# ELF Farm Supplies

## Annual Biofilter Testing

### Elf Farm Supplies Pty Ltd

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Prepared by:

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## Revision Record

| Revision | Date | Prepared By | Checked By | Authorised By |
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| TR01R01 | 28 August 2024 | Ali Naghizadeh | Jason Shepherd | Ali Naghizadeh |
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# Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Elf Farm Supplies Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid. Results relate to only to the items tested, calibrated, or sampled.

This report is for the exclusive use of the Client and shall not be reproduced except in full. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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# 1.0 Introduction

SLR Consulting Australia (SLR) was commissioned by Elf Farm Supplies (EFS) to conduct annual odour emission testing of the Biofilter Control System serving the EFS substrate facility located at 108 Mulgrave Road, Mulgrave NSW.

The purpose of the emission testing was to measure the odour concentration, emission rate and removal efficiency of the EFS biofilter and compare these against measurements taken in 2018 (as part of a site wide odour audit completed by SLR), which were subsequently adopted for the Odour Impact Assessment report prepared by The Odour Unit, dated 28 August 2015 (the OIA).

This report outlines the methodology and results of the biofilter odour monitoring. This report is limited to factual presentation of the monitoring data with minimal interpretation of results. This test report only includes the results from the locations nominated in **Section 1.1**.

## 1.1 Biofilter Testing Methodology

SLR conducted representative odour testing of the Biofilter in general accordance with:

- Australian Standards and New Zealand Standards (AS/NZS) 4323.4:2009 "*Stationary source emissions - Area source sampling - Flux chamber technique*"; and
- AS/NZS 4323.3:2001 "*Stationary source emissions – Determination of odour concentration by dynamic olfactometry*"; and
- AS4321.1:2021 (and NSW EPA method TM-2 (USEPA method M2)) "*Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)*".

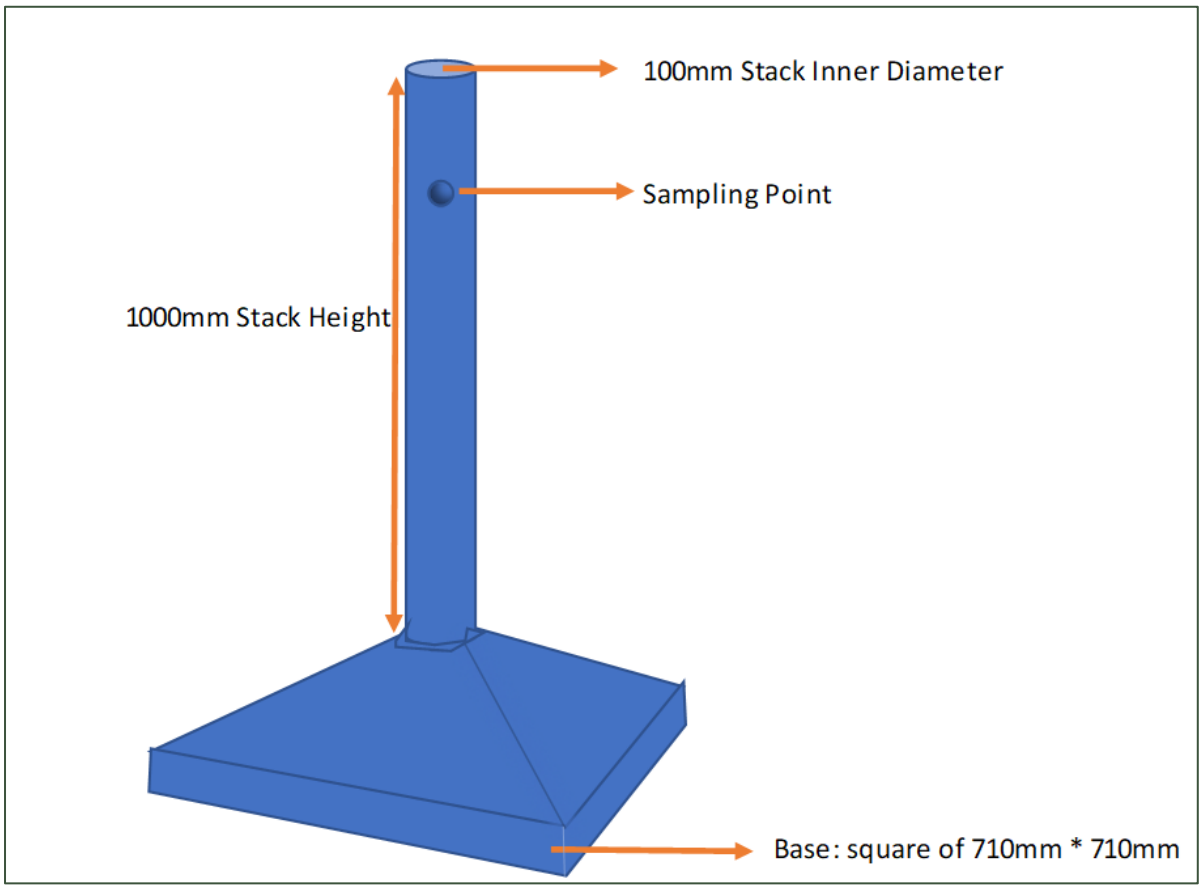
### 1.1.1 Biofilter Outlet Odour and Flow Testing

The AS/NZS 4323.4 flux chamber technique is typically used for non-aerated surfaces such as landfill sites, ponds etc. A flux chamber is placed on the surface and nitrogen supply sweep air is used to stimulate the odorous surface within the flux chamber from which an odour sample is collected. However, a biofilter system is aerated by a pressurised ventilation system. Therefore, SLR adopted the use of a Witches Hat hood (WHH) that do not require nitrogen sweep air to collect a representative odour sample. Refer to **Figure 1** for an illustration of the Witches Hat hoods being used on the EFS Biofilter bed. Refer to **Figure 2** for a schematic of the Witches Hat hood used. Air flow measurements were undertaken using an anemometer to directly read average velocity from the outlet of the witches hat hood from which the air flow rate from the hood stack was calculated.

**Figure 1 Illustration of Witches Hat Hoods being used on EFS Biofilter Beds**

| Witches Hat Hoods on Eastern Bed | Witches Hat Hoods on Western Bed |
|---|---|
|  |  |

**Figure 2 Illustration of Witches Hat Hood Dimensions**



In order to account for the emission variability that is typically associated with biofilters, SLR divided the Biofilter outlet into two beds, identifying these as the eastern bed and the western bed. These two beds service the two biofilter inlets (refer **Section 1.1.2**) .SLR then further divided these two beds into evenly distributed rows (length and width).

The eastern bed had a surface area of approximately 1,500 square meters ($m^2$). SLR divided this bed into six equal rows along its length and three equal rows along its width (approximately 10 m by 9 m grid cells). This resulted in a grid of 18 sample areas evenly distributed across the eastern biofilter bed from the centre of which samples could be collected.

The western bed has a surface area of approximately 1,278 $m^2$. SLR divided this bed into five equal rows along its length and three equal rows along its width (approximate 9 m by 9 m grid cells). This resulted in a total of 15 sample areas evenly distributed across the western biofilter bed from the centre of which samples could be collected.

EFS confirmed the total surface area of the Biofilter outlet bed is 2,778 $m^2$.

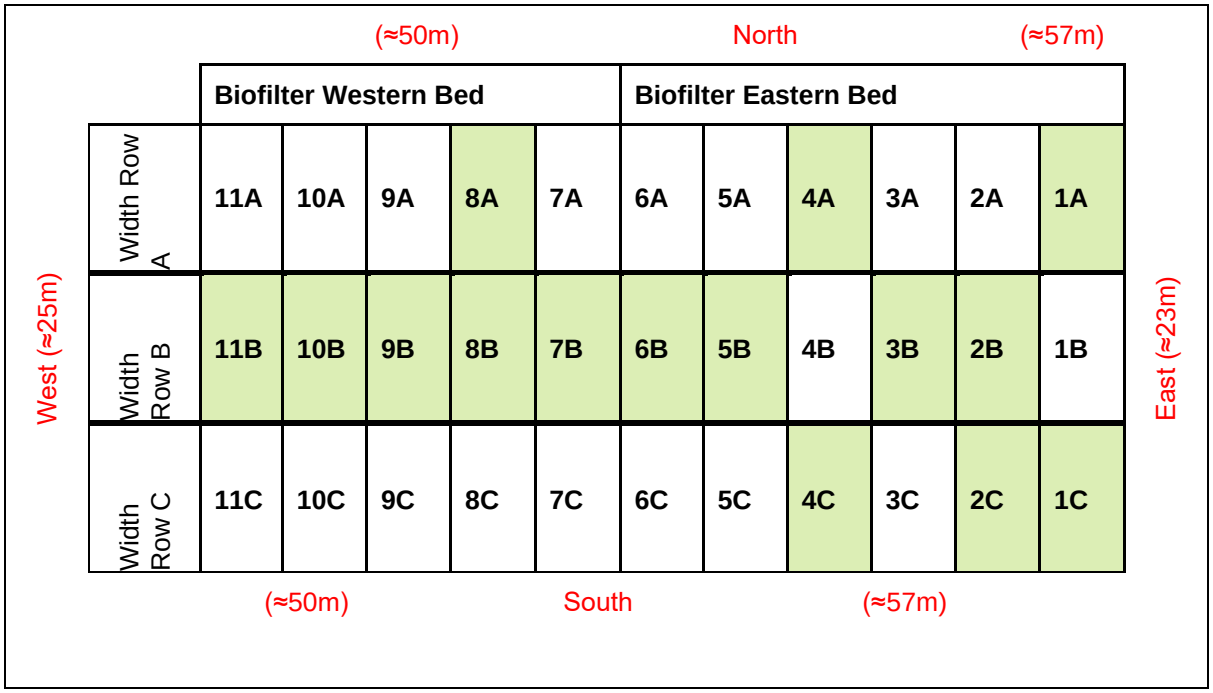
It is noted that at the time of the sampling, parts of the eastern and western beds were inactive as the bedding material was being replaced. The active area of the beds was measured as follows:

- eastern bed: approximately 23 m by 57 m
- western bed: approximately 25 m by 50 m

The number of sample points for each bed was kept consistent with sampling conducted as part of a site wide odour audit completed by SLR in 2018. The smaller active surface area resulted in a tighter grid (approximately 8 m by 8 for the eastern bed and 9 m by 9 for the Western bed).

Refer to **Figure 3** for an illustration of the Biofilter outlet beds (as sampled) distributed into their grids.

**Figure 3 Illustration of the Biofilter Outlet Distributed into 33 Grids**




Notes: The image above does not represent actual layout.
Odour samples were collected from cells highlighted green

The temperature and surface velocity was measured for at the centre of each grid cell. The data was then assessed to determine if surface velocities measured for each north to south row were generally consistent with the average, or if there was evidence of breakthrough (high velocity) or blockage (low velocity). SLR considered surface velocities that differed by more than 20% from the average surface velocity measured to be *inconsistent*. Where a north to south row demonstrated an inconsistent result(s), SLR collected a single odour sample from that north to south row from the grid point with the highest surface velocity measured and a single odour sample from the grid point with the lowest surface velocity measured. For all north to south rows with consistent surface velocities, SLR collected single samples from the middle grids (Row B).

A total of 15 samples were collected from the Biofilter outlet. The sample locations are indicated in Figure 3.

The samples were analysed The Odour Unit (TOU), NATA accreditation No.17069 within the 30 hour from sample collection criterion as specified in AS/NZS 4323.3.

### 1.1.2 Biofilter Inlet Odour Testing

A 'lung method' was used to collect samples from the Biofilter inlet. in accordance with AS/NZS 4323.3:2001 "*Stationary source emissions – Determination of odour concentration by dynamic olfactometry"*. The samples were analysed TOU within the 30 hours of collection. One sample was collected for the inlet into the eastern bed and one sample was collected for the inlet into the western bed."

A sample access point compliant with the requirements of AS/NZS 4323.1:2021 "*Stationary source emissions - Method 1: Selection of sampling positions"* was available for the western biofilter (see **Figure 4**), but not the eastern biofilter due to the design of the eastern bed.

For the western biofilter inlet, air flow measurements were undertaken and reported in accordance with AS4321.1:2021 (and NSW EPA method TM-2 (USEPA method M2))

"*Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)*". The velocity profile was obtained across the ventilation duct from the western inlet utilising an S-Type pitot tube. Wet bulb and dry bulb temperature measurements were collected and used to estimate the gas stream moisture content.

A sample point could not be installed on the eastern biofilter inlet and several sample access points would need to be installed along the aluminium ducting to each section of the eastern bed to be able to sample the total flow. Therefore, the odour sample for the eastern biofilter inlet was collected from a sample point installed approximately midway down the biofilter (see **Figure 5**). SLR assumed that the total air flow at the eastern biofilter inlet was equal to the total air flow at the eastern biofilter.

SLR is NATA accredited for the measurement of flow in accordance with AS4323.1:2021 and NSW EPA TM-2.

**Figure 4 Illustration of Western Biofilter Inlet Sample Ports**

**Figure 5 Illustration of Eastern Biofilter Inlet Sample Port**


# 2.0 Measurement of Uncertainty

**Table 1** Provides the estimated measurement accuracy associated with the monitoring methods.

**Table 1 Estimated Measurement Uncertainty**

| Parameter | Test Method | Uncertainty |
|---|---|---|
| Velocity | NSW EPA TM-2, AS 4323.1, USEPA Method 2 | ±5 % |
| | Anemometer measurements: AS/NZS 4323.4:2009 Stationary source emissions - Area source sampling - Flux chamber technique | ±1.0% of reading ±4 ft/min (±0.02 m/s) |
| Temperature | NSW EPA TM-2, USEPA Method 2 | ±2°C |
| Moisture | Dry/wet bulb temperature | ±25% |
| Odour | AS/NZS 4323.3:2001 Stationary source emissions – Determination of odour concentration by dynamic olfactometry | ±50 - 124% (based upon a single determination) |
| | AS/NZS 4323.4:2009 Stationary source emissions - Area source sampling - Flux chamber technique | |

# 3.0 Assessment Criteria

No assessment criteria were applicable to the measurements.

# 4.0 Deviations From the Method

There were no deviations to the specified test reference methodologies.

# 5.0 Reference Conditions

Volumetric flow rates are reported as actual and normalised (dry and referenced to 0°C and 101.3 kpa).

# 6.0 Sample Plane Requirements (West Biolfilter Inlet)

**Ideal sampling positions:** In the absence of cyclonic flow activity ideal sampling plane conditions will be found to exit at 7-8 diameters downstream and 2-3 diameters upstream from a flow disturbance. However, in most cases, a suitable sampling plane will be in a position fitting the minimum criteria specified in Table 1 of AS/NZS 4323.1.

**Non-Ideal sampling position:** If the measurement near a bend is unavoidable, the sampling position shall be greater than one duct diameter upstream of the bend or greater than two duct diameters downstream of the bend. When the criteria in Table 1 of AS/NZS 4323.1 cannot be met, a greater number of sampling points shall be used in order to retain as much accuracy as is practicable.

# 7.0 Operating Conditions

The EFS substrate facility was considered to be operating under normal conditions.

# 8.0 Biofilter Odour Results

## 8.1 Biofilter Outlet Results

The Biofilter outlet was tested under normal operating conditions on Wednesday 3 July 2024 and Thursday 4 July 2024. These days are considered to represent the worst-case scenario in terms of odours being generated from the composting activities occurring on site. All samples were collected using the Witches Hat Hood method.

Refer to **Table 2** and **Table 3** for a summary of sampling times, temperature and air velocities measured within the Witches Hat hoods.

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Refer to **Table 4** to Error! Reference source not found. for results of the odour concentrations measured for the eastern and western biofilter beds. Certificates of Analysis are provided in **Appendix A**

In summary, the maximum odour concentration measured was 832 odour units (ou) and the average odour concentration measured was 350 ou.

Error! Reference source not found. provides detailed results of the mass odour emission rates (MOER) per biofilter grid cell measured. The total MOER for the entire biofilter was 18,964 ou.$m^3$/s. It is noted that MOERs presented in Error! Reference source not found. for each grid point have been calculated based on an area of 72 $m^2$ for the eastern bed samples and 83 $m^2$ for the western bed samples rather than the actual areas. This was to allow for grids that were not sampled. As such, the sum of all MOERs is representative of the whole biofilter rather than just those grid cells sampled.

**Table 2 Summary of Biofilter Measured Results – Temperature and Air Velocities – 3 July 2024**

North

| | | | Biofilter Western Bed | | | | | Biofilter Eastern Bed | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Grid Identification** | West | Row A | **11A** | **10A** | **9A** | **8A** | **7A** | **6A** | **5A** | **4A** | **3A** | **2A** | **1A** |
| Time of Measurement | | | 8:20 | 8:43 | 8:47 | 9:10 | 9:12 | 9:26 | 9:41 | 9:44 | 10:00 | 10:02 | 10:19 |
| Air Velocity (m/s) | | | 1.0 | 1.1 | 1.1 | 1.1 | 1.3 | 1.4 | 1.4 | 0.5 | 1.1 | 0.9 | 0.8 |
| Temp in WHH (°C, dry) | | | 26.7 | 28.9 | 28.9 | 29.9 | 29.1 | 28.3 | 28.3 | 22.3 | 19.3 | 18.0 | 16.3 |
| **Grid Identification** | | Row B | **11B** | **10B** | **9B** | **8B** | **7B** | **6B** | **5B** | **4B** | **3B** | **2B** | **1B** |
| Time of Measurement | | | 8:27 | 8:39 | 8:50 | 9:07 | 9:14 | 9:28 | 9:39 | 9:51 | 9:57 | 10:04 | 10:15 |
| Air Velocity (m/s) | | | 1.0 | 1.3 | 1.2 | 0.9 | 1.4 | 1.4 | 1.3 | 0.8 | 1.2 | 0.8 | 1.2 |
| Temp in WHH (°C, dry) | | | 26.2 | 28.8 | 29 | 27.9 | 28.1 | 29.0 | 27.6 | 26.0 | 29.3 | 20.6 | 24.3 |
| **Grid Identification** | | Row C | **11C** | **10C** | **9C** | **8C** | **7C** | **6C** | **5C** | **4C** | **3C** | **2C** | **1C** |
| Time of Measurement | | | 8:30 | 8:34 | 8:58 | 9:03 | 9:20 | 9:31 | 9:37 | 9:53 | 9:55 | 10:07 | 10:11 |
| Air Velocity (m/s) | | | 1.1 | 1.2 | 1.3 | 1.0 | 1.0 | 1.7 | 1.3 | 1.5 | 1.4 | 1.2 | 1.3 |
| Temp in WHH (°C, dry) | | | 27.3 | 26.9 | 29.8 | 28.2 | 26 | 29.2 | 28.5 | 28.2 | 30.6 | 26.5 | 24.0 |

East

South

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Avg. Air Velocity (m/s)** | **1.0** | **1.2** | **1.2** | **1.0** | **1.2** | **1.5** | **1.3** | **0.9** | **1.2** | **1.0** | **1.1** |
| **Avg. Air Velocity across Biofilter (m/s)** | **1.1** | | | | | | | | | | |

**Table 3 Summary of Biofilter Measured Results – Temperature and Air Velocities – 4 July 2024**

North

| | | | Biofilter Western Bed | | | | | Biofilter Eastern Bed | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Grid Identification** | West | Row A | **11A** | **10A** | **9A** | **8A** | **7A** | **6A** | **5A** | **4A** | **3A** | **2A** | **1A** |
| Time of Measurement | | | 9:35 | 9:20 | 9:17 | 9:03 | 9:01 | 8:43 | 8:33 | 8:31 | 8:18 | 8:18 | 7:55 |
| Air Velocity (m/s) | | | 1.7 | 1.4 | 1.5 | 1.1 | 1.2 | 1.2 | 1.1 | 0.4 | 0.7 | 0.7 | 0.4 |
| Temp in WHH (°C, dry) | | | 27.3 | 29.9 | 29.4 | 28.3 | 27.4 | 27.3 | 24.2 | 19.8 | 16.9 | 18.0 | 14.3 |
| **Grid Identification** | | Row B | **11B** | **10B** | **9B** | **8B** | **7B** | **6B** | **5B** | **4B** | **3B** | **2B** | **1B** |
| Time of Measurement | | | 9:34 | 9:23 | 9:14 | 9:07 | 8:59 | 8:41 | 8:36 | 8:29 | 8:21 | 8:10 | 8:01 |
| Air Velocity (m/s) | | | 1.5 | 1.5 | 1.4 | 0.7 | 1.6 | 1.5 | 0.8 | 1.0 | 1.2 | 0.8 | 1.2 |
| Temp in WHH (°C, dry) | | | 27.6 | 27.9 | 30.4 | 24.6 | 30.5 | 29.5 | 21.5 | 23.2 | 25.9 | 17.8 | 21.5 |
| **Grid Identification** | | Row C | **11C** | **10C** | **9C** | **8C** | **7C** | **6C** | **5C** | **4C** | **3C** | **2C** | **1C** |
| Time of Measurement | | | 9:30 | 9:26 | 9:12 | 9:09 | 8:55 | 8:39 | 8:38 | 8:26 | 8:24 | 9:06 | 8:03 |
| Air Velocity (m/s) | | | 1.8 | 1.5 | 1.4 | 0.8 | 1.2 | 1.6 | 1.3 | 1.4 | 1.6 | 1.3 | 1.2 |
| Temp in WHH (°C, dry) | | | 25.8 | 26.3 | 30 | 25.2 | 24.3 | 30.2 | 26.3 | 24.8 | 30.8 | 20.2 | 22.4 |

East

South

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Avg. Air Velocity (m/s)** | **1.7** | **1.5** | **1.4** | **0.8** | **1.3** | **1.4** | **1.1** | **0.9** | **1.2** | **0.9** | **0.9** |
| **Avg. Air Velocity across Biofilter (m/s)** | **1.2** | | | | | | | | | | |

## Table 4 Summary of Biofilter Outlet Results – Eastern Bed – 3 July 2024

| Parameter | Sample 1A | Sample 1C | Sample 2B | Sample 2C | Sample 3B |
|---|---|---|---|---|---|
| SLR Sample No. | 14542 | 14533 | 14534 | 14535 | 14536 |
| Sample Start Time | 03-07-2024 8:00 | 03-07-2024 11:15 | 03-07-2024 11:47 | 03-07-2024 11:47 | 03-07-2024 12:18 |
| Sample Finish Time: | 03-07-2024 8:12 | 03-07-2024 11:27 | 03-07-2024 11:57 | 03-07-2024 11:57 | 03-07-2024 12:30 |
| NATA Laboratory I.D No. | SC24331 | SC24332 | SC24333 | SC24334 | SC24335 |
| Analysis Date & Time Completed | 04-07-2024 9:51 | 04-07-2024 10:22 | 04-07-2024 10:55 | 04-07-2024 11:22 | 04-07-2024 11:49 |
| Sample Analysis Period in Compliance (≤30-hrs) | 1.6 | 22.9 | 23.0 | 23.4 | 23.3 |
| **($D_{s\ WHH}$)** Sample Point WHH Stack Internal Diameter (mm) | 100 | 100 | 100 | 100 | 100 |
| **($A_{s\ WHH}$)** Sample Plane Cross Sectional Area ($m^2$) | 0.0079 | 0.0079 | 0.0079 | 0.0079 | 0.0079 |
| **($T_{s\ WHH}$)** Average Stack (Surface) Temperature ($^oC$) | 24.3 | 24.6 | 24.5 | 29.0 | 30.4 |
| **($Ps_{\ WHH}$)** Average Stack / Surface Pressure (kPa) | 103.2 | 103.2 | 103.2 | 103.2 | 103.2 |
| **($v_{s\ (WHH)}$)** Average Grid Stack Air Velocity (m/s) | 0.80 | 1.58 | 1.16 | 1.20 | 1.32 |
| **($Q_{a\ WHH}$)** Actual Grid Flow Rate ($m^3/s$) | 0.0063 | 0.0124 | 0.0091 | 0.0094 | 0.0104 |
| **($D_{B\ WHH}$)** WHH Base Internal Diameter (mm) | 801 | 801 | 801 | 801 | 801 |
| **($A_{B\ WHH}$)** WHH Base Cross Sectional Area ($m^2$) | 0.504 | 0.504 | 0.504 | 0.504 | 0.504 |
| **($Q_{flux}$)** Actual Grid Surface Flux Velocity (m/s) | 0.012 | 0.025 | 0.018 | 0.019 | 0.021 |
| **Odour Concentration (wet) (ou)** | 158 | 169 | 60 | 128 | 181 |
| Odour Character | Water, musty | Water, musty | Water, musty, dirt | Water, musty | Water, musty, dirt |

**Table 5 Summary of Biofilter Outlet Results – Eastern Bed – 3 July 2024 – Continued**

| Parameter | Sample 4A | Sample 4C | Sample 5B | Sample 6B |
|---|---|---|---|---|
| SLR Sample No. | 14537 | 14538 | 14539 | 14540 |
| Sample Start Time | 03-07-2024 12:45 | 03-07-2024 12:45 | 03-07-2024 13:11 | 03-07-2024 13:11 |
| Sample Finish Time: | 03-07-2024 12:57 | 03-07-2024 12:57 | 03-07-2024 13:23 | 03-07-2024 13:23 |
| NATA Laboratory I.D No. | SC24336 | SC24337 | SC24338 | SC24339 |
| Analysis Date & Time Completed | 04-07-2024 13:11 | 04-07-2024 13:41 | 04-07-2024 14:17 | 04-07-2024 14:52 |
| Sample Analysis Period in Compliance (≤30-hrs) | 24.2 | 24.7 | 24.9 | 25.5 |
| **($D_{s\ WHH}$)** Sample Point WHH Stack Internal Diameter (mm) | 100 | 100 | 100 | 100 |
| **($A_{s\ WHH}$)** Sample Plane Cross Sectional Area ($m^2$) | 0.0079 | 0.0079 | 0.0079 | 0.0079 |
| **($T_{s\ WHH}$)** Average Stack (Surface) Temperature ($^oC$) | 21.8 | 31.8 | 29.0 | 33.4 |
| **($P_{S\ WHH}$)** Average Stack / Surface Pressure (kPa) | 103.2 | 103.2 | 103.2 | 103.2 |
| **($v_{s\ (WHH)}$)** Average Grid Stack Air Velocity (m/s) | 0.60 | 1.23 | 1.07 | 1.79 |
| **($Q_{a\ WHH}$)** Actual Grid Flow Rate ($m^3/s$) | 0.0047 | 0.0097 | 0.0084 | 0.0141 |
| **($D_{B\ WHH}$)** WHH Base Internal Diameter (mm) | 801 | 801 | 801 | 801 |
| **($A_{B\ WHH}$)** WHH Base Cross Sectional Area ($m^2$) | 0.504 | 0.504 | 0.504 | 0.504 |
| **($Q_{flux}$)** Actual Grid Surface Flux Velocity (m/s) | 0.009 | 0.019 | 0.017 | 0.028 |
| **Odour Concentration (wet) (ou)** | 85 | 194 | 239 | 512 |
| Odour Character | Water, musty, dirt | Water, musty | Earth, dirt | Sour, sewage |

## Table 6 Summary of Biofilter Outlet Results – Western Bed – 4 July 2024

| Parameter | Sample 7B | Sample 8A | Sample 8B | Sample 9B | Sample 10B | Sample 11B |
|---|---|---|---|---|---|---|
| SLR Sample No. | 14546 | 14547 | 14548 | 14545 | 14544 | 14543 |
| Sample Start Time | 04-07-2024 10:45 | 04-07-2024 11:20 | 04-07-2024 11:20 | 04-07-2024 10:45 | 04-07-2024 10:20 | 04-07-2024 10:20 |
| Sample Finish Time: | 04-07-2024 10:57 | 04-07-2024 11:32 | 04-07-2024 11:32 | 04-07-2024 10:57 | 04-07-2024 10:32 | 04-07-2024 10:32 |
| NATA Laboratory I.D No. | SC24344 | SC24345 | SC24346 | SC24343 | SC24342 | SC24341 |
| Analysis Date & Time Completed | 05-07-2024 13:15 | 05-07-2024 13:45 | 05-07-2024 14:28 | 05-07-2024 11:57 | 05-07-2024 11:23 | 05-07-2024 10:51 |
| Sample Analysis Period in Compliance (≤30-hrs) | 26.3 | 26.2 | 26.9 | 25.0 | 24.9 | 24.3 |
| **($D_{s\ WHH}$)** Sample Point WHH Stack Internal Diameter (mm) | 100 | 100 | 100 | 100 | 100 | 100 |
| **($A_{s\ WHH}$)** Sample Plane Cross Sectional Area ($m^2$) | 0.0079 | 0.0079 | 0.0079 | 0.0079 | 0.0079 | 0.0079 |
| **($T_{s\ WHH}$)** Average Stack (Surface) Temperature ($^oC$) | 30.0 | 31.0 | 24.3 | 24.8 | 31.7 | 30.0 |
| **($Ps_{\ WHH}$)** Average Stack / Surface Pressure (kPa) | 103.4 | 103.4 | 103.4 | 103.4 | 103.4 | 103.4 |
| **($v_{s\ (WHH)}$)** Average Grid Stack Air Velocity (m/s) | 1.11 | 1.29 | 0.92 | 1.02 | 1.21 | 1.05 |
| **($Q_{a\ WHH}$)** Actual Grid Flow Rate ($m^3/s$) | 0.0087 | 0.0101 | 0.0072 | 0.0080 | 0.0095 | 0.0082 |
| **($D_{B\ WHH}$)** WHH Base Internal Diameter (mm) | 801 | 801 | 801 | 801 | 801 | 801 |
| **($A_{B\ WHH}$)** WHH Base Cross Sectional Area ($m^2$) | 0.504 | 0.504 | 0.504 | 0.504 | 0.504 | 0.504 |
| **($Q_{flux}$)** Actual Grid Surface Flux Velocity (m/s) | 0.017 | 0.020 | 0.014 | 0.016 | 0.019 | 0.016 |
| **Odour Concentration (wet) (ou)** | 724 | 724 | 97 | 832 | 832 | 315 |
| Odour Character | Cabbage | Cabbage | Cabbage | Cabbage, Ammonia | Cabbage, water | Cabbage, water |

**Table 7 Summary of Biofilter Mass Odour Emission Rates – 5 July and 6 July 2023**

| Location | ($Q_{flux}$) Actual Grid Surface Flux Velocity (m/s) | Odour Concentration (wet) (ou) | (SOER) Surface Odour Emission Rate (wet) (ou.m/s) | Biofilter Grid Cross Sectional Area ($m^2$) | Flow through Biofilter during Sampling ($m^3$/hr) | (MOER) Mass Odour Emission Rate per Section (wet) ($ou.m^3/s$) | OIA[1] MOER Modelled Operations ($ou.m^3/s$) |
|---|---|---|---|---|---|---|---|
| Sample 1A | 0.012 | 158 | 2.0 | 72.2 | 3,240 | 141 | NA |
| Sample 1C | 0.025 | 169 | 4.2 | 72.2 | 6,400 | 300 | NA |
| Sample 2B | 0.018 | 60 | 1.1 | 72.2 | 4,700 | 78 | NA |
| Sample 2C | 0.019 | 128 | 2.4 | 72.2 | 4,860 | 171 | NA |
| Sample 3B | 0.021 | 181 | 3.7 | 72.2 | 5,340 | 267 | NA |
| Sample 4A | 0.009 | 85 | 0.8 | 72.2 | 2,430 | 57 | NA |
| Sample 4C | 0.019 | 194 | 3.7 | 72.2 | 4,980 | 267 | NA |
| Sample 5B | 0.017 | 239 | 4.0 | 72.2 | 4,330 | 285 | NA |
| Sample 6B | 0.028 | 512 | 14.3 | 72.2 | 7,250 | 1,030 | NA |
| Sample 7B | 0.017 | 724 | 12.5 | 82.7 | 5,140 | 1,030 | NA |
| Sample 8A | 0.020 | 724 | 14.6 | 82.7 | 5,980 | 1,200 | NA |
| Sample 8B | 0.014 | 97 | 1.4 | 82.7 | 4,260 | 114 | NA |
| Sample 9B | 0.016 | 832 | 13.2 | 82.7 | 4,730 | 1,090 | NA |
| Sample 10B | 0.019 | 832 | 15.7 | 82.7 | 5,610 | 1,290 | NA |
| Sample 11B | 0.016 | 315 | 5.2 | 82.7 | 4,870 | 426 | NA |
| **Total (scaled)** | **--** | **--** | **--** | **2,540** | **163,535** | **18,067** | NA |

[1] Odour Impact Assessment prepared by The Odour Unit dated 28 August 2015

## 8.2 Biofilter Inlet Results

The biofilter inlets were measured on Wednesday 3 July 2024 and Thursday 4 July 2024 in parallel with the biofilter outlet testing. Refer to **Table 8** for a detailed summary of the biofilter inlet measured results. The Certificates of Analysis is provided in **Appendix A**.

**Table 8 Summary of Biofilter Inlet Results – 5 and 6 July 2023**

| Parameter | East | West |
|---|---|---|
| SLR Sample No. | 14541 | 14549 |
| Sample Start Time | 03-07-2024 12:20 | 04-07-2024 12:53 |
| Sample Finish Time: | 03-07-2024 12:32 | 04-07-2024 13:07 |
| NATA Laboratory I.D No. | SC24340 | SC24347 |
| Analysis Date & Time Completed | 04-07-2024 15:28 | 05-07-2024 15:00 |
| Sample Analysis Period in Compliance (≤30-hrs) | 26.9 | 25.9 |
| **($A_s$)** Sample Plane Cross Sectional Area ($m^2$) | -- | 4.5 |
| **($T_s$)** Average Stack Temperature ($^oC$) | 35.6 | 34.9 |
| **(Ps)** Average Stack Pressure (kPa) | -- | 103.5 |
| **($Q_a$)** Actual Flow Rate ($m^3/hr$) | -- | 73,400 |
| Flow Rate through Biofilter Outlet during Sampling ($m^3/hr$) | 85,100[1] | 93,100 |
| **Odour Concentration (wet) (ou)** | **7,640** | **17,700** |
| **Mass Odour Emission Rate (MOER) ($ou.m^3/s$)** | **186,100** | **360,900** |
| Odour Character | ammonia, chicken feathers | rubber, ammonia |

1 denotes that SLR have assumed that Biofilter Inlet total air flow is equal to Biofilter Outlet due to no suitable access points being available to conduct air velocity measurements for the Eastern Biofilter Inlet.

## 8.3 Biofilter Efficiency Results

The efficiency of the western biofilter (for which a suitable sampling port for the measurement of air velocity is available) were assessed through the comparison of inlet versus outlet MOERs as follows:

$$\frac{\text{Inlet MOER } (358{,}383\ ou.m^3/s) - \text{Outlet MOER } (12{,}926\ ou.m^3/s)}{\text{Inlet MOER } (358{,}383\ ou.m^3/s)}$$

Result ≥ 95% efficiency

For the eastern biofilter, in the absence of a suitable sample point compliant with the requirements of AS 4323.1, efficiency calculations were assessed using the odour concentrations measured and assuming the flows through the biofilter inlet and outlet are similar.

The efficiency of the Eastern Biofilter has been calculated as follows:

$$\frac{\text{Inlet Conc.}(7640\ \text{ou}) - \text{Average Outlet Conc.}(192\ \text{ou})}{\text{Inlet Conc.}(7{,}640\ \text{ou})}$$

Result ≥ 95% efficiency

Alternatively:

$$\frac{\text{Inlet MOER}\ (186{,}100\ \text{ou.m}^3/\text{s}) - \text{Outlet MOER}\ (5{,}220\ \text{ou.m}^3/\text{s})}{\text{Inlet MOER}\ (186{,}078\ \text{ou.m}^3/\text{s})}$$

Result ≥ 95% efficiency.

# 9.0 Summary and Comparison against OIA and Previous Measurements

**Table 9** presents a comparison of odour concentrations and emission rates collected as part of this study and compares these against those assumed by the OIA and collected annually since 2018. In summary:

- The measured biofilter outlet odour emission rates (based on measured concentrations and flow through the biofilter) are 67% lower than those assumed by the OIA.
- Peak biofilter outlet odour emissions rates are estimated to be 20% lower than those assumed by the OIA.
- The average biofilter outlet odour concentration measured is 350 ou which is 30% lower than the odour concentration assumed by the OIA.
- The average biofilter odour removal efficiency is greater than 95%.

Based on the above, the biofilter is considered to be performing satisfactory on the day of monitoring.

**Table 9 Summary of Biofilter results and Comparison against OIA and Previous Measurements**

| Year | Average Flow through Biofilter during Sampling ($m^3$/hr) | Average Odour Concentration (wet) (ou) | Total Biofilter MOER (wet) (ou.$m^3$/s) | Average Biofilter Efficiency | Maximum Flow through Biofilter ($m^3$/hr) | Maximum Estimated Biofilter MOER (wet) (ou.$m^3$/s) | Change Compared to OIA (%) |
|---|---|---|---|---|---|---|---|
| OIA | | 500 | | | 390,000 | 54,168 | |
| 2018 | 204,610 | 165 | 9,482 | > 95% | 390,000 | 18,073 | -67% |
| 2020 | 189,717 | 150 | 8,767 | > 95% | 402,000 | 18,576 | -66% |
| 2021 | 193,070 | 82 | 4,578 | > 95% | 402,000 | 9,533 | -82% |
| 2022 | 233,506 | 183 | 11,752 | > 95% | 402,000 | 20,231 | -63% |
| 2023 | 122,178 | 171 | 7,360 | > 95% | 402,000 | 24,215 | -55% |
| **2024** | **166,971** | **350** | **18,067** | **> 95%** | **402,000** | **43,498** | **-20%** |

# 10.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our 2023 Charity Partner - Lifeline, for every completed form.

# Appendix A Certificate of Analysis

## ELF Farm Supplies

### Annual Biofilter Testing

**Elf Farm Supplies Pty Ltd**

SLR Project No.: 610.031984.00001

28 August 2024

THE ODOUR UNIT

☒ **Sydney Laboratory**
The Odour Unit Pty Ltd
Level 3, 12/56 Church Avenue
MASCOT NSW 2020
P: +61 2 9209 4420
E: info@odourunit.com.au
ABN: 53 091 165 061

☐ **Brisbane Laboratory**
The Odour Unit (QLD) Pty Ltd
2/57 Neumann Road
CAPALABA QLD 4165
P: +61 7 3245 1700
E: qldinfo@odourunit.com.au
ABN: 87 102 255 765

# Odour Concentration Measurement Report

**Sampling and Laboratory Information**

| | | | |
|---|---|---|---|
| Organisation | SLR Consulting | Telephone | +61 2 9424 2210 |
| Contact | D. Echeverri | Email | decheverri@slrconsulting.com |
| Sampling Site | Not disclosed | Sampling Personnel | SLR Consulting |
| Sampling Method | Not disclosed | Laboratory Location | Mascot, NSW |

**Order and Project Information**

| | | | |
|---|---|---|---|
| Order requested by | D. Echeverri | Order accepted by | A. Schulz |
| Date of order | 05/06/2024 | TOU Project # | N1869 |
| Order number | PO 35054 | Project Manager | A. Schulz |
| Signed by | D. Echeverri | Panel Operator | A. Schulz |

| | |
|---|---|
| Investigated Item | Odour concentration in odour units 'ou', determined by sensory odour concentration measurements, of an odour sample supplied in a sampling bag. |
| Identification | The odour sample bags were labelled individually. Each label recorded the testing laboratory, sample number, sampling location (or Identification), sampling date and time, dilution ratio (if dilution was used) and whether further chemical analysis was required. |
| Method | The odour concentration measurements were performed using dynamic olfactometry according to the Australian/New Zealand Standard: Stationary source emissions – *Part 3*: '*Determination of odour concentration by dynamic olfactometry* (AS/NZS 4323.3). The odour perception characteristics of the panel within the presentation series for the samples were analogous to that for butanol calibration. Any deviation from the Australian standard is recorded in the 'Comments' section of this report. |
| Measuring Range | The measuring range of the olfactometer is $2^2 \leq \chi \leq 2^{18}$ ou. If the measuring range was insufficient the odour samples will have been pre-diluted. The machine is not calibrated beyond dilution setting $2^{17}$. This is specifically mentioned with the results. |
| Environment | The measurements were performed in an air- and odour-conditioned room. The room temperature is maintained at 22 °C ±3 °C. |
| Measuring Dates | The date of each measurement is specified with the results. |
| Instrument Used | The olfactometer used during this testing session was:<br>TOU-OLF-004 |
| Laboratory Precision | The precision of this laboratory (expressed as repeatability) for sensory quality must be $r \leq 0.477$ in accordance with the AS/NZS 4323.3.<br>$r = 0.127$ Compliance – Yes |
| Laboratory Accuracy | The accuracy of this laboratory for sensory quality must be $A \leq 0.217$ in accordance with the AS/NZS 4323.3.<br>$A = 0.209$ Compliance – Yes |
| Lower Detection Limit (LDL) | The LDL for the olfactometer has been determined to be 16 ou, which is 4 times the lowest dilution setting. |
| Traceability | The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. The assessors are individually selected to comply with fixed criteria and are monitored in time to keep within the limits of the standard. The results from the assessors are traceable to primary standards of n-butanol in nitrogen. Note Disclaimers on last page of this document. |

**Accredited for compliance with ISO/IEC 17025 - Testing.**



Date: Monday, 15 July 2024

Panel Roster Number: SYD20240704_048

**A. Schulz**
Authorised Signatory

# THE ODOUR UNIT

Accreditation Number: 14974

**Odour Sample Measurement Results**
**Panel Roster Number:** SYD20240704_048

| Sample ID / Location | Laboratory ID | Sampling Date & Time | Analysis Date & Time | Panel Size | Valid ITEs | Final Odour Concentration (ou) |
|---|---|---|---|---|---|---|
| 1A - 14532 resampled as **14542** | SC24331 | 04.07.2024 0800 - 0812 hrs | 04.07.2024 0951 hrs | 5 | 10 | 158 |
| 1C - 14533 | SC24332 | 03.07.2024 1115 - 1127 hrs | 04.07.2024 1022 hrs | 5 | 10 | 169 |
| 2B - 14534 | SC24333 | 03.07.2024 1145 - 1157 hrs | 04.07.2024 1055 hrs | 5 | 10 | 60 |
| 2C - 14535 | SC24334 | 03.07.2024 1145 - 1157 hrs | 04.07.2024 1122 hrs | 5 | 10 | 128 |
| 3B - 14536 | SC24335 | 03.07.2024 1218 - 1230 hrs | 04.07.2024 1149 hrs | 5 | 10 | 181 |

**Samples Received in Laboratory** – From: SLR Consulting (D. Echeverri) Date: 03.07.2024 Time: 14:00 hrs

**Note:** The following are not covered by the NATA Accreditation issued to The Odour Unit:

1. The collection of samples by a method that is not prescribed by AS/NZS 4323.3.
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit have performed the dilution of samples.

# THE ODOUR UNIT

Accreditation Number: 14974

**Odour Sample Measurement Results**
**Panel Roster Number:** SYD20240704_048

| Sample ID / Location | Laboratory ID | Sampling Date & Time | Analysis Date & Time | Panel Size | Valid ITEs | Final Odour Concentration (ou) |
|---|---|---|---|---|---|---|
| 4A - 14537 | SC24336 | 03.07.2024 1245 - 1257 hrs | 04.07.2024 1311 hrs | 5 | 10 | 85 |
| 4C - 14538 | SC24337 | 03.07.2024 1245 - 1257 hrs | 04.07.2024 1341 hrs | 5 | 10 | 194 |
| 5B - 14539 | SC24338 | 03.07.2024 1311 - 1323 hrs | 04.07.2024 1417 hrs | 5 | 10 | 239 |
| 6B - 14540 | SC24339 | 03.07.2024 1311 - 1323 hrs | 04.07.2024 1452 hrs | 5 | 10 | 512 |
| Inlet East - 14541 | SC24340 | 03.07.2024 1220 - 1232 hrs | 04.07.2024 1528 hrs | 5 | 10 | 7,640 |

**Samples Received in Laboratory** – From: SLR Consulting (D. Echeverri) Date: 03.07.2024 Time: 14:00 hrs

**Note:** The following are not covered by the NATA Accreditation issued to The Odour Unit:

1. The collection of samples by a method that is not prescribed by AS/NZS 4323.3.
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit have performed the dilution of samples.

# THE ODOUR UNIT

Accreditation Number: 14974

## Odour Panel Calibration Results

| Reference Odorant | Reference Odorant Panel Roster Number | Concentration of Reference gas (ppb) | Panel Target Range for n-butanol (ppb) | Measured Concentration (ou) | Measured Panel Threshold (ppb) | Does this panel calibration measurement comply with AS/NZS 4323.3 (Yes / No) |
|---|---|---|---|---|---|---|
| n-butanol | SYD20240704_048 | 44,200 | $20 \leq \chi \leq 80$ | 724 | 61 | Yes |

Comments: Odour characters (non-NATA accredited) as determined by odour laboratory panel:

| Laboratory ID | Odour Character | Laboratory ID | Odour Character |
|---|---|---|---|
| SC24331 | water, musty | SC24336 | water, musty, dirt |
| SC24332 | water, musty | SC24337 | water, musty |
| SC24333 | water, musty, dirt | SC24338 | earthy, dirt |
| SC24334 | water, musty | SC24339 | sour, sewage |
| SC24335 | water, musty, dirt | SC24340 | ammonia, chicken feathers |

Departures: Clause 9.5.3 (d) – Cross-sectional distribution of airflow and concentration from port openings are not checked due to the impracticality of the requirement.

Disclaimers:
1. Parties, other than The Odour Unit, responsible for collecting odour samples have advised that they have voluntarily furnished these odour samples, appropriately collected and labelled, to The Odour Unit for the purpose of odour testing.
2. The collection of odour samples by parties other than The Odour Unit relinquishes The Odour Unit from all responsibility for the sample collection and any effects or actions that the results from the test(s) may have.
3. Any comments included in, or attachments to, this Report are not covered by the NATA Accreditation issued to The Odour Unit.
4. This report shall not be reproduced, except in full, without written approval of The Odour Unit.

Report Status

| Status | Version | Prepared by | Date | Checked by | Date | Change | Reason |
|---|---|---|---|---|---|---|---|
| Draft | 0.1 | A. Schulz | 15.07.2024 | -- | -- | -- | -- |
| Final | 1.0 | -- | -- | I. Farrugia | 15.07.2024 | -- | -- |
| Revised | 1.1 | -- | -- | -- | -- | -- | -- |

**END OF DOCUMENT**

THE ODOUR UNIT

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E: qldinfo@odourunit.com.au
ABN: 87 102 255 765

# Odour Concentration Measurement Report

**Sampling and Laboratory Information**

| | | | |
|---|---|---|---|
| Organisation | SLR Consulting | Telephone | +61 2 9424 2210 |
| Contact | D. Echeverri | Email | decheverri@slrconsulting.com |
| Sampling Site | Not disclosed | Sampling Personnel | SLR Consulting |
| Sampling Method | Not disclosed | Laboratory Location | Mascot, NSW |

**Order and Project Information**

| | | | |
|---|---|---|---|
| Order requested by | D. Echeverri | Order accepted by | A. Schulz |
| Date of order | 05/06/2024 | TOU Project # | N1869 |
| Order number | PO 35054 | Project Manager | A. Schulz |
| Signed by | D. Echeverri | Panel Operator | A. Schulz |

| | |
|---|---|
| Investigated Item | Odour concentration in odour units 'ou', determined by sensory odour concentration measurements, of an odour sample supplied in a sampling bag. |
| Identification | The odour sample bags were labelled individually. Each label recorded the testing laboratory, sample number, sampling location (or Identification), sampling date and time, dilution ratio (if dilution was used) and whether further chemical analysis was required. |
| Method | The odour concentration measurements were performed using dynamic olfactometry according to the Australian/New Zealand Standard: Stationary source emissions – *Part 3*: '*Determination of odour concentration by dynamic olfactometry* (AS/NZS 4323.3). The odour perception characteristics of the panel within the presentation series for the samples were analogous to that for butanol calibration. Any deviation from the Australian standard is recorded in the 'Comments' section of this report. |
| Measuring Range | The measuring range of the olfactometer is $2^2 \leq \chi \leq 2^{18}$ ou. If the measuring range was insufficient the odour samples will have been pre-diluted. The machine is not calibrated beyond dilution setting $2^{17}$. This is specifically mentioned with the results. |
| Environment | The measurements were performed in an air- and odour-conditioned room. The room temperature is maintained at 22 °C ±3 °C. |
| Measuring Dates | The date of each measurement is specified with the results. |
| Instrument Used | The olfactometer used during this testing session was:<br>TOU-OLF-004 |
| Laboratory Precision | The precision of this laboratory (expressed as repeatability) for sensory quality must be $r \leq 0.477$ in accordance with the AS/NZS 4323.3.<br>$r = 0.127$ Compliance – Yes |
| Laboratory Accuracy | The accuracy of this laboratory for sensory quality must be $A \leq 0.217$ in accordance with the AS/NZS 4323.3.<br>$A = 0.209$ Compliance – Yes |
| Lower Detection Limit (LDL) | The LDL for the olfactometer has been determined to be 16 ou, which is 4 times the lowest dilution setting. |
| Traceability | The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. The assessors are individually selected to comply with fixed criteria and are monitored in time to keep within the limits of the standard. The results from the assessors are traceable to primary standards of n-butanol in nitrogen. Note Disclaimers on last page of this document. |

**Accredited for compliance with ISO/IEC 17025 - Testing.**



Date: Monday, 15 July 2024

Panel Roster Number: SYD20240705_049

**A. Schulz**
Authorised Signatory

# THE ODOUR UNIT

Accreditation Number: 14974

**Odour Sample Measurement Results**
**Panel Roster Number:** SYD20240705_049

| Sample ID / Location | Laboratory ID | Sampling Date & Time | Analysis Date & Time | Panel Size | Valid ITEs | Final Odour Concentration (ou) |
|---|---|---|---|---|---|---|
| 11B - 14543 | SC24341 | 04.07.2024 1000 - 1032 hrs | 05.07.2024 1051 hrs | 5 | 10 | 315 |
| 10B - 14544 | SC24342 | 04.07.2024 1020 - 1032 hrs | 05.07.2024 1123 hrs | 5 | 10 | 832 |
| 9B - 14545 | SC24343 | 04.07.2024 1045 - 1057 hrs | 05.07.2024 1157 hrs | 5 | 10 | 832 |
| 7B - 14546 | SC24344 | 04.07.2024 1045 - 1057 hrs | 05.07.2024 1315 hrs | 5 | 10 | 724 |
| 8A - 14547 | SC24345 | 04.07.2024 1120 - 1132 hrs | 05.07.2024 1345 hrs | 5 | 10 | 724 |

**Samples Received in Laboratory** – From: SLR Consulting (D. Echeverri) Date: 04.07.2024 Time: 14:15 hrs

**Note:** The following are not covered by the NATA Accreditation issued to The Odour Unit:

1. The collection of samples by a method that is not prescribed by AS/NZS 4323.3.
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit have performed the dilution of samples.

# THE ODOUR UNIT

Accreditation Number: 14974

**Odour Sample Measurement Results**
**Panel Roster Number:** SYD20240705_049

| Sample ID / Location | Laboratory ID | Sampling Date & Time | Analysis Date & Time | Panel Size | Valid ITEs | Final Odour Concentration (ou) |
|---|---|---|---|---|---|---|
| 8B - 14548 | SC24346 | 04.07.2024 1120 - 1132 hrs | 05.07.2024 1428 hrs | 5 | 10 | 97 |
| Inlet West - 14549 | SC24347 | 04.07.2024 1253 - 1307 hrs | 05.07.2024 1500 hrs | 5 | 10 | 17,700 |

**Samples Received in Laboratory** – From: SLR Consulting (D. Echeverri) Date: 03.07.2024 Time: 14:00 hrs

**Note:** The following are not covered by the NATA Accreditation issued to The Odour Unit:

1. The collection of samples by a method that is not prescribed by AS/NZS 4323.3.
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit have performed the dilution of samples.

# THE ODOUR UNIT

Accreditation Number: 14974

## Odour Panel Calibration Results

| Reference Odorant | Reference Odorant Panel Roster Number | Concentration of Reference gas (ppb) | Panel Target Range for n-butanol (ppb) | Measured Concentration (ou) | Measured Panel Threshold (ppb) | Does this panel calibration measurement comply with AS/NZS 4323.3 (Yes / No) |
|---|---|---|---|---|---|---|
| n-butanol | SYD20240705_049 | 44,200 | $20 \leq \chi \leq 80$ | 724 | 61 | Yes |

Comments: Odour characters (non-NATA accredited) as determined by odour laboratory panel:

| Laboratory ID | Odour Character | Laboratory ID | Odour Character |
|---|---|---|---|
| SC24341 | cabbage, water | SC24346 | cabbage |
| SC24342 | cabbage, water | SC24347 | rubber, ammonia |
| SC24343 | cabbage, ammonia | | |
| SC24344 | cabbage | | |
| SC24345 | cabbage | | |

Departures: Clause 9.5.3 (d) – Cross-sectional distribution of airflow and concentration from port openings are not checked due to the impracticality of the requirement.

Disclaimers:
1. Parties, other than The Odour Unit, responsible for collecting odour samples have advised that they have voluntarily furnished these odour samples, appropriately collected and labelled, to The Odour Unit for the purpose of odour testing.
2. The collection of odour samples by parties other than The Odour Unit relinquishes The Odour Unit from all responsibility for the sample collection and any effects or actions that the results from the test(s) may have.
3. Any comments included in, or attachments to, this Report are not covered by the NATA Accreditation issued to The Odour Unit.
4. This report shall not be reproduced, except in full, without written approval of The Odour Unit.

Report Status

| Status | Version | Prepared by | Date | Checked by | Date | Change | Reason |
|---|---|---|---|---|---|---|---|
| Draft | 0.1 | A. Schulz | 15.07.2024 | -- | -- | -- | -- |
| Final | 1.0 | -- | -- | I. Farrugia | 15.07.2024 | -- | -- |
| Revised | 1.1 | -- | -- | -- | -- | -- | -- |

**END OF DOCUMENT**

# Appendix B Equipment and Calibration Details

## ELF Farm Supplies

### Annual Biofilter Testing

**Elf Farm Supplies Pty Ltd**

SLR Project No.: 610.031984.00001

28 August 2024

Table B1 summarises the equipment details for the equipment need to complete the testing.

**Table B-1**

| Equipment Type | SLR Asset Number | Manufacturer and Model | Calibration Due Date |
|---|---|---|---|
| Pitot Tube | 5076 | NA | 03-04-2027 |
| Anemometer | 5000 | TSI Velocicalc – Air Velocity Meter – Model 5725 | 24-04-2025 |
| Manometer | 2815 | Dwyer series 475 Mark III digital manometer | 07-07-2024 |
| Thermometer (digital) | 5085 | FLUKE thermometer 53/54 II B | 12-10-2024 |
| Thermocouple | 5090 | FLUKE thermocouple | 12-10-2024 |
| Thermocouple | 5092 | FLUKE thermocouple | 12-10-2024 |
| Timepiece - AQ | 5082 | Apple - Iphone | NA |
| Measuring Tape | 1960 | Craft Right | 24-05-2028 |
| Witches Hats | NA | Client owned | NA |
| Odour drum | 1622 | NA | Inspected |
| Odour drum | 1623 | NA | Inspected |
| Air pump | 2775 | SKC-Aircheck | 20-03-2025 |
| Air pump | 2776 | SKC-Aircheck | 20-05-2025 |
| Drycal | 5005 | Mesa Labs | 13-06-2025 |

# Appendix C Sampling Plane Records and Measurements

## ELF Farm Supplies

### Annual Biofilter Testing

**Elf Farm Supplies Pty Ltd**

SLR Project No.: 610.031984.00001

28 August 2024

| Description | Results | Measurement Point Pictures |
|---|---|---|
| **Location** | **West Inlet** | |
| **Date** | **04-07-2024** | |
| **Sampling time** | **12:55-13:44** | |
| Test method | **NSW EPA TM-2, AS 4323.1** | |
| **Duct diameter** | **2.4 m** | |
| **Upstream requirements** | | |
| Type of disturbance | **Bend** | |
| Distance from disturbance | **8 m** | |
| Number of duct diameters | **3.3D** | |
| Ideal minimum distance criterion | **2D** | |
| Number of diameters less than ideal | **1D** | |
| Sampling Factor | **1** | |
| **Downstream requirements** | | |
| Type of disturbance | **Connection** | |
| Distance from disturbance | **12 m** | |
| Number of duct diameters | **5D** | |
| Ideal minimum distance criterion | **6D** | |
| Number of diameters less than ideal | **1D** | |
| **AS 4323.1 compliance** | **Compliant, Non-Ideal Sampling Plane** | |
| Sampling Factor | **1.05** | |
| **Number of sampling points for manual isokinetic sampling** | | |
| Minimum number of sampling traverse | **2** | |
| Minimum number of access holes | **2** | |
| Minimum number of sampling points | **2** | |
| Total number of sampling points | **24** | |
| **Measurements** | | |
| Actual volumetric flow | **20 $m^3/s$** | |
| Normal volumetric flow | **18 $m^3/s$** | |
| Average velocity | **4.5 m/s** | |

| Description | Results | Measurement Point Pictures |
|---|---|---|
| Average Temperature | **34.9 °C** |  |
| Dry temperature | **34.9 °C** | |
| Wet temperature | **33.5°C** | |
| Moisture content | **4.4%** | |
| Static pressure | **1.0 kpa** | |
| Total absolute stack pressure | **103.5 kpa** | |
| BOM ambient pressure | **103.4 kpa** | |
| **Additional notes** | **None** | |
| **Testing officer** | **Danny Echeverri** | |