

Poste Saint-Jean 315kV Project

BIUDDO Brief Submitted to BAPE
May 10, 2016

Brief submitted by: Jeffrey Derevensky on behalf of Build it Underground DDO (BIUDDO)/Construisez-la souterrain
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Projet de construction du poste Saint-Jean à 315-25kV et d'une ligne d'alimentation à 315kV à Dollard-Des-Ormeaux

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EXECUTIVE SUMMARY

A group of concerned Dollard-Des-Ormeaux residents remain opposed to the aerial construction of a new 315kV line linking the Hydro Quebec substations on Boul. Des Sources and Boul. Saint-Jean. The proposed 315kV line is to be constructed along the densely populated and heavily inhabited De Salaberry Rd. corridor within a servitude owned by Hydro Quebec. Additionally, this project entails the expansion and upgrading of the Poste Saint-Jean substation to accommodate the 315kV power line (the expansion of the Saint-Jean substation, as proposed, requires Hydro Quebec to acquire property owned by the city of Dollard-Des-Ormeaux). Representatives from Hydro Quebec contend that the Saint-Jean substation, originally commissioned in 1957, remains in need of extensive upgrading and must be replaced to meet the "increasing demand for electricity on Montreal's West Island." While the citizens of Dollard-Des-Ormeaux acknowledge the need to refurbish the station and expand the capacity of the grid, in a meeting at Hydro Quebec's offices on April 30, 2015, citizens were informed that the existing 120/12kV line is currently operating at 80% capacity. As such, the necessity to upgrade the line at the present time has only minimal merit. It would seem that the upgrading of the Saint-Jean substation is required to fulfill future power demands west of Dollard-Des-Ormeaux (west of the Saint-Jean substation) as well as elsewhere on the island of Montreal. As per the BAPE transcript of April 21, 2016, Page 16- afternoon session, Mr. Bruno Picard of Hydro Quebec states "And Saint-Jean will be very good, will give us some leeway to provide service on Montreal island in a durable fashion."

Hydro Quebec's proposal calls for the construction of a new *additional* overhead 315kV line approximately three kilometers in length as well as the expansion and rebuilding of the Saint-Jean substation to accommodate the new transmission line power. This project involves the re-construction and expansion of the substation in close proximity to existing homes and the proposed addition of 11 new 52 meter tall pylons that will support the aerial transmission lines. These lines are proposed to run adjacent to the existing 120/12kV line, already supported by 11, 32 meter tall pylons that are currently erected between the two substations.

This brief addresses the major concerns of the Dollard-Des-Ormeaux citizenry, disputes some of Hydro Quebec's "factual evidence", and presents data suggesting that Hydro Quebec failed to provide adequate and substantial consultation with the public, selectively omitted empirical studies contrary to their position, provided inaccurate information, and failed to provide impartial evidence by independent experts. On April 20, 2016, at the first day of the BAPE hearings, Hydro Quebec was represented by more than 14 paid consultants or employees supporting their claim for an overhead aerial line solution. This brief further provides evidence indicating that only the

economic costs and speed with which this project could be completed were used in their determination of the type of project proposed, in spite of the Regie de l'énergie's requirements that "Hydro Quebec must submit the *best possible project*, one that is technically, economically, *environmentally* and *socially* sound that benefits its customers" (italics added). In testimony before the BAPE, Mr. Mathieu Bolullo, Hydro Quebec's project director and chief spokesperson before the BAPE hearings, indicated the underground solution was considered from an economic perspective (Transcript BAPE hearings, April 20, 2016, page 26) without apparently addressing the social and environmental factors. As a crown corporation, Hydro Quebec has a responsibility and obligation to provide accurate and factual information to both the government and its citizens. In spite of the fact that Hydro Quebec's net revenues between the years 2010-2014 were reported to be \$12.3 billion dollars (Hydro Quebec recently wrote off \$100 million in bad debt, provides exorbitant severance and retirement settlements - its former President is paid \$470,000 indexed for life and its current President, M. Eric Martel, earns over \$480,000 per year), the proposed project is solely based on costs and ease of installation.

It should also be noted that the citizens of Dollard-Des-Ormeaux are not alone in their opposition of overhead transmission lines in densely populated residential areas. On the contrary, community after community, where extensive upgrading projects are proposed, continue to argue for an underground solution based upon social and environmental factors.

The concerned citizens of Dollard-Des-Ormeaux (a petition of over 1,000 signatures was presented to Hydro Quebec – not 200 as inaccurately reported by Hydro Quebec in their documentation (petition can be provided if required) oppose the aerial installation. The citizens of Dollard-Des-Ormeaux, the Mayor, and City Council recommend that the BAPE propose that this new high voltage TRANSMISSION line be constructed underground as is currently being done in the community of Limoilou, Quebec (a suburb of Quebec City) and other densely populated jurisdictions throughout North America and internationally. Mr. Serge Abergel, a spokesperson for Hydro Quebec in his Global News interview (See Appendix - Global News, January 6, 2015), is quoted as saying more and more cables are being buried underground in new residential areas. Google Earth images (see Appendix) point to the growth of the city and the density of residential homes along the servitude. While Hydro Quebec, a crown corporation, professes to be an "international leader" in supplying energy to the constituents of Quebec and the sale and distribution of energy to its neighbors, it has failed to make the distribution and transmission of electrical power environmentally friendly, safe and provide socially responsible solutions. The proposed transmission line and pylons are to be erected in close proximity to a highly populated residential area in the heart of the city of Dollard-Des-Ormeaux.

In a meeting of the City Council of Dollard-Des-Ormeaux, on December 9th 2014, the following resolution was unanimously adopted:

Understanding citizens' concerns, the City of Dollard-Des-Ormeaux Municipal Council, including the mayor, unanimously adopted a resolution on December 9th 2014 requesting that the new 315kV line be constructed underground.

A copy of this resolution was forwarded to Mr. Carlos Leitao, MNA for Dollard-Des-Ormeaux; Mr. Thierry Vandal, then President-Director General of Hydro-Québec; Mr. Pierre Arcand, Minister of Energy and Natural Resources; Mr. David Heurtel, Minister of Sustainable Development and Environment; and Dr. Philippe Couillard, Prime Minister of Québec.

The following concerns are expressed by the citizens of Dollard-Des-Ormeaux (substantiation and details follow in the attached documentation):

- **Inadequate Public Consultation**

Hydro Quebec has failed to provide the citizens of Dollard-Des-Ormeaux with sufficient factual information, has not provided evidence of independent studies, and has failed to meet with residents in a timely fashion outlining the project, potential hazards and possible alternative solutions. Only one public consultation meeting was held in December 2014. **The timeline of this project has been advanced by two years without due consultation with the municipality and residents.**

- **Confounding Facts**

A large number of confounding statements and documents concerning costing, total amperage of the line, combined EMF exposure readings, the possibility of an underground solution, health-related issues, environmental and social issues, amongst others has been presented in a variety of documents submitted by Hydro Quebec. Throughout this brief we shall highlight a number of these issues.

- **Health Risks**

Research and epidemiological studies conducted over the past four decades have shown evidence that Electromagnetic Fields (EMFs) *may* have some adverse biological and health impacts including childhood leukemia, metabolic changes, depression and Alzheimer's disease. Detractors have argued that these studies have not *consistently* proven a causal link between EMFs and adverse health outcomes beyond statistical significance. Nevertheless, both the International Agency for Research on Cancer (IARC) and World Health Organization (WHO) have classified EMFs as a "possible" human carcinogen. In other jurisdictions in North America and Europe, governmental policies are in place to limit EMF exposure through distancing high-voltage lines from high densely populated areas. As early as 1997, Goeters documented the U.S. Government's recommendations via the National EMF Research and Public Information Dissemination program which openly encouraged states to adopt safety regulations in residential areas and called for a moratorium on new overhead installations (Goeters, 1997). The adoption of a policy of "Prudent Avoidance" was recommended. Renee Levaque, coordinator of health and environment at the Direction regionale de sante publique (DRSP), in discussing the installation of a 230 kV transmission line in Limoilou, Quebec, argued that while some studies show possible negative health effects of EMF, and others show no effect, we invoke the principle of "precaution" (See Appendix - Le Soleil, March 23, 2011). The Institut nationale de sante publique du Québec, in a public document (Exposition aux Champs Électromagnétiques: Mise a Jour des Risques pour la Santé et Pertinence de la Mise en Oeuvre du Principe de Précaution (Direction Risques Biologiques, Environnementaux et Occupationnels (December 2006), page iii), similarly called for caution due to suspected health-related concerns.

- **Current Safety Standards Regarding EMF Exposure**

International standards have been established and sanctioned for safe EMF exposure by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and Institute of Electrical and Electronics Engineers (IEEE). While Hydro Quebec claims total compliance with the ICNIRP values, inconsistencies in reports and testimony concerning the maximum cumulative EMF exposure for residences taking into account the 120kV and the additional 315kV line has not been presented. The combined exposure resulting from the existing power lines and the newly planned 315kV line in close proximity to a large number of residents/homes remains of concern. Additionally, there is concern about multi-story buildings (there are senior citizen residences along the De Salaberry corridor) and the exponential EMF exposure based on height.

The information that has been provided by Hydro Quebec in the Impact Report with regards to EMF intensity, shared with the Regie de L'Energie, various ministries and the public, is not based on the final operational conditions of the 315kV aerial line projected between Boulevard des Sources substation and St. Jean substation. The evaluation of the electric and magnetic EMF components were done at 147A per circuit (294A for the line), which would likely reflect the initial average operation of the Saint-Jean substation with 2 transformers only.

During the BAPE meetings, Hydro Quebec provided EMF data for 300A per circuit (600A for the line), which would be the *average current* for the final operation of the substation (with 4 transformers). Nevertheless, based on the transformers' capacity (560MVA), the possible current through the transformers could be significantly higher than the average quoted by Hydro Quebec. Finally, Hydro Quebec has also indicated that the maximum current through the line itself could be as high as 3500A, even though it is understood that this would not be considered an average situation but rather an emergency situation. Therefore, with the suggested growing power needs of the West Island and Hydro Quebec's evolution strategies and projects, we are concerned that significantly more power/current will flow through the line and impact the EMF intensity, even during normal/average operation conditions. As such, the estimated EMF figures that were used and presented by Hydro Quebec for the approval of the project by the Regie de L'Energie and the various Ministries were significantly lower than they would be in reality (future), even under average operational conditions of the projected 315kV line.

- **Cost of the 315kV Installation**

While we acknowledge there are increased costs associated with the underground construction of high-voltage lines, these elevated costs would be amortized over 80 years by all Hydro Quebec users and cannot and should not outweigh the potential environmental and social costs. The estimated costs provided by Hydro Quebec for aerial vs. underground installation of the new line are based upon an 80 year lifespan. Amortized costs over the lifespan of the underground installation of this line are negligible in light of Hydro Quebec's revenues.

No detailed cost analyses or independent studies, lab reports etc., which were requested, have been provided other than a single page document which lists generalized costs. The projected differential costs for building underground versus overhead lines for the Dollard-Des-Ormeaux project appear highly inflated. Mr. Abergel is quoted as saying the costs of building underground are ten times the cost of overhead lines. "For instance, building *one kilometer* (italics added) of a Hydro-Quebec power line above ground costs \$100,000 compared to \$1 million for underground." (Global News, January 6, 2015). If this is accurate, and the distance required is 3 kilometers, the cost should be \$3 million vs. \$300,000.

- **The Saint-Jean Substation**

The proposed enlargement and upgrading of the Saint-Jean substation raises extremely serious concerns for the residents in close proximity. The footprint of the station will be greatly increased resulting in increased noise and greatly reduced distance between the substation and adjacent homes. To mitigate these concerns, Hydro Quebec is proposing the installation of an architectural wall for aesthetic reasons and to reduce the acoustic emissions from the newly configured and enlarged substation. Due to the height of this wall, homes abutting this architectural wall will suffer from reduced sunlight at different times of the day. In the documents Hydro Quebec submitted to the Regie de L'energie, they indicate when analyzing the Saint-Jean substation there were several options including the possibility of relocating the station. This would have been the best alternative. For residents in these homes, financial compensation or expropriation should seriously be considered.

- **Property/Market Values of Residences**

Overwhelming research indicates that the market values of homes near aerial high-voltage power lines and towers/pylons are negatively impacted. Hydro Quebec argues that “power lines, like roads and railways, are an integral part of our modern landscape” and acknowledge that studies on property evaluation (not property market values) tend to show that a power line “may” result in a decrease in property valuation. While many factors impact property and market valuations, in a study supported and funded by Hydro Quebec examining home values in Brossard, Professor Francois Des Rosiers (Laval University) concluded that “severe visual encumbrances due to a direct view on a pylon or conductors does exert a significantly negative impact on property prices, with depreciations ranging from 5% to well in excess of 20%”(Des Rosiers, 2002). He further suggests that the potential health concern and fears from perspective buyers, founded or unfounded, can exacerbate the devaluation of home prices.

- **Financial Compensation for Homeowners Residing Near Aerial Power Line Installations**

In a recent BAPE report (313, issued March 2015) concerning the installation of a 735kV aerial power line in Terrebonne, it was recommended that Hydro Quebec should establish a process of fair financial compensation for residents living adjacent to this newly installed hydro line. No such compensation has been discussed or proposed concerning the Dollard-Des-Ormeaux project, especially for homes near the substation or in close proximity to electrical towers. In British Columbia, BC Hydro purchased 100 homes near a controversial Tsawwassen powerline at a cost of \$62 million after residents were concerned about EMF exposure.

- **Sound Emissions**

Hydro Quebec contends that simulations on the 120kV line carried out by their acoustical engineer, under all conditions, emit sound levels that are less than ambient noise levels. They acknowledge that under certain weather conditions, noise levels “likely increase” but still remain below ambient noise levels. These simulations were not run nor verified by independent acoustical engineers. Rather, all sound emission levels were conducted by Mr. Franck Duchassin, an acoustic engineer at Hydro Quebec (Testimony page 48). High-voltage lines emit sounds, especially under heavy loads and the emissions can be affected by the air and atmospheric conditions

In an effort to minimize the sound emissions at the substation, Hydro Quebec is proposing a sound (fire) wall be established. No independent sound or acoustic studies were performed. Under testimony it was stated by Mr. Bolullo that sound emissions would be decreased due to the upgrading of equipment (Testimony, page 43). Yet no independent reports were provided verifying this information.

- **Physical Safety**

High-voltage power lines present potential safety hazards including risks of electrocution, electrical arcing, fire and the possibility of pylon/tower failure.

- **Weather Impact on the Power Grid**

Aerial lines remain vulnerable to harsh weather including snow/ice storms or high velocity winds, solar or lightening storms jeopardizing the reliability of the power grid. There is research (e.g., Fenrick & Getachew, 2012; McNair & Abelson, 2010) suggesting the financial benefits for underground transmission given power loss (and subsequent revenues) is much less frequent (in September, 2015 thunderstorm activities left 28,000 homes without power across Quebec (6,000 Montreal households), with no disruption of service for residences and commercial establishments where transmission lines were underground.

- **Ecological Factors, Visual Impact and Aesthetic Appearance**

Pylons and aerial wires remain aesthetically unappealing and detract from the urban landscape independent of the proposed landscaping. The proposed project will add an additional 11 much taller pylons, further reducing the available green space (Hydro Quebec does not intend to remove the existing 120kV pylons).

Recommendations

Recognizing Hydro Quebec's stated need to upgrade the power grid, the residents of Dollard-Des-Ormeaux request, based on all of the concerns listed above, that the newly proposed 315kV line be constructed underground in consultation with city council and representatives from concerned citizens groups. In a densely populated urban environment such as the De Salaberry corridor, high-voltage power lines should be constructed underground. There is ample evidence supporting the increasing underground cabling network in Quebec, Canada, the U.S. and Europe, even in non-residential areas (e.g., Underground High Voltage Cables: Wiring Europe for the Future (www.leonardo-energy.org/drupal/book/export/html/868); "Although cables have been in use for over half a century, today's underground high voltage cables are leveraging state-of-the art technology and advanced design to expand their reach and are increasingly becoming an efficient and reliable alternative to overhead lines." According to Hydro Quebec, "Power line undergrounding is gaining popularity. In the United States, most new residential developments have an underground distribution network. In Québec, **wirefree environments are becoming a feature of the urban landscape**. In addition to improving the landscape, undergrounding protects electrical equipment from bad weather and vegetation. It also helps create more open space in neighborhoods" (<http://www.hydroquebec.com/learning/distribution/voie-souterraine.html>).

While there has been no conclusive causal link found between EMF exposure and adverse health outcomes, sufficient serious doubt has been raised (refer to attached documents and World Health Organization classifications). A growing number of national and international jurisdictions have adopted and are continuing to adopt a precautionary policy based on prudent avoidance of unnecessary EMF exposure. An analogy can be made to the use of asbestos in residential and building construction. For many years, asbestos was deemed a safe and effective insulator. Over the years, it became apparent that many adverse health conditions were related to asbestos exposure resulting in it no longer being used for these purposes. In fact, asbestos has been classified as "Known to be a human carcinogen" according to the National Toxicology Program. If one examines the available scientific studies, underground cabling is a more prudent alternative for the safety of all concerned. Assuming that current EMF exposure standards may be adequate to protect against all adverse health outcomes is potentially short sighted until more definitive and rigorous longitudinal research studies have been completed. Dr. Genevieve Ostiguy, a trained Family Physician with little scientific research expertise on EMFs and Hydro Quebec's medical advisor, remains unconvinced in spite of a large number of studies clearly suggesting higher rates of certain forms of cancer. Hydro Quebec physicians remain unconvinced about the potential health related risks of the 315kV line installation despite an overwhelmingly large number of studies showing increased cancer rates. No impartial medical experts with EMF scientific background have been consulted. While causality cannot be empirically validated (through many animal studies), the potential medical and psychological harm toward residents living in close proximity to the substation and overhead lines, along with decreased property values, should be considered. Nevertheless it was reported by Ms. Monique Beausoleil that the MSSS has proposed that such EMF emissions are at a safe level. On the other hand the Institut nationale de sante publique du Quebec's document, entitled Exposition aux Champs Electromagnetiques: Mise a Jour des Risks pour la Sante et Pertinence de la Mise en Oeuvre du Principe de Precaution (Direction Risques Biologiques, Environnementaux et Occupationnels (December 2006 -page iii), calls for caution due to suspected health-related concerns.

Based upon Hydro Quebec's four pillars of project development (social viability, economic concerns, technical feasibility and environmental impact), we the citizens of Dollard des Ormeaux strongly recommend that the proposed 315kV transmission line be constructed underground. Hydro Quebec's own "Prudent Management Position" (www.hydroquebec.com/fields/pdf/position_hq_cem.pdf), in discussing possible health-related risks (2006), acknowledged that it is still possible that children exposed to magnetic fields may be at greater risk of developing cancer. They further state that Hydro Quebec acknowledges the uncertainty could be a concern to its employees, customers and the general public. Their policy goes further, "Hydro Quebec also intends to exercise caution by continuing to contribute to research efforts, being constantly attuned to new knowledge, sharing such knowledge with its partners and the public, and reviewing, as necessary, its electrical equipment design and practices." The Prime Minister of Quebec, Dr. Phillipe Couillard, on May 2, 2016, said "The well-being of our loved ones, our children, is what we have that is most precious."

We urge Hydro Quebec to adhere to its own prudent management position in promoting the health and well-being of its citizens and the aesthetic values it professes. It remains unconscionable to erect eleven-52 meter pylons and high voltage overhead transmission lines in the heart of Dollard Des Ormeaux, in a densely populated residential area consisting of many families with young children and elderly senior citizens.

We urge the BAPE Chairman and Commissioners to recommend to the Minister that this project be significantly modified before being realized and that an underground solution is a necessity based upon the environmental, social viability, and possible negative health impacts of an overhead transmission line of this magnitude. Still further, we strongly recommend that upon completion of the installation of the 315kV line, that the 120 kV line be removed.

INFORMATION RELATED TO THE PROPOSED SAINT-JEAN HYDRO QUEBEC 315KV PROJECT IN DOLLARD-DES-ORMEAUX

The following document provides greater details and evidence supporting an underground solution and addresses the multitude of the concerns by the residents of Dollard-Des-Ormeaux concerning the expansion and rebuilding of the Saint-Jean substation and the aerial construction of the new 315kV line

1. INADEQUATE PUBLIC CONSULTATION BY HYDRO QUEBEC

Hydro Quebec claims to have initially sent 1,000 letters concerning the proposed project to Dollard-Des-Ormeaux (DDO) homes directly impacted by the project during the week of November 24, 2014. This unilingual French letter briefly described the proposed 315kV project and invited residents to attend an information meeting on December 2, 2014 at the DDO Civic Center, giving concerned citizens less than 2 weeks' notice regarding the meeting. Approximately 40-50 residents attended this meeting. According to Hydro Quebec documentation, a follow up public consultative meeting was scheduled for the Spring of 2015, but this meeting never convened. At the request of the Build it Underground (BIUDDO) citizen group, a meeting was held on April 30, 2015 at Hydro Quebec's offices on Jarry Street. At this meeting, Hydro Quebec representatives assured the BIUDDO team that additional public consultations would be held. Unfortunately, there were no other public consultation meetings. Consultation by Hydro Quebec has merely consisted of several newspaper advertisements depicting the proposed project, with none of these advertisements calling for a public consultative process, as promised, nor was there any indication of the need for community discussion and/or dialogue. Throughout our door-to-door canvassing and discussions with residents, we did not encounter a single person who was aware of the proposed hydro line project, underlining the lack of public consultation for this project. Additionally, after our arranged meeting with Hydro Quebec in April, 2015, it seems that the original timeline for the project had been unilaterally accelerated with construction slated to begin two years earlier than originally presented, once again without any public notice or consultation. On April 19, 2016, the day before the scheduled BAPE hearings, a limited number of citizens received a document published by Hydro Quebec entitled "Seven questions about the Saint-Jean Project" in their mailbox (BAPE document DA15) which attempted to address the citizens' concerns as voiced on March 30, 2016 in a general meeting held as part of the BAPE hearings. In several meetings, Dollard-Des-Ormeaux city council requested a delay for the initiation of this project in order that the city might engage independent consultants to provide expertise and advice. This was once again requested at the BAPE hearing on April 21, 2016 by Mayor Ed Janiszewski and was not supported by Hydro Quebec. On April 21st, 2016, in testimony before the BAPE hearings, Mr. Bolullo, project director for the Saint-Jean project and employee of Hydro Quebec, indicated consultations were requested with the City of Dollard des Ormeaux to show how Hydro Quebec might be open to an underground solution based upon a cost sharing program. In sworn testimony before the BAPE hearings on April 21st, Mr. Jacques Benzsqen, Town Manager, testified having been at all meetings between the City and Hydro Quebec and having never being contacted by Hydro Quebec with any possible alternative solutions in spite of testimony by Mr. Bollulo (BAPE transcript - April 20, Page 124).

For well over a year the representatives of the residents of Dollard-Des-Ormeaux have called for alternative solutions or design features, and repeatedly requested more detailed cost analyses, reports and laboratory findings. Throughout all discussions, Hydro Quebec indicated that only lattice poles were possible due to concerns related to graffiti and aesthetic concerns. The first publicly presented alternate aerial installation options were unveiled by Hydro Quebec at the BAPE hearings on April 20-21, 2016. These alternative pylon types

(varying heights/spans) and pylon placements, had never been previously discussed with the residents or city officials nor had the possibility of an underground solution on a cost sharing basis (once again no details were provided). This lack of discussion is representative of Hydro Quebec's perceptions of "consultation" with the residents in the municipality.

2. HEALTH CONCERNS

Few environmental health issues are as contentious as the question as to whether or not exposure to EMFs from overhead power lines increases cancer or is associated with other related health risks (Schoen, 1996). During the past forty years, there have been a large number of studies attempting to assess whether or not EMF emissions from high-voltage power lines have any associated negative health-related risks. More specifically, these studies have been done in controlled laboratory settings as well as in naturalistic environments. The potential for impact upon individuals has intensified significantly since 2000, with hundreds if not thousands of studies being conducted and published. While Dr. Ostiguy, a family physician and Hydro Quebec consultant, testified that these studies have shown no causal effect, the most recent Bioinitiative Report (2012) prepared by 29 international experts from 10 countries holding medical degrees, PhDs, and MSc, MA or MPH degrees, after reviewing the epidemiological evidence from several thousand studies over four decades, point to serious biological and health related harms from EMFs. These studies have been conducted internationally, spanning many decades and incorporating a multitude of methodologies and varying numbers of participating subjects. The evidence indicates that causal links between health problems and EMFs may have been identified. Additionally, the Bioinitiative Group in 2007, written by 14 scientists, public health and public policy experts, after reviewing the scientific evidence available at that time suggested that existing public safety limits for EMF exposure are inadequate to protect public health (Bioinitiative Report, 2007). Dr. Ostiguy, when requested by the Chairman to produce the evidence refuting the Bioinitiative report produced rather general documentation (BAPE Document DA32). In testimony before the hearings, Dr. Ostiguy presented a slide indicating that no possible effects of cancer were found to be associated with EMF exposure (DA 8). Yet, Dr. Durre Hassan, a physician and resident living near the 120kV line and afflicted with acoustic neuroma, aptly pointed out to Dr. Ostiguy that relative risks of cancer greater than 1.0 presented in Dr. Theriault's summary of results (BAPE Document DA8) is in fact significant and of great concern.

2.1 EMFs Classified as Possible Human Carcinogen

The findings of numerous research studies indicate a myriad of correlative health-related concerns related to EMF exposure. In a 1996 report by the American Cancer Society, after reviewing 20 years of population health and illness research, concluded a possible relationship between brain cancer and EMF exposure. In 1998, a working group of the U.S. National Institute of Environmental Health Sciences concluded that exposure to EMFs is a possible human carcinogen, while in 2001 a working group assembled by the International Agency for Research on Cancer (IARC) concluded that EMF exposure can be classified as a **Group 2b carcinogen (possible human carcinogen)**.

Most notable is the work supported by Hydro Quebec of Dr. Theriault and his colleagues (BAPE Document DA8) which was presented in documentation by Hydro Quebec. Theriault's study examined retrospectively 4151 cases of cancer that occurred between 1970 and 1989 among 223,000 utility workers in Quebec, Ontario and France and matched them with a control group of subjects similarly working for the utility companies but who were cancer free. Two categories of cancer were examined: (a) leukemia, brain cancer and melanoma; and (b) all other forms of cancer. Theriault's findings were inconsistent across the three groups of workers studied, with some groups showing elevated risks associated with EMF exposure while others did not. Explaining his results, Theriault suggested it "was tough to do. I felt it was my duty not to create panic, but I could not hide what I saw either. I had to say there might be a risk here. But it's minimal" (Schoen, 1996). This study, published in the American Journal of Epidemiology, 1994, Volume 139, 550-572, was not without criticism and resulted in Drs.

Theriault and Armstrong replying to critics (American Journal of Epidemiology, Volume 145, March 1997). In a further review of EMF research, Dr. Theriault concluded "Something's going on that still evades our comprehension" (Theriault, 1995). One further point on Theriault et al.'s study is important to note. A report in Microwave News, 1994, Volume XIV, No 6, dated November/December (see Appendix) indicates that Hydro Quebec refused to allow the researchers the opportunity to further analyze the data collected in the \$3 million dollar funded project. Dr. Gilles Theriault is quoted as saying "I can't use the data anymore...It's in the contract that the data belongs to the utility and so I can't use them." Dr. Michel Plante, another medical advisor to Hydro Quebec, and liaison between the utility company and the McGill research team, is quoted as saying "...we have a contract problem that has to be resolved and there will be no new mandate until it is solved." This withdrawal of the contract and refusal for further data analysis drew strong negative reactions and criticism to Hydro Quebec from the international scientific community. Such data confirming an association between EMFs and cancer prompted the lawsuit between residents and BC Hydro (this will be further discussed in the section identifying a loss in homeowner's property values). It should be noted that in the BC Hydro case, the proposed transmission line was 230kV for a length of 3.7kms. This lawsuit (available http://www.oag-bvg.gc.ca/internet/English/pet_259_e_31670.html) provides further documentation on health risks associated with EMFs.

2.2 Childhood Leukemia

As far back as 1979, childhood leukemia has been correlated with exposure to residential electromagnetic fields (<http://www.emfsolutions.ca/powerline-EMF.php>). With dozens of studies having been published to date, power frequency (ELF-EMF) is amongst the most comprehensively studied environmental factor (Bioinitiative Report, Summary for the Public, 2012). Sufficient evidence exists from epidemiological studies of an increased risk for this type of cancer from repeated exposure to EMFs that cannot be attributed to chance, bias or confounding variables. In 2000, Ahlbom and colleagues conducted a review of the relationship between EMFs and health effects, and reported that there was a doubling in childhood leukemia (a low base rate disorder) for children exposed to magnetic fields of over 0.4 μ T (4 milligauss).

A 1996 study by Coghill on childhood leukemia in the U.K. reported not only an increase in leukemia and cancer risk but that exposure to high frequency EMFs was a contributing factor to headaches, fatigue, depression and sudden infant death syndrome (SIDS).

In 2001, the World Health Organization (WHO) conservatively classified the EMFs generated by power lines as a carcinogen (Class 2b) based on epidemiological studies of childhood leukemia. They issued Factsheet No. 263 in October 2001 on EMFs and cancer. This classification of EMFs as a possible carcinogen was based primarily on the IARC's similar evaluation with respect to childhood leukemia.

In 2002, the EMF Program of the California Department of Health (CDH) concluded in their Executive Summary (California EMF Risk Evaluation): "To one degree or another, all of the Department of Health scientists are inclined to believe that EMFs can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig's Disease, and miscarriage." <http://www.ehib.org/emf/RiskEvaluation/ExecSumm.pdf>

In 2005, Draper et al. studying 29,000 cases of childhood cancer in the U.K. found an increased risk of childhood cancer (including leukemia) for those living within 200 meters (656 Ft) of an overhead transmission line at birth compared with those who lived beyond 600 meters.

In 2012, Kundi (Bioinitiative Report) stated that "the balance of evidence [from EMF/childhood leukemia studies] suggests that childhood leukemia is associated with exposure to power frequency EMFs either during early life or pregnancy."

It should be noted that Dr. Ostiguy, in hearings before the BAPE, provided testimony attempting to discredit the Bioinitiative report. When asked to provide details, she provided very general non-specific references (DA32) which failed to identify specific reports, documents or research. As previously noted Dr. Ostiguy, is a family physician with no academic credentials as a clinical research scientist concerning EMF exposure. While a medical consultant to Hydro Quebec, she has never been directly involved in designing research methodologies related to the issue of EMFs nor has she published any scientific evidence in peer reviewed publications concerning the impact of EMF exposure.

The Institut nationale de sante publique du Québec, in a public document (Exposition aux Champs Électromagnétiques: Mise a Jour des Risques pour la Santé et Pertinence de la Mise en Ceuvre du Principe de Précaution (Direction Risques Biologiques, Environnementaux et Occupationnels (December 2006), page iii), calls for caution due to suspected health-related concerns from EMF exposure:

Le niveau de risque associé à l'exposition aux CEM pour l'ensemble de la population, s'il est réel, s'avère faible. Néanmoins, du fait que pour certains groupes plus exposés, il peut s'agir d'un risque important, l'institut national de santé publique du Québec considère que le gouvernement du Québec devrait prendre position sur la gestion des CEM et se doter d'une approche de précaution. Cette position devra considérer d'une part, la sensibilité des enjeux autour du risque de leucémie chez l'enfant et d'autre part, les incertitudes scientifiques quant à la détermination d'un lien causal (Institut national de sante publique Québec, 2006).

2.3 Changes in Metabolism

In peer review journal articles, researchers Li and Heroux (2011, 2014) reported that **low frequency magnetic fields alter metabolism in ways that have not been accounted for in any published safety standards**. Their study indicates that "environmental MFs act on the core metabolism" and that "the interaction between power-frequency MFs and living organisms may have been underestimated for a long time" (Li & Heroux, 2014, 274).

2.4 Melatonin, Breast Cancer

There is evidence that exposure to EMFs can result in decreased melatonin production which may increase risk for breast cancer (Bioinitiative Report, Summary for the Public, 2012). Levallois et al. (2001) reported that "Chronic residential exposure to magnetic fields from high-power lines may accentuate the decrease in melatonin secretion observed in some vulnerable subgroups of the population." Feychting et al. (1998) found an elevated risk of breast cancer among exposed women in the youngest age category in their study, findings which were consistent with the results from several previous studies.

2.5 Alzheimer's Disease

There is growing epidemiological evidence that exposure to EMF may be a risk factor for Alzheimer's Disease. There are now 12 studies of ELF EMF exposure and Alzheimer's/dementia – 9 of which support a positive correlation between ELF exposure and Alzheimer's (Bioinitiative Report, Summary for the Public, 2012). The results from Huss et al.'s (2008) longitudinal study in Switzerland also supports the hypothesis that magnetic field exposure plays a role in Alzheimer's disease and senile dementia. Additionally, another neurodegenerative disease susceptible to EMFs is Amyotrophic Lateral Sclerosis (ALS). A 2010 report by the ICNIRP concluded that the evidence of an association between EMF exposure and these diseases was inconclusive, even though some studies had shown a correlation. This conclusion was based primarily on the absence of a biological mechanism to explain a potential association between EMF exposure and these diseases, however this does not preclude the existence of such an association.

2.6 Statistical Significance and Meaningfulness of Data

In interpreting these studies it is important to present information concerning statistical significance of findings. In essence, biostatisticians and scientists use a multitude of statistical procedures to ensure that their findings are not derived by chance when comparing two groups (e.g., those exposed to high EMFs and those not exposed). The lower the “p value” (p is the probability value used to determine statistical significance) the greater the certainty of findings. However, this does not necessarily equate to meaningfulness. Other studies report their data using odds ratios, thus suggesting the probability of an individual having a particular disorder. However, there is an important distinction between statistical significance and *meaningfulness*. The argument for a protective policy is such that it handles outlier cases and instances where findings may be mixed. For example, some illnesses have low base rates of occurrence (e.g., childhood leukemia). But imagine if only 1 child gets leukemia as a result of living in this environment and it was your child or grandchild. While the occurrence of one child being inflicted may not reach statistical significance, the negative consequences are indeed devastating for the child and his/her family. Similar parallels can be found in pharmacological studies. While such studies may not conclusively confirm causality, the findings of association should necessitate a precautionary approach from a public health policy perspective.

It is essential to note that the population of Dollard-Des-Ormeaux is comprised of 17.1% of children age birth to 14 years of age, this compared to the city of Montreal with 15% of its population at this age. If in fact, younger individuals are more vulnerable to EMFs, Dollard-Des-Ormeaux has a higher percentage of young people and families than Montreal (Ville de Montreal - Table 8.2, 2014a, 2014b).

3. PRECAUTIONARY APPROACH TO EMF EXPOSURE

There remains little doubt that technological developments bring social and economic benefits to society as a whole. It is undeniable that our reliance on stable electricity is essential. However, the health effects, or potential health effects, and consequences of exposure to EMFs can be difficult to predict and manage (*The Sensitivity of Children in Electromagnetic Fields* by Drs. Kheifets, Repacholi, Saunders and van Deventer in the journal *Pediatrics*, a top tiered peer reviewed publication - accessible from www.pediatrics.aappublications.org/content/1156/2/e303.full.html). Based upon workshops held by the World Health Organization in Turkey in June 2004, they concluded that when risks are small or complex or an established cause-effect is absent or the scientific findings are not sufficiently quantifiably robust, “the need for timely preventative action makes a precautionary approach an essential part of policy making.” They further go on to suggest that “with regards to childhood exposure to EMFs (and exposure during pregnancy), several factors argue for the adoption of precautionary measures, including the possibility that EMFs might affect children.” The World Health Organization’s policies argue for this precautionary approach as has the Direction regionale de sante publique (DRSP).

As new evidence continues to emerge, it becomes even more difficult and costly to remove overhead transmission lines and towers and reposition them underground. Predicated on maintaining the social and environmental fabric of Quebec, we urge for a precautionary approach.

Prudent avoidance and limiting of EMF exposure has been adopted as part of policy in several countries, including Australia, New Zealand and Sweden, while other countries and American States have argued for a similar approach. The following Table provides an overview and example of a number of jurisdictions incorporating a precautionary approach in high density areas and in close proximity to schools.

Table 1: Examples of various approaches to EMF exposure limitation for the general public good

Jurisdiction	Limits	Comments
The Netherlands, 2005	Increased distance between power lines and places where children can spend significant amounts of time to ensure that their mean exposure will not exceed 0.4 μ T	This regulation applies to new buildings near existing power lines, or new power lines near existing buildings
USA	Restrictions on placing new schools close to existing electric transmission lines	Adopted by the California Department of Education
	New lines must be buried unless technically unfeasible and there must be buffer zones near residential areas, schools, day care facilities and youth camps	Adopted by the State of Connecticut

(Extracted from the World Health Organization report, 2007)

4. CURRENT SAFETY STANDARDS REGARDING EMF EXPOSURE

International standards have been established and sanctioned for safe EMF exposure by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and Institute of Electrical and Electronics Engineers (IEEE). While Hydro Quebec claims complete compliance with the ICNIRP values, Hydro Quebec has not yet disclosed the EMF exposure for residences (especially for those residences within close proximity to the substation and/or overhead transmission lines 25-30 meters of the projected power lines) taking into account the combined exposure resulting from the existing 120kV power lines as well as the newly planned 315kV line that are in close proximity to a large number of residential homes. Additionally, concern about the maximum amperage of the 315kV line and the values presented for EMF fields by Hydro Quebec appears to be underestimated.

During the BAPE meetings, Hydro Quebec provided EMF data for 300A per circuit (600A for the line), which would be the *average current* for the final operation of the substation (with 4 transformers). Nevertheless, based on the transformers' capacity (560MVA), the possible current through the transformers could be significantly higher than the average quoted by Hydro Quebec. Finally, Hydro Quebec has also indicated that the maximum current through the line itself could be as high as 3500A, even though it is understood that this would not be considered an average situation but rather an emergency situation. Therefore, with the suggested growing power needs of the West Island and Hydro Quebec's evolution strategies and projects, we are concerned that significantly more power/current will flow through the line and impact the EMF intensity, even during normal/average operation conditions. As such, the estimated EMF figures that were used and presented by Hydro Quebec for the approval of the project by the Regie de l'Energie and the various Ministries were significantly lower than they would be in reality (future), even under average operational conditions of the projected 315kV line.

5. PROPERTY VALUES

5.1 Empirical Studies Indicate Property Devaluation

Contrary to Hydro Quebec's position, there is abundant research indicating that property values of homes near aerial high-voltage power lines and towers/pylons are negatively impacted by proximity to the towers/pylons.

Pitts and Jackson (2007) reported that the effects of high-voltage lines on the value of residential properties are determined by five interplaying factors; proximity to towers and transmission lines, view of towers/power lines, type and size of the high-voltage lines, pylon structures, and appearance of the easement. They interviewed brokers and realtors and were told that these professionals had observed negative property resale impacts on home directly adjacent to high-voltage power line rights of way. On average, they reported price discounts ranged from 2% to 7% for homes adjacent to the servitude.

Des Rosier (2002), in a study supported by Hydro Quebec in Brossard, Quebec, argued that there are multiple determinants impacting resale values of homes. Nevertheless he concluded that "severe visual encumbrances due to a direct view on a pylon or conductors does exert a significantly negative impact on property prices, with depreciations ranging from 5% to well in excess of 20%." He further suggests that the potential fear from perspective buyers, especially within higher social economic status (SES) areas (personal communication, April 29, 2016), founded or unfounded, can exacerbate the devaluation of home prices. Higher valued homes are generally more sensitive to the negative impacts of high-voltage lines than lower-end homes (Des Rosiers, 2002). Similar findings have been reported in Brisbane, Australia (Han & Elliot, 2020), Wisconsin (Jackson, Pitts, & Norwood, 2012), Research Department of the Appraisal Institute (Delaney & Timmons, 2001), Texas (Boltyon & Sick, 1999), and San Francisco (Priestley & Evans, 1996). In a comprehensive review by Thomas Jackson, Clinical Associate Professor at Texas A & M University, he reviewed 13 research studies in 13 urban environments in Canada and the U.S. and found that all study authors reported lower market values when homes are situated near high tension overhead transmission lines. As Kielisch in Wisconsin and Des Rosier in Quebec noted, "Perception = market value." Independent of research findings, the perception that high EMF may induce cancer or be associated with other negative health consequences has a direct negative impact on market value.

5.2 BC Hydro - the Tsawwassen 230kV Project

In 2009, a project initiated by BC Hydro to install a 230kV transmission line in Tsawwassen, BC resulted in the utility purchasing 104 homes from residents living adjacent to this new power line development. BC Hydro paid residents \$62 million dollars to purchase their homes with the intention of reselling the properties over at least a 2 year period (See Appendix - Canada.com, May 27, 2009). In March 2010, CTV Vancouver news reported that only 28 of the 104 homes had been sold. Veteran realtor Paul Eviston was quoted as saying "You're probably going to find for every 10 buyers, 2 would consider buying there and 8 would not" (See Appendix - CTV News, March 28, 2010). BC Hydro estimated that by the time all the homes would be sold, its net costs for the repurchasing program would be \$23 million. Interestingly, the projected cost for burying the lines was estimated to be \$24 million (See Appendix - Canada.com, May 27, 2009)

5.3 Property Value vs. Market Value

In a question posed to Mr. Bernard Cote, by the Chair of the BAPE, Mr. Bergeron, it was stated that he was unaware of property devaluations on the city's tax role (April 20, 2016 testimony, p.141). However, the issue here is not city evaluation as much as market value. There is clear evidence that the closer one is to the overhead transmission lines the more impactful this project will be. While it should be noted that many of the residents having homes along the servitude are middle class or upper middle class, a large number of homes are occupied by individuals for whom their entire life savings and financial security rests with the market value of their homes. It is Hydro Quebec's contention (Hydro Quebec PowerPoint presentation, April 30, 2015) that there

are no serious implications for resale of homes after such a project, "Hydro Quebec believes that, in the residential market, properties bordering a transmission line right-of-way will always find interested buyers". The issue is not whether homes can be sold but at what cost and reduced valuation. Market value remains of significant concern to the residents.

5.4 Property Value Diminution - Hydro Quebec Compares Dollard-Des-Ormeaux to Rural New Hampshire

The Northern Pass Transmission lines project, used by Hydro Quebec as support for negligible changes in property value discusses market values from four studies and suggests that there will be a small impact (3.5% impact) on property values in *Northern New Hampshire*. By using this report, Hydro Quebec implies that the property valuations for the homes along the De Salaberry corridor will only be marginally impacted. The impact on residential properties in Dollard-Des-Ormeaux is not comparable to a more rural, less densely populated environment. While Dr. Chalmers, the author of the Northern Pass study, emphasizes the importance of distinguishing between the "empirical evidence and the public perception of real estate value effects" this is completely contradictory to the sophisticated models elaborated upon by Des Rosiers, in a study funded by Hydro-Quebec but yet not referenced by Hydro Quebec. A lack of transparency and selective use of data by Hydro Quebec remains a serious concern. There is also evidence that the height of the towers supporting overhead transmission lines may be related to market value.

6. COST OF THE 315KV INSTALLATION

6.1 Actual Costs and Amortization

While there are undoubtedly increased costs associated with the underground construction of high-voltage lines, these elevated costs will be amortized over many years to all Hydro Quebec users, as is done in every single project. For example, the construction costs of the Limoilou project are realized by all Hydro Quebec subscribers. The City of Dollard-des-Ormeaux, and many of its citizens, have requested detailed costs associated with the construction of the 315kV line and upgrading of the substation (additional land must be purchased) as well as detailed comparative data with the underground solution in Limoilou, which was a much more complex project. The Poste Saint-Jean project, which will directly negatively impact the residents of Dollard-Des-Ormeaux, is in fact designed to improve the overall grid for Montreal and service other communities (e.g., Pointe Claire, Beaconsfield, Baie D'Urfe). As previously noted, we were informed that DDO is operating at 80% capacity. The population of Dollard-Des-Ormeaux has risen marginally from 1991 to 2011 (46,922 to 49,637). In fact, between the years 2006 and 2011 it was virtually identical (48,930 in 2006 and 49,637 in 2011) (Ville de Montreal, 2014a, 2014b). With little land for new homes and many warehouses and businesses closed it is likely that we are operating at less capacity, thus the immediate need should not be imminent. Additionally, by upgrading the capacity of the Boul. St Jean substation, presumably Hydro Quebec will be able to offer power to a larger number of residents/locations therefore further increasing revenues and amortizing the costs.

6.2 Cost Comparison of the Poste Saint-Jean and Other Underground Projects

Documents provided by Hydro Quebec (DA3, DA27) highlight costing between the Poste Saint-Jean project and the Limoilou and De Viger/De Lormier projects (DA27). With respect to the Saint-Jean project, no explanations are provided as to why there is an increased projected costs for "approvisionnement" during the second cycle (\$11.2 million vs \$13.4 million). As well, additional costs for provisions increased. Still further, why does Hydro Quebec pay financial interest at 8.0% with their overall net annual revenues last year being \$3.38 billion, with an approved rate increase for 2016 being 2.9%? From a construction cost perspective, overall management fees of the project seems excessive. If one is adding demolition costs for cycle 2, why is there not a reduction in engineering and pre-project costs? In a project of this scope, is it not customary to have multiple bids from contractors? Financing and other costs total \$12.6 million for both cycle 1 and cycle 2. Once again, this seems exorbitant, representing almost 22% of the overall budget. Finally, a comparison presented in documentation

provided (DA27) by Hydro Quebec failed to double their costs of underground cabling in other projects , as was done in the Dollard-Des-Ormeaux project.

7. HYDRO QUEBEC REVENUES

7.1 Hydro Quebec Shows Record Revenues

To put this project and other ongoing projects in perspective, in 2014, Hydro Quebec profits rose 15% to \$3.38 billion. Each year, Hydro Quebec proposes a rate increase and is granted this increase in spite of growing revenues. A rate increase of 2.9% was also approved for 2016. Additionally, Hydro Quebec's former president retired with a very generous, indexed pension of roughly \$470,000 per annum.

7.2 Cost vs. Revenue for the Poste Saint-Jean Project

The Poste Saint-Jean project is intended to provide additional power to other West Island jurisdictions and will therefore generate significant revenues for Hydro Quebec. In all of the discussions regarding the costing of the project, there has never been any consideration of the projected increased revenues that will be generated.

7.3 Financial Compensation for Homeowners

In the Bureau d'audiences publiques sur l'environnement (BAPE) report 313 issued in March, 2015 concerning the installation of a 715kV aerial hydro line in Terrebonne, Quebec, the BAPE concluded that "the promoter (Hydro Quebec) should establish a process of fair financial compensation for residents living adjacent to this newly installed hydro transmission line." This ruling establishes an important precedent for other Hydro installations. Should the overhead transmission lines be constructed, the citizens of Dollard-Des-Ormeaux request compensation based upon a declining market value rate for their homes. The reality is that the market value of homes in close proximity to the new overhead lines and pylons will see a significant decrease in actual value and residents should be appropriately compensated. In contrast, It should be noted that Hydro Quebec, through its Integrated Enhancement and Development Program, has expressed that they will give \$400,000 to the city to support any initiative chosen by them while not providing homeowners any compensation for lost market value.

8. ECOLOGICAL CONCERNS

8.1 Ecological Factors, Visual Impact and Aesthetic Appearances

There is little doubt that the inclusion of additional pylons and aerial wires are aesthetically are unappealing, detract from the urban landscape, do not respect the city's bylaws, and are green space unfriendly. The proposed project will add an additional eleven 52 meter pylons (roughly twice the height of the existing 120 kV pylons) , further reducing the available green space (they do not intend to remove the existing 120 kV pylons). While Hydro Quebec has provided pictures depicting the beautification of the servitude after installation of the overhead lines and pylons (see Appendix), they have failed to adequately take care of its servitude (see Appendix - picture taken June, 2015 from Montevista facing East). In testimony before the BAPE, and questioned why the citizens should believe the beautification pictures proposed (Hydro Quebec in their PowerPoint presentation indicated that they "intend to create a model right-of-way with the collaboration of the city of DDO (Landscaping and recreational facilities)", Hydro Quebec indicated that they only cut the grass twice per year on their servitude near existing homes. Yet, the residents of DDO are asked to believe that "accessibility and recreational use will be maintained and improved." The doubling of the number of existing pylons will significantly detract from the landscape independent of the beautification of this property. In documentation provided by Hydro Quebec, they suggest they "will create an *exemplary* (italics added) property with the collaboration of the municipality by creating recreation and landscaping in the existing Hydro Quebec property." Unfortunately, they have not realized this since the incorporation of the city. They further profess that "The installations would permit a harmonious cohabitation in the long term between vegetation and the electrical lines." Once again, the residents remain more than skeptical about such dubious claims. Still further, the greatly enlarged Saint-Jean substation

will significantly encroach on neighboring homes. There remains no level of landscaping that could realistically hide such large transmission towers with shrubbery.

9. NOISE EMISSIONS

Research indicates that high-voltage power lines emit audible noise. The following concerns have been raised (a) Increased sound emission: constant hum that can go up to 30dB; (b) the transmission lines can crackle under adverse weather conditions going up to 70dB; and (c) humidity, rain, snow fog increase the electric conductivity of the air and increases the corona effect (Robert Dent, IEEE, Scientific America).

In dry weather conditions, noise from a 300 kV transmission line (Rpd-Tveiten) measured 4-26, 18-29 and 22-33dB at distances of 50m, 30m and 20m, respectively, from the outer line (NVE 1979). In humid weather, the noise increases up to 15-30dB compared to recordings in dry weather. A study by Ustad (1997) revealed that discharge noise from a 300kV power line in Slidalen dominated over background noise (wind noise) in the frequency area between 2 and 16kHz in misty weather. Noise from the line and the surrounding vegetation was recorded in the range 30Hz to 16kHz, with corresponding sound pressure varying from 70dB to less than 5dB. Yet testimony before the BAPE suggests sound levels from both the 120kV and 315kV lines collectively would not exceed that of ambient noise levels. It is also important to note that homes bordering the servitude vary in distance from the proposed towers, that the proposed transmission line will be in very close proximity to a senior citizen's residence, and that sound checks were not taken at different heights.

10. PHYSICAL SAFETY

High-voltage aerial power lines present safety hazards including the risk of electrocution, electrical arcing, fire and the possibility of pylon/tower failure under severe weather conditions (such as the those encountered in the ice storm of 1998). In an article in the West Island section of the Montreal Gazette from April 1, 2015, Jean-Phillipe Rousseau of Hydro Quebec, responding to inquiries about the felling of trees in the Bois-de-Liesse park stated, "Electricity can arc from a line to a tree causing injury to bystanders and even fire." (See Appendix - Montreal Gazette, April 1, 2015). Later in the article, he also stated "We do prune trees but under high-voltage wires, pruning does not allow us to control the risk." Based on these statements, how would it be safe to build a park or recreational facilities below these power lines as there seems to be considerable risk associated with aerial high-voltage lines?

11. WEATHER IMPACTS ON THE POWER GRID

Aerial lines are vulnerable to harsh weather including snow/ice storms or high velocity winds, jeopardizing the reliability of the power grid. Undergrounding the wires ensures the minimization of weather related disruptions. Based upon testimony of Mr. Christian Royer, an engineer employed by Hydro Quebec, "...underground lines are very reliable so any internal breakage due to, you know, wiring is so (italics added) rare, once every five or ten years. And that's worldwide experience" (April 21, Volume 2 testimony, p.48).

12. BURYING POWER LINES – WHAT RESPONSIBLE JURISDICTIONS ARE DOING: SOME EXAMPLES

12.1 United States

According to the Federal Energy Information Agency, nearly all new residential and commercial developments have underground electric service (Smith, 2014).

12.2 Quebec

According to the Hydro Quebec website (<http://www.hydroquebec.com/learning/distribution/voie-souterraine.html>, Retrieved April 5, 2015), power line undergrounding is gaining popularity. In the United States, most new residential developments have an underground distribution network. In Québec, wire free

environments are becoming a feature of the urban landscape. More and more towns and cities are choosing to bury distribution lines in new neighborhoods. In addition to improving the landscape, undergrounding protects electrical equipment from bad weather and vegetation. It also helps create more open space in neighborhoods. In Québec, it was reported that less than 1% of the distribution lines are below ground (Testimony, page 56). It was suggested that this figure is consistent with undergrounding rates elsewhere in Canada. Undergrounding any distribution system is more expensive than building overhead lines, and the decision is up to provincial and municipal authorities, not utilities (Hydro Quebec, 2015).

13. HYDRO PROJECTS IN OTHER JURISDICTIONS

Research shows that in other jurisdictions within Canada and even Quebec, the proposal of new aerial high-voltage lines has met, and continues to meet, with strong opposition from residents in St-Adolphe de Howard, Rawdon, Brossard and others. After strong opposition from residents in Limilou Quebec regarding the trajectory of an underground solution, a much more complex solution than that in Dollard-Des-Ormeaux, was arrived at by a task force consisting of representatives from Hydro Quebec, residents and other stake holders.

14. CONCLUSIONS & RECOMMENDATIONS

While it is not realistic to reconstruct all exiting electrical distribution systems in the short term, steps to reduce exposure from these existing system needs to be initiated especially in places where children spend time (Hardell & Sage, 2008). From a reliability perspective, there is little doubt that residential and commercial establishments rely heavily upon continuous service. Overhead lines are more subject to service outages. The undergrounding of power lines can be effective in mitigating or preventing common sources of interruptions and provides a useful alternative in providing a reliable power supply (Fenrick & Getachew, 2012; McNair & Abelson, 2010). Of particular importance is the adoption of a precautionary approach limiting EMF exposure in high-density urban area adjacent to homes with young families. In documents filed by Hydro Quebec, it was stated that EMF exposure does not represent a significant problem. There is a growing body of scientific evidence suggesting adverse health consequences are associated with high EMF exposure. A prudent management position suggest extreme caution in continuing an overhead solution in densely populated areas.

The urban plan of the City of Montreal (Ville de Montreal 2014a, 2014b) puts forth seven orientations and priorities for the planning of the entire Island. these include:

- Living areas that are of quality, diversified, and complete.
- Structured transportation network that is efficient and well integrated in the urban landscape.
- A prestigious centre, user friendly and inhabited.
- Dynamic employment sectors, accessible and diversified.
- A quality urban landscape and architecture.
- Archeological, built and natural heritage that is valued.
- A healthy environment.

The proposed project with 52 meter pylons is certainly not well integrated into the urban landscape, it does not convey a prestigious user-friendly, inhabited centre, it fails to bring forth a quality urban landscape or architecture, and does not in any way promote a healthy environment. As such, the proposed project fails to adhere to the City of Montreal's planning directives.

Recognizing Hydro Quebec's need to upgrade the power grid, the residents of Dollard-Des-Ormeaux request, based on all of the concerns listed above, that the newly proposed 315kV line be constructed underground. In a densely populated urban environment such as the De Salaberry corridor, high-voltage power lines should be constructed underground. While there has been no conclusive link found between EMF exposure and adverse

health outcomes, serious doubt has been raised. Many international jurisdictions are adopting a precautionary policy based on prudent avoidance of unnecessary EMF exposure. An analogy can be made to the use of asbestos in home and building construction. For many years, asbestos was deemed a safe and effective insulator. Over the years, it became apparent that many adverse health conditions were related to asbestos exposure resulting in it no longer being used for these purposes. Assuming that current EMF exposure standards may be adequate to protect against adverse health outcomes is potentially short sighted until more definitive and rigorous longitudinal research studies have been completed. As was the case of asbestos, originally deemed safe, scientists have subsequently learned their significant carcinogenic impact. Numerous jurisdictions have called for a precautionary, prudent approach to EMF exposure in densely populated areas.

It is worth reiterating Premier Couillard's recent statement, "The well-being of our loved ones, our children, is what we have that is most precious." For health, safety, social and environmental reasons and the well being of the residents, and in keeping with Quebec's, the City of Montreal and the City of Dollard-Des-Ormeaux's priorities and policies, we urge the BAPE to recommend that this project, as currently presented, be reconsidered and the 315kV line be built underground.

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APPENDIX

Debate to bury power lines resurfaces Tim Sargeant

<http://globalnews.ca/news/1758710/debate-to-bury-power-lines-resurfaces>



Density of homes along the De Salaberry Corridor

Publié le 23 mars 2011 par Monlimoilou.com | Mis à jour à 13:59

Enfouissement des fils électriques à Limoilou : prudence, dit la Santé publique

Rues de Limoilou : fils électriques enfouisSource : Stéphanie Martin, Le Soleil, 23 mars 2011

<http://blogue.monlimoilou.com/2011/enfouissement-des-fils-electriques-a-limoilou-prudence-dit-la-sante-publique/>

Microwave News, XIV, No.6, November/December, 1994

Hydro-Quebec bars further work on transient data by McGill University

<http://microwavenews.com/back-issues/1994>

Hydro pays \$62 million for homes near power lines

BC Hydro will pay \$62 million to purchase about 100 homes near a controversial Tsawwassen power line, a document filed by the Crown corporation reveals.

BY THE VANCOUVER SUN, MAY 27, 2009

http://www.canada.com/story_print.html?id=69a9e95d-f260-44ad-8016-abd55837d7b3

SALES POOR FOR CONTROVERSIAL TSAWWASSEN HOMES

ctvbc.ca

Published Sunday, March 28, 2010 8:01PM

<http://bc.ctvnews.ca/sales-poor-for-controversial-tsawwassen-homes-1.496585>

DESPITE AGREEMENT, HYDRO FELLS TREES IN BOIS-DE-LIESSE PARK

ANNE SUTHERLAND, MONTREAL GAZETTE

PUBLISHED ON: APRIL 1, 2015 | LAST UPDATED: APRIL 1, 2015 8:13 AM EDT

<http://montrealgazette.com/news/local-news/west-island-gazette/despite-agreement-hydro-fells-trees-in-bois-de-liesse-park>



Hydro Quebec Projected Beautification of the De Salaberry Corridor



De Salaberry servitude June 2015 - Actual image showing servitude poorly maintained by Hydro Quebec



De Salaberry Corridor Facing West - Electric Highway of Pylons



Saint-Jean Substation-Close Proximity to Residences

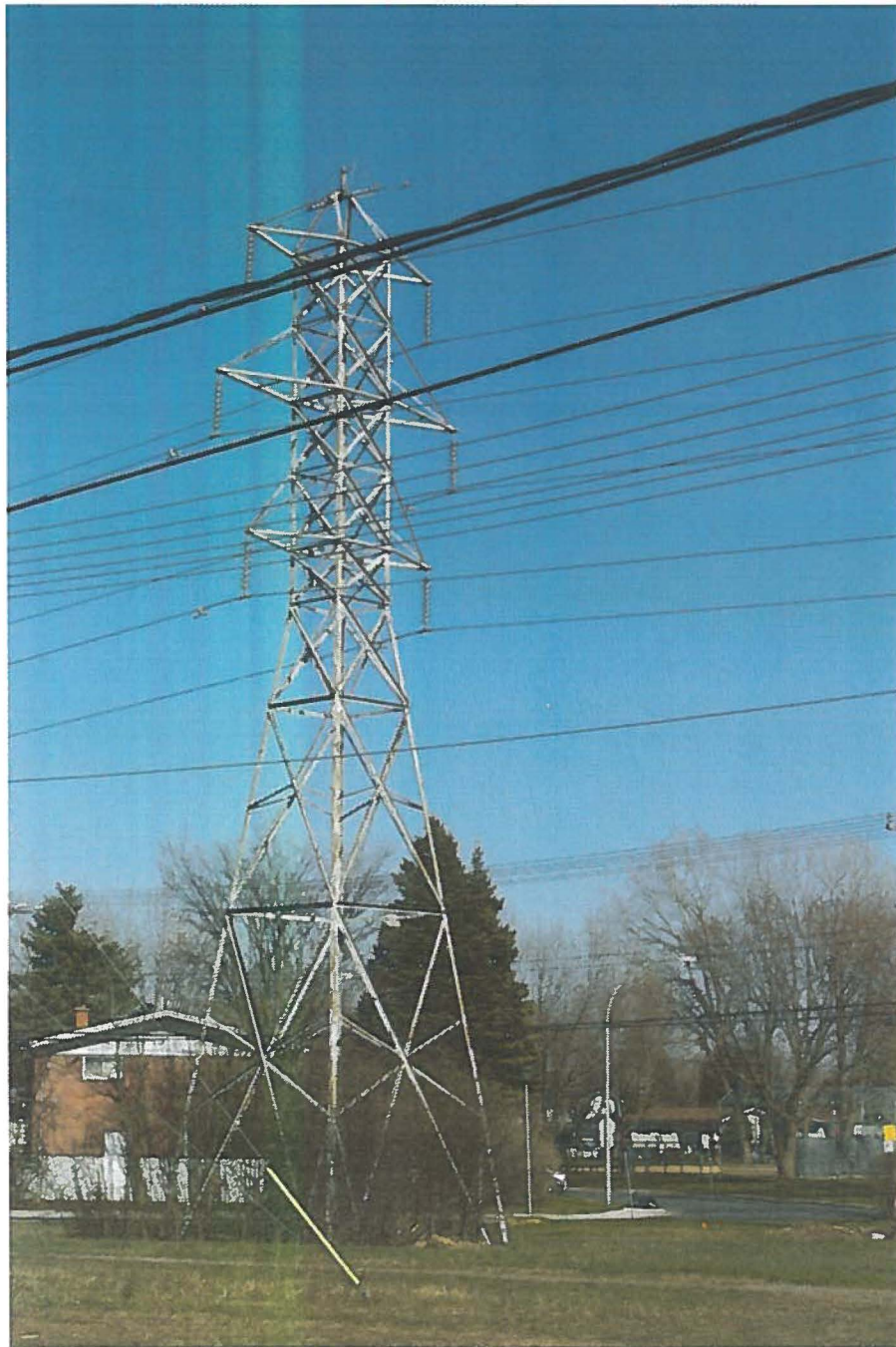


Image Depicting Extremely Close Proximity of 120kV Pylon to Home



Image Depicting Proximity of 120kV Tower to Senior Residence

END OF REPORT

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