

The Lake Cedar Group Proposal Violates the Jefferson County Tower/Debris Fall Zoning Resolution

By Deb Carney, attorney for Plaintiffs other than City of Golden

INTRODUCTION-“The LCG Tower as the Sword of Damocles”

Like the guy wires suspending the massive Lake Cedar Group (LCG) “supertower” above the ground, only a single horse hair keeps the sword from crashing down onto Damocles head in the “Sword of Damocles” legend. The vulnerable guy wires of the proposed LCG tower are like that single horse hair because the severing of any one of those guy wires can cause an entire tower to come crashing down. The “sword” is the massive 730 foot tall LCG tower hung with heavy antennas from top to bottom suspended above the steep flanks of Lookout Mountain by those guy wires. “Damocles” represents the fate of the residents now and in generations to come throughout this century occupying dwellings in the range of the debris unless Jefferson County acts to protect the residents’ health, safety and welfare by denying the LCG proposal because it violates the Jefferson County setback resolution.

VISUAL AIDES FOR THIS COMPLEX SITE AND TOPOGRAPHY

Exhibit 1-Three dimensional site model. The details of the various scenarios begin with the area closest to the LCG proposed tower and move outward. Mr. Hislop’s scale model demonstrates what takes place in the immediate location. Beginning with the top of Lookout Mountain around the site, Al Hislop’s detailed model shows the complexities of the terrain, the multiple towers (many of which are not owned by LCG and subject to cascading tower failure), the long guy wires and the nearby homes. Mr. Hislop will show the various mechanics of falling towers interacting with this location. This model shows debris radius up to 110%.

Exhibit 2-Assessor Map. Debris radius for icefall and guy wire whip require a change of scale to the assessor’s map of residential property. The inner red ring shows how far the debris could travel using the Vellozi example of an actual tower collapse where the guy wire swung out the entire distance from its anchor. This is a debris radius of 231.5%. Contemplating level ground, Wolfgang Scherer’s advocates a 400% setback to prevent tower debris from striking homes. Exhibit 3. This radius is shown as the middle red circle on Exhibit 2. This circle encompasses a substantial number of dwellings on the top of Lookout Mountain as well as dwellings in the Stonebridge area of the City of Golden. The Shelton PUD for 12 residential lots is also included within this recommended 400% setback. One hundred ten homes fall within these circles. Exhibit 11.

Three-dimensional topographic and aerial photography. Prof. Gary Olhoeft’s software allows the viewer to visualize the site from various perspectives and can be focused both on the immediate site and pulled back to show larger scale. Exhibits 53-55.

Buildings not in trees are visible. This software also diagrams the degree of downhill slope from the tower to the dwellings below. Exhibits 55-84. Some of these screenshots are attached but a far crisper visual image and better understanding is gained by viewing a demonstration in real time.

THE SEVERING OF ONE GUY WIRE CAN BRING DOWN AN ENTIRE TOWER

Of the over 240 broadcast tower failures as of last year, over 95% of them were guyed towers. History documents guy wires are easily severed by a variety of forces ranging from wind, ice, construction errors, manufacturing defects, deterioration, vandalism, airplanes or other objects colliding with the tower mast or guys. (LCG Expert Ernest Jones, P.E. Report R13020 and CARE Tower Collapse Chronicles). The DVD of the 1982 Missouri City, Texas tower collapse documents that a falling antenna can sever a guy wire and bring down the tower. Exhibit 4. The court decision and the "Engineering Ethics" papers are included in the Tower Collapse Chronicles notebook and verify that the antenna severing one guy wire was the cause of the collapse. One of the LCG antennas weighs only 1 ton less than the 6-ton antenna that severed the guy wire on the Texas tower. The Tower Collapse Chronicles notebook also documents an antenna falling off a tower long after construction was complete as well as at least ten other incidents where a single guy wire brought down an entire tower.

1957-Nashville, Tennessee-Neighbors reported, "a noise, like a wire being pulled tight and then just slipping a little bit" right before the tower crashed.

1978-Illinois- The top part of WJJY fell to the ground, cutting several of guy wires, hit the ground, punched 15-foot deep hole and bounced out into adjacent field. The entire tower then collapsed 20 feet from farmer's bedroom. In another incident that year, the top 1,000 feet of tower fell after icing in identical manner as WJJY on the same day. The top part of antenna fell into guy wires.

1989-Huntsville, Alabama- Tower section "windmills" down during construction and sheers guy. In Raleigh, North Carolina, uneven melting of ice on guy wires generated "guy gallop" that led to guy failure and two towers collapsed.

1996-Cedar Hill, Texas-a falling gin pole severed a guy wire during construction

2000-A vandal sawed guy anchor rod on tower number 3. When tower number 3 fell, it took out guy wires on tower number 2.

2002-Lee County, North Carolina. A plane appeared to hit guy wire and took the whole tower down with it.

2003-Omaha, Nebraska. High winds brought down tower during HDTV upgrade. Neighbors reported hearing the guy wires snap at 11:09 PM

2004-Morganfield, Kentucky. A runaway boom truck severed support cables, causing the tower to fall.

(note-in the 2004 hearings in this case, witnesses reported seeing an incident where teen vandals pushed a car off Cedar Lake Road that just narrowly missed a Channel 4 guy wire)

Ice and structures on nearby towers can also sever guy wires as well as fall on occupied structures. As described in the 1989 Raleigh, North Carolina dual tower failure, uneven melting of ice on the guy wires caused the guys to “gallop” and eventually fail. The Record contains photos of large chunks of ice falling from the Channel 4 guy wires and documentation of icefall damage to the Hathaway (now Taslimi Hossein dwelling) and Deeth house. These records document significant ice accumulations at this location. R 15233. The National Weather Service records, CARE Exhibit 130 (previously filed) document numerous incidents of extremely high winds in this area that caused partial and total tower failure to two towers along the Front Range in addition to the two tower collapses on Lookout Mountain.

TOWERS FREQUENTLY FALL OVER DURING CONSTRUCTION

Like the proposed consolidated LCG tower, Dresser Industries was building a consolidated tower for several broadcasters in Minnesota. On September 7, 1971 this tower collapsed, killing seven men. Photos and accounts that show that the debris extended a quarter mile. (5 Newspaper Accounts in Tower Collapse Chronicles and Oversized Newspaper Archive accounts Exhibits 5-9). The heightened vulnerability of towers to collapse while under construction or DTV upgrade is illustrated repeatedly in the CARE Tower Collapse Chronicles Notebook and the Missouri City, Texas tower collapse as well as the fact that broadcast towers have fallen over more often than not during construction at this approximate location.

History of repeated tower collapse at this location during construction. Broadcast towers have toppled over sidewise like a fallen tree in two of the three attempts to construct the present Channel 4 tower. The existing Channel 4 tower was constructed in 1955 as the KOA tower. Prior to the construction of this 843-foot nonconforming tower, the owners began to construct a broadcast tower at approximately the same location. On December 6, 1953, this KOA tower was blown over in windstorm before it began transmitting. KOA then began construction on a 330-foot replacement broadcast tower. This replacement tower was blown over March 10, 1955. This tower fell across the public road leading to the Votaw cabin. Channel 4 then gated the public road. Votaw 99 Exhibit 10

Instead of rebuilding a 330-foot tower, KOA built the 843-foot guyed tower now known as the Channel 4 tower: the tallest tower on Lookout Mountain, without the oversight or consent of the county or the citizens and without thought to the dangers of tower fall. The present Channel 4 tower was completed after many homes already were built and most of Lookout Mountain was zoned residential and is a nonconforming use in residentially zoned land. In fact, all of the LCG towers on Lookout Mountain and all but 2 of all the towers owned by others are nonconforming structures on land that has been zoned residential for half a century. None of the towers of the LCG members were located with

any regard to the safety of residents and all of them are in cascading tower collapse range of the LCG tower. The same situation applies for other nonconforming towers on Lookout Mountain. Exhibits 11-14. If this proposal is denied, Jefferson County can eliminate all these towers as nonconforming use as rapidly as possible as required by Colorado law.

STAFF FINDING THAT SETBACK VIOLATED

On August 25, 2005, staff revised its report to find that Lake Cedar Group (LCG) does not satisfy the Zoning Resolution's setback requirements and again recommended denial of this rezoning. Staff interprets the resolution to require setbacks to equal the tower height. The proposed tower is 730 feet. Staff found that the channel 7 tower lies within the setback for the Channel 4 tower. The property of Grant and Carol Reynolds is within 100% of the fall zone of the Channel 7 tower in the event that the channel 4 tower were to fail and strike the Channel 7 tower causing it to fail. Carol Reynolds affidavit signed August 21, 2005 states that they have no intention of selling their property to LCG. Exhibit 15 & 16.

NUMEROUS ADDITIONAL WAYS THAT THE SETBACK RESOLUTION IS VIOLATED

The staff finding of one type of setback violation is important but underestimates the debris radius and misses a number of additional violations of the setback resolution by the LCG proposal. Using actual events and various analyses, experts demonstrate that the initial travel of the debris to dwellings could far exceed the radius of 100% of the tower height.

Debris Roll even if debris falls right at base of LCG Tower. The determination of the maximum radius of where the debris first lands is only one factor determining whether this debris could fall onto occupied dwellings because most of the debris would land not on level terrain but on the steep flanks of this rocky mountain. Exhibit 52 diagrams the numerous antennas that would be on the LCG tower and provides photos of similar antennas.

If debris falls at base of LCG tower, it will already be on the down slope and be capable of rolling downhill from there to the east. Exhibits 80-84. This is not true for the current Channel 4 tower, which is on more level ground higher on the mountain. At the LCG tower 80% or 100% debris fall limits to the east, the topography drops an additional 200 to 300 feet below the tower base. Moving the tower from the current Channel 4 tower location to the new LCG tower location has increased the likelihood for downhill roll or sledding of tower fall debris. Further, debris hitting at the 80% and 100% fall limits has been taken past most of the trees onto steeper slopes with less soil and less vegetation to impede roll or sledding further downhill. Exhibits 55-84 & 87.

The debris could sled or roll down the mountain or breach the earthen Lookout Mountain Water District dam, releasing tons of water down to Golden. One of the antennas of various shapes hung from the bottom to the top of the LCG tower weighs 5 tons.

Professor Gary Olhoeft, using sophisticated three dimensional, topographic and aerial photography, demonstrates the various ways these debris could then travel down the steep slopes of Lookout Mountain to fall onto many occupied dwellings in Golden. Exhibits 53-85.

These various scenarios of debris fall will be overviewed in this report. The LCG tower falling on the Channel 4 tower or vice versa is just one of many scenarios for debris traveling to occupied dwellings. The analysis of how far the various types of tower debris could initially travel before striking the ground precedes the analysis of how far this debris could then roll, bounce or sled down Lookout Mountain to the dwellings below.

Where the debris initially land does not mean that is where the debris will stop moving. If the debris fell on flat terrain in deep soil such as frequently seen in the Midwest and did not bounce, then the debris motion should cease. The laws of gravity continue to act on these debris on Lookout Mountain. LCG is proposing to build its tower on the steep granite flanks of Lookout Mountain, perched above the City of Golden, the School of Mines and numerous Golden residents. CARE requests these commissioners take “judicial notice” of the fact that for many months of the year, this flank of Lookout Mountain is covered in snow and ice, soil development is thin, and slopes are steep.

MANDATORY REQUIREMENT OF SETBACK RESOLUTION

The proposed 730-foot guyed LCG tower violates the setback Zoning Resolution. Jefferson County Zoning Resolution 15 F.2.b. (2) requires:

“All new structures must be set back from the property line sufficient to prevent all icfall materials and debris from tower failure or collapse from falling onto occupied dwellings other than those occupied by the tower owner. Where more than one tower is located on a site, the set back between such towers shall be sufficient to prevent multiple failures in the event one tower falls.”

This zoning resolution does not call for a prediction of the probability of failure or collapse. This resolution mandates the tower be placed far enough away from any home or tower so that such collapse does not cause another tower to fail or icfall and debris from falling onto occupied dwellings. In this post 9/11 age, there is no question that any tower can be brought down. The issue is how much of a setback is necessary to fulfill all the mandates of this zoning resolution.

Debris or icfall from the LCG tower could fall on occupied dwellings even if there were no other towers within fall range. This same debris could cause other towers to fail and these other tower failures could cause debris to fall onto occupied dwellings. Before beginning the analysis of how far tower debris could travel it is important to understand the location of “occupied dwellings.”

“OCCUPIED DWELLINGS...”

People with zoning right to build should be protected by this setback.

The surrounding zoning is shown in Exhibits 17-22. Nothing in this zoning resolution indicates that its application is limited to the dwellings that presently exist. The tower/debris fall hazard continues into the future because LCG plans for this 730-foot tower to remain in place for decades. People with land already zoned and assessed as residential or agricultural are entitled to protections offered by the setback resolution because their zoning permits dwellings, not towers.

Broadcast towers are forbidden in both residential and agricultural land because towers are limited to 35 feet in height in agriculturally zoned land and towers cannot be built on residentially zoned land. To not apply this setback resolution to their land is to take away the rights of people with land zoned to permit dwellings to safely add dwelling structures to their property. In effect, Jefferson County would be sanctioning a “taking” by LCG of the rights of owners of surrounding land to build dwellings without threat of harm from tower failure. Surely the people who own land that has been platted as housing lots since 1924 and zoned residential since 1955, like Jim and Pam Clark, are entitled to the protection of this setback resolution. Pam Clark’s letter to Commissioner August 26, 2005 Exhibit 23 A & B. The Clark’s plans, right and dream to build a mother-in-law apartment are threatened by this proposal. Records of others with vacant land only 667 feet from the Channel 4 tower such as Patrick Jenkins show that they are in the process of building dwellings. Exhibit 24. The City of Golden owns the next lots west of the Reynolds. The Colorado School of Mines also has a right to put residential structures on its land immediately downhill from the LCG tower. Exhibit 25 Detailed zoning maps of Golden and Jefferson County are attached together with the CSM’s plans for building near this tower. Exhibits 17-22.

Residential parcels within 1.5 miles of proposal. One thousand seven hundred twelve residential parcels exist within 1.5 miles of the LCG proposed tower. These are depicted in the map prepared using Jefferson County Assessor’s office data August 24, 2005. (Exhibit 2 small version-large version is laminated). Also see Exhibit 26-28. Professor Gary Olhoeft demonstrates how many of these parcels on the flanks of Lookout Mountain are threatened by falling tower and antenna debris continuing to roll or sled down the mountain onto their dwellings. Exhibits 53-74.

“Household Units within 400% radius” Jefferson County Staff has confirmed that 61 “household units” are within 2920 feet of the LCG tower and 104 “household units” are within 3372 feet of the Channel 4 tower. The number of homes within the combined radii total 110. Exhibit 11.

Properties within 1320 feet and sample distances. The zoning and ownership of properties within 1320 feet of the Channel 4 portion of the LCG property based upon County Assessor records as of June 2005 are shown in Exhibits 29-31. All of the nontower properties with addresses appear to be dwellings occupied by the person listed

with the exception of Rita Benetti's. Mrs. Benetti's address is the same as the Votaw address. Mrs. Benetti owns two water taps and maintains a mailbox on Cedar Lake Road.

“THE SET BACK BETWEEN SUCH TOWERS SHALL BE SUFFICIENT TO PREVENT MULTIPLE FAILURES IN THE EVENT ONE TOWER FALLS.”

CASCADING TOWER FALLS

Cascading tower failures have been documented to extend up to 9 miles. Exhibit 32. Staff wisely found that the Channel 7 tower was within the fall radius of the Channel 4 tower. This same problem exists for many other towers, not only those towers owned by LCG but also many other towers owned by third parties, including Jefferson County.

As previously shown, many towers in this area are far closer together than 100% of the tower height. The LCG tower is not far enough away from either the Channel 4 tower or the high-tension transmission towers on the site. The inadequate setback from Channel 4 continues with inadequate setbacks for most of the towers. Exhibits 11-13 and 33. A small sampling of the magnitude of the problem is shown in the following chart of only the towers that are within the 100% setback of the height of the Channel 4 tower.

Name of tower	Distance from Ch 4	% of Ch 4 Height
Channel 9	462	55.39
Mauna	558	66.9
KOSI-FM	618	74.1
TAS	632	75.77
LCG	690	82.73
EXCEL 2	738	88.48
High Voltage lines	750	89.92
Channel 7	770	92.3

At least 4 other towers, Spectra 2, Spectra 3, Spectra 4 and EXCEL 1, are less than 110% setback from the Channel 4 tower. Exhibit 12.

FIFTEEN NON-LCG TOWERS WITHIN 100% FALL RADIUS OF CASCADED LCG TOWER FAILURE

Fifteen towers not owned by LCG are subject to fall. Three of these towers are owned by Jefferson County! Judge Jackson recognized that the setback resolution was designed not only to protect people from harm, but also to protect the property of those who are not members of LCG. LCG Exhibit D-Order May 4, 2004 at page 4-5. Judge Jackson was under the impression that the only towers subject to collapse belonged to LCG when he stated "...at least implicit in the remainder, that the purpose of the regulation is the

protection of the public and the protection of property other than the property of the tower owners.” Jefferson County has every right to deny this rezoning based upon the potential danger to the property of Jefferson County alone. Here are the non-LCG towers within the 100% fall radius of cascaded LCG tower failure.

Two towers owned by Alpha Wolf Communications, Inc.
one 268 feet from the Channel 7 tower
one 282 feet from the Channel 7 tower

Three towers owned by Jefferson County
one 223 feet from the Channel 7 tower
one 215 feet from the Channel 7 tower
one 247 feet from the Channel 7 tower

One tower owned by MAUNA Towers, LLC, 228 feet from the Channel 7 tower

Four towers owned by Spectrasite, Inc.
one 213 feet from the Channel 7 tower
one 135 feet from the Channel 7 tower
one 140 feet from the Channel 7 tower
one 122 feet from the Channel 7 tower

One tower owned by Entravision (KOSI-FM) 618 feet from the Channel 4 tower

One tower owned by Tower Assets Sub, Inc. 166 feet from the Channel 7 tower,
632 feet from the Channel 4 tower

Three towers owned by XCEL
one 843 feet from the Channel 4 tower
one 738 feet from the Channel 4 tower
one 756 feet from the proposed LCG tower

All of these towers, not owned by Lake Cedar Group, could be impacted by a direct or cascaded multiple tower fall of Lake Cedar Group towers for Channels 4,7 or 9, which might be initiated by collapse of either the proposed 730 foot LCG tower or the existing Channel 4 tower.

In addition, Exhibit 33A shows how close the Channel 4 tower is to the FOX TV broadcasting tower. The FOX TV tower (Ch 31) is big enough to take out homes to the south of it.

100% SETBACK NOT ADEQUATE BASED ON ACTUAL TOWER FALLS

The following examples of tower fall are in the public record. These show how the proposed LCG tower violates the staff's interpretation of a safe setback radius of 100% of the tower's height.

CARE TOWER COLLAPSE CHRONICLES NOTEBOOK

Year	Location	Event
2000	Chicago or Indiana	Vandal sawed guy anchor rod on tower #3. When tower #3 fell, it took out guy wires on #2
2000	Mexico, Mo	Storm took down KXEO tower and that tower took top off microwave tower and power lines
2003	Alabama	Photo shows one tower leaning next to second tower and they bump and both collapse
2004	Fenton, La	2 towers fell-"we built a new tower and we were in the process of taking the old tower down."

CHANNEL 4 TOWER MAST TOO CLOSE TO LCG TOWER

The hazard posed by the location of the 730-foot LCG tower is increased by the fact that the proposed tower is too close to the existing 843-foot Channel 4 tower. (Exhibits 34-36 also Black Notebook, Tab 96) The approximately 690 foot distance between the Channel 4 tower and the LCG tower does not meet the Zoning Resolution requirement that *“Where more than one tower is located on a site, the set back between such towers shall be sufficient to prevent multiple failures in the event one tower falls.”*

The distance between the Channel 4 tower mast the LCG tower mast is less than the height of either tower. LCG's own expert admitted that debris from guy whip could reach 100% of the height of the tower in his expert report. (LCG Expert Ernest Jones, P.E. Report R 13023) Staff's interpretation is that minimum setbacks must be 100% of the height of the tower. Therefore, these towers should be separated by at least 843 feet.

CHANNEL 4 AND LCG GUY WIRES TOO CLOSE TOGETHER

Compounding the danger of either mast falling on the other is the fact that many of the guy wires of each of these towers are much closer than 100% of the height of either tower so that anything falling from either tower could sever the guy wires of the other. There are 12 main guy cables for the proposed LCG tower. The longest LCG guy cable is approximately 1140' long. The anchors for the longest guy cables attached to this tower are located 345' below, and 615' away from the base of the LCG tower. The existing Channel 4 tower has 30 guy wires. The anchor for the southeastern set of guy wires is just 220 feet from the LCG tower mast and every one of those guy cables are almost directly under the LCG Tower guys and could be cut simultaneously by icfall, antennas or other debris falling off the LCG tower. (Exhibit 33-36 also Black Notebook, Tab 96)

THE LCG TOWER IS TOO CLOSE TO TWO HIGH TENSION POWERLINE TOWERS

In the event that the LCG tower failed, it could bring down the high-tension power line towers on the LCG site in violation of the zoning resolution. Exhibits 37-42. The distance from LCG proposed to High Voltage lines is 600 feet and that is just 82% of the LCG tower height. The distance from these lines to Ch 4 is only 750 feet and that is just 90% of the Channel 4 tower height. The HV lines are only 210 feet away from the LCG Northeast guy anchor. R 900, 935, 974, 980, 1001, 1007, 1034, 1055, 1074, 1435.

Note that these two high voltage electric transmission towers are in a steep canyon and were installed by helicopter. The canyon is heavily vegetated with downed trees and a significant fire hazard. Further, the spacing of the towers just above and just below is much smaller (less than 500 ft) than between these two towers (1300 ft), indicating extra wire stress that tower fall would release and could cause galloping of the high tension wires well beyond the immediate consequences to the first two support towers in the canyon. Exhibit 32 Hubbell PowerSystems "to the rescue" report of 62 towers down over a 9-mile stretch due to galloping wires in 1999. Note also that occupied dwellings exist along these high tension lines both above (Colorow Road less than ½ mile up wire) and below (Stonebridge less than ¾ mile down wire) from the LCG tower fall impact zone, and both well within the 4 mile galloping induced collapse in 1999.

DEBRIS RADIUS OVERVIEW

If a 400% debris radius is used, there are at least 23 communication towers and 5 High Voltage towers, and 61 dwellings within range of the LCG tower debris radius. Russ Clark, Jefferson County. Exhibits 11, 12-14. If a 168-257% debris radius is appropriate, the same situation applies except there are only 3 High Voltage towers at the lower radius. If the 110% to 120% radius is applied, 5 dwellings, 3 potential dwellings and 19 towers are in danger. If the 100% radius is applied, 4 dwellings and 17 towers are within the fall zone. The attached detailed Tower Setback Radius comparisons summarize key evidence; distance to the LCG and Channel 4 towers and cross references to the record. This debris radius is exclusive of debris roll and cascading tower failure into other towers. Exhibit 43.

110% DEBRIS RADIUS

The tower expert for the City of Golden documents that it is feasible for debris to travel laterally further than the height of the tower. 110% debris radius is listed in the Mulherin, U.S. Army Cold Regions Research and Engineering Laboratory Report on atmospheric Icing and Tower Collapse in the United States. Exhibit 44.

LCG PREVIOUS EXPERT ADMITTED 110%. LCG knows that at least a 110% debris radius is reasonable because its own tower fall expert put that radius in his report to Jefferson County. In 1999, Raymond White of Kline Towers admitted a debris radius of 110% for the tower. This Kline Towers report is contained in the 1998 rezoning materials filed in this case on August 9, 2005. 1998 Record (98) 695, 3201, 3202, 6112. This same 110% debris radius appears in the 2004 LCG Tower Setback Drawing. Although the circle for the radius was taken out, a close examination of the document

shows the curving lettering, “110 % of Tower height” where the 110% radius circle would extend. Exhibits 45, 45, large blueprint at Tab 76, CARE Black Notebook.

REYNOLDS HOME ALMOST 100% FROM CHANNEL 4 TOWER. The Reynolds’ home, at just 845 feet from the 843 foot Channel 4 tower using Jeffco software, is just 2 feet past the 100% debris radius for the Channel 4 tower. LCG omitted the Reynolds property from its 2004 setback drawing. Exhibit 47. The Reynolds had no intention of selling to LCG as of this last Friday Carol Reynolds August 21, 2005 Affidavit 15. Aug 23, 2005 records from Jefferson County on Reynolds property showing ownership, various building permits and approvals.

DEBRIS BEYOND 100%. The Mulherin report contained an account of the WKOX tower jumping 5 feet of its base and then laying out like a tree. An incident where a man was thrown 600 yards from the KXTX Cedar Hill tower documents that he landed well over 110% of the distance of the height of the tower.

ICEFALL-168% DEBRIS RADIUS

Ice from the Channel 4 tower has already damaged a home. Exhibit 48. Not only could this ice fall on occupied dwellings, but it could also strike a number of towers that in turn could fall and that debris could fall on occupied dwellings. Kathleen Jones – Research Physical Scientist for the Snow and Ice Branch of the US Army Corps of Engineers “Cold Regions Research and Engineering Laboratory” calculated that the ice from a 500-foot high tower could travel up to 839 feet (in an 85 mph wind). This is 168% of the tower’s height.

Bob Barrett, using Ms. Jones equations and the known wind gust speeds (110 mph) and ice types prevalent on Lookout Mountain calculated that ice from the proposed LCG tower could travel 1570 feet (215% of the LCG tower’s height). Exhibit 48 A. He recommended a slightly lower safety setback of 1350 feet (185% of the LCG tower’s height) for damaging icefall from the LCG tower. Exhibit 48A. His detailed reports are contained in the Black CARE Notebook “THE LCG PROPOSAL VIOLATES THE ZR REGARDING TOWER/DEBRIS FALL Vol. 2 of 2” at Tab 31 and 92. His testimony was presented to the previous board by DVD. Not only could this ice fall on occupied dwellings, but it could also strike a number of towers (including Channel 4) that in turn could fall and that debris could fall on occupied dwellings. There are examples of tower failure caused by ice fall onto anchors and differential ice melt in the public record and in our submitted information on tower failures. Falling ice can cause great damage and guy line gallop. Exhibit 49. Icefall from either tower could cause the other tower to fail.

Comment [B21]: I WILL BRIEFLY TOUCH ON THIS IN MY PRESENTATION.

GUY WIRE WHIP 231% to 400 % DEBRIS RADIUS

Severed guy wires can whip and cause enormous damage. Two of LCG’s tower experts acknowledged that the debris radius could be up to at least 100% because of guy whip. (LCG Expert Ernest Jones, P.E. Report R 13023 and Raymond White of Kline Towers.

The 1982 Missouri City, Texas tower collapse video captures four guy wires whipping and snaking across the horizon. As stated earlier, Wolfgang Scherer recommends a setback of 4 times the height of the tower to take this guy wire whip into account. Exhibit 3. A 400% setback for the LCG tower would be 2,920 feet. This 400% radius is shown on the Assessor's Map of Residential Properties. Exhibit 2. Also shown is the 231.5% Vellozi debris radius with no safety factor. This radius is based on documentation of a severed guy wire "laying out" like a whip during failure caused by a severe wind. Vellozzi. Exhibit 50. This documentation is contained in Raymond White of Kline Towers rebuttal report for LCG's 1999 "supertower" proposal. Bob Barrett and his neighbors in the Lookout Mountain Park subdivision presented this information to the previous commissioners in 2003. Mr. Barrett's detailed report and presentation appears at Exhibit 51 and Tab 23 of the Black Notebook. The setback for the LCG tower would be 1,875 feet using his recommended setback, which includes the Vellozi demonstrated "guy whip" debris radius applied to the proposed LCG tower with a 10% safety factor.

The channel 4 setback would be 1950 feet (using a 231% setback with no safety factor). Obviously, many dwellings could have the guy wire debris fall onto them under this scenario. Likewise, many towers could be impacted by these whipping guys and could fall onto occupied homes. If the "Vellozi Debris Radius" setback were to be applied to the Channel 4 tower, it would include:

- 24 currently occupied dwellings
- 3 commercial properties, at least one of which includes a live in caretaker
- The Lookout Mountain Water District water supply reservoir
- 3900 feet of high tension power lines
- 2500 feet of emergency access highway (Lookout Mountain Road) and
- Nearly all other communication and broadcast towers on Lookout Mountain.

None of these properties, public highway, or utilities are currently owned or potentially leased by LCG. Very few of the communication or broadcast towers or support buildings belong to this group either.

Tower Chronicles Notebook

Year	Location	Event
1982	Missouri City near Houston Texas	DVD from A& E Engineering Disasters V Four guy wires seen whipping and traveling laterally at high speed behind fence after tower falls
1989	Charleston, N. C.	tower fell horizontally and guy wire extended straight out from anchor point- -Vellozi Report WTAT TV 24 R (98) 3228-3231, 6112-6125, 7892-7922
1973	Orlando, FL	"huge steel cables jerked out of the ground by the falling tower demolished 2 parked automobiles and damaged 2 others." "Tension lines were flying all over the place". Tower only 4 yrs old.
2002	Hemingford, Neb	"Two workers who were accounted for and a bystander, the finance of one of the workers, were all injured when

		the brace cables to the tower snapped and swung to the ground."
2002	Denali, Alaska	Pg 16-settlement of guy wires on a wooden power pole caused the guy wire to snap, and it rebounded up and over the 3 phases of the distribution circuit resulting in a short circuit
2004	Basset, Neb	Mississippi man killed when steel cable broke loose and knocked him from National Education TV tower
2003	Huntsville, Al	guy wires did significant damage to cars and trees under them. Spectrasite Tower fell during strengthening

CONCLUSION

The preceding demonstrates how the mandates of the setback resolution are violated many different ways. The live testimony and demonstrations will clarify these points further. The LCG tower is not setback far enough from the Channel 4 tower and high-tension power line towers, even using staffs' 100% analysis. Plaintiffs have documented that tower debris have exceeded 110% radius. The proximity of these towers causes a very real scenario of multiple cascading tower fall that includes numerous towers not owned by LCG. Even if debris only fell at the base of the LCG tower, the slope is sufficient to send debris rolling down to Golden. Not only is the tower setback zoning resolution violated but there is also considerable possible hazard to the public in the LCG proposal. Such hazard is not made up from whimsy but from numerous documented examples of where such tower failure has already occurred in the recent past. As the City of Golden pointed out in their recent submission, Lake Cedar cannot fit 50 pounds in a 20-pound sack or a tall tower in a neighborhood with towers and other hazards. This proposal should be denied because it violates this mandatory zoning resolution.

Respectfully submitted this 30th Day of August, 2005 with a notebook of exhibits,

Deborah Carney
Attorney for Plaintiffs other than the City of Golden
LCG Rezoning

References

CARE Notebooks submitted Aug. 9, 2005

1. THE LCG PROPOSAL VIOLATES THE ZR REGARDING TOWER/DEBRIS FALL Vol. 1 of 2

(Relevant pleadings filed with Judge Jackson regarding the tower setback zoning resolution highlighted in yellow)

2. THE LCG PROPOSAL VIOLATES THE ZR REGARDING TOWER/DEBRIS FALL Vol. 2 of 2

(Relevant documents from this rezoning record submitted to Judge Jackson regarding the tower setback zoning resolution highlighted in index in green)

3. TOWER COLLAPSE CHRONICLES-Actual Tower/Debris/Ice Fall Incidents in Chronological Order from court decisions, web pages, various government records and other sources.

4. SUPPLEMENTAL TOWER COLLAPSE CHRONICLES

5. TOWER FALL MISCL. NOTEBOOK

6. PROFESSOR GARY OLHOEFT AUGUST 12, 2004 AND RECENT DOCUMENTS

7. TOWER FALL DOCUMENTS FROM 1998 REZONING

SUPPLEMENTAL SOURCES

15,000 PLUS PAGES OF RECORD ON APPEAL IN THIS CASE

9,000 PLUS PAGES OF RECORDS OBTAINED FROM THE FCC REGARDING LOOKOUT MOUNTAIN TOWERS AND ANTENNAS AND FCC ONLINE DATABASE

EVERY JEFFERSON COUNTY PLANNING AND ZONING DEPARTMENT RECORD REGARDING TOWERS OR BROADCAST ANTENNAS ON LOOKOUT MOUNTAIN

According to legend, Damocles was a sycophant at the court of Dionysius the Elder, tyrant (i.e. ruler) of the Sicilian city of Syracuse in the 4th century BC. He so persistently praised the power and happiness of Dionysius that the tyrant ordered a banquet at which Damocles was the guest of honour but at which he found himself seated beneath a sword that was suspended from the ceiling by a single horse hair. Dionysius explained that the rank and power of the tyrant were no less precarious. The story is told by the Roman orator Cicero in his *Tusculan Disputations* (Book V, 61)

