

November 19, 2004
2-4561-3-1025



Jack Keir, General Manager
Fundy Region Solid Waste Commission
10 Crane Mountain Road
P.O. Box 3144, Station B
Saint John, NB
E2M 4X7

Dear Mr. Keir:

Re: EIA Registration # 1025 – Crane Mountain Landfill Cell Elevation Increase

The Project Assessment Branch has received the registration for the landfill cell elevation request. The Technical Review Committee is currently reviewing the document and will be providing comments.

In response to the Public Consultation suggestions in the registration document, I would like to let you know that there are new minimum requirements for public consultation that have been developed and utilized over the course of a number of months in draft form. These have now been publicly released and are in effect. I am attaching to this letter a copy of the updated Guide to Environmental Impact Assessment (EIA) in New Brunswick. I would like to draw your attention to Section 6.0 of the Registration Guide and Appendix C for further details. It is imperative that the public meeting / open house is adequately advertised, that people are given sufficient notice and that the information which will be mailed to stakeholders advising of the project clearly also indicates the time of the public session. Please note these are minimum requirements and that given the nature of the project, the Commission may want to add additional measures. The importance of public involvement was highlighted in the letter of March 10, 2004 to Ron Nelson, FRSWC by Paul Vanderlaan. A detailed public involvement program, considering the new requirements should be submitted to me at your earliest convenience. It would be appreciated if a list of anticipated stakeholders for consultation were included with this plan.

Thank you in advance for this information.

Sincerely,

A handwritten signature in black ink, appearing to read "GP".

Germaine Pataki-Thériault, P. Eng.
Project Manager

attach.

December 10, 2004
4561-3-1025



Jack Keir, General Manager
Fundy Region Solid Waste Commission (FRSWC)
Crane Mountain Landfill
10 Crane Mountain Road
Saint John, NB
E2M 7T8

Dear Mr. Keir:

Thank you for the registration package received November 15, 2004. The technical review committee has reviewed the documentation and provides the following comments and questions for your response.

Extending Life of Landfill:

It is clear that the proposed increase in the cell elevations at the landfill will increase its operational life, there is no supporting information included in the registration to verify how much longer an increase in cell elevation would permit the landfill to continue to operate. The original EIA report summary states,

“approximately 114,403 tonnes of municipal solid waste would be handled by the proposed facility annually. Even assuming no increase in per capita waste generation, this amount is predicted to grow to 145,627 tonnes by the year 2016 due to population increase and economic growth”.

Further, in the original report (page 3-1), it states,

“The Fundy Solid Waste Action Team... has developed a comprehensive waste management strategy to serve the needs of the residents of the region for a minimum of 25 years... Assuming the Team’s waste diversion objective of 50 percent is achieved by the year 2000, then the landfill should serve the residents of the region for 45-50 years.”

The landfill opened in 1997 and as stated was expected to have enough capacity, without waste diversion to operate for approximately 25 years (until 2022). Some confusion has resulted in the interpretation of the projected life of the landfill:

On page 2 (Section 4.2) it is stated that with the increase in cell elevation from 90 to 105 metres, it is expected that the landfill could continue to receive municipal solid waste until the year 2048, an additional 26 years. However on page 7 (Section 5.5.5), it is stated “An increase in cell elevation is expected to extend the operation of the Crane Mountain landfill by 10 to 15 years.” This would take it to 2037.

1. Please clarify this apparent 11-year difference.

It is recognized that composting, recycling and other programs have been successful in diverting waste from the landfill and likely have extended the useful life of the landfill

beyond the original 25-year estimation. This information has, however, not been quantified in the registration document.

2. Please provide a detailed quantification of how the FRSWC determined that increasing the cell height at the landfill would allow it to operate until 2048?

The initial (higher) projected tonnages resulted in a 25-year lifespan of the landfill.

3. Please clarify and quantify how the actual lower operating tonnages have affected the initially projected lifespan.

Alternatives to Cell Height Increase:

There is no information in the registration to support the FRSWC's claim that extending the life of the landfill will, in the long run, "benefit the Fundy Region environmentally and economically".

4. Have any other disposal options and/or increased waste reduction initiatives been considered? If so, please provide details.
5. Has a cost/benefit analysis been performed to compare further waste reduction initiatives/waste disposal alternatives vs. extending the operational life of the landfill (e.g. a railway to another landfill currently in operation combined with more intense waste diversion at the landfill)? If so, please provide details.
6. If the analysis mentioned in 4 and 5 above have not been undertaken, please provide draft terms of reference for consideration as to how such analysis would be accomplished.

Potential Impact to Existing Infrastructure (Construction):

7. To support the information contained within the "Geotechnical Implications of Raising Landfill Height to 105 metres" report prepared by GEMTEC Limited that was included in the registration as Appendix 2, please submit all relevant reference material that was used to support the findings in this report.
8. The report mentioned in 7 above did not specifically comment on how the current liner system (clay and geomembrane) would function in relation to an increased leachate head (cell height) and the required 25-year minimum breakthrough time. Please address this matter.
9. Please also provide comment and provide supporting documentation on whether or not there will be any impacts to the operation of the leachate collection system and the management of leachate at the landfill due to an increase in hydraulic head.

Slope Stability

10. Please clarify what, if any, affects this increase in cell height would have on future capping of the cell and construction problems that may occur?

Settlement / Geomembrane Puncture Protection

There is a potential for leachate collection pipes and liners to be damaged by stresses caused by foundation movements. The report concludes that an approximate 15mm consolidation settlement of the **clay liner** is likely. The report also discusses the possibility of the **geomembrane** liner being punctured by a stone due to additional effective stresses

11. Have the affects that differential settlement and/or compression (and any other relative stresses such as shear) would have on the geomembrane liner, leachate piping, sumps and landfill gas collection piping (present or future) been considered? It should also be verified that these stresses would not negatively impact the clay liner.
12. Are there any increases or changes in soil bearing stresses? Have they been considered in relation to the bearing capacity of the soil?
13. Are there any concerns relating to hydrostatic pressure in relation to the solid waste containment cell (such as confining pressure of the foundation and liner system)?
14. Have the potential effects of this settlement to the surrounding hydrology/hydrogeology (impact to the groundwater aquifer, or groundwater flow) been considered? Are there any concerns of this nature?
15. The designed maximum effective stress of 815 kPa is extremely close to the proposed calculated effective stress of 800 kPa. Is this an acceptable factor of safety for the design of a municipal solid waste landfill?

Pipe Failure

16. Is this factor of safety acceptable for the design and operation of a municipal solid waste landfill?

Visual Impact:

This project has been described as increasing the landfill waste disposal cells elevation from 90 metres to 105 metres. There is mention of an 85-metre height maximum for the landfill in the original EIA registration.

17. The point of reference for these elevations should be provided (e.g. above sea level). What is the current elevation of the cells?

In the Summary of Public Participation document for the original EIA there is mention of approximately 20 metres height of garbage.

18. What is the current actual height of the garbage?
19. Approaching from Saint John on Route 7, the landfill can already be clearly viewed, which doesn't seem to be reflected in the "Visual Assessment of Raising Landfill Height to Elevation 105m & Options for Potential Recreation Use at Time of Closure" prepared by Daniel K. Glenn Landscape Architects & Park Planners view plane G. This situation will become even more pronounced with an increase in cell height. How is the FRSWC is proposing to mitigate this matter?

20. Please confirm that the visual assessment locations chosen represent "worst case scenario" locations.
21. The visual assessment clearly shows that the landfill will be able to be viewed from various locations on or near the Grand Bay interchange. As the FRSWC recalls, visual impacts of the landfill was a major concern expressed by the public during the landfill's initial EIA. How does the FRSWC propose to ensure that the landfill remains 'hidden' from these (and all other locations) from which it is currently not visible?
22. Please include a view plane on Highway 7 heading south towards Saint John from Fredericton approaching the landfill. The location should be a "worst case scenario" visibility angle.
23. Pages L6 and L7 of the Visual Assessment detail the "simulated 20-25 year tree growth" and is confusing. For instance, on page L-6 (profile 'C') the first group of trees are approximately 15 feet high (representing a 4 metre growth from the 11metre height indicated on page L-4 (profile 'C')), yet the trees planted on the slopes of the landfill are indicated to grow to as high as 22 or 23 metres. Please clarify.
24. It should be noted that the construction and demolition debris disposal site (C&D Site) at the landfill can clearly be viewed from the highway. What measures will the FRSWC put into place to 'hide' the C&D Site from being visible from the highway and any other public area off of the landfill property?
25. It should be indicated in the Assessment at what "growth-stage" the trees being used as visual barriers are in their development (i.e. newly planted, 5-10 years, fully mature, etc.).
26. A "Visual Screening Concept" (also prepared by Daniel K. Glenn Landscape Architects & Park Planners) dated May 1997 used during the initial EIA process used a 2 metre 'observer height'. Why has only 1.5 metres been used this time?

Greenhouse Gas Emissions:

By expanding the landfill and extending its lifespan, there will be a rise in Greenhouse Gas (GHG) emissions, largely due to methane production.

27. An estimate of the increased GHG emissions should be provided. It is understood that the landfill currently has a system of gas collection and venting to the atmosphere. In order to decide on the most reasonable way of handling the landfill gas, the proponent should provide an estimate of the expected gas flow rate, as well as an analysis of any trace gases (e.g. hydrogen sulphide) that might be found in the gas stream. If it is feasible to recover the gas for use in power generation, the proponent may wish to consult the following NRCan website

http://www.canren.gc.ca/tech_appl/index.asp?CaID=2&PgId=1150) for additional information in this regard.

Odours:

Odour issues **have** been an ongoing problem at the landfill. Cell height will have the potential at least to increase odour in the surrounding area, unless otherwise mitigated. This issue has not been adequately addressed in the registration.

28. Please provide further detail on odour impacts associated with the proposed project.

29. What is the FRSWC long-term plan for odour control? Is it the FRSWC's intention to capture and flare the landfill gasses?

It should be noted in Section 5.5.3 – Odors, Methane and Landfill Gases that the Department has no plans to establish landfill gas management guidelines. Also the last paragraph in section 5.5.3 is misleading. The recent communication the FRSWC has had with the Department regarding a landfill gas control system was limited to an exchange of information pertaining to a federal program called the "Opportunities Envelope" and the requirements for preparing and submitting an application to be involved in the program. The Department also helped to ensure that the FRSWC's application was submitted to the Federal Government before the deadline. The Department was not involved in the FRSWC's decision-making process and only provided guidance on the preparation of their application.

30. This section should be deleted or updated to clarify what its relevance is with regard to the registration.

Leachate Management:

On page 6 of 8 (first paragraph) of the registration it states that the Department was involved in a subcommittee that reviewed leachate management issues at the landfill.

31. Please expand this statement and indicate that the Department's involvement was from a Local Government (unincorporated area representation) perspective and not environmental.

Increasing the operational life of the landfill will increase the length of time that leachate will have to be managed by the FRSWC. As such, discussion of leachate management must be incorporated into an EIA review of the life extension proposed by the cell height increase.

32. Please provide details on how leachate will be managed and disposed of and on the results of the decision regarding various options as discussed on page 6 of 8 of the registration (last paragraph).

It is stated on page 2 of the Assessment of Leachate Management Options that less than half of the total leachate flow is being processed by the WPF, the remainder being trucked to the Lancaster sewage treatment plant. It is understood from page 5 of the registration document (section 5.5.4) that the WPF consists of a bioreactor/ultrafiltration system followed by two-stage reverse osmosis treatment.

33. Please clarify whether the leachate that is being trucked to Lancaster is being treated by the first stage of the WPF (the bioreactor/ultrafiltration system).
34. If it is the intent of the FRSWC to decommission the Zenon plant and have all the generated leachate at the landfill discharged to the City of Saint John's Lancaster sewage treatment facility, then a long-term written agreement (as is indicated on pg 7 of 8 of the registration) is required. The agreement must be clear that the City of Saint John will accept leachate at the Lancaster facility for as long as the FRSWC requires disposing of leachate (including post-closure generated leachate). Please confirm whether this option is the desire of FRSWC and provide a signed copy of this written agreement to the Department.
35. The agreement requested in 29 above should include confirmation from the City of Saint John by a professional engineer licensed to practice engineering in New Brunswick that the Lancaster facility will have enough capacity to treat all the leachate generated from the landfill for as long as the landfill is generating leachate (including post-closure) and that accepting the leachate will not disrupt the regular operation of the facility nor prevent the City of Saint John from meeting its discharge requirements.
36. If the Zenon plant is to be decommissioned, please clarify how FRSWC intends to pre-treat leachate as per the original EIA conditions.
37. The registration does not comment on how leachate would be managed, treated and discharged should (for whatever reason) the Lancaster facility be unable to accept the landfill's leachate. A Contingency Plan that discusses how the FRSWC would handle such an emergency should be submitted to the Department.
38. Does the FRSWC have an "Emergency Response Plan" prepared in case of a leachate spill during trucking of the leachate from the landfill to the Lancaster facility? A copy should be submitted to the Department.
39. There are portions of some municipal solid waste containment cells at the landfill that have not yet been capped. The FRSWC should submit a report (complete with scaled drawings) to the Department showing all the containment cells at the landfill and clearly illustrating those portions that are currently uncapped. Further, the report should include details on which cells will remain uncapped (and for what length of time) if the proposed project is permitted to proceed and a timeframe that indicates when the remaining portions will be capped.

The proponent has attempted to predict the maximum leachate volumes that would be expected from these events in Section 2.2 of Appendix 1.

40. The source of the return period rainfall data should be identified.
41. In addition, information should be provided describing how precipitation and snowmelt data were used to calculate the leachate volumes. For example, it appears that 1 in 25-year and 1 in 100-year return periods were assessed for events of 24 hours duration, corresponding to the climatological day. It should be clarified whether events of shorter duration (with greater rates) or longer duration (which produce more precipitation) were examined to determine whether they would cause the facility unforeseen problems.
42. The FRSWC also took into consideration the potential for snowmelt to augment the volume of leachate generated during an extreme precipitation event. However, it was not clear whether the snowpack available for melting during such an event was maximized or whether the snow depth just prior to the Mar. 30, 2003 storm (about 10 cm at Saint John Airport) was used in the calculations.
43. Given the landfill's lifespan of up to 75 years (including a "post-closure period" of 20-30 years during which time leachate will still be generated), the FRSWC should also take into account that more intense precipitation events are very likely over the coming decades as a result of climate change. It would therefore be prudent to adjust the design criteria for the surge pond now, rather than to retrofit the facility in the future.

Additional climatological data can be obtained from Environment Canada's Atlantic Climate Centre:

Environment Canada
Atlantic Climate Centre
77 Westmorland Street, Suite 400
Fredericton, New Brunswick E3B 6Z3
Phone: (506) 451-6006 Fax: (506) 451-6010 E-Mail: climate.atlantic@ec.gc.ca
<<mailto:climate.atlantic@ec.gc.ca>>

44. The strength of the leachate has only been described in terms of a single parameter, BOD. A complete chemical characterization of the leachate should be provided to determine whether the wastewater treatment facility will be able to accommodate the anticipated strength and volume of leachate over a 12-month period (including extreme precipitation events). Parameters that should be included, as a minimum, are: BOD, COD, pH, TDS, TSS, alkalinity, Total P, TKN, Ammonia-N, heavy metals and sulphate.

From a public health perspective there seems to be merit to the River Road option for leachate management and in particular as a partnership option. The area (South Bay to Martinon) could benefit greatly given the long existing use of septic systems on very small lots with poor soil coverage.

Groundwater:

45. The results of the ground and well water monitoring review that is being undertaken by the "Host Community group" should be submitted to the Department. It is important that all required samples are obtained by a qualified professional and analyzed by a laboratory that is, as a minimum, a member in good standing of the Canadian Association of Environmental Analytical Laboratories (CAEAL) Proficiency Testing Program for Environmental Laboratories, for the parameters currently indicated in conditions 82 and 83 of Approval to Operate SL6-R1. "BTEX/TPH" should be analysed in accordance with the Atlantic RBCA Tier 1 Guidelines for Laboratories and shall include the following parameters:

- Benzene
- Toluene
- Ethylbenzene
- Xylene
- C6-C10 Hydrocarbons
- >C10-C21 Hydrocarbons
- >C21-<C32 Hydrocarbons
- Modified TPH (Tier 1)
- % Rec. iso-butylbenzene-Volatile
- % Rec. iso-butylbenzene-Extractable
- % Rec. n-dotriacontane-Extractable

46. The FRSWC should include an up to date scaled site map that clearly illustrates the location of all groundwater monitoring well nests in association with the current (and future) solid waste containment cell, leachate ponds and sedimentation ponds (i.e. an inventory of monitoring wells). The review should also discuss recommendations for wells that should be decommissioned, replaced, relocated or otherwise altered. Recommendations for the installation and location of new groundwater monitoring wells, if applicable, should also be included.

Wind blown litter:

If the height of the landfill cell increases, the potential for wind blown litter to become more pronounced exists and the more difficult it will be to control.

47. Please provide more detail is required on how and where the litter fencing could be placed to reduce wind blown litter.

Miscellaneous Site Issues:

It can be expected that there will be a cumulative increase in the amount of tires, household hazardous waste and recyclable material brought to the landfill if it is operated for a longer period of time.

Recycling:

48. Please provide an update to the Department on the status of its waste diversion initiatives as stated in their letter of August 8, 1996.

Tires:

49. The FRSWC should provide a tire management plan that includes details on how tires will be stored, managed and disposed. A designated area at the landfill should be identified.

Household Hazardous Waste:

50. The landfill should indicate its plans for the establishment of a household hazardous waste program at the landfill including how and when it will be operated.

Public Involvement:

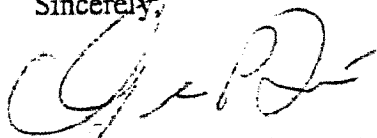
51. Further to my letter of November 19, 2004 to you, a detailed public involvement program, considering the new EIA public consultation requirements should be submitted to me at your earliest convenience. It would be appreciated if a list of anticipated stakeholders for consultation were included with this plan.

52. I wanted to also highlight the public consultation report that will be required for submission to the Minister. The minutes of the public meeting(s), including all questions and answers to those questions, should be included in the report to the Department.

53. Please ensure that the entire scope of the project, as described in this letter, is included in the public consultation program.

If you would like further clarification on the contents of this letter, please do not hesitate to call me at (506) 453-6857.

Sincerely,



Germaine Pataki-Thériault
Project Manager

cc: Technical Review Committee



December 14, 2004
4561-3-1025

FAXED
Dec. 14, 04

Jack Keir, General Manager
Fundy Region Solid Waste Commission (FRSWC)
Crane Mountain Landfill
10 Crane Mountain Road
Saint John, NB
E2M 7T8

Dear Mr. Keir:

Re: EIA Registration #1025 – Crane Mountain Landfill Height Increase

I have received additional groundwater related questions from a technical review committee member for the above-mentioned project. Could you please have these responded to in addition to the questions dated December 10, 2004?

In the EIA registration document, it is stated that a third party will be conducting a review of the existing monitoring program.

1. Please provide a report summarizing the findings of the review as part of this project EIA evaluation.

Additional settlement (15mm) is expected of the clay liner if cell elevations increase from 90 to 105 metres.

2. What is the expected settlement of the underlying bedrock aquifer?
3. Could additional settlement result in the collapse of water-bearing fractures?
4. If so, how will this impact down-gradient water users?

Thank you in advance for your responses to the questions posed.

Sincerely,

A handwritten signature in black ink, appearing to read "GP".

Germaine Pataki-Thériault
Project Manager

cc: Gina Giudice, DELG