



**THE ODOUR  
UNIT** *m<sup>3</sup>*



# **Veolia Environmental Services (Australia) Pty Limited**

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**Clyde Waste Transfer Terminal**

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**Odour Audit VII**

**Final Report**

**November 2006**

**THE ODOUR UNIT PTY LTD**

**ACN 091 165 061**

**Suite G03, Bay 16**

**Locomotive Workshop**

**Australian Technology Park**

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## 1 INTRODUCTION

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The Odour Unit Pty Ltd (TOU) was commissioned by Veolia Environmental Services (Australia) Pty Ltd (VES) to undertake the seventh odour audit on the Clyde Waste Transfer Terminal on 14<sup>th</sup> September 2006.

The seventh odour audit for the months June, July and August 2006 was carried out on September 2006 required under the Conditions of Consent – 48(f) outlined below.

*48. The Odour Management Plan must address, but is not necessarily limited to, the following issues:*

*(f) An odour audit program which provides for a comprehensive odour audit of the premises and nearby commercial and residential areas, by an independent, appropriately qualified and experienced person, to be conducted 3-monthly for the initial 24 months of receiving un-containerised waste at the terminal, and 6-monthly thereafter, unless otherwise approved in writing by the Director-General.*

Odour Audit VII focused on issues relating to general housekeeping, fugitive odour emissions, ground level odour impacts and complaints handling. The approach included a general inspection of the tipping floor, container packing area and site access roads; smoke

testing inside the transfer building; inspection of the complaint register and site meteorological data log; and a field ambient odour survey both on- and off-site.

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## 2 FINDINGS AND RECOMMENDATIONS

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### 2.1 General Housekeeping

The container packing area was clean and tidy with operators on hand to ensure any spilled waste is cleaned up as soon as possible. The containers appeared to be in excellent condition. Odour emission from this area was observed to be minimal and localised.

An inspection of the transfer building found that the waste level on the tipping floor was kept to a minimum, being cleared into the compactor as soon as possible. Site access roads were clean with no waste spills visible during inspection. VES advised TOU that these roads are hosed down and washed every night.

### 2.2 Smoke Testing

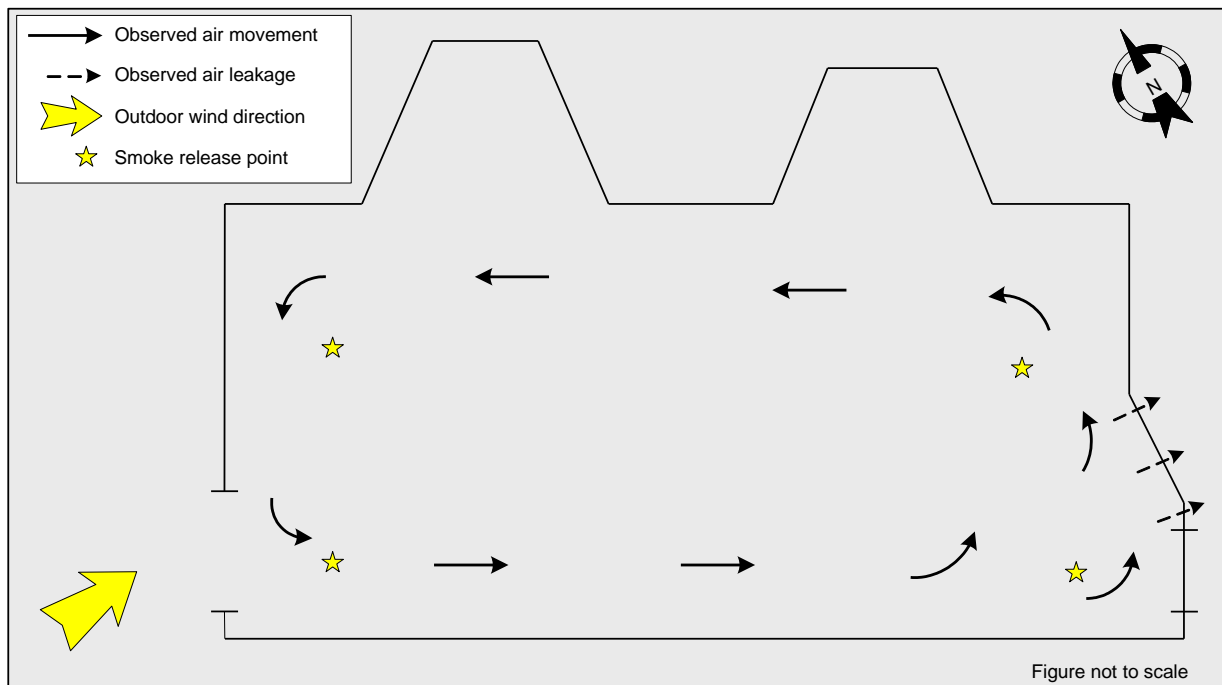
Smoke testing was again carried out as part of Odour Audit VII to investigate natural air flow patterns into, within and out of the building to reveal potential fugitive emissions from the transfer building.

It has been acknowledged in previous odour audits that the Clyde facility and the large number of truck movements could 'pressurise' the transfer building due to wind pressure on

the open truck doorway. It is therefore essential that continued work be performed on improving the sealing of the breezeways and other 'gaps' in the building.

The weather conditions during the testing were mild and partly cloudy, with a calm to light ( $0 - 2 \text{ m s}^{-1}$ ) wind blowing from a westerly direction ( $\sim 270$  degrees). There was a noticeable flow of air through the doorway into the building. The surging and changing airflow prevented accurate measurement of wind velocity through the doorway.

The smoke was released at floor level at several locations; the observed airflow is represented in **Figure 2.1**.



**Figure 2.1** – Transfer Building smoke release locations and observed airflow patterns.



The principal finding of the smoke testing re-confirmed what was found in previous odour audits; that there was minimal visible airflow towards the extraction fans. The bulk of the smoke dispersed inside the building as if there was little mechanically induced air movement, with a very slow counter-clockwise circulation. The westerly wind through the doorway was the main influencing factor in this airflow pattern. All extraction fans were operating at the time except for Fan 3, which was found to be offline. VES advised TOU that Fan 3 was brought back online as immediate as possible after the day of the audit. The plastic strip curtain covering the upper-third of the open truck doorway prevented fugitive emissions from exiting back out of the top of the doorway. The airflow was observed to descend from above the doorway, into the westerly flow at the surface and then return back into the circulation within the building.

Smoke released at the southeastern corner showed clearly that air was escaping the building through gaps in the breezeways, in particular the unsealed breezeway directly north of the roller-door. This could be a major source of fugitive emissions and should be sealed as soon as possible.

The proposed new extraction system, using a single tall stack, will result in changes to the airflows within the building. The effect of this system will need to be assessed, once this system is commissioned.

In the meantime, TOU strongly recommends that the breezeways at the southeastern corner of the building be fully sealed as soon as possible along with any other 'gaps' in the breezeways that may be apparent elsewhere.

### **2.3 Odour Complaints Handling and Meteorological Data**

The VES complaints handling procedure is responsive and comprehensive. It was evident that complaints were immediately logged and investigated as soon as was practicable by the VES Site Manager with comments on weather conditions, observations made during inspection, and action taken. As recommended in Odour Audit VI, VES have included observed wind direction and the transfer building waste level corresponding to each complaint.

TOU recommends that wind speed (m/s) and temperature (°C) should also be included in the register to highlight further relationships between complaints and meteorological conditions. Additionally, the complainants should be encouraged to include an odour intensity and odour character description with every complaint they lodge to be recorded in the register.

**Table 2-1** shows the total number of documented complaints received by VES in the months June through to August 2006.

**Table 2-1: Odour Complaints Summary (June - August 2006)**

Month	Dates	Complainants
June	01/06/2006 (x2)	Manildra
July	No complaints	-
August	07/08/2006, 14/08/2006	Manildra
<b>Total</b>	<b>3</b>	

A detailed and comprehensive record of meteorological data was logged at 15-minute intervals by an automatic weather station, which was downloaded weekly by the VES Site Manager and stored on a database. The database included important parameters relevant to dispersion modelling including sigma-theta, 2m temperature, 10m temperature and solar radiation. Should the station go offline, data from a Bureau of Meteorology AWS located nearby at Homebush Bay can be acquired as a substitute. The station instruments appeared to be in excellent condition and properly maintained.

## 2.4 Ambient Odour Assessment

At present, no Australian Standard exists for field based ambient odour assessment surveys. Consequently, The Odour Unit utilises a method for assessing the ground level impacts of odour emissions using a modified version of the German Standard VDI 3940 (1993) – ‘Determination of Odorants in Ambient Air by Field Inspections’.

Field based ambient odour surveys are considered a valuable odour impact assessment tool as previous experience with ambient odour sampling and subsequent olfactometry testing suggests that accurate and useful ambient odour concentration data is difficult to obtain. Therefore, TOU has adopted a more practical approach based on the field measurement of odour intensity. With this method, calibrated and experienced odour specialists traverse the downwind surrounds of odour sources in a strategically mapped pattern, assessing the presence, character and intensity of any odours encountered and recording these observations along with wind speed and direction.

An ambient odour assessment was performed downwind of the Clyde facility on 28/09/2006 (1154 – 1237). TOU assessors firstly determined the wind direction and then assessed downwind locations attempting to cover as much territory as possible, given that the area was essentially private industrial land or rail tracks. This restricted the survey's assessment locations to the site access roads and the surrounding public roads.

The assessors spent between a few minutes at each assessment location in order to gauge the effects of any odour impact. At each location, wind velocity was measured using a TSI Model 8345 Velocicalc anemometer, while wind direction was determined using a compass. If an odour was detected at a location, the assessors attempted to characterise it. The general aim was to determine the extent of the impact of odours off-site and rank

their intensity. The ranking scale for the German Standard VDI 3940 ‘Determination of Odorants in Ambient Air by Field Inspections’ was used for the intensity assessments. The standard’s ranking system is based on the following seven-point intensity scale.

#### VDI 3940 – Intensity Scale

0	Not Detectable
1	Very Weak
2	Weak
3	Distinct
4	Strong
5	Very Strong
6	Extremely Strong

The results of the ambient assessment surveys are depicted in two principal ways. The field log sheets completed by the assessors contain the unprocessed data for each location and the derived result of the survey is illustrated as an odour impact map. The map illustrates the locations assessed, and the level of odour intensity detected downwind of the Clyde facility.

As **Appendix A** illustrates, the characteristic garbage smell was localised to the access roads to the northwest of the transfer building, eliciting a peak intensity score of 2 (weak).

No odour impact was detected along Parramatta Road, Berry Road or Clyde Station.



## **Appendix A**

### **Ambient Assessment Log Sheets and Location Map**





Client: *Collex Pty Limited*  
 Client Contact: *Evelyn Melinis*  
 Survey Site: *Collex Clyde Waste Transfer Terminal*  
 Survey Date: *28 September 2006*  
 Survey Time: *1154 - 1237*  
 Weather Conditions: *Sunny, 24°C*



ASSESSMENT LOCATION	TIME	WIND DIRECTION (Degrees)	WIND VELOCITY (m/s)	ODOUR PRESENT (Y/N)	ODOUR CHARACTER	GERMAN INTENSITY STANDARD VDI3882 SCALE (0-6)	COMMENTS
5	1154	110	2.5 - 3.5	Y	Garbage	1	Odour was detected fairly constantly.
13	1157	100	2.5 - 3.5	Y	Garbage	2	Odour was detected constantly.
14	1200	100	2.5 - 3.5	Y	Garbage	2	Odour was detected constantly.
15	1203	120	2.5 - 3.5	Y	Garbage	1	Odour was detected intermittently.
16	1206	120	2.5 - 3.5	N	-	0	None.
6	1210	140	3.5 - 4.0	N	-	0	None.
7	1213	140	1.5 - 2.0	Y	Sweet, fermented	1	Odour was detected intermittently.
17	1215	Variable	0.5 - 1.0	N	-	0	Assessment area was sheltered by buildings and vegetation. Distinct H <sub>2</sub> S odour detected emitting from Duck River.
18	1217	130	1.5 - 2.0	N	-	0	None.

ASSESSMENT LOCATION	TIME	WIND DIRECTION (Degrees)	WIND VELOCITY (m/s)	ODOUR PRESENT (Y/N)	ODOUR CHARACTER	GERMAN INTENSITY STANDARD VDI3882 SCALE (0-6)	COMMENTS
19	1220	Variable	0.5 - 1.0	N	-	0	Assessment area located near the corner of Parramatta Road and Wentworth Street. Area sheltered by buildings and vegetation.
20	1224	100	1.5	N	-	0	Assessment area located near the corner of Parramatta Road and Kendall Road.
21	1227	110	1.5	N	-	0	Assessment area located near the corner of Parramatta Road and Berry Road.
22	1230	Variable	0.5 - 1.0	N	-	0	Assessment area located halfway along Berry Road between Parramatta Road and Clyde train station. Area sheltered by buildings.
23	1234	100	1.5 - 2.5	N	-	0	Assessment area located near the northern side of Clyde train station.
24	137	110	1.5	N	-	0	Assessment area located near the southern side of Clyde train station.