

Richmond Sanitary Landfill Site

Odour Monitoring Plan

Revision No. 1

March 2012

**Prepared for:
Waste Management of Canada Corporation
1271 Beechwood Road
Napanea, ON K7R 3L1**

**Prepared by:
GENIVAR Inc.
1450 First Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2**

Project No. 081-12459-00 (8570)



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March 22, 2012

Mr. Randy Harris, Landfill Manager
Waste Management of Canada Corporation
1271 Beechwood Road
Napane, ON K7R 3L1

Re: Odour Monitoring Plan - Revision No. 1
Waste Management of Canada - Richmond Landfill Site

Dear Randy:

We are pleased to provide this updated Odour Monitoring Plan for the Richmond Landfill site. The report was originally submitted to satisfy Condition 8(d) of the Provisional Certificate of Approval for a Waste Disposal Site No. A371203, amended March 31, 2010, which required Waste Management to submit an odour monitoring plan to the Ministry of Environment (MOE) by June 30, 2010. In January 2012, the MOE issued Environmental Compliance Approval (ECA) No. A371203, which revoked and replaced the previous Certificate of Approval. Condition 8.5 of the ECA requires Waste Management to submit a revised odour monitoring plan. This updated document is intended to satisfy this condition, and is reflective of the site's current conditions and most recent approvals.

Please find enclosed **fifteen (15) copies** for your distribution as you see fit. **One (1) copy** has been provided to the Ministry of the Environment, Environmental Assessment and Approvals Branch in Toronto, ON by our office under separate cover. **One (1) copy** should be provided to the MOE district office in Kingston, ON, retain **one (1) copy** for your records, and the remainder can be distributed as needed at the landfill. If you require additional copies, please let us know. Please note that an electronic version of this document has been provided to Reid Cleland and Wayne Jenken.

We trust the enclosed is satisfactory. However, if you have any additional questions, please do not hesitate to contact the writer.

Very truly yours,

GENIVAR Inc.

Jeff E. Armstrong, P.Eng.
Designated Consulting Engineer
Director, Solid Waste Management

JEA/bdl
Encl.

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1.0 INTRODUCTION

1.1 Background

Waste Management of Canada Corporation's (WM) Richmond Landfill site is located within Part of Lots 1, 2, and 3, Concession IV, Former Township of Richmond, now the Town of Greater Napanee. The landfill site consists of a 16.2 hectare waste disposal landfill site within a total site area of 138 hectares, and operates under Environmental Compliance Approval (formerly Certificate of Approval) No. A371203, including amendments.

The landfill is located between Kingston and Belleville, just north of Highway 401, and is shown on the following **Figure 1**. More specifically, the landfill is located just east of Lennox and Addington County Road 10, and just north of Beechwood Road. The site is located in a rural setting, surrounded by land that is used primarily for agricultural purposes.

On June 30, 2011, the Richmond Landfill ceased to accept waste for landfilling. The installation of the final cover system on the remaining uncapped portion of the landfill was completed in September 2011.

1.2 Purpose and Scope

The original purpose of this Odour Monitoring Plan (Plan) was to satisfy Condition No. 8(d) of the amended Provisional Certificate of Approval No. A371203, issued March 31, 2010, which stated:

"The EMP shall also include a monitoring program to identify odour issues along with appropriate odour abatement activities and a communication plan for the public."

On January 9, 2012, the Ministry of Environment (MOE) issued an Environmental Compliance Approval (ECA) for the Richmond Landfill. This approval included the addition of several documents which were submitted to fulfill various conditions from the March 31, 2010 Certificate of Approval (Waste) amendment. The ECA also listed several new conditions related to site activities, including the requirement to submit an addendum report for the Environmental Monitoring Plan (EMP) for approval. The addendum report is required to include a revised Odour Monitoring Plan (Plan). As a result of this ECA condition, and to reflect current site conditions, this Plan has been updated.

The Plan will outline measures that will be taken throughout the post-closure period of the landfill to monitor and minimize the potential for offsite odour events. The following sections outline the procedures that WM will implement to monitor and control fugitive odour emissions from the site.

1.3 Changes to the Odour Monitoring Plan

Updates of the Plan manual may be required from time to time due to changes in site operations or revisions to existing ECAs. **Appendix A** provides a record of change for this manual.



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SHEET 1	DWN BY: TCG CHK BY: JEA	DATE: MAR 2004 SCALE: SEE BAR SCALE
	WASTE MANAGEMENT OF CANADA CORP.	
	DRAWING NO. 0857013 - Figure 1	

SITE LOCATION PLAN
RICHMOND LANDFILL

 WASTE MANAGEMENT

 GENIVAR
1450 First Avenue West, Suite 101, Owen Sound, ON, N4K 2K8 Telephone: (519) 376-7612 / Fax: (519) 376-8008

2.0 POTENTIAL ODOUR SOURCES

The following section of the report describes the potential odour sources at the landfill:

2.1 Odour Sources

2.1.1 Final Cap Systems

Installation of the final cover system over the remaining uncapped portion of the landfill was completed in September 2011. It is expected that the final cover system will act in conjunction with the landfill gas collection system as an adequate barrier to prevent landfill gas from escaping the underlying waste.

2.1.2 Landfill Gas Collection System

The landfill gas collection system (LFGCS) was implemented in part for odour control at the Richmond Landfill site in 2000. As of March 2012, the LFGCS collects gas from five (5) leachate clean-outs, two (2) leachate collection manholes and 58 vertical gas wells and has worked well to reduce the landfill gas quantities at the site.

2.1.3 Leachate Collection System

Leachate manholes around the landfill site are another source of potential odour. Five (5) leachate clean-outs and two (2) leachate collection manholes are connected to the LFGCS. Through the application of vacuum to the leachate collection system by way of the LFGCS, the gas originating in these structures is collected and sent to the flare for destruction, which effectively prevents fugitive odours from being emitted.

2.1.4 Public Drop Off Facility

The public drop off facility, which ceased operations when the Richmond Landfill was closed in June 2011, was re-opened to the public in February 2012. Conditions of amended ECA No. A371203 govern the types of waste that are accepted at the facility, the quantity of waste that can be received and stored, and the removal frequency of waste materials. Historically, no complaints were received regarding odours emanating from the public drop off facility.

3.0 MONITORING AND INSPECTION PROGRAMS

The following sections outline the monitoring and inspection programs that will be completed at the landfill, and on the potential odour sources at the landfill site during the post-closure period.

3.1 General

3.1.1 Odour Survey

Regular odour inspection activities will be performed by designated WM personnel. The frequency of these inspections will occur weekly during the closure period, since the site is closed and all final cover is in place on the landfill mound.

The WM staff member performing the odour inspections will have the sensitivity of their nose verified, to ensure they are neither insensitive, nor overly sensitive to odours. Employees who are verified to perform the odour inspections are listed on the odour control training log, which is retained in the odour log. An example of this form is provided in **Appendix B.1**.

The odour survey route will consist of driving around the perimeter site road at the toe of the landfill slope, then proceeding out of the landfill onto Beechwood Road east to Johnson Side Road, north to Selby Road, west to County Road 10, south to Beechwood Road, and back to the site, as a minimum. Surveys will be completed offsite by driving at approximately 20 kilometres per hour with the window open and the inspector trying to detect odour. Walking of the route is not feasible due to the considerable distance. Surveys completed at the footprint limit around the perimeter of the landfill mound will be completed in a vehicle travelling at 10 kilometres per hour or less, with the windows lowered. The odour surveys will be completed at varying times during the required day, or during varying weather conditions to ensure surveys are completed under no constant condition.

Once an odour is detected, the odour observer will move around the area to determine other locations where the odour is detected. As this practice is continued, a general direction can be determined as the source of the odour, and the odour observer will trend in that direction until the source is determined. On days where wind is present, the direction of the wind will provide a guideline for the path the odour observer should travel. On wind free days, the path detection is more difficult, and will require the observer to travel larger and more varied distances.

Detectable odours from the site will be noted and recorded on the odour inspection and dispatch log as provided in **Appendix B.2**. At a minimum, the odour information will include:

- A description of the odour;
- Location where the odour was detected;
- The time of day it was detected (to correspond with wind conditions); and

- If possible, an indication of the main sources contributing to the odour.

It should be noted there is an on-site meteorological station that records temperature, humidity, pressure, and wind speed and direction, which will assist in completing information on the odour inspection and dispatch log.

3.1.2 Final Cap System

Conditions of the ECA in effect for the site assist in monitoring and controlling emissions from the final cover system. During the closure period, the site is inspected weekly for leachate seeps, which may result in odours. Seeps are to be repaired within 48 hours of detection. A quarterly site inspection is also performed, and among the items inspected is the integrity of the cover soil and vegetative cover. Any deficiencies noted in the aforementioned items are to be repaired within one month of the date of the inspection.

The final cap system can also be inspected through the performance of a surface emissions survey. The surface emission survey will be used to confirm the integrity of the final cover, and will identify if there are areas of the final cover where landfill gas (methane) is escaping.

The survey consists of a grid survey of the entire landfill mound using a handheld Total Hydrocarbon Concentration (THC) analyzer, such as a Flame Ionization Detector (FID). The FID is calibrated using a methane gas standard and zeroed using ultra pure zero air. Measured THC concentrations are measured as methane. The instrument used for the survey must have the following characteristics:

- A response time of at least 15 seconds;
- An accuracy of 3% or better; and
- A minimum detectable limit of 5 ppmv (or lower).

The surface emissions events are completed when winds are less than eight (8) kilometres per hour (five (5) miles per hour), and during dry conditions (no measurable precipitation for the proceeding 72 hours prior to sampling). The survey will be completed in a grid like formation, gathering data from a height of 7.6cm or lower above the ground surface. Areas consisting of cracks, fissures, areas of bubbling surface water, or patches of dead (burnt) vegetation on the mound will be visually observed and noted for THC concentrations (methane) exceeding 500ppm. Areas that display these readings will be identified as “of concern”, and will assist WM in defining potential landfill gas release points that require remedial action.

Any exceedance locations discovered during the survey will be repaired as soon as possible, and no later than two months after identification. Upon completion of the repair, additional monitoring will be performed. When the readings indicate a THC concentration less than 500ppm, a report will be prepared and submitted to the MOE. The report will include the following:

- Date, time, and weather conditions during event;
- Precise locations of all sampling sites on a site map;
- Identification of all data obtained in the field measurements; and
- Documentation of remedial action and confirmation readings if exceedances were detected during the initial survey.

The results of the surface emissions surveys, the times they were completed, and any remedial actions, will each be noted in the site odour inspection and dispatch log.

Current practices have WM completing surface emissions for one year after closure in the spring, summer, and fall. After this period, surface emission surveys will be completed annually until (3) years of no exceedances above 500ppm are documented. After this time, the surveys will be discontinued.

3.1.3 Landfill Gas Collection System

WM staff, or other designated personnel, will be responsible for inspecting the landfill gas collection and flaring system to ensure the equipment is running properly. Monthly wellfield monitoring is performed by WM staff, and any odours detected within the wellfield are documented and repaired. At the flaring station, the inspection includes:

- Review of system vacuum at the blower;
- Review of gas flows entering the flare;
- Verifying the composition of gas entering the flare; and
- Review of the temperature of the combustion flares.

These items are currently recorded automatically by a computer SCADA system. Any anomalies, such as low vacuum, low flare temperature, and high/low gas volumes, will be noted in the odour inspection and dispatch log. The record shall include:

- The time the anomaly was recorded;
- The corrective action taken; and
- The time the corrective action was implemented.

At any time that upgrades are made to the collection system, such as vertical well installation or collector pipe replacement, WM staff, or a designated representative, will inspect, oversee the installation of, and maintain the integrity of these structures to ensure that the collection of landfill gas continues with high efficiency.

3.1.4 Leachate Collection System

WM staff, or other designated personnel, will routinely monitor the leachate collection system to ensure that it is operating as designed. This inspection will include a visual survey of any access points (cracks and/or fissures) within soils around access points. Leaking areas can be readily identified by a visual inspection.

The vacuum in the leachate collection system caused by the gas system will be monitored on a monthly basis in order to assist with the detection of any leaks that are not as clearly visible as described above. The vacuum readings should be negative with respect to ambient conditions.

Any anomalies noted during the visual survey or during the recording of vacuum readings will be recorded in the odour inspection and dispatch log, along with any corrective actions taken and timing of these actions.

3.1.5 Public Drop Off Facility

WM staff will regularly monitor the public drop off area for odours. A condition of the amended ECA requires WM to remove waste materials a minimum of twice per week from the facility. In the event that odours are detected from waste brought to the site, the material will be removed from the facility as soon as possible and disposed of at a licensed facility.

4.0 RECORDKEEPING PROCEDURES

4.1 Odour Log

Throughout this document, there is reference to an odour log that will be maintained on site. This log will include notes made during the inspection of the items listed in **Section 3.0**, as well as any other notes relevant to odour at the site. The log will consist of a three-ringed binder that will contain separate sections for training logs, inspection and remediation activity logs, general notes, and the complaint log, and shall contain all records for the previous two (2) years. On an annual basis, the logs will be reviewed, and any unfavourable trends will be examined further to identify corrective actions. A summary of any complaints received, and responses made, will be included in the annual monitoring report as per conditions of the ECAs.

4.1.1 Odour Complaints Log

An odour will be considered significant if it is sufficient to cause a member of the general public to file a complaint. **Appendix B.3** contains an example of a standard form to be used when an odour complaint is received. The logs will include the following information, at a minimum:

- WM will record and number each complaint, and record the following information:
 - The nature of the complaint
 - The name, address, and telephone number of the complainant (if the complainant will provide this information; and
 - The time and date of the complaint.
- WM will initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint, and forward a formal reply to the complainant; and;
- WM will complete a written report within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents. A copy of the report will be retained onsite.

A summary of any complaints received, and the responses made, will be included in the annual monitoring report as per conditions of the ECAs.

5.0 COMMUNICATION PLAN WITH THE PUBLIC

As required under the ECA, WM has established a Public Liaison Committee (PLC) for the site, in order to exchange information and monitoring results with representatives from the Town of Greater Napanee, the MOE, the Township of Tyendinaga, the Quinte Conservation Authority and the Mohawks of the Bay of Quinte. The PLC will be provided with the opportunity to review and provide input on a variety of matters, include ongoing operations, monitoring programs, including this Plan, and WM's complaint response programs. All recommendations made to WM by the PLC will be discussed at joint meetings with representatives from both parties.

In addition, WM also has a site complaints procedure posted at the site entrance along with phone numbers to receive complaints or questions related to the landfill.

Respectfully submitted:

GENIVAR Inc.

Beverly D. Leno, C.E.T
Environmental Technologist
Solid Waste Management
BDL/JEA

Jeff E. Armstrong, P.Eng.
Designated Consulting Engineer
Director, Solid Waste Management

Appendix A

Record of Changes to the Odour Monitoring Plan

[illegible]

Appendix B

Odour Monitoring Plan – Standard Forms

Appendix B.1

Odour Control Training Log

Richmond Landfill Best Management Plan Odour Control Training Log



Trained Employee Name	Date of Training	Supervisor Signature

Appendix B.2

Odour Inspection and Dispatch Log

Richmond Landfill Best Management Plan Odour Inspection and Dispatch Log



Inspected by: _____ Inspection Date: _____

Areas to inspection include: Final Cap, Gas Collection System and Flare, Leachate Collection System, and Waste Diversion Area

Area Inspected/Date and Time	Quality / Characteristic of Odour	Source Identified and Distance Downwind Odours are Detectable	Corrective Action to be Completed	Notes
Example Leachate Collection System 2011/11/29 @ 10:30 a.m.	Strong odour, smells like rotten eggs	NW corner of Cell 1 Detectable 20 metres from source Not detectable off site	Replace leaking piping in collection system Action completed within 20 minutes of notable odour	Once repair complete, odour survey to ensure issue has been corrected

Appendix B.3

Odour Complaint Log

Richmond Landfill Best Management Plan Odour Complaint Form



WM Personnel:	
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Date of Call		Time of Call	
Complainant Name		Complainant Contact Number	
Complainant Address			

Date of Odour Incident		Time of Odour Incident	
Description of Event			

Operations at Time of Incident			
Winds at Time of Incident			
Investigation Results and Corrective Action			