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Ken Carrusca P.Eng.  
Senior Engineer, Regional Utility Planning  
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Metro Vancouver

File: 76780-35/GVRD/Plan09

GVRD	
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Dear Mr. Ken Carrusca:

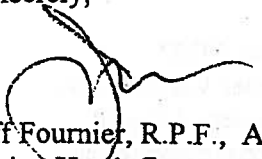
**Re: Input on the Metro Vancouver Draft AECOM Life Cycle Analysis Report**

Thank you for the ongoing opportunity for ministry staff to provide input on the draft AECOM report associated with the Solid Waste Management Plan (SWMP) that is being developed.

We appreciated the opportunity to attend and provide input during the May 13, 2009 presentation on the report. Further to the comments we provided at the meeting, please find attached a listing of the information we feel should be clarified or added to the report. Ashley Smith can be contacted at 604 582-5358 to provide clarification on the comments we have provided.

Again thank you for this opportunity to provide input. We look forward to the opportunity to review a copy of revised AECOM report once it becomes available.

Sincerely,



Jeff Fournier, R.P.F., A.Ag  
Acting Head, Government and Compliance  
Ministry of Environment

To: File

Date: June 2, 2009

File: 76780-35/GVRD/Plan09.

**Re: Comments on Metro Vancouver's Life Cycle Analysis of Disposal Options for Post-Diversion Waste Residuals.**

### High Level Questions

1. Metro Vancouver needs to submit and discuss the final report (including other reports: Sheltair, Air quality modeling) to MOE before submitting it to the Board.
2. A dry entombment scenario should be added to the LCA. The only landfill design that was considered was a bioreactor landfill. The bioreactor landfills are assumed to have different rates for waste decomposition and LFG capture. No significant differences were shown in the report versus traditional VL. Good know more about worldwide and Canadian experience with this type of landfills, pros, cons, applicability to BC conditions.
3. An in region W2E facility without district heating scenario should be added to the LCA. Need to perform the comparative analysis of all possible scenarios.
4. An out of region W2E facility with District heating scenario should be added to the LCA. Need to perform the comparative analysis of all possible scenarios.
5. The report does not include carbon storage data in the calculation of the overall emissions from landfill just assuming that all carbon disposed to the landfill will be decomposed (i.e. biogenic carbon vs. fossilized carbon debate). This approach needs to be justified or adjusted to be in accordance with the approach accepted worldwide. Any links to climatic conditions should be identified.
6. Metro Vancouver should identify why they didn't model the diversion rate above 70%.
7. Do the W2E scenarios line up with the MV's Air Quality Management Plan framework and/or the government's commitment to clean air and GHG reductions?

### Specific Questions Assumed To Be Answered in Final Report

1. The report does not mention what happens to the waste between 2010 and 2015?
2. What are the impacts to the local airshed including within the Lower Fraser Valley (LFV) and Howe Sound. The report limits its analysis to facility emissions. The report should contain a full airshed analysis. There is no clear connection between different options and subsequent air quality. Further sensitivity analysis required to address these concerns. This information would also be relevant for informing the public during the consultation phase and when submitting a final application.
3. Relative health risks for different scenarios in relation to ambient background risks need to be discussed.

4. The LFG capture rates used for Vancouver Landfill and out-of-region bioreactor landfill are 35 and 65% respectively. It has been mentioned that the rates are to be adjusted to 75% in both cases. How does this affect the calculations of overall emissions in comparison to WTE?
5. It is unclear as to how the avoided emissions for landfills were calculated.
6. It is unclear as to what the waste composition was assumed.
7. Metro Vancouver should model LFG generation from traditional landfill in dry climate scenario
8. The draft report talks about W2E and landfilling out of region. Does out of region strictly mean BC or is there an assumption for Alberta and the United States. How will this impact the scenarios?
9. The report should show costs and revenues separately to better understand the pro and cons (capital, operational, etc).

#### Other Technical Questions

1. The report does not consider the varying types of engines that can be used for beneficial use to captured landfill gas. The report needs to clarify and compare the different techniques / technologies in terms of environmental impacts (emissions).
2. The report stresses that organic diversion programs would compete with bioreactor landfills, but no clear assumptions about the organic content of the landfilled waste in the future assuming different numbers for organic diversion. The report did not identify any recommendations as what organic diversion programs or at least what percentage might be put in place and/or how to proceed with organic diversion.
3. It is not clear what were other numbers (k values, waste quantities) used in LandGem model for calculating LFG generation
4. The numbers for GHG emissions from waste management options do not seem to correlate with Environment Canada calculations.
5. The conclusion that eventually the overall cost for tipping fees paid to private landfill owners will be higher than capital costs for building WTE needs to be justified or at least explained in more details
  - Calculations and assumptions about emissions from landfills need to be confirmed and clearly identified. Would be good to have some typical values for the emissions from landfills versus WTE from different literature sources. E.g. comparison of metals content in emissions hence health issues
6. The report does not identify what percentage of biogenic carbon would be found in the RDF.
7. The draft report assumes that the residuals from WTE such as fly ash can be disposed at regular landfill. What happens if fly ash fails the TCLP test and is considered a hazardous waste? How will it affect the overall picture for WTE?
8. Can fly ash be beneficially used? The report should consider this.
9. What happens if bottom ash / fly ash cannot be used beneficially. That adds additional waste to the annual tonnage of a facility for disposal. The report should clarify this.
10. Do offsets for energy assume future clean energy use?

Questions Relevant to the development of the SWMP; not necessarily to AECOM Report

1. All technologies and scenarios need clear description in terms of pros and cons including environmental, economic and social impacts. This information is required when presenting to the public.
2. The report appears to show an apparent bias towards W2E. It implies that "not in my backyard" is only for landfills (page 105). The report also assumes North America's situation can be fully compared to the European / Japanese experiences. Further clarification is required and/or more justification. North America has more available land, therefore does not have the same restrictions and therefore has to solely focus on W2E.
3. Siting a new facility will be a concern. The public requires information to enable them to make an informed decision. Again, the report needs to identify pro and cons for all scenarios and be up front with the public.
4. What are the contingencies if GVRD cannot site a W2E and/or find a development large enough to use district heating? If district heat demand is not available or needed, what are the impacts toward GHG emissions and the differing scenarios as it would no longer be considered net positive. Another scenario and sensitivity analysis is required to address this concern.