



Odour Emission Report Summary

odour testing exercise

16 – 21 February 2018



1 INTRODUCTION

The principal objectives of the tests were to measure odour emission concentrations from the stack and to determine compliance of the odour emission with the facility's Environment Protection Licence (EPL) No. 6229. The EPL was issued by the Environment Protection Authority (EPA) in accordance with the *Protection of the Environment Operations Act 1997*. The EPA is now incorporated into the Office of Environment and Heritage (OEH).

The emission parameters monitored in this survey were:

- **Odour concentration**
- **Stack exhaust gas velocity, exhaust gas temperature, and hence discharge volume**
- **Moisture**
- **Mass Odour Emission Rate (MOER).**

Odour emission testing was undertaken between 16 and 21 February 2018 at various times during a typical composting cycle. Table 1-1 shows when emission testing was conducted at the stack.

TABLE 1-1 ODOUR TESTING PROGRAM

Day of the Week	Date	Time of the Day Sample was Taken	Number of Odour Samples Taken per Visit
Friday	16/02/2018	AM	1
Sunday	18/02/2018	PM	1
Monday	19/02/2018	AM	1
Tuesday	20/02/2018	PM	1
Wednesday	21/02/2018	AM	1

2 PRODUCTION CONDITIONS

The odour emission samples were collected with the composting plant operating under a normal cycle with sampling commencing on a Friday. Samples were taken on five separate days over a six day period.

Elf Farm Supplies holds all relevant production records should they be required for review.



3 RESULTS AND DISCUSSION

3.1 EMISSION TEST RESULTS

The results of the compliance emission tests are presented in Table 3-1. SEMA completed the odour sampling. SEMA is NATA accredited for the odour sampling, NATA accreditation number 15043.

Odour Research Laboratories Australia (ORLA) performed the odour analysis. ORLA is a division of Peter W Stephenson & Associates Pty Ltd and is NATA accredited to AS4323.3 for odour analysis, accreditation number 15043.

The Certificates of Analysis, Olfactometer Test Reports No. 5900/ORLA/01, 5900/ORLA/02 and 5900/ORLA/03 can be provided on request to Elf Farm Supplies.

The odour emission sampling and olfactometric analysis was conducted in accordance with Australian Standard (AS) 4323.3. Refer to Section 5 of this report for further detail.

TABLE 3-1 ODOUR EMISSION CONCENTRATION RESULTS

Day of Week	Friday	Sunday	Monday	Tuesday	Wednesday
Date	16/02/2018	18/02/2018	19/02/2018	20/02/2018	21/02/2018
Time Sample Taken (hours)	10:56-11:06	16:45-16:55	3:04-3:14	17:10-17:20	3:00-3:10
SEMA Sample No.	726820	726831	726832	726837	726838
ORLA Sample No.	4857	4860	4861	4867	4868
Concentration (ou)	2,800	4,000	3,400	4,100	5,700

Key:
ou = odour unit



3.2 ENVIRONMENT PROTECTION LICENCE NO. 6229

Table 3-2 summarises the odour emission limit for the tunnel composter stack at Elf Farm Supplies Pty Ltd under their EPL Licence No. 6229. The criterion is defined by the 100th percentile odour emission limit as a Mass Odour Emission Rate (MOER) in Odour Units per second (ou/s) on a rolling annual average.

TABLE 3-2 100TH PERCENTILE ODOUR EMISSION LIMIT

EPA Licence No.6229 Criteria	
100 th Percentile MOER Limit	55,400 ou.m ³ /s
Averaging Period	Rolling annual

Key:

MOER = Mass odour emission rate
 ou.m³/s = odour unit volume cubic metres per second

3.3 ODOUR EMISSION RATES

The MOER for all samples was determined to establish compliance with the EPA/OEH EPL criteria.

The MOER can be calculated using the following formula:

$$\text{MOER} = \text{velocity (m/s)} \times \text{internal area of the stack (m}^2\text{)} \times \text{odour concentration (ou)}$$

Velocity = velocity of air in stack in metres per second as shown in Table 3-3.

Total Surface Area of the Stack = Cross Sectional Area of the Stack in square metres (m²). Odour

Concentration = As per Table 2-1 and Table 3-3.

The above formula calculates MOER based on actual conditions. However the Reference Conditions specified that the MOER is to be reported as dry, 293 degrees Kelvin (K) and 101.3 kilopascals (kPa).

SEMA measured the moisture content, temperature and pressure of the exhaust gas stream, at the same time as the odour emissions were sampled. These measurements enabled the MOER to be corrected to the above reference conditions. The MOER for each of the samples is shown in Table 3-3.

TABLE 3-3 ODOUR EMISSION RATES OVER A TYPICAL COMPOSTING CYCLE – FEBRUARY 2018

Day	Friday	Sunday	Monday	Tuesday	Wednesday	Ave.
Date	16/02/18	18/02/18	19/02/18	20/02/18	21/02/18	
ORLA Sample No.	4857	4860	4861	4867	4868	
Time (hours)	10:56-11:06	16:45-16:55	3:04-3:14	17:10-17:20	3:00-3:10	
Odour Concentration (ou)	2,800	4,000	3,400	4,100	5,700	4,000
Stack Velocity (m/s)	7.4	9.5	7.6	8.4	8.4	8.2
Stack Cross Section Area (m ²)	1.3	1.3	1.3	1.3	1.3	1.3
MOER (ou.m ³ /s)	23,000	42,000	28,000	38,000	54,000	37,000
EPL MOER Limit (ou.m ³ /s) Annual Rolling Average	55,400	55,400	55,400	55,400	55,400	55,400

Key:
 Ave. = average
 No. = Number
 ou = odour unit
 m/s = metres per second
 m² = square metres
 MOER = Mass Odour Emission Rate
 ou.m³/s = odour unit volumes per second



4 CONCLUSIONS

This odour emission survey was conducted over a typical composting cycle. The measured stack MOER's for the monitoring period were in the range of 23,000 ou.m³/s to 53,000 ou.m³/s. The average MOER for the February 2018 composting cycle, which was considered to be typical, was 37,000 ou.m³/s.

Therefore, these MOER's comply with the EPA/OEH EPL No. 6229 Licence Criteria of 55,400 ou.m³/s Rolling Annual Average.