

Accufacts Inc.

“Clear Knowledge in the Over Information Age”

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**To: Chairman Robert Walberg
And Fellow Boone County Board Members
1212 Logan Avenue
Belvidere, Illinois 61008**

**Re: Placement of Wind Turbine Power Generation Farm in Proximity to Major
Hydrocarbon Liquid Transmission Pipelines**

Accufacts was asked to provide independent observations related to the proposed installation of a multi-megawatt wind turbine farm “Project,” last estimated at approximately 200 MW, to be installed over, or in close proximity to, two existing liquid transmission pipelines sharing a pipeline right-of-way, or “ROW,” in Boone County, Illinois (see Attachment 1 presenting buffer zones from structures and the pipelines’ approximate ROW). It is my understanding that these two pipelines are fairly new and operated by Enbridge Pipelines in a 45-foot wide pipeline ROW. Specifically, the wind farm could impact: 1) a 42-inch pipeline moving dilbit (a blend of Canadian tar sand bitumen and diluent) moving oil south via Line 61, and 2) a 20-inch pipeline moving diluent north (aka Southern Lights Diluent Pipeline).¹ Both of these pipelines have been identified as part of Enbridge’s Lakehead Pipeline System.² A Google Map aerial view of the general area of the proposed wind farm area shows the terrain of the overall site including the exiting pipelines’ ROW (See Attachment 2).

While an offset distance from the pipeline ROW is one possible way to approach certain threats to the existing pipelines, Accufacts believes, after reviewing Attachment 1, that such an approach may not adequately deal with the threats to the pipeline that can be associated with the Project. Federal pipeline safety regulations place specific obligations on Enbridge, the pipeline operator, to assure the safety of the pipeline from various threat activities that may exist off, as well as on, a pipeline ROW. Local and state agencies should be able to place as a condition of a permit approving the Project, that certain precautions including prudent engineering analysis have been performed, documented and are sound (usually subject to independent verification). Such agencies can require the Project to produce engineering calculations, usually with the documented approval of the pipeline operator that assumptions, the design, the installation and its operation are appropriate and thorough to

¹ Enbridge website: <http://www.enbridgesus.com/Delivering-Energy/Growth-Projects/Mainline-Expansions/>

² Enbridge website: <http://www.enbridgesus.com/Delivering-Energy/Pipeline-Systems/Liquid-Pipelines/>.

assure local agencies that the public is adequately protected from a pipeline failure that might be caused by the Project.

Accufacts sees at least three categories of threat to the pipelines from the Project:

- a. external loading threats,**
- b. misplacement or improper alignment of the wind turbines, such that tower loads or turbine blade failure could reach the pipelines, and**
- c. stray current effects from the Project's electrical system.**

Under federal pipeline safety regulation, all of the above risks are the responsibility of the pipeline operator whether the threat is on or off the pipeline ROW. The pipeline operator should be able to demand certain requirements such that the Project will not threaten the pipelines. Local agencies should be able to mandate and require adequate proof and documentation from the pipeline operator that these threats have been prudently evaluated and resolved in the final design, its placement, and the Project's operation.

Federal pipeline safety regulation, **49CFR§195.110 External loads**, clearly places an obligation on the pipeline operator to anticipate external loads that might cause the pipeline to fail. Specifically the above regulation requires:

“(a) Anticipated external loads (e.g.), earthquakes, thermal expansion, and contraction must be provided for in designing a pipeline system. In providing for expansion and flexibility, section 419 of ASME/ANSI B31.4 must be followed.”

Such anticipated external loads could be from various Project activities, associated with construction as well as day-to-day operation. Enbridge should be able to show what load threat with sufficient safety margin, would be permitted, given the depth and soil conditions of the pipeline in the area of the Project. Distance can also be a safety factor though it may not be that critical for this type of threat, given the fairly level terrain (see Attachment 2).

Federal pipeline safety regulation, **49CFR§195.442 Damage prevention program**, places additional demands on the pipeline operator to assure activities around a pipeline don't imperil the pipeline so as to cause its failure. Such activities that may threaten a pipeline can go well beyond the pipeline's ROWs. Specifically,

“(a) Except as provided in paragraph (d) of this section, each operator of a buried pipeline must carry out, in accordance with this section, a written program to prevent damage to that pipeline from excavation activities. For the purpose of this section, the term “excavation activities” includes excavation, blasting, boring, tunneling, backfilling, the removal of aboveground structures by either explosion or mechanical means and other earth moving operations.”

Blasting is an example of where activities well beyond a pipeline ROW can be restricted if such activities can cause a pipeline to fail. As an example, Enbridge should be able to require the relocation or alignment of each generator in proximity to the pipeline ROW such

that placement would not allow a failed turbine blade break to impact the buried pipelines. I suspect the pipelines are not buried deeply enough to prevent impingement given the size and weight of the turbine blades. This is a category of threat where distance could be used to provide prudent pipeline safety.

The potential for electric generation/transmission stray current interference to quickly rip the steel from buried pipelines, even very deep pipelines, is well understood and known in the pipeline industry. Federal pipeline safety regulation, **49CFR§195.577 What must I do to alleviate interference currents**, requires pipeline operators:

“(a) For pipelines exposed to stray currents, you must have a program to identify, test for, and minimize the detrimental effects of such currents.”

These stray currents are often created by electric transmission or power equipment poorly designed and/or placed and are usually associated with facilities not on the pipeline ROW. While distance helps to reduce the effects of stray current to a pipeline, Attachment 1 suggests that the placement of electric power lines will be highly scattered in proximity to the pipelines from the Project. The pipeline is well within its rights to demand and understand the Project’s electrical design/installation and its possible impacts to generate stray current on the pipelines. Enbridge should stay very close to the Project’s electrical design / layout and its potential to generate stray currents that could seriously and very rapidly impact the soundness of the pipelines.

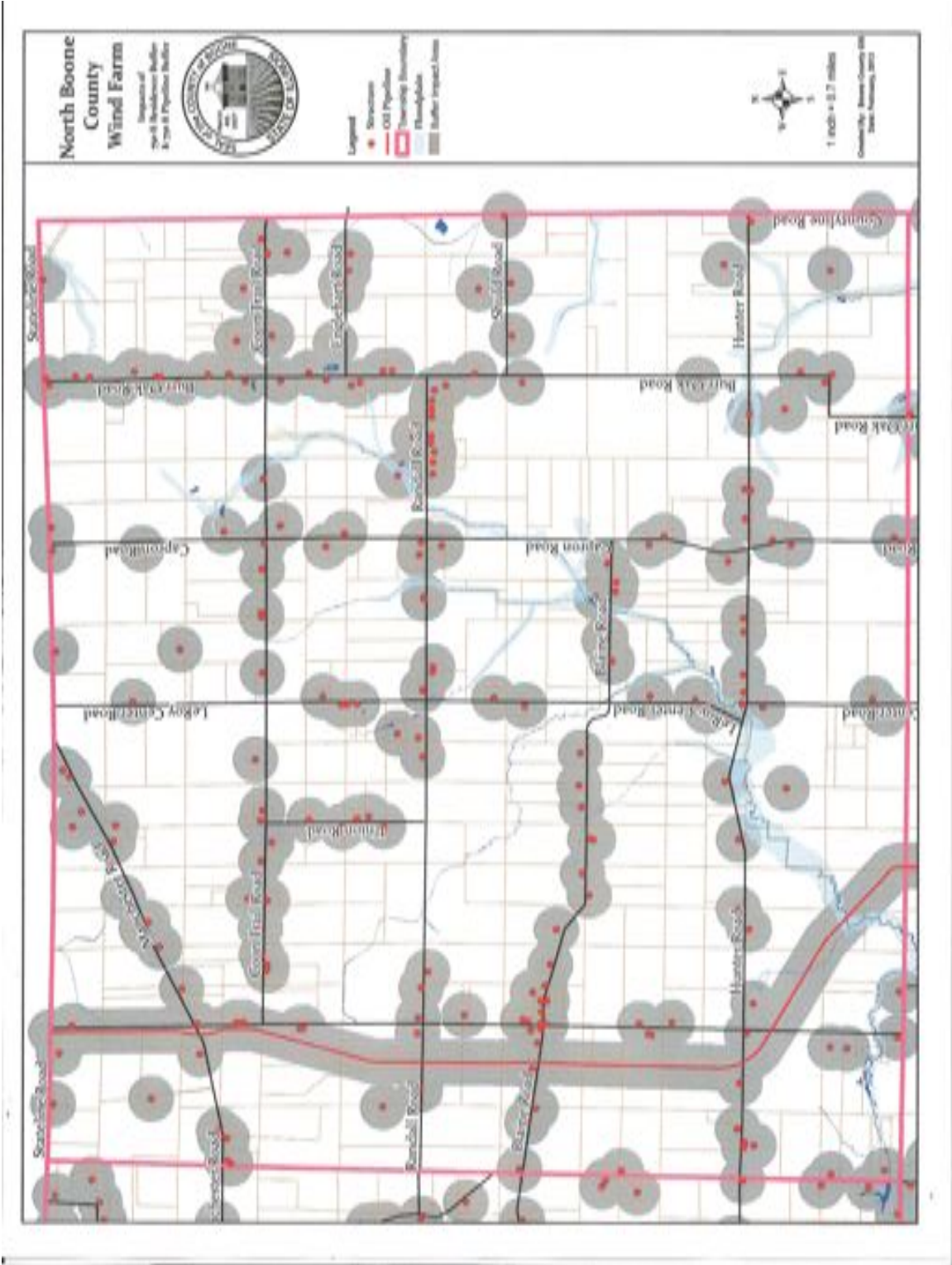
Accufacts’ observations are based on our extensive experience concerning pipeline issues, including but not limited to: routing, design, construction, operation, maintenance, emergency response, SCADA operation, leak detection, spill response, pipeline incident investigations, integrity management, pipeline safety regulatory development, and risk management, especially in sensitive areas. I have consulted for various local, state and federal agencies, NGOs, the public, and pipeline industry members on pipeline safety regulation, operation and design, with particular emphasis on operation in unusually sensitive areas of high population density or environmental sensitivity where a pipeline release could have serious consequences.

I understand that this information is being submitted as testimony. Having previously been sworn for expert testimony on many pipeline matters, I am familiar with the serious nature of giving my oath and you may consider this written document to be my sworn affidavit. All of my opinions are based on reasonable engineering and scientific certainty.



Richard B. Kuprewicz
President,
Accufacts Inc.

Attachment 1 - North Boone County Wind Farm 750 Ft Buffers



Attachment 2 - Google Map of General Project Area Near Pipelines' ROW

