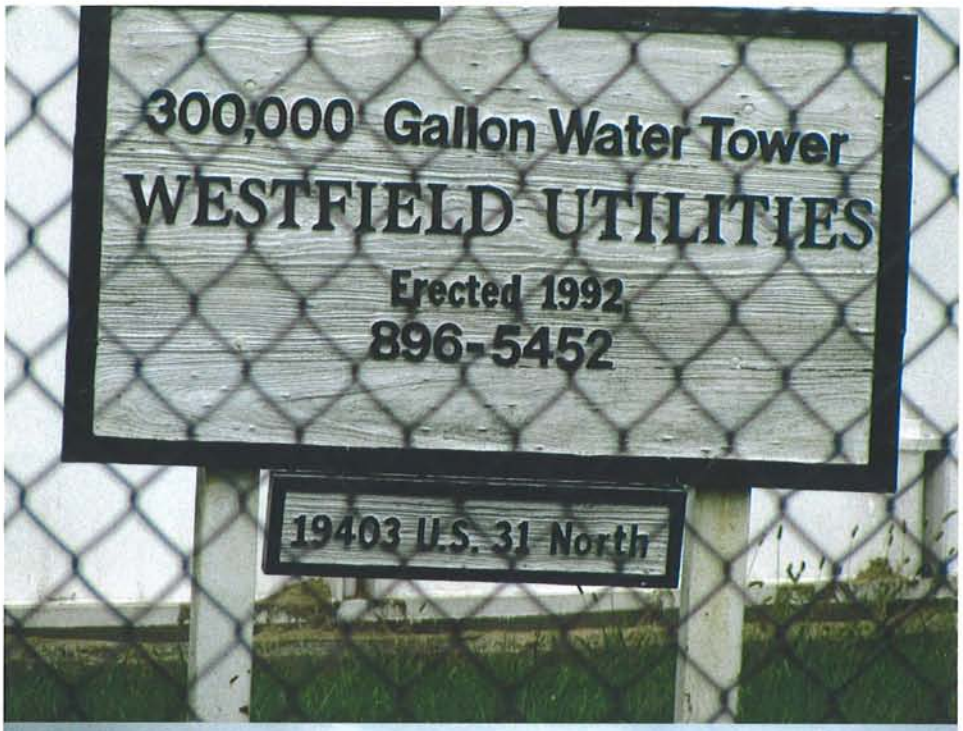
Types of collocations that have been established in and around the State of Indiana are as follows:

Government Authority Tower (ex: Hamilton County Sheriffs Tower)
Water Tanks
Other Cellular Carriers (ex: Sprint, Verizon, T-Mobile, etc.)
Tower Companies (ex: American Tower, SBA, Crown Castle, etc.)
Radio Stations
Power Companies
Independent Tower Owner

Coverage Objective:
It is to solidify coverage along State Road 38 between US Highway 31 and Noblesville. It would provide good to adequate coverage to Residential Area on the North side of Westfield. This site fills a gap in the current network's coverage, which will drastically reduce the dropped calls and/or no service along State Road 38 & US Highway 31.

This will also provide E911 service to the area.

Looking Southwest at T-Mobile Tower
(From the Intersection of Lake Terrace Ct. & Myers Lake Dr.)



Looking at Westfield Water Tower

Looking at Existing Antennas Mounted on Water Tower

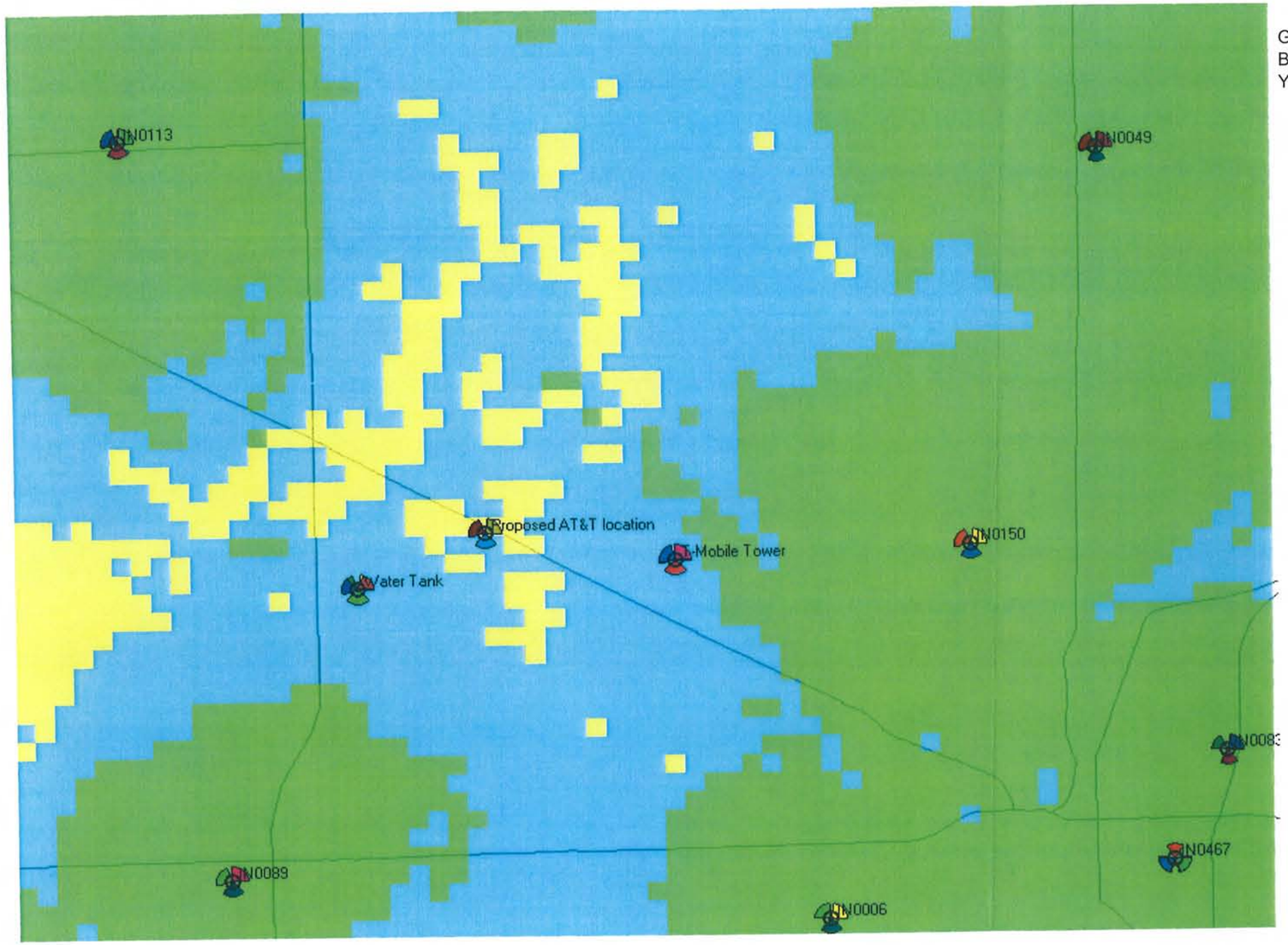
Looking East at Concrete Power Pole
(On SR 38 in between Hinkle Rd. and Proposed Site)

Looking West at Concrete Power Pole

Looking Southwest at Concrete Power Pole

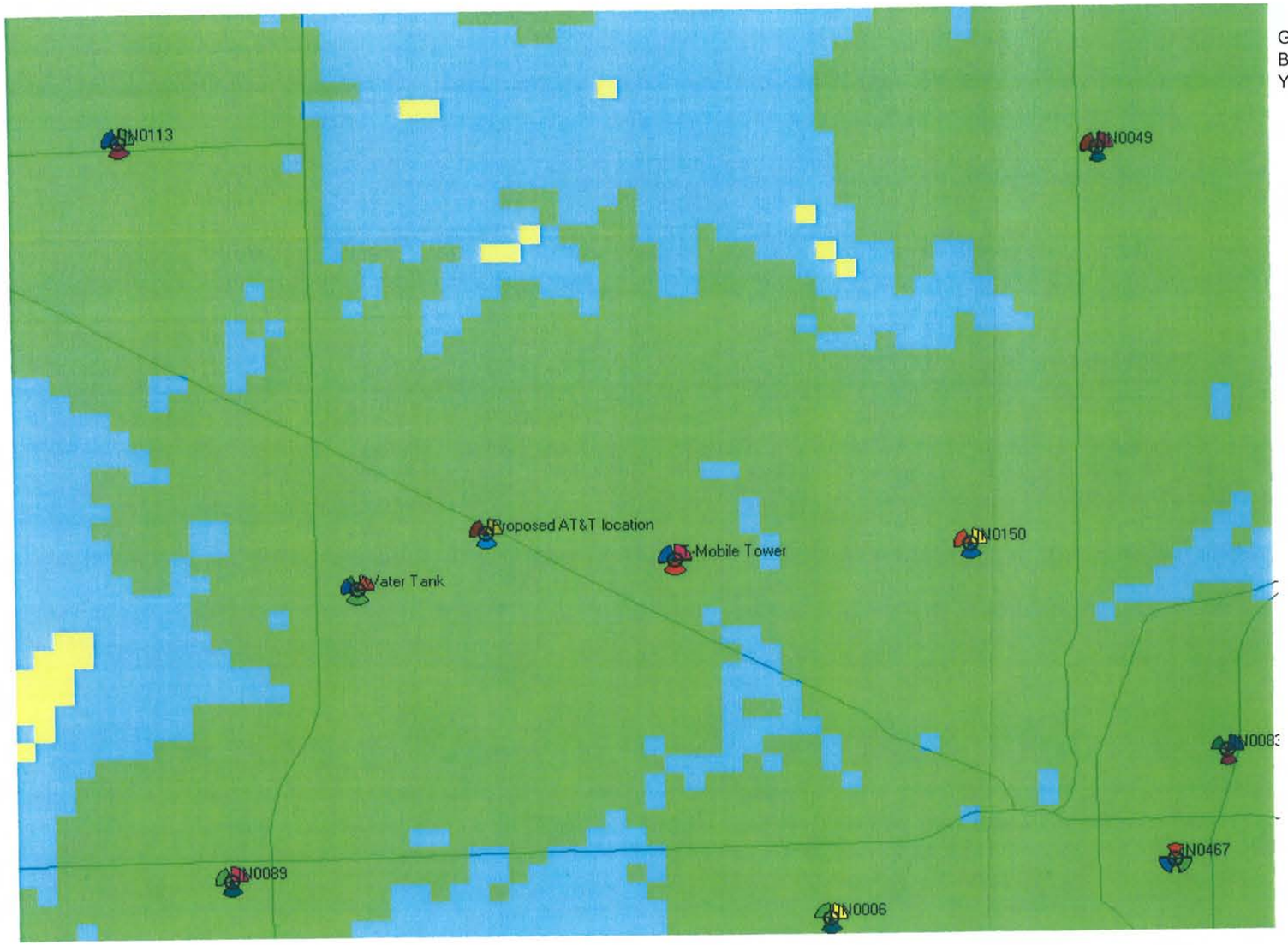
Dual Line Concrete Power Pole

Dual Line Lattice Transmission Tower (SR 38 & US 31)



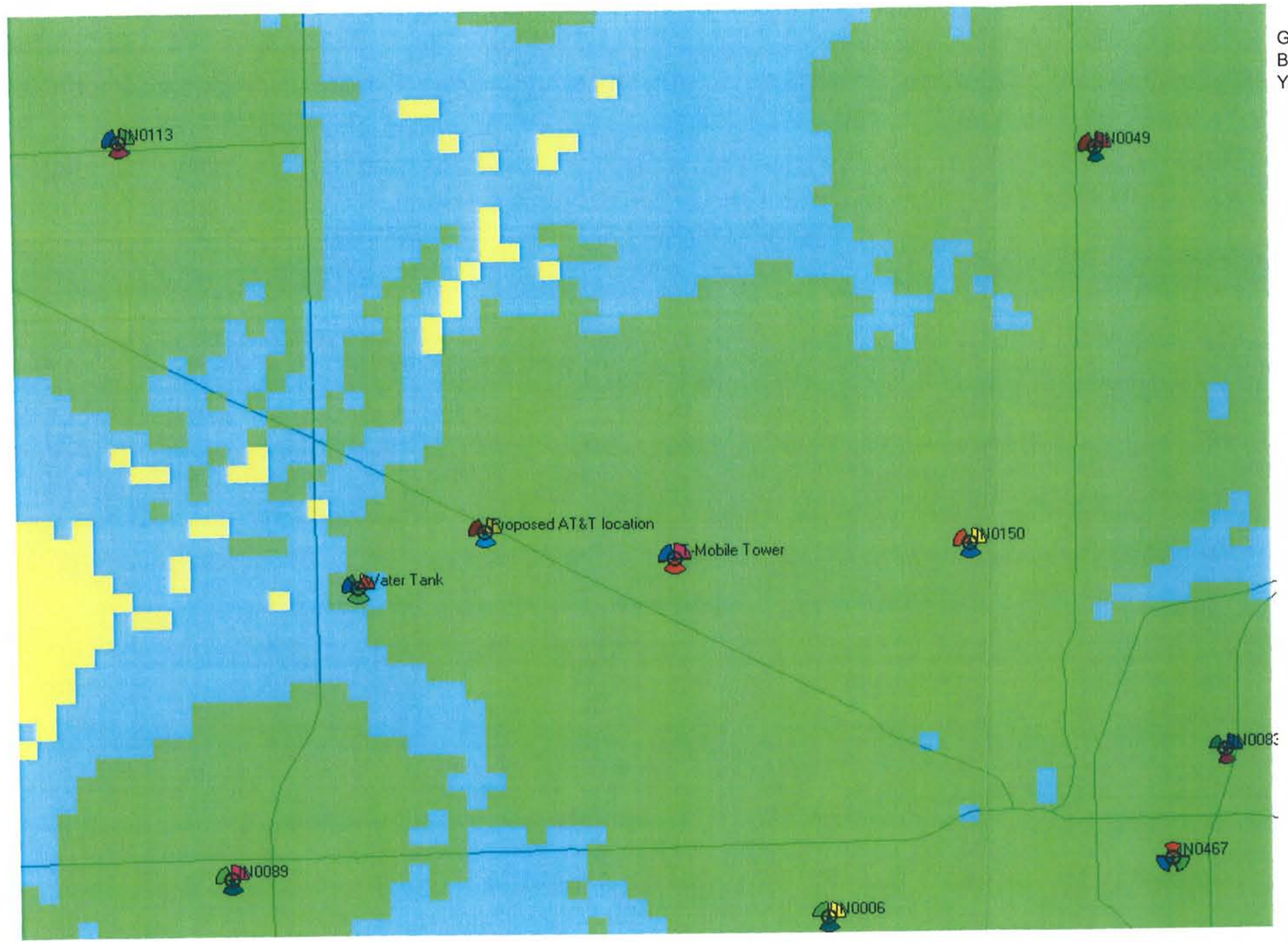
Green=Good Coverage
Blue=Marginal to Good Coverage
Yellow=Poor Coverage

Existing coverage



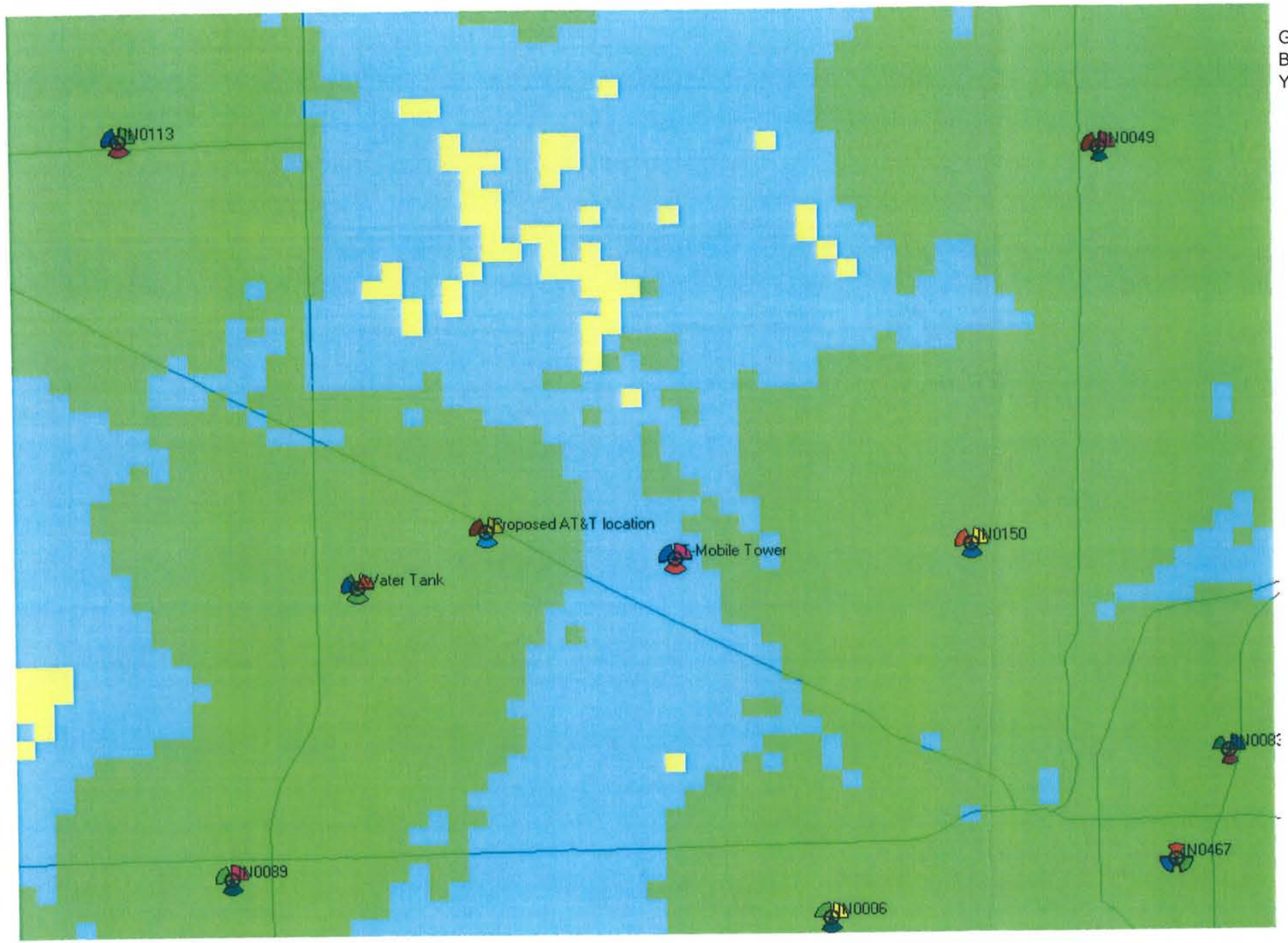
Green=Good Coverage
Blue=Marginal to Good Coverage
Yellow=Poor Coverage

Proposed coverage-Proposed Loc



Green=Good Coverage
Blue=Marginal to Good Coverage
Yellow=Poor Coverage

Proposed Coverage-T-Mobile Twr



Green=Good Coverage
Blue=Marginal to Good Coverage
Yellow=Poor Coverage

Proposed Coverage-Water Twr

PROJECT INFORMATION

SCOPE OF WORK:	THE PRINCIPAL SERVICES AND EQUIPMENT TO BE PROVIDED UNDER THIS PROJECT ARE THE INSTALLATION OF DRIVEWAY, FOUNDATIONS AND A PREFABRICATED EQUIPMENT SHELTER. SERVICES SHALL ALSO INCLUDE ERECTION OF A 150' MONOPLOE TOWER. THE INSTALLATION OF AN ANTENNA MOUNTING PLATFORM. THE CONTRACTOR SHALL INSTALL CELLULAR COAX, SUPPLY AND INSTALL COAX CABLE HARDWARE, INSTALL CELLULAR ANTENNAS, SUPPLY AND INSTALL CONDUITS FOR 200 AMP SINGLE PHASE ELECTRICAL SERVICE, SUPPLY AND INSTALL CONDUITS FOR T1 TELCO SERVICE, SUPPLY AND INSTALL EXTERIOR GROUNDING RING, INSTALL QUARTER-WAVE LIGHTING PROTECTION, PROVIDE FINAL GRADE AND REPAIR ANY DAMAGED AREAS AND PROVIDE ALL NECESSARY COORDINATION WITH TELCO AND COMMERCIAL POWER MUNICIPALITIES. CONTRACTOR SHALL ALSO PROVIDE AND INSTALL COMPOUND FENCING AS PER A&E DRAWINGS. AT&T MOBILITY WILL PROVIDE CELLULAR ANTENNAS AND QUARTER-WAVE LIGHTNING PROTECTION. ALL OF THE ABOVE DESCRIBED SERVICES SHALL BE COMPLETED IN STRICT ACCORDANCE WITH THE DRAWINGS FROM GPD ASSOCIATES AND ANY SUPPLEMENTAL DIRECTION FROM BECHTEL.
SITE ADDRESS:	5005 SHERIDAN ROAD NOBLESVILLE, IN 46062
LATITUDE:	N40° 04' 56.37"
LONGITUDE:	W86° 06' 08.52"
JURISDICTION:	WESTFIELD, IN
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
BECHTEL ENGINEER CONTACT:	FAROOQ SOFI PHONE: (847) 273-1133
BECHTEL CONSTRUCTION COORDINATOR:	SCOTT GRESHAM PHONE: (317) 334-1015

at&t

SITE NUMBER: IN0318
SITE NAME: SR38 & HINKLE ROAD

DRAWING INDEX

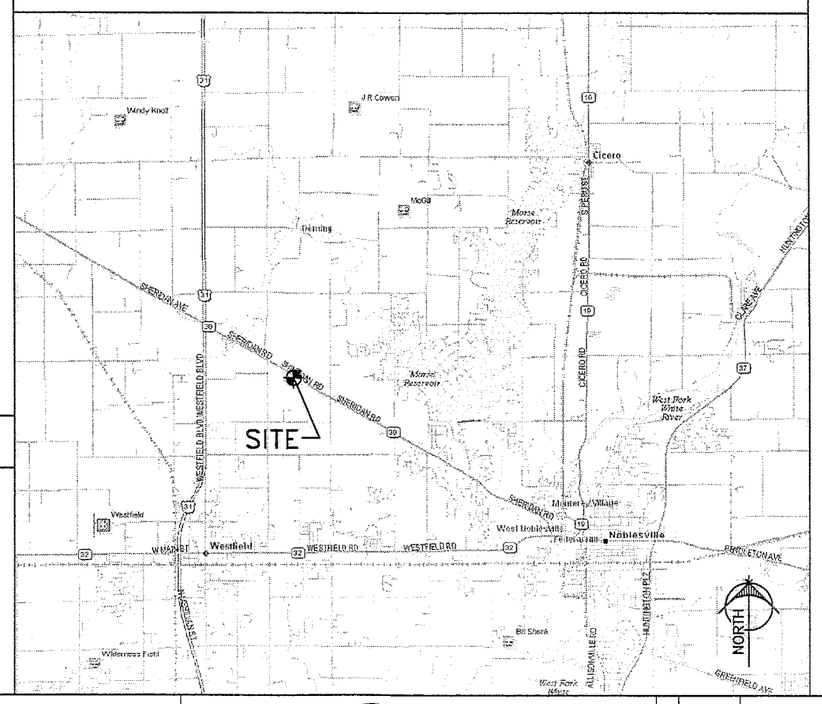
		REV
IN-0318-ZD-01	TITLE SHEET	A
	SURVEY (BY OTHERS)	A
IN-0318-ZD-02	PROPOSED OVERALL SITE PLAN	A
IN-0318-ZD-03	PROPOSED DETAILED COMPOUND PLAN	A
IN-0318-ZD-04	PROPOSED TOWER ELEVATION, ANTENNA PLAN AND SCHEDULE	A

NOTES

NOTE:
THIS PLAN SET IS A ONE HALF SCALE SET REPRODUCED FROM 22"x34" PRINTS.

VICINITY MAP

DIRECTIONS: FROM 8888 KEYSTONE AT THE CROSSONG. GO TOWARDS N KEYSTONE AVENUE. GO APPROXIMATELY 6 MILES TO US 31 NORTH. CONTINUE NORTH ON US 31 GO APPROXIMATELY 10 MILES TO STATE ROAD 38 (SHERIDAN AVENUE) TURN RIGHT ONTO SHERIDAN AVENUE. GO APPROXIMATELY 2 MILES ON SHERIDAN AVENUE. SITE IS ON THE SOUTH SIDE OF SHERIDAN AVENUE WEST OF HINKLE ROAD AT AMF BOAT STORAGE, 5005 SHERIDAN AVENUE.



APPLICABLE BUILDING CODES AND STANDARDS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:
[INTERNATIONAL BUILDING CODE (IBC), 2006 w/INDIANA AMENDMENTS]

ELECTRICAL CODE:
[NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70 – LATEST EDITION, NATIONAL ELECTRICAL CODE, AS ADOPTED BY THE STATE OF INDIANA]
LIGHTNING PROTECTION CODE:
[NFPA 780 – LATEST EDITION, LIGHTNING PROTECTION CODE]

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS.
AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM
IEEE 1100 (2005) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41 (2002), RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1275 – LATEST EDITION, GENERAL INSTALLATION REQUIREMENTS

TELCORDIA GR-1503 – LATEST EDITION, COAXIAL CABLE CONNECTIONS

ANSI T1.311 – LATEST EDITION, FOR TELECOM – DC POWER SYSTEMS – TELECOM, ENVIRONMENTAL PROTECTION

ANSI J-STD-607 – LATEST EDITION, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

GLAUS PYLE SCHOMER BURNS & DEHAVEN, INC.
GPD ASSOCIATES
8275 Allison Pointe Trail . Suite 220 Indianapolis, Indiana 46250
317-299-2996 , Fax 317-293-1331
GPD JOB# 2008042.02

SITE NAME: SR38 & HINKLE ROAD
SITE NUMBER: IN0318
5005 SHERIDAN ROAD
NOBLESVILLE, IN 46062
HAMILTON COUNTY

at&t
900 EAST 96TH. STREET
SUITE 500
INDIANAPOLIS, INDIANA 46240

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	9/15/08	ISSUED FOR ZONING REVIEW	LJB	TTP	(INT)

SCALE: AS SHOWN | DESIGNED BY: LJB | DRAWN BY: LJB

DAVID B. GRANGER REGISTERED No 60800405 STATE OF INDIANA PROFESSIONAL ENGINEER

AT&T MOBILITY

TITLE

DRAWING NUMBER	REV
IN-0318-ZD-01	A

PROJECT BENCHMARKS

BENCHMARK #1
IRON PIN (CP#1)
NORTH: 1760994.234
EAST: 206178.366
ELEV: 878.95

BENCHMARK #2
IRON PIN (CP#3)
NORTH: 1760943.387
EAST: 206314.143
ELEV: 877.03

LAND SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THIS PLAT AND SURVEY WERE MADE UNDER MY SUPERVISION AND THAT THE ANGULAR AND LINEAR MEASUREMENTS AS WITNESSED BY MONUMENTS SHOWN HEREON ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Ralph M. Wallem

RALPH M. WALLEM — PLS NO. 80040185

OWNER APPROVAL: — DATE

AT & T MOBILITY APPROVAL: — DATE

FLOOD DATA THIS PROPERTY IS IN ZONE X OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 18057C0130F WHICH HAS AN EFFECTIVE DATE OF 2/19/2003 AND IS NOT IN A SPECIAL FLOOD HAZARD AREA. THERE WAS NO FIELD SURVEY PERFORMED TO DETERMINE THIS ZONE. AN ELEVATION CERTIFICATE MAY BE NEEDED TO VERIFY THIS DETERMINATION FROM FEMA.

UTILITIES

TELEPHONE COMPANY:
GTE/VERIZON
19845 US 31 NORTH
WESTFIELD, IN 46074
888.571.3971

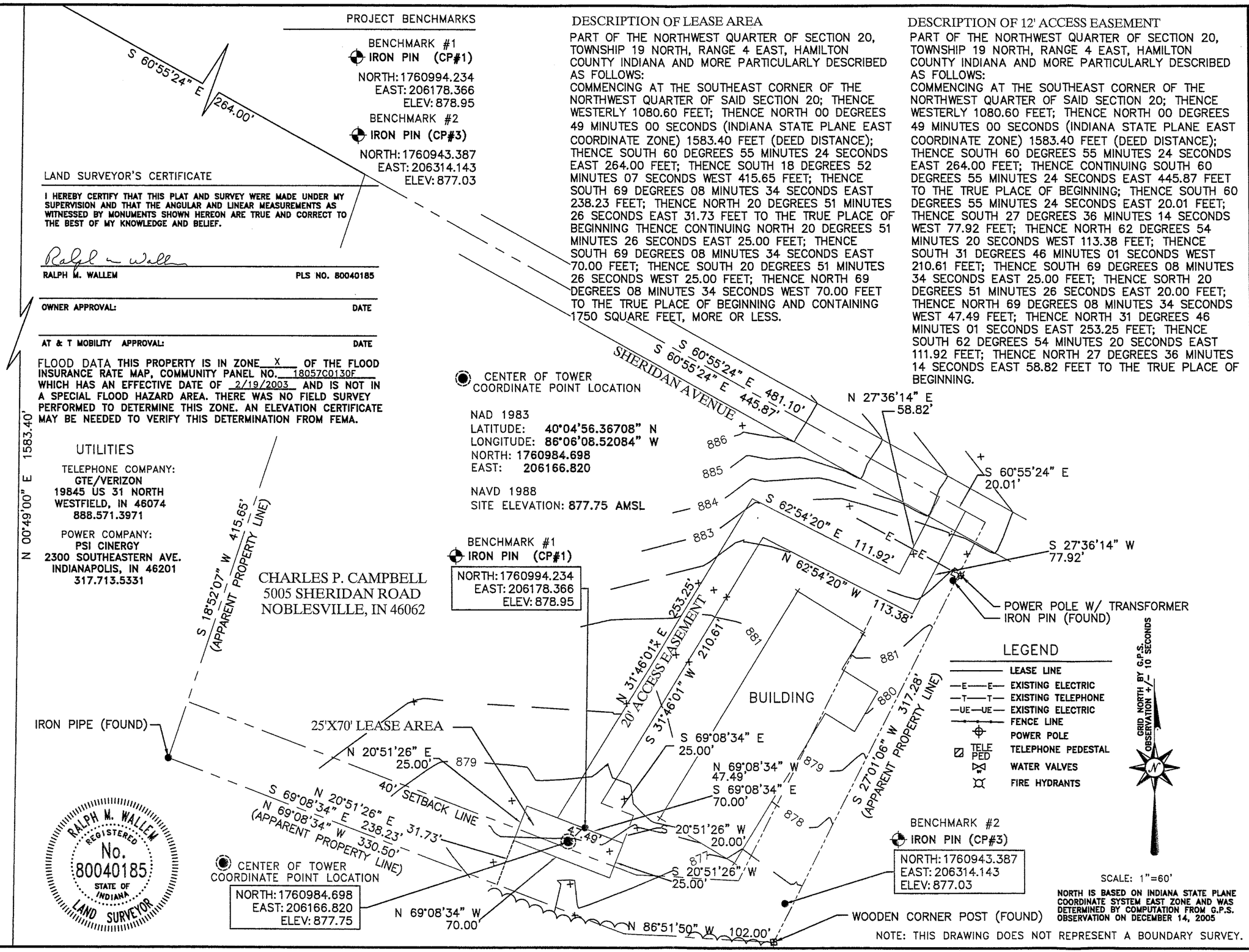
POWER COMPANY:
PSI CINERGY
2300 SOUTHEASTERN AVE.
INDIANAPOLIS, IN 46201
317.713.5331

DESCRIPTION OF LEASE AREA

PART OF THE NORTHWEST QUARTER OF SECTION 20, TOWNSHIP 19 NORTH, RANGE 4 EAST, HAMILTON COUNTY INDIANA AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHWEST QUARTER OF SAID SECTION 20; THENCE WESTERLY 1080.60 FEET; THENCE NORTH 00 DEGREES 49 MINUTES 00 SECONDS (INDIANA STATE PLANE EAST COORDINATE ZONE) 1583.40 FEET (DEED DISTANCE); THENCE SOUTH 60 DEGREES 55 MINUTES 24 SECONDS EAST 264.00 FEET; THENCE SOUTH 18 DEGREES 52 MINUTES 07 SECONDS WEST 415.65 FEET; THENCE SOUTH 69 DEGREES 08 MINUTES 34 SECONDS EAST 238.23 FEET; THENCE NORTH 20 DEGREES 51 MINUTES 26 SECONDS EAST 31.73 FEET TO THE TRUE PLACE OF BEGINNING THENCE CONTINUING NORTH 20 DEGREES 51 MINUTES 26 SECONDS EAST 25.00 FEET; THENCE SOUTH 69 DEGREES 08 MINUTES 34 SECONDS EAST 70.00 FEET; THENCE SOUTH 20 DEGREES 51 MINUTES 26 SECONDS WEST 25.00 FEET; THENCE NORTH 69 DEGREES 08 MINUTES 34 SECONDS WEST 70.00 FEET TO THE TRUE PLACE OF BEGINNING AND CONTAINING 1750 SQUARE FEET, MORE OR LESS.

DESCRIPTION OF 12' ACCESS EASEMENT

PART OF THE NORTHWEST QUARTER OF SECTION 20, TOWNSHIP 19 NORTH, RANGE 4 EAST, HAMILTON COUNTY INDIANA AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHWEST QUARTER OF SAID SECTION 20; THENCE WESTERLY 1080.60 FEET; THENCE NORTH 00 DEGREES 49 MINUTES 00 SECONDS (INDIANA STATE PLANE EAST COORDINATE ZONE) 1583.40 FEET (DEED DISTANCE); THENCE SOUTH 60 DEGREES 55 MINUTES 24 SECONDS EAST 264.00 FEET; THENCE CONTINUING SOUTH 60 DEGREES 55 MINUTES 24 SECONDS EAST 445.87 FEET TO THE TRUE PLACE OF BEGINNING; THENCE SOUTH 60 DEGREES 55 MINUTES 24 SECONDS EAST 20.01 FEET; THENCE SOUTH 27 DEGREES 36 MINUTES 14 SECONDS WEST 77.92 FEET; THENCE NORTH 62 DEGREES 54 MINUTES 20 SECONDS WEST 113.38 FEET; THENCE SOUTH 31 DEGREES 46 MINUTES 01 SECONDS WEST 210.61 FEET; THENCE SOUTH 69 DEGREES 08 MINUTES 34 SECONDS EAST 25.00 FEET; THENCE SORTH 20 DEGREES 51 MINUTES 26 SECONDS EAST 20.00 FEET; THENCE NORTH 69 DEGREES 08 MINUTES 34 SECONDS WEST 47.49 FEET; THENCE NORTH 31 DEGREES 46 MINUTES 01 SECONDS EAST 253.25 FEET; THENCE SOUTH 62 DEGREES 54 MINUTES 20 SECONDS EAST 111.92 FEET; THENCE NORTH 27 DEGREES 36 MINUTES 14 SECONDS EAST 58.82 FEET TO THE TRUE PLACE OF BEGINNING.



SCALE: 1"=60'

NORTH IS BASED ON INDIANA STATE PLANE COORDINATE SYSTEM EAST ZONE AND WAS DETERMINED BY COMPUTATION FROM G.P.S. OBSERVATION ON DECEMBER 14, 2005

NOTE: THIS DRAWING DOES NOT REPRESENT A BOUNDARY SURVEY.

at&t
AT&T Mobility LLC

GLAUS PYLE SCHOMER BURNS & DEHAVEN, INC.
GPD ASSOCIATES
8275 Allison Pointe Trail, Suite 220, Indianapolis, Indiana 46250
317-299-2996 , Fax 317-293-1331

BENCHMARK SERVICES, INC.
Consulting Engineers
Land Surveyors
318 North Main Street
P.O. Box 5
Huntingburg, Indiana 47542
Phone: (812) 683-3049
Fax: (812) 683-2040
e-mail: benchmark@insightbb.com

SITE NUMBER: IN-0318

SITE NAME: SR38 & HINKLE RD

SITE ADDRESS: 5005 SHERIDAN ROAD NOBLESVILLE, IN 46062

LEASE AREA: 1750 SQ. FT.

PROPERTY OWNER: CHARLES P. CAMPBELL 5005 SHERIDAN ROAD NOBLESVILLE, IN 46062

SECTION/TOWNSHIP/RANGE: 20-19-4

COUNTY: HAMILTON COUNTY

PARCEL NUMBER: 08-06-20-00-00-008.006

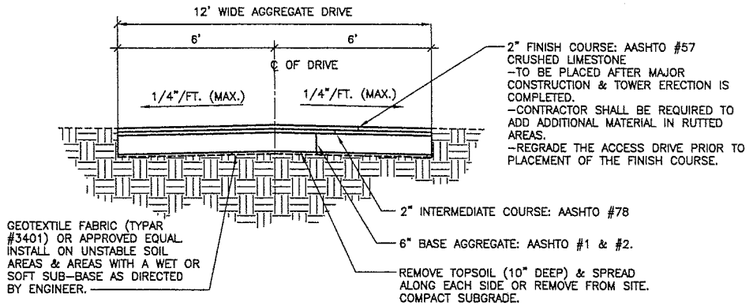
LATITUDE: 40°04'56.36708"
LONGITUDE: 86°06'08.52084"

DWG BY:	CHKD BY:	DATE:
GVW	RMW	12.19.05

NO.	REVISION/ISSUE	DATE:
1.	ACCESS	12.28.05
2.	ACCESS	9.12.08

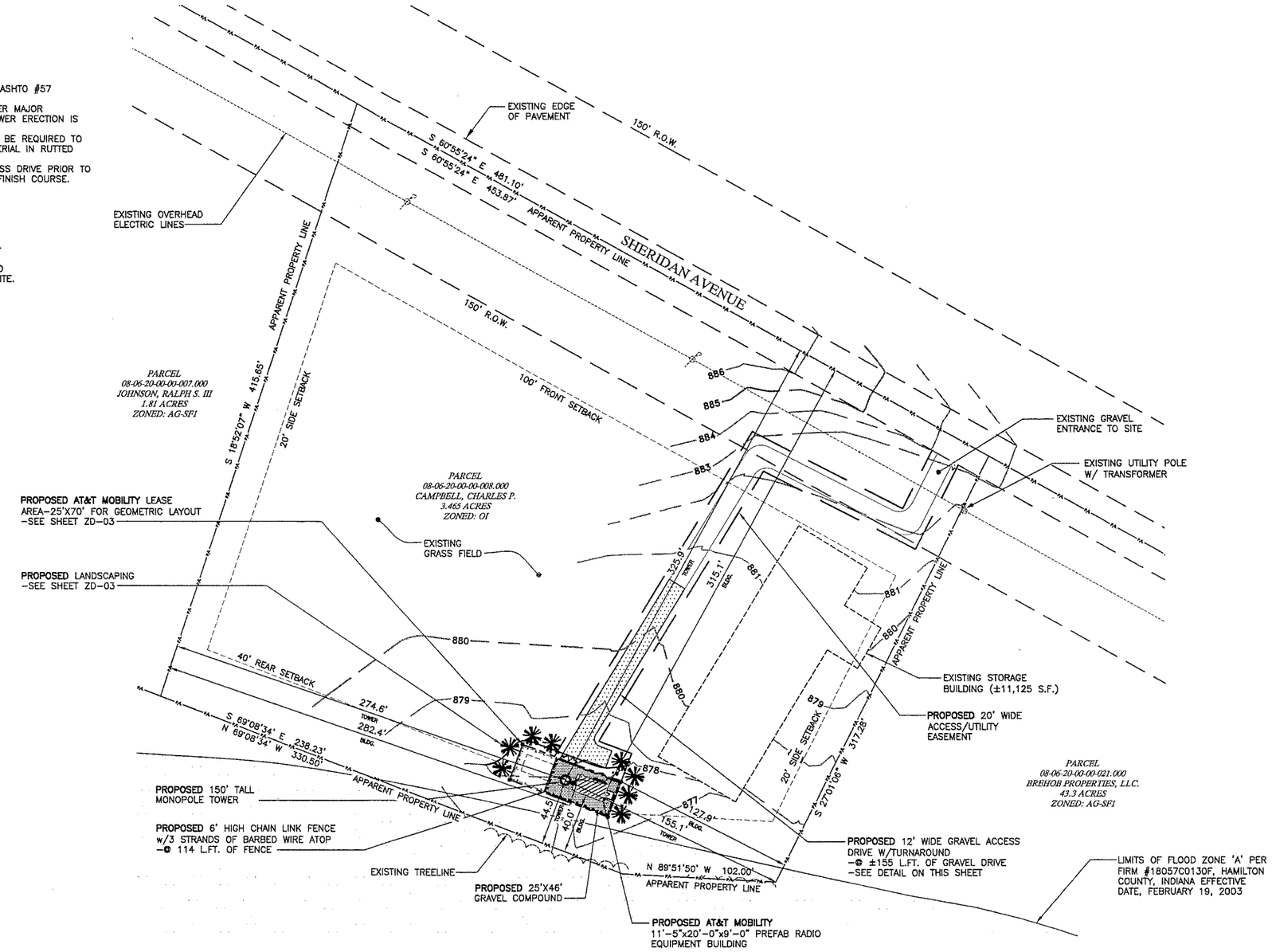
TITLE: SURVEY PLAN

SHEET: C-2



TYPICAL ACCESS DRIVE SECTION

SCALE: N. T. S.
LIMITS: FROM EXISTING ROAD TO SITE



PROPOSED OVERALL SITE PLAN

SCALE: 1" = 40'

GLAUS PYLE SCHOMER BURNS & DEHAVEN, INC.
GPD ASSOCIATES
8275 Allison Pointe Trail . Suite 220 Indianapolis, Indiana 46250
317-299-2996 , Fax 317-293-1331
GPD JOB# 2008042.02

SITE NAME: SR38 & HINKLE ROAD
SITE NUMBER: IN0318
5005 SHERIDAN ROAD
NOBLESVILLE, IN 46062
HAMILTON COUNTY

at&t
900 EAST 96TH. STREET
SUITE 500
INDIANAPOLIS, INDIANA 46240

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	9/15/08	ISSUED FOR ZONING REVIEW	LJB	TTP	(INT)

SCALE: AS SHOWN | DESIGNED BY: LJB | DRAWN BY: LJB

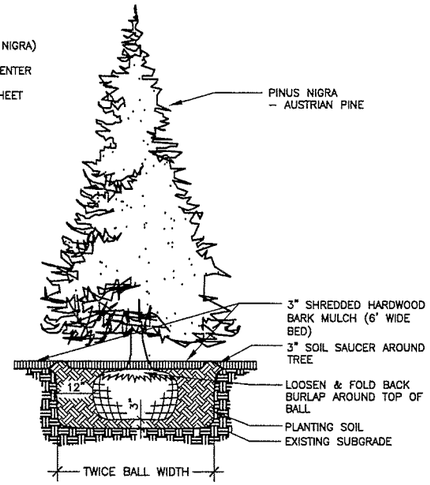
DAVID B. GRANGER REGISTERED NO 60880405 STATE OF INDIANA PROFESSIONAL ENGINEER

AT&T MOBILITY

PROPOSED OVERALL SITE PLAN

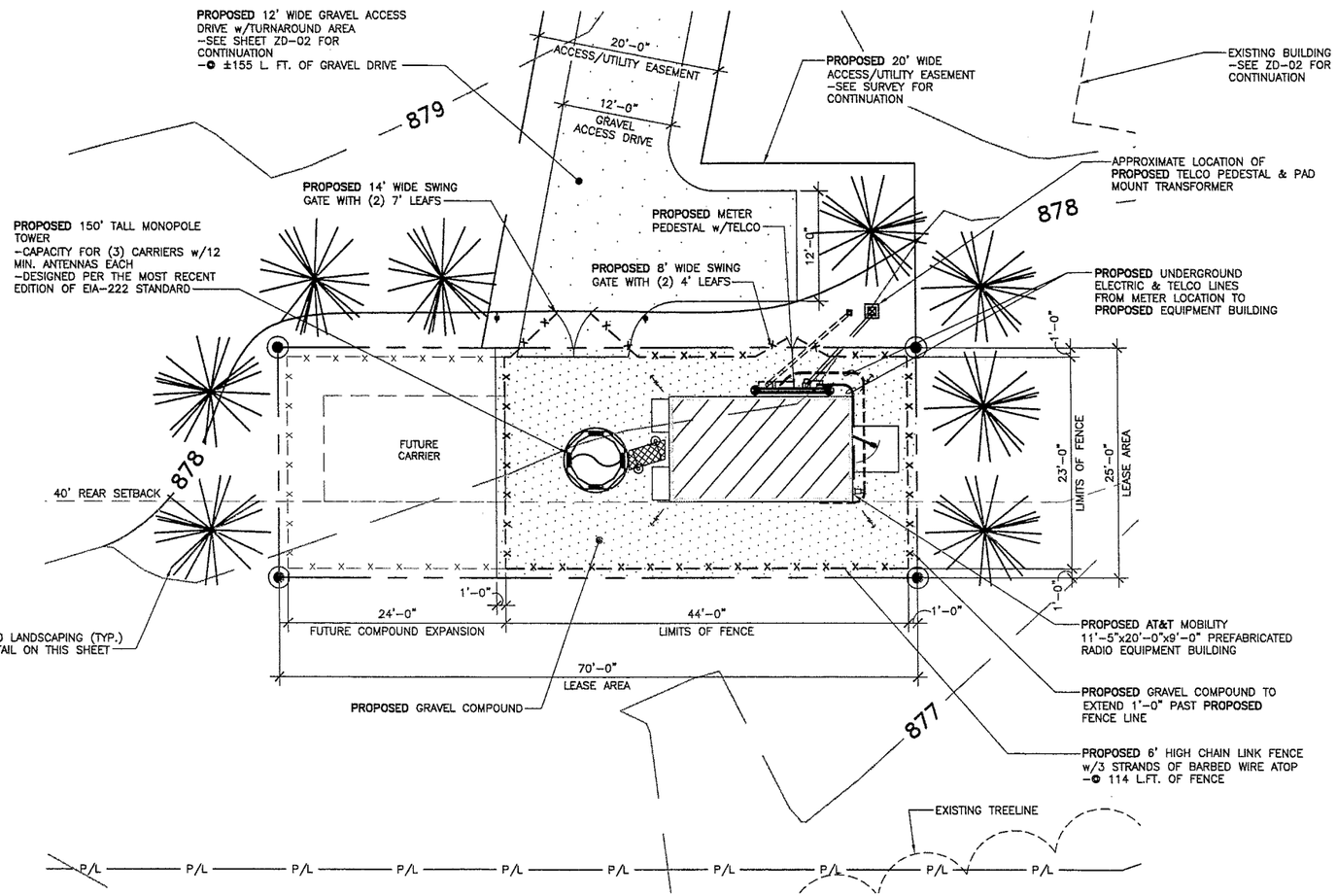
DRAWING NUMBER	REV
IN-0318-ZD-02	A

AUSTIAN PINE (PINUS NIGRA)
- BALL AND BURLAP
- PLANTED 15' ON CENTER
- MIN. 6'-0" HEIGHT
- SEE DETAIL THIS SHEET
- TYPICAL OF 8



TREE PLANTING

NO SCALE



PROPOSED DETAILED COMPOUND PLAN

SCALE: 1" = 5'-0"

NORTH

"DON'T DIG BLIND"

"HOLEY MOLEY" SEZ:

Call Monday thru Friday – 7 am. to 6 pm.
1-800-382-5544
TOLL FREE
1-800-428-5200
OUTSIDE INDIANA

NOTICE TO CONTRACTOR

PER INDIANA STATE LAW IS-69-1991, IT IS AGAINST THE LAW TO EXCAVATE WITHOUT NOTIFYING THE UNDERGROUND LOCATION SERVICE TWO (2) WORKING DAYS BEFORE COMMENCING WORK.

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GPD ASSOCIATES
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317-299-2996 , Fax 317-293-1331
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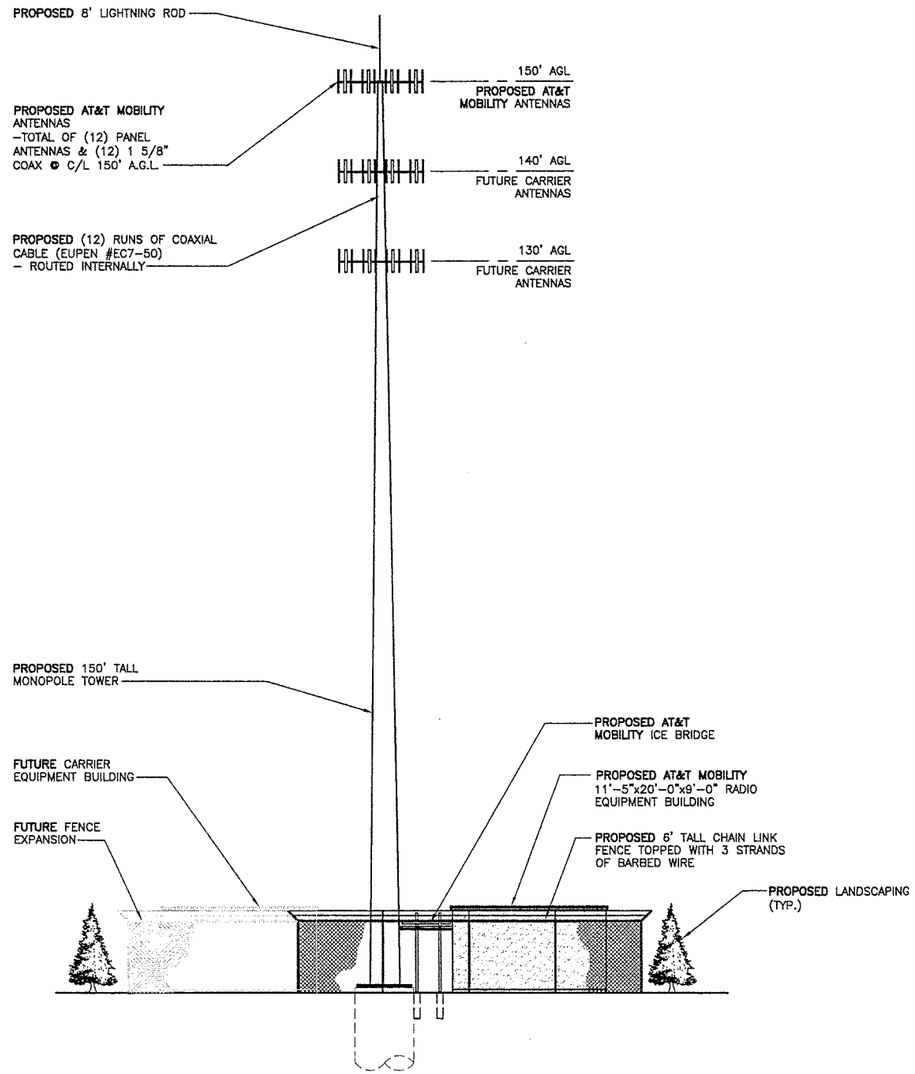
SCALE: AS SHOWN | DESIGNED BY: LJB | DRAWN BY: LJB

DAVID R. GRANGER
REGISTERED
Nº 60800405
STATE OF INDIANA
PROFESSIONAL ENGINEER

AT&T MOBILITY

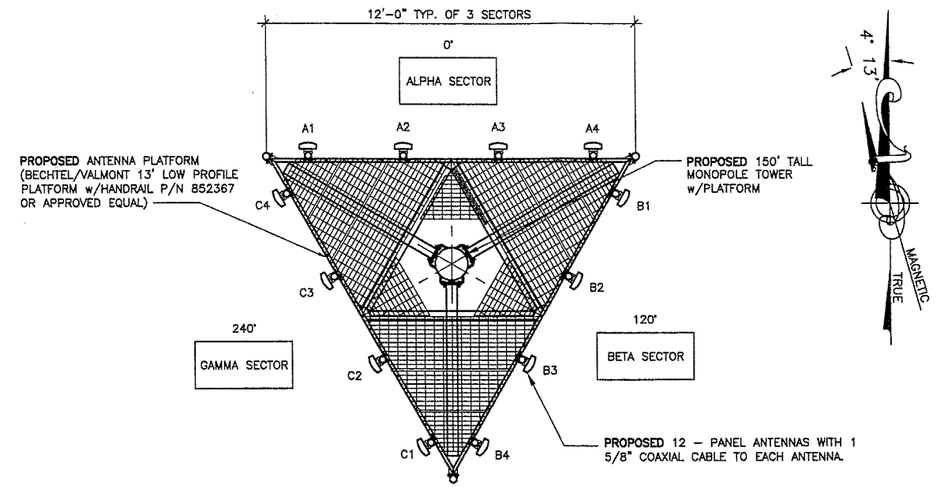
PROPOSED DETAILED COMPOUND PLAN

DRAWING NUMBER	REV
IN-0318-ZD-03	A



PROPOSED TOWER ELEVATION

SCALE: N.T.S.



PROPOSED ANTENNA PLAN

N. T. S.

PROPOSED ANTENNA SCHEDULE

ANTENNA TYPE	SECTOR	CABLE DATA EUPEN EC7-50 LENGTH	CABLE DATA EUPEN EC7-50 DIA.	ELECTRICAL DOWNTILT	MECHANICAL DOWNTILT
POWERWAVE 7750 (850/1900 MHz)	0°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	0°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	0°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	0°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	120°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	120°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	120°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	120°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	240°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	240°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	240°	170'	1 5/8"	0°	0°
POWERWAVE 7750 (850/1900 MHz)	240°	170'	1 5/8"	0°	0°

1. ANTENNA CABLE LENGTHS LISTED ARE APPROXIMATE AND ARE NOT INTENDED TO BE USED FOR FABRICATION. DUE TO FIELD CONDITIONS, ACTUAL ANTENNA CABLE LENGTHS REQUIRED MAY VARY FROM LENGTHS TABULATED. FIELD VERIFY ANTENNA CABLE LENGTHS PRIOR TO ORDER.
2. ALL ANTENNA CABLES SHALL UTILIZE GROUNDING KITS.
3. COAX SHALL BE TYPE ANDREW
4. CONTRACTOR SHALL RECEIVE FINAL APPROVAL OF ELECTRICAL AND MECHANICAL DOWNTILT AND RF DATA PRIOR TO COMPLETION OF CONSTRUCTION.

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SCALE: AS SHOWN | DESIGNED BY: LJB | DRAWN BY: LJB

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AT&T MOBILITY

PROPOSED TOWER ELEVATION, ANTENNA PLAN & SCHEDULE

DRAWING NUMBER: IN-0318-ZD-04
REV: A

Exhibit 10

SITE NUMBER: IN0318
SITE NAME: SR38 & HINKLE ROAD

PROJECT INFORMATION

SCOPE OF WORK:	THE PRINCIPAL SERVICES AND EQUIPMENT TO BE PROVIDED UNDER THIS PROJECT ARE THE INSTALLATION OF DRIVEWAY, FOUNDATIONS AND A PREFABRICATED EQUIPMENT SHELTER. SERVICES SHALL ALSO INCLUDE ERECTION OF A 150' MONOPLOE TOWER. THE INSTALLATION OF AN ANTENNA MOUNTING PLATFORM. THE CONTRACTOR SHALL INSTALL CELLULAR COAX, SUPPLY AND INSTALL COAX CABLE HARDWARE, INSTALL CELLULAR ANTENNAS, SUPPLY AND INSTALL CONDUITS FOR 200 AMP SINGLE PHASE ELECTRICAL SERVICE, SUPPLY AND INSTALL CONDUITS FOR T1 TELCO SERVICE, SUPPLY AND INSTALL EXTERIOR GROUNDING RING, INSTALL QUARTER-WAVE LIGHTING PROTECTION, PROVIDE FINAL GRADE AND REPAIR ANY DAMAGED AREAS AND PROVIDE ALL NECESSARY COORDINATION WITH TELCO AND COMMERCIAL POWER MUNICIPALITIES. CONTRACTOR SHALL ALSO PROVIDE AND INSTALL COMPOUND FENCING AS PER A&E DRAWINGS. AT&T MOBILITY WILL PROVIDE CELLULAR ANTENNAS AND QUARTER-WAVE LIGHTNING PROTECTION. ALL OF THE ABOVE DESCRIBED SERVICES SHALL BE COMPLETED IN STRICT ACCORDANCE WITH THE DRAWINGS FROM GPD ASSOCIATES AND ANY SUPPLEMENTAL DIRECTION FROM BECHTEL.
SITE ADDRESS:	5005 SHERIDAN ROAD NOBLESVILLE, IN 46062
LATITUDE:	N40° 04' 56.37"
LONGITUDE:	W86° 06' 08.52"
JURISDICTION:	WESTFIELD, IN
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
BECHTEL ENGINEER CONTACT:	FAROOQ SOFI PHONE: (847) 273-1133
BECHTEL CONSTRUCTION COORDINATOR:	SCOTT GRESHAM PHONE: (317) 334-1015

DRAWING INDEX

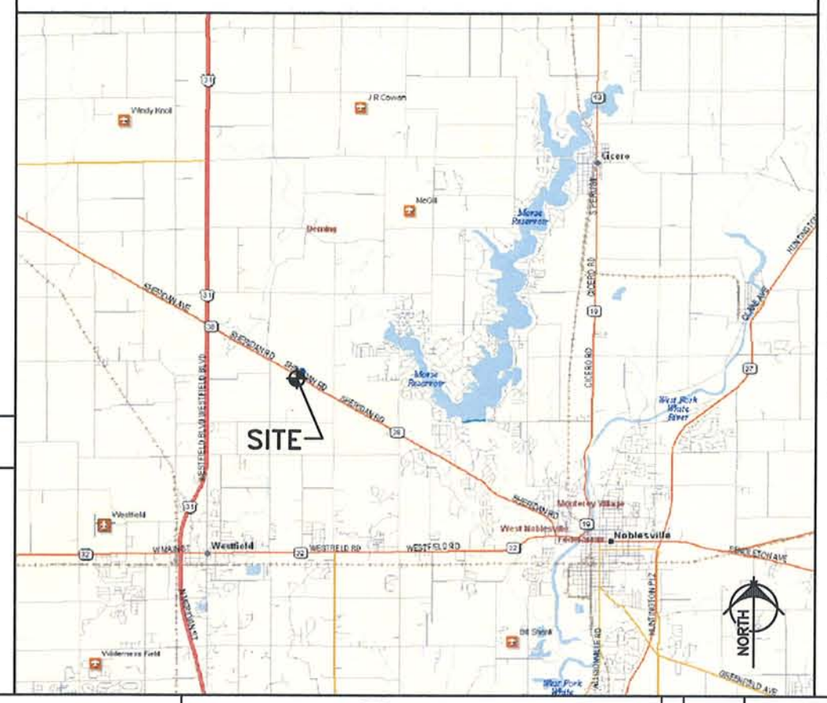
		REV
IN-0318-ZD-01	TITLE SHEET	B
	SURVEY (BY OTHERS)	B
IN-0318-ZD-02	PROPOSED OVERALL SITE PLAN	B
IN-0318-ZD-03	PROPOSED DETAILED COMPOUND PLAN	B
IN-0318-ZD-04	PROPOSED TOWER ELEVATION, ANTENNA PLAN AND SCHEDULE	B

NOTES

NOTE:
THIS PLAN SET IS A ONE HALF SCALE SET REPRODUCED FROM 22"x34" PRINTS.

VICINITY MAP

DIRECTIONS: FROM 8888 KEYSTONE AT THE CROSSONG. GO TOWARDS N KEYSTONE AVENUE. GO APPROXIMATELY 6 MILES TO US 31 NORTH. CONTINUE NORTH ON US 31 GO APPROXIMATELY 10 MILES TO STATE ROAD 38 (SHERIDAN AVENUE) TURN RIGHT ONTO SHERIDAN AVENUE. GO APPROXIMATELY 2 MILES ON SHERIDAN AVENUE. SITE IS ON THE SOUTH SIDE OF SHERIDAN AVENUE WEST OF HINKLE ROAD AT AMF BOAT STORAGE, 5005 SHERIDAN AVENUE.



APPLICABLE BUILDING CODES AND STANDARDS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:
[INTERNATIONAL BUILDING CODE (IBC), 2006 w/INDIANA AMENDMENTS]

ELECTRICAL CODE:
[NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70 – LATEST EDITION, NATIONAL ELECTRICAL CODE, AS ADOPTED BY THE STATE OF INDIANA]
LIGHTNING PROTECTION CODE:
[NFPA 780 – LATEST EDITION, LIGHTNING PROTECTION CODE]

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS.
AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM
IEEE 1100 (2005) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41 (2002), RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1275 – LATEST EDITION, GENERAL INSTALLATION REQUIREMENTS

TELCORDIA GR-1503 – LATEST EDITION, COAXIAL CABLE CONNECTIONS

ANSI T1.311 – LATEST EDITION, FOR TELECOM – DC POWER SYSTEMS – TELECOM, ENVIRONMENTAL PROTECTION

ANSI J-STD-607 – LATEST EDITION, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

GLAUS PYLE SCHOMER BURNS & DEHAVEN, INC.
GPD ASSOCIATES
8275 Allison Pointe Trail . Suite 220 Indianapolis, Indiana 46250
317-299-2996 , Fax 317-293-1331
GPD JOB# 2008042.02

SITE NAME: SR38 & HINKLE ROAD
SITE NUMBER: IN0318
5005 SHERIDAN ROAD
NOBLESVILLE, IN 46062
HAMILTON COUNTY

at&t
900 EAST 96TH. STREET
SUITE 500
INDIANAPOLIS, INDIANA 46240

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	10/2/08	RE-ISSUED w/COUNTY COMMENTS	LJB	TTP	(INT)
A	9/15/08	ISSUED FOR ZONING REVIEW	LJB	TTP	(INT)

SCALE: AS SHOWN | DESIGNED BY: LJB | DRAWN BY: LJB

DAVID B. GRANGER REGISTERED NO 60800105 STATE OF INDIANA PROFESSIONAL ENGINEER

AT&T MOBILITY

TITLE

DRAWING NUMBER: IN-0318-ZD-01 | REV: B

22 x 34 "D" SIZE

LAND SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THIS PLAT AND SURVEY WERE MADE UNDER MY SUPERVISION AND THAT THE ANGULAR AND LINEAR MEASUREMENTS AS WITNESSED BY MONUMENTS SHOWN HEREON ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RALPH M. WALLEM — PLS NO. 80040185

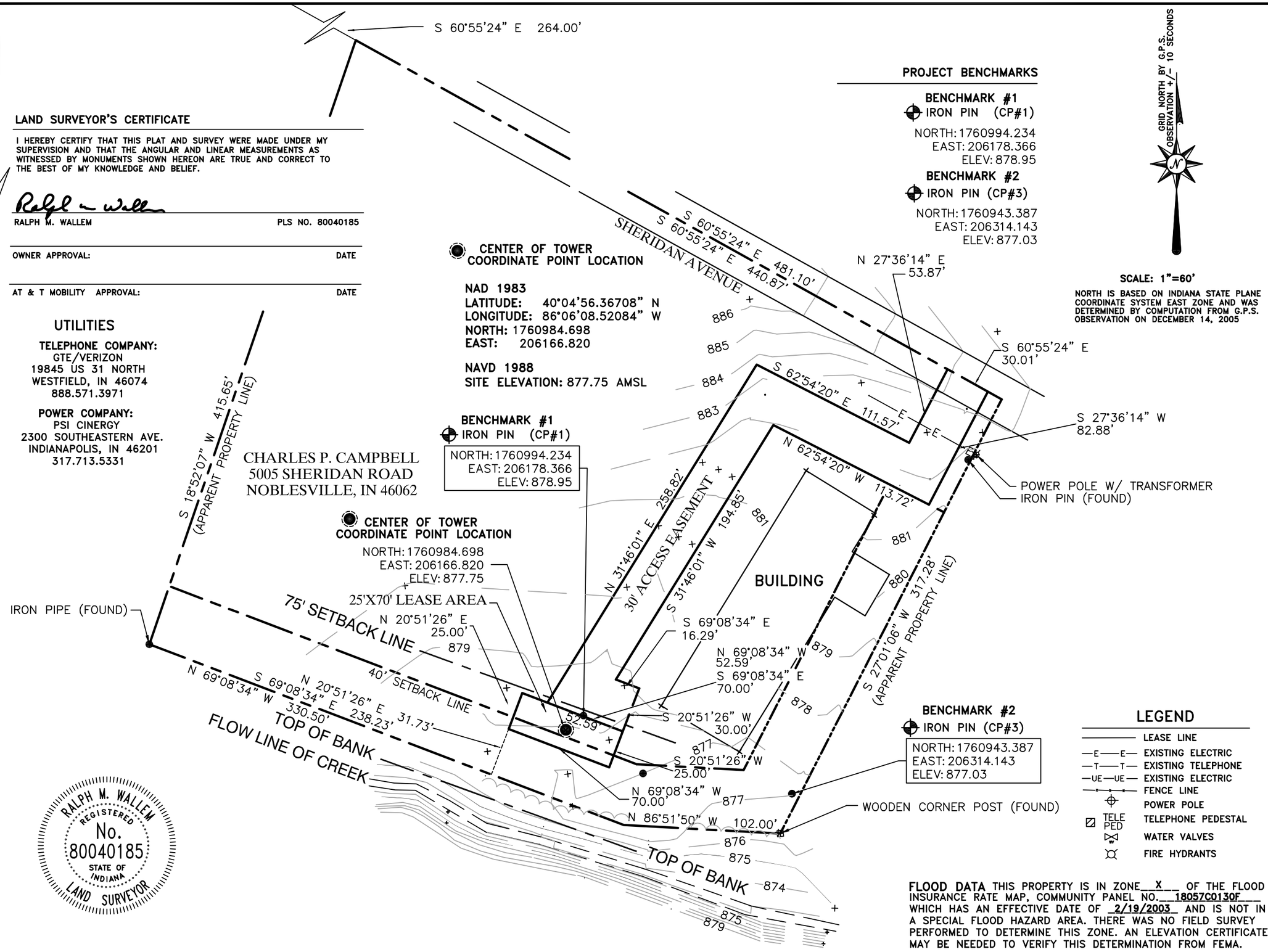
OWNER APPROVAL: — DATE

AT & T MOBILITY APPROVAL: — DATE

UTILITIES

TELEPHONE COMPANY:
GTE/VERIZON
19845 US 31 NORTH
WESTFIELD, IN 46074
888.571.3971

POWER COMPANY:
PSI CINERGY
2300 SOUTHEASTERN AVE.
INDIANAPOLIS, IN 46201
317.713.5331



RALPH M. WALLEM
REGISTERED
No. 80040185
STATE OF INDIANA
LAND SURVEYOR

FLOOD DATA THIS PROPERTY IS IN ZONE X OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 18057C0130F WHICH HAS AN EFFECTIVE DATE OF 2/19/2003 AND IS NOT IN A SPECIAL FLOOD HAZARD AREA. THERE WAS NO FIELD SURVEY PERFORMED TO DETERMINE THIS ZONE. AN ELEVATION CERTIFICATE MAY BE NEEDED TO VERIFY THIS DETERMINATION FROM FEMA.

NOTE: THIS DRAWING DOES NOT REPRESENT A BOUNDARY SURVEY.

at&t
AT&T Mobility LLC

GLAUS PYLE SCHOMER BURNS & DEHAVEN, INC.
GPD ASSOCIATES
8275 Allison Pointe Trail, Suite 220, Indianapolis, Indiana 46250
317-299-2996 , Fax 317-293-1331

BENCHMARK SERVICES, INC.
Consulting Engineers
Land Surveyors
318 North Main Street
P.O. Box 5
Huntingburg, Indiana 47542
Phone: (812) 683-3049
Fax: (812) 683-2040
e-mail: benchmark@insightbb.com

SITE NUMBER: IN-0318

SITE NAME: SR38 & HINKLE RD

SITE ADDRESS: 5005 SHERIDAN ROAD NOBLESVILLE, IN 46062

LEASE AREA: 1750 SQ. FT.

PROPERTY OWNER: CHARLES P. CAMPBELL 5005 SHERIDAN ROAD NOBLESVILLE, IN 46062

SECTION/TOWNSHIP/RANGE: 20-19-4

COUNTY: HAMILTON COUNTY

PARCEL NUMBER: 08-06-20-00-00-008.006

LATITUDE: 40°04'56.36708"
LONGITUDE: 86°06'08.52084"

DWG BY:	CHKD BY:	DATE:
GVW	RMW	12.19.05

NO.	REVISION/ISSUE	DATE:
1.	ACCESS	12.28.05
2.	ACCESS	9.12.08
3.	CREEK	10.2.08
4.	ACCESS	10.2.08

TITLE: SURVEY PLAN

SHEET: C-2

DESCRIPTION OF LEASE AREA

PART OF THE NORTHWEST QUARTER OF SECTION 20, TOWNSHIP 19 NORTH, RANGE 4 EAST, HAMILTON COUNTY INDIANA AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHWEST QUARTER OF SAID SECTION 20; THENCE WESTERLY 1080.60 FEET; THENCE NORTH 00 DEGREES 49 MINUTES 00 SECONDS (INDIANA STATE PLANE EAST COORDINATE ZONE) 1583.40 FEET (DEED DISTANCE); THENCE SOUTH 60 DEGREES 55 MINUTES 24 SECONDS EAST 264.00 FEET; THENCE SOUTH 18 DEGREES 52 MINUTES 07 SECONDS WEST 415.65 FEET; THENCE SOUTH 69 DEGREES 08 MINUTES 34 SECONDS EAST 238.23 FEET; THENCE NORTH 20 DEGREES 51 MINUTES 26 SECONDS EAST 31.73 FEET TO THE TRUE PLACE OF BEGINNING THENCE CONTINUING NORTH 20 DEGREES 51 MINUTES 26 SECONDS EAST 25.00 FEET; THENCE SOUTH 69 DEGREES 08 MINUTES 34 SECONDS EAST 70.00 FEET; THENCE SOUTH 20 DEGREES 51 MINUTES 26 SECONDS WEST 25.00 FEET; THENCE NORTH 69 DEGREES 08 MINUTES 34 SECONDS WEST 70.00 FEET TO THE TRUE PLACE OF BEGINNING AND CONTAINING 1750 SQUARE FEET, MORE OR LESS.

DESCRIPTION OF 30' ACCESS & UTILITY EASEMENT

PART OF THE NORTHWEST QUARTER OF SECTION 20, TOWNSHIP 19 NORTH, RANGE 4 EAST, HAMILTON COUNTY INDIANA AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHWEST QUARTER OF SAID SECTION 20; THENCE WESTERLY 1080.60 FEET; THENCE NORTH 00 DEGREES 49 MINUTES 00 SECONDS (INDIANA STATE PLANE EAST COORDINATE ZONE) 1583.40 FEET (DEED DISTANCE); THENCE SOUTH 60 DEGREES 55 MINUTES 24 SECONDS EAST 264.00 FEET; THENCE CONTINUING SOUTH 60 DEGREES 55 MINUTES 24 SECONDS EAST 440.87 FEET TO THE TRUE PLACE OF BEGINNING; THENCE SOUTH 60 DEGREES 55 MINUTES 24 SECONDS EAST 30.01 FEET; THENCE SOUTH 27 DEGREES 36 MINUTES 14 SECONDS WEST 82.88 FEET; THENCE NORTH 62 DEGREES 54 MINUTES 20 SECONDS WEST 113.72 FEET; THENCE SOUTH 31 DEGREES 46 MINUTES 01 SECONDS WEST 194.85 FEET; THENCE SOUTH 69 DEGREES 08 MINUTES 34 SECONDS EAST 16.29 FEET; THENCE SOUTH 20 DEGREES 51 MINUTES 26 SECONDS EAST 30.00 FEET; THENCE NORTH 69 DEGREES 08 MINUTES 34 SECONDS WEST 52.59 FEET; THENCE NORTH 31 DEGREES 46 MINUTES 01 SECONDS EAST 258.82 FEET; THENCE SOUTH 62 DEGREES 54 MINUTES 20 SECONDS EAST 111.57 FEET; THENCE NORTH 27 DEGREES 36 MINUTES 14 SECONDS EAST 53.87 FEET TO THE TRUE PLACE OF BEGINNING.

RALPH M. WALLEM
REGISTERED
No.
80040185
STATE OF
INDIANA
LAND SURVEYOR

LAND SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THIS PLAT AND SURVEY WERE MADE UNDER MY SUPERVISION AND THAT THE ANGULAR AND LINEAR MEASUREMENTS AS WITNESSED BY MONUMENTS SHOWN HEREON ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Ralph M. Wallem

RALPH M. WALLEM — PLS NO. 80040185

OWNER APPROVAL: — DATE

AT & T MOBILITY APPROVAL: — DATE

NOTE: THIS DRAWING DOES NOT REPRESENT A BOUNDARY SURVEY.

at&t
AT&T Mobility LLC

GLAUS PYLE SCHOMER BURNS & DEHAVEN, INC.
GPD ASSOCIATES
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LEASE AREA: 1750 SQ. FT.

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SECTION/TOWNSHIP/RANGE 20-19-4

COUNTY: HAMILTON COUNTY

PARCEL NUMBER: 08-06-20-00-00-008.006

LATITUDE: 40°04'56.36708"
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DWG BY:	CHKD BY:	DATE:
GVW	RMW	12.19.05

NO.	REVISION/ISSUE	DATE:
1.	ACCESS	12.28.05
2.	ACCESS	9.12.08
3.	CREEK	10.2.08
4.	ACCESS	10.2.08

TITLE: SURVEY PLAN

SHEET: C-2a

Exhibit 11

16.04.125 Wireless Communication Service Facilities

A. Wireless Communication Service Facilities shall be a permitted use in the following districts:

EI, EI-PD, OI, and OI-PD

B. Wireless Communication Service Facilities shall be a special exception in the following districts:

1. GO-PD, GB-PD, and AG-SF1;

2. In any district where the antennas are to be located upon pre-existing structures or buildings owned or operated by units of government of public utilities so long as the antennas and antenna support structures do not exceed the height of those structures or buildings by more than twenty (20) feet;

3. In any district, in a Non-Urban Area, a term associated with Indiana Code 36-7-4-1103. "Urban Area" is defined in the Code as follows: all lands and lots within the corporate boundaries of a municipality, any other lands or lots used for residential purposes where there are at least eight (8) residences within any quarter mile square area, and other lands or lots that have been or are planned for residential areas contiguous to the municipality.

C. Wireless Communication Service Facilities shall be bound by the standards below as well as the applicable requirements of the zoning district in which they are located except where otherwise noted in Section 2: Development Standards.

Section 1: Procedural Standards

All Wireless Communication Service Facilities shall meet the following requirements:

A. The applicant for a Wireless Communication Service Facility must demonstrate that they have exhausted all efforts to locate the proposed facilities upon existing antenna support structures in the geographical area of the proposed Wireless Communication Service Facility. They should submit a master plan for their Wireless Communication Service Facilities throughout the jurisdictional area where the Town of Westfield exercises planning and zoning jurisdiction. That master plan should show efforts to minimize the size and number of antenna support structures throughout the geographical area, taking into consideration existing technology.

B. The placement of antennas upon existing antenna support structures may be administratively approved by the Community Development Department.

C. In the event an antenna support structure ceases to be used, the antenna support structure shall be removed within one hundred eighty (180) days of termination of use.

D. In the zoning districts in which a Wireless Communication Service Facility is listed as either a permitted use or a special exception in WC 16.04.180, Figure 2, Permitted Use List a Wireless Communication Service Facility may be deemed an accessory use.

Section 2: Development Standards

All Wireless Communication Service Facilities shall meet the following requirements:

A. The height of the antenna support structure shall not exceed two hundred (200) feet.

B. The antenna support structure shall be set back a minimum of forty (40) feet from the property line, unless the adjoining property is zoned or used for a residential use. If the antenna support structure adjoins property which is zoned or used for residential use, the setback shall not be less than the height of the support structure.

C. Except as required by the Federal Aviation Administration or Federal Communications Commission, the antenna support structure shall not be illuminated by any artificial means and shall not display strobe lights.

D. No signs or advertising shall be placed upon an antenna support structure and associated equipment buildings or structures.

E. The support structure and any antenna located on the support structure must be designed to blend into the surrounding environment through the use of color and camouflaging architectural treatment.

F. All utility buildings and structures accessory to the antenna support structure must be architecturally designed to blend into the surrounding area.

G. A landscaping plan for the wireless communication service facility shall be submitted with the application and shall be substantially similar to landscaping required for other uses in commercial and industrial zones.

H. All Wireless Communication Service Facilities shall be designed structurally, electrically, and in all other respects to accommodate the user's equipment and the equipment of at least two additional service providers.

I. A qualified and licensed engineer must approve the design of the antenna support structure and certify that it is constructed to comply with the requirements set out in paragraph (H) above.

J. All applications shall include a notarized letter of intent committing the antenna support structure owner or lessee on behalf of themselves and their successors in interest that the antenna support structure shall be shared with additional users if the additional user(s) agrees to meet reasonable terms and conditions of shared use.

K. No transmissions from a Wireless Communication Service Facility shall interfere with any existing public safety communications.

Section 3: Limitations on Zoning Authority

A. The Board of Zoning Appeals in consideration of the special exception, shall not consider any evidence or base a denial of the location of a Wireless Communication Service Facility on any evidence concerning adverse environmental or health effects of radio frequency emissions so long as those emissions meet the standards of the Federal Commission.

B. Nothing herein shall be construed as a prohibition of the location of Wireless Communication Service Facilities within the planning jurisdiction of the Town of Westfield, Indiana.

C. Nothing herein shall be construed or applied to unreasonably discriminate between providers of functionally equivalent service, or services which compete one against the other for various wireless communication services.

Bingham • McHale LLP

attorneys at law

Exhibit 12

Matthew M. Price
Attorney
Direct: 317-686-5225
mprice@binghammchale.com

November 26, 2008

Jeremy Miller
Westfield City Services Building
2706 E. 171st Street
Westfield, IN 46074

Dear Jeremy:

Please find included with this letter supplemental materials for the hearing next month. Over the last 10 years, AT&T has worked closely with Westfield on all facets of locating wireless facilities. At various times, this has involved a dialogue with the town (now city) about the best way to accomplish providing reliable wireless services to customers in Westfield, while respecting the zoning and land use considerations of the community. AT&T, for example, was the first carrier to locate on a water tower in Westfield and has worked with community leaders and planning staff on each site. Here, I anticipate that the BZA will want to engage in a similar dialogue and hear first hand about AT&T's experience in Westfield and other communities as it relates to the need for this infrastructure and its affect on adjoining properties and future development. We intend to bring additional speakers with us to the next hearing to add depth and flavor to this dialogue and provide the BZA with the best information available in a textured and real sense.

We believe this is a very good location and certainly the best one available in the search area. We further believe that an open and forthright dialogue, consistent with our past practice in Westfield and with real world examples, is the best way to reach a good decision. In that spirit, please consider these materials as an indication of our intentions for the hearing next month, realizing that we will offer live testimony as well (as I think was the BZA's expectation and desire).

Have a Happy Thanksgiving!

Sincerely,

Matt Price

Matthew M. Price

MMP/saf

Bingham • McHale LLP
attorneys at law

8900 Keystone Crossing
Suite 400
Indianapolis, IN 46240
317.635.8900
binghammchale.com

AT&T MOBILITY

PRESENTATION BOOKLET

(SUPPLEMENTAL MATERIALS)

NOVEMBER 26, 2008

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AT&T MOBILITY

PRESENTATION BOOKLET- SUPPLEMENTAL MATERIALS

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RACEWAY ROAD (NO. 1)	3
RACEWAY ROAD (NO. 2)	4
KEY POINTS FOR DISCUSSION	5

Plum Creek Blvd
Prelude Ln
Hazel Dell Pkwy
Stanwich Pl
Hoosier Dr
Carnoma Ct
Sandalwood
Jo Ann Dr
E 126th St
Autumn Gate Way
© 2008 Tele Atlas
Streaming 100%
Google
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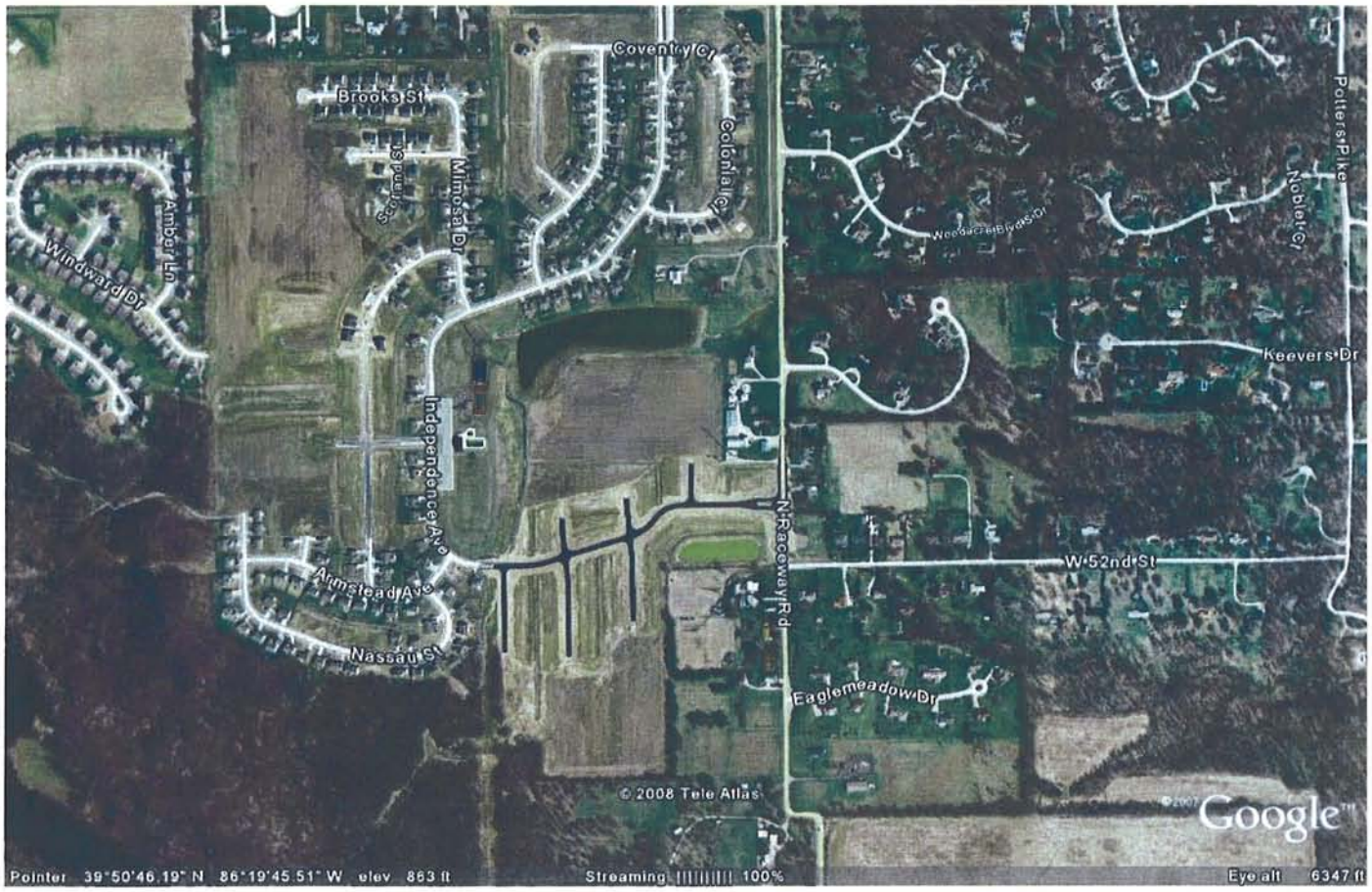
Eye alt 2891 ft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Coventry Cr
Colonial Cr
Potters Pike
Noblet Cr
Woodacre Blvd S Dr
Mimosa Dr
Amber Ln
Windward Dr
Keevers Dr
Independence Ave
N Racoway Rd
W 52nd St
Armstead Ave
Nassau St
Eaglemeadow Dr
© 2008 Tele Atlas
Google
Pointer 39°50'46.19" N 86°19'45.51" W elev 863 ft
Streaming 100%
Eye alt 6347 ft

Stings Trce
N Raceway Rd
W 52nd St
© 2008 Tele Atlas
Google
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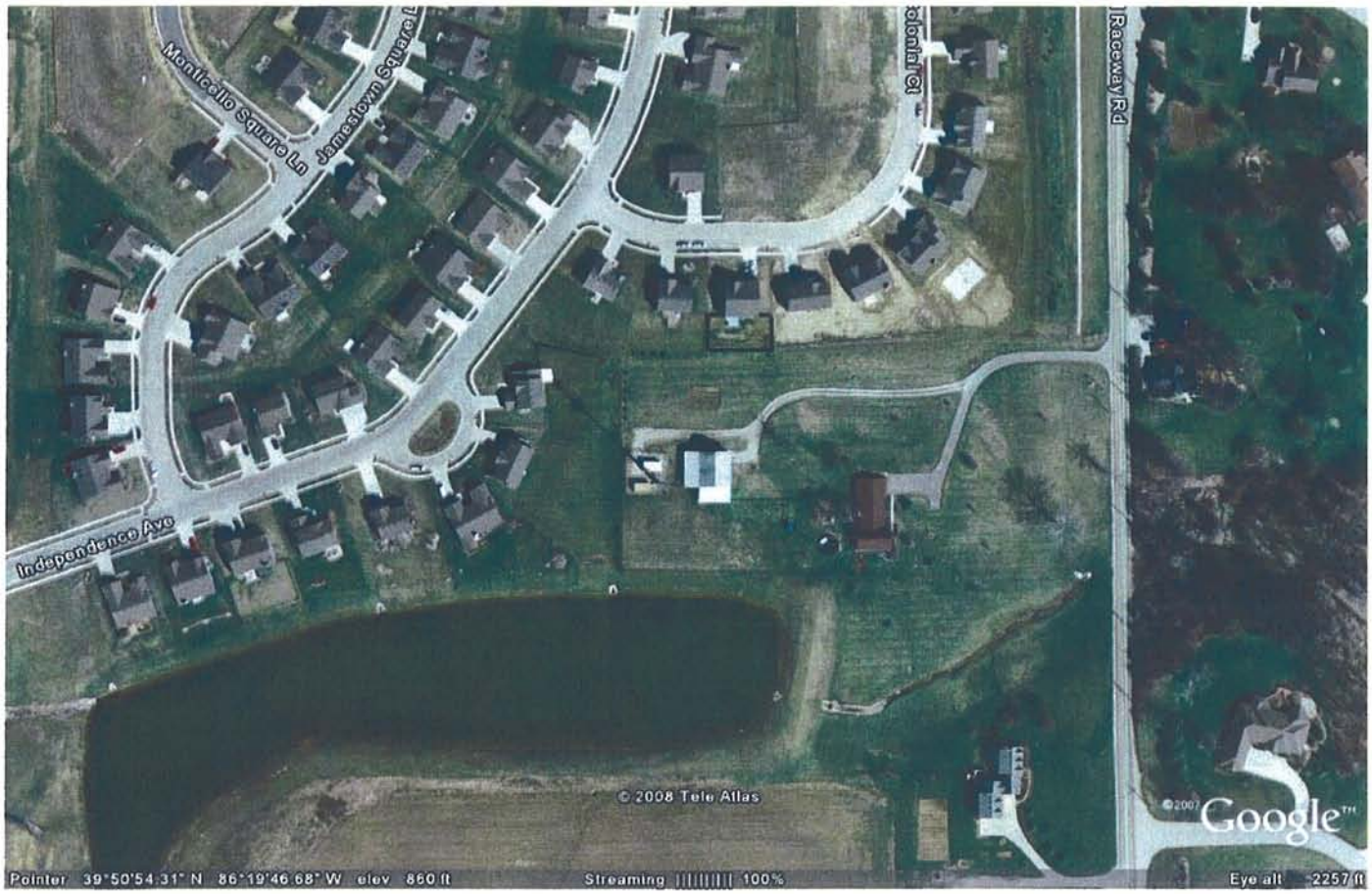
Monticello Square Ln
Jamestown Square
Colonial Ct
Raceway Rd
Independence Ave
© 2008 Tele Atlas
©2007 Google™
Pointer 39°50'54.31" N 86°19'46.68" W elev 860 ft
Streaming 100%
Eye alt 2257 ft

KEY POINTS FOR DISCUSSION

- The proposed use is permitted as a special exception in this zoning district. Any alternative location satisfying AT&T's radio frequency and coverage requirements would also need to be located within this zoning district, but in areas likely to be developed for predominantly residential land uses.

- The proposed location adjoins a transportation corridor enhancing coverage for the business, personal and public safety needs of customers within the vicinity.

- The proposed site is in an area likely to be redeveloped for relatively intense land uses in the future because of its location along the highway. This is evidenced by zoning map amendments relating to properties north of this location and adjoining the highway.

- The proposed location is within an area likely to be used for a relatively intense land uses and adjoining properties along the highway are likely to be developed for similar uses, which makes it the best location within the search area.

- As reflected by the photographs, wireless facilities are commonplace across the area landscape and do not impede the normal and orderly development of surrounding property.

- Wireless facilities are also not injurious to surrounding properties because they do not generate traffic, noise or odor. The specific location for this facility provides ample setbacks from adjoining, existing uses and will not diminish property values within the vicinity.

- The proposed site reflects the best alternative within the search area with the least impact on adjoining properties and anticipated future development.

Exhibit 13

AT&T / SHERIDAN ROAD

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Tab 3 .....**RADIO FREQUENCY INFORMATION**

Tab 4 .....**IMPACT ON FUTURE DEVELOPMENT AND PROPERTY VALUES**

Tab 5 ..... **STRUCTURAL DESIGN OF TOWER**

Tab 6 ..... **INFORMATION ON LIGHTENING**

PROJECT SUMMARY/SUPPLEMENTAL INFORMATION

Wireless Communications Services

This Application is filed on behalf of AT/T Mobility ("AT/T") for zoning relief to enable AT/T to pursue a critical part of its wireless communications network. With the proposed communications facility, AT/T will enhance its wireless service to the City of Westfield and its citizens, improving voice communications, supporting broadband data transmissions to notebook computers, portable facsimile machines, personal digital assistants, two-way paging and other wireless audio and video services. These technologies are an integral part of daily life in Westfield and will serve to enhance public safety and foster business and economic activity by providing information to people wherever and whenever they need it. This information is in the form of video, graphics, data or voice. With this facility, AT/T's wireless network in Westfield will provide better quality mobile communications service and will enhance the quality of various types of wireless service.

Statement of Necessity

Engineers at AT/T have identified the need for this antenna support structure and equipment facility, a "cell site," to serve this portion of the City of Westfield. This proposed facility is necessary to provide quality, seamless coverage to AT/T's customers as part of its network.

In developing and maintaining this system, a cell site must be located within a narrowly defined area allowing it to function as an integral unit in the network system without gaps in service, and without interfering with the signal from surrounding cell sites. The wireless network is laid out in a grid pattern and the spacing, height, and location of each component cell site is critical for the successful operation of the entire system. The system design requires an antenna facility to be located at or near the center of each cell site, within a radius AT/T refers to as the search area.

The site which is the subject of this location, at 4909 Sheridan Road, within the City of Westfield, Indiana, and is required to provide coverage within the immediate vicinity of the proposed location. The location of this site is currently required to conform to the remainder of the grid pattern in the design of the network. Included with these materials is a depiction of the relevant search area, and the subject location is near the center of this area.

Co-Location Analysis

The central thrust of the regulation of wireless facilities within the City of Westfield is the requirement that an applicant demonstrate that it has exhausted efforts to locate antennae upon existing tall structures within the vicinity of the search area, including existing towers. This policy is consistent with industry practice and AT/T's own company practice. It is cost-effective to co-locate whenever and wherever possible, and AT/T does so routinely where an existing location can be integrated within the network to solve a coverage deficiency. Indeed, AT/T has co-located within the City of Westfield as part of its existing network.

Here, there are no existing tall structures within the search area. However, AT/T has evaluated whether it could utilize existing tall structures within the vicinity of the search area in order to satisfy its radiofrequency requirements for seamless coverage.

As the staff report indicates, co-location is not possible on the Westfield water tower because of the antenna mounting system. The current mounting system would not structurally hold any new equipment without covering an access hatch for the water tower.

AT/T also evaluated the T-Mobile location as a part of reviewing potential co-location alternatives. AT/T's radiofrequency engineer has determined that co-location upon the T-Mobile facility, even assuming it were technically feasible, would not satisfy AT/T's network requirements. Specifically, AT/T's radiofrequency engineer, Hamed Zia, indicates that co-location at the "T-Mobile location would still leave a coverage hole near the intersections of State Road 38 and US 31, thus requiring AT/T to build a new site there as well." Mr. Zia has provided coverage maps showing what the coverage would look like with a site at the proposed location and what it would look like at the T-Mobile location.

The proposed site is positioned within the search area and is designed to fill the gap in coverage immediately north and west of the site. Adding additional antennae at the T-Mobile site may marginally improve coverage in the vicinity of the proposed location itself, but does not address the coverage hole further north and to the west of the subject site, including the intersection of SR 38 and US 31. Accordingly, the T-Mobile location is not a viable option and would only result in the need for another tower further north and towards the intersection.

Lastly, AT/T has considered co-locating upon existing power poles that bi-sect the vicinity. This is not a common practice, but the poles are tall structures and appropriate to evaluate in considering all options. After due investigation, AT/T has determined that the height and location of these poles eliminates them from being considered as viable alternatives to a new facility. In addition, AT/T understands that the electric utility is unwilling to make these poles available for communications equipment under any circumstances.

Accordingly, AT/T believes it has evaluated all co-location alternatives and determined that no such alternative is viable and meets its radiofrequency requirements.

Availability of Property

When the search area for this location was identified, AT/T reviewed and analyzed the zoning ordinances, base maps and comprehensive plan to determine the most appropriate zoning districts within the search area as available locations for the facility. AT/T has also performed an analysis of other factors, such as ground elevation, existence of floodways, and size and constructability of the parcel to evaluate the feasibility of the site. Although a search area is often limited, AT/T is dedicated to working with local officials and residents to locate its facilities upon sites within each search area that are most appropriate to the community.

After a thorough analysis, site search and evaluation of parcels within the search area, an appropriate site was located at the subject site. The parcel is within the AG-SF1 zoning district,

like other properties within the relevant search area. AT/T believes this location will meet its design criteria, fill a coverage gap with a single tower and have no adverse impact upon adjoining properties or the community.

Existing Land Uses and Comprehensive Plan Designation

The subject location is in the northeast section of Washington Township which area, along SR 38, is a mixture of residential and agricultural uses, together with some business uses along the highway. The subject parcel has included a boat repair business for at least the last 25 years. The proposed site is bordered to the south and east by a commercial nursery and office for the nursery, respectively. State Road 38 is to the north, and residential property to the west.

The Comprehensive Plan for this area refers to it as "New Suburban." The staff report indicates that cell towers are not mentioned in this section of the Plan. However, the City has studied the issue of wireless communications infrastructure as part of its strategic planning and correctly concluded that additional wireless facilities will be necessary to fill in coverage gaps, serve a growing population base, and support enhanced technologies.

Specifically, the City's Economic Development Strategic Plan ("Strategic Plan") acknowledges that there are some "dead" areas within the community and correctly observes that with growing populations and as wireless communications facilities become more advanced, "cellular phone usage, high-speed internet usage, data transmission, telecommuting, etc. will continue to grow, which will eventually saturate the current communications infrastructure." The Plan goes on to consider whether wireless communications infrastructure could be used to expand the City's local capacity for wireless network data transmission. In this way, it would appear that the City has considered this issue and how it relates to the future and concluded that wireless communications will be a needed component of the City's future and of its economic development.

Additionally, areas within this general vicinity of northeast Washington Township have already been rezoned, providing a glimpse into what a "New Suburban" development likely may entail. The detailed Concept Plan for Aurora depicts a modern, mixed use development stretching from SR 38 to the east all the way to US 31 to the west. The project is designed with retail businesses along SR 38 and commercial uses along US 31. This land development makes sense for the specific project and seems likely to reflect the development pattern for the subject property as well, with more intense land uses adjoining the highway. This argues in favor of locating a wireless communications facility within an area likely to be developed for commercial uses in the future, rather than locating it away from the highway in an area where residential uses will likely prevail. A copy of this Concept Plan is included with these submitted materials.

Accordingly, AT/T believes that the proposed facility is entirely consistent with a New Suburban designation. This designation would appear to include mixed and economically balanced land uses equipped with modern technology serving a vibrant and mobile citizenry with their work, education, hobbies and recreation. Certainly, it would appear that Westfield is planning for a future that includes technology, promotes managed growth, and encourages new investment and

not one that excludes technology in certain areas or limits its effective use in large sections of northeast Washington Township.

Subscriber Base

The majority of wireless facilities in the City of Westfield are designed to cover a relatively small geographic area. This site is designed to provide coverage to the immediate area, including the intersection of SR 38 and US 31 and points immediately southwest and northeast of that intersection. Residents, businesses and travelers in and around this portion of the City of Westfield will be the direct beneficiaries of this installation and resulting improved wireless communications service.

Description of the Property/Existing Improvements

The subject property is located at 5005 Sheridan Road within the City of Westfield. The property is owned by Charles P. Campbell. The property is zoned AG-SF1. AT/T will occupy a 25' x 70' leased area for the installation of the antenna and associated equipment. Other equipment for the facility will be housed within an equipment shelter.

The property is currently improved with a residential structure and two accessory structures. The residential structure is used as a dwelling, and the accessory structures are used as retail and repair facilities for boats and other aquatic equipment. The staff report previously indicated that the accessory structures were in violation of applicable zoning ordinances respecting setbacks, rendering the site as nonconforming. However, further investigation into these structures indicates that they pre-date the effective date of the zoning ordinance and are legally established, requiring no variances or other development approvals.

The proposed location of the facility appears to be within a regulated legal drain, requiring approval from the Hamilton County Surveyor's Office for the location of the accessory building. AT/T has applied for this approval from the Surveyor's Office, and a copy of this request is included with these materials. AT/T has received preliminary indications that this request will be approved.

Nature of Request

The site plan and associated materials with the Application illustrate the proposed installation, which is described further below.

AT/T is requesting approval of a Special Exception to construct the base station facility consisting of a 150-foot monopole tower (with 8' lightning rod), together with an equipment storage shelter to be located upon the subject parcel. AT/T believes it meets all other zoning requirements to allow construction of the facility.

Size (square feet) and Type of Equipment Shelter

The electronic telephone equipment shelter is a prefabricated and "unstaffed" building with approximate dimensions of 11'-5" by 20' (for a total of 230 square feet). The shelter is delivered with the electronic equipment already installed. AT/T's lease parcel has dimensions of 25' x 70', for a total of 1750 square feet.

Construction

After initial site preparation, the foundations for the monopole and the equipment shelter are installed. Once the concrete has cured, the monopole tower and building are installed and utilities are connected. The antenna is a 150' monopole, self-supporting structure. The electronic cellular telephone equipment shelter is a prefabricated building. The building comes with the electronic telephone equipment already installed.

AT/T has provided a detailed letter outlining the structural strength of the tower and design standards to which it will be constructed. This letter supports the statement that the tower has been engineered to fall within the boundaries of the subject property, so as not to cause injury or property damage on adjoining properties. Its position on the subject property and its structural design assure that the tower will not endanger the safety of any member of the public, including adjoining property owners. A depiction of the "fall zone" for the tower is also included with these materials.

Also, AT/T has included articles concerning the structural integrity of these antenna structures as best evidenced by their survival through recent natural disasters in the United States. Indeed, one of the true success stories of the wireless age has been the reliability of, and absolute necessity for, wireless communications following a natural disaster. Wireless networks are oftentimes the only remaining channels of communication following an extreme weather event, natural disaster or accident. In this way, the proposed facility would enhance public safety in the City of Westfield by adding wireless communications infrastructure to an area that is highly travelled today and likely will become a population center in the future.

The structural design letter also describes that the tower has been engineered for up to three co-locators, thereby promoting the policy objectives of the Westfield Zoning Ordinance and limiting the proliferation of towers in the jurisdiction, while providing the additional wireless infrastructure contemplated by the Strategic Plan.

Statement of Non-Interference

No nuisances will be generated by the installation or use of this proposed facility. The facility is unmanned, and there will be no utility facilities needed for this site other than electricity and telephone, both of which are available to the site. Following installation, there will be no impact on traffic; no on-site employees other than periodic (approximately monthly) service and maintenance visits; no loading or unloading of supplies; no materials handled, stored, discharged, or discarded; and no noise will be generated.

The use of the facility will not injure the public health, safety or welfare, nor will it adversely impact the neighborhood. The proposed facility will be integrated within AT/T's existing network to provide necessary infrastructure and a vital communications link which has repeatedly proven its effectiveness in emergency situations; such systems are commonly being utilized by police and fire departments to protect the general public's health, safety and welfare. As a part of the necessary infrastructure for modern personal and business communications, this facility will contribute to the welfare, comfort and convenience of the public.

AT/T has also submitted a summary of research conducted concerning lightning strikes, evidencing that the tower is safe and will not cause lightning strikes or threaten public safety.

Statement of Operations

After construction of the facility is complete and the signal transmission equipment is fine-tuned, visitation to the site by service personnel for customary maintenance will, as noted above, occur one time per month in a station wagon or panel/van type vehicle. The facility is entirely self-monitored and connects directly to a central office, where sophisticated computers alert personnel to any equipment malfunction or breach of security.

A wireless facility of this sort is unmanned, and, accordingly, there will be no "hours of operation" and no impact to existing traffic patterns. Ingress and egress will be provided with a driveway for the service personnel vehicles which arrive infrequently to service the cell site.

Adjoining Property Values/Future Development of the Site

AT/T has hundreds of communications facilities across its network, and its experience with these facilities indicates that they do not adversely impact property values. This is for a variety of reasons. First, cellular wireless facilities have become common to the American landscape since the passage of the Telecommunications Act of 1996. Today, these facilities are no more unusual than a telephone pole, a lift station or a variety of other utility installations which dot the landscape. Second, cellular wireless facilities are not objectionable. Wireless facilities of this kind do not emit light, noise or odor and have little or no impact on adjoining property values. Third, the cultural acceptance of these facilities and their innocuous nature is supported by data respecting the values of properties adjoining wireless facilities.

AT/T has included an affidavit from its expert witness in this area verifying this fact, together with objective data derived from properties adjoining wireless facilities in other locations in central Indiana, including Hamilton County. These materials include a photograph of a location within the City of Carmel, along Hazel Dell Parkway, adjoining a residential neighborhood. The market value property tax assessments for these adjoining properties, when compared to the market value property tax assessments for properties within the same neighborhood, but not adjoining the wireless facility, indicate that the wireless facility has had no material or substantial adverse impact on values. AT/T's expert will testify to this fact and to the fact that property values are typically driven by other "macro" factors, including location, applicable tax rates, zoning restrictions, quality of schools, traffic, commute times, and a variety of other factors.

Wireless facilities, when positioned appropriately on a property, do not inhibit the development of adjoining properties or the remainder of the subject property. Again, AT/T's real estate expert will testify that a wireless facility may only adversely affect the development of a parcel to the extent that its physical location limits the area available for building, restricts parking or inhibits traffic flow.

This testimony will be supported, in part, by reference to the installation of a wireless facility within the Precedent office park in Marion County. A photograph of this office park demonstrates that the location of an approximately 120' monopole did not inhibit or impede future investment on the adjoining property (as it is now developed for a Class A office building) because the location of the facility is out of the way and does not inhibit parking or impede access or traffic flow. Further, AT/T has identified another nearby site at the northeast corner of 146th Street and US 421 where developers plan a retail and medical office development in Boone County on the same site with an existing communications tower. Again, the development will proceed in an orderly and planned fashion because the location of the tower is such that the remainder of the parcel can be developed with adequate parking, ready access and appropriate traffic circulation (as shown on the concept plan included herewith reflecting this development).

The properties and locations described above are a few of many examples from around the area depicting both how common cellular facilities are to the landscape and how little, if any, these facilities affect property values or adjacent development.

Benefits of Wireless Technology

AT/T is required under the terms of its license from the FCC to provide seamless coverage to its customers, and, in doing so, AT/T supports technologies that provide many benefits to the community. These benefits include, but are not limited to, the following:

Technology supports 911 program allowing motorists to summon aid and report dangerous situations (this is particularly relevant in high travel areas like the subject location).

Support for emergency services by providing wireless communications to paramedics, firefighters, and law enforcement agencies.

The ability to transmit data allowing for immediate access to vital information.

A backup system to the land-line system in the event of a natural disaster or man-made disaster (in the event of power failure, AT/T's facilities will have back-up power capability for hours of continued operation).

Communication capabilities in remote areas, enhancing the safety of travelers by allowing immediate access to emergency assistance.

Support services for the busy lives of people in Westfield, reducing stress, increasing productivity and enhancing quality of life.

The City of Westfield is a growing community with a high quality of life, including great schools, parks and green spaces, modern shopping options, a reinvigorated downtown and many quality neighborhoods. The future for Westfield is very bright, and its own plans for the community contemplate the expansion of wireless communications as an aspect of enhancing the local quality of life, promoting investment in the community, fostering a culture of lifelong learning, attracting an educated workforce and improving public safety. The proposed facility, as part of AT/T's network serving Westfield, will contribute to this bright future by providing the needed wireless infrastructure platform for the voice, video and data communications of the future. The site is appropriately placed along a major transportation corridor and will not adversely affect adjoining property values or future development in the area. Rather, it will support the people and land uses to come in the future with much needed technologies for an innovative, active and mobile citizenry.

NON-ENFORCEMENT OF DRAINAGE EASEMENT ON INDIVIDUAL TRACTS

STATE OF INDIANA) BEFORE THE HAMILTON
)
COUNTY OF HAMILTON) COUNTY DRAINAGE BOARD

At the request of AT&T Mobility *The Hamilton County Drainage Board considered the extent of the drainage easement on the* Beals & Cox Regulated *Drain on parcel number* 08-06-20-00-00-008.000.

The legal description for this parcel is found in Deed Record -- *Page* -- *or instrument number* 200500059191 *in the Hamilton County Recorders Office. The undersigned owners of record hereby agree and covenant with this Board that:*

Neither the Hamilton County Drainage Board nor any contractor or workman operating under the authority of said Board will be liable for damages resulting from construction, reconstruction or maintenance of the above named drain at said location, whether to the real estate or improvements thereon, and said owners, their grantees and assigns do release and agree to hold the Board harmless from any such damage. *****Damages to paid by the land owner*****

_____

_____

The Board will not enforce the easement beyond a distance of _____ *feet from the* _____ *side of the top of bank / center line of the tile of the said ditch / drain at that location.*

The Board will not object to the improvement of the said real estate at a distance beyond the enforced portion of the easement.

OTHER CONDITIONS _____

_____

AGREEMENT WILL BECOME EFFECTIVE UPON RECORDING.

DATED THIS _____ **DAY OF** _____ **20**_____.

_____
PRESIDENT OF DRAINAGE BOARD

_____
MEMBER OF DRAINAGE BOARD

_____
MEMBER OF DRAINAGE BOARD

_____
APPLICANT

Jason Riggs as Representative of AT&T Mobility
PRINTED NAME

Chas. P. Campbell
Chas. P. Campbell
CO-APPLICANT (Owner of Land Involved)

"I affirm, under the penalites for perjury, that I have taken reasonable care to redact each Social Security Number in this document, unless requried by law _____"

Prepared by the Hamilton County Drainage Board: _____
(Surveyor)

Adobe PDF Fillable Form

Revised July 2006

NON-ENFORCEMENT INFORMATION

Hamilton County Surveyor's Office
One Hamilton County Square, Suite 188
Noblesville, IN 46060
317-776-8495 fax: 317-776-9628

Name of Drain: Beals & Cox Regulated Drain

Project Name: SR38 & Hinkle Rd.

Parcel Number: 08-06-20-00-00-008.000

Township: 19

Applicant's Name: AT&T Mobility

Property Owner: Charles P. Campbell

Address: 900 East 96th Street, Suite 500
Indianapolis, IN 46240

Property Address: 4909 Sheridan Rd.
Noblesville, IN 46062

Phone: (____)

Phone: (317) 877-0802

Fax: (____)

Fax: (____)

Contact Name: Jason Riggs

Contractor-Installer: TBD Upon Bid Awarded

Address: 6402 Corporate Dr. Indianapolis, IN 46278

Address: TBD

Phone: (317) 281-9451

Phone: (____)

Fax: (317) 471-1234

Fax: (____)

Purpose of Non-enforcement: To locate a prefab concrete building, monopole tower, & chain link fence

Reduced to: _____ feet on _____ side of Drain.

If Utility, how many feet is line paralelling drain: _____

Plan Project / Job Number: Wireless Communication Facility / IN0318

Project Location: 4909 Sheridan Rd., Noblesville, IN 46062

Engineering Firm: GPD Associates

Address: 8275 Allison Point Trail , Suite 220, Indianapolis, IN 46250

Phone: (317) 299-2996

Fax: (317) 293-1331

For Office Use Only

Permit # _____ Project # _____ Check # _____

Adobe PDF Fillable Form

INSTRUCTIONS FOR FILING NON-ENFORCEMENT REQUESTS FOR INDIVIDUAL TRACTS

The following are instructions for the completion of the **Non-Enforcement** form for individual tracts.

A. The **Non-enforcement Request** and **Non-enforcement Information form** shall be submitted to the Hamilton County Surveyors Office one (1) week prior to the Hamilton County Drainage Boards monthly meeting. The Drainage Boards meeting usually takes place on the last Monday of each month.

B. Request shall be on the standard form, as supplied by the Surveyors Office.

C. The form shall be completely filled out with the following information:

1. Name of individual, firm, partnership or corporation owning tract.
2. Name of legal drain.
3. Parcel number of tract as shown in the Hamilton County Auditors Office.
4. Recording information for Deed. (From Hamilton County Auditor or Recorders Office.)
   * A copy of the warranty Deed is to be returned with the application. *
5. Signed by the individual or officer of firm or corporation or general managing partner of partnership. Show printed name of signatory and his or her title if done by firm, corporation or partnership. If joint ownership both or all parties must sign. **DO NOT FILL IN THE DATE ON THE FORM.**

A copy of a site plan, plat or engineered drawings showing what structures are proposed to encroach the Hamilton County Drainage Easement shall be submitted with the application.

D. The **Surveyor** shall fill in the remaining items:

Distance from the top of bank/center line of tile.
Side of top of bank/center line of tile
Other conditions

E. This form must be signed by and have printed name of owner of record as shown on the warranty deed from the Hamilton County Auditor.

F. This form shall require **one check** submitted with it. **One check for seventy-five ($75.00) dollars made out to the Hamilton County Treasurer Office, If the petitioner is a corporation or partnership or the project is a commercial project then a one hundred ($100.00) dollar check is required.**

Adobe PDF Fillable Form

Prescribed by State Board of Accounts

A.E. Boyce Co., Inc. Muncie, IN • General Form No. 352 • 1145

RECEIPT

Hamilton County Surveyors Office
NAME OF UNIT, AGENCY, BOARD OR DEPARTMENT

8019

Nonenforcement FUND

NO.

Noblesville IN, Date 2/23/09

RECEIVED FROM Goodman Networks Inc. $ 100.00

THE SUM OF One Hundred 100 DOLLARS

ON ACCOUNT OF Beals & Lox Brain SR 38 & Hinkle

PAYMENT TYPE AND AMOUNT: 08/06-20-00-00-008.000 (AT&T Cell tower)

CASH _____ CHECK 1273 M.O. _____

EFT _____ CC/BC _____ OTHER _____

Janet Hanson
AUTHORIZED SIGNATURE

The new at&t
Your world. Delivered.

February 23, 2009

Dear Sir or Madam:

I am writing this letter to explain why the exiting T-mobile location will not satisfy AT&T's needs for a new site in the Westfield area. Building a new site at the T-mobile location would still leave a coverage hole near the intersections of HWY 38 and US 31, thus requiring AT&T to build a new site there as well. AT&T would like to build a new site west of the T-Mobile location to fully cover Westfield and not have to build a second site. Attached are proposed coverage maps showing what the coverage would look like with a site at the desired AT&T location and what it would look like at the T-Mobile location.

Sincerely,
Hamed Zia
RF Engineer IV, AT&T

HAMED ZIA
13862 Barberry court
Carmel, IN 46033
(317) 372-4546

Objective To obtain a challenging management position in Telecom.

Experience March 2003 – Present AT&T (formerly Cingular Wireless) Indianapolis, IN

RF Engineer IV

- Responsible for RF GSM/UMTS design as well as any forth-coming future new technology. Responsibilities include: New cell site design, search area generation, resolving Radio Frequency interference and coverage issues, performance evaluation and optimization of existing cell sites.
- Responsible for growth planning and assisting in budget preparation.
- Successfully worked as RF Engineering Lead for network integration of Cingular Wireless network and AT&T Wireless network in Indiana.

June 2001 – March 2003 Cingular Wireless Indianapolis, IN

Manager of RF Engineering (Design & Performance)

- Responsible for all Design and Performance of GSM, TDMA, and AMPS RF networks.
- Managed growth, future planning, day to day performance monitoring, and optimization of existing networks.
- Successfully managed large scale network deployment of new GSM network while successfully maintaining high quality levels of legacy TDMA network.
- Performed as Indiana Market Team Leader for Network Operations group which comprised of RF Engineering, Operations, Network Engineering, Real Estate and Construction, and Implementation. Represented Network Operations in Indiana senior market leadership meetings with Sales, Marketing, and Finance.

Jan 2000 – June 2001 Cingular Wireless Indianapolis, IN

Manager of RF Engineering (Design)

- Through managing RF Design group, was responsible for following: New cell site design, Radio Frequency planning, traffic engineering growth planning, search area generation, resolving Radio Frequency interference and coverage issues, performance evaluation and optimization of existing cell sites, and budget preparation.

August 1995 – Jan 2000 Cellular One(BellSouth) Indianapolis, IN

RF Engineer

- Responsible for all of following: New cell site design, Radio Frequency planning, traffic engineering growth planning, search area generation, resolving Radio Frequency interference and coverage issues, performance evaluation and optimization of existing cell sites.
- Responsible for Regulatory Compliance including FCC and FAA filings, RF exposure compliance, and environmental compliance.
- Responsible for growth forecasting and assisting in budget preparation.

- Responsible for all aspects of Cellular Digital Packet Data (CDPD) network including System Administration, RF Planning and Optimization, and Network Planning.
- Supervised and trained less experienced staff in CDPD technology.
- Performed as Acting Manager of RF Engineering Design and Performance group for a period of 6 months.

August 1994 – August 1995 Cellular One (BellSouth) Indianapolis, IN

Network Engineer

- Designed and prepared system network, interconnect, and traffic projections for cellular, microwave, and mobile data systems.
- Responsible for all aspects of Cellular Digital Packet Data (CDPD) network including System Administration, RF Planning and Optimization, and Network Planning.
- Coordinated with vendors, contractors, software developers, and customers in deployment of CDPD network.

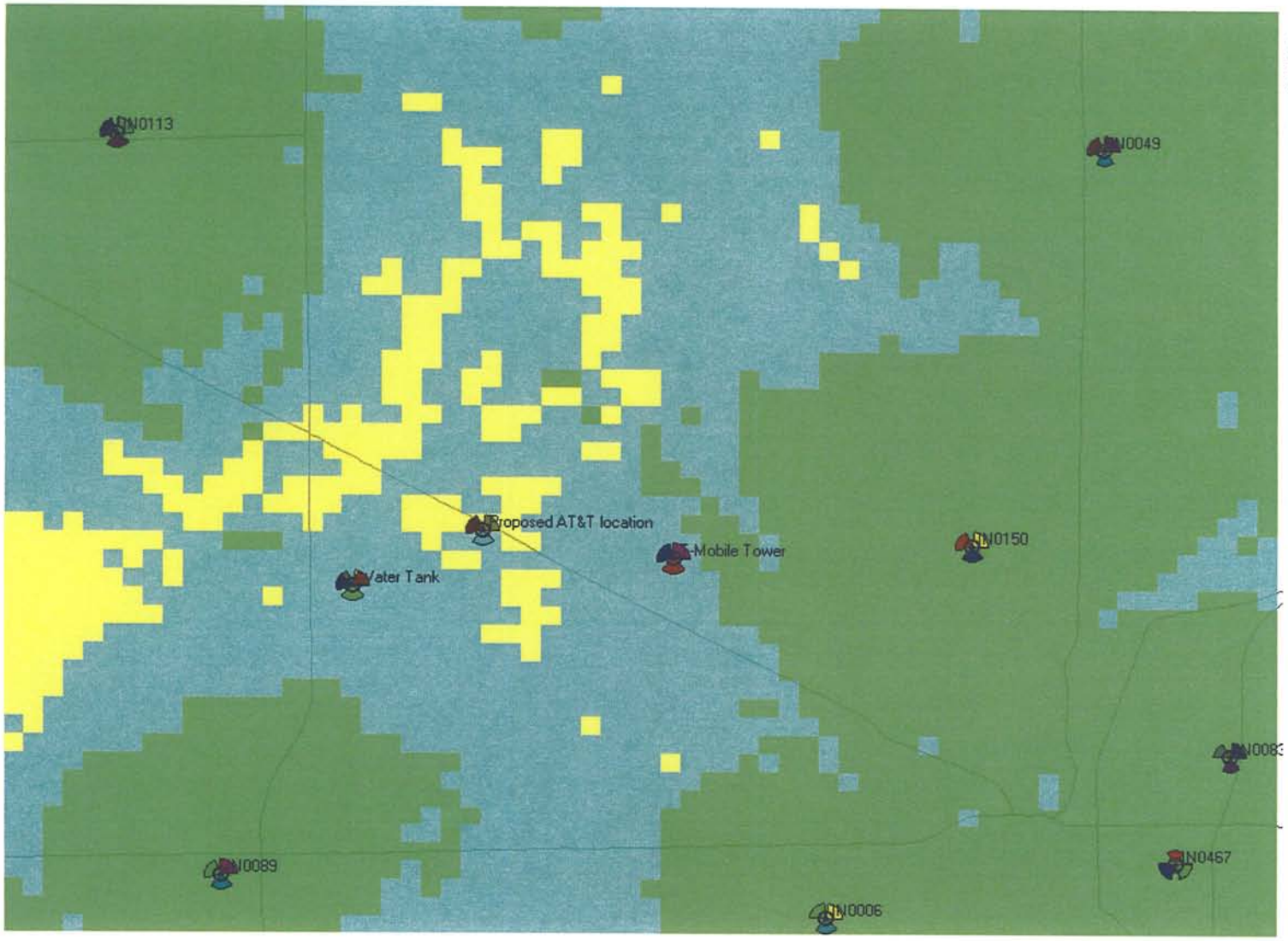
Education

1995 – 1997 University of Indianapolis Indianapolis, IN
MBA, Master of Business Administration

1990 – 1994 Purdue University West Lafayette, IN
BS, Bachelor of Science in Electrical Engineering

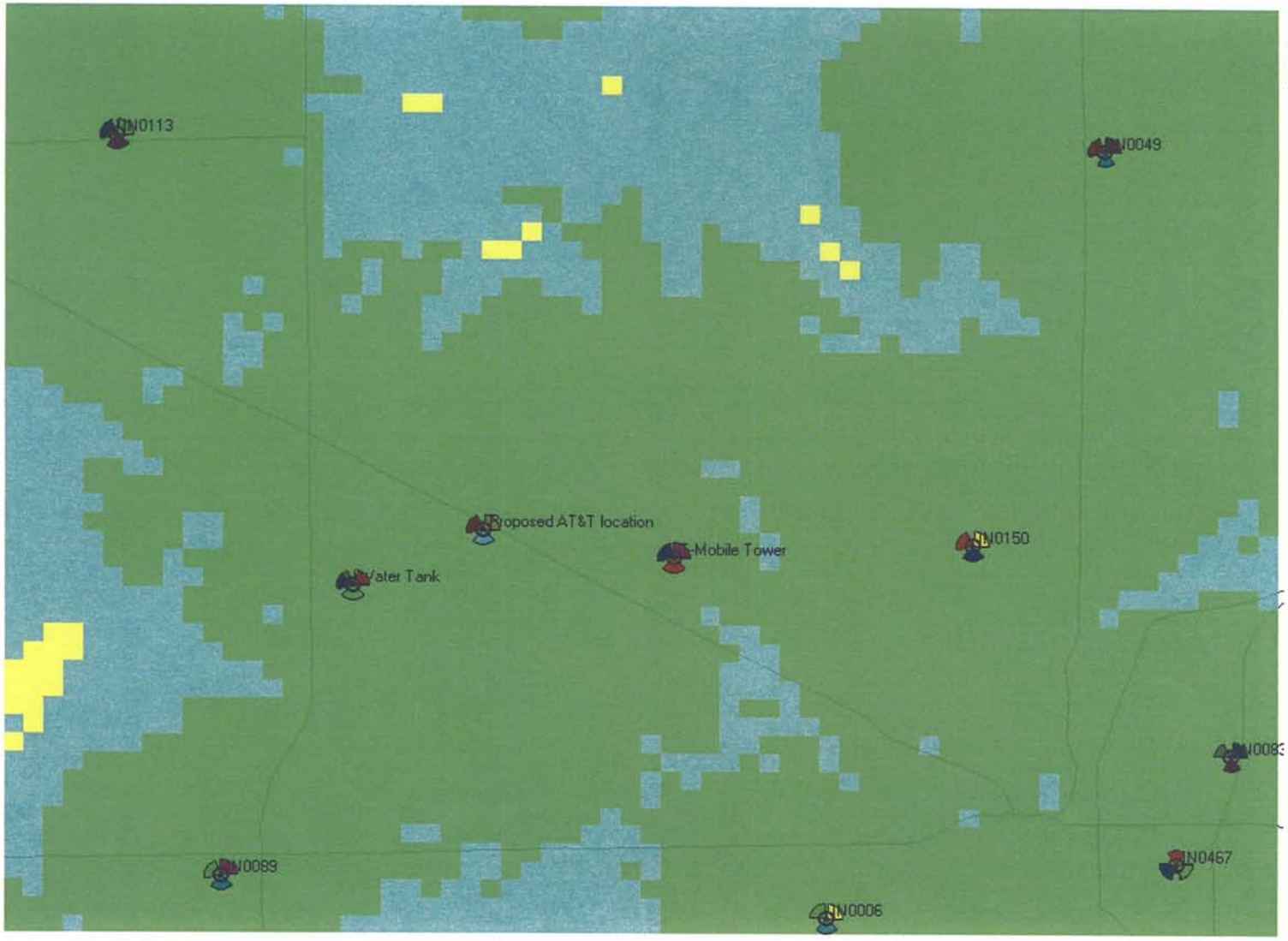
Citizenship United States citizen.

References Available upon request.



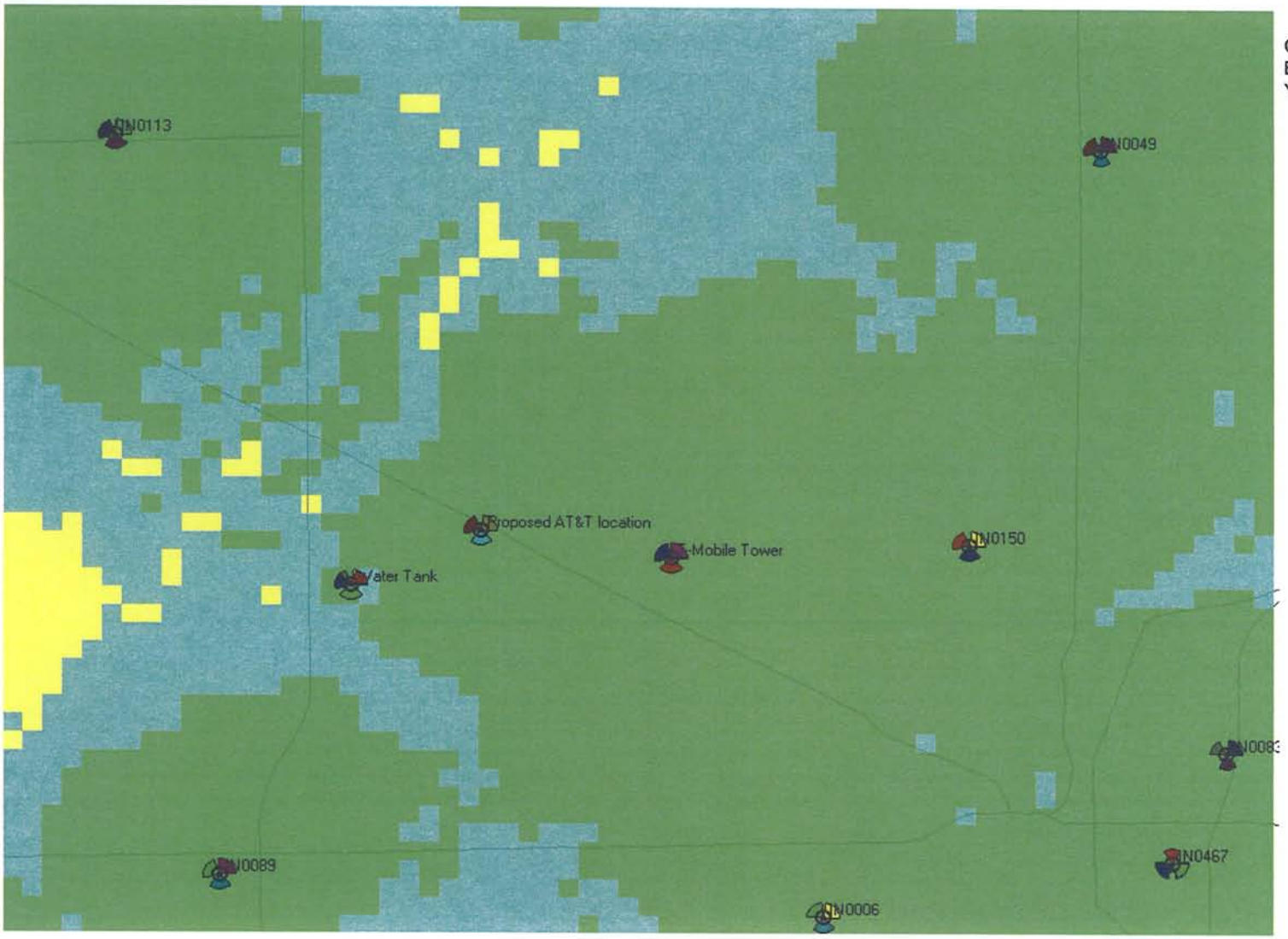
Green=Good Coverage
Blue=Marginal to Good Coverage
Yellow=Poor Coverage

Existing coverage



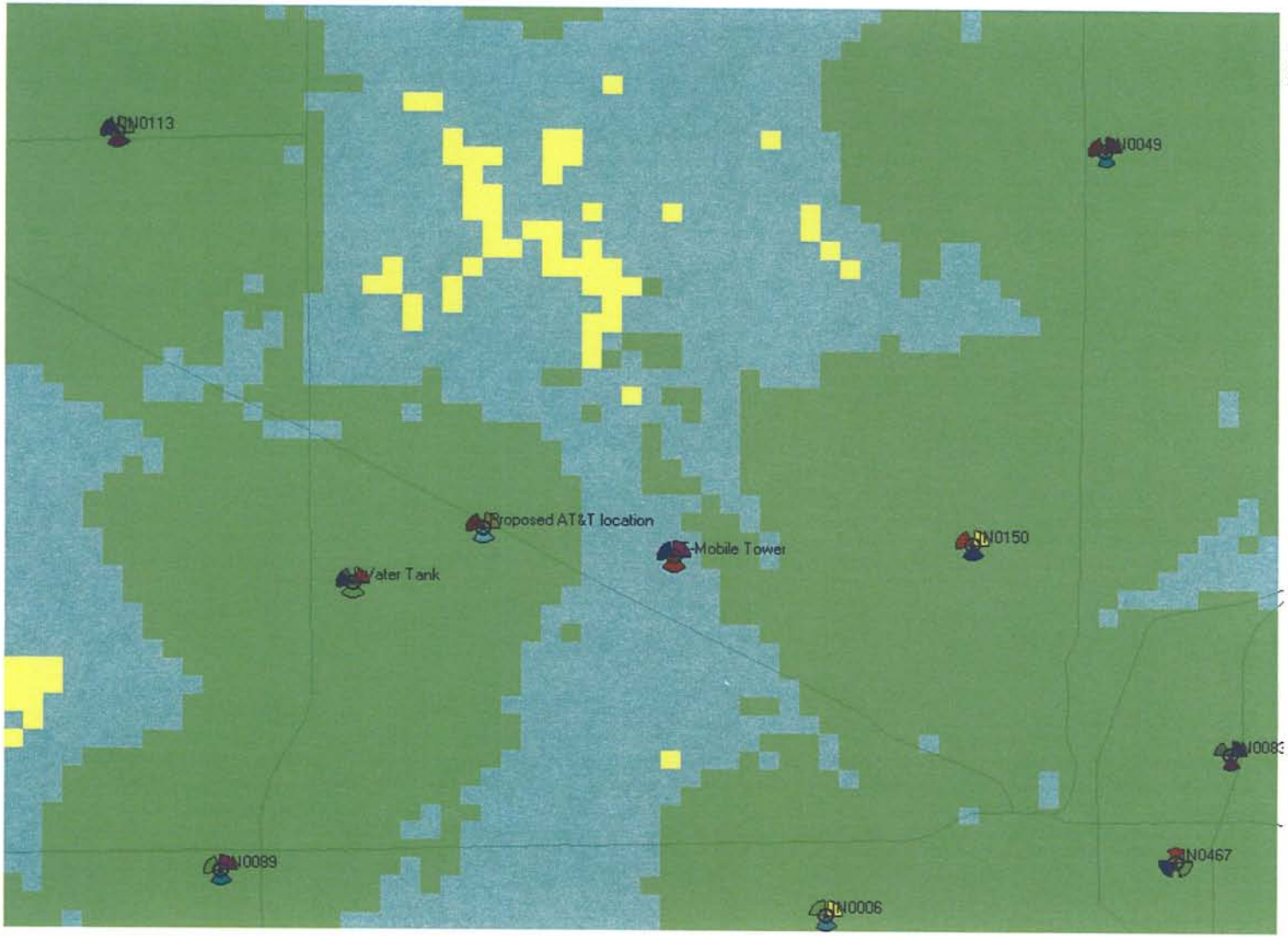
Green=Good Coverage
Blue=Marginal to Good Coverage
Yellow=Poor Coverage

Proposed coverage-Proposed Loc



Green=Good Coverage
Blue=Marginal to Good Coverage
Yellow=Poor Coverage

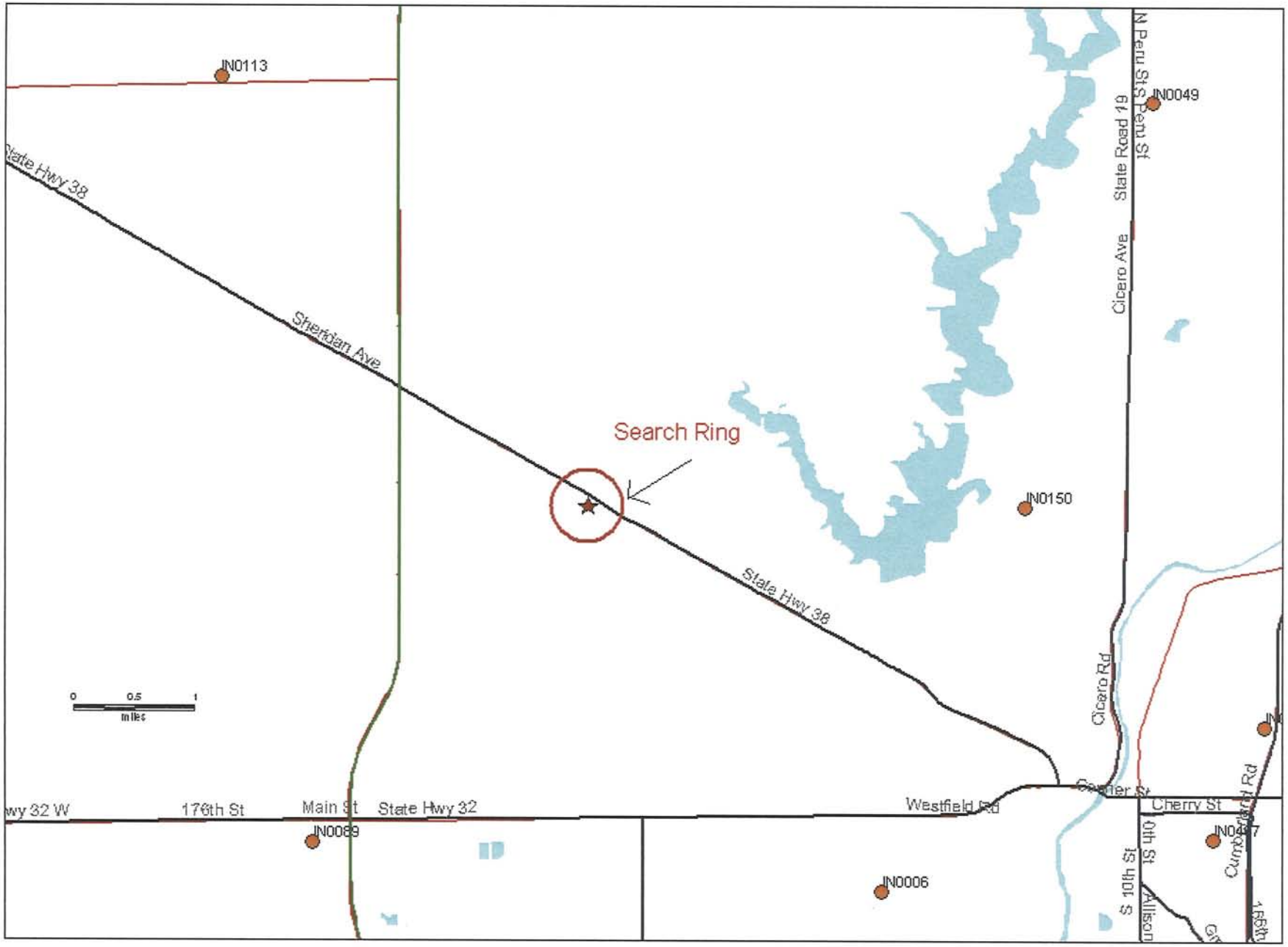
Proposed Coverage-T-Mobile Twr



Green=Good Coverage
Blue=Marginal to Good Coverage
Yellow=Poor Coverage

Proposed Coverage-Water Twr

AT&T SITE IN0318 SEARCH RING



February 23, 2009

To Whom It May Concern:

As a full service wireless telecommunications contractor, Fortune Wireless often finds an opportunity for telecommunications providers to collocate equipment on existing infrastructure. We are currently working with a wireless communications provider to place cellular service in the town of Westfield Indiana. We have been asked by the Town of Westfield to consider placing the wireless equipment on an existing high wire electrical pole or transmission tower that is owned and operated by Duke Energy.

We would like to know if Duke Energy is agreeable to locating telecommunications equipment on the existing dual mounted high power towers that are located within the town of Westfield, IN. Please provide a gage of your interest at your earliest convenience to the address below.

If you have any questions or would like a further explanation, please call.

Sincerely,

Jason Riggs
Project Manager
Site Development Services
Fortune Wireless, Inc.
A Subsidiary of Fortune Industries, Inc.
6402 Corporate Drive
Indianapolis, IN 46278
Cell: 317-281-9451
Fax: 317-471-1234
Email: jriggs@ffi.net

STATE OF INDIANA)
)SS:
COUNTY OF HAMILTON)

AFFIDAVIT OF MARK HARTMAN

I, Mark Hartman, having been duly sworn under oath, state as follows:

1. I am a licensed real estate broker within the State of Indiana. I have 28 years experience representing buyers and sellers in real estate transactions.

2. In the course of my representation of parties to real estate transactions, I regularly advise my clients about factors affecting a property's value, including adjoining land uses, vehicular access, utility services, existing improvements and zoning controls.

3. In my experience, a wireless communications facility on a property has little or no adverse impact on adjoining property values. Other factors, including but not limited to, access, applicable zoning and available utilities, are the primary determinants of land value, rather than common utility installations which produce no traffic, noise or odor. As a result, it is common to see investment directly adjoining or in close proximity with wireless communications facilities. In my experience, these adjoining properties appreciate at rates comparable to properties not adjoining wireless facilities within the same marketplace.

4. In addition, a wireless communications facility on a parcel will not adversely affect a property's future value or development prospects to any substantial degree, so long as the facility is oriented on the parcel so as not to affect the placement of building pads and parking and does not affect traffic circulation. These issues are typically not presented where the facility is located along a property line and away from any adjoining streets. As a result, it is common to see the development of parcels where wireless facilities already exist, provided, that

the facility is positioned on the parcel so as not to affect the placement of building pads, availability of parking, and circulation of traffic.

FURTHER AFFIANT SAYETH NOT.

I AFFIRM UNDER PENALTY OF PERJURY THAT THE FOREGOING STATEMENTS ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Date: Feb. 24, 2009

Mark Hart

Mark Hartman

STATE OF INDIANA)
) SS:
COUNTY OF HAMILTON)

Before me the undersigned, a Notary Public in and for said County and State, personally appeared Mark Hartman, and acknowledged the execution of the foregoing instrument this 24th day of February, 2009.

Vicki L. Shaw

Notary Public

VICKI L. SHAW

Printed Name

My Commission Expires:

VICKI L. SHAW
NOTARY PUBLIC - OFFICIAL SEAL
State of Indiana, Hamilton County
My Commission Expires Apr. 9, 2014

County of Residence:

HAMILTON

1375267

02/23/2009

PAYCHEX
02/23/2009

IBM
02/23/2009

02/23/2009

Assessed Valuation Data for Parcel Containing
Telecommunications Equipment
(new construction adjacent to pre-existing tower)
Source: City of Indianapolis

Parcel Address: 9229 Delegates Row, Indianapolis, IN 46240

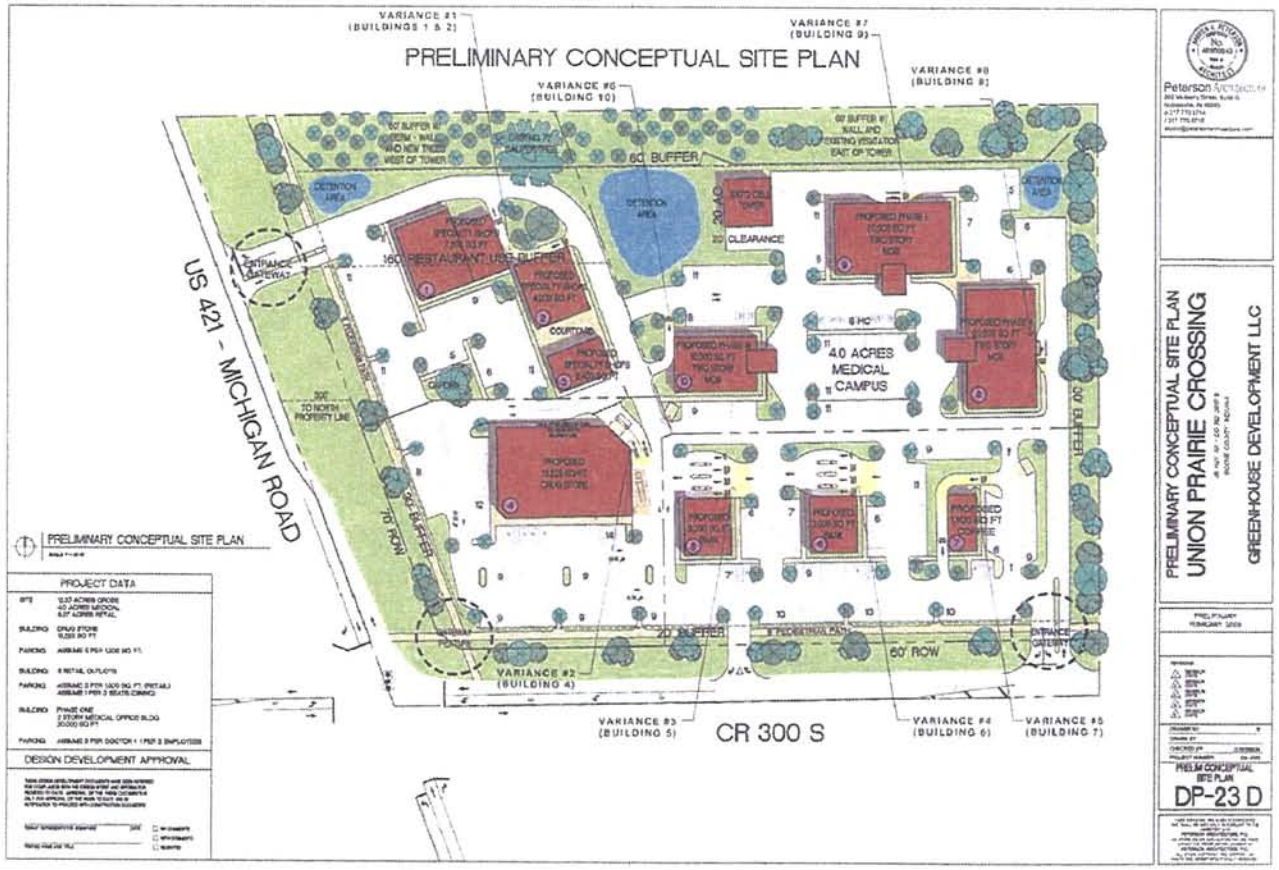
Assessed Valuation: **$17,911,500**

JONES
JONES
02/23/2009

02/23/2009

JONES
GREENHOUSE
HAPPY HOLIDAYS
SEE YOU
NEXT SPRING
JONES
GREENHOUSE
02/23/2009

02/23/2009


PRELIMINARY CONCEPTUAL SITE PLAN
VARIANCE #1 (BUILDINGS 1 & 2)
VARIANCE #7 (BUILDING 9)
VARIANCE #8 (BUILDING 8)
VARIANCE #6 (BUILDING 10)
60' BUFFER
DETENTION AREA
20' CLEARANCE
160' RESTAURANT USE BUFFER
COURTYARD
4.0 ACRES MEDICAL CAMPUS
US 421 - MICHIGAN ROAD
70' ROW
20' BUFFER
60' ROW
ENTRANCE GATEWAY
VARIANCE #2 (BUILDING 4)
VARIANCE #3 (BUILDING 5)
CR 300 S
VARIANCE #4 (BUILDING 6)
VARIANCE #5 (BUILDING 7)
PRELIMINARY CONCEPTUAL SITE PLAN
PROJECT DATA
DESIGN DEVELOPMENT APPROVAL
Peterson Architects
PRELIMINARY CONCEPTUAL SITE PLAN
UNION PRAIRIE CROSSING
GREENHOUSE DEVELOPMENT LLC
PRELIMINARY
FEBRUARY 2023
PRELIM CONCEPTUAL SITE PLAN
DP-23 D

Plum Creek Blvd
Prelude Ln
Opus Dr
Hazel Dell Pkwy
Stanwich Pl
Honors Dr
Sandalwood
E 126th St
Autumn Gate Way
Pebble Allaseam Dr
© 2008 Tele Atlas
Google™
Pointer 39°58'20.01" N 86°04'07.58" W elev 751 ft
Streaming 100%
Eye alt 2891 ft

Assessed Valuation Data for Residentially Platted Lots
Adjacent To Telecommunications Equipment
Source: Hamilton County, Indiana

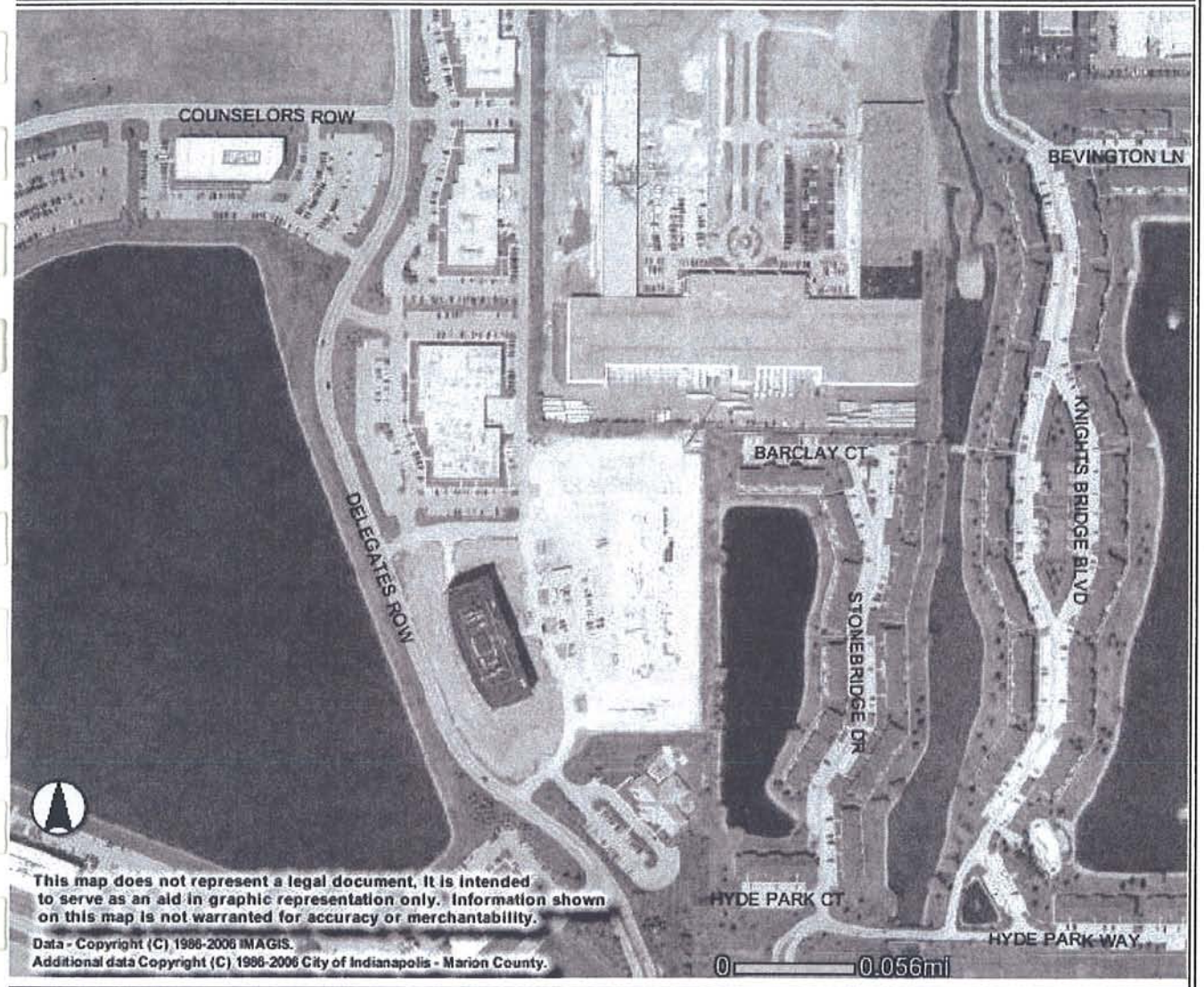
12608 Stanwich Place	$202,700
12614 Stanwich Place	$179,600
12620 Stanwich Place	$188,900
12628 Stanwich Place	$181,000
12636 Stanwich Place	$205,600
12642 Stanwich Place	$193,100
12648 Stanwich Place	$206,600
12654 Stanwich Place	$196,600
12660 Stanwich Place	$176,600
TOTAL	**$1,730,700**

Assessed Valuation Data for Residentially Platted Lots
In Proximity To Telecommunications Equipment
Source: Hamilton County, Indiana

5859 Sandalwood Drive	$187,300
5865 Sandalwood Drive	$179,200
5860 Sandalwood Drive	$191,900
5866 Sandalwood Drive	$187,100
5871 Sandalwood Drive	$170,600
5872 Sandalwood Drive	$175,700
5878 Sandalwood Drive	$180,600
5884 Sandalwood Drive	$195,100
5890 Sandalwood Drive	$179,200
TOTAL	**$1,646,700**

Aurora
Concept Plan
Sunrise Park
The Shoppes
State Road 38
The Vistas
Pond
Pond
Pond
Pond
Pond
Pond
Pond
Commerce Parke
(Area 1)
Pond
Pond
Meridian
US 31
New Frontage Road
Aurora Parkway
The Villas
Pond
The Gardens
Pond
Business Parke
Commerce Parke
(Area 2)
The Townes
Pond
Pond
Pond
Grassy Branch Road
North
SCALE: 1" = 200'

Precedent



Legend

Street Centerlines

1999 Aerial Photography

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40°04'56.56" N 86°06'08.48" W
elev 879 ft
Mar 2005
Eye alt 1805 ft

Hurricane Hugo was the worst hurricane to rip the East Coast in 30 years. The San Francisco earthquake left thousands of people without power for days.

Because major catastrophes occur infrequently, businesses and community officials are often unprepared to handle them. Many officials believe that phone service will continue to function in the event of a disaster. However the after-effects of disasters quickly dispel these beliefs.

In the event of a disaster, a community's only hope is to have a comprehensive disaster recovery program in place which includes backup communications systems. Many safety departments and communities find cellular phone service adequately replaces or supplements landline phone service in times of disaster.

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Along with two-way radios, cellular phone service is becoming an integral part of disaster recovery programs, especially by those safety departments using cellular on a daily basis.

The physical integrity of the cellular tower, designed to withstand high winds and vibrating earthquakes, assures it can provide uninterrupted service.

In a disaster like Hurricane Hugo, cellular towers have proved resilient in maintaining their service when other forms of communication failed. If a cellular tower becomes damaged, another nearby tower compensates for damages within the system and automatically redirects calls.

In the case of the San Francisco earthquake, only nine of the more than 100 cell sites operating in the area were deemed inoperable the morning after. When Hurricane Hugo hit Puerto Rico, only two of 19 cell sites were disabled by the storm.

Many carriers are actively working with local safety officials on expanded programs and equipment for providing emergency communications.

Lost phone service can be incredibly costly from an emergency safety standpoint, where lost time can result in injuries and possibly death. When a train carrying toxic chemicals derailed and caught fire in Miamisburg, Ohio in 1986, Cellular One's Dayton office provided 20 cellular transportable phones to police and fire safety officials.

Police and EPA officials used cellular phones to contact the chemical manufacturer in North Carolina to determine how they would react in a fire and how to protect area residents from noxious fumes.

Edward Kovar, executive director for the Miami Valley Emergency Management Authority, was responsible for activating emergency broadcast systems in Miamisburg. With two-way radio traffic overloaded, cellular provided an alternative to busy radio airwaves.

"Cellular phones were invaluable in this in this instance. I couldn't put a price on their worth," Kovar says. As a result, Miamisburg recommended similar service to other surrounding town's emergency

agencies.

During the Northwest Airlines DC9 collision aftermath at Detroit Metropolitan Airport in December 1990, the airport's phone lines were congested and inaccessible to safety officials. Eight people lost their lives in the fiery explosion when the DC9 accidentally taxied onto a runaway during a dense fog and was struck by a Northwest 727 taking off.

Gary Bramer, telecomm analyst for Northwest Airlines, agrees that cellular service is key to maintaining communications during a catastrophic event.

"It is extremely important in times like this. We needed the service to contact families of the survivors, call the FAA to investigate the cause of the crash, and to maintain contact with the Northwest Airlines home office in Minnesota," recalls Bramer.

According to Sanford Moser, Cellular One's Detroit regional sales manager, 20 cellular phones were provided to Northwest Airlines officials and FAA investigators within a few hours of the crash. To prevent landline communication systems overloading in the future, Northwest officials purchased three handheld units to have a backup in the event of another disaster.

"At NWA, we believe an ounce of prevention is worth a pound of cure," Bramer says.

Ohio safety officials worked to establish a comprehensive disaster recovery program that is efficient, convenient and beneficial to all.

Working with emergency groups throughout Ohio, northern Kentucky, southeastern Indiana and Michigan, Cellular One will make up to 107 transportable and portable phones available to safety officials under the auspices of their Disaster Recovery Program.

Each phone includes two batteries and use of complimentary cellular service during the disaster. As part of the program there is a toll free number (800/589-CEL1) to secure cellular communications in the event of a disaster.

A mix of portable and transportable cellular phones is best for disaster recovery. It always is a good idea to have spare batteries and exterior antennas on hand for longer phone life. Phones with a long battery life, easy to operate and yet lightweight, are most effective in maintaining communications services.

Once a disaster recovery program is outlined, it's helpful to test the program in a local mock disaster program. Many communities stage mock disasters through local hospitals, airports or fire departments.

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You don't need a hurricane to be prepared

Don't wait for a disaster to figure out your phone tactics

David J. Phillip / AP file

Utility trucks stage after Hurricane Gustav Sept. 2 in Lafayette, La. AT&T, the main landline phone company in the state, said it had 2,000 employees working to assess damage and perform repairs. Most of its cellular towers in areas hit by the hurricane were working afterward.

By Suzanne Choney
msnbc.com
updated 6:40 p.m. ET, Thurs., Sept. 11, 2008

msnbc.com

Suzanne Choney

• E-mail

As Hurricane Ike continues its path toward Texas, phone companies and wireless carriers are preparing. Are you?

Even if you don't live along the Gulf Coast, the lessons learned since Katrina, and before that, Sept. 11, about the vulnerability of communications networks are important for everyone. And one of the lessons is that it's good to be prepared and to give yourself options when services are strained or out.

Tropical Storm Hanna visited our area last weekend, its effects minimal, no major destruction. We were — and are — grateful. Our Internet and cable TV service was out for more than a day, a very small price to pay for something that could have been a lot worse.

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I still had Internet and e-mail access because I use two different smartphones, an iPhone and a Palm Treo, both with those features. I have two cell phones because of the work I do. Without those phones, and without TV or Internet service over the weekend, I would have felt pretty cut off from the world.

And, luckily, the two wireless providers of those phones, AT&T and Verizon Wireless, respectively, didn't seem to have any problems in our area, and the cell phones worked, as did my husband's Sprint cell phone. One of the few plusses of one household using different carriers, and not having a "family plan" with one company, is that you increase your odds of success if one of those providers is out, but the other is still up and running.

If you don't want to add a second provider, consider a prepaid cell phone, one that runs on a different network than your regular cell phone. For example, if you have Verizon Wireless as your carrier, a Boost prepaid cell phone might be a good complement. Boost is owned by Sprint.

During Hanna, our landline phone still worked, something that isn't always guaranteed during such bad weather. We do not "bundle" our Charter Communications service to include the phone with the TV and Internet service. In this instance, that was a good thing; there was no interruption to our phone service.

"Most of the outages were because customers lost power," said Lizz Walker, a spokeswoman for Charter. "We had just under 35 (outages) in Virginia and North Carolina where our standby power supplies ran out, mainly in the Outer Banks (N.C.), where flooding kept us from going in right away to restore service."

Customers using the company's digital phone service "have the option of having a battery backup, which means they would not lose phone service," she said.

But not everyone knows to do that. Walker said the back-up battery, which costs about $40, lasts up to eight hours. That can mean a world of difference if you're without other communications resources.

The eight-hour issue

More and more of us are increasingly relying on cell phones as our main phones, dropping landline service completely.

More than a year after Katrina resulted in downed communications networks, the Federal Communications Commission mandated that nearly all cell phone sites provide at least eight hours of backup power for customers.

CTIA-The Wireless Association, the cell phone industry trade group, has challenged that mandate in court, and a federal appeals court recently put the FCC rule on hold.

Still, wireless carriers have worked to be better prepared for emergencies, adding portable generators and portable cell towers that can be moved relatively quickly to areas where their cell towers might be down, or where extra capacity is needed.

Sprint, for example, says it has spent $59 million in the Southeast for hurricane readiness with portable generators, cell sites on wheels and satellite cell trucks, as well as now having its own "private weather forecast company."

Other carriers have made similar preparations. And at least one has made a thoughtful gesture to customers.

After Hurricane Gustav, Alltel Wireless said customers who were under mandatory evacuation orders in Louisiana and the Mississippi Gulf Coast between Aug. 29 and Sept. 12 will receive 1,000 free nationwide minutes, as well as unlimited text messaging for that period.

No matter what a company's precautions and plans, it's up to you to make your own in the event of an emergency. When it comes to cell phone service, here are some recommendations from wireless carriers and others:

Consider texting, not calling. Text messaging "has a greater success rate in getting through the network during high-usage periods, versus voice calls," says T-Mobile, and it helps free up the voice part of the phone network for emergency calls.

CTIA-The Wireless Association, meeting in San Francisco this week, said Wednesday that text messaging in general continues to set records among wireless customers. In the United States, there were 75 billion messages sent in June, a 160 percent increase over June 2007, the organization said.

CTIA's announcement comes at the same time that a member of the Senate Judiciary Committee is asking AT&T, Verizon Wireless, Sprint and T-Mobile, the nation's four largest wireless carriers, to justify the "sharply rising rates" customers are charged for text messages. Sen. Herb Kohl, D-Wis., said the costs have gone from about 10 cents a message in 2005 to about 20 cents a message now.

Get ICE. Program your cell phones with emergency contact numbers, and consider "ICEing" them. That means putting the letters "I-C-E" (for "In Case of Emergency") next to those numbers and the names of those you would need to reach should disaster strike.

David Aylward, director of COMCARE Emergency Response Alliance, a national nonprofit emergency communications advocacy group, recommends parents do that for their children's cell phones as well.

Stay charged. Keep your cell phone batteries fully charged. Consider getting a second battery for each cell phone, and make sure they're charged, as well.

Ziploc it. Round up all cell phones, pagers, batteries, cell phone car chargers, and keep them in a handy place and in a plastic bag to avoid water and other damage.

Go forward. Forward your home number to your mobile if you're evacuated. "Because call forwarding is based out of the telephone central office, you will get incoming calls from your landline phone even if your local telephone service is disrupted at your home," says AT&T.

"In the unlikely event that the central office is not operational, services such as voice mail, call forwarding, remote access call forwarding and call forwarding busy line/don't answer may be useful."

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Be patient. During an emergency, phone lines are jammed, and what you might hear are "fast busy" signals on your cell phone, or "a slow dial tone on your landline phone," AT&T says.

"If this happens, hang up, wait several seconds and then try the call

again. This allows your original call data to clear the network before you try again."

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February 10, 2009

Mr. Jason Riggs
Fortune Wireless
6402 Corporate Drive
Indianapolis, IN 46278

SUBJECT: STRUCTURAL INTEGRITY LETTER
AT&T IN 0318

Dear Mr. Riggs:

As requested we have prepared this letter to document the design procedures that will be followed for the structure proposed for the referenced site, which will be located off 5005 Sheridan Road, Noblesville IN.

The support structure will be a 150 foot high steel monopole.

1. The monopole has been specified to meet the requirements of ANSI/TIA/EIA-222-F (1996) "***Structural Standards for Steel Antenna Towers and Antennas Supporting Structures***". This standard is the basis for design and manufacturing of all communication structures in the United States.
2. The tower will be designed to support three carriers. Each carrier's platform will be designed to support 12 antennas with each antenna having an assumed surface area of 6 square feet per antenna. Each set of antennas will have a standoff frame to support the antennas. The surface of the standoff frames and platform will be assumed to be 15 square feet per sector. It will also be assumed that each carrier will have 12-1 5/8" coaxial cables extending to the platform/standoff frame from the monopole with the cables running vertically inside of the monopole.
3. AT&T is currently having the structural engineering drawings prepared for this site. These drawings will be prepared and stamped by a Professional Engineer licensed in the State of Alabama. The drawings will identify the design criteria for the tower based upon the ANSI/TIA/EIA standards referenced above and the requirements specified in this letter. The design parameters from the ANSI/TIA/EIA standards are established for individual counties throughout the United States. The criteria established for Hamilton County are as follows:
   - Case 1: 70 mile per hour wind load.
   - Case 2: ½" radial ice at 75% of the base wind load (or 61 mph).

4. The design criteria for steel communications towers, establishes allowable stress ranges for the flexural stress of the tower elements. This is often expressed as a percentage of the yield stress of the material and for tower legs is 60% of the yield stress. For failure to occur the actual stresses would have to 1.5 times the yield stress. In this case, where the tower will be manufactured of 50,000 psi steel, the design stress will be 30,000 psi. The failure stress is estimated to be 75,000 psi. As a result, the tower will have to undergo loads of 2.5 times the design loading to reach a failure point. Steel structures are very ductile and as a result do not fail in a catastrophic or instantaneous manner. As failure begins in a steel structure, the steel will begin to yield and deformation will occur. A byproduct of this process is the fact that the steel begins to transform into an even stronger material. The closest comparison to this process is when you try and bend a paper clip until it breaks. The clip will actually get harder as you try and break it through repeated bending.
5. As mentioned, the controlling loads are dictated by the ANSI/TIA/EIA standards. The standards dictate that the wind velocity be applied to the tower from three directions; normal to the tower, at 60 degrees and 90 degrees. The standard does not allow for shielding of the antennas (if two antennas on the tower are placed 180 degrees apart, the full load is applied to each antenna). In actuality, the construction of the tower and appurtenances results in substantial shielding. This further reinforces the conservative nature of the design of these structures.
6. The tower including appurtenances will be constructed far enough from the adjoining property to protect from potential impact of tower failure by accommodating tower failure within the site.

We hope that this letter addresses any concerns about the structural design of the tower. However, if any questions arise from your review, please contact me at your earliest convenience.

Yours truly,

James Westbrook & Associates, LLC

James P. Westbrook
President

A question has been raised within the Town of Westfield as to whether a wireless tower actually attracts more lightning to the jurisdiction that the tower is placed. Because lightning is dangerous, this is a very good question. The question is also very easy to answer after a short research.

The information below is a summarization of research conducted by the: Global Hydrology and Climate Center (GHCC) at NASA, also by the National Lightning Safety Institute (NLSI), the National Weather Service (NOAA) and by reading *All About Lightning* by Martin A Uman, New York: Dover Publications 1986. Articles from the GHCC, NLSI and NOAA are attached.

The short answer to the question, "Does a wireless tower attract lighting to an area?" is no. But a more accurate answer is not exactly. The question was raised as a concern for the safety of the citizens of Westfield and by just stating no does not tell the entire story.

Lightning is an unpredictable event because the occurrence is so prevalent and because the warning signs are imprecise. Lightning occurs most often during thunderstorms. According to the NLSI, at any given time throughout the year there are about 2000 thunderstorms that produce between 75 and 100 strikes every second. Lightning occurs when there is an imbalance between positively charged particles at one layer of the atmosphere and negatively charged particles at another layer. The imbalance is corrected by the discharge of lightning. At times this discharge remains within the atmosphere and at times the discharge reaches the earth. The only warning sign for lightning are high winds, rainfall and darkening clouds. In other words if there is a thunderstorm nearby, lightning is a possibility. In addition, lightning may persist for 30 minutes after a thunderstorm has passed. This makes the predictability of lightning unlikely.

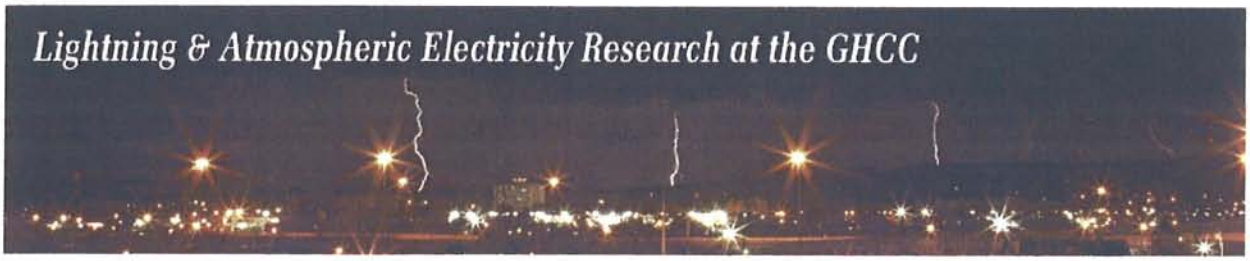
While lightning is not predictable on a local level, we can predict that more lightning will strike in Florida than any other state in the union. Just as well, we can predict that lightning will occur in Rwanda or Congo than any other region. This is because lightning occurs most often during thunderstorms and thunderstorms are most prevalent in Florida than any other state and more prevalent in Rwanda and Congo than any other region.

In order to be accurate, the answer to the question above is not exactly. A wireless tower does not attract lightning to a geographic area; lightning is already in the area. The amount of charged particles and the frequency that these particles discharge is not increased or decreased by locating a wireless tower. However, the placement of a tower may change the manner in which the discharge takes place.

Wireless towers are often struck by lightning. When lightning does reach ground level it will take the path of least resistance. When placed next to each other for example, a golf club will be struck before a blade of grass and a taller structure will be struck before the golfer. Towers are struck more often because they provide a lower path of resistance which is why towers are grounded in accordance with ANSI recommendations.

The grounding equipment that is installed on wireless towers is designed to safely neutralize the electrical charge of a lightning strike just as the system of grounding equipment protects a house. In this same fashion and in fairness to the question of lightning safety for the citizens of Westfield; it would appear that having a wireless tower is safer than not having one.

With that said, during a thunderstorm; please stay inside…



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A Lightning Primer

Introduction

Lightning, the thunderbolt from mythology, has long been feared as an atmospheric flash of supernatural origins: the great weapon of the gods. The Greeks both marveled and feared lightning as it was hurled by Zeus. For the Vikings, lightning was produced by Thor as his hammer struck an anvil while riding his chariot across the clouds. In the East, early statues of Buddha show him carrying a thunderbolt with arrows at each end. Indian tribes in North America believed that lightning was due to the flashing feathers of a mystical bird whose flapping wings produced the sound of thunder.

Today, scientific rather than mystical techniques are used to explain lightning with experimental procedures replacing intuitive concepts. Yet, we remain in awe of lightning which still shines with its mystery, and rightly so. Each year, lightning is responsible for the deaths of a hundred or so people, injuries to several hundred more, and millions of dollars in property damage, in the United States alone.

While these are more than sufficient reasons for NASA to pursue lightning research, lightning has a direct effect on day-to-day operations as well. The avoidance of lightning strikes to a spacecraft during launch relies heavily on the ability of meteorologists to accurately forecast and interpret lightning hazards to NASA vehicles under varying weather situations. Severe hazards for NASA due to lightning have been well documented. One major incident occurred during the 1969 launch of the Apollo 12 mission when lightning briefly knocked out vital spacecraft electronics. Fortunately, the astronauts regained control.

The unmanned Atlas Centaur 67 which carried a Naval communication satellite was determined to have been struck by a triggered cloud-to-ground lightning flash on March 26, 1987. The lightning current apparently altered memory in the digital flight control computer. This glitch resulted in the generation of a hard-over yaw command which caused an excessive angle of attack, large dynamic loads, and ultimately the breakup of the vehicle.

On a smaller scale, two sounding rockets being prepared for launch from NASA's Wallops Island in 1987 were prematurely launched as a direct result of lightning.

It is now well recognized that lightning strikes near aircraft most often originate from the craft itself. The flash is believed to begin with the inception of a leader, propagating in both directions away from the craft. These are called "triggered" lightning flashes.

It is difficult to obtain accurate statistics on lightning injuries and fatalities since a systematic compilation of information on lightning casualties does not exist. Many case histories show heart damage. Inflated lungs and brain damage have also been observed from lightning fatalities. Loss of consciousness, amnesia, paralysis and burns are reported by many who have survived.

Deaths and injuries to livestock and other animals, thousands of forest and brush fires, as well as millions of dollars in damage to buildings, communications systems, power lines, and electrical systems are also the result of lightning.

Finally, the threat of lightning causes many work stoppages and lost production increasing the time and cost required to prepare NASA spacecraft for flight.

History

Benjamin Franklin performed the first systematic, scientific study of lightning during the second half of the 18th century. Prior to that time, electrical science had developed to the point where positive and negative charges could be separated. Electrical machines could, by rubbing together two different materials, store the charges in primitive capacitors called Leyden Jars from which sparks could be generated and observed.

While others had previously noted the similarity between laboratory sparks and lightning, Franklin was the first to design an experiment which conclusively proved the electrical nature of lightning. In his experiment, he theorized that clouds are electrically charged, from which it follows that lightning must also be electrical. The experiment involved Franklin standing on an electrical stand, holding an iron rod with one hand to obtain an electrical discharge between the other hand and the ground. If the clouds were electrically charged then sparks would jump between the iron rod and a grounded wire, in this case, held by an insulating wax candle.

This experiment was successfully performed by Thomas Francois D'Alibard of France in May 1752 when sparks were observed to jump from the iron rod during a thunderstorm. G. W. Richmann, a Swedish physicist working in Russia during July 1753, proved that thunderclouds contain electrical charge, and was killed when lightning struck him.

Before Franklin accomplished his original experiment, he thought of a better way to prove his hypothesis through the use of a kite. The kite took the place of the iron rod, since it could reach a greater elevation and could be flown anywhere. During a Pennsylvania thunderstorm in 1752 the most famous kite in history flew with sparks jumping from a key tied to the bottom of damp kite string to an insulating silk ribbon tied to the knuckles of Franklin's hand. Franklin's grounded body provided a conducting path for the electrical currents responding to the strong electric field buildup in the storm clouds.

In addition to showing that thunderstorms contain electricity, by measuring the sign of the charge delivered through the kite apparatus, Franklin was able to infer that while the clouds were overhead, the lower part of the thunderstorm was generally negatively charged.

Little significant progress was made in understanding the properties of lightning until the late 19th century when photography and spectroscopic tools became available for lightning research.

Lightning current measurements were made in Germany by Pockels (1897-1900) who analyzed the magnetic field induced by lightning currents to estimate the current values. Time-resolved photography was used by many experimenters during the late l9th century to identify individual lightning strokes that make up a lightning discharge to the ground.

Lightning research in modern times dates from the work of C.T.R. Wilson who was the first to use electric field measurements to estimate the structure of thunderstorm charges involved in lightning discharges. Wilson, who won the Nobel Prize for the invention of the Cloud Chamber, made major contributions to our present understanding of lightning.

Research continued at a steady pace until the late 1960's when lightning research became

particularly active. This increased interest was motivated both by the danger of lightning to aerospace vehicles and solid state electronics used in computers and other devices as well as by the improved measurement and observational capabilities which were made possible by advancing technology.

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NASA Contact: Jim Smoot
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A Lightning Primer

Characteristics of a Storm

LIGHTNING

As the ice particles within a cloud (called hydrometeors) grow and interact, they collide, fracture and break apart. It is thought that the smaller particles tend to acquire positive charge, while the larger particles acquire more negative charge. These particles tend to separate under the influences of updrafts and gravity until the upper portion of the cloud acquires a net positive charge and the lower portion of the cloud becomes negatively charged. This separation of charge produces enormous electrical potential both within the cloud and between the cloud and ground. This can amount to millions of volts, and eventually the electrical resistance in the air breaks down and a flash begins. Lightning, then, is an electrical discharge between positive and negative regions of a thunderstorm.

A lightning flash is composed of a series of strokes with an average of about four. The length and duration of each lightning stroke vary, but typically average about 30 microseconds. (The average peak power per stroke is about 10^{12} watts.)

THUNDER

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Sound is generated along the length of the lightning channel as the atmosphere is heated by the electrical discharge to the order of 20,000 degrees C (3 times the temperature of the surface of the sun). This compresses the surrounding clear air producing a shock wave, which then decays to an acoustic wave as it propagates away from the lightning channel.

Although the flash and resulting thunder occur at essentially the same time, light travels at 186,000 miles in a second, almost a million times the speed of sound. Sound travels at the relatively snail pace of one-fifth of a mile in the same time. Thus the flash, if not obscured by clouds, is seen before the thunder is heard. By counting the seconds between the flash and the thunder and dividing by 5, an estimate of the distance to the strike (in miles) can be made.

CLOUDS AND RAIN

When moisture-laden warm air is heated, it begins to rise. As these currents or bubbles of warm moist air rise higher in the atmosphere, both the surrounding air pressure and temperature decrease. The air bubbles expand, causing cooling of the moisture which eventually condenses to form clouds. As the cloud cools further, more moisture condenses and the water droplets making up the cloud grow and merge until some become so large and heavy that the air currents within the cloud can no longer support them. These water droplets begin to fall as rain.

HAIL

Air currents in cumulonimbus clouds can be very violent. Even when lightning is not produced, pellets of ice may grow by the accumulation of liquid droplets. When the updrafts are very strong, the growing ice pellets can be suspended for long periods, allowing them to grow larger.

Eventually some may become too large for a given updraft and begin to fall as hail. Diameters are typically 5 to 10 mm, although a l40 mm hailstone has been recorded.

Types of Lightning Discharges

THE MOST COMMON TYPES OF LIGHTNING

Cloud-to-ground lightning is the most damaging and dangerous form of lightning. Although not the most common type, it is the one which is best understood. Most flashes originate near the lower-negative charge center and deliver negative charge to Earth. However, an appreciable minority of flashes carry positive charge to Earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually the process takes place within the cloud and looks from the outside of the cloud like a diffuse brightening which flickers. However, the flash may exit the boundary of the cloud and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

The ratio of cloud-to-ground and intra-cloud lightning can vary significantly from storm to storm. Storms with the greatest vertical development may produce intra-cloud lightning almost exclusively. Some suggest that the variations are latitude-dependent, with a greater percentage of cloud-to-ground strikes occurring at higher latitudes. Others suggest that cloud-top height is a more important variable than latitude.

Details of why a discharge stays within a cloud or comes to ground are not understood. Perhaps a flash propagates toward the Earth when the electric field gradient in the lower regions of the cloud is stronger in the downward direction.

Depending upon cloud height above ground and changes in electric field strength between cloud and Earth, the discharge stays within the cloud or makes direct contact with the Earth. If the field strength is highest in the lower regions of the cloud a downward flash may occur from cloud to Earth.

Inter-cloud lightning, as the name implies, occurs between charge centers in two different clouds with the discharge bridging a gap of clear air between them.

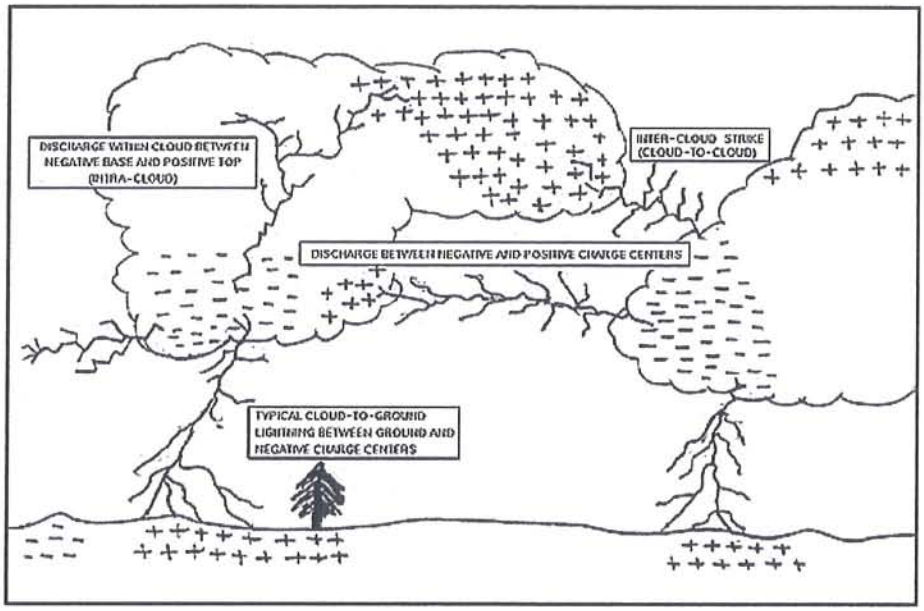
OTHER TYPES OF LIGHTNING

There are numerous names and descriptions of various types and forms of lightning. Some identify subcategories, and others may arise from optical illusions, appearances, or myths. Some popular terms include: *ball lightning, heat lightning, bead lightning, sheet lightning, silent lightning, black lightning, ribbon lightning, colored lightning, tubular lightning, meandering lightning, cloud-to-air lightning, stratospheric lightning, red sprites, blue jets, and elves.*

DESCRIPTION OF LIGHTNING DISCHARGE PROCESSES

With the initial breakdown of the air in a region of strong electric fields, a streamer may begin to propagate downward toward the Earth. It moves in discrete steps of about 50 meters each and is called a stepped leader. As it grows, it creates an ionized path depositing charge along the channel, and as the stepped leader nears the Earth, a large potential difference is generated between the end of the leader and the Earth. Typically, a streamer is launched from the Earth and intercepts the descending stepped leader just before it reaches the ground. Once a connecting path is achieved, a return stroke flies up the already ionized path at close to the speed of light. This return stroke releases tremendous energy, bright light and thunder. Occasionally, where a thunderstorm grows over a tall Earth grounded object, such

as a radio antenna, an upward leader may propagate from the object toward the cloud. This "ground-to-cloud" flash generally transfers a net positive charge to Earth and is characterized by upward pointing branches.



The lower part of a thundercloud is usually negatively charged. The upward area is usually positively charged. Lightning from the negatively charged area of the cloud generally carries a negative charge to Earth and is called a negative flash. A discharge from a positively-charged area to Earth produces a positive flash.

The initial breakdown and propagation are similar for intra-cloud lightning, but the discharge generally occurs between regions of opposite charge. Without the benefit of air conducting Earth, intra-cloud lightning does not produce a return-stroke-like feature. Rather, it is characterized by slower propagating "recoil streamers" and "K" changes. Nevertheless, tremendous energy, bright light, and thunder are still produced by intra-cloud lightning.

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A Lightning Primer

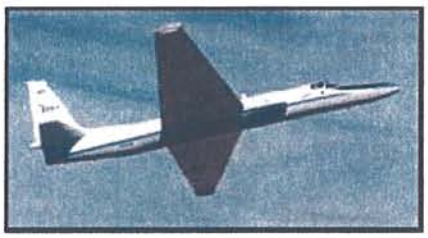
Investigations Using Rockets, High-Altitude Airplanes & Spacecraft

For many investigations, lightning must be observed from as close a vantage point as possible. One technique is to probe inside hostile thunderstorms in order to study how thunderclouds electrify, but this does not ensure close-up encounters with lightning. Close-up measurements are difficult to obtain because of the unpredictability of where and when lightning will strike. Hence, methods have been developed to create lightning discharges under somewhat controlled conditions.

Rocket-triggered lightning research has been an important tool for close-up investigation.

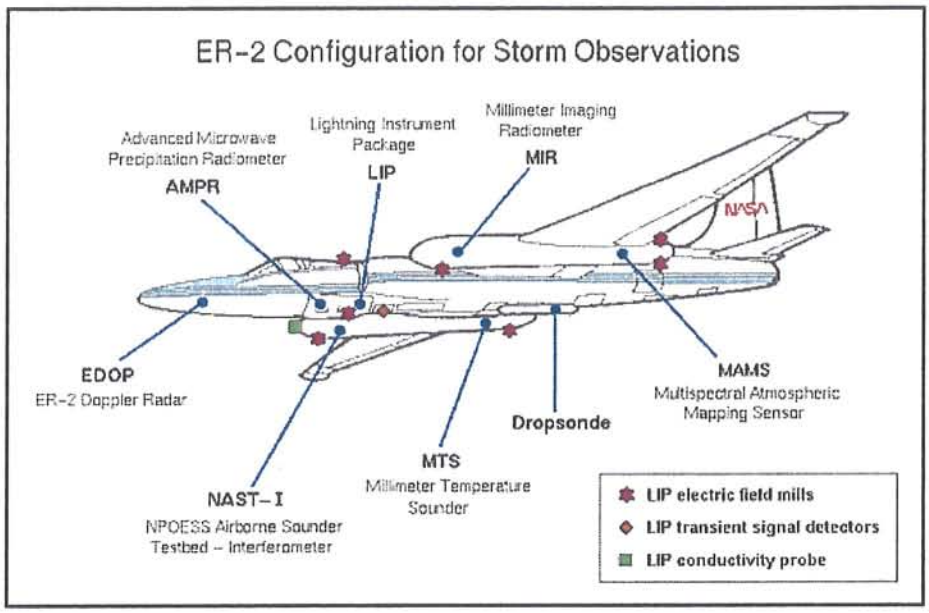
With this technique, small sounding rockets connected to long copper wires have replaced Franklin's kite. These rockets are launched into thunderstorms with electronic sensors located near the bottom end of the wire instead of a key. When the rocket is struck by lightning, the wire is vaporized.

Data collected before and during the occurrence of lightning provide detailed information of the discharge's characteristics. Sounding rockets can also provide in-cloud measurements of thunderstorms in a challenging environment. While extensive ground based optical and electrical measurements of lightning have been made, the emphasis has been on cloud-to-ground discharges with little study of intra-cloud lightning being undertaken. This is partly due to the fact that optical measurements of in-cloud lightning are severely affected by light scattering from water droplets within the cloud. For this reason, ground-based measurements alone have not been considered an appropriate means for determining the optical characteristics of lightning as viewed from above.



In order to determine the requirements for making optical measurements from space, U-2 and ER-2 high altitude airplanes have been used to study the electrical and optical characteristics of lightning activity in thunderstorms. Flying at an altitude of 20 km and at speeds of 200 meters per second, they are capable of flying over very large thunderstorms.

Much has been learned from these aircraft observations. For example, they have confirmed C. T. R. Wilson's theory that strong electric fields over the tops of thunderstorms cause conduction currents to flow to the tops of clouds. The penetrative convective cells which rise above the anvil are the most active electric regions in the storm and cause the most intense electrical stresses, as seen from high altitude aircraft.



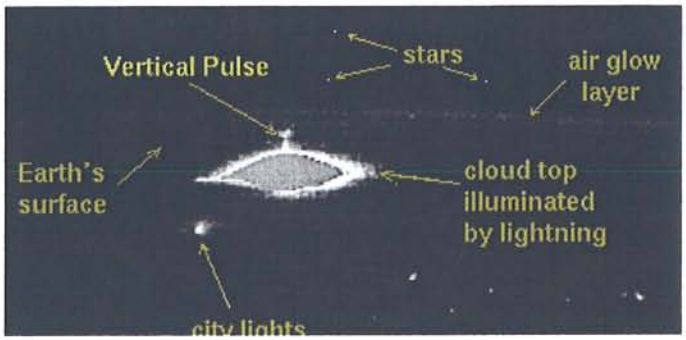
The ER-2 has a larger payload capability than its predecessor the U-2. Both have provided direct observations of severe thunderstorms and other clouds using multi-sensor payloads including lasers, infrared, visible and microwave scanners, spectrometers, and electric field antennas.

In addition, photography of lightning from above clouds has been accomplished using an open shutter technique. In this method, the camera is pointed toward the thundercloud with the shutter open. In the dark nocturnal sky, no light falls onto the film until lightning strikes. An example of an open shutter photograph from the U-2 is shown on the left. The illuminated storm cell depicts a convective cloud turret approximately 11 km in height and 12 km in diameter.

To complement the optical measurements from aircraft, video lightning images have been taken during a number of space shuttle flights while conducting the Mesoscale Lightning Observation Experiment (MLE). These observations have revealed many interesting lightning events.

For example, on April 28, 1990, a video image from space showed a single stratospheric luminous discharge appearing to move upward into clear night air. This was recorded on the space shuttle STS-32 mission using the payload bay TV camera.

The direction of this event has not been firmly established, however, the stratospheric discharge is of interest because it may provide evidence for a theory postulated by C. T. R. Wilson in 1925. This theory predicted that electric fields can cause ionization at great heights and could therefore give rise to discharges between clouds and the upper atmosphere.



Stratospheric lightning could potentially deposit significant energy into the stratosphere, causing important chemical perturbations. In addition, these

lightning events may generate strong electric fields and electromagnetic pulses which might interact with the Earth's ionosphere and magnetosphere. Finally, strong fields at high altitudes may generate runaway electrons which could then produce high energy x-rays and even gamma rays. Thus, it is possible that lightning may generate electromagnetic radiation, ranging from extremely low frequency to gamma radiation.

Researchers from the Geophysical Institute at the University of Alaska have confirmed shuttle observations by capturing images on videotape of what appear to be brief flashes of light emanating from thunderstorms into the stratosphere. These "stratospheric optical flashes", also known as "red sprites", were photographed from NASA's DC-8 Airborne Laboratory while flying at an altitude of about l2 km during a night-time mission to videotape lightning over Iowa and Kansas during June and July of 1993. Stratospheric flashes are brief, persisting for less than about a tenth of a second. They appear to be associated with intense thunderstorm activity, but are both rare and fainter than typical cloud-to-ground or intra-cloud lightning. Unlike familiar ground level lightning events that are electrical discharges confined to narrow channels, the flashes appear to cover a relatively broad horizontal extent of several miles, and to extend to altitudes of perhaps as much as 95 km, or about 60 miles.

Lightning Detection Networks (Ground Based)

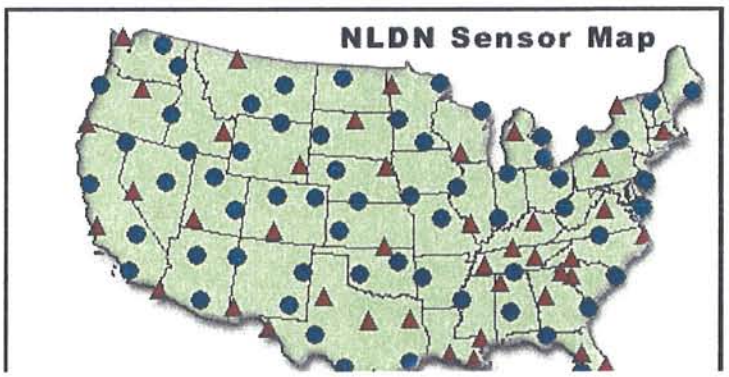
National and regional lightning networks which use magnetic direction finders, time of arrival techniques, or VHF interferometry, provide important lightning and storm information. For a number of years, the Federal Government assisted in the financing of a national lightning data service combining independently operated systems into one network. Used primarily for operational evaluation by NOAA, it evolved into a product with substantial value for both private industry and by other Federal agencies. By 1991, recognition of the importance of lightning detection had become apparent with economically viable commercially-sponsored systems coming into existence.

The National Lightning Detection Network (NLDN) which is operated by Global Atmospherics, Inc. (GAI) in Tucson, Arizona, is a network of at least 130 magnetic direction finders which covers the entire United States. Each direction finder determines a direction toward a detected electromagnetic lightning discharge. The location of the lightning discharge is determined by triangulation. Each of these sensors is capable of detecting cloud-to-ground lightning flashes at a distance of 400 km away and greater. Processed information is transmitted to the Network Control Center (NCC) in the form of a grid map showing lightning across the U.S.

The Atmospheric Research Systems, Inc. (ARSI) time-of-arrival (TOA) system provides 11 Lightning Position And Tracking Systems (LPATS) which cover the U.S. and extend hundreds of miles into both oceans and beyond the borders of Canada and Mexico. ARSI ground strokes lightning data includes information on latitude and longitude, date and time, polarity, and amplitude.

Recently, GDS purchased the ARSI system, and is in the process of combining the direction finding and time of arrival techniques into a single comprehensive network.

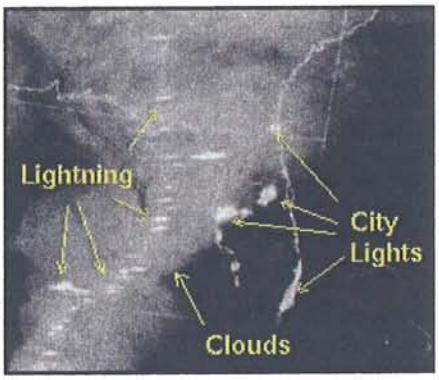
The TOA system operates by digitizing the waveform of a received lightning signal at each sensor and accurately timing the peak with a resolution of up to 100 nanoseconds. The difference of arrival time at four or more receivers is



then used to calculate the location. The geographical positions of the various sensors making up the network are shown in the U.S. map.

Internationally, two very different types of lightning detection and location networks have been developed. The SAFIR two-dimensional VHF interferometer system developed by the French aerospace research organization ONERA and commercialized by Dimensions of France, is used to provide detailed information on all types of lightning activity within a relatively small area. The VLF Arrival-Time Difference (ATD) system designed and operated by the United Kingdom Meteorological Office, detects and locates lightning at very long range, but with less detection efficiency. In addition, other networks cover portions of Europe, Asia, Australia, China, and Canada.

Global Studies

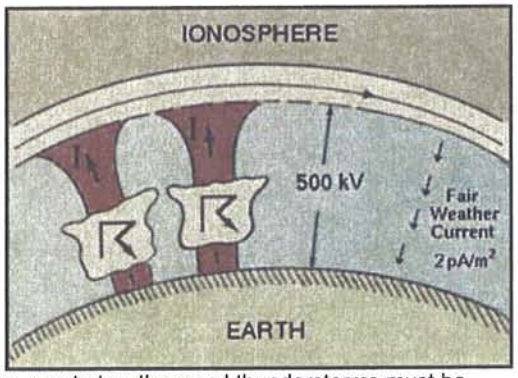


Global lightning signatures from the Defense Meteorological Satellite Program (DMSP) Operational Linescan System (OLS) have been analyzed from the filmstrip imagery which is archived at the National Snow and Ice Data Center in Boulder, Colorado. These signatures show up as horizontal streaks on the film images. The location of each of these streaks has been digitized in order to develop a preliminary database of global lightning activity.

While the database continues to be enlarged, the available data are spotty, making a comprehensive history of global lightning behavior impossible to produce. However, direct digital OLS data are becoming available now which will greatly improve and expand the global lightning database which is an important reference dataset.

Lightning annual, interannual , and seasonal variations could then be compared with other global datasets (e.g. precipitation; global and regional synoptic patterns) both to improve understanding of the role of lightning on a global basis and to use lightning as an indicator of global change.

The Global Electric Circuit



During fair weather, a potential difference of 200,000 to 500,000 Volts exists between the Earth's surface and the ionosphere, with a fair weather current of about $2x10^{-12}$ amperes/meter^2. It is widely believed that this potential difference is due to the world-wide distribution of thunderstorms.

Present measurements indicate that an average of almost 1 ampere of current flows into the stratosphere during the active phase of a typical thunderstorm. Therefore, to maintain the fair weather global electric current flowing to the surface, one to two thousand thunderstorms must be active at any given time. While present theory suggests that thunderstorms are responsible for the ionospheric potential and atmospheric current for fair weather, the details are not fully understood.

Ground-based radio frequency measurements of global rates have significant uncertainties and limitations. A high resolution space based sensor is necessary in order to help eliminate some of the present uncertainties associated with measuring global lightning activity.

The Optical Transient Detector (OTD)

The OTD is a highly compact combination of optical and electronic elements. It was developed as an in-house project at NASA's Marshall Space Flight Center in Huntsville, Alabama. The name, Optical Transient Detector, refers to its capability to detect the momentary changes in an optical scene which indicates the occurrence of lightning. The OTD instrument is a major advance over previous technology in that it can gather lightning data under daytime conditions as well as at night. In addition, it provides much higher detection efficiency and spatial resolution than has been attained by earlier lightning sensors.

At the heart of the system is a solid-state optical sensor similar in some ways to a TV camera. However, in overall design and many specific features, OTD had to be uniquely designed for the job of observing and measuring lightning from space. Like a TV camera, the OTD has a lens system, a detector array (serving a function somewhat analogous to the retina in the human eye), and circuitry to convert the electronic output of the system's detector array into useful data.

Further Information:

OTD Homepage

Tropical Rainfall Measuring Mission (TRMM)

Rainfall is at the heart of Earth's unique ability to sustain life as we know it. Vegetable, animal, and human life is controlled to a large degree by the availability of moisture. On the global scale, heat released by the condensation of water vapor is a principal cause of motion in the atmosphere. Tropical rainfall, due to its abundance, plays a significant role in this process.

The measurement of rainfall is a difficult challenge due to its high spatial and temporal variability. Tropical rainfall is especially difficult as it is relatively inaccessible to in situ measurements.

Launched in November, 1997, TRMM is a space based system for measuring tropical rainfall and its variations. Its orbit is circular, at an inclination of 35 degrees to the equator, and at an altitude of 350 km. The low altitude of TRMM provides high resolution images, thus, more accurate rainfall measurements are obtained over very small areas of the globe.

TRMM is an international collaboration with Japan, providing the first Precipitation Radar (PR) in space. The PR instrument provides information on 3-D rainfall distributions over both land and ocean.

A multichannel microwave radiometer, referred to as the TRMM Microwave Imager (TMI), provides information on precipitation content, and the real distribution and intensity of rainfall.

The Visible InfraRed Scanner (VIRS) provides high resolution information on cloud coverage and type, and cloud top temperatures.

The Clouds and the Earth's Radiant Energy System (CERES) is a visible and infrared sensor designed especially to measure emitted and reflected radiative energy from the Earth, and from the atmosphere and its constituents.

The Lightning Imaging Sensor (LIS) is investigating the global incidence of lightning and the relationship of lightning to precipitation and other geophysical parameters.

Further Information:

TRMM NASAFact Sheet
Tropical Rainfall Measuring Mission (TRMM)

Lightning Imaging Sensor (LIS)

This instrument, flying on the TRMM Observatory, was designed to study the distribution and variability of total lightning on a global basis. It consists of a staring imager which is optimized to locate and detect

lightning with storm-scale resolution of 5-10 km over a large region (600 x 600 km) of the Earth's surface. The field of view (FOV) is sufficient to observe a point on the Earth or a cloud for 80 seconds, adequate to estimate the flashing rate of many storms. The instrument records the time of occurrence of a lightning event, measures the radiant energy, and estimates the location.

This calibrated lightning sensor uses a wide FOV expanded optics lens with a narrow-band filter in conjunction with a high speed charge-coupled device detection array. A Real-Time Event Processor (RTEP) is used to determine when a lightning flash occurs, even in the presence of bright sunlit clouds.

Weak lightning signals that occur during the day are hard to detect because of background illumination. The RTEP will remove the background signal, thus enabling the system to detect weak lightning and achieve a 90% detection efficiency.

TRMM will study mesoscale phenomena such as storm convection, dynamics, and microphysics. These will be related to global rates and amounts and distribution of convective precipitation, as well as to the release and transport of latent heat, which are all influenced by global scale processes.

LIS contributes significantly to several TRMM mission objectives by providing a global lightning and thunderstorm climatology from which changes (even subtle temperature variations) might be easily detected.

Further Information:

LIS Homepage

Christian, H.J., R.J. Blakeslee, and S.J. Goodman, The Detection of Lightning from Geostationary Orbit, *Journal of Geophysical Research*, Vol. 94, 13,329-13,337, 1989.

Christian, H.J., R.J. Blakeslee, and S.J. Goodman, *Lightning Imaging Sensor (LIS) for the Earth Observing System*, NASA Technical Memorandum 4350, MSFC, Huntsville, AL, February, 1992.

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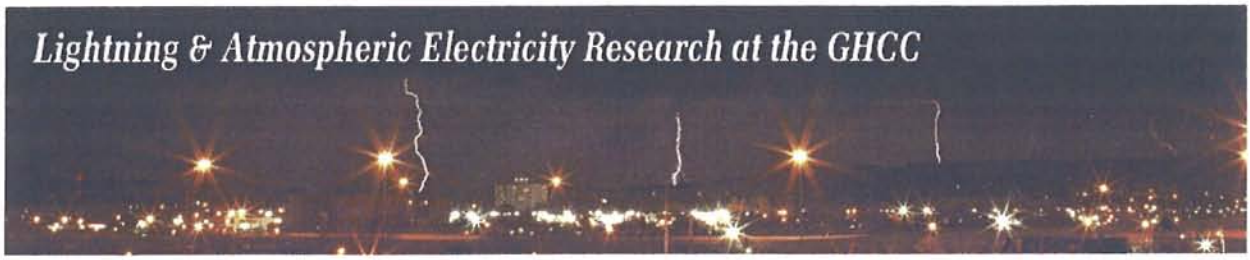

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A Lightning Primer

The Future of Lightning Detection

Lightning Mapper Sensor (LMS)

The goal of the Lightning Mapper program is to place a sensor, capable of continuously mapping lightning discharges during both the day and night, with a spatial resolution of 10 km, in geostationary orbit.

In a geostationary orbit, the Lightning Mapper Sensor will be capable of detecting and locating both cloud-to-ground and intra-cloud discharges with high spatial resolution and detection efficiency, i.e., detect and locate lightning with a storm-scale resolution over large areas of the Earth's surface.

With such an instrument, scientists will be able to study the electrosphere over dimensions ranging from the Earth's radius all the way down to individual thunderstorms. A Lightning Mapper Sensor would be capable of detecting all types of lightning phenomena, and will provide near uniform spatial coverage.

Disseminating this information in near real time, these measurements could be related on a continuous basis to other observables such as radar returns, cloud images and other meteorological variables to enhance the accuracy of weather nowcasting.

The data will be used to determine flash rates, and storm motion and evolution. This will be correlated with information obtained from other sensor systems such as observations of precipitating electrons, VLF-ELF noise, and ULF waves in the ionosphere.

The LMS will provide information which can only be obtained with a space based instrument. Because the data will be distributed in real time, weather forecasters will find it an invaluable tool for storm nowcasting as well as for the issuing of severe storm warnings.

Uses of a Lightning Mapper in Geostationary Orbit

1. Severe storm detection and warning (lightning, flash floods, tornadoes, hailstorms, and downbursts). Convective rainfall estimation. Storm tracking. Aviation hazards (terminal and enroute use). Hazard warnings: Power companies, fuel depots, golf courses, etc. Algorithms for forest fire likelihood forecasting (uses location, frequency, and duration of flashes). Can be used as an indicator of cyclone development and evolution. Improvement of long-term forecasting by quantifying lightning activity for the time of day, season, location, and storm type. Improvement in the understanding of the physics of the Global Electric Circuit Increased understanding of lightning interactions with the magnetosphere and the ionosphere. NOx generation studies. Studies of whistler and other wave propagation phenomena. Magnetospheric-ionospheric research.
2. Solar-tropospheric studies.

The Future of Lightning Detection in Space

Typically, more than 2,000 thunderstorms are active throughout the world at a given moment,

producing on the order of 100 flashes per second.

As our society becomes more dependent upon computers and information networks (as well as various other electronic devices), protection from system disruptions becomes essential. One such protection comes from increasing our understanding of thunderstorms and how and why they occur.

The Lightning Mapper Sensor will assist in answering some of these questions. The knowledge from the studies described will strengthen the utility of NASA's Lightning Imaging Sensor and will add to the capability of a Lightning Mapper Sensor.

Most importantly, it will help us to better understand the Earth's atmosphere. As a response to fundamental forcing, lightning contains far more information than just the electrical aspects of the atmosphere. It tells us where strong convection is occurring, when large quantities of water are growing in the mixed phase regions of storms, and suggests how latent heat is being released during the storm's life cycle. Since the microscales on which particles interact to generate electricity are coupled through storm scale processes to synoptic scale systems, lightning activity should provide information on the development of the atmosphere over many scale sizes. Hopefully, with further study, we will learn to estimate convective rainfall rates from lightning flash rates, to identify local temperature anomalies from changing weather patterns, and study developing weather systems by the evolution of lightning activity.

Investigations will continue to focus on the relationships between global and regional lightning activity and rainfall, linking electrical development to the environments of surrounding storms. Field programs in the tropics will provide ground based data sets to be used in conjunction with radar, satellite, and lightning data, in order to develop and improve existing precipitation estimation algorithms, while providing a better understanding of the co-evolving electrical and dynamic structures of storms.

By better understanding all of the processes that lead to lightning, we will better understand the atmosphere and improve our ability to become wise tenants of the Planet Earth.

Credits

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Lightning Safety

The six most common dangerous activities associated with lightning strikes, in order,

are:

1. Work or play in open fields.
2. Boating, fishing, and swimming.
3. Working on heavy farm or road equipment.
4. Playing golf.
5. Talking on the telephone.
6. Repairing or using electrical appliances.

If caught in the open during a strike and the hair on your head or neck begins to stand on end (this really happens) go inside the nearest building. If no shelter is available, crouch down immediately in the lowest possible spot and roll up in a ball with feet on the ground. (DO NOT LIE DOWN.)

Treatment:

A. Check breathing and pulse.
B. TREAT APPARENTLY DEAD FIRST.
C. Perform mouth-to-mouth resuscitation.
D. Apply cardiopulmonary resuscitation.

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Section 6.1.14

Measured Lightning Activity Worldwide

Thunderstorm Days Per Year Worldwide	
Bogor, Indonesia (1988)	322
Cerromatoso, Columbia	275-320
Malaysia	180-260
Singapore	160-220
Florida, U.S.	90-110
Colorado, U.S.	65-100
Brazil	40-200
Argentina	30-200
Japan	35-50
Most of Europe	15-40
Australia	10-70
England	5-10

Top 10 locations of lightning flash density (ground strikes per km/sq.) worldwide per Christian, 2003. About 2,000 global continuous thunderstorms deliver about 75-100 strikes to earth per second.

Top Lightning Flash Density Sites Worldwide	
Kamembe, Rwanda	82.7
Boende, Dem. Rep. Congo	66.3
Lusambo, Dem. Rep. Congo	52.1
Kananga, Dem. Rep. Congo	50.3
Kuala Lumpur, Malaysia	48.3
Calabar, Nigeria	47.3
Franceville, Gabon	47.1
Posadas, Argentina	42.7
Ocana, Colombia	39.9
Concepcion, Paraguay	37.0

National Lightning Safety Institute
Providing expert training and consulting for lightning problems

Avoiding the Risks of Deadly Lightning Strikes

Lightning is one of the most underrated severe weather hazards, yet ranks as the second-leading weather killer in the United States. More deadly than hurricanes or tornadoes, lightning strikes in America each year kill an average of 73 people and injure 300 others, according to NOAA's National Weather Service.

How Lightning Works
Lightning is caused by the attraction between positive and negative charges in the atmosphere, resulting in the buildup and discharge of electrical energy. This rapid heating and cooling of the air produces the shock wave that results in thunder. During a storm, raindrops can acquire extra electrons, which are negatively charged. These surplus electrons seek out a positive charge from the ground. As they flow from the clouds, they knock other electrons free, creating a conductive path. This path follows a zigzag shape that jumps between randomly distributed clumps of charged particles in the air. When the two charges connect, current surges through that jagged path, creating the lightning bolt.

The Warning Signs
High winds, rainfall, and a darkening cloud cover are the warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the beginning of an approaching storm, more than 50 percent of lightning deaths occur after the thunderstorm has passed. The lightning threat diminishes after the last sound of thunder, but may persist for more than 30 minutes. When thunderstorms are in the area, but not overhead, the lightning threat can exist when skies are clear.

Safety Precautions
While nothing offers absolute safety from lightning, some actions can greatly reduce your risks. If a storm is approaching, avoid being in, or near, high places, open fields, isolated trees, unprotected gazebos, rain or picnic shelters, baseball dugouts, communications towers, flagpoles, light poles, bleachers (metal or wood), metal fences, convertibles, golf carts and water. If you can see lightning or hear thunder, the risk is already present. Louder or more frequent thunder means lightning activity is approaching, increasing the risk for lightning injury or death. If the time delay between seeing the lightning and hearing the thunder is less than 30 seconds, you are in danger.

No place is absolutely safe from the lightning threat, however, some places are safer than others. Large enclosed structures are safer than smaller, or open, structures. Avoiding lightning injury inside a building depends on whether the structure incorporates lightning protection and its size. When inside during a thunderstorm, avoid using the telephone, taking a shower, washing your hands, doing dishes, or having contact with conductive surfaces, including metal doors, window frames, wiring and plumbing. Generally, enclosed metal vehicles, with the windows rolled up, provide good shelter from lightning.

Action Plan For Outside Events
Coordinators of outdoor events should monitor the weather and evacuate participants when appropriate. School buses are an excellent lightning shelter, which outdoor event organizers can provide. Consider placing lightning safety tips and/or the action plan in game programs, flyers, scorecards, etc., and placing lightning safety placards around the area. Lightning warning signs are effective means of communicating the lightning threat to the general public and raise awareness.

First Aid for Lightning Victims
Ninety percent of lightning victims survive their encounter with lightning, especially with timely medical treatment. Individuals struck by lightning do not carry a charge, and it is safe to touch them and provide medical treatment. Call 911 and start mouth-to-mouth resuscitation. If the victim has no pulse, begin cardiac compressions. In cold, wet situations put a protective layer between the victim and the ground to lower the risk of hypothermia.

Lightning Quick Facts

- 25 million cloud-to-ground lightning strikes occur in the United States each year

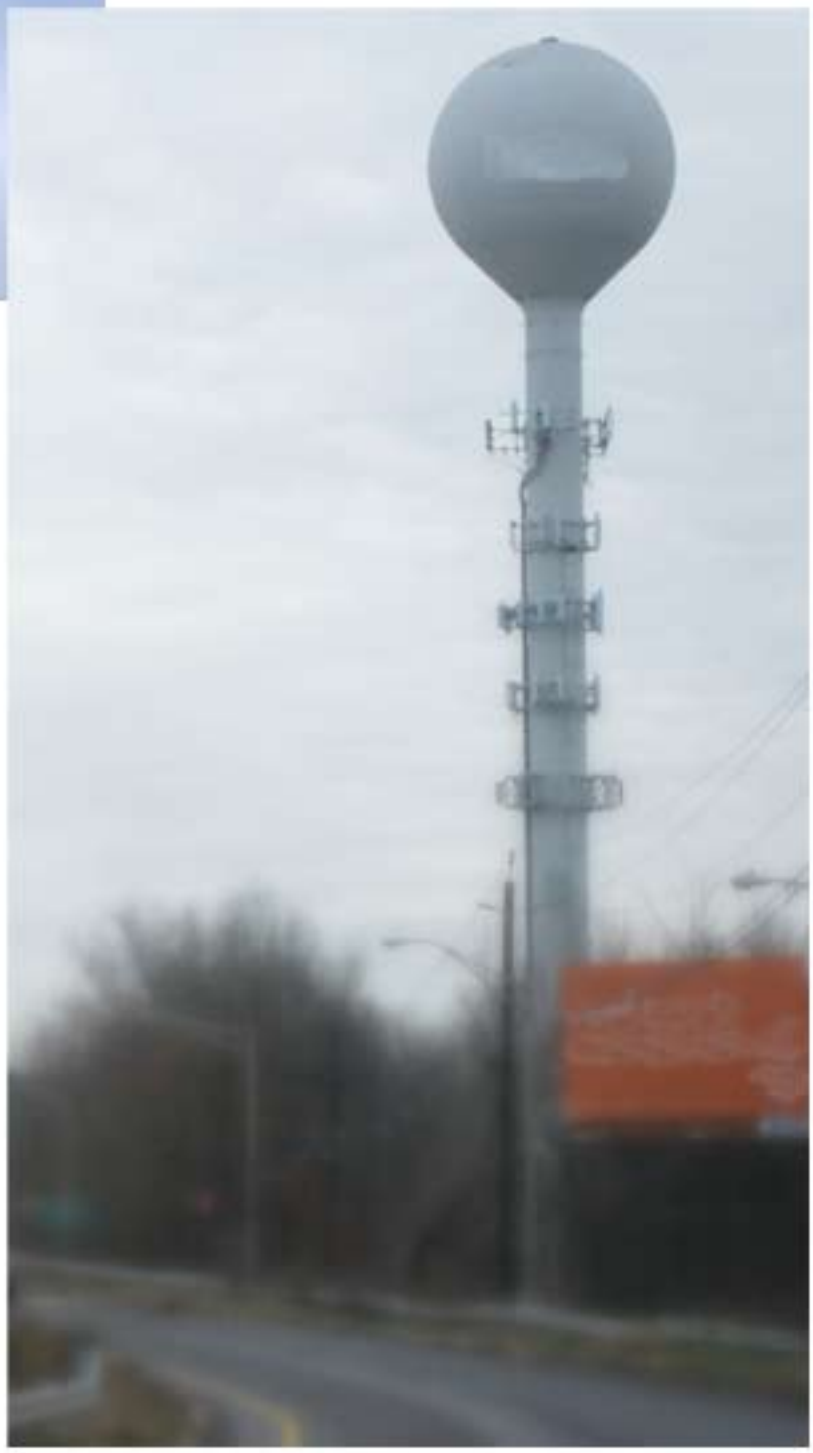
- The air within a lightning strike can reach 50,000 degrees Fahrenheit
- Lightning can heat its path five times hotter than the surface of the sun
- One ground lightning stroke can generate between 100 million and 1 billion volts of electricity

For more information contact National Weather Service public affairs at (301) 713-0622 or visit NOAA's Lightning Safety Web Site.

NOAA Public Affairs | Reporter Resources | NOAA Backgrounders

Updated June 2001

Exhibit 14



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