

Dingledine brief on truck pollution
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DANFORD LAKE LANDFILL SITE

IMPACT OF TRUCK POLLUTION ON LOCAL RESIDENTS AND THEIR HOMES

BRIEF SUBMITTED BY PAUL DINGLEDINE 08/06/2007
(scheduled for presentation in the afternoon of Friday June 15, 2007)

EXECUTIVE SUMMARY

Of major concern to all the residents living on, or close to, the Highways 105 and 301 is the considerable noise, vibration and air pollution they would have to endure from large increases in heavy truck traffic triggered by the operation of the Danford Lake landfill.

The landfill promoter claims that the truck noise will be mitigated by enforcement of speed limits for truck drivers and improvements to the highways. But these are factors over which he has no control.

Similarly unhelpful is the noise study undertaken by Teknika which concluded that the additional truck noise would hardly be noticed. But their methodology does not address the annoyance dimension of the noise of a passing truck which, it is estimated, increases the ambient noise level by 16 times. Having this happen by up to 200 more times per day will dramatically affect nearby residents. The study, in its presentation of current truck noise, seriously understates the problem. Readings were taken where the trucks make the least amount of noise and, worse, at points further from the highways than are many of the homes along the route.

Residents already complain about the damage to their homes resulting from the vibrations caused by trucks. The National Research Council lists factors which cause traffic vibration in buildings. This data, if applied to Highways 105 and 301, show that this route is particularly ill suited for major increases in truck traffic because of the age, construction and proximity of homes to the highways, and because of the poor condition of the highway itself.

Trucks are notorious air polluters. Numerous studies show that there are serious health hazards to living close to truck traffic. Increases in the number of trucks, arguably up to doubling the volumes of truck traffic, would pose serious risks to the health and wellbeing of those people living close to the routes travelled.

Residents are also concerned about litter along the highways and in their front yards, in particular from open topped 7 ton trucks that only have a loose netting to prevent the contents of their load escaping.

In sum, the significant noise, vibration and air pollution caused by trucks going to and coming from the Danford Lake landfill would pose serious annoyance and health problems for residents who live and travel on Highways 105 and 301. This route is highly inappropriate for the volumes and type of truck traffic that the landfill would create. I believe that waste should be processed as close as possible to where it is generated. If it must be transported long distances, the routes chosen should be four lane highways, well removed from residential areas.

For these, and many other reasons, I believe very strongly that the Danford Lake landfill should not be approved.

(end of Executive summary)

DANFORD LAKE LANDFILL SITE

IMPACT OF TRUCK POLLUTION ON LOCAL RESIDENTS AND THEIR HOMES

Of major concern to all the residents living on, or close to, the highways 105 and 301 is the incredible noise, vibration and air pollution they already endure from the heavy truck traffic on these highways. They recognize that an increase by 50% to 100% of the number of trucks will have a proportionate increase in the pollution they must endure.

The following brief is divided into four sections: noise, vibration, air pollution, and litter from trucks.

NOISE

In his presentation on May 15, the promoter claimed that the main noise mitigation measures will be “first, respect of the speed limits by the truck drivers and (second) awareness activities by the Sûreté du Québec in terms of braking using the engines, and (third)... MTQ's awareness to maintain the road in good condition”

Admirable goals, but these measures are beyond LDC's ability to control or even influence. In their study on noise levels, Teknika notes that the observed speed limits at the roadside sites they studied were 65 kph in posted 50 kph zones, and 100 kph in posted 90 kph zones. Those of us who drive these highways daily can attest to the fact that current speeds equal to, or often, exceed these limits.

There is simply no way that LDC could enforce the speed limit from Wakefield to Danford Lake. Nor could they oblige the Sûreté du Québec to enforce the prohibitions (which are non legislated, to the best of my knowledge) against the use of engine brakes by the trucks (In practice, most trucks currently respect municipal requests not to use engine brakes in the villages, but they routinely use them elsewhere along the route. Noise levels from this practice are incredibly high).

The same logic applies to the activities to be undertaken by Ministry of Transport to maintain the roads. The roads currently are in deplorable condition over large portions of the route from the Northern end of Highway 5 to Danford Lake. While some maintenance is undertaken every year, the highways continue to deteriorate. LDC has no control or influence over this fact.

It is illogical and frankly disingenuous for LDC to list the above factors in their presentation as “mitigation factors” that they will pursue. They have no way of doing so.

Residents naturally assume that sizeable increases of truck traffic will increase the noise by the same percentage (arguably the number of trucks on the highway, and the amount of noise they create, will double if the landfill were to be approved - see the submission entitled “*Brief on the transportation and commuter safety of the Proposed Danford Dump*” made by Mr. Ed Masotti).

Not so, according to Groupe Teknika – HBA. One of the 22 studies conducted by this group and Fondex was on the noise impact of the additional traffic generated on these highways by the construction and operation of the dump. It concluded that the noise impact would be “not significant” (“non significatif”) and well within the range permissible by the Ministère du Développement durable, de l'Environnement et des Parcs.

Teknika collected noise data from six sites...two on Highway 105 (one in the centre of the village of Kazabazua, the other several kilometres north of the village) and four on Highway 301 (one to the East of the village of Danford Lake, one in the centre of the village itself, and two to the west of the village).

The sites all share a common characteristic: the trucks passing the sites do so at a steady speed on level ground. They do not slow down, speed up, turn, etc. each of which generates many times the noise of a truck just rolling at a steady speed.

Moreover, despite the 85 kilometres that most of the waste will have to travel, only the last 15 kilometres were tested for noise.

The measurements themselves were taken by equipment designed for this task and located at points ostensibly specified by the government of Quebec. This point was from 3 – 6 metres from the closest local residence to the measurement point, and at a distance of 15 metres or more from the centre line of the road. Not surprisingly, in Kazabazua the location was a vacant lot, there being practically no other location in the village where the residences were more than 15 metres from the centre of the road. And, not surprisingly, the location was more than one kilometre from the intersection. A similar location well distant from the crossroads was taken in Danford Lake.

Despite noting that the average truck speeds in the spots surveyed were 65 kph in a 50 kph zone, and 100 kph in a 90 kph zone, Teknika decided to conduct their simulation at the posted, not actual, speeds.

At all the sites except in the village of Danford Lake, Teknika took measurements for only one hour on one day! This despite the fact that truck traffic varies considerably from day to day, and hour to hour. The results can hardly be regarded as a representative measurement of noise. (In Danford Lake, the noise survey was spread over 12 hours, and two half days).

At the hearings held on May 16 these matters were discussed with Teknika. Their rationale for all of the above choices was that they were only studying the relative noise levels before and after construction of the landfill. Therefore they claimed it was irrelevant at what locations they conducted the studies along the route, for how long they did so, the time of year chosen, the speeds of the trucks and the distance measurements were taken from the highway. They argued that since they were only doing a “before/after” survey the differences would be the same irrespective of the above variables.

This model of study they used is a common tool for measuring average noise levels over a period of time. But, as an indicator of the extent of annoyance of the additional trucks passing your front door, this type of study is totally unhelpful.

There are two major problems:

First, as indicated above, the study focuses only on relative noise, in other words the additional noise generated by the new truck traffic relative to current noise levels. It did not consider the absolute levels of noise and the effect current levels already have upon near-by residents, even without the impact of hundreds of additional trucks.

According to the testimony of May 16, Ministry of Transport guidelines say that 65 dBa should be the maximum allowable noise for most homes adjacent to a highway.

But Teknika's study, and their comments at the hearings of May 16, indicate that in many areas the level of noise already exceeds this limit over short periods of time. When a truck passes (at 15 metres) the noise level goes to 75 dBa or higher. **Doubling the number of trucks on the route would double the number of instances when the noise levels exceed 65 dBa.**

Moreover, as pointed out above, Teknika's data was collected at points where the trucks make the least noise (no acceleration, deceleration, turning, hill climbing, braking, etc.) And it was collected for an extremely limited time. So even the absolute data they present seriously understates the actual noise levels.

More serious is that Teknika's measurements were taken from a distance of 15 metres from the highway. But as the BAPE has seen from other briefs presented, there are over 130 homes on Highway 105 between Wakefield and the 105/301 intersection in Kazabazua that are **well under 15 metres** from the highway. Indeed some are as close to two metres from the road. Similarly, in the village of Danford Lake there many residences in the centre of the village that are only a few metres from the side of Highway 301.

Teknika's measurements show that a truck passing creates a noise of 72 to 81.5 dBA from a distance of 15 metres. But from a distance of two metres the noise level will be several times higher, conceivably approaching 100 dBA according to some studies. If the truck were accelerating or turning this number would substantially increase.

Thus peak noise levels are already well over the Ministry's recommended level.

A 50% to 100% increase in the number of times this happens every day would present a catastrophic noise problem for residents.

A more serious flaw in this type of study is that it averages the increased noise levels out over a period of time. But the human ear does not average! It hears what it hears when it hears it. This study model does not address the annoyance and inconvenience level of the noise from the passing truck.

From the data Teknika collected, they allege that the principal source of noise is heavy trucks, no other significant source being identified. They note that, in the absence of truck traffic, the ambient noise levels were at about 35 dBA. As noted above, in their study a heavy truck however generates a noise level of 75 dBA or more.

It is important to recognize that the dBA scale is a logarithmic scale. Thus an increase of 10 dBA **doubles** the noise. Hence 45 dBA is twice as loud as 35 dBA; 55 dBA is four times as loud as 35 dBA, and 75 dBA (generated by a passing truck) is **16 times** louder.

The number of trucks Teknika simulated is seriously disputed in other briefs presented by Coalition members. But, for the purposes of this segment, I will use the number of trucks projected by Teknika in their study on noise. To give an example, Teknika project that the dump will trigger 122 more trucks per day on highway 301 from Kazabazua to Danford Lake and through the village itself. This is an increase in the number of trucks of slightly over 50%.

Averaged out over a day, this 50% increase in truck traffic allegedly resulted in an increase of just 2.1 dBA per day, an amount that is judged to be insignificant, probably not detectable by people living in range of the noise.

This is a very misleading way to express the impact of noise.

In effect, in Danford Lake and along 301, the noise levels will increase by 16 times for each truck that passes (and far, far higher for

people living closer to the road). To suggest that increasing the number of times that this happens by 122 instances per day (minimum) will not be noticed by residents is not credible.

We tend to think of noise levels as an annoyance. But in fact, noise is far more sinister than that! Here are some disturbing quotes from the US History Encyclopedia under their definition of “noise pollution”

- **“Apart from hearing loss, ...noise can cause lack of sleep, irritability, heartburn, indigestion, ulcers, high blood pressure, and possibly heart disease. One burst of noise, as from a passing truck, is known to alter endocrine, neurological, and cardiovascular functions in many individuals; prolonged or frequent exposure to such noise tends to make the physiological disturbances chronic. In addition, noise-induced stress creates severe tension in daily living and contributes to mental illness.**
- **This unwanted sound can seriously damage and effect physiological and psychological health. For instance, noise pollution can cause annoyance and aggression, hypertension, high stress levels, tinnitus, hearing loss, and other harmful effects depending on the level of sound, or how loud it is. Furthermore, stress and hypertension are the leading causes to heart problems, whereas tinnitus can lead to forgetfulness, severe depression and at times panic attacks.**
- **High noise levels can contribute to cardiovascular effects and exposure to moderately high (e.g. above 70 dBA) levels during a single eight hour period causes a statistical rise in blood pressure of five to ten mmHg; a clear and measurable increase in stress; and vasoconstriction leading to the increased blood pressure” noted above as well as to increased incidence of coronary artery disease.**

It is perhaps no surprise therefore that, of all the issues attracting the attention of residents outside the Municipality of Alleyn-and-Cawood, truck noise probably ranks first in their objections to the landfill.

The Teknika studies conclude that the noise effect of all these additional trucks will be negligible. Suffice it to say that no one who lives anywhere near highways 105 or 301 will consider this conclusion even remotely reasonable!

VIBRATIONS

Residents living close to Highways 105 and 301 complain frequently about the effect upon their homes, and their lifestyles, of vibrations from trucks passing their homes. The BAPE heard evidence of repeated broken windows from one such resident, whose home is only two metres from the edge of the highway. But many others have similar complaints: cracked foundations in their residences, cracks in their plaster, dry-wall screws popping out from the studs, all dishes and glasses in the house rattling, and the personal inconvenience of having to pause their daily activities (e.g. talking on the phone) because of the noise and vibration of a truck passing only a few metres from where they sit.

In the studies undertaken by Teknika/Fondex very little attention was devoted to this issue. The topic did surface however in the hearings on May 16 in the context of a discussion about the broken windows one house had suffered from vibrations. In response to the questioner, Teknika put into the record a study conducted by the National Research Council of Canada entitled "Traffic Vibrations in Buildings" (title of the original English version). The Teknika representative read out a quotation from this study: *"It's quite possible that house owners will complain of damage caused by traffic vibration. Damage to cracks, damage to the ceiling and walls. But this is attributable to other causes as well. Vibration is rarely high enough to be directly linked to these cracks or damages"*.

The impression left by this selective quote was that vibration is not a serious issue. It is true that the study does include this statement. But it says much more. The study notes that vibrations induced by road traffic are a common complaint in Canada. "There may be concern about the possibility of adverse long-term effects of vibrations on historic buildings, especially those in a weak condition". It also points out that vibrations come not just from the ground, but that the noise itself can generate vibrations in buildings, especially if they are close to the road.

The NRC study lists a number of factors which influence the degree to which a building is affected by vibrations. They include, among others:

- Irregularities in the road surface, for example cracks and potholes
- Distance of building from the road
- Vehicle weight
- Vehicle speed
- Type of building
- Soil type

These factors all relate to each other in complicated ways. For example rough roads matter less at low speeds.

It is not practical to do a vibration study over a distance of 85 kilometres; nor would such a study produce a meaningful result. It is possible, however, to examine the above factors and see how they apply to local conditions on routes 105 and 301.

- **Road irregularities**

It is obvious to anyone driving these two highways that much of the road surface is in deplorable condition. Except for the short areas that have been repaved in the last two years, the roads are rough and full of potholes and cracks.

- **Distance of buildings from road**

As noted elsewhere in this brief there are a great many homes along the full length of Highway 105 and within the villages of Kazabazua and Danford Lake that are extremely close to the roadway, some within a few metres. Such is the case for the house where the broken windows were reported.

- **Vehicle weight**

The worst offenders for causing vibrations are, of course, the fully loaded logging trucks. But 27 ton garbage haulers passing a few metres from people's living rooms would be almost as bad.

- **Vehicle speed**

As noted in the Teknika noise study, vehicle speeds on highways 105 and 301 are high, averaging (from their observations) about 10 kph above the speed limit in 100 kph zones and 15 kph above the speed limit in 50 kph zones.

- **Type of building**

Of particular concern are the many heritage homes built very close to highway 105. As was pointed out at the hearings, many of these are homes were built by placing log over log, held together by old mortar or whatever combination of rock, mud, or other materials were available to the owner at the time. But in addition to the very old buildings, almost all of the homes and farmhouses along 105, and within the villages of Kazabazua and Danford Lake, are 50 years old or more. They were constructed (often by the then owner of the property) when few building standards were in effect; such standards as existed were rarely if ever enforced in rural areas. These buildings are much more susceptible to vibration damage than a modern timber frame home built to today's demanding specifications.

The NRC study also points out that poor maintenance or past renovations and repairs can produce "residual strains" on homes which are exacerbated by even small vibration levels. A quick visual inspection of the buildings along 105 and 301 suggests that many structures would fall into this category.

- **Soil Type**

While soil types vary at different points along the route, the soil in and around Kazabazua and Danford Lake is sandy, below a few inches of rough gravel. The study notes that sandy soils can settle

over time, induced by repeated vibrations from the highway, and could produce a long term indirect impact on building foundations.

In concluding this segment of truck pollution, it is clear that vibration is only one of many factors that affects the deterioration of buildings. But, based on the NRC study, the homes, cottages and farmhouses along Highways 105 and 301 would be particularly vulnerable due to their proximity to the highways, their age, their condition, and the poor state of the highways themselves. The significant increases in truck traffic proposed by LDC would likely have a dramatic impact on the liveability and conditions of these homes over time, damage that would be far less likely to occur on a more modern highway with more modern adjacent structures.

AIR POLLUTION

Trucks are bad! Here are some sample statements taken from a variety of studies in the US and Europe:

- *(as reported in the San Diego Earth Times in June 2003) "Frank O'Donnell, executive director of the Clean Air Trust, noted that today's truck standards "are so pitifully weak that most trucks do not use an available truck version of the catalytic converter used on automobiles." Although trucks account for under 6 percent of the miles driven by highway vehicles in the United States, they are responsible for –*
 - *one-quarter of smog-causing pollution from highway vehicles*
 - *over half the soot from highway vehicles*
 - *the majority of the cancer threat posed by air pollution in some urban areas"*
- Dutch researchers looked at the effects of long-term exposure to traffic-related air pollutants on 5,000 adults. They found that

- people who lived near a main road were almost twice as likely to die from heart or lung disease and 1.4 times as likely to die from any cause compared with those who lived in less-trafficked areas. *Hoek, Brunekreef, Goldbohn, Fischer, van den Brandt. (2002). Association between mortality and indicators of traffic-related air pollution in the Netherlands: a cohort study. Lancet, 360 (9341): 1203-9.*
- A study in Erie County, New York (excluding the city of Buffalo) found that children living in neighborhoods with heavy truck traffic within 200 meters of their homes had increased risks of asthma hospitalization *Lin, Munsie, Hwang, Fitzgerald, and Cayo. (2002). Childhood Asthma Hospitalization and Residential Exposure to State Route Traffic. Environmental Research, Section A, Vol. 88, pp. 73-81.*
 - Researchers observed an approximately 10-20% increase in the risk of premature birth and low birth weight for infants born to women living near high traffic areas in Los Angeles County. *Wilhelm, Ritz. (2002). Residential Proximity to Traffic and Adverse Birth Outcomes in Los Angeles County, California, 1994-1996. Environmental Health Perspectives. doi: 10.1289/ehp.5688.*
 - A study of nearly 10,000 children in England found that wheezing illness, including asthma, was more likely with increasing proximity of a child's home to main roads. The risk was greatest for children living within 90 meters of the road. *Venn et al. (2001). Living Near A Main Road and the Risk of Wheezing Illness in Children. American Journal of Respiratory and Critical Care Medicine. Vol. 164, pp 2177-2180.*
 - A study of 1,068 Dutch children found that asthma, wheeze, cough, and runny nose were significantly more common in children living within 100 meters of freeways. Increasing density of truck traffic was also associated with significantly higher asthma levels - particularly in girls. *van Vliet et al. (1997). Motor exhaust and chronic respiratory symptoms in children living near freeways. Environmental Research. 74:12-132.*
 - A study of 1498 children in 13 schools in the Province of South Holland found a positive relationship between school proximity to freeways and asthma occurrence. Truck traffic intensity and the concentration of emissions measured in schools were found

to be significantly associated with chronic respiratory symptoms. *Speizer, F. E. and B. G. Ferris, Jr. (1973). Exposure to automobile exhaust. I. Prevalence of respiratory symptoms and disease. Archives of Environmental Health. 26(6): 313-8. van Vliet, P., M. Knape, et al. (1997). Motor vehicle exhaust and chronic respiratory symptoms in children living near freeways. Environmental Research. 74(2): 122-32.*

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- An American study – *Greening Garbage Trucks: New Technologies for Cleaner Air* – found that “garbage trucks are among the oldest, least fuel-efficient, and most polluting fleet vehicles in the United States:
 - There are more than twice as many garbage trucks in the US (179,000) as there are urban transit buses (82,600). The garbage truck fleet includes refuse and recycling collection vehicles as well as transfer trucks.
 - Forty-one percent of garbage trucks in use are more than 10 years old, nearing the end of their lifetime (12 to 14 years), and performing at reduced efficiencies.
 - Garbage trucks use more fuel than any other type of vehicle – averaging 8,600 gallons per year – except for tractor-trailers and transit buses (which use 11,500 gallons and 10,800 gallons on average per year, respectively).
 - Garbage trucks in the US consume approximately 1 billion gallons of diesel fuel annually and get the lowest fuel efficiency (2.8 miles per gallon) of any vehicle type. Transit buses, single-unit heavy-duty trucks, and tractor-trailers get 2.9, 7.0, and 6.1 miles per gallon, respectively.

- Diesel garbage trucks are a major source of air pollution, including smog-forming compounds, particulate matter, and toxic chemical constituents. While heavy-duty diesel-powered vehicles, including garbage trucks, make up only 7 percent of vehicles on the road, they contribute 69 percent of on-road fine particulate pollution and 40 percent of nitrogen oxide emissions.
- Diesel garbage trucks are notoriously loud, generating noise levels of up to 100 decibels, which can cause serious hearing damage. Garbage truck operators, as well as those living along garbage truck routes, are affected by this noise.”

There are dozens more studies such as these. It is clear that trucks are not good for your health. It is obvious, as it relates to the location of a landfill, that the distance between the source of the garbage and the place of its ultimate disposition is critical. The 85 kilometre distance between the projected major source (the city of Gatineau) of most of the garbage for Danford Lake would be a major contributor to pollution and greenhouse gasses.

It is also clear from the above studies that, when it comes to health, proximity counts. Residents living close to the highways are far more likely to suffer health problems from traffic in general and trucks in particular. If garbage must be transported, the further the route is located from developed residential areas, the better.

And finally it is clear that the older the truck, the worse the pollution. The presentation made by my colleague (*“Brief on the transportation and commuter safety of the Proposed Danford Dump”*) illustrates that many of the trucks going to Danford Lake will not be the giant modern 27 ton compacted waste transporters as suggested by the promoter. Instead they would more likely be the 7 ton open-topped trucks or garbage trucks themselves. Observations that I and other Coalition members made of the trucks crossing the Ontario/Quebec provincial boundary suggest that many of these types of trucks are older, and some are in noticeably poor condition. It would seem a reasonable conclusion that these types of trucks are likely to contribute to much more air pollution than larger more modern vehicles – both because

the smaller amount they carry requires more trips, and because the truck itself is a less efficient burner of fuel.

It is true that, over the very short term, the distance from Gatineau to Danford Lake is less than the distance from Gatineau to Lachute, a route that also goes through residential areas. But that is a very short term issue: Highway 148 will soon be replaced by Highway 50 as the route to be followed by waste transporters, removing to a large extent the traffic from close proximity to urban dwellings. And over the medium term the City of Gatineau has said that it is looking at more modern waste disposal technologies that will most likely obviate the necessity for long distance transport of waste.

LITTER

A significant concern for residents who live directly on Highways 105 and 301 is litter, principally paper, collecting on or adjacent to their properties. Since little is done by the province to keep the areas close to these highways clean, most of the clean up is done by residents themselves, either working as individuals or as groups.

Residents are concerned that the amount of litter may increase from additional truck traffic. The large garbage transporters and modern sealed garbage trucks may not be a major part of the problem. But the 7 ton trucks, equipped only with a loose netting over the truck box, could present significant difficulties. Obviously such trucks, if they are carrying loose paper, cardboard, or other light materials will be unable to keep them totally within the truck. I believe, as does my colleague Ed Masotti, that a large part of the fleet of trucks carrying garbage to Danford Lake would be these 7 ton trucks. (Pictures of these trucks can be seen in Annex "C1" and Annex "C2" of his submission entitled "*Brief on the transportation and commuter safety of the Proposed Danford Dump*").

Photographs we have seen of other landfill sites, including the Carp site in Ottawa, attest to the amount of garbage that is strewn along the highways as a result of garbage transportation.

CONCLUSION

Increases in truck traffic generated by the landfill in Danford Lake will have dramatic effects upon the quality of life experienced by residents who travel on, or live near, Highways 105 and 301. The higher truck traffic levels on these dangerous roads, the significant increase in the amount of noise, and pollution of the air that will result from the trucks would all have serious health effects on this population. Similarly their homes would suffer both structurally and aesthetically.

Urban waste should be disposed of in a location as close as possible to the source of the waste. If it must be transported, this should be done on safe, well maintained highways as far away as possible from urban dwellings. The route of 105/301 is especially poorly suited for this type of transportation. Living on, or near, these highways would become less and less enjoyable and more and more dangerous if the Danford Lake landfill proceeds.

Approval of the establishment of this landfill should not be given!