City of Peterborough

TO:	**Members of the Waste Management Steering Committee**
FROM:	**W. H. Jackson, Director of Utility Services**
MEETING DATE:	**September 19, 2011**
SUBJECT:	**Report WMC11-005** **2010 Annual Landfill Monitoring Report**

PURPOSE

To provide the Committee with a copy of the Summary of Key Comments and Conclusions and Recommendations from the May 13, 2011 UEM Consulting Services report entitled County/City of Peterborough WMF 2010 Annual Monitoring Report.

RECOMMENDATION

That the Waste Management Committee endorse the recommendation as outlined in Report WMC11-005 dated September 19, 2011, of the Director of Utility Services as follows:

That Report WMC11-005 providing the Committee with a copy of the Summary of Key Comments and Conclusions and Recommendations from the UEM Consulting Services May 13, 2011 report entitled County/City of Peterborough WMF 2010 Annual monitoring Report from be received for information.

BUDGET AND FINANCIAL IMPLICATIONS

There are no budget or financial implications as a result of this report.

BACKGROUND

At the July 12, 2011 meeting of the Peterborough County/City Waste Management Site Liaison Committee meeting, Mr. Joseph Ocvjak of UEM Consulting Services presented the Landfill 2010 Annual Report. The operation of the south and north fill areas was discussed as were the ground water/surface water monitoring results. Also discussed was the operation, maintenance and expansion of the Landfill Gas System and Gas Utilization Plant.

The attached copy of pages 41 to 48 inclusive of the UEM report includes the report's Summary of Key Comments and Conclusions and Recommendations sections. The full report is available in the City and County offices if required.

Submitted by,

W. H. Jackson
Director, Utility Services

Attachment:

- Pages 41 to 48 Inclusive of the UEM Consulting Services report County/City of Peterborough WMF 2010 Annual Monitoring Report dated May 13, 2011.

10.0 SUMMARY OF KEY COMMENTS AND CONCLUSIONS

The following presents the key conclusions of this report:

APPROVAL STATUS

1. In June 2008 MOE issued a Permit to Take Water (PTTW) allowing dewatering related to construction of the NFA. In 2008 it was determined that dewatering was not required to maintain basal stability during construction of future landfill cells. Dewatering by sump and pump method was required from July 8, 2010 to September 23, 2010.

2. Section 53 OWRA approval to construct the stormwater management system and site drainage works for the NFA was received on July 30, 2009. On September 24, 2009 Certificate of Approval 6802-7VFRUK was issued, adding approval for leachate management facilities for the NFA and revoking and replacing certificate 8389-7NRK7. These works were completed in June 2010.

3. In September 2009, the City awarded a contract to construct the NFA storm water management pond; leachate pump station, meter chamber and associated forcemain; a gravity sewer between the NFA pump station and future Cell 2 and a gravity sewer between a future compost pond and the pump station; and associated roads, ditches and berms. A second contract to construct the first NFA Cell was awarded in March 2010 and completed in October 2010.

4. In 2010 Notices 11 and 12 were issued on July 29 and December 14 respectively to amend Certificate of Approval A341508. The amendments were issued to accept the design report for the landfill gas and flaring system and to grant approval to begin the detailed design of the landfill gas and flaring system for the SFA.

SITE DEVELOPMENT

5. In 2010 a total of 50,200 tonnes of waste was placed in the SFA and 10,048 tonnes of waste was placed in the NFA.

6. To December 31, 2010, 1,735,317 tonnes of waste have been disposed in the PCCWMF.

7. About 3.69 ha of the 18.1 ha SFA was not under final cover at the end of 2010 and available to receive waste.

8. A January 2011 topographic survey of the SFA was used to estimate that 2,776,500 m^3 of airspace has been consumed to January 2011. The volume of airspace remaining in the SFA as of January 2011 was about 150,400 m^3.

9. The volume remaining for waste and daily cover alone (excluding final cover) in the SFA is calculated as 103,100 m^3.

10. The remaining life of the SFA was estimated assuming an annual waste disposal rate of 60,000 tonnes and an apparent waste density of 0.65 tonnes per m^3 which suggests that about 92,300 $m^3$of capacity is expected to be consumed per year.

11. As of January 2010, the remaining life of the SFA is estimated to be about 1.1 years. Because waste placement has continued in the NFA during the first quarter of 2011 and is expected to resume in the SFA in the spring of 2011, the SFA is projected to reach approved capacity by summer of 2012.

12. The NFA will provide capacity for about 885,000 tonnes of waste based on a total air space of 1,527,000 m^3 and an apparent waste density of 0.62 tonnes/m^3. The actual capacity will depend on waste types, actual apparent waste density, compaction effort, waste to cover ratio, moisture content and rate of waste decomposition.

13. The PCCWMF (SFA and NFA combined) will provide waste disposal capacity for the County and City of Peterborough for more than 15 years (from January 2011) based on the estimated capacity of each fill area and an assumed annual waste disposal rate of 60,000 tonnes.

OPERATIONS AND MAINTENANCE

14. No violations of C of A conditions were noted in 2010.

15. In 2010 there were 623 un-tarped load offences recorded.

16. In 2010 there were no violations related to loads containing over 10 percent recyclable materials.

17. On December 1, 2009, a notice was issued by the City advising users that the Tipping Fee at the PCCWMF will increase, effective January 1, 2010, from $85 per tonne to $90 per tonne.

SITE LIAISON COMMITTEE

18. The Site Liaison Committee met on January 19 and July 13, 2010. Odour complaints raised in January 2010 were caused by biosolids being sent to the site. In April 2010 shipment of biosolids to the site ceased.

LCS MONITORING, OPERATION AND MAINTENANCE

19. The volume of leachate and groundwater removed in 2010 was about 50,733 m^3. In the next few years, leachate generation should start to decline in the SFA as final grades are achieved and final cover is placed. When the NFA becomes operational, leachate quantities will increase.

20. The 2010 annual precipitation at the Peterborough Airport was measured to be 656.7 mm while evapotranspiration was 442.0 mm. The 2010 annual water surplus was 214.7 mm. Based on the water balance analysis, the SFA leachate collection system continues to effectively collect leachate.

21. The City's current Sewer Use By-Law parameters are sufficient to evaluate the potential impact of leachate on the WWTP.

22. The 2010 leachate quality generally meets Sewer Use By-law No. 05-104 criteria with the exception of TKN during both sampling events, and nonyl-Phenols during the October event. Historically, TKN concentrations periodically exceed Sewer Use By-law criteria.

23. In-waste leachate concentrations of chloride, sodium, potassium, magnesium, alkalinity, and total Kjeldahl nitrogen generally fluctuate within a lower range since 2005 compared to concentration ranges between 1986 and 1993, but exhibit a general decreasing trend between 2005 and 2010. The concentration fluctuations are attributed to the variable nature of leachate within refuse although it is expected that parameter concentrations within the refuse will decrease over the long term. Installation of additional in-waste monitors is not warranted provided a discrete leachate sample from the last cell (MHT10-07) can be obtained.

24. Groundwater Interceptor leachate quality in general, has fluctuated with no distinguishable trend. The groundwater in the interceptor system is somewhat degraded due to natural conditions, brine influences and low levels of some residual leachate related parameters.

25. Future sampling of leachate in the holding tank and comparison to the City By-law is recommended.

26. Leachate at waste monitor 23B is typical of older leachate. Concentrations of leachate indicator parameters as well as other parameters at these locations have been declining.

27. The quantity of leachate discharged to the City's sewer system was within the historical rates and is considered insignificant with respect to leachate hydraulic loading on the WWTP. Leachate contributed less than 1 percent of the total influent volume of the WWTP in 2010.

28. BOD_5 and TSS loads on the WWTP from landfill leachate are low and represent only a small portion of the WWTP capacity

29. TKN/ammonia load on the WWTP appear to be in the range of 3.2 to 4.2%.

30. The leachate collection systems are functioning as designed and none of the trigger levels to initiate any contingency programs have been exceeded. There is no leachate mounding at any level of concern.

31. During 2010, a leachate seep was identified near the entrance to Cell 1-West B. The seep was repaired and the area restored.

32. The leachate collection system was flushed and video inspected in August 2010. The video inspection indicated that the LCS is generally clear of debris, structurally sound and is conveying leachate as designed.

33. The forcemain was pressure tested and found to be within the guideline of the OPSS.

GROUNDWATER MONITORING ASSESSMENT

34. Water quality effects from the landfill consist of leachate impacts and historical road salt effects to the east and north of the SFA, similar to previous monitoring. Leachate impacts are limited to overburden monitors immediately downgradient of the waste in these areas.

35. During 2010, toluene was detected in several groundwater monitors, including monitors located within the NFA. Historical low concentrations of VOCs in other downgradient monitors, and within the NFA, may be naturally occurring and/or attributed to other sources.

36. The Reasonable Use Policy limits that were exceeded are related to either road salt or natural groundwater quality variability at the site and are not attributed to landfill leachate. The performance monitoring program demonstrates that no contingency measures are required at this time.

37. The NFA overburden and bedrock groundwater quality is representative of the natural baseline conditions, as no landfilling activities took place until late 2010. The groundwater quality based on the 2010 results and previous monitoring indicates fresh overburden and bedrock groundwater, and brine influenced bedrock groundwater at two monitor locations, 86-I and 89-I.

SURFACE WATER MONITORING

38. Surface water quality during 2010 was similar to that of previous years. Water quality generally satisfied the PWQO with the exception of iron and phosphorous at several locations, including the upstream stations SW19 and SW20. The exceedances at the upstream stations indicate that PWQO exceedances at the downstream stations are considered to be naturally occurring, or the result of road runoff or agricultural impacts. The landfill site does not have a measurable influence on the water quality within the adjacent surface water bodies.

LANDFILL GAS ODOUR CONTROL SYSTEM

39. During 2010 the LFGS operated in compliance with the C of A (Air).

40. During flare operations, exhaust temperature was in accordance with Condition 2 of the C of A (Air).

41. The landfill surface monitoring program identified areas with high concentrations of THC.

42. Odours from LCS manholes were generally lower than in 2009. However a number of manholes still showed high THC concentrations.

43. Soil gas probe monitoring shows no evidence of gas migration beyond the property boundary. No additional monitoring is required.

CONTINGENCY PLANS

44. Monitoring shows no contingency measures are required at this time.

11.0 RECOMMENDATIONS

The following recommendations are based on the results of the 2010 monitoring and inspection program:

The Monitoring Program shown as Table 1.1 should be continued in 2011 for groundwater, surface water and leachate monitoring. However, the 2011 monitoring program will incorporate the recently installed groundwater monitoring nests BH108, BH109, and BH110, which are adjacent to Cell 2.

1. Groundwater Monitor 62-I should be decommissioned in accordance with the requirements of Regulation 903 and replaced to ensure that a properly functioning deep bedrock monitor is present at this location.

2. The LCS should continue to be flushed and video inspected to confirm the integrity of the system.

3. Monitoring for the passive gas probes should continue.

4. For future collection of leachate quality samples from the holding tank the following procedures should continue to be followed:

    a. No discharge from the leachate interceptor trench pumping station (MH4) to the holding tank should occur for 24 hours prior to the sampling event. Record the MH4 pump hour records for the day before the sampling event and the day of the sampling event;

    b. Conduct sampling at least 72 hours after a precipitation event; and,

    c. Record the position of the leachate control valves at MHT6-94 and TDCO-A0-05.

5. Decommissioning of standpipe monitors SP5-90 and SP9-91, and inclined standpipes ISP1-94 through ISP6-95 and ISP10 is recommended as they are no longer part of the monitoring program.

6. The surface monitoring program identified areas with high THC. Manholes where gas is escaping should be placed under negative pressure. The LFGS should continue to be maintained and upgraded to reduce the potential for odour emissions.

7. New gas valve chambers on the north slope of the SFA should be surveyed and shown on the appropriate figures in the 2011 annual report. Similarly, HC06-95 should be surveyed and inserted on future figures.

8. Three additional gas probes should be installed and monitored in 2011; one near BH106; one near MHG2; and one north of Cell 2 along the north property boundary at the west limit of Cell 2.