



INFORMATION REGARDING ENVIRONMENTAL AUDIT REPORTS

August 2007

VICTORIA'S AUDIT SYSTEM

An environmental audit system has operated in Victoria since 1989. The *Environment Protection Act 1970* (the Act) provides for the appointment by the Environment Protection Authority (EPA Victoria) of environmental auditors and the conduct of independent, high quality and rigorous environmental audits.

An environmental audit is an assessment of the condition of the environment, or the nature and extent of harm (or risk of harm) posed by an industrial process or activity, waste, substance or noise. Environmental audit reports are prepared by EPA-appointed environmental auditors who are highly qualified and skilled individuals.

Under the Act, the function of an environmental auditor is to conduct environmental audits and prepare environmental audit reports. Where an environmental audit is conducted to determine the condition of a site or its suitability for certain uses, an environmental auditor may issue either a certificate or statement of environmental audit.

A certificate indicates that the auditor is of the opinion that the site is suitable for any beneficial use defined in the Act, whilst a statement indicates that there is some restriction on the use of the site.

Any individual or organisation may engage appointed environmental auditors, who generally operate within the environmental consulting sector, to undertake environmental audits. The EPA administers the environmental audit system and ensures its ongoing integrity by assessing auditor applications and ensuring audits are independent and conducted with regard to guidelines issued by EPA.

AUDIT FILES STRUCTURE

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Report executive summaries, findings and recommendations should be read and relied upon only in the context of the document as a whole, including any appendices and, where applicable, any certificate or statement of environmental audit.

AUDIT REPORT CURRENCY

Audit reports are based on the conditions encountered and information reviewed at the time of preparation and do not represent any changes that may have occurred since the date of completion. As it is not possible for an audit to present all data that could be of interest to all readers, consideration should be made to any appendices or referenced documentation for further information.

When information regarding the condition of a site changes from that at the time an audit report is issued, or where an administrative or computation error is identified, environmental audit reports, certificates and statements may be withdrawn or amended by an environmental auditor. Users are advised to check [EPA's website](#) to ensure the currency of the audit document.

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FURTHER INFORMATION

For more information on Victoria's environmental audit system, visit EPA's website or contact EPA's Environmental Audit Unit.

Web: www.epa.vic.gov.au/envaudit

Email: environmental.audit@epa.vic.gov.au



30 June 2009

ENVIRONMENTAL AUDIT REPORT

Methane Gas Audit: Hallam Road Landfill 310 Hallam Road, Hampton Park, Victoria

Submitted to:

Environment Protection Authority
Herald and Weekly Times Tower,
40 City Road, SOUTHBANK, VIC, 3006

REPORT



A world of
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2 Copies – Environment Protection Authority
2 Copies - SITA Environmental Solutions
2 Copies - Golder Associates Pty Ltd





Executive Summary

Mr Roger Parker of Golder Associates Pty Ltd was requested by SITA Environmental Solutions to prepare an Environmental Audit Report under Section 53V of the Environment Protection Act 1970 to assess the risk of any possible harm or detriment of methane gas emissions from the landfill operations located at 310 Hallam Road, Hampton Park, Victoria. The table below provides summary information relating to the Audit and the site.

This report presents the findings of an Environmental Audit into the risk of harm presented by methane gas emissions from the Hallam Road Landfill operated by SITA Environmental Solutions. The Audit has been undertaken in accordance with the scope of work agreed with EPA and has focussed on assessing the risk of harm presented by the emission and possible migration of methane from the landfill site.

The Hallam Road Landfill site has an active landfill gas extraction system operated by LMS Generation Pty Ltd with the collected gas being used to generate electricity at a 3.3 Megawatt on-site power station. The results of methane gas monitoring in close proximity to the landfill indicated that landfill gas migration beyond the limits of the landfill cells was occurring in a limited area prior to extraction system upgrades in October or November 2008. Since that time, methane gas concentrations beyond the limit of the landfill cells have been significantly reduced and maintained at acceptable levels, provided there is on-site monitoring of occupied buildings.

The nearest sensitive receptors to the site are houses located on the west side of Hallam Road. Commercial properties are also located on the east side of Hallam Road. Boundary monitoring of landfill gas has demonstrated that methane gas concentrations are negligible other than in bore LFG 8 where the methane concentrations are very low, generally around 2% v/v or less in the deepest monitoring location. The concentrations are stable and do not suggest significant migration of landfill gas across the boundary. There is also a likelihood the methane may not be a result of landfill activities.

Based on the findings of the Environmental Audit, the Auditor concludes:

- a) Methane gas monitoring at the site boundaries is adequate for the detection of potential methane migration off-site.
- b) Methane has been detected in one location (LFG 8) along the western boundary of the site; however, the results indicate that this poses a low risk to the environment and sensitive receptors off-site, and may not be of landfill origin.
- c) Long-term monitoring has recorded methane gas beyond the cell boundary, specifically at Cell 1A which is one of the oldest landfill cells at the site and has only a compacted clay liner. Gas concentrations have significantly reduced following the upgrade of the gas extraction system in this area in October/November 2008. This highlights the importance of the gas extraction system in controlling methane emissions from the landfill.
- d) The risks of methane emissions through the cap are likely to be low however at this stage there is insufficient data to confirm emissions through the cap.
- e) The overall risk to air environment posed by methane gas at the site is low provided that the best practice management and control of gas and gas monitoring at the site continues, and that recommendations and improvement opportunities identified by the Auditor are implemented.
- f) The mitigation measures and controls, namely, the active gas extraction system and monitoring programme implemented at the site should limit methane gas emissions off-site to within the EPA investigation trigger level (apart from the vicinity of GMP8 where a higher trigger level is recommended by the Auditor). In order to maintain and where possible, minimise the risk of harm of methane gas emissions from the site, the Auditor has identified a number of opportunities for improvement.



Further, the Auditor concludes that with respect to methane emission from the landfill, the beneficial uses of air are protected and the risk of harm from methane to the off-site environment is low and acceptable. Recommendations to maintain acceptable risks to the on-site and off-site environment are outlined below.

Audit Recommendations

The Auditor has identified a range of measures throughout the Audit Report that are required to be implemented to ensure that the risk of harm posed by methane emissions from the site to the beneficial uses can be maintained at acceptable levels. These recommendations have been summarised and presented below in order of significance of impact or ease/feasibility of implementation:

HIGH PRIORITY

- The Landfill Gas Management Plan for the site should document provisions for future installation and/or upgrade of gas extraction at the site that includes criteria for installation (timely installation), construction of the network, review of performance of the system and repair/modifications as needed.
- All aspects of management, operation and monitoring of the gas extraction system (discussions between SITA and LMS may be necessary to define responsibilities) at the site to be addressed through the Landfill Gas Management Plan, including:
 - Routine planned maintenance of gas extraction system;
 - Management and monitoring of gas collection and extraction bores at the perimeter of the site;
 - Regular review and upgrade (where necessary) of the gas extraction system during the life of the landfill.
- Daily monitoring during and continuing for 3 to 5 days after shutdown of the extraction system. The monitoring should continue after the shutdown if methane is detected in any of the monitoring bores.
- Replacement of LFG 3 and inclusion into the monitoring programme.

MEDIUM PRIORITY

- Revise the Landfill Gas Management Plan as per guidance provided in Section 10.6 of this Audit Report and include provision for:
 - Ongoing monthly monitoring of all gas bores unless trigger levels are exceeded in a particular bore as follows:
 - Daily monitoring if methane concentration in any bore (except LFG 8) is detected at concentrations > 1 % v/v. Daily monitoring of the relevant bore to continue until the concentration drops below the EPA investigation trigger level;
 - Daily monitoring of LFG 8 when methane concentrations exceed < 2.5 % v/v (approximately equivalent to 50 % of the lower explosive level for methane). Daily monitoring to continue until methane concentration drops below 2.5 % v/v;
 - Weekly monitoring of methane gas within site buildings for a period of 12 months (or longer if data indicates potential risk of harm to on-site personnel). Based on the results reduction in frequency to monthly may be appropriate;



HALLAM ROAD LANDFILL METHANE GAS AUDIT

- Once-off daily monitoring for a week in summer and a week in winter to be conducted during the next 12 months;
- Bi-annual (twice per annum) surface gas monitoring in accordance with guidance provided in EPA 722 (sample locations). The frequency of surface emission monitoring could be reduced to yearly following demonstration of that methane emissions are low from three consecutive rounds of monitoring.
- Calibration of gas analyzing equipment according to the manufacturer's specification.
- The updated Landfill Gas Management Plan should be reviewed by a person who is an Environmental Auditor.
- Further, this Plan should be reviewed after 12 months with Environmental Auditor confirmation of its adequacy to manage landfill gas risks at and beyond the site.
- Any changes in the Landfill Gas Management Plan that may be required in the future should be reviewed by a person who is an Environmental Auditor.
- A detailed review of the monitoring programme and the Landfill Gas Management Plan should be undertaken every 3 years. It may be appropriate for EPA to require this to be an Environmental Audit in accordance with Section 53V of the Environment Protection Act 1970.

LOW PRIORITY

- Given the inconclusive potential source of methane gas detected in LFG 8, the Auditor recommends SITA to investigate the feasibility of undertaking isotopic analyses of the landfill gas at this location. SITA may wish to pursue this recommendation as high priority. Depending on the results of the isotopic analyses, the frequency of monitoring LFG 8 may be reduced to monthly (i.e. if the source of the gas at LFG 8 is confirmed to be unrelated to landfill operations at the site).



HALLAM ROAD LANDFILL METHANE GAS AUDIT

Table 1: Summary of Audit Information.

Summary Information Required	Details
EPA File Reference Number	60797-4
Auditor	Roger Parker
Auditor Term of Appointment	03 February 2008 – 02 February 2012
Name of Person Requesting Audit	Mr Michael O' Keeffe
Relationship to Premises/Location	Post Collection Manager, SITA Environmental Solutions
Date of Request	06 January 2009
Date EPA Notified of Audit	19 January 2009
Completion Date of the Audit	30 June 2009
Reason for Audit	Voluntary following discussion with EPA
Description of Activity	Landfill capable of generating methane
EPA Region	South Metro
Dominant – Lot of plan	Lot 2 PS 517790
Additional – Lot of plan(s)	Lots 1,4,6,7,10, CM1 PS 517790, Lot 3 PS 447749 and Lot 4 PS 445749
Site/Premises Name	Hallam Road Landfill
• Building/Complex Sub-Unit No.	
• Street/Lot – Lower No.	274
• Street/Lot – Upper No.	310
• Street Name	Hallam
• Street Type	Road
• Street Suffix	
• Suburb	Hampton Park
• Postcode	3976
GIS Coordinate of Site Centroid	145.270894
• Longitude/Northing (GD94)	
• Latitude/Easting (GDA94)	-38.055976
Members and Categories of Support Team Utilised	None used
Outcomes of the Audit	The overall risk to air environment posed by methane gas at the site is low provided that the best practices management and control of gas and gas monitoring at the site continues, and that recommendations and improvement opportunities identified by the Auditor are implemented.
Further Work or Requirements	Implementation of Audit recommendations.



HALLAM ROAD LANDFILL METHANE GAS AUDIT

Table 2: Physical Site Information.

Summary Information Required	Details
Groundwater Segment	Segments B, C
Surrounding Land Use	North: Residential (closest approximately 300m north of the site along Redwood Road); South west corner: Retail/commercial (nursery); East: Open Space; and West: Residential (closest approximately 150m west along Hallam Road).