Comment Related to

Tribute Resources Inc. Bayfield Storage Project Development

and
Bayfield Resources Inc. as General Partner for Huron Bayfield Limited Partnership and
Bayfield Pipeline Corp "Tribute"

Regarding

Ontario Energy Board Files

EB-2011-0076
EB-2011-0077
EB-2011-0078
EB-2011-0285

Response to Interrogatory Filed by Huron County Federation of Agriculture

and

Municipality of Bluewater

Issue 4.5 – Impacts of Industrial Wind Turbines

Comments by

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to Huron County Federation of Agriculture

July 17, 2012

Background:

According to a presentation at their Annual General Meeting, Tribute Resources Inc. is a junior energy resources company incorporated in Alberta in 1997 with two main business lines, underground natural gas storage, and renewable energy project development (wind turbines and small hydro). All current business activity appears to be located in Ontario. Tribute Resources re-applied to the Ontario Energy Board in April 2011 for the Huron Bayfield Gas Storage Project with initial development of two pools, the Bayfield pool with a capcity of 4.7 BCf and the Stanley pool with a capacity of 1.4 Bcf. A related project proposes to construct 70 km of NPS 16" line to connect to Union Gas's Dawn-Trafalgar Line. Pending an Ontario Energy Board decision the plan is to drill injection / withdrawal wells and to commence pipeline and compressor station construction.

Both the Municipality of Bluewater and the Huron County Federation of Agriculture raised formal questions through the Ontario Energy Board related to the interaction between the natural gas storage project and wind turbine developments planned for the area.

On June 19, 2012, the Huron County Federation of Agriculture posed the following three questions:

- (Q 4.5 – 1) Will there be any issues with the proposed industrial Wind Turbine Projects and the associated infrastructure in this area on Tribute's Gas Storage Project (i.e. storage lands and facilities, including equipment, pipelines, wellheads, compressor station etc.)?
- (Preamble) Stantec mentions that there is a high probability of wind power development in Huron County. There is a second mention on Page 382 in a letter from Huron County Planning Department dated Dec 23, 2008 on Industrial Wind Turbines (IWT). It is now a fact that there are two IWT projects very close to development in the Municipality of Bluewater, the Nextera Varna Project – 37 IWTs and the Nextera Goshen Project – 63 IWTs. There is also a third project proposed in Bluewater belonging to Northland Power, and additional 48 IWTs. The two Nextera projects are in the same immediate area as the Tribute gas storage project and pipeline.
    - (Q 4.5 – 1a) Are you aware of these projects and the locations of the IWTs as related to your gas storage projet?
    - (Q 4.5 - 1b) Do you foresee any issues that the IWT projects could have on the gas storage project? i.e. safety issues, construction issues,, sharing of municipal road allowances where pipelines and hydro lines (underground and above ground) share the same road allowance, the location of IWTs relative to the DSA lands or the proposed compressor station land.

The Municipality of Bluewater asked related questions on June 20, 2012:

- Q 4 a) What are the impacts, if any, of Industrial Wind Turbine Projects and the associated infrastructure on Tribute's project?

- Q 4 b) What are the impacts, if any, of Tribute's project on Industrial Wind Turbine Projects?

The answer given to these questions presented by Tribute Resources Inc. was as follows:

Answer: Tribute is aware of these two wind projects and their locations. Tribute is familiar with each of these companies and their representatives and will be meeting with them to discuss the locations for the injection and withdrawal wells, which are already planned and established. Tribute has already provided maps of the project locations, proposed well locations and DSA's to NextEra for the Bayfield and Stanley pools, as well as other potential future development pools (Zurich, Canton Shoal, Dashwood, Grand Bend, etc.). Tribute is in the process of arranging meetings to discuss these maps and the interaction of both projects.

It is not anticipated that there will be any major constraints in respect of both projects being located on the same lands or use of municipal rights of way. The base of each IWT occupies less than one acre and usually only one turbine is located on 50 – 100 acres of land. Additionally, IWT foundations usually excavate and remove subsoil for several meters in depth, but in no way does that activity affect drilling, casing and cementing and gas injection and withdrawal operations, which extend well into bedrock. IWT locations are subject to changes through the REA process and even up until the time of construction. As well, the connecting pipeline network will be limited and will be all underground, with a coordinated effort to ensure compatibility and non-interference with the underground electric infrastructure.

It may be possible that there is an opportunity for NextEra, Tribute and Northland to work together in terms of road placements for the facilities, which work well for our joint landowners.

The Huron Federation of Agriculture asked me to provide a professional engineering opinion if the response given by Tribute Resources Inc. addressed all anticipated interaction between the natural gas storage facility and the wind turbines, identified by the Tribute Resources Inc. response as potentially being *"located on the same lands or use of municipal rights of way."*

Professional Commentary:

1. The response that *"Tribute is aware of these two wind projects and their location. … and will be meeting with each of these companies … to discuss the locations of the injection and withdrawal wells … Tribute is in the process of arranging meetings to discuss these maps and the interaction of both projects"* **provides no confidence that the interaction has been dealt with.** The statement, *"It is not anticipated that there will be any major constraints in respect of both projects being located on the same lands or use of municipal rights of way."* **can provide no confidence that the interaction dealt with.** The statement that, *"IWT*

locations are subject to changes through the REA process and even up until the time of construction." **continues to provide no confidence that any limits for the interaction between the wind turbines and gas storage project, its compressor station, injection or withdrawal wells, or the 16 inch pipeline have been specified.**

2. Without any limitations being specified, it would appear that the approval by the Ontario Energy Board would simply be based on a "trust me" commitment, without basis. Professional opinion related to a public safety issue is that "trust me" is not a sufficient basis for an interaction with a 4.7 Bcf pressurized natural gas storage project and its supporting infrastructure and a system that can present a number of risk factors to the natural gas storage system without having firmly established limits for the interaction specified.

3. Current proposals from Nextera for Ontario wind projects include the use of GE 1.6-100 wind turbines, with a 100 metre rotor diameter and 80 to 95 metre hub heights. Some of the risks to the safety of the natural gas storage system and its supporting infrastructure include:
    a. General Electric documentation specifies that ice throw from it's wind turbines suggest a setback of 1.5 x (hub height + rotor diameter) or in this case, 300 metres. (See attachment)

    b. wind turbine blade parts falling from General Electric turbines (as at Port Burwell in Ontario, the Prince Wind Farm in Ontario, in New York State, Montana, or California (naming only some of the GE wind turbine blade failures) have resulted in blade pieces at some distance from the tower. In some cases, blade pieces from wind turbines have traveled as far as 500 metres from the tower during overspeed induced failures.

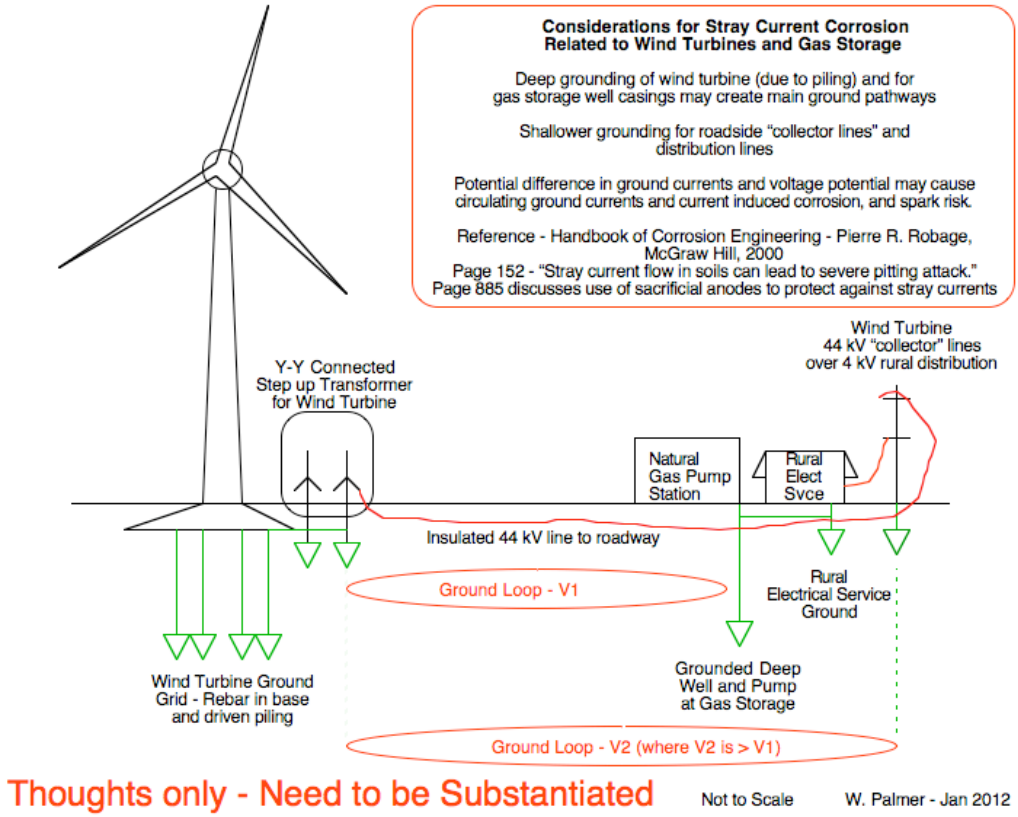
    c. General Electric wind turbines have collapsed at several different sites in the United States following overspeed failures (at lest two separate incidents in New York State). These can result in blade parts a considerable distance from the tower. (see photo file attached)

    d. Wind turbines including General Electric wind turbines have been destroyed by fire following lightening strikes, and other failures, resulting in flaming bits of burning blades traveling a distance from the turbine. (see photo file attached.)

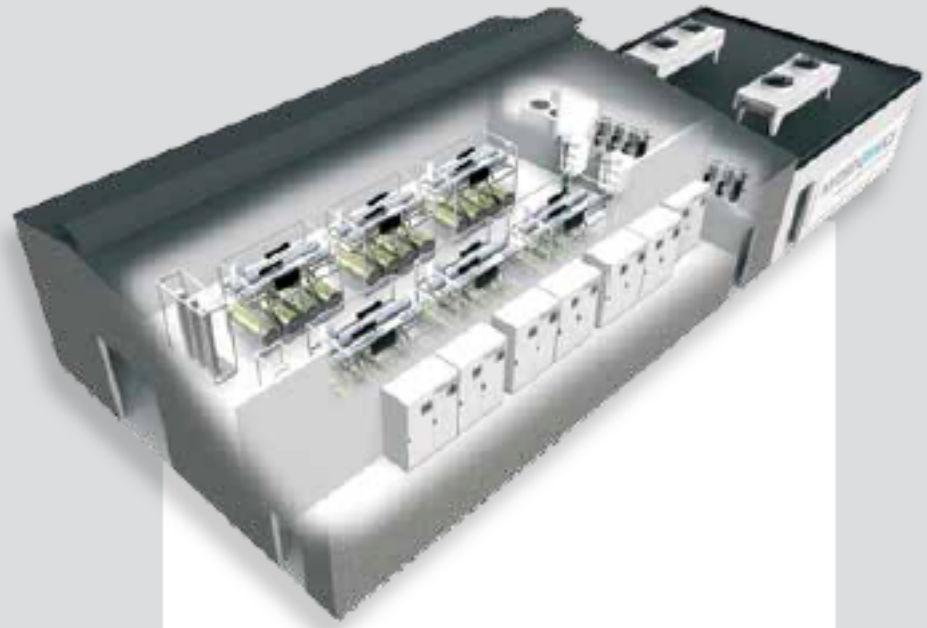
4. In some cases, wind turbine developers have specified that setbacks less than the 550 metres specified in Ontario as a setback to a residence are appropriate based on their calculations that the probability of a car being on the highway passing the turbine, or of a farmer being in the adjacent field are low, no credit can be taken for this calculation method for a natural gas compressor station, or its associated injection or withdrawal wells (which clearly must penetrate the earth), as they are in the same spot 24/7. The normal method of performing a risk assessment must

be used for this case, which is to assume that the impacted person (or in this case infrastructure component) must be assumed to being present unless protected. Providing a proection from a wind turbine blade, 50 metres in length, with a mass in the order of 7 tonnes, falling from a tower some 100 metres from the air would require a far more robust bomb-proof building bunker than a standard sheet metal building that protects a natural gas compressor – and in fact some are installed with no protection at all. This would require a setback of some 500 metres from the wind turbine and the natural gas facility – so the placement of both on the same lands without a clearly defined separation would suggest rejection of approval until a separation agreement is identified to ensure a 500 metre separation.

5. The nature of ground currents induced from wind turbine collection wiring results in ground currents on buried underground piping. Since by definition the natural gas storage facility includes buried piping in the 16 inch NPS pipeline and the injection and withdrawal wells, the circulating current can result in accelerated corrosion of steel lines. See the sketch below.



6. Currently in Ontario, a significant consideration related to the deployment of wind turbines is the addition of storage facilities. One proposal currently being considered by a natural gas producer is to buy energy produced by wind turbines during excess generation periods, and to generate hydrogen for injection into the natural gas piping system. The major proponents for this method are Enbridge who just announced a purchase of Hydrogenics, to be able to generate hydrogen and inject it into the natural gas storage system. The proximity of the Tribute Resources gas storage facility proposed near a number of wind power developments would seem to make this a favourable location for this sort of facility. The addition of a hydrogen electrolyzer near the wind turbines would appear to further increase the risk. This is not currently part of the Tribute Resources proposal, but the Ontario Energy Board should ensure that any risks this would incur would need to be addressed.



A 2MW installation: 2 lines of 3 HySTAT® 60 with a total production of 360 Nm^3/h of high quality hydrogen. Each line has on large purification system, one closed loop cooling system, one feed water treatment system and is operated by one control panel to offer redundancy.

Conclusions:

1. Review of the response given by Tribute Resources to either the Municipality of Bluewater or the Huron Federation of Agriculture gives no confidence that the interaction between the gas storage facility and its associated infrastructure has been addressed.

2. Approval of a project that has public safety risk implications (as can impact a natural gas storage facility with a storage of 4.7 Bcf of pressurized natural gas on the basis of a "trust me" response cannot be justified.

3. No arguments can be given for transient occupancy of the natural gas facility – the hazard is present 24/7. Thus, adequate setbacks would be required to protect against:
    a. ice throw – since a piece of ice similar in size to ice that has been detected falling from an Ontario wind turbine falling from a 100 metre hub height hits the ground with the same impact as a concrete block falling from an 8 storey building.
    b. blade throw – has been measured at up to 500 metres from a tower
    c. tower collapse
    d. fire – that can result in fire from a burning wind turbine blade being carried downwind hundreds of metres, if passing over a natural gas vent could result in an even bigger fire.

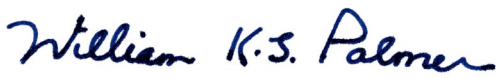
4. A minimum separation of at least 500 metres from the nearest wind turbine to the natural gas compressor station of any vent lines would be called for.

5. The possibility of accelerated corrosion of buried natural gas piping needs to be addressed due to circulating ground currents induced by adjacent wind turbines.

6. The possibility of a hydrogen electrolyzer on the same site as the natural gas storage facility would increse the risk to an even higher level.

The response by Tribute Resources does not adequately respond to the questions posed by the Municipality of Bluewater or the Huron Federation of Agriculture.

Submitted by,



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