

88A.

See Section 7.1 of the EIS.

88B.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

88C.

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88D.

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LAVERNE & JUNE HOFSCHULTE



Sect - 15 Twp-109 Range-01
51.70 acres East of River and
Lot 1 of North 1/2 of Aud Lot 7
& EX 0.30 acres East of River
of Aud Lot 6

89A

We purchased this property in 1978 and had it registered as a Tree Farm in 2005. We have planted in excess of 20,000 seedlings trees over the years. The varieties include Black Walnut, White Ash, Silver Maple, Red Pine, White Pine, Scotch Pine, Red Oak, White Oak as well as several wild life packages.

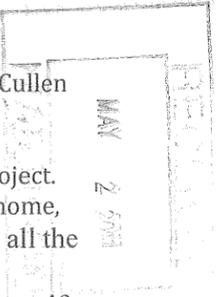


Sect-15 Twp- 109 Range 014
11.00 Acres all South & East of
River of NW 1/4

THIS WOULD BE PART OF THE
PLANTATION LOST TO CAPX 2020.

89A.

Your comment is noted and will be forwarded to the administrative law judge.



To Whom It May Concern: This letter regards the home of Tiffany & Cullen Houser at 12359 18th Ave NW, Oronoco MN, 55960.

Our home is one of the homes located within 75ft of the Cpax 2020 project. We are very concerned with all the impacts this power line will have on our home, property and our children, and feel that there is insufficient information on all the effects.

High voltage power lines emit high levels of corona discharge, a type of electrical signal that is formed when the power lines ionize the surrounding air creating interference with audio and video signals. So I would have to assume since we are located so close, the noise and interference would have a much greater chance of disturbing us. The lines are also vulnerable to storms and lightning. If they are knocked over in strong winds, which we have had an ample amount of this past year, they can cause extreme damage to property and humans. We had three enormous trees come down at our property alone last year due to high winds.

Not only could this power line be damaging, but aesthetically displeasing. A letter by Cpax 2020 reported that this power line would increase the value of our home. I find that untrue and would like to know where they got that information. Speaking with many realtors I have come to the conclusion that it is in fact the opposite, making it much harder to sell your home with a high voltage power line in visible sight of a property. On top of that, might it have an effect on all my landscaping, flower gardens and vegetable gardens, making my yard less productive and desirable? According to Zeki Demir's 2010 study entitled "Proximity effects of high voltage electric power transmission lines on ornamental plant growth," high voltage power lines alter the growth patterns of ornamental plants. The study tested a series of Leyland Cypress and Japanese Privet seedlings, concluding that there was a negative correlation between the diameter at breast height (dbh) of seedlings and the distance away from the power line.

Another concern is the cost. Not only will it negatively affect the home's value, but also what responsibility does the taxpayer have to endure with the construction and maintenance of these lines?

The health effects are of my most concern. I have a family of Pileated Woodpeckers that nest right below where the Cpax 2020 power line would be going. Although Pileated Woodpecker is not currently listed as a threatened or *endangered* species, it is a protected species. Wild life is abundant in this area and there is a concern for all the animals. There is even more concerns for human's right? I have three small children that play outside all the time and would be catching the bus directly under the power line every day. Stated by Rachel Bennett "There have been a range of scientific studies conducted into the health effects of living near high voltage power lines. A study by the Oxford Childhood Cancer Research Group analyzed 33 years of data, concluding that children (15 years and under) who live within 100 meters of high voltage power lines have nearly double the risk of developing leukemia compared to

- 90A
- 90B
- 90C
- 90D
- 90E
- 90F
- 90G
- 90H

- 90H (cont)
- 90I 90J
- 90K

those who live elsewhere. This risk is even greater for children up to the age of five. The risk of child cancer is evident in magnetic field exposures of 0.4 microtesla or above." Plus what are the effects on our air and water quality? There is such unclear and insufficient information on all these matters, it is very hard to assess all the impacts this power line could have with our area.

Our property is only about 400 yards from the other power line off county rd 12 (3P-010 or 3P-005) as well, so we will have double emissions. We strongly disagree with this being the route of choice because it affects so many houses. There must be an alternate route. Our family moved to the country four years ago to get far away from pollutants. The Cpax 2020 power line will force us to relocate and not only cost us financially, but emotionally and physically.

The DEIS doesn't address why I need this: 'Reliability' without supporting data doesn't answer to the need when the power I have today is extremely reliable. Five un-elected (appointed) individuals decided I need this - should be a referendum on this for all Minnesotans to decide

Recreation: swimming, boating, fishing, skiing, hunting - all in one location, no other route has all this.

Tiffany Houser
507-269-3198

90L	The DEIS doesn't address why I need this: 'Reliability' without supporting data doesn't answer to the need when the power I have today is extremely reliable. Five un-elected (appointed) individuals decided I need this – should be a referendum on this for all Minnesotans to decide
90M	- Insufficient information on impact to rare/endangered aquatic species - Insufficient information found on impact to state listed threatened/endangered rare species (listing only)
90N	- 3P-009 does not indicate/there is no mention (map) the crossing of Lake Zumbro and wetlands (Ferber to Midthun) P162-163 - No information pertaining to the impact on wetland areas and Lake Zumbro 3P-009 migratory path.
90O	- Mortality information of migratory birds and waterfowl is absent - Increased stopover population due to disturbance of Lake Shady
90P	- Doesn't sufficiently cover air and water quality impact
90Q	- Insufficient information on electronic interference
90R	- Very little information on public health effects - childhood leukemia and adult cancer
90S	- What will this do to our archaeological and historic resources P166 – not addressed
90T	- Very little information on pros/cons of burying the line – cost addressed some but not to the extent expected. Some data research shows 2-3% more expensive vs. Xcel Energy's 10 times more expensive (why the enormous difference)? P17 P18...provide supporting data for the information provided.
90U	- Why generating plant sites aren't constructed close to the required need vs. transporting
90V	- Taxpayer costs are not addressed
90W	- Citizen rights information not provided
90X	Observation: In reading similar EIS statements from around the country and power company Q&A's on the web, our DEIS looks very much the same, as if the material has been lifted/reused
90Y	3P009 Route Option Issues/Concerns (for Judge hearing June 13) - Prime Farmland is lower in other alternate routes - Stray voltage near cattle a great concern (electric fences, etc. – decrease in milk production and behavior problems in cattle are documented in other studies) - Mines and future reserve areas have been identified on this route - Impacts to economically important forestry resources on this route - Displacement impacts: 6 homes within 75 feet and a total of 38 homes within 500 feet - Fresh water mussel colony located in 3-P Zumbro N and S

90S	- Many wildlife resources have been identified on this route, fish, waterfowl and migratory birds/ducks 3P-009: Trumpeter Swan, Pelican, Bald Eagle, Loon, Whooping Crane (bird of concern), Heron, Kirkland and Cerulean Warbler (birds of concern) - Two Bald Eagle Nests on Ferber property overlooking Lake Zumbro - Wetlands - Natural springs present - Recreation: swimming, boating, fishing, skiing, hunting - all in one location..no other route has this
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90A.

See Section 7.9 of the EIS.

90B.

See Section 7.1 of the EIS.

90C.

See Section 7.3.1 of the EIS.

90D.

The EIS does not claim that the transmission line would increase property values to any particular piece of property along the line. Rather the EIS reviews property value studies, including some in which increased values were observed.

90E.

As the comment points out, this particular paper indicates that seedling growth is about 17 percent faster under a high-voltage line that it was 30 meters away. No reason or mechanism for this improved growth rate under the powerlines is suggested. The paper also points out the conflicting results shown in similar studies completed over the last decade.

90F.

Ratepayers served by the Applicant's (all of whom are regulated utilities) will pay for the maintenance of the lines, once constructed. The approximate cost is described in EIS Section 2.9.1.

90G.

See Section 7.7 of the EIS.

90H.

Your comment and provided study are part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and PUC for consideration.

90I.

Your comment is noted and will be forwarded to the administrative law judge. Please note that the purpose of the EIS is to assess the human and environmental impacts of the alternative routes identified. Not only are air quality impacts associated with the Project expected to be immeasurably small at a regional level, air quality impacts are not expected to vary notably from one route to the next, and therefore, do not provide a useful metric in weighing the viability of one route versus another.

90J.

See Section 7.8 of the EIS.

90K.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

90L.

The need for this transmission line has been previously determined by the Minnesota Public Utilities Commission (Docket No. CN-06-1115). Questions of need for this project cannot be addressed in this document, Minn. Stat. 216E.02, Subp. 2.

90M.

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

90N.

See Section 7.12.6, 8.3.4.8, and 8.3.4.12. These sections mention that the Zumbro River is crossed by all of the route alternatives in the North Rochester Substation to Mississippi River Segment.

90O.

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90P.

Your comment is noted and will be forwarded to the administrative law judge. Please note that the purpose of the EIS is to assess the human and environmental impacts of the alternative routes identified. Not only are air quality impacts associated with the Project expected to be immeasurably small at a regional level, air quality impacts are not expected to vary notably from one route to the next, and therefore, do not provide a useful metric in weighing the viability of one route versus another.

90Q.

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90R.

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90S.

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90T.

A broader discussion of impacts to archaeological and historic sites is provided in Section 7.10 of the EIS.

90U.

The analysis of the cost of burying the transmission line at the Mississippi River crossing was prepared for the applicant by Power Engineers. The estimate was based on quotations from high voltage cable manufacturers and contractors familiar with the installation of high voltage underground cable systems. The Power Engineers underground analysis, including cost differentials, was included in the DEIS as Appendix D. While this analysis was conducted for the Mississippi River crossing, most of the factors that result in higher costs for undergrounding transmission lines would also apply to burying the transmission line in overland portions of the route.

90V.

The need for this transmission line has been previously determined by the Minnesota Public Utilities Commission (Docket No. CN-06-1115). Questions of need for this project cannot be addressed in this document, Minn. Stat. 216E.02, Subp. 2.

90W.

See Sections 2.0 and 3.0 of the EIS.

90X.

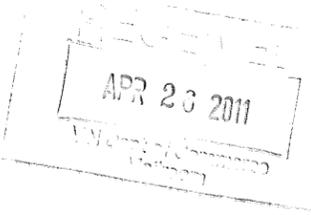
Many general concerns regarding high-voltage lines, such as property values and EMF, are the same on proposed projects throughout the U.S and elsewhere. Since much of the same research is relied on to address these concerns, the documents do cover similar information.

90Y.

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85 7th Place East, Suite 500, St. Paul, MN 55101-2198
main: 651.296.4026 tty: 651.296.2860 fax: 651.297.7891
www.commerce.state.mn.us



PUBLIC COMMENT SHEET

CapX Hampton-Rochester-La Crosse Transmission Line Project

PUC Docket Number: E002/TL-09-1448

Name:

Gale Haven

Representing:

Roscoe Twp.

Address:

49500 130th Ave Wauwamingo, Mn. 55983

Email:

Comments:

The least environmental impact would be to go along Hwy 52 or along Hwy 56 and Hwy 14.

91

Please submit comments by **4:30pm, April 29, 2011** to:

Matthew Langan
Minnesota Dept. of Commerce
85 7th Place East
Suite 500
St. Paul, MN 55101-2198

Email: matthew.langan@state.mn.us
Phone: 651-296-2096
Fax: 651-297-7891

91A.

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Langan, Matthew (COMM)

From: Clay View Dairy [cviewdairy@sleepyeyetel.net]
Sent: Friday, April 29, 2011 10:45 AM
To: Langan, Matthew (COMM)
Subject: Unwanted ground current

Mr. Langan:
 In response to our phone conversation:
 House Ag Committee
 May 4
 10:15 am

One other issue comment:
 In the EIS it mentioned that "stray voltage" was more of a distribution (local power company) issue when their lines cross transmission lines. What mitigation practices are the power companies or transmission line companies going to enroll to prevent those problems? Who pays for it? Who is ultimately responsible or liable for the intersection problems that are created?

Jon Huseth
 Clay View Dairy LLP
 38765 Hwy. 56 Blvd.
 Dennison, MN 55018
 507-649-1490

92A

92A.

As stated in Section 7.1.2 of the EIS: ""mitigation measures may be necessary if the project transmission line parallels or crosses distribution lines. These appropriate measures are site specific and may include, but are not limited to:

- Cancellation: Arranging transmission line phase conductors in a configuration to minimize EMF levels, bonding distribution neutral and transmission shield wires together, and employing an under built transmission shield wire bonded to distribution neutral rather than a normal overhead shield wire.
- Separation: Increase the distance between transmission and distribution facilities by placing across the road and/or burying the distribution facilities, or providing greater vertical distance between the transmission line phase conductor and an under built distribution line.
- Enhanced Grounding: Employing bare buried counterpoises connected to the distribution neutral and/or transmission shield wire (Asah, Personal Communication, Additional Stray Voltage Information 2009)."

Ron Huseth
 Jon Huseth
 Clay View Dairy LLP
 38765 Hwy 56 Blvd.
 Dennison, MN 55018

Mr. Mathew Langan
 State Permit Manager
 Minnesota Office of Energy Security
 85 7th Place East, Suite 500
 St. Paul, MN 55101

Dear Mr. Langan:

Please accept the following comments and supporting material regarding the proposed Hampton-Rochester-LaCrosse 345 kV and 161 kV Transmission line project.

Clay View Dairy LLP maintains a register feedlot at 38765 Hwy. 56 Blvd. Dennison, MN. This particular feedlot is essential to the 695 cow Clay View operation, because it houses the PG heifers. These heifers are of the highest genetic value available to the world dairy industry, including high value bloodlines developed through embryo flushing and transfers.

The main points we would like to make are as follows:

- 1.) We understand better than most the effects unwanted electrical current can have on a dairy operation. At our Clay View milking site we mitigated a problem that stretched back to the construction of the site. Since the time of mitigation in 2003, our herd performance, herd health, and financial performance has moved from sub-par to one of the best in the industry. We now recognize and have invested in ways to monitor unwanted current, measure it and establish its effects on dairy animals. We have been at both ends of the spectrum and are now well equipped to hold power providers responsible. **We would prefer another route be established to not only avoid the risk, but also reduce the transmission line provider's exposure. Has the State of MN Dept. of Energy included this within the environmental impact statements?**
- 2.) A power provider has been taken to task recently by the MN Supreme Court in regards to the Siewert Case in Wabasha County. Do power providers or transmission suppliers want another case on the books? The game plan to tie these cases up long term is now proving to be quite ineffective, as many legal precedents have now been set against those who create unwanted electrical current. We can assure you that Clay View would have a high performance history, competent consultants and the best measuring equipment installed before the transmission line was installed. **Again, we would propose that another route be used to avoid an issue.** (Please see enclosed MPR news article) **Has the**

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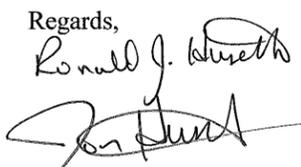
93E

93F

State of MN Dept. of Energy included this issue within the Environmental Impact Statement?

- 3.) There are numerous publications documenting the negative effects unwanted electrical current has on dairy animals. The negative effects include: decreased milk production, poor reproduction due to increased release of cortisol, and decreased disease resistance to due increased blood cortisol levels. (Please see "Effects of Electrical Shock", by Dr. Donald Hillman) **Avoidance of the Hwy. 56 route would be the best. Has this been included in the Environmental impact statement? It has been proven over and over again and has been supported now by the MN Supreme Court. Legal precedent has set, which requires you to include it.**
- 4.) McGill University, Montreal, Quebec studied the effects of electric and Magnetic fields on dairy cows. The findings were as follows: 1. Milk production decreased 5% 2. Fat-corrected milk decreased 14% 3. Milk fat decreased 16% 4. Dry matter intake increased 5%. **Measurable problems** (See enclosed article) **Has the State of MN included this within the scope of the Environmental impact statement?**
- 5.) Before and after measurements of unwanted electrical current has been documented already on numerous occasions. Dr. Hillman of Michigan State detailed those measurements in 2004. These measurements are real and they have negative impact on dairy cattle. (Electrical Transmission Lines, Individual Rights Vs. Utility Rights of Public Domain) **Has the State of MN included this within the scope of the Environmental impact statement?**

Mr. Langan, in summary your organization's alternative's site down MN state 56 would be a poor choice for the Huseth's Clay View Dairy and a poor choice for Excel. There are other routes, which would be more economically feasible. The data available is very clear regarding the negative effects between dairy cattle and unwanted current. Many large court cases have proven it. We hope the above points have been researched within the environmental impact statement process.
 Thank you for your time and consideration.

Regards,

 Ron Huseth
 Jon Huseth

CLAY VIEW DAIRY
 35694 215th Ave.
 Goodhue, MN 55027



JON HUSETH
 General Manager

Dairy: (651) 923-5067
 Fax: (651) 923-5066
 Mobile: (507) 649-1490

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Wednesday, April 13, 2011

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(more cities)

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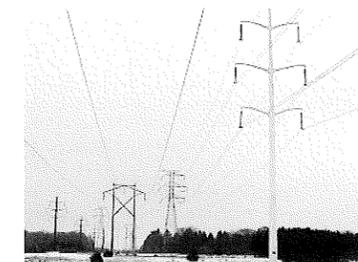
THE CIVIL WAR
A FILM BY KEN BURNETT



< Africa have your say | Main | The gulf of St. Paul >

Supreme Court hands dairy farmers a win over stray voltage

Posted at 1:22 PM on January 26, 2011 by Bob Collins (10 Comments)
Filed under: Crime and Justice, Energy



A divided Minnesota Supreme Court ruled today that two Wabasha County farmers can seek money from an electric utility, whose stray voltage, they say, has caused their cows to give out less milk (see opinion). The stray voltage is also believed to have killed 80 dairy cows.

In upholding a lower court's ruling, the Supreme Court said Greg and Harlan Siewert of Zumbro Falls are free to seek damages from Northern States Power Company, the parent of Xcel Energy. When the two moved to their new farm in 1989, they noticed the milk production decreased from their 150-200 cows. Experts said it was because electrical current returned to the ground through the cows.

"It's a slow, painful tortuous death, is what it is for them," Greg Siewert told the Star Tribune in 2008. "It's like watching someone die of AIDS."

The court rejected the utility's claim that any damages would impact electricity rates in violation of state law, especially if it had to redesign its electrical distribution system.

In her dissent, Chief Justice Lori Gildea wrote, "the judiciary is not in the position to order NSP to adopt one electrical distribution system over another without potentially undermining the nuanced balancing and determinations made by the Minnesota Public Utilities Commission..."

She acknowledged, however, that "NSP did not deliver electricity in the safest or most prudent way."

The effect of stray voltage on cows has been a controversy in Minnesota since farmers started raising the issue in the 1990s. About a half-dozen farmers have filed suit over the years against utility companies.

Recommend 16 people recommend this.

Comments (10)

OK, so they moved into an area that is not good for animals to produce milk and are suing because of it?

Or is it that Xcel Energy claims that the power lines are not the cause?

Interesting either way.

Posted by BJ | January 26, 2011 3:30 PM

They don't claim the powerlines aren't the cause. They changed an isolator or something which reduced the stray voltage, though the farmers say there still is some -- though reduced -- voltage.

They didn't move into an area that was not good for animals to produce milk because stray voltage wasn't much known back then.

If you look at farmland all over Minnesota, there are a lot of powerlines running through it.

Posted by Bob Collins | January 26, 2011 3:52 PM

I'm a little skeptical about the idea that there's any voltage even passing through the cows. I gather by "stray voltage" they mean that current is leaking from the power lines into the ground. If this is the case, then to get to the ground the voltage either has to be passing through the poles or through the air itself. If the former is the case it's hard to imagine how it's passing through the cows along the way. If they're arguing the latter, then do they have evidence to show there's that much voltage passing through the air? (You have to reach a fairly high voltage between this can take place.)

Posted by Jim B. | January 26, 2011 4:04 PM

So, if you stand around there, can you feel it?

Posted by Heather | January 26, 2011 5:04 PM

http://minnesota.publicradio.org/collections/special/columns/news_cut/archive/2011/01/su... 4/13/2011

93C

Effects of Electrical Shock on Cattle

Dr. Donald Hillman, Ph.D., Professor Emeritus, Department of Animal Science, Michigan State University, East Lansing, Michigan 48824

Conclusions from Careful Examination of Published Research

[An article, *Review of Stray Voltage Research, Effects on Livestock*, by Robert J. Fick, Director of the Michigan Agricultural Electric Council (an employee of the electric power industry) and Visiting Assistant Professor, Agricultural Engineering Department, Michigan State University, and Truman C. Surbrook, Professor, Agricultural Engineering Department, is on the MSU information network and in other Michigan State University publications. Conclusions of that article are challenged for understating effects of low voltage on health and performance of dairy cattle on farms. Conclusions are too dependent on limited research of doubtful merit while ignoring findings and implications of other valid, conflicting research. Such representations jeopardize administration of justice to owners of herds so afflicted and risk the establishment by the Michigan Public Service Commission or others of nonactionable voltages which are biased in favor of electric power suppliers. Such actions threaten access of plaintiffs to due process and are financially detrimental to dairy farm users and their families affected by such extraneous voltage. D.H. 1/30/99]

Research workers have documented effects of electrical shock on cattle and reported in scientific journals. They have called the electrical shock of concern here stray voltage. More precise and inclusive it is termed "extraneous voltage" defined as any outofplace voltage within environment of the animal regardless of cause, source, or magnitude (recommended by Bodman, Ref. 5). As cattle vary widely in response to voltage and to the same voltage on different days, opinions vary by research workers on effects of electrical shock on cattle. Our analyses indicate that major experiments had few enough cows that important differences in milk production, reproduction, and herd health may not have been detectable. Other conclusions are not excluded. The following is a summary of those findings:

Commonly Cited Cow Responses to Electrical Shock were summarized by Appleman and Gustafson (3): 1) Intermittent periods of reduced production; 2) reasons unexplained; 3) increased incidences of mastitis; 4) elevated somatic cell count [in milk samples]; 5) lengthened milking times; 6) incomplete milk letdown; 7) extreme nervousness in milking parlor [stepping, or raising of feet, switching of tail, kicking off milkers]; 8) reluctance to enter the milking parlor; 9) rapid exit from the parlor; 10) reluctance to use water bowls or metallic feeders; and 11) altered consummatory behavior [such as lapping water or splashing rather than normal drinking behavior]. Authors observed effects of stray voltage on four general areas: milking performance and behavior, herd health, nutritional intake, and yield of product. Reproduction should be added to the list.

Cows exhibit clear responses to applications between 2 and 4 mA of current according to Scott, Gorewit, and Drenkard (21). Variation between responses of cows to 4 and 8 mA shocks was large. Same cow response differed markedly to the same current on different days for Drenkard et al. (7).

Lefcourt (12) reported that as little as 0.199 volts and 0.693 mA electrical current was mildly shocking and 0.272 volts (.964 mA) resulted in distinct shock reactions in one cow in five tests for behavioral response to electrical shock. He found resistance from 250 to 405 Ohms and concluded that a cow with little electrical resistance is twice as susceptible to stray voltage as is a cow with high electrical resistance. He further concluded: "Therefore, because stray voltages on a farm do not exceed .5 V does not mean that the farmer will be free of stray voltage problems. In addition, because sensitivity to electrical current varies with parts of the body through which it passes, it is possible that cows might be even more sensitive to stray voltage if the current passes through the teat or tongue."

Electricians commonly include a 500 Ohm resistor in the circuit when measuring voltage in areas of cow contact as if the resistor represents resistance of the cow. Ohms should be at least 250-500, although resistances presumably change regularly as a cow picks up one or more feet either in walking or attempting to escape electrical current. Further, if the filament of a light bulb represents resistance on the circuit, then the heat and light produced by the resistor hardly can be considered no consequence in the circuit. A possible relationship between regular low amperages, e.g. 1 or 2 mA, causing pain (hot-foot ?), separation of hoof laminae, abnormal hoof growth, and other anomalies associated with stray voltage on farms cannot be ruled out by published research. Use of resistors in voltage meters would underestimate likely effects of low voltage on cattle. Also, transient voltages measured during low peak usage often increase

<https://www.msu.edu/user/hillman/elecshok.htm>

4/13/2011

significantly in late afternoon when heavier loads are consumed from same lines in the neighborhood.

In the latter experiments of Lefcourt et al., (14) 28% of the cows (2 of 7 cows) became so distressed by 10 mA electrical current that they could not be handled safely and had to be removed from the experiment. And Gorewit et al. (8) reported that 2 of 30 cows in one test and 4 of 44 first parity cows in another test refused to drink at 4, 5, or 6 V for 36 h and were given an alternative water source; that cows might have died should be part of the outcome. Such difference may not be statistically significant but may be economically significant (loss of \$7,200 in cows plus \$18,000 of milk) with no other water source available as under farm conditions.

Effects on Milk Yield and Milk Fat: In New Zealand (25, 26) as the number of electrical shocks 1 min before milking increased, workers found milk ejection increasingly was suppressed. Milk yields were 10% less when Phillips (19) applied three volts between milking claw and the rear feet of the cow during milking. Lefcourt and Akers (13) reported that 5 mA current resulted in 11% to 17% decrease of milk yield: "Milk yield and milking time were decreased in cows subjected to stimulation by intermittent voltage."

Similarly, Aneshansley et al. (1) reported to the American Society of Agricultural Engineers, (ASAE #87-3034, page 6, Milk Production)--"week 5 was significantly lower than week 2 for all cows that received voltages greater than 0." The authors' graphic presentation of "Milk Production Decline," Figure 11, is in the Appendices. Milk production changed (up to 3.5 kg/day) and at all voltages: 0.5, 1, 2, and 4 volts compared to the controls. Weeks 1 and 2 were pre-trial adjustment, weeks 3, 4, & 5 were voltage treatments, and weeks 6 & 7 were posttreatment.

Trends were apparent for "Water Consumption," Figures 2A vs 2B (Appendices), "Feed Consumption" Figures 12A vs 12B (Appendices), and possibly "Milk Fat" Figure 14A vs 14B (Appendices). Gorewit et al. (8) on the same experiments in the Journal of Dairy Science did not mention the significant differences at week 5 and did not present the graphic figures from the ASAE report. However, they did report that two animals receiving 4 volts did not drink for 36 h, at which time their voltages were disconnected. [And] "All other animals drank within 36 h and showed no significant long-term difference in the monitored parameters." This is not consistent with the Aneshansley report (1) where milk production was affected by a wide range of low voltages. Addition of 44 more cows to their numbers for a 2 d water and feed consumption and milk production "experiment" where they found four more cows that did not drink for 36 hours drew their conclusion: "... no significant long-term difference in monitored parameters." Variances, small numbers, and limited time exposure render contribution doubtful for describing on-farm expectations from stray voltage.

Behr (4), a forensic economist, studied research notes and data provided by Cornell workers under Court subpoenas and concluded that "The turnover of cows in the samples is too high to support a claim of controlled full-lactation experimentation." He determined that the number of cows per slot (40 slots) averaged 3.6 for the 394 days and 141 cows which passed through the experiment from 9/2/88 to 9/30/89. This computes to a 365 d "cull" rate of 3.3 cows per slot, or 230% compared to the more usual 30%, or at about 8 times the normal farm cull rate. And Behr concluded that the turnover rate "is so far in excess of feasible farm conditions it renders the Cornell Research results irrelevant even if they were valid."

A list of the "Final 40" cows in means was not provided in either published article nor request for such data. However, lactation records were provided for 40 cows identified as □93 "The Final 40."

For these, differences between groups for published 305-d lactations were surprisingly small as if means were restricted from varying as they would with normal residual variation among cows. Authors' conclusion that none of voltages 0, 1, 2, and 4 V affected milk production 7312, 8527, 6938, and 7725 kg probably should elaborate that design did not enable such evaluation through this trial. Conclusion that voltage did not affect milk yield may have misled where it was testimony by expert witnesses in court.

Milk fat was depressed from voltages (Aneshansley et al. (2)) during measurement of cow sensitivity to electricity during milking. "Milk fat was lower when currents were applied to first lactation cows [-.2%] and significantly lower [-.5% (p<.05)] for multiple lactation cows." Decreases of fat test reduced the market value of milk at least \$.20 to \$1.60 per 45.5 kg of milk sold; \$40 to \$320 per cow for a typical herd averaging 9,091 kg milk/cow/year. Similarly, milk fat was less for all voltages (1, 2, and 4 V) vs 0 controls in the full lactation trial by Gorewit et al. (9, Table 2). The average percent for the three periods given for 2 volts is miscalculated and should be 3.7% rather than 4.0%. Average for controls was 3.8% fat in milk.

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4/13/2011

Milk fat depression is a common response to heat stress (24), and apparently it occurs in cows subjected to electrical stress as well. Depressed milk fat is common in farm herds subjected to stray voltage, but it has been attributable to variations of dietary fiber and electrolyte imbalances, not mentioned in the Cornell reports but assumed to be equally distributed among treatments. Because cows were fed supplemental grain individually from an automatic transponder feeder, differences in amount of grain fed could have affected fat test. Depression of milk fat by electrical stress, if real, may be further supporting evidence of the adrenocortical stress syndrome as increased blood cortisol is produced by electrical stress.

Effects on Health and Stress-Related Disorders: Persistent, intermittent electrical shock produces typical stress syndrome characterized by increase of blood adrenal hormones: cortisol (hydrocortisone) (7) and epinephrine (adrenalin) (7,14). Henke Drenkard and Gorewit, et al. (7) found blood cortisol increased by 4 and 8 milliamps (mA) electrical current applied for 5 of every 30 sec during milking. While increased mean cortisol of 4 mA treatment during milking (6.44, 8.78, and 10.86 ng/ml) was not different from controls, with 6 cows and treatments switched every 8th day for 3 wk, (p>.05) a trend is apparent, and the 8 mA group mean was significantly different. Cortisol continued to rise for 16 to 20 h posttreatment when means were 13.25, 14.31, and 18.38 ng/ml for the 0, 4, and 8 mA shock. More somatic cells in milk of cows from the control group suggest that mastitis might have played a role in the controls as evident by the larger SCC standard deviation and its possible effects on blood cortisol and statistical analysis. The authors noted that: In work prior to this trial, most cows exhibited behavioral responses to electrical current at 4 mA.

In the full lactation report on Cow Health and Reproduction (9) Cornell authors noted, "When an experimental cow got mastitis, she was removed from the experimental pen and placed with other mastitic herd cows." "Also, the waterer for any mastitic cows was not connected to any voltage." Apparently, effects of exposure to voltage on the severity or recovery of sick animals was not considered important nor was the effect of replacing mastitic experimental cows with other cows in the analysis of data. Gorewit's statement, "All indications of cow health that were measured (somatic cell counts, cases of mastitis, repeat mastitis, hoof problems, and body weight) showed no detrimental effect that was due to voltage," needs to be qualified to advise readers "given the large variations and few cows on our experiment."

Calculation (22) of "sample size" necessary to show significant differences between controls and treatment means for the measured "Services per Conception" where treatment means and SEM (standard error of the means) are in Table 2, p. 2729, revealed that 48 cows per treatment would be required to show significant differences (p<.05) to be sure that means will be significantly different 90% of the time.

In the USDA (14) experiment, blood glucocorticoids of 0 mA controls were abnormally elevated, nearly twice baseline of treatment groups (controls=13.9 baseline) compared to treatment baselines of 9.9, 6.0, 6.0, 6.9, and 8.3 ng/ml for 2.5, 5.0, 7.5, 10.0, and 12.5 mA treatments for 10 seconds, 1 hour prior to milking. These high cortisol controls made significant differences between treatment baseline-minus-peak versus controls impossible for any voltage treatments with "standard error of the mean (range) 4.5-5.5 ng/ml." Results were based on seven cows divided into two groups shocked bi-weekly. Calculation of the sample size required to show statistical significance indicates that 25 cows per treatment would have been required to be sure that means are different 90% of the time (22). Otherwise, the experiment provides no scientific basis for claiming that any voltage had "no significant effect" on the hormones measured. The inadequate controls and small number of cows would not allow any other conclusion, except that two cows became so unmanageable as to endanger workers at 10 mA that they were not subjected to 12.5 mA currents, and the experiment was terminated without completing its objective. Unmanageable cows were labeled "exceptional" as in the Cornell reports, although they represented 28% of the cows on experiment.

Reproductive Efficiency may be inhibited by electrical stress because repeated acute stress, with a brief significant rise of blood cortisol, can disrupt the preovulatory luteinizing hormone (LH) surge and ovulation in heifers (23) such as caused by transportation or severe climatic conditions. These authors noted that previous investigators have found that ACTH, cortisol, and progesterone, also released by the adrenal cortex, can inhibit LH surge in the cow. Wilson et al. (27, 28) confirmed that controlled heat stress inhibited ovarian function and reproductive efficiency in cows and heifers by inhibiting follicle growth and development and increasing incidence of delayed regression of corpus lutea. Reproductive failure is a common complaint in herds affected by stray voltage and can have severe economic consequences by reducing the number of off-spring born, culling opportunity, and eventual number of cows in the herd. Increasing adjusted calving interval resulted in net revenue losses of \$7.33 (US) per cow/day in a study of the economic effects of reproductive efficiency (20). Data in the Cornell (10) study were too limited for valid conclusions regarding effects of electrical stress on health and reproduction. Also, cows that were not seen in estrus within 50 d

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4/13/2011

after calving were given prostaglandins F2-alpha to destroy the corpus luteum, stimulate estrus, and were inseminated in 5 to 7 d. This procedure corrects the delayed (retained) corpus luteum problem caused by stress as described by Wilson et al. and, therefore, corrects the problem supposedly being measured by the experiment, rendering it invalid and unrelated to objectives of the experiment. From the means and variances for services per conception, 48 cows per treatment would have been necessary to obtain statistical significance and be sure that means would be different 90% of the time. Again, the few cows and large variation limit data and concluding "no significant difference" can be misleading.

Effects on Resistance to Disease: Increased blood cortisol caused by persistent stress, such as prolonged intermittent electrical shock, results in an immediate leukocyte shift, longer adrenocortical fatigue, and eventual reduction of peripheral white blood cells. Serial injections with 100 and 200 IU of ACTH to stimulate adrenocortical hormones reduced phagocytosis (engulfing) of bacteria (staphylococcus aureus) by white blood cells 43% and 56% after the sixth injection through a combination of decreased lymphocytes and decreased phagocytosis, as demonstrated by Paape (17) and (18, Tables 3, 6, & 7) and Gwazdauskas et al. (11). ACTH is the hormone produced by the pituitary gland, at the base of the brain, in response to stressful stimuli. It stimulates the increase of cortisol and other hormones produced by the adrenal glands. ACTH injection and heat stress of cattle produced similar moderate leukocytosis and increases in somatic cell counts of milk in Arizona studies (24).

Electrical stress from stray voltage may be similar to heat stress in which both feed and water consumption dramatically were reduced, and milk energy output declined nearly twice as much as digestible energy intake, resulting in marked decrease of efficiency of utilization of energy, and in considerably higher maintenance energy requirements (15). Corresponding protein catabolism via gluconeogenesis, electrolyte imbalances, atrophy of the thymicolymphatic system and gastrointestinal ulcers are all known consequences of adrenocortical stimulation caused by such noxious stressors as exposure to extreme cold, heat, xrays, burns, intense sound or light, pain, forced muscular exercise, starvation, hemorrhage, and anxiety. Electrical shock now can be added to the list of common stressors. Eventually, we may learn that electrical shock may be a contributor to abnormal incidences of metabolic disorders, lameness or bone disorders, and an immune deficiency syndrome similar to AIDS in humans.

Water and Feed Consumption: Craine (6) reported that water consumption from a watering trough charged with 6.0 volts was 68% less than from the zero volt trough, and 48% less for the 6.0 volts than from a 3.0 volt trough. Three volts reduced water consumption about 20%. Norell et al. (16) taught cows to escape from 5.0 mA treatments over a front to rear hooves pathway. During the test, cows were exposed from 1.0 to 5.0 mA. Cows expressed the learned escape behavior in 23% of 2.0 mA current treatments and 97% of 5.0 mA treatments. When the same series of current treatments was applied over a mouth-to-all hooves pathway, cows responded to 15% of 1.0 mA treatments and to 90% of 5.0 mA treatments.

In contrast, Cornell workers claimed no significant differences in milk yield or composition, health and reproduction, or water consumption (1, 9) of cows exposed to 0, 1, 2, or 4 volts at their waterers. In the Journal of Dairy Science articles, authors claim that results were based on 40 cows (10 cows per treatment group) for complete lactations. However, five months were required to complete filling the treatment groups with 10 fresh cows as designed, and apparently, according to research notes of the trial furnished by the authors under Court Subpoena, 141 cows were actually in the pens during the trial, and cows were put in the wrong pens 16 times during the trial. Water consumption was measured for the whole pen, not for individual cows; and cows were observed drinking from the waterers over the fence from outside the electrocution stall. Therefore, water consumption reported has no direct relationship to milk production of experimental cows because nonexperimental cows occupied spaces to keep the pens full. Gorewit et al. (9) stated that average current (and ranges) for 2 d (randomly selected) were 3.1 mA (4.5 to 1.5), 6.5 mA (8.6 to 4.6), and 11.2 mA (14.1 to 7.5) for the 1, 2, and 4 V pens, respectively in the Cornell experiment. Evidently current was not monitored regularly.

In view of results by others, design of the Cornell trials must have permitted meager exposure of cattle to electricity for outcomes to have differed so from reports of decreased water, feed consumption, and milk yield.

Researchers claim that amperage (flow of electrical current) rather than voltage per se is the culprit affecting cattle. The relationship between voltage and current is expressed by Ohm's Law:

$E=IR$, where E is volts, I is current flow (amperes), and R is resistance of the circuit (Ohms). Then, volts divided by resistance equals amperage.

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4/13/2011

A table of resistances to current flow through various pathways of the body is in the publication by Appleman and Gustafson (3). Resistances ranged from 244 to 1960 Ohms depending on the animal contact point and the pathway through the animal. For example: if the particular animal's path resistance is 250 Ohms, then .5 volts yield 2 milliamps as:

$.5 \text{ volts}/250 \text{ Ohms} = .002 \text{ amps} \times 1000 = 2 \text{ milliamps current.}$

Because individual animals respond differently, arbitrarily selecting a predetermined voltage or amperage as safe for all animals seems foolish and irresponsible. Economic consequences occur when as little as 2 of 37 or 2 of 7 of the cows in a herd are afflicted by stray voltage.

The Attorney General of Michigan concluded (Re: Michigan Electric and Gas Association, Case No. U11368, October 15, 1997) that the Michigan Public Service Commission does not have the statutory authority to approve rules to regulate the levels of extraneous electrical current, which attempt to authorize utilities to spread unwanted and detrimental electrical power (voltage and/or current) outside of contractual easements onto private property to the detriment of the health, safety and welfare of both people and animals, and to the detriment of the use and enjoyment of property. The Attorney General's opinion was in response to a request by Consumers Energy Company for the PSC to rule that 2 mA electrical current or less was not harmful to livestock, and, therefore, plaintiffs claims could not be brought to litigation.

Conclusions

Scrutiny of the published articles cited in *A Review of Stray Voltage Research, Effects on Livestock*, by Robert J. Fick and Truman C. Surbrook, does not support their conclusion that 2.0 or less milliamps current from extraneous voltage is harmless to dairy cows and of no economic consequence to dairy farmers. Much of the data are unreliable and irrelevant to voltages found on farms and are misleading to an unsuspecting public.

Acknowledgements

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4/13/2011

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Appendices

Figures from: D. J. Aneshansley, R. C. Gorewit, D. C. Ludington et al. Paper #87-3034. 1987. *Am. Soc. Agr. Engineers* (Baltimore, Md.).

Figure 11: Milk Production Decline.

Figures 2A and 2B: Water Consumption.

Figures 12A and 12 B: Feed Consumption.

Figures 14A and 14B: Milk Fat

<https://www.msu.edu/user/hillman/elecshok.htm>

4/13/2011

[FROM: Aneshansley, D. J., R. C. Gorewit, D. C. Ludington, and Z. Xin. 1987. Effects of Neutral-To-Earth Voltage on Behavior, Production and Water Intake in Dairy Cattle. Paper No. 87-3034. Am. Soc. Agricultural Engineers. Baltimore, MD.]

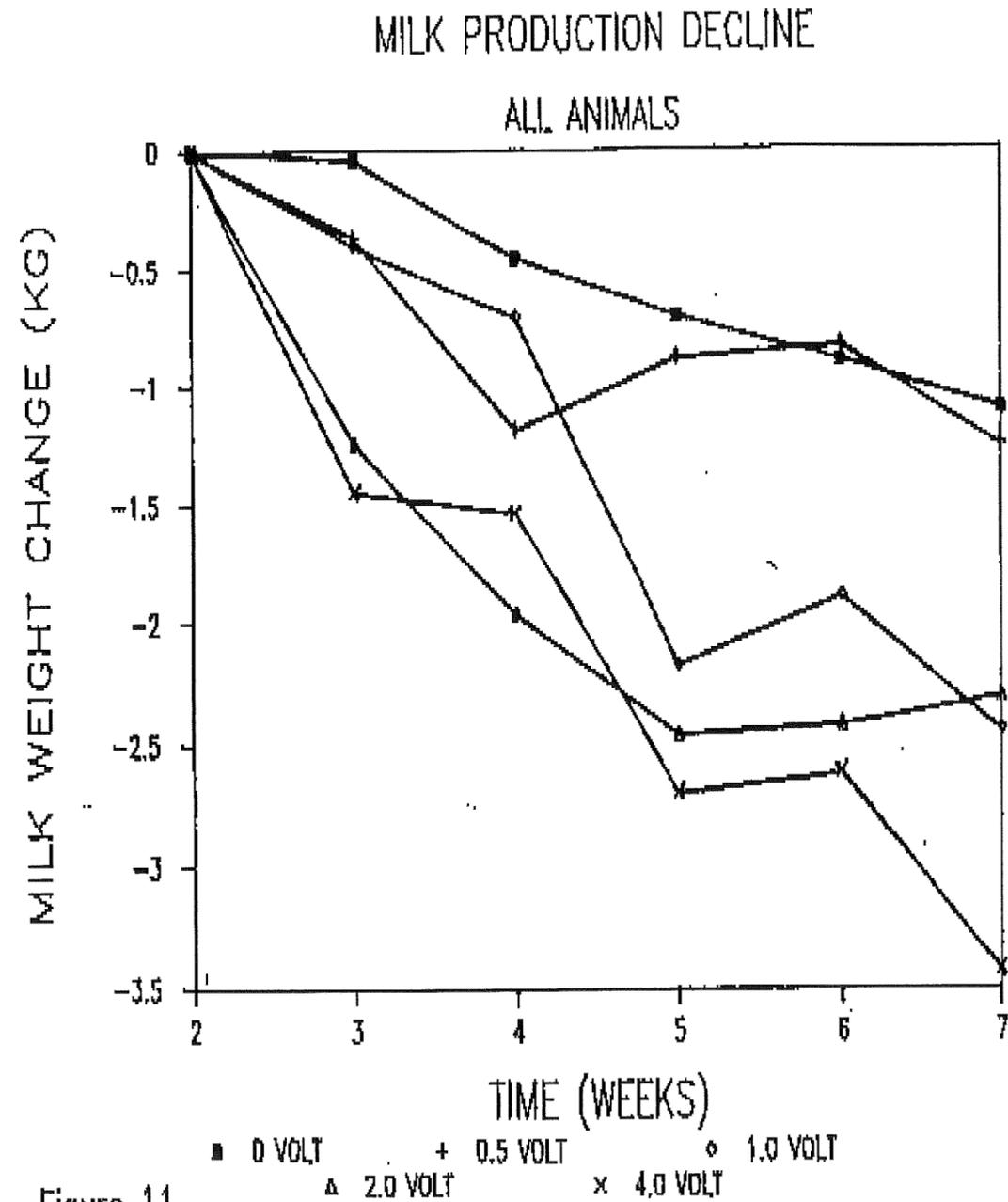


Figure 11

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4/13/2011

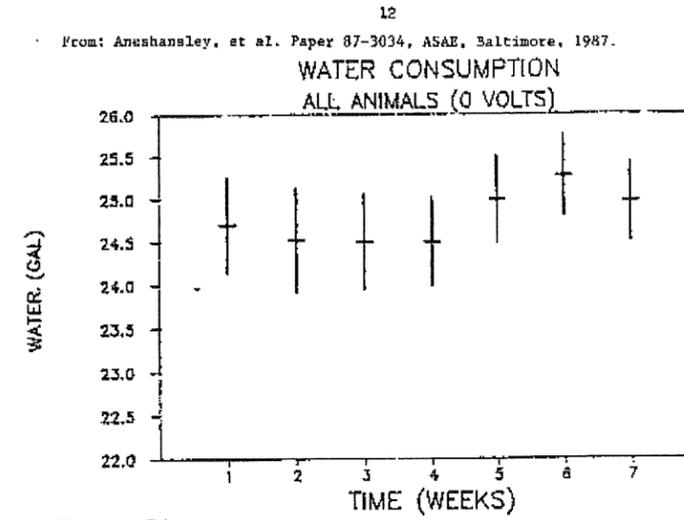


Figure 2A

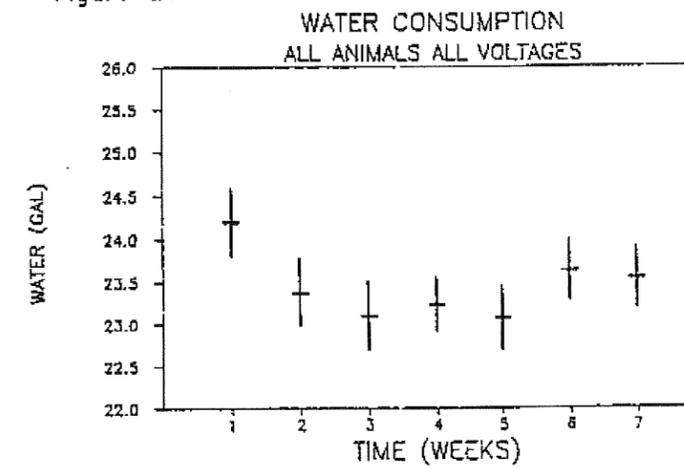


Figure 2B

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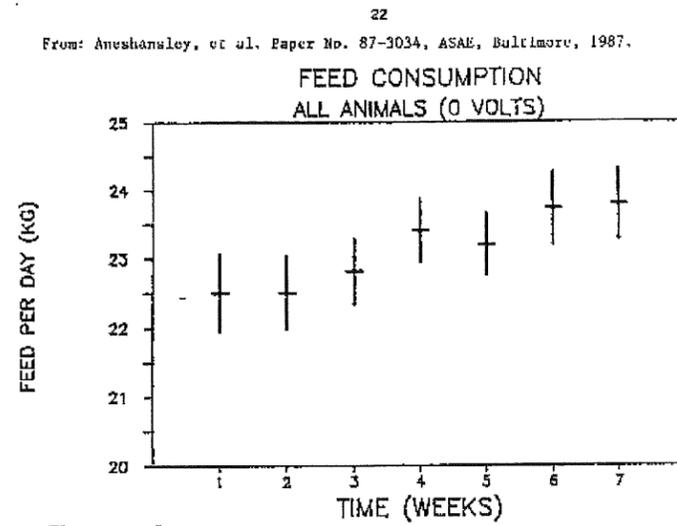


Figure 12A

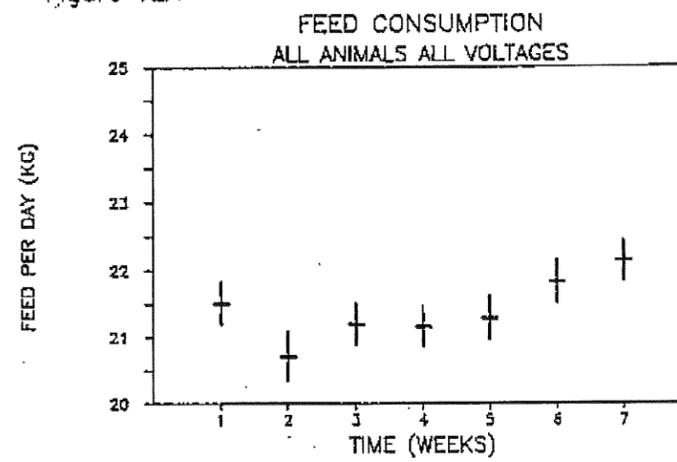


Figure 12B

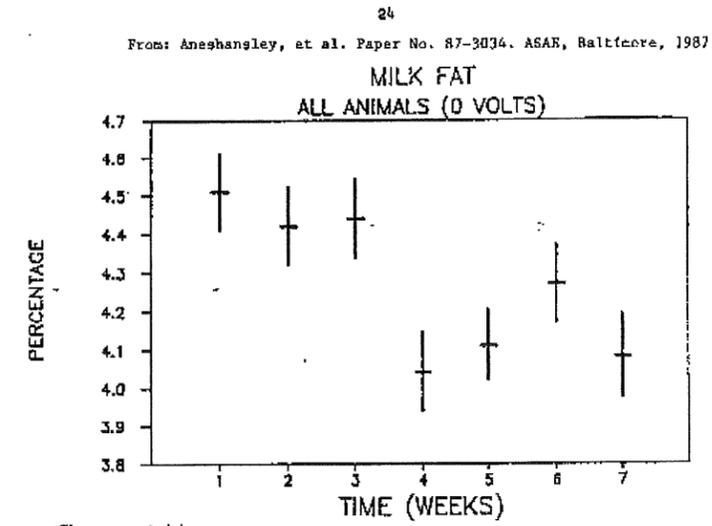


Figure 14A

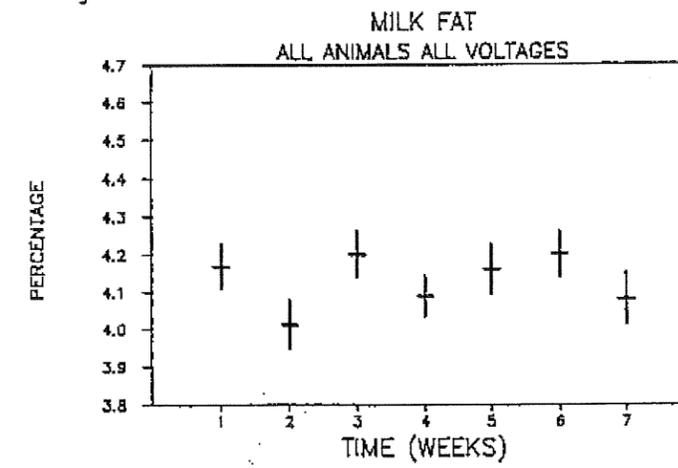
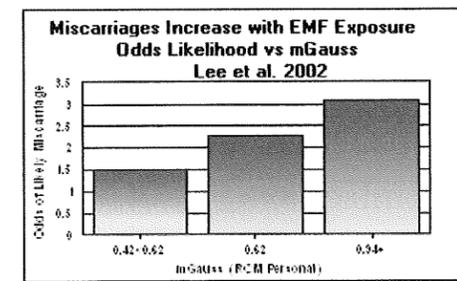


Figure 14B

Transmissions
Continued from Page 37

CANCER RISKS, VS ELECTRICITY IN USA

An Evaluation of the possible risks from electric and magnetic fields (EMF) from power lines, internal wiring, electrical occupations & appliances was conducted in by the California Department of Health and Human Services for the Public Service Commission. They concluded that more than 50% chance of a small increased risk of childhood leukemia, adult brain cancer, and amyotrophic lateral sclerosis (ALS - Lou Gehrig's Disease), and more than 50% chance of 5-10% added miscarriages, 10-50% increased risk of male breast cancer, childhood brain cancer, suicide, Alzheimer's disease, or sudden cardiac death. <http://www.dhs.ca.gov/chib/emf/RiskEvaluation/riskeval.html>.



Non-Hodgkin's Lymphoma was associated with intensity of electric fields and exposure time of Ontario, Canada, Hydro (utility) workers. Subjects in the upper tertile of percentage of time spent above electric field intensities of 10 and 40 Volts per meter had odds ratios of 3.05 and 3.57 indicating they were 3 to 3.57 times more likely to get Non-Hodgkin's lymphoma (cancer) than utility employees who were less exposed to electric fields. Electrical exposures of utility workers in various occupations had been monitored while they worked. (Villeneuve, Paul J., et al. 2000. Non-Hodgkin's lymphoma among electric utility workers in Ontario: the evaluation of alternative indices of exposure to 60 Hz electric and magnetic fields. Occupational and Environmental Medicine, 57:349-357).

It should be noted that Electric Fields on the Chick farm under the transmission line were 8 kV/m, approximately 8,000 times higher than exposure of the Canadian electrical workers.

SUMMARY OF NINE STUDIES

Children residing in homes with exposure levels < 0.4 µT had no increased risk, while children with exposures ≥ 0.4 µT had a relative risk estimate two times greater than children exposed to < 0.4 µT (0.4

microTesla = 4 milliGauss). From: A Pooled Analysis of Magnetic Fields and Childhood Leukaemia. British Journal of Cancer.

FURTHER FROM THE UK:

Childhood leukemia risk doubles within 100 meters of high-voltage power lines. This result from the Oxford Childhood Cancer Research Group study, headed by Gerald Draper analyzed and compared 33 years of data (from 1965-1995) on 35,000 children diagnosed with cancer, with their distance to the nearest electricity transmission line. The biggest ever funded UK study into power lines and child cancer has found that children under the age of 15 living within 100 meters of high-voltage power lines have close to twice the risk of developing leukemia.

Blood sugar levels of diabetics increased as measures of electricity (millivolts and microsurgers) increased in the living environment of patients diagnosed with diabetes.

Secondly, reducing electrical pollution (high frequency electrical noise) by use of microsurge filters plugged into wall outlets resulted in blood glucose decreasing within minutes.

Insulin use decreased from 36 to 9 units (Humlin 70/30) per day when the filters were installed in the home of an elderly patient with diabetes. [M. Havas and D. Stetzer, International Conference on Childhood Leukaemia, London, Sept. 6-10, 2004].

Similarly, persons living near electrical transmission lines had significantly more cases of Type II diabetes than persons living farther from the transmission lines in Australia [Beale, Ivan L., Neil E. Pearce, Roger J. Booth, and Sandra A. Heriot. 2001. Association of Health Problems with 50 Hz Magnetic Fields in Human Adults Living Near Power Transmission Lines. J. Australian College of Nutritional & Environmental Medicine 20(2):9-12,15,30]. Results indicated that the average and the mean time-integrated magnetic field exposure (mGauss-hour) ranged from 6.4 at the lowest to 307.6 mG-h at the highest exposures in the two or three rooms in which occupants spent one or more hour per day on average. Chronic illnesses and asthma were also linearly related to the flux density of magnetic field exposure, mG-h. The report contained results from 112 subjects in each exposure category, 560 total.

Effects of electricity on the immune system may play a role.

These diabetes findings correspond with reports that insulin secretion from pancreatic cells of laboratory animals was reduced by exposure to EMF in three of four reports [Sakurai, T., et al., 2004. An extremely Low Magnetic Field Attenuates Insulin Secretion From the Insulinoma Cell Line, RIN-m. Bioelectromagnetics 25:160-166 (2004)].

EFFECTS OF ELECTRIC AND MAGNETIC FIELDS ON DAIRY COWS

Studies conducted at McGill University, Montreal, Quebec, Canada, have revealed that several changes in blood and cerebrospinal fluid

Continued on Page 40

Transmissions
Continued from Page 38

(CSF), milk and milk-fat production occurred when dairy cows were exposed to 10 kV/m vertical electric fields, and 30 µT (micro Tesla) horizontal magnetic fields for 28 day periods. Intensities are equivalent to standing under a 735 kV electrical transmission line. Tesla and Gauss are measures of the flux density of magnetic fields, (1.0 µT = 10 milliGauss) named after their inventors.

BURCHARD ET AL. REPORTED IN BIOELECTROMAGNETICS (2003):

Sixteen non-pregnant lactating Holstein cows with 150 ± 40 days of lactation were confined to wooden metabolic crates in a E&MF chamber during the experiment with a 12:12 h light:dark cycle. Results were as follows:

1. Milk production decreased 5% from exposed cows compared to controls.
 2. Fat-corrected milk decreased 14% compared to controls.
 3. Milk fat decreased 16% compared to controls
 4. Dry matter intake increased 5% compared to controls.
- No significant change in milk or fat production was found during an earlier 28-day trial report in the Journal of Dairy Science 79(9):1549-1554 (1996).

PHYSIOLOGICAL EFFECTS FROM BURCHARD ET AL. INCLUDE:

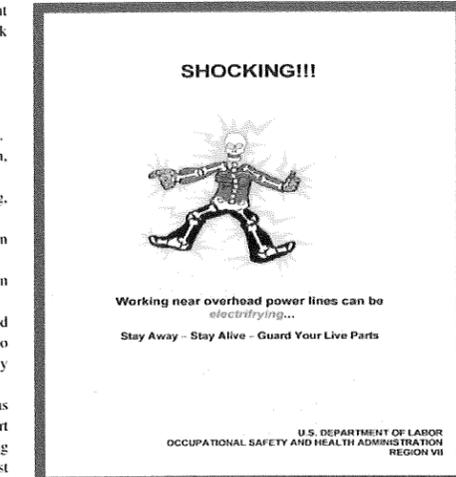
1. Melatonin, a hormone produced in the Pineal gland in the brain, decreased in cows exposed to EMF.
 2. Melatonin has strong oncstatic immunological, and antioxidant properties in the blood. It normally follows the pattern of light:dark nocturnal exposure.
 3. Progesterone increased in lactating pregnant cows.
 4. Length of estrus cycle increased 3 days.
 5. Insulin-like growth factor (IGF-1) increased in blood.
 6. Growth hormone was modified during part of the nocturnal cycle.
 7. Macro and trace element changes in blood: Calcium, magnesium, iron, and copper were affected by EMF exposure.
 8. Cerebrospinal fluid (CSF) changes in concentrations of Ca, P, Mg, Mn and Na occurred.
 9. Quinolinic acid increased in CSF, tryptophan tended to increase in CSF.
 10. CSF changes were consistent with weakening of Bloodbrain barrier, according to the authors.
- While none of these physiological disturbances were considered clinical, needing treatment, exposure of the cows to EMF was limited to 28 days. Under farm conditions, they are likely to be exposed continuously from birth to death.
- Secondly, the low milk-fat production of cows exposed to EMF as reported in the latest McGill University experiment concurs with a report by Cornell workers in which cows exposed to electricity during milking had lower fat test. "Milk fat was lower when currents were applied to first

lactation cows and significantly lower for multiple-lactation cows." The low milk fat production of cows exposed to electricity may be due to a diabetic condition. If electrical exposure depresses insulin release from the pancreas, absorption of glucose from blood into mammary cells may be limited. Glucose is essential for synthesis of milk fat in mammary cells. Further research is needed to assess this relationship.

Investigators in Italy analyzed the blood cells and antigens of dairy cows housed 7 meters under a 380 kV transmission line. Cattle on farm A were exposed to 1.98 to 3.28 µT, whereas the values measured on the control farm B can be considered zero, except in brief periods (3 min 4 x per day) the measures were from 0.2 to 0.7 µT when the automatic feeder was running.

Results indicate that certain sub-populations of lymphocytes particularly CD4+/CD8 ratios indicate a depressing effect on blood cells and immunity that may be specific for ELF-EMF electrical exposure. (Calogero et al., Effects of EMF on Circadian Rhythms and Distribution of Some Leucocyte Differentiation Antigens in Cows, University of Padua, Italy, International Veterinary Conference, Quebec 2004).

Marino et al., at LSU Medical Center, concluded that power frequency fields produce changes in the immune system that were both real and inconsistent, thus linear relationships should not always be expected while statistical method for chaos were most helpful. Serotonin, the most important neurotransmitter in the body; and neuroreceptors in the brain were modified by EMF in experiments at several universities.





Electric Transmission Lines Individual Rights vs Utility Rights of Public Domain



By Donald Hillman, Ph.D., Professor Emeritus, Michigan State University

Published by Shocking News,¹ No. 6. Email: donag1@aol.com

January 10, 2005

A few years ago most electricity was generated at local Rural Electrification Administration (REA Cooperative) generation plants. As demand for electrical energy has increased, most utilities have adopted the practice of purchasing electricity from generators located hundreds of miles away, e.g. Alabama, Mississippi, Texas, etc. The electricity is shipped to other utilities via high voltage, high current transmission lines. The companies that own the transmission lines may not be the producers nor the utility serving local customers. They are simply independent transmission operators (middle-men) who make a profit by moving electricity across personal private property in their overhead lines and selling it to utilities at some other location. The electricity moving through the transmission lines is not ordinarily used by utility customers over which it travels. It is simply being transported across your private domain as the raw material from which profits are made somewhere else. In that regard, the transmission line does not serve eminent interests of public domain; there are other means of getting electricity to public citizens and businesses. It serves the profit interests of a utility located elsewhere.

In the early days of rural electrification, Right of Way (ROW) for local "distribution lines" were granted by farmers and land owners to serve the interests of neighbors and themselves. As utilities grew larger and reached greater distances, ROWs for transmission lines were also granted for the noble purpose of serving the public through a "public utility." Transmission lines were generally smaller, limited to two or four lines, and carried less volts and current.

Now citizens are asking for answers to reasonable questions and are opposed to unnecessary, excessive, and intrusive development of transmission lines trespassing on private property. Questions about use of underground transmission cables; insulation of the transmission lines; local power generation instead of transporting hundreds of miles; appropriate environmental appraisals; and protection from secondary health effects on families, children in schools, neighborhoods and businesses; and effects on property values are all on the table and often end up in court.

Utilities using a grounded-Y system have saved millions of dollars by using the ground as part of their electric circuits instead of returning the unused neutral current through hard

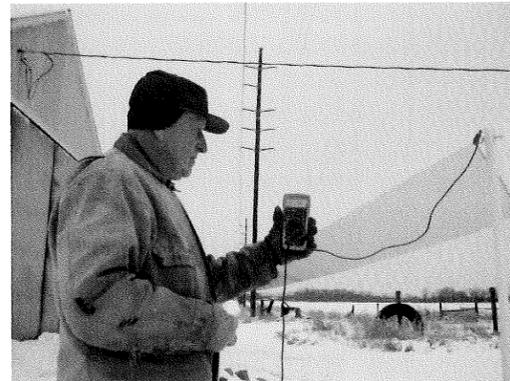
wires. (Donald W. Zipse, PE, Electrical Shock Hazard Due to Stray Current, 2002).

Some Things are Different Now

Today utilities are using that same ROW that was obtained 30 to 50 years ago to install higher voltage/current transmission lines in locations where the farmer or landowner never intended such a transmission line to be built.

For example, Consumers Power Co. (Consumers Energy) had a 133-foot ROW that passed between a dairy barn and within a corn-crib/ machine-shed that was obtained 30 years ago. The power line was originally a 3-wire circuit.

In 2004, Consumers decided to increase the transmission line to 9-wires (three 3-wire, 0.71 inch diameter circuits) in the same location. Each of the wires carries 46 kV (46,000 Volts) pushing several thousand amperes of current to a new sub-station across the highway from the farm.



Mr. Chick Reading 71.6 Volts under 46 kV Transmission Line

The farmer/landowner objected to this large increase in electricity passing over the most common workspace for preparing and repairing farm machinery, storage of grain, entrance to the dairy barn, and cattle lots located next to the transmission line and the dairy barn. He offered free ROW to Consumers if they would change the location of the

¹*Shocking News* (dba) is a registered publisher of science-based information dedicated to public awareness of electric and magnetic fields (EMF) in the living environment and their effects on the health and welfare of humans and animals. Editor is Don Hillman, Ph.D., Professor Emeritus, Department of Animal Science, with help from wife Mary, MS, Michigan State University, East Lansing, MI. Don is a member of the American Society of Agricultural Engineers and The American Dairy Science Association. Telephone: (517) 351-9561.

transmission to traverse next to the road-fence ¼ mile south of the farmstead, a path that would be directly across from the new sub-station and would not induce the extra health-risk in the working/living area of the farm.

Consumers refused the offer saying they had the right of eminent domain, and they proceeded with construction of the transmission line between the barn and the storage building. Consumers claimed the transmission lines posed no danger to the farmer or to livestock on the farm. They claimed there was no basis for health concerns.

A similar situation is developing in the north-east section of Grand Rapids (Ada, MI) where Consumers has decided to build a transmission line through 10.7 miles of suburban, high valued property after allegedly having told local landowners no transmission lines would be built on the ROW (See mlive.com, 1/10/05, Ed White, Grand Rapids Press).

Voltage, Electric and Magnetic Fields Under the Transmission Lines at the Leslie Farm

Voltage on a temporary fence registered 68.9 to 71.6 Volts (root mean square, rms), January 10, 2005, and 60.3 Volts on July 18, 2004. Voltage was measured with a Fluke® 79III oscilloscope at a height about 5.5 feet above the ground, between a wire fence and the ground. The fence was a 15 foot x 1 foot wire mesh (1/8" hardware cloth) strung between insulated plastic stakes parallel to and directly below the power lines.

Electric fields were 8 kV/m (kilovolts per meter) measured about 6 feet above the ground, with an Alpha Lab® TriField Meter, January 10, 2005. EMF readings about 5 feet above the ground November 8, 2004, at 2:30 PM, were 2.5 kV/m e-fields and 4 milliGauss (mG) magnetic fields. Effects of electric and magnetic fields on health of humans and cattle are reported below.

Voltage differential from the metal roof of the building to ground was 5.0 V, and on the galvanized-steel door of the building next to the power line, 4.6 V ac (8/18/04). The farmer reported that he received a strong electric shock when he touched the door to open or close it.

Prior to installation of the 9-wire line, voltage from (corncrib) roof to ground was 0.112 to 0.16 V (peak to peak). The metal door-to-ground measured 1.28 Vrms (7/05/04). The dairy-barn roof on the south side of the transmission line ROW measured 0.448 Vrms at 8:15 PM, 7/05/04 prior to energizing of the 9-wire installation.

A study of the **Electrostatic and Electromagnetic Effects of Overhead Transmission Lines**, was conducted by the Rural Electrification Administration (REA), Division of the United States Department of Agriculture, May 1976. It contains numerous illustration and examples of the induction of amperage and voltage from transmission lines to fences, trucks, and other metallic conductive objects at various distances from power lines, ranging from 345 to 765 kiloVolts (kV). At page 9, the document states, "When a conductive object is connected to ground through a person's body resistance, a shock current flows through the connection if an induced voltage exists between the point of contact and ground. The seriousness of this shock is determined by the magnitude of current flowing through the body. Currents of 1 milliampere (mA) or more, but

less than 6 mA, are often termed secondary shock currents. Currents with magnitudes of 6 mA or more are considered primary shock currents. A possible consequence of primary shock current is ventricular fibrillation of the heart which results in an immediate arrest of blood circulation. Table II-1 summarizes typical effects of electric currents on an average size man (150 pounds), reference 10." [Reference 10 is IEEE Midwest Power Symposium, University of Cincinnati "Investigation of the Electrostatic Voltages Induced by EHV and UHV Transmission Lines," by J. C. Procario and S. A. Sebo, October 1974].

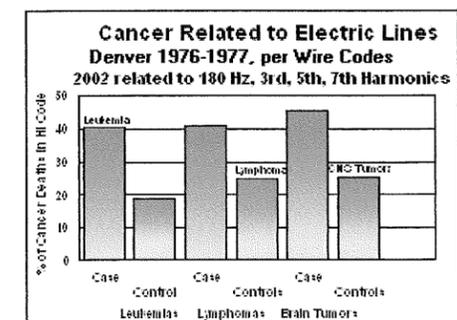
Some will ask, "Who wants to be challenged to the highest likely "let go" current without preventing it if possible.

A protective electrically-insulated suit is now available for electrical workers to reduce induced body current and contact current when working near high power radio, TV, or transmission sites. See: KW-Gard™, Euclid Garment Manufacturing Company, Kent, OH. The suits effectiveness was confirmed by Richard A. Tell and Associates, consulting engineers, Las Vegas, NV. Families may want to inquire about protective playsuits for children?

Harmful Effects of Exposure to Electricity Radiated from Transmission Lines

Increased Risk of Childhood Leukemia, Brain Tumors and other forms of Cancer-

In Denver, Colorado (2002), a study conducted by electrical engineers and epidemiologist reported that the risk of children dying from cancer was four times higher if they lived near high voltage/high current electrical lines than controls who did not live near high current lines. The incidence of cancer was directly related to the intensity of electromagnetic fields (EMF) in the living area of the homes of victims who died from cancer. Electric current was followed from the utility service drop-hot, and neutral wires grounded to the water lines and EMF was related to current on the water lines to which the electric system was grounded [W. T. Kaune, et al. Study of High- and Low-Current Configuration Homes From the 1988 Denver Childhood Cancer Study. *Bioelectromagnetics* 23:177-186 (2002)].



FEIS ID #93

93A.

Your objection/preference of the specified route is noted. Your comment is now part of the record in this matter by its inclusion in this EIS, and will be submitted to the Office of Administrative Hearings (OAH) and Commission for consideration. See Section 7.1.2 of the EIS.

93B.

Whether the occurrence and effective mitigation (or not) of stray voltage leads to litigation is an issue beyond the scope of this EIS. Stray voltage is discussed in Section 7.1.2. of the EIS.

93C.

See Section 7.1.2 of the EIS. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

93D.

See Section 7.1.2 of the EIS. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

93E.

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.



Matthew Langan
 State Permit Manager
 Minnesota Office of Energy Security – Energy Facility Permitting
 85 7th Place East, Suite 500
 St Paul, MN 55101

Dear Mr Langan,

I have completed my review of the DEIS in the Matter of the Application by Xcel Energy for a Route Permit for the Hampton-Rochester-La Crosse 345 kV and 161 kV Transmission Line Project.

The DEIS is lacking fundamental and significant data that is extremely important to the people of Minnesota. It focuses on the multitude of routes vs. the detailed data needed. The routes and numbering schema are extremely confusing. We are having a hard time discerning what all this means.

DEIS Feedback:

- The DEIS doesn't address why I need this: *'Reliability'* without supporting data doesn't answer to the need when the power I have today is extremely reliable. Five un-elected individuals decided I need this – should be a referendum for all Minnesotans to decide.
- Insufficient information on impact to rare/endangered aquatic species – provide the facts
- Insufficient information found on impact to state listed threatened/endangered rare species (listing only) – provide the facts
- 3P-009 does not indicate nor mention the crossing of Lake Zumbro and wetlands (Ferber to Midthun) P162-163 – This is absent from the map. This is an extreme miscalculation and an important migratory path and animal reserve.
- No information pertaining to the impact on wetland areas and Lake Zumbro 3P-009 migratory path.
- Mortality information of migratory birds and waterfowl is absent
- Increased stopover population due to disturbance of Lake Shady
- Doesn't sufficiently cover air and water quality impact
- Insufficient information on electronic interference
- Very little information on public health effects - childhood leukemia and adult cancer

94A

94B

94C

94D

94E

94F

94G

94H

94I

94J

94K

94L

94M

94N

- What will this do to our archaeological and historic resources P166 – not addressed?
- Very little information on pros/cons of burying the line – cost addressed some but not to the extent expected. Some data researched shows 2-3% more expensive vs. Xcel Energy stating it's 10 times more expensive (why the enormous difference)? P17 P18...provide sustentative data for information provided.
- When I look at other Power company websites, it's as though you've lifted the information off their pages...it's all the same, almost word for word. I want to see real data, real examples, real cost.
- Why generating plant sites aren't constructed close to the required need vs. transporting
- Taxpayer costs are not addressed
- We are already paying for State highways and freeways. We want this on those routes, not taking the land of private citizens.
- Citizen rights not provided

Mr. Langan, when I read the DEIS, I read a very high level document that provides little substantive data. The maps and routes are so confusing no one can make them out. There are so many people trying to figure it out. Why don't you pick a route that affects the smallest number of people and present that to us. The last meeting I attended didn't show my home on a route and now there is one. And this route crosses the lake and wetlands and a migratory path *and* it would displace a very large number of people. So I really need to understand why that makes sense from a cost and a natural environment perspective.

I am requesting to speak with the Judge on June 13th.
 Thank you for taking my feedback and for your consideration.

Regards,

Lori Isch
 41025 565th St
 Mazeppa MN 55956
 507-367-2520 lisch@pitel.net

FEIS ID #94

94A.

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

94B.

The need for this transmission line has been previously determined by the Minnesota Public Utilities Commission (Docket No. CN-06-1115). Questions of need for this project cannot be addressed in this document, Minn. Stat. 216E.02, Subp. 2.

94C.

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

94D.

Review of Map 8.3-35 indicates that the crossing and wetlands are shown. Text discussing the Zumbro River and potential impacts associated with the crossing of the river has been added to the FEIS in Sections 6.3.1, 8.2.4.8, 8.3.4.7 and 8.3.4.8. In addition, existing text in Section 8.4 includes the Zumbro River in the discussion of the Mississippi River crossing.

94E.

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

94F.

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

94G.

Your comment is noted and will be forwarded to the administrative law judge. Please note that the purpose of the EIS is to assess the human and environmental impacts of the alternative routes identified. Not only are air quality impacts associated with the Project expected to be immeasurably small at a regional level, air quality impacts are not expected to vary notably from one route to the next, and therefore, do not provide a useful metric in weighing the viability of one route versus another.

94H.

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

94I.

Your comment is noted and will be forwarded to the administrative law judge, however, the comment is indefinite and does not provide tangible feedback that can be interpreted and translated into an explicit revision, update, or correction to the EIS.

94J.

A broader discussion of impacts to archaeological and historic sites is provided in Section 7.10 of the EIS.

94K.

The analysis of the cost of burying the transmission line at the Mississippi River crossing was prepared for the applicant by Power Engineers. The estimate was based on quotations from high voltage cable manufacturers and contractors familiar with the installation of high voltage underground cable systems. The Power Engineers underground analysis, including cost differentials, was included in the DEIS as Appendix D. While this analysis was conducted for the Mississippi River crossing, most of the factors that result in higher costs for undergrounding transmission lines would also apply to burying the transmission line in overland portions of the route.

94L.

The need for this transmission line has been previously determined by the Minnesota Public Utilities Commission (Docket No. CN-06-1115). Questions of need for this project cannot be addressed in this document, Minn. Stat. 216E.02, Subp. 2.

94M.

See Sections 2.0 and 3.0 of the EIS.

94N.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

Langan, Matthew (COMM)

From: Marc Jackson [mbjack@pitel.net]
Sent: Thursday, April 28, 2011 2:00 PM
To: Langan, Matthew (COMM)
Subject: Hampton-Rochester-La Crosse 345KV & 161KV Transmission Line Project Draft DEIS

I was not able to attend any of the April 12-14, 2011 public meetings on the draft DEIS. I have attended nearly all of the prior public meetings. I have had but one comment regarding the proposed 161KV transmission line route.

I own farm property in the NW corner of Oronoco Township Section 19. My land borders along the East side of 60th Avenue NW.

I request the alternate route for the 161KV transmission line along the "Douglas Trail" versus along 60th Avenue NW. This alternate route would be the least disruptive to my farming operation and/or my farming neighbors.

95A

If the 60th Avenue NW route is chosen over the above alternate route then I request the 161KV transmission line be routed on the West side of 60th Avenue NW. This route would be the least disruptive to my farming operation.

Thanks for the opportunity to submit my comments on the draft DEIS.

Marc Jackson

95A.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

Langan, Matthew (COMM)

From: Elisha Joecks [elle_1581@yahoo.com]
Sent: Friday, April 29, 2011 11:48 AM
To: Langan, Matthew (COMM)
Subject: Cap X2020

I am in agreement with the following information and statements Daniel Hiebert has gathered and reiterated from yo studies and Draft Environmental Impact Statement information.
 Elisha Joecks

Based on the routing information and content in the section 8.2:

<http://energyfacilities.puc.state.mn.us/documents/25731/E%20-%20CapX%20Hampton-Rochester-La%20Crosse%20DEIS%20Sec8.2.pdf>

and

http://energyfacilities.puc.state.mn.us/documents/25731/Segment2_MapBook_North_Rochester_to_Northern_Hills

- 96A 2P and 2P-001 **should not be** considered as the route for the 161 kV line for the following environmental reasons, along or near County Road 31 NW, near Pine Island MN:
- 96B 1. 2P and 2P-001 cross large sections of Wetlands, public waterways and rivers/streams
- 96C 2. 2P and 2P-001 are near Zoological area, of MN DNR Natural Heritage.
- 96B 3. 2P and 2P-001 have "State threated species of Tuberous Indian-plantain, Elktoe and Wood turtle with the RC
- 96D 4. 2P and 2P-001 have the following species within 1 mile. Glade mallow, Ellipse, Blanding's turtle and Timbe rattlesnake
- 96B 5. 2P and 2P-001 have 17 and 10 watercourse crossings respectively.
- 96D 6. 2P and 2P-001 have the largest # of archaeological sites of 6 and 14 within 1/2 mile. 2p and 2p-001 are the c routes flagged with the most extensive archaeological sites with 1/2 mile and are inclusive to the beautiful environment around 2P and 2P-001 routes.
- 96E 96F 7. 2P and 2P-001 have 108 and 100, respectively homes with-in 500'. This dramatically diminishes the aestheti value for rural, dramatically effecting the property values for rural homes.

Based on all the above reasons, I believe the 2P and 2P-001 route should not be selected. Additionally, any other variant such as 2B-001, 2C3-001-2 that includes the County 31 corridor, should not be selected as the route for the kV, because all the above reasons still apply.

After careful evaluation of the EIS study the following routes make the most sense for 161kV.

- 96A
 - 2P-002 makes most sense for 161 kV, follows a route that already has highway 52 established corridor, and least impacts to animal, plants, property values, etc. 2P-002 may impact the most home, because it glances across Oronoco, but given it is on the highway 52 corridor, the property values are already adjusted to accommodate the noise and visual blemish of a highway.
 - 2A - seems to have little impact on peoples homesteads.
 - 2C3-002-2
 - 2C3-003-2
 - 2C3-004-2

--

96A.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

96B.

See Section 7.8 of the EIS.

96C.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration. See Section 7.6 of the EIS.

96D.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

96E.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

96F.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

Matthew Langan
 State Permit Manager
 Minnesota Office of Energy Security –Energy Facility Permitting
 85 7th Place East, Suite 500
 St Paul, Minnesota 55101

Subject: EIS-PUC Docket E003/TL-09-1448

Dear Mr. Langan:

Stanton Sport Aviation has reviewed the Draft Environmental Impact Statement (EIS) for the Hampton-Rochester-LaCrosse 345 kV and 161kV transmission project line. We concur with the analysis on page 99 of the EIS however we think further examination of two factors should be considered and addressed.

1. The effect of transmission lines and pole structures on Stanton's Automated Weather Observation Station (AWOS). No acknowledgement of the Stanton AWOS was made in the EIS though there was a discussion of the issue in general.
2. Stanton caters to gliders and small general aviation aircraft. Gliders, with only a few exceptions, are not powered by an engine and therefore are severely limited in their ability to alter altitude on final approach. FAA guidelines do not address the special limitations of gliders.

If you have any questions or would like to meet to discuss these issues please contact me at 507-645-4030 or KENTJOHN@frontiernet.net

Sincerely,



Kent Johnson
 Airport Manager and
 Member Board of Directors
 Stanton Sport Aviation, Inc.



97A.

Mitigation measures discussed in Section 7.9.6 can be used to minimize or eliminate impacts to electronic device interference. While the EIS addresses to address issues like electronic device interference on a broad level (see Minnesota Rules 4410.2300), specific issues may be addressed in greater detail during permitting and final design. For example, a condition may be included in applicant's route permit requiring the applicant to work with Stanton Airport during design and operation to mitigate impacts to Stanton Airport's Automated Weather Observation Station.

97B.

See Section 7.11 for a discussion of impacts to aircraft. The Stanton airport caters to gliders and small aircraft and is discussed in Section 8.1.4.11 of the EIS. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

97A

97B

Langan, Matthew (COMM)

From: Regina Harris [rharrismn@visi.com]
Sent: Friday, April 29, 2011 10:53 AM
To: Langan, Matthew (COMM)
Subject: EIS comment letter

Matthew Langan
 State Permit Manager
 Minnesota Office of Energy Security –Energy Facility Permitting
 85 7th Place East, Suite 500
 St Paul, Minnesota 55101

Subject: EIS-PUC Docket E003/TL-09-1448

Dear Mr. Langan:

Stanton Sport Aviation has reviewed the Draft Environmental Impact Statement (EIS) for the Hampton-Rochester-LaCrosse 345 kV and 161kV transmission project line. We concur with the analysis on page 99 of the EIS however we think further examination of two factors should be considered and addressed.

98A

1. The effect of transmission lines and pole structures on Stanton's Automated Weather Observation Station (AWOS). No acknowledgement of the Stanton AWOS was made in the EIS though there was a discussion of the issue in general.

98B

2. Stanton caters to gliders and small general aviation aircraft. Gliders, with only a few exceptions, are not powered by an engine and therefore are severely limited in their ability to alter altitude on final approach. FAA guidelines do not address the special limitations of gliders.

If you have any questions or would like to meet to discuss these issues please contact me at 507-645-4030 or KENTJOHN@frontiernet.net

Sincerely,
 Kent Johnson
 Airport Manager and
 Member Board of Directors
 Stanton Sport Aviation, Inc.
 1235 Highway 19
 Stanton, Minnesota 55018

98A.

Mitigation measures discussed in Section 7.9.6 can be used to minimize or eliminate impacts to electronic device interference. While the EIS attempts to address issues like electronic device interference on a broad level, specific issues may be addressed in greater detail during permitting and final design. For example, a condition may be included in applicant's route permit requiring the applicant to work with Stanton Airport during design and operation to mitigate impacts to Stanton Airport's Automated Weather Observation Station.

98B.

See Section 7.11 for a discussion of impacts to aircraft. The Stanton airport caters to gliders and small aircraft and is discussed in Section 8.1.4.11 of the EIS. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.



85 7th Place East, Suite 500, St. Paul, MN 55101-2198
 main: 651.296.4026 try: 651.296.2860 fax: 651.297.7891
 www.commerce.state.mn.us

PUBLIC COMMENT SHEET

CapX Hampton-Rochester-La Crosse Transmission Line Project

PUC Docket Number: E002/TL-09-1448

Name: Neil L JONAS Representing: _____

Address: 46669 Hwy 57 Wanamingo, Mn 55983 Email: _____

Comments:
Segment 1A-001
State License Day care.
House - with 75 ft of Highway
one West side
one East "

Please submit comments by **4:30pm, April 29, 2011** to:

Matthew Ianoan

Email: matthew.ianoan@state.mn.us



FEIS ID #99

99A.

The houses the commenter suggests are missing are in the GIS file but not shown on Appendix A maps because they are greater than 500 feet from the proposed line.



85 7th Place East, Suite 500, St. Paul, MN 55101-2198
main: 651.296.4026 tty: 651.296.2860 fax: 651.297.7891
www.commerce.state.mn.us

PUBLIC COMMENT SHEET

CapX Hampton-Rochester-La Crosse Transmission Line Project

PUC Docket Number: E002/TL-09-1448

Name: *Spencer Jostock* Representing: *Self*
Address: *34057 574th St Rochester Mn* Email: *el.jostock@earthlink.net*

Comments:

We live a 1/2 mi. S. of Hammond. We own a dairy & hog farm. Our financial plan includes land values in our bottom line and any cut in value will impact our business. Our hog are raised humanely in accordance with AWT. We also have 3 young grandkids that live on the farm also. their house is on County Rd 6 (32). they would have to literally play under this. We also have many deer for, squirrel, turkey, possum, racoon and various birds including Bald Eagle on our farm. Our neighbor hood is full of young children.

Please submit comments by **4:30pm, April 29, 2011** to:

Matthew Langan
Minnesota Dept. of Commerce
85 7th Place East
Suite 500
St. Paul, MN 55101-2198
Email: matthew.langan@state.mn.us
Phone: 651-296-2096
Fax: 651-297-7891

Be side the quantity of road quality rock - We have rock a 30T back not couldn't dig out.

100A

100B

100C

100D

100A.

See Section 7.2 of the EIS.

100B.

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

100C.

See Section 8.3.4.12 of the EIS.

100D.

In general, engineering and design strategies have been developed to accommodate a wide range of challenges presented by the physical conditions encountered in field allowing power to be distributed to people living in regions with different types of terrain and geologic conditions. Specific strategies will be identified and implemented during the detailed design phase of the proposed Project.



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www.commerce.state.mn.us

PUBLIC COMMENT SHEET

CapX Hampton-Rochester-La Crosse Transmission Line Project

PUC Docket Number: E002/TL-09-1448

Name: Paul Kalzss Representing: Landowner

Address: 16094 440th St, Zumbrota MN Email: _____

Comments: It still seems to only make sense to stay of the 57 right of way rather than disrupt the farm fields - less hassle all around.

Please submit comments by 4:30pm, April 29, 2011 to:

Matthew Langan Email: matthew.langan@state.mn.us
Minnesota Dept. of Commerce Phone: 651-296-2096
85 7th Place East Fax: 651-297-7891
Suite 500
St. Paul, MN 55101-2198

101A

101A.

Your objection/preference of the specified route is noted. The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

Matt Langan
Matthew.langan@state.mn.us
 Fax 651-297-7891

RE: PUC Docket No. TL-09-1448

This letter to the MOES will point out the concerns that we feel are either missing or need further explanation within the Draft EIS for the 345KV Hampton to LaCrosse route. My wife Katie and I are located on the Route currently labeled 3A; the alternate route north of Pine Island referred to as the 'North Route.' We are also active members of the North Route Group.

The following is a list of items that we feel is incorrect or missing from the DEIS document:

102A **Home locations:** Our home, in section 16 of Mazeppa TWP Wabasha County, is not located on any of the DEIS maps and evaluations (See attached map labeled '*Kennedy_Home*'). Our home is located within 275' of the centerline of Route 3A and our new shed is located within 30' of the centerline. Some of our neighbor's homes were also either not located or improperly identified in the DEIS. The attached map shows the actual locations of the homes within the 500' ROW of 3A in Section(s) 15 and 16 of Mazeppa TWP. (T109N R14W). The DEIS states that there are 5 homes within 1 mile when in reality there are a total of 6 homes in less than that mile, all within 500' of the center line of Route 3A. Please see attached map labeled '*MR28_actual_Locations*'.

102B **Bluffland Impacts:** Minnesota State Rule 6120.2500 – 3900 is a Shoreland protection rule that not only protects lands adjacent to lakes and streams but also protects bluff land areas. Each County in Minnesota adopted these shoreland rules in the 1980's with some variation. In general the definition of a bluff is a slope of greater than 30% over a grade change of 25 feet in elevation or greater along a continuous slope. The value of this natural resource is held at a level of protection high enough to enact a State Rule for protection. For instance, Wabasha County, as well as most other counties in Minnesota, holds land use standards within bluffland impact zones. Article, Section 3 subd. 5 states that no towers will be placed within ¼ mile of bluff impact zone. Within our property alone there are several slopes greater than 30% (greater than 60% for that matter). We are concerned that removing vegetation from these slopes will make them unstable and cause erosion and sedimentation issues. The DEIS did not address the impacts that each route would have on bluffland resources. Although it was briefly mentioned in Hillstrom's testimony, this resource needs to be addressed further for each proposed route. See attached labeled '*NRG_30%_slopes*' map depicting 30% and greater slopes in just 1.5 miles of the North Route 3A. I am surprised the Minnesota DNR did not have any concerns with Route 3A crossing this heavily wooded entrenched terrain.

102C **Route 3A will use no existing electrical corridors by itself...** As noted in *Appendix J*, Route 3A shows that 22% of the route follows existing transmission lines. The only common area where power lines exist on 3A is where the 3A and 3P lines connect making them a common line. The combination of these lines EAST of the Zumbro River should not have been used to address the individual routes that come from HWY 52 and cross the Zumbro. Please address.

102D **Natural Environment Impacts:** Our 10 acres is home to a family of owls, eagles spotted regularly atop a dead elm tree located along our bluff line, showy orchids, trout lilies among many other rare natural plants and animals. The natural setting of this habitat will be destroyed by a segmenting this old growth timber forest with a high voltage powerline. The noise emitted from these powerline will be much more noticeable on our section of the route as well. No major roads are located near our property and when the wind is calm, we could hear a pin drop on our south property line. The constant noise from these structures is a concern of ours and our neighbors.

102G **Hillstrom Testimony:** Why is there only a 300' wide evaluation of each route in Hillstrom's testimony? The DEIS looks at the effects each proposed route will have within a 500' buffer of the centerline. In Hillstrom's testimony he refers to

102G (cont) resources within a 300' buffer of the centerline, as listed in schedule 8. The request by CapX2020 is to approve/deny the 500' width of a route...not a 300' wide route.

102H **Testimony of Amanda King:** The magnetic fields from the Fargo Line are twice as high as the magnetic field readings from the Hampton Line when looking at the same configuration. For example, from 100 feet away on the North Rochester to Alma route on a single pole reads 11.17mG. On the Fargo line, with the same single pole and same distance reads 26.9 mG. It is mentioned that this route is not planning on running as much power through the lines as the Fargo route. First of all, plans change. What is stopping these plans from changing in the future? Also Ms. King mentions on pages 5 and 6 of her testimony that there is a lack of large generation power plants in SE Minnesota that will keep the future levels low. The Alma coal power plant is 30 miles from our home and the Red Wing nuclear plant is 40 miles from our home....these generators appear to be near enough to supply large loads of electricity that could impact our well being. Ms. King estimated that 6 hours per day levels could be 600 MVA or greater. This means that mG levels would be above 2mG at our home and well above 2mg at our shed. Again, our house is 270' and the shed is 30' from the centerline.

102I **Dam Route:** The dam route was mentioned in the DEIS but not elaborated on. The 3A and 3P routes for the North Route and the White Bridge Road Route were both investigated in great depth. Why was the dam route not held at such a level as the 3A and 3P?

102J **Recreation:** Recreational usage in the Zumbro River Bottoms was mentioned but not expanded on. Recreation along the 3A stretch of the Zumbro River Bottoms is extensive. Canoeist, fisherman, hunting, cyclist, bird watchers, etc. flock to this area to enjoy the beauty of this unbroken vegetated landscape. The proposed 3A route would be crossing the Zumbro River in a location where there are no other utility or road crossings. Please divulge on this topic more. This should be weighted heavily in the decision making process.

The following are items listed in Appendix J of the DEIS that we feel were well documented and should be highlighted when evaluating each route:

102 **Percentage of Richard Doer Memorial Hardwood Forest Impacted:** The amount of State Forest Land which will be impacted over the 3A route is almost 4 times greater than the preferred route. Over 3,600 acres of State Memorial Hardwood Forest lies within the 3A while 949 acres lie within the 3P route. Those 949 acres of impacted route are located where the alternate and the preferred connect east of the Zumbro River. On this the 50th anniversary of the Richard Doer Memorial Hardwood Forest a impact of 3,600 acres of vegetation clearing is not listed as a long range goal or accomplishment.

102L **Linear Feet of Trout Stream Impacted:** The North Route 3A crossing will impact about 19,700 linear feet of trout streams while the other routes impact roughly 11,000 linear feet. The North Route is home to some pristine trout habitat, which attracts fisherman and wildlife enthusiasts from far away.

102M **Percentage of Existing Corridors Followed:** The North Route has by far the highest amount of cross country ROW type @ 51.1% while other routes are around 28% or less. This evaluation should be kept in the forefront when decision makers review this document in order to follow Minnesota State Statute 216E.03 Subd.7(b)(8) which states that transmission lines must use shared railroad and/or highway ROWs.

Thank you for your time and consideration on this matter. Please feel free to call us or email us with any questions/comments.

Beau and Katie Kennedy
 59525 415th Ave.
 Mazeppa, MN 55956
 507-301-1545 beaukennedy@yahoo.com



**102A.**

Houses were added to the GIS shapefile and are shown in updated Appendix A maps and Table 8.3.4.3-1 of the EIS

102B.

See updated text in Section 7.4, 8.1.4.4, 8.2.4.4, and 8.3.4.4 of the EIS.

102C.

The EIS uses a consistent approach to evaluating each route alternative. It evaluates the length of each route alternative between substations; in this instance, route alternatives between the North Rochester substation and the Mississippi River crossing at Kellogg. Looking at the length of each route, in total, is not intended to be confusing.

102D.

Your objection/preference of the specified route is noted. Your comment is now part of the record in this matter by its inclusion in this EIS, and will be submitted to the Office of Administrative Hearings (OAH) and Commission for consideration. See Section 7.6 of the EIS.

102E.

See Section 7.3.1 of the EIS.

102F.

See Section 7.3.2 of the EIS.

102G.

The OES has evaluated impacts within the proposed route width for the EIS. The testimony the commenter refers to is from Xcel energy and OES cannot speak to the reasoning behind their choice of buffer.

102H.

The maximum calculated magnetic field at the edge of the ROW under the highest anticipated loading conditions at some point in the future (assumed 600 MVA loading) for sections of the line built at a 345/345/69kV triple circuit would be 5.06 mG. This value is below all state established guidelines for magnetic fields at the edge of transmission ROW as indicated in Table 7.1.1.2-4 of the EIS.

102I.

Options for all route alternatives for crossing the Zumbro River are discussed in Section 8.3.4.8 of the FEIS.

FEIS ID #102

102J.

Text discussing the Zumbro River and potential impacts associated with the crossing of the river has been added to the FEIS in Sections 6.3.1, 8.2.4.8, 8.3.4.7 and 8.3.4.8. In addition, existing text in Section 8.4 includes the Zumbro River in the discussion of the Mississippi River crossing.

102K.

The comment is part of the record in this matter by its inclusion in the EIS, and will be submitted to the OAH and Commission for consideration.

102L.

See Section 7.8 of the EIS.

102M.

See Section 7.11 of the EIS.



2200 IDS Center
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April 22, 2011

Valerie T. Herring
(612) 977-8501
vherring@briggs.com

VIA ELECTRONIC FILING AND U.S. MAIL

Hon. Kathleen D. Sheehy
Administrative Law Judge
Office of Administrative Hearings
P.O. Box 64620
St. Paul, MN 55164

**Re: In the Matter of the Route Permit Application for the CapX2020
Hampton -- Rochester -- La Crosse 345 kV Transmission Line
MPUC Docket No. E002/TL-09-1448
OAH Docket No. 7-2500-20283-2**

Dear Judge Sheehy:

Enclosed and filed today through www.edockets.state.mn.us please find a revised copy of page 4 of the Direct Testimony of Amanda King correcting the amperage formula that was contained in the original filing. A redline comparing the revised copy to the original is also enclosed. A copy of this filing is also being served via e-mail or mail upon the persons on the attached Service List.

Sincerely,

Valerie T. Herring

Enclosures

103A

- 1 **Q. WHAT WAS THE HIGHEST FLOWS YOU ESTIMATED FOR 2015 AND 2025?**
- 2 A. The highest system intact flow reported in the Application was ~~143-248~~ MVA,
- 3 along the North Rochester to Mississippi River segment. To convert this flow
- 4 to amperage, you divide the MVA flow by the product of the square root of 3
- 5 and the voltage. In this case, you take the MVA, ~~143-248~~ MVA, and divide by
- 6 the product of the square root of 3 and 345 kV (.345 MV). The result is and
- 7 the amperage is 145-415 amps.
- 8 248 MVA / (√ of 3 * 0.345 MV)=415 amps
- 9 **Q. IN THE FARGO PROJECT, CALCULATIONS FOR 600 MVA AND 1500 MVA**
- 10 **WERE PROVIDED. WHAT ANALYSIS HAS THE COMPANY DONE TO**
- 11 **DETERMINE IF IT WOULD BE APPROPRIATE TO CONSIDER THE SAME LEVELS**
- 12 **HERE?**
- 13 A. The Company considered potential flows on the 345 kV line facilities that
- 14 could occur under the highest anticipated loading conditions at some point in
- 15 the future. High line loading conditions could occur during off-peak demand
- 16 periods if significant generation were to be located in the area and if there were
- 17 an unplanned outage of a major Twin Cities 345 kV transmission source such
- 18 as Byron—Prairie Island or King—Eau Claire. These off-peak demand
- 19 periods generally occur for about six hours per day. Based on this scenario,
- 20 planning engineers determined that the highest flow that could reasonably be
- 21 expected to occur on the facilities would be on the North Rochester—
- 22 Mississippi River segment of the line; flows on the Hampton—North
- 23 Rochester segment would be lower. The North Rochester—Mississippi River
- 24 segment could potentially experience approximately 600 MVA for short
- 25 periods of time. Planning engineers also assessed whether there was a scenario
- 26 could result in flows higher than 600 MVA. Planning engineers determined

1 **Q. WHAT WAS THE HIGHEST FLOWS YOU ESTIMATED FOR 2015 AND 2025?**

2 A. The highest system intact flow reported in the Application was 248 MVA,
3 along the North Rochester to Mississippi River segment. To convert this flow
4 to amperage, you divide the MVA flow by the product of the square root of 3
5 and the voltage. In this case, you take the MVA, 248 MVA, and divide by the
6 product of the square root of 3 and 345 kV (.345 MV). The result is 415 amps.

$$248 \text{ MVA} / (\sqrt{3} * 0.345 \text{ MV}) = 415 \text{ amps}$$

7
8 **Q. IN THE FARGO PROJECT, CALCULATIONS FOR 600 MVA AND 1500 MVA**
9 **WERE PROVIDED. WHAT ANALYSIS HAS THE COMPANY DONE TO**
10 **DETERMINE IF IT WOULD BE APPROPRIATE TO CONSIDER THE SAME LEVELS**
11 **HERE?**

12 A. The Company considered potential flows on the 345 kV line facilities that
13 could occur under the highest anticipated loading conditions at some point in
14 the future. High line loading conditions could occur during off-peak demand
15 periods if significant generation were to be located in the area and if there were
16 an unplanned outage of a major Twin Cities 345 kV transmission source such
17 as Byron—Prairie Island or King—Eau Claire. These off-peak demand
18 periods generally occur for about six hours per day. Based on this scenario,
19 planning engineers determined that the highest flow that could reasonably be
20 expected to occur on the facilities would be on the North Rochester—
21 Mississippi River segment of the line; flows on the Hampton—North
22 Rochester segment would be lower. The North Rochester—Mississippi River
23 segment could potentially experience approximately 600 MVA for short
24 periods of time. Planning engineers also assessed whether there was a scenario
25 could result in flows higher than 600 MVA. Planning engineers determined

**In the Matter of the Application
for a Route Permit for the CapX2020
Hampton-Rochester-LaCrosse
345 kV Transmission Line**

**CERTIFICATE OF SERVICE
MPUC Docket No. ET-2/TL-09-1448
OAH Docket No. 7-2500-20283-2**

Theresa Senart certifies that on the 22nd day of April, 2011, she filed true and correct copy of the **Revised Page 4 of the Amanda King's Direct Testimony** by posting the same on www.edockets.state.mn.us. Said Revised Copy of Page 4 of the Direct Testimony of Amanda King was also served via U.S. Mail or e-mail as designated on the Official Service List on file with the Minnesota Public Utilities Commission in the above-referenced docket.

/s/ Theresa Senart
Theresa Senart

Assigned Service List Members

MPUC Docket No. E002/TL-09-1448
OAH Docket No. 7-2500-20283-2

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Service List Member Information**Electronic Service Member(s)**

Last Name	First Name	Email	Company Name	Delivery Method	View Trade Secret
Agrimonti	Lisa	lagrimonti@briggs.com	Briggs And Morgan, P.A.	Electronic Service	No
Anderson	Julia	Julia.Anderson@state.mn.us	Office of the Attorney General-DOC	Electronic Service	Yes
DeBleekere	Patricia	tricia.debleekere@state.mn.us	Public Utilities Commission	Electronic Service	Yes
Ferguson	Sharon	sharon.ferguson@state.mn.us	Department of Commerce	Electronic Service	Yes
Haar	Burl W.	burl.haar@state.mn.us	Public Utilities Commission	Electronic Service	Yes
Hammel	Karen Finstad	Karen.Hammel@state.mn.us	Office of the Attorney General-DOC	Electronic Service	Yes
Herring	Valerie	vherring@briggs.com	Briggs and Morgan, P.A.	Electronic Service	No
Langan	Matthew	matthew.langan@state.mn.us	Office of Energy Security	Electronic Service	Yes
Lindell	John	agorud.ecf@state.mn.us	Office of the Attorney General-RUD	Electronic Service	Yes
Schlatter	Laura	Laura.Schlatter@state.mn.us	Office of Administrative Hearings	Electronic Service	Yes
Seykora	David	dave.seykora@state.mn.us	MN Department of Transportation	Electronic Service	Yes
Shaddix Elling	Janet	jshaddix@janetshaddix.com	Shaddix And Associates	Electronic Service	Yes
Thompson	SaGonna	Regulatory.Records@xcelenergy.com	Xcel Energy	Electronic Service	No

Paper Service Member(s)

Last Name	First Name	Company Name	Address	Delivery Method	View Trade Secret
Hillstrom	Tom	Xcel Energy	7th Floor, 414 Nicollet Mall, Minneapolis, MN-554011993	Paper Service	No
Maccabee	Paula	Just Change Law Offices	1961 Selby Avenue, St. Paul, MN-55104	Paper Service	No
Overland	Carol	Legalelectric, Inc.	P.O. Box 176, Red Wing, MN-55066	Paper Service	No
Sheehy	Kathleen D.	Office of Administrative Hearings	PO Box 64620, St. Paul, MN-551640620	Paper Service	Yes

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103A.

The revised highest flow of 248 MVA and corresponding 415 amps are reported for the North Rochester to Mississippi River 345 kV line is accurately reported in the EIS in section 7.1.1.2.